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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
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 our project. We also adopted the acceptable standards 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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**AMOEBIASIS**

**Introduction**
A common parasitic infection of the gastrointestinal system caused by the protozoan Entamoebahistolytica

**Acquired through** faeco-oral transmission.

**Clinical features**
It may present as:

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

- **Amebic abscess**
  - This can occur in any of the following forms as a result of spread via the blood stream:
    - Liver abscesses: swelling, pain in the right sub-costal area
    - Intrahepatic space-occupying lesion
    - Lungs: cough and blood stained sputum
    - Amoeboma: swelling anywhere in the abdomen
  - Anal ulceration: may occur by direct extension from the intestinal infection

**Chronic Carriers**
Symptom-free

**Differential diagnoses**
- Bacillary dysentery
- Any other cause of bloody diarrhoea
- Cancer of the liver

**Complications**
Rupture of abscess into the lungs, peritoneum
Space-occupying lesion in the brain
Right inguinal mass

**Investigations**
- Stool: microscopy for cysts and motile organisms (amebic dysentery)
- Full Blood Count
- Chest radiograph (in ameobic liver abscess)
- Abdominal Ultrasound Scan

**Treatment objectives**
Rehydrate adequately
Eradicate the protozoa

**Drug treatment**

**Amebic dysentery**
Correct dehydration (see section on rehydration)

**Metronidazole**

- **Adult**: 800 mg 8 hourly for 5 days
- **Child**: 30 mg/kg/day in 3 divided doses for 5 days

**Ameobic liver abscess**
Metronidazole

- **Adult**: 800 mg 8 hourly for 10 days
- **Child**: 50 mg/kg/day in 3 divided doses for 7-10 days

**Non-drug treatment**
Aspiration is indicated to prevent spontaneous rupture of abscesses.

**Consult a surgeon.**

**Asymptomatic cyst carriers**
Treat cyst carrier if patient is a food handler:

- **Diloxanide furoate**
  - **Child**: 200 mg orally every 8 hours for 10 days
  - **Adult**: 500 mg every 8 hours for 10 days

**Notable adverse drug reactions**

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

**BACILLARY DYSENTERY**

**Introduction**
An important cause of colonic diarrhoea in developing countries,

**Caused** by pathogenic species of Shigella A-D (dysenteri, flexneri, boydii and sonnei).

**Transmitted** via the faeco-oral route.

**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

**Differential diagnoses**
Amebic dysentery

**Idiopathic enterocolitis (ulcerative)**

**Campylobacter jejuni infection**

**Colorectal cancer**

**Complications**
- Septicaemia/bacteraemia
- Severe rectal bleeding
- Intestinal perforation

**Reiter's syndrome**

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

**Treatment objectives**
- Rehydrate adequately
- Eradicate bacterial pathogens

**Drug treatment**
- Oral Rehydration Therapy (see rehydration under diarrhoea)

- Parenteral hydration therapy (see rehydration under diarrhoea)

- Antibacterial drugs are usually not necessary: even diarrhoeas resulting from bacterial infection are usually self-limiting. Appropriate systemic antibiotics are however required when systemic infections occur.
  - Amoxicillin: 500 mg 8 hourly for 5 days
  - Cotrimoxazole: 960 mg 12 hourly for 3-5 days
  - Ciprofloxacin: 500 mg - 1 g orally 12 hourly for 5 days
  - Azithromycin: 500 mg daily for 3 days for resistant strains

**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 (classical and El Tor species).

**Excessive** secretion of fluid is mediated by the release of enterotoxin (released by the bacilli), which acts on the enterocytes of the small intestine via cyclic AMP.

**Highly infectious**; spread by faeco-oral route.

**Aetiology**
- Transmitted via the faeco-oral route.

**Clinical features**
- Mild watery diarrhoea
- Severe life-threatening diarrhoea leading to hypovolaemic shock if untreated

**Complications**
- Mild watery diarrhoea
- Severe life-threatening diarrhoea leading to hypovolaemic shock if untreated

**Investigations**
- Stool microscopy, culture and sensitivity

**Treatment objectives**
- Rehydrate adequately
- Eradicate the infective organism
- Prevent spread of the infection

**Drug treatment**
- Oral Rehydration Therapy
- Antibiotic therapy
- Tetracycline: Adult: 500 mg orally every 6 hours for 5 days

**Or:**
- Doxycycline: Adult: 200 mg orally once daily for 5 days
- Child: 12 - 18 years, 200 mg on first day, then 100 mg daily
- Severe infections, 200 mg orally daily

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

**Supportive measures**
- Monitor fluid intake and output (vomitus, urine and stool)
- Food hygiene
- Safe disposal of human waste
- Cholera vaccine

**CONSTIPATION**

**Introduction**
A clinical condition characterized by infrequent 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, cancer
- 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
**GASTRITIS**

**Introduction**
Inflammation of the gastric mucosa. Can be acute or chronic.

The most important risk factors for acute gastritis include use of drugs (NSAIDs in particular) and alcohol. *H. pylori* infection is the most important risk factor for chronic gastritis.

All agents of gastritis work through the common path of disrupting the protective mucosal barrier of the stomach. Acute gastritis may evoke pain that mimics peptic ulcer disease; chronic gastritis is a precursor of peptic ulcer disease (type B gastritis) and gastric cancer (type A gastritis).

**Clinical features**
Chronic gastritis is essentially asymptomatic. Acute gastritis evokes acute abdominal pain that mimics peptic ulcer disease (see peptic ulcer disease).

Occasionally acute gastritis may be haemorrhagic with melaena stools or rarely haematemesis.

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

**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
  - 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
  - Amoxicillin 1g orally every 12 hours for 7 days
  - Omeprazole 20 mg 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 lactase 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 faecal fat assessment
Jejunal biopsy

**Treatment objectives**
Rehydrate adequately
Eradicate parasite
Replace malabsorbed (deficient) nutrients

**Drug treatment**

Metronidazole
Adults: 2 g orally daily for 3 days or 400 mg 8 hourly for 5 days

Child: 1-3 years 500 mg orally daily; 3-7 years 600-800 mg daily; 7-10 years 1 g daily for 3 days

Tinidazole
Adults: 40 mg/kg orally as a single dose; repeat after 1 week

Child: 50 to 75 mg/kg as a single dose; repeat after 1 week

**Supportive**
Vitamin B₁₂ supplementation
Avoidance of milk

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**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
- Diabetic acidosis
- Urinary acidosis
- Hyperkalaemia: from excessive use of potassium-containing fluids

**Drug treatment**

- Antacids
- H₂ receptor antagonist
- Proton pump inhibitors

**Differential diagnoses**
- Viruses (particularly Rotavirus) are responsible for over 70% of diarrhoeas in children below 2 years.
- Many bacteria and some parasites are also important aetiologic agents, particularly in adolescents and adults.
- Endemic and epidemic presentations can occur.
- Contamination of food and water by bacterial toxins can also lead to acute diarrhoea, sometimes with associated vomiting (i.e. food poisoning). This is usually self-limiting.

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

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**Diagnosis**
- Stool microscopy and faecal fat assessment
- Jejunal biopsy

**Treatment objectives**
- Identify and eliminate cause(s)
- Evacuate hard faecal matter
- Indications for use of laxatives
- Avoid precipitants
- Antacids
- H₂ receptor antagonist
- Proton pump inhibitors

**Drug treatment**

- Oral Rehydration Therapy - ORT (low osmolarity) for mild to moderate dehydration
- Intralesional saline (0.9%)
- 1 litre 2-6 hours for moderate-to-severe dehydration
- Alternatively with Darrow's solution depending on serum potassium

**Supportive measures**
- Monitor fluid intake/output
- Provide access to safe drinking water
- Sanitary disposal of human waste

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- Watery diarrhoea of varying volumes, sometimes with vomiting: this is the commonest presentation, and suggests pathology in the small intestine.
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**Complications**
- Hypovolaemic shock with multiple organ failure
- Viral hepatitis
- Bacterial endocarditis
- Urinary tract infection

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- Intralesional saline (0.9%)
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**Supportive measures**
- Monitor fluid intake/output
- Provide access to safe drinking water
- Sanitary disposal of human waste
H. pylori

Nasogastric tube suctioning
Decrease pancreatic inflammation
Prevent, identify and treat complications

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

Prevention
Control alcohol ingestion

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 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 CO2 breath test)

Differential diagnoses

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

Treatment objectives

Relieve pain
Prevent complications

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

Analgeses
Promote healing of ulcers
Eradicate H. pylori
Prevent/reduce recurrence

Drug treatment

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

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

Or:
- Clarithromycin 500 mg orally every 12 hours for 7 days
- Amoxicillin 1g orally every 12 hours for 7 days
- Omeprazole 20 mg orally every 12 hours for 7 days

Adjunct 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

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

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- Omeprazole 20 mg orally every 12 hours for 7 days
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)

Complications
- Hypovolaemic shock
- Congestive heart failure from chronic severe anaemia

Investigations
- Upper gastrointestinal endoscopy: picks up lesions in 90% of cases
- Upper gastrointestinal barium radiography: 80% detection rate
- Selective mesenteric arteriography
- Radio isotopic scanning
- Oesophageal varices
- 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

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

Hepatitis and Biliary Disorders
HEPATITIS
Introduction
Inflammation of the liver that can be caused by infective agents, drugs and other toxins

The most predominant and important presentation of liver disease worldwide

The suffixes acute, chronic, viral, autoimmune, alcoholic etc. define the agents causing hepatic injury or their duration as the case may be

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

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 haemato poetic toxicity

Flu-like illness
Leucopenia
Psychiatric-like symptoms

Development of early resistance if theyre excess 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

Hepatic Encephalopathy
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

Predisposing 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
Fetor hepaticus
Insomnia
Flapping tremor (asterixis)

Differential diagnoses
Intracranial lesions (haemorrhage, tumour, abscess etc.)
**Investigations**
- LFTs: determine levels and nature of bilirubin, liver enzymes (AST, ALT, Alkaline phosphotase)
- Abdominal ultrasound scan: look out for canalicular dilatation and stones

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

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

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

**Supportive measures**
- Reassurance and monitoring
- Phototherapy in neonatal jaundice

**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.

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

**KWASHIORKOR**
- Definition:kwashiorkor: Kwashiorkor: Growth retardation
- Muscle wasting
- Anaemia
- Apathy
- Moon face
- Lack-luster skin
- Easily plucked hair
- Pedal oedema
- Hypo-pigmented skin patches
- Exfoliation,
- Diarrhoea
- Physical abnormalities:
  - Thin; protruding bones
  - Whimpering cry
  - Periodic growth monitoring
  - Nutritional counselling
  - Adequate nutrient intake: may require assistance and special preparations e.g. nasogastric feeding, etc.
  - Periodic growth monitoring

**Prevention**
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CHAPTER 2: BLOOD AND BLOOD-FORMING ORGANS

INTRODUCTION

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.

Anaemia can be classified on the basis of red cell morphology:

- Macrocytic
- Megaloblastic
- Non-megaloblastic

INVESTIGATIONS

Blood, urine and stool tests

TREATMENT OBJECTIVES

Correct nutrient deficiencies

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.

Classification of BMI

Underweight: <18.5 kg/m²
Normal weight: 18.5 - 24.9 kg/m²
Overweight: 25 - 29.9 kg/m²
Obesity (Class 1): 30 - 34.9 kg/m²
Obesity (Class 2): 35 - 39.9 kg/m²
Extreme obesity (Class 3): > 40 kg/m²

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).

Waist/hip ratio = Waist circumference (in cm) divided by 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:

- Gall stones

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 diseases:

- 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

Dietary changes and increased level of physical activity are the most economical means to lose weight.

Maintain records of goals, instructions and weight progress charts

Surgical intervention may be required in extreme cases

CHAPTER 1: ALIMENTARY TRACT

Chapter 1: Alimentary Tract

Standard Treatment Guidelines for Nigeria 2008

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INVESTIGATIONS

Blood, urine and stool tests

Other investigations as appropriate

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Chapter 2: Blood and Blood-Forming Organs

Types of blood transfusion

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 preparations:

Iron dextran given as "total dose" infusion

Dose in mL (of 50 mg/mL preparations) = \[\text{Patient's wt. in kg} \times \frac{14 \text{ Hb in g/dL}}{10}\]

**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

**Response of the newborn anaemia**

- Response to therapy is satisfactory if administered dose is limited to the minimal daily requirement
- Treatment with vitamin B12 (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 B12 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 haematologic response in vitamin B12-deficient patients but worsen the neurological complications

Large doses of vitamin B12 also give haematologic 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
- Safest blood for patients

The three main types are:

- 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:

- Recurrent acute haemorrhage
- Haemolytic disease of the new born
- 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
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
  - Septicemia
  - Miliary tuberculosis
  - Malignant histiocytosis
- Worsening ill-health
- Coomb's test
- Bone marrow examination
- Liver function tests
- Prothrombin time, partial thromboplastin 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

Investigations

- Haematocrit
- Red cell indices: MCH, MCV, MCHC
- Total haemocyte and differential counts
- Reticulocyte count
- Erythrocyte sedimentation rate
- Platelet count
- Treatment objectives
  - To raise haemoglobin concentration and other blood parameters to normal levels
  - To prevent blood transfusion complications
- Non-drug treatment
  - Tranexamic acid
  - Tranexamic acid
- Iron therapy
  - Parenteral iron

Drug treatment

- Furosemide 40 mg on administration of one unit of blood
- Promethazine 25 mg intramuscularly or intravenously
- Hydrocortisone sodium succinate 100 mg injection
- Appropriate nutrition
- Adequate hydration
- Notable adverse drug reactions, caution
- Furosemide: dehydrations, hypersensitivity
- Immediate: drowsiness, hypersensitivity
- Prevention
- Avoid/prevent accidents

HAEMOSTASIS AND BLEEDING DISORDERS - refer for specialist care

LEUKAEMIAS

Introduction

Two heterogeneous group of diseases characterized by infiltration of the blood, bone marrow and other tissues by neoplastic cells of the haematopoietic system

- Two main types
  - Myeloid leukaemia
  - Lymphoid leukaemia
- Each is further divided into acute and chronic
- Acute leukaemias are defined pathologically as blast cell leukaemias or malignancies of immature haematopoietic cells. The bone marrow shows > 30% blast cells
- Two main groups of acute leukaemias
  - Acute myeloid leukaemia (AML)
  - Acute lymphoblastic leukaemia (ALL)
- Childhood leukaemias: patients aged < 15 years
- Adult leukaemias: patients aged > 15 years
- Leukaemias in adults aged > 60 years: an important group because
  - Their responses to current treatment protocols both for ALL and AML are inferior
  - These patients are not usually considered for more radical treatment approaches such as autologous or allogeneic bone marrow transplantation
- 80% of adult cases: AML

Epidemiology/predisposing conditions

Acute lymphoblastic leukaemia (ALL) and Acute myeloid leukaemia (AML)

More common in industrialized than rural areas
- Environmental agents implicated in the induction of certain types of leukaemia:
  - Ionising radiation: X-rays and other ionizing rays
  - Chemical carcinogens
  - Benzene and other petroleum derivatives
  - Alkylating agents
- Host susceptibility e.g. genetic disorders:
  - Bloom's syndrome
  - Fanconi's anaemia (AML)
  - Ataxia telangiectasia (ALL)
  - Down's syndrome
  - blast transformation in pre-existing myeloproliferative disorders:
    - Aplastic anaemia (ALL)
    - Oncogenic viruses:
      - HTLV-1 (Human T-cell Lymphotropic virus 1): implicated in adult T cell leukaemia/lymphoma

Treatment objectives

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

Non-drug treatment

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

Chapter 2: Blood and Blood-Forming Organs

- Febrile transfusion reactions
- Post-transfusion purpura
- Reactions due to white cell and plasma protein antibodies
- Uracil
- Anaphylaxis
- Non-malignant: Transmission of disease
- Circulatory overload
- Thrombophlebitis
- Air embolism
- Transfusion haemosiderosis
- Complications of massive transfusion

Tests of Compatibility

A minimum of three major procedures must be carried out:
- Determine the recipient's ABO and Rhesus groups
- Select compatible donor blood
- Cross-match donor cells against recipient's serum

Donor blood should be screened for infective agents:
- HIV, hepatitis B, and C viruses

Other investigations

- Haemoglobin concentration
- Haematocrit
- Red cell indices: MCH, MCV, MCHC
- Total haemocyte and differential counts
- Reticulocyte count
- Erythrocyte sedimentation rate
- Platelet count

Treatment objectives

- To raise haemoglobin concentration and other blood parameters to normal levels
- To prevent blood transfusion complications

Non-drug treatment

- Tranexamic acid
- Tranexamic acid
- Iron therapy
- Parenteral iron

Drug treatment

- Furosemide 40 mg on administration of one unit of blood
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- Notable adverse drug reactions, caution
- Furosemide: dehydrations, hypersensitivity
- Immediate: drowsiness, hypersensitivity
- Prevention
- Avoid/prevent accidents

Standard Treatment Guidelines for Nigeria 2008

- Prompt treatment of illnesses that could be complicated by anaemia
- Regular medical check-ups
**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
- For 7 days
  - Prednisolone 40 mg/m² orally for 14 days
  - Nervous system prophylaxis is not required
  - Assess for remission after 3 courses

**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-potent haemopoietic 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 leukemia
    - 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

**Blasts -5% but <30% in marrow**
- Anemia (Hb <10 g/dL) not attributable to treatment

**Thrombocytosis (>1000 x 10⁶/L)**
- Acquisition of specific new cytogenetic abnormalities
- Increasing marrow fibrosis

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

**Prognosis**

**Induction**
- Daunorubicin 60 mg/m² by intravenous infusion over one hour on days 3 - 9
- Vincristine 1.4 mg/m² intravenously on days 1 and 8
- Cytarabine 50 mg/m² subcutaneously every 12 hours

**Consolidation**
- To be given every 3 months with
- Daunorubicine 1.4 mg/m² to a maximum of 2 mg weekly on days 1 and 8

**Maintenance**
- Methotrexate 20 mg/m² orally weekly
- For 3 years if remission is maintained, otherwise reassessment

**Pulse therapy**

**Intensification**

**To be given on day 29**
- COAP regimens to be given once provided WBC count is
  - 1x10⁹/L and platelet count is = 100 x 10⁹/L

**Maintenance**
- 6-Mercaptopurine 75 mg/m² orally daily
- Methotrexate 20 mg/m² orally daily

**Non-drug treatment**

**Drug treatment**

**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**
- Profound nausea, vomiting, diarrhoea and abdominal discomfort
- Secondary malignancies
- Steroids: Cushing’s syndrome, hypertension, diabetes mellitus, immunosuppression, infections
- Vincristine: neurotoxicity

**Daunorubicin: alopecia, haemorrhagic cystitis
Cytosine Arabinoside: 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 bone blood 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
- - Less than 10% of patients have symptoms
- - Accounts for 60% of cases
- - Rarely diagnosed below the age of 40 years

**Clinical features**
- Asymptomatic
- Anorexia
- Lymphadenopathy
- Splenomegaly
- Increased risk of developing CLL with exposure to high doses of irradiation
- Increased risk of developing CLL with exposure to high doses of irradiation
- 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

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

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

**Investigations**

**Treatment objectives**

**As for acute leukaemia plus**
- Determination of Philadelphia chromosome
- Lactic dehydrogenase
- Serum calcium
- Determination of Philadelphia chromosome
- Lactic dehydrogenase
- Serum calcium

**Chapter 2: Blood and Blood-Forming Organs**

**Standard Treatment Guidelines for Nigeria 2008**

**Clinical features**
- Asymptomatic
- Abdominal swelling/pain
- Lethargy
- Shortness of breath on exertion
- Weight loss
- Unexplained haemorrhage at various sites e.g. gums, intestinal/urinary tract
- Increased sweating
- Visual disturbances
- Gout
- Priapism
- Anaemia
- Haemorrhage
- Fever
- Lymphadenopathy (rare in chronic phase)

**Complications**
- Blastic transformation
- Death

**Investigations**

**Treatment objectives**

**As for acute leukaemia plus**
- Determination of Philadelphia chromosome
- Lactic dehydrogenase
- Serum calcium
- Determination of Philadelphia chromosome
- Lactic dehydrogenase
- Serum calcium
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

**Pathophysiology**

- Vary widely according to histological subtype, stage and bulk of disease
- Prednisolone 100 mg orally on days 1-5
- Repeat every 3 weeks

**Supportive measures**

- Appropriate nutrition
- Adequate hydration
- Red cell and platelet concentrate transfusions as required

**Sickle cell disease**

- Prednisolone 1.4 mg/m² (maximum 2 mg) on days 1 and 8
- Vincristine 1.4 mg/m² (maximum 2 mg) intravenously on days 1 and 8
- Prednisolone 40 mg orally on days 1-14
- MOPP

**Hodgkin's lymphoma**

- Mechlorethamine 6 mg/m² intravenously on days 1 and 8
- Vincristine 1.4 mg/m² (maximum 2 mg) intravenously on days 1 and 8
- Procarbazine 100 mg/m² orally on days 1 and 8
- Prednisolone 40 mg orally on days 1-14

**Optional**

- Chlorambucil 6 mg/m² orally on days 1 and 14
- Vinblastine 6 mg/m² (maximum 10 mg) intravenously on days 1 and 18
- Prednisolone 40 mg orally on days 1-14

**Supportive measures**

- Appropriate nutrition
- Adequate hydration
- Red cell and platelet concentrate transfusions as required

**Notable adverse drug reactions, caution**

- All the drugs are contraindicated in patients with hypersensitivity reactions to the respective medicines
- Profound nausea, vomiting, diarrhoea and abdominal discomfort
- Secondary malignancies
- Myelosuppression (except the steroids)
- Steroids (prednisolone) may cause Cushing's syndrome, hypertension, diabetes mellitus, suppression of immunity, infections
- Vincristine: neurotoxic
- Cyclophosphamide: alopecia and haemorrhagic cystitis
- Doxorubicin: cardiotoxic

**Prevention**

- Avoid unnecessary exposure to irradiation and chemicals

**LYMPHOMAS**

**Introduction**

- Solid neoplasms that originate in lymph nodes or other lymphatic tissues of the body
- A heterogeneous group of disorders
- Can arise at virtually any site
- More often occurs in regions with large concentrations of lymphoid tissues, e.g. lymph nodes, tonsils, spleen and bone marrow
- Two main groups:
  - Hodgkin's disease
  - Non-Hodgkin's lymphomas

**Hodgkin's disease**

- Hodgkin's disease is characterized by Reed-Sternberg cells (large binucleate cells with vesicular nuclei) and prominent eosinophilic nucleoli
- Reed-Sternberg cells are occasionally found in other clinical conditions e.g. hyperplastic or inflammatory lesions of lymph nodes

**Non-Hodgkin's lymphomas**

- A heterogeneous collection of lymphoproliferative malignancies
- Vary widely according to histological subtype, stage and bulk of disease

**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

**Pathophysiology**

- Vary widely according to histological subtype, stage and bulk of disease
- Prednisolone 100 mg orally on days 1-5
- Repeat every 3 weeks

**Supportive measures**

- Appropriate nutrition
- Adequate hydration
- Red cell and platelet concentrate transfusions as required

**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
- Chlorambucil 6 mg/m² orally on days 1 and 14
- Prednisolone 40 mg orally on days 1 and 8
- Vincristine 1.4 mg/m² (maximum 2 mg) intravenously on days 1 and 8
- Prednisolone 40 mg orally on days 1-14
- MOPP

**Hodgkin's lymphoma**

- Mechlorethamine 6 mg/m² intravenously on days 1 and 8
- Vincristine 1.4 mg/m² (maximum 2 mg) intravenously on days 1 and 8
- Procarbazine 100 mg/m² orally on days 1 and 8
- Prednisolone 40 mg orally on days 1-14

**Optional**

- Chlorambucil 6 mg/m² orally on days 1 and 14
- Vinblastine 6 mg/m² (maximum 10 mg) intravenously on days 1 and 18
- Prednisolone 40 mg orally on days 1-14

**Supportive measures**

- Appropriate nutrition
- Adequate hydration
- Red cell and platelet concentrate transfusions as required

**Notable adverse drug reactions, caution**

- All the drugs are contraindicated in patients with hypersensitivity reactions to the respective medicines
- Profound nausea, vomiting, diarrhoea and abdominal discomfort
- Secondary malignancies
- Myelosuppression (except the steroids)
- Steroids (prednisolone) may cause Cushing's syndrome, hypertension, diabetes mellitus, suppression of immunity, infections
- Vincristine: neurotoxic
- Cyclophosphamide: alopecia and haemorrhagic cystitis
- Doxorubicin: cardiotoxic

**Prevention**

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**SICKLE CELL DISEASE**

**Introduction**

- A group of conditions with pathological processes resulting from the presence of Haemoglobin S
- Usually inherited from the parents who have themselves inherited haemoglobin S
- The principal genotypes include:
  - Homozygous sickle cell disease (SS)
  - Sickle cell-haemoglobin C disease (SC)
  - Sickle cell-B-thalassaemia (SBthal)
- Sickle cell-B-thalassaemia Type I (SBthalthal.Type I)
- Sickle cell-B-thalassaemia Type II (SBthalthal.Type II)

**Prevention**

- Avoid unnecessary exposure to irradiation and chemicals

**Clinical features**

- Vary widely from one patient to another:
  - Persistent anaemia/pallor
  - Growth retardation (variable)
  - Jaundice (variable)
  - Bone pains (recurrent)
  - Prominent facial bones due to increased bone marrow activity
  - Leaner body build and less weight (on average)
  - Some fingers are shortened as a result of infarction (destruction due to blockage of blood supply)
  - Hand-foot syndrome (painful and swollen hands and feet) in childhood
- Life span on average shorter than normal
- Sexual development is delayed in both sexes: menarche occurs at a mean age of 15.5 years (range 12 - 20 years) compared to non-sicklers (mean 13.2 years)
- Impotence can occur from prolonged priapism
- High foetal loss in pregnancy

**Sickle cell crises**

- Patient has acute symptoms/signs attributable directly to sickle cell disease
- Two main types:
  - Pain (vaso-occlusive) crisis
  - Anaemia crisis
- Vaso-occlusive crises

**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
- Normal haemoglobin F

**Sickle cell disease**

- 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**

- Red cells have reduced deformability and easily adhere to vascular endothelium, increasing the potential for decreased blood flow and vascular obstruction
- Abnormalities in coagulation, leucocytes, vascular endothelium, and damage to the membranes of red cells contribute to sickling
- Haemolytic anaemia and vasculopathy are the result of the various pathophysiologic processes
- Organ damage is on-going and is often silent until far advanced
- The course of the disease is punctuated by episodes of pain

**Clinical features**

- Vary widely from one patient to another:
  - Persistent anaemia/pallor
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  - Jaundice (variable)
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- Vaso-occlusive crises
## Chapter 2: Blood and Blood-Forming Organs

### Painful
- Tender, swollen bones
- Acute hepatopathy
- Acute chest syndrome
- Priapism

### Painless
- Haematuria
- Cerebrovascular disease (accident) - in descending order of prevalence:
  - Thrombotic stroke
  - Haemorrhage
  - Retinopathy (commonest in SC patients)

### Anaemic crises
- Acute splenic (or hepatic) sequestration
- Hyper-haemolytic (e.g. precipitated by malaria)
- Megaloblastic (folic acid deficiency)
- Haemolytic (due to infection or renal failure)
- Aplastic (e.g. due to epidemic parvo virus B19)

### Differential diagnoses:
- Connective tissue disorders e.g. rheumatoid arthritis
- Liver disease
- Other causes of failure to thrive

### Complications
- Kids:
  - Hypostenuria (reduced ability to concentrate urine/conservé body fluids)
  - Haematuria
  - Albuminuria
  - Reduced kidney function
  - Occur around ankles
  - Heal slowly and tend to recur
- Bones and Joints
  - Osteomyelitis
  - Avascular necrosis
- These may cause:
  - Hip pain
  - Limping gait
  - Kyphoscoliosis when necrosis affects spinal vertebral bones

### Infections:
- Salmonella osteomyelitis
- Pneumococcal pneumonia
- Pneumococcal meningitis (rare in adolescents and adults)
- Tonsillitis and pharyngitis
- Brain and nerves:
  - Strokes, seizures (not common in adults)
  - Menigitis (not common in adults)
  - Cerebral haemorrhage
  - Mental neuropathy (rare)

### Cardiovascular/respiratory:
- Heart failure

### Investigations
- Full Blood Count (haemoglobin, haematocrit, total leucocyte count and differential counts, platelet counts)
- Erythrocyte sedimentation rate
- Red cell indices (MCH, MCHC, MCV)
- Reticulocyte count
- Sickling tests: solubility test, metabisulphite test
- Haemoglobin electrophoresis
- Seizures:
  - Using cellulosic acetate paper at pH 8.4 (alkaline)
  - or citrate gel at pH 5.6 (acidic)
- Serum Electrolytes, Urea and Creatinine

### Treatment
- Maintain (or restore) a steady state of health
- Prevent and treat complications
- Provide accurate diagnosis, relevant health education and genetic counselling to patients, relatives and heterozygotes
- Improve quality of life
- Provide a positive self-image in affected persons

### Treatment strategies
- Counselling and health education
- Encouraging membership of support groups
- Providing infection prophylaxis (antimalarial; anti-pneumococcal, hepatitis B virus vaccines)
- Providing folate supplementation
- Avoiding pain-inducing conditions
- Providing prompt treatment of symptoms
- 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

### Pulmonary hypertension
- Acute chest syndrome

### Adjunct treatment

<table>
<thead>
<tr>
<th>Disease</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>Anti-malarials</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>1 g, every 4 - 6 hours to a maximum of 4 g daily</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>Anti-haemolytic agents</td>
</tr>
<tr>
<td>Sodium Phosphate</td>
<td>100 mg daily</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>1 g, every 4 - 6 hours to a maximum of 4 g daily</td>
</tr>
<tr>
<td>Pneumococcal pneumonia</td>
<td>Anti-pneumococcal vaccine</td>
</tr>
</tbody>
</table>

### 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
- Myocardial infarction
- 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
- ß blockers
  - Atenolol 50 - 100 mg daily
  - Glyceryl trinitrate 0.3 - 1 mg sublingually, repeated as required
  - Verapamil 80 - 120 mg orally 8 hourly
  - Aspirin (acetylsalicylic acid) 75 mg orally daily

- Nitrates
  - Glyceryl trinitrate 0.3 - 1 mg sublingually, repeated as required
  - Isosorbide 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

Treat as for acute myocardial infarction

Sinus arrhythmias

Coronary artery bypass graft (CABG)

Anxiety

Other measures

- Antidepressants
- Antipsychotics
- Antiepileptics

Treat/reduce risk factors

- Hypertension
- Hypercholesterolaemia
- Diabetes mellitus
- Smoking
- Obesity
- Male sex
- Age

Other measures

- Angioplasty (PTCA)
- Coronary artery bypass graft (CABG)
- Ablation (electrophysiology)
- Cardioversion: acute arrhythmias

Drug treatment

- ß blockers
- Bradycardia
- Caution in asthmatics and patients with chronic obstructive airways disease because of bronchoconstriction.
- Nitrites: hypotension
- Calcium channel antagonists: hypotension
- Aspirin, thrombolytics: bleeding
- Avoid in recent stroke and in upper gastrointestinal bleeding
- Avoid concurrent use of ß-blockers with verapamil

Prevention
- Nutrition education
- Address risk factors
- Healthy living

CARDIAC ARRHYTHMIAS

Introduction
Conditions in which cardiac rhythms become abnormal

- Usually complicate acquired and congenital heart diseases
- Abnormal arrangements of the cardiac impulse fibres or fibrosis affect the conduction fibres

Clinical features
- Mild arrhythmias might go unnoticed
- May present with:
  - Palpitations
  - Sudden collapse
  - Dizziness
  - Syncope
  - Near-syncope
  - May be complicated by cardiac failure, stroke, etc

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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
- Electrophysiology
- Electrocardiography
- Foetal echocardiography
- Angiography

Treatment objectives
- Relieve symptoms
- Treat the definitive defect(s)
- 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

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
- Prothrombine time
- KCCT
- Doppler of the leg/pelvic vessels (veins)
**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

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

**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)

**CHARTERED CARDIOVASCULAR SYSTEM**

**Echocardiography**

**Electrocardiography**

**Venography** (pelvic or calf veins)

**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

**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
The commonest cause in Nigeria is hypertension
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

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**HYPERLIPIDAEMIA**

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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, xanthelasma, and corneal arcus

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

**Complications**
- Ischaemic heart disease
- Peripheral vascular disease

**Precautions**
- The use of β blockers, atrial natriuretic peptide analogues and endothelin receptor antagonists should be reserved for specialist care

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

**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
Chapter 3: Cardiovascular System

Differential diagnoses
- White coat hypertension
- Anxiety/fright/stress

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

Investigations
- Full Blood Count
- Urea, Electrolytes and Creatinine
- Electrocardiography
- Chest radiograph
- Echocardiography
- Urinalysis; urine microscopy

Investigations (not in all cases)
- Abdominal ultrasound
- Renal angiography (not in all cases)

Treatment objectives
- Educate patient about disease and need for treatment adherence
- Reduce blood pressure to acceptable levels
- Prevent complications (primary, secondary, tertiary)
- Rehabilitate

Non-drug treatment (lifestyle modification)
- Low salt diet
- Achieve/maintain ideal body weight (BMI 18.5 - 24.9 kg/m²)
- Stop smoking
- Regular moderate exercise
- Reduce polyunsaturated fatty acid intake

Drug treatment
- Diuretics:
  - Thiazides
  - Bendroflumethiazide 2.5 - 10 mg orally 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 or every 8 - 12 hours
- Or:
- 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
- Or:
- Prazosin 0.5 - 1 mg orally daily
- Centrally acting drugs:
- Alpha methyldopa 250 - 500 mg orally twice, three or four times daily
- Fixed combinations:
- Reserpin 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
- Involve the administration of antihypertensives by the parenteral route (usually intravenous hydralazine or sodium nitroprusside)

Supportive measures
- Patient/care giver education
- Notable adverse drug reactions
drug reactions, caution and contraindications
- All antihypertensive drugs may themselves cause hypotension
- Angiotensin converting enzyme inhibitors, angiotensin receptor blockers: angioedema; cough with ACEIs
- Alpha methylldopa, thiazides (and potentially other anti-hypertensive drugs): erectile dysfunction
- SLE-like syndrome: hydralazine
- Do not use β-blockers in asthmatics

Prevention
- Weight reduction
- Exercise moderately and regularly
- Public education
- Individual approach
- Population approach
- Advocacy for the positive lifestyle change

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 nodes
- Janeway lesions
- Roth spots

Differential diagnoses
- Myocarditis
- Rheumatic heart disease

Complications
- Cardiac failure
- Destruction of heart valves
- Systemic embolism (could be infective)

Investigations
- Full Blood Count and differentials; ESR
- Urinalysis; urine microscopy
- Echocardiography
- Bed rest
- Low salt diet

Drug treatment
Initiate therapy with:
- Benzylpenicillin 7.2 g daily by slow intravenous injection or intravenous infusion in 6 divided doses for 4 - 6 weeks
- May be increased up to 14.4 g daily if necessary (e.g. in endocarditis)
- Non-drug treatment
- Bed rest
- Low salt diet

Drug treatment
Initiate therapy with:
- Benzylpenicillin 7.2 g daily by slow intravenous injection or intravenous infusion in 6 divided doses for 4 - 6 weeks
- May be increased up to 14.4 g daily if necessary (e.g. in endocarditis)
- Gentamicin 60 - 80 mg intravenously or intramuscularly every 8 hours for 2 weeks

Following bacteriological confirmation institute appropriate antimicrobial therapy
- Staphylococci:
  - Flucloxacillin
  - 250 mg - 2 g intravenously every 6 hours for 4 - 6 weeks
- Candida:
  - Systemic antifungals

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 for 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 3 years: a quarter of adult dose; 5 - 10 years: half/adult dose
     - Or:
     - Adult: 3 g orally 4 hours before induction, then 3 g orally as soon as possible after the procedure
     - Child under 3 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
Treat the effect on the heart
Treat complications
Bed rest

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

Notable adverse drug reactions
Antiarrhythmics may be pro-arrhythmic

Exercise (later)
Stop smoking
Aspirin (acetylsalicylic acid) 150 - 300 mg orally stat, then 75 - 150 mg daily

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
- Preceding pain: discomfort, heaviness, tightening lasting 30 minutes or more
- Shortness of breath
- Palpitations
- Cough productive of frothy sputum
- Signs of right or left-sided cardiac failure and shock

Differential diagnoses
- Pulmonary embolism
- Aortic dissection
- Pericarditis

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

Investigations
- Full Blood Count; ESR
- Urea, Electrolytes and Creatinine
- Uric acid
- Fasting blood glucose
- 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

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

Drug treatment
- Aspirin (acetylsalicylic acid) 150 - 300 mg orally stat, then 75 - 150 mg daily
- Morphine 10 mg by slow intravenous injection over 5 minutes (i.e. 2 mg/minute)

Unfractionated heparin
Adult: 5,000 - 10,000 units (75 units/kg) by intravenous injection as loading dose followed by continuous infusion of 15 - 25 units/kg/hour
- 15,000 units 12 hours by subcutaneous injection

Small adult or child: lower loading dose, then 15 - 25 units/kg/hour by intravenous infusion, or 250 units/kg every 12 hours by subcutaneous injection

Or:
- Lowmolecular weightheparin
- Enoxaparin: 30 mg intravenous bolus (optional) then 1 mg/kg subcutaneously every 12 hours for 7 - 8 days

Thrombolytics
- Streptokinase
Adult: 1,500,000 units by intravenous infusion over 60 minutes, then 250 units over 30 minutes according to condition (with monitoring)
Child: 1 month - 12 years, initially 2,500 - 4,000 units/kg over 30 minutes followed by continuous infusion of 500-1,000 units/kg/hour for up to 3 days until reperfusion occurs
- 12 - 18 years: initially 250,000 units intravenously over 30 minutes, followed by intravenous infusion of 100,000 units/hour for up to 3 days until reperfusion occurs

Recombinant plasminogen activator (use by specialist physician)
- Alteplase 15 mg intravenously over 1 - 2 minutes, followed by intravenous infusion of 50 mg over 30 minutes then 35 mg over 60 minutes
(Total dose, 100 mg over 90 minutes; lower doses in patients less than 65 kg
- B blockers
- Atenolol 50 - 100 mg orally daily
- Propranolol 180 - 240 mg orally in 2 - 4 divided doses daily
- Angiotensin converting enzyme inhibitors
- Captopril 6.25 - 50 mg orally once, twice or three times daily
- Lisinopril 2.5 - 10 mg daily

Maintenance anti-anginal therapy
- Coronary artery bypass graft (CABG)
- Secondary or rescue PTCA

Supportive measures
- Treat arrhythmias
- Oxygen: 100% at 5L/minute

Notable adverse drug reactions, caution
- Heparin or streptokinase: bleeding (risk of bleeding in recent stroke, diabetic retinopathy, brain tumours, peptic ulcer disease or surgery)
- Laboratory monitoring is essential: preferably daily, and dose adjusted accordingly
- Aspirin: dyspepsia
- ß-blockers: bradycardia
- Should be avoided in patients presenting with this symptom

Prevention
- Treat hypertension, diabetes mellitus, and hyperlipidaemia
- Stop smoking
- Nutrition education

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
Poisons e.g. alcohol
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
Cardiomegaly
S3 or S4 (with or without murmurs of regurgitation in the mitral/tricuspid areas)

Differential diagnoses
- Other forms of cardiac failure, e.g. peripartum cardiac failure

Investigations
- Full Blood Count and differentials
- Urea, Electrolytes and Creatinine
- Uric acid
- Fasting blood glucose
- Lipid profile
- Enzyme assays: AST, CK-MB, and LDH
- Electrocardiograph monitoring throughout admission
- Coronary angiography
- Myocardial biopsy

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

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Treat the effect on the heart
Treat complications

Non-drug treatment
Bed rest

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

Notable adverse drug reactions
- Antiarrhythmics may be pro-arrhythmic

Prevention
- Prevent infection (viral, bacterial, etc)
- 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

Differential diagnoses
- Endomyocardial fibrosis
- Sarcoidosis
- Amyloidosis

Complications
- Pericardial tamponade
**PULMONARY EMBOLISM**  
(Also see in Respiratory system)  

**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 thrombus-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

**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 400 - 800 mg orally every 12 hours  
- Steroids  
  - Prednisolone 30 mg orally every 8 hours  

**Differential diagnoses**  
- Lobar pneumonia  
- Myalgia  
- Pleurisy

**Complications**  
- Right-sided cardiac failure  
- Arrhythmias  
- Hypotension  
- Peptic ulcer disease  

**Investigations**  
- Full Blood Count and differentials  
- Electrocardiograph  
- Sinus tachycardia  
- Atrial fibrillation/flutter  
- S wave in lead 1, Q wave in lead 3 and an inverted T wave in lead 3  
- QRS axis >90°, 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 to 10,000 units intravenously stat, followed by 1000 - 2000 units per hour (APTT or INR 1.5 - 2.5 greater than normal)  
- 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)  
- Warfarin  
  - 1 - 5 mg (INR 1.5 - 2) for 6 - 12 weeks (as maintenance after initial parenteral anticoagulation)

**Prevention**  
- Avoid radiation  
- Prevent infection

**RHEUMATIC FEVER**  

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

**Major:**  
- Carditis  
- Sydenham's chorea  
- Erythema marginatum  
- Subacute nodules  
- Arthritis (migratory polyarthritis)  

**Minor:**  
- Fever  
- Leucocytosis  
- Arthralgia  
- Raised ESR  
- Raised ASO titre (> 200 IU)  

**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
Throat swab
Treatment objectives
Relieve symptoms
Treat the bacterial throat infection
Reduce or abolish inflammatory process
Treat cardiac failure if present
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 62.5 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 mg every 6 hours; 2 - 8 years 250 mg every 6 hours; doses doubled for severe infections

  Saliycylates - 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

  - Initialy, up to 10 - 20 mg orally daily; up to 60 mg daily in severe disease (preferably taken in the morning after breakfast); dose can often be reduced within a few days, but may need to be continued for several weeks or months

- Maintenance 2.5 - 15 mg orally daily

Prophylaxis against infective endocarditis

- Benzathine penicillin 720 mg (1.2 million units) intramuscularly 3 - 4 weekly until the age of 25 years (or 10 years after the attack whichever is longer)

Notable adverse drug reactions
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
Secondary prevention and prophylaxis against endocarditis

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
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 radiograph
Coronary angiography

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

Non-drug treatment
Bed rest
Low salt diet

Drug treatment
Treat for heart failure if present
Use anticoagulants if necessary

A common cause of cardiac failure in Nigeria
Prophylaxis against endocarditis (see Infective Endocarditis)
Benzathine penicillin 720 mg (1.2 million units) intra muscularly monthly for life
Other measures:
- Valve replacement
- Valve repair
- Treat endocarditis

Notable adverse drug reactions, caution
Penicillin may cause hypersensitivity reaction / anaphylaxis
- Caution in patients with a history of penicillin allergy

Prevention
Personal hygiene and good sanitation to prevent recurrence of rheumatic fever

Chapter 3: Cardiovascular System

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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
Hysteria
Premonitory symptoms of epilepsy
Migraine aura

Warning symptom of posterior circulation stroke
Brain tumour (acoustic neuroma)

Falls with injury
Embolic phenomena

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

Differential diagnoses
Benign positional vertigo
Labyrinthine disorders
Hysteria
Premonitory symptoms of epilepsy
Migraine aura

Warning symptom of posterior circulation stroke
Brain tumour (acoustic neuroma)

Falls with injury
Embolic phenomena

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
**Chapter 4: Central Nervous System**

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**Secondary headaches**
Medical or surgical management of identified causes

- Antibiotics for infections like meningitis, sinusitis
- Steroids for vasculitits

Notable adverse drug reactions, caution

- Aspirin and other NSAIDs: use with caution in patients with history of dyspepsia, and asthma
- Tricyclic antidepressants: use with caution in patients with cardiac symptoms
- Tricyclic antidepressants: anticholinergic effects e.g urinary retention in the elderly

**Prevention**
Reduce stress levels
- Prophylactic medications if attacks last more than 15 days a month, or are severely incapacitating (in the absence of other causes)
- Early detection and correction of refractive errors, sinusitis, oto-rhino-laryngologic and dental problems

**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
- Altered level of consciousness
- Neck stiffness and positive Kernig’s sign
- May present in epidemics
- Other presentations:
  - Fever of unknown origin: chronic meningitis
  - Mass lesion with focal neurological deficits: tuberculoma, empyema

**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

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

- 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)

**Antipyretics:**
- Aspirin (acetylsalicylic acid)

**HEADACHES**
Introduction
The commonest neurological disease in Nigerian communities

- Defined as pain or discomfort in the head and the surrounding structures

They may be:
- Primary (idiopathic)
- Secondary

**Primary headache types**
- 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**
- Depend on the underlying type/cause(s):
  - Tension type
    - Head pain or other cranial nerve symptoms
  - Cervical spondylitic type
  - Cluster type
  - Migraine type

**Secondary headache**
- Presence of additional symptoms
- Fever
- Vomiting
- Neck stiffness
- Alteration in level of consciousness
- Convulsions
- Cranial nerve deficits
- Limb weakness (hemiparesis, quadriplegia)
- Papilloedema as evidence of raised intracranial pressure
- Evidence of disease in other organs
- Evidence of drug or alcohol abuse

**Differential diagnoses**
- Meningitis
- Malaria
- Tuberculosis
- Infections
- Allergic reactions
- Drug reactions
- Psychological causes

**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 pain
- Treat the precipitating factor or disease
- Prevent recurrence

**Non-drug treatment**
- Psychotherapy
- Physiotherapy
- Biofeedback

**Drug treatment**
- Simple analgesics and non-steroidal anti-inflammatory agents
- Tricyclic antidepressants
  - Amitriptyline 10 - 25 mg daily at night
  - Nortriptyline 25 - 75 mg at night
  - Lorazepam 1 - 2.5 mg at night. Use lower doses for the elderly patient

**Complications**
- Cranial nerve palsies
- Subdural pus collection (empyema)
- Stroke
- Epilepsy
- Heat stroke
- Syndromes of Inappropriate Antidiuretic Hormone secretion (SIADH)

**Prevention**
- To demonstrate presence of inflammatory cells (after exclusion of raised intracranial pressure by fundoscopy or CT scan)
- Full Blood Count and differentials
- Electromyography
- Erythrocyte sedimentation rate
- Random blood glucose
- Electrolytes, Urea and Creatinine
- Chest radiograph
- Mantoux test (if tuberculosis is suspected)
- HIV screening

**Management**
- Neuro-imaging: CT scan, MRI, carotid Doppler etc
- Depends on the aetiological factor identified

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

**Non-drug treatment**
- Physiotherapy: pressure stockings
- Aspirin and other NSAIDs: use with caution in patients with history of dyspepsia, and asthma

**Secondary headaches**
Medical or surgical management of identified causes

- Antibiotics for infections like meningitis, sinusitis
- Steroids for vasculitits

**Notable adverse drug reactions, caution**
- Aspirin and other NSAIDs: use with caution in patients with history of dyspepsia, and asthma
- Tricyclic antidepressants: use with caution in patients with cardiac symptoms
- Tricyclic antidepressants: anticholinergic effects e.g urinary retention in the elderly

**Prevention**
- Reduce stress levels
- Prophylactic medications if attacks last more than 15 days a month, or are severely incapacitating (in the absence of other causes)
- Early detection and correction of refractive errors, sinusitis, oto-rhino-laryngologic and dental problems

**MENINGITIS**

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

**Antipyretics:**
- Aspirin (acetylsalicylic acid)
MIGRAINE
Introduction
Headache resulting from changes in the calibre of certain blood vessels in the brain with resulting physical, autonomic and emotional disturbance

Can be very incapacitating
Affects more females than males, usually between the ages of 15 and 50 years

Clinical features
Vascular Headaches
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
Classical migraine (or migraine with aura):
- Attacks of pain preceded by seeing flashes of light
- Disturbances in the field of vision (scotomas)
Visual hallucinations
Childhood periodic syndromes:
- Abdominal pain and vomiting
- Alternating hemiplegia
- Benign positional vertigo
Basilar artery migraine - predominantly brain stem symptoms
- Dysarthria
- Vertigo
- Tinnitus
- Decreased hearing
- Diplopia
- Ataxia
May coexist with tension-type headache
May present without headache (migraine equivalent) usually seen in psychiatry
May present with complications: stroke-like manifestations

Ophthalmoplegia
Status attacks: unrelieved, persistent headaches

Differential diagnoses
Epilepsy
Hysteria
Glaucoma
Multiple sclerosis
Brain tumours

thrombophlebitis
- Contraindicated in congestive cardiac failure and pulmonary oedema

Prevention
- Immunize against communicable diseases
- Meningococcus, haemophilus, streptococcus (especially for sicklers).
- Chemoprophylaxis (Rifampicin or ciprofloxacin)
- As determined by national policy
- For close contacts of clinical cases

Drug treatment
Acute attack
Aspirin (acetylsalicylic acid) tablets 300 - 900 mg every 4 - 6 hours when necessary
Maximum 4g daily.

Child and adolescent - not recommend (risk of thrombophlebitis- Contraindicated in congestive cardiac failure and pulmonary oedema)

Child: Adult:
300 - 1 g/kg every 12 - 24 hours (every 24 hours in neonates born before 31 weeks gestation)

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, repeated every 8 hours as necessary; higher doses may be required in resistant cases

Or:
Mannitol 20% solution

Adult: 50 - 200 g by intravenous infusion over 24 hours, preceded by a test dose of 200 mg/kg by slow intravenous injection

Child: neonate 0.5 - 1 g/kg (2.5 - 5 ml/kg of 20% solution) repeated if necessary 1 - 2 times after 4 - 8 hours

1 month - 18 years: 0.5 - 1.5 g/kg (2.5 - 7.5 ml/kg of 20% solution); repeat if necessary 1 - 2 times after 48 hours

Chemoprophylaxis
- Treat contacts during meningococcal epidemics with either ciprofloxacin or rifampicin
- Rifampicin

Adult: 600 mg orally every12 hours for 5 days
Child: 10 mg/kg orally every12 hours for 5 days

Under 1 year: 5 mg/kg orally every12 hours for 5 days
- Ciprofloxacin

Adult: 500 mg orally as a single dose
Child: 5 - 12 years 250 mg orally as a single dose

Notable adverse drug reactions, caution and contraindications
Diazepam
- Must be administered slowly intravenously to avoid respiratory depression
Chloramphenicol
- May cause aplastic anemia
Mannitol
- May cause chills and fever
- Extravasation causes inflammation and thrombophlebitis

Differential diagnoses
Epilepsy
Hysteria
Glaucoma
Multiple sclerosis
Brain tumours

Clinical features
- Classical disease:
  - Abdominal pain and vomiting
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  - Benign positional vertigo
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Differential diagnoses
Epilepsy
Hysteria
Glaucoma
Multiple sclerosis
Brain tumours

Notable adverse drug reactions, caution and contraindications
- Aspirin and other NSAIDs: use with caution in patients with history of dyspepsia and in asthmatics
- Tricyclic antidepressants used with caution in patients with cardiac symptoms
- Ergotamine: use should not exceed 4 - 6 mg per attack
- Caution in patients with vascular and renal disorders
- Not recommended for children
- Opiates: risk of addiction
- &-blockers: slow down cardiovascular function; reduce sensitivity to hypoglycaemia in diabetics

Prevention
- Avoid precipitants
- Immunize against communicable diseases
- Chemoprophylaxis (Rifampicin or ciprofloxacin)

- For close contacts of clinical cases

Adult: 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

Child: not recommended

Prophylaxis
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
- Throbbing pain usually affecting one side of the head around the temples, associated nausea and vomiting
- Dislike of light and noise

Clinical features
- Common migraine (or migraine without aura):
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May present with complications: stroke-like manifestations

Ophthalmoplegia
Status attacks: unrelieved, persistent headaches

Differential diagnoses
Epilepsy
Hysteria
Glaucoma
Multiple sclerosis
Brain tumours

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

Standard Treatment Guidelines for Nigeria 2008

Chapter 4: Central Nervous System

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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/asphyxia
  - Drug abuse/overdose/withdrawal
  - Neuro-degeneration

Clinical features
- Classical attack with sudden loss of consciousness, convulsions (tonic and/or clonic).
- Abnormal sensation or perception
- Autonomic disturbances: epigastric discomfort, sphincteric incontinence
- Semi-purposive actions (automatisms)
- 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
- Ménier's disease

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

- Caution is advised to avoid falls
- Anticholinergic drugs: constipation; memory problems
- Contraindicated in the presence of glaucoma

Prevention
- Avoid identified causative agents where feasible
- Timely and appropriate treatment to prevent/reduce complications

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

Partial seizures
- Carbamazepine
  - 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 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 - initial loading dose 20 mg/kg by slow intravenous injection, then 2 - 4.4 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 1.5 - 2.5 mg/kg every 12 hours, adjusted according to response to 2.5 - 5 mg/kg every 12 hours (usual maximum dose 7.5 mg/kg every 12 hours or 300 mg daily)
    - 12 - 18 years: initially 75 - 150 mg every 12 hours, adjusted according to response to 150 - 200 mg daily (usual maximum 300 mg every 12 hours)

- Parethixyphenidyl (benzhexol) 1 mg orally daily, increased gradually (usually 5 - 10 mg in 3 - 4 divided doses up to a maximum of 20 mg)

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

- 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

- Dopamine receptor agonists
- Bromocriptine 1 - 2.5 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)

Investigations
- Electroencephalography
- Neuro-imaging: CT scan, MRI
- Random blood glucose

Treatment objectives
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- Treat underlying cause if identified
- Improve quality of life

Drug treatment

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    - 1 month - 12 years: initially 1.5 - 2.5 mg/kg every 12 hours, adjusted according to response to 2.5 - 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
    - Adult: 600 mg daily in 2 divided doses

- Not recommended in pregnancy
- Phenytoin
  - Adult: 60 - 180 mg orally daily

- Child: 5 - 8 mg orally daily

Paroxysmal attacks
- Ethosuximide
  - Adult: 500 mg daily initially; increase by 250 mg at intervals of 4 - 7 days to doses of 1 - 1.5 g daily

- Child over 6 years: same as adult dose
- Up to 6 years: 250 mg daily; increase gradually to 20 mg/kg (maximum 1 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
- Acute and/or foetal 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

- Phenytoin: sedation and mental dullness and may affect school performance in children
Chapter 4: Central Nervous System

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
- Death
Lacunar syndrome:
- Complete deficits: speech defects with clumsy hand involvement
- Pure motor and/or pure sensory deficits
Dementia:
- Arises from small, recurrent strokes resulting in cognitive impairment and functional dependence

Differential diagnoses
Brain tumour
Subdural haematoma

Brain abscess
Meningitis/encephalitis
Cerebral malaria
Migraine headache
Multiple sclerosis
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
- Echocardiography
- 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

Drug treatment
- 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

- 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:
- Vasovagal 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

Drug treatment
- Diazepam by the intravenous route must be administered slowly to avoid respiratory depression and laryngeal spasm

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

Management
- Depends on the cause(s)

Treat/control known risk factors
- Prevent recurrence

Notable adverse drug reactions, caution
- Aspirin and other NSAIDs: use with caution in patients with history of dyspepsia, and in asthmatics

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. meningi-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
  - Stuporous: a state deeper than sleep; vigorous stimulation required to stimulate response

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

#### Introduction
A disorder characterized by a wide spectrum of problems.

**Clinical features**
- Tolérance
- Withdrawal episodes
- Compulsive desire to use alcohol
- Cerebrospinal fluid analysis
- Drug levels/toxicology screen
- Full Blood Count
- Blood culture

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

**Notable adverse drug reactions**

**Prevention**
- Diazepam, if required, should be administered slowly intravenously to avoid respiratory depression
- 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.

**Clinical features**
- Tolérance
- Withdrawal episodes
- Compulsive desire to use alcohol
- Cerebrospinal fluid analysis
- Drug levels/toxicology screen
- Full Blood Count
- Blood culture

**Complications**
- Dependence on (and withdrawal from) other substances
- 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

**Notable adverse drug reactions**

**Prevention**
- Diazepam, if required, should be administered slowly intravenously to avoid respiratory depression
- 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**

**ANXIETY DISORDER**

**Introduction**
Generalized anxiety disorder (GAD) is characterized by exaggerated worry and tension, even when there is little or no cause for anxiety.

**Clinical features**
- Sustain abstinence
- Acquire an alcohol-free lifestyle
- Prevent relapse

**Differential diagnoses**

- Alcoholism (Alcohol dependence)
- Schizophrenia
- Organic mood/affective disorder (including effects of drug abuse)
- Social and personal consequences of inappropriate behaviour (e.g. unplanned pregnancy, sexually-transmitted infections, etc)

**Prevention**
- Avoid of undue and extreme stress
- Avoid psycho-active substances

**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

**Differential diagnoses**

- Schizo-affective disorder
- Schizophrenia
- Organic mood/affective disorder (including effects of drug abuse)
- Social and personal consequences of inappropriate behaviour (e.g. unplanned pregnancy, sexually-transmitted infections, etc)

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

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

**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

**Differential diagnoses**

- Schizo-affective disorder
- Schizophrenia
- Organic mood/affective disorder (including effects of drug abuse)
- Social and personal consequences of inappropriate behaviour (e.g. unplanned pregnancy, sexually-transmitted infections, etc)

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

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

**Treatment objectives**
- Achieve remission of symptoms
- Prevent relapse

**Non-drug treatment**
- Cognitive-behavioural therapy
**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
- Prophylaxis: initially 300 - 400 mg daily
- 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 - 600 mg 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

**DEPRESSION**

**Introduction**
- A disorder of mood and affect in which the predominant emotion is sadness/unhappiness
- Can occur alone (unipolar depression) or as part of an alternation disorder in which elevation of mood also occurs (bipolar disorder)
- Varies in severity from mild to severe
- Life events, especially those involving loss, are often (but not always) the triggers

**Notable adverse drug reactions**
- More likely with doses above recommended upper limits
- Lithium
- Gastrointestinal disturbances
- Tremors
- Confusion
- Myoclonic twitches
- 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 elderly inpatients; up to 40% among acutely ill geriatric patients
- Predisposition and mis-diagnosis are common
- The most 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

**Diagnosis**
- Dementia
- Acute (idiopathic) psychotic disorders

**Complications**
- Transient memory impairment
- Worsening of co-morbid physical conditions
- Increased mortality
- Disturbance of sleep and appetite
- Impaired concentration
- Morbid or suicidal rumination or ideation
- Somatic complaints of various types

**Differential diagnoses**
- Normal grief reaction
- Medical conditions causing lowering of mental and physical activities (e.g. anaemia, hypothyroidism)
- Infections (e.g. viral)

**Complications**
- Worsening of co-morbid physical illness
- Suicide
- Recurrence (in 50% or more)

**Investigations**
- Full Blood Count and differentials
- Thyroid function test
- Indicative infection screen

**Treatment objectives**
- Normalize mood
- Prevent suicide attempts
- Return to active life
- Prevent recurrence
- Non-drug treatment
- Cognitive-behavioural treatment
- Inter-personal psychotherapy

**Drug treatment**
- Tricyclic antidepressants (TCAs)
  - Amitriptyline in increasing doses up to 150 mg orally/day
  - Fluoxetine 20 - 80 mg orally/day
- Antidepressants
  - Selective Serotonin Reuptake Inhibitors (SSRIs)
  - Serotonin syndrome

**Notable adverse drug reactions, caution**
- Tricyclic antidepressants:
  - Dryness of the mouth
  - Urinary retention
  - Constipation
  - Blurring of vision
- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - Sleep disturbance
  - Sexual dysfunction

**Prevention**
- Early treatment of infective and metabolic conditions
- Care with the use of drugs (especially anticholinergic medications) in the elderly

**Depression**

**Introduction**
- A disorder of mood and affect in which the predominant emotion is sadness/unhappiness
- Can occur alone (unipolar depression) or as part of an alternation disorder in which elevation of mood also occurs (bipolar disorder)
- Varies in severity from mild to severe
- Life events, especially those involving loss, are often (but not always) the triggers
- Strong genetic is vulnerability sometimes present
- Occurs in about 2 - 5% of the population at any given time and in about 10 - 25% in their lifetime
- Women are generally at an elevated risk

**Clinical features**
- Sadness, unhappiness, feeling low
- Loss of interest in usual activities
- Reduced energy
- Disturbance of sleep and appetite
- Impaired concentration
- Ideas of worthlessness, guilt, or failure
- Morbid or suicidal rumination or ideation
- Somatic complaints of various types

**Differential diagnoses**
- Normal grief reaction
- Medical conditions causing lowering of mental and physical activities (e.g. anaemia, hypothyroidism)
- Infections (e.g. viral)

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  - 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 suicide ideation in adolescents**
**Chapter 4: Central Nervous System**

**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 hours (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 daily or 3 - 5 mg 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 mg 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

**Insomnia**

**Introduction**
- Difficulty in falling asleep or staying asleep
- May be primary and unrelated to any physical or mental disorder
- May relate to a mental disorder, medical or physical conditions
- May be an adverse effect of medication (or psychoactive substances)
- A common, often chronic problem; tends to increase with age

**Clinical features**
- Early insomnia: difficulty in initiating sleep
- Middle insomnia: difficulty in going back to sleep after waking up at night
- Terminal insomnia: early awakening, commonly 2 hours or more before desiring to do so

**Differential diagnoses**
- Useful to consider possible aetiological factors: medical, mental, situational, environmental
- Pain is a common factor

**Complications**
- Deteriorating physical and/or mental health
- Decline in overall well-being and quality of life

**Investigations**
- Mainly of the presumed underlying cause(s)

**Treatment objectives**
- To improve sleep, especially sleep satisfaction
- To remove underlying/associated factors

**Non-drug treatment**
- Sleep hygiene
- Behavioural modifications to enhance relaxation
- Avoid habits and lifestyles that promote insomnia
- Improve environmental/sleeping conditions

**Drug treatment**
- General principles
  - Treat underlying cause(s)
  - Avoid sedatives: use for only short periods when indicated
- Short-acting benzodiazepines e.g.:
  - Nitrizepam 5 -10 mg at night for short term use
  - For the elderly, 2.5 - 5 mg
  - For early insomnia
- Or:
  - Longer-acting benzodiazepines e.g.
  - Diazepam at low doses: 2.5 - 10 mg for no more than 2 - 3 weeks
- For middle insomnia

**Supportive measures**
- Relaxation therapy: a useful adjunct for the most common forms of insomnia
- Notable adverse drug reactions
- Benzodiazepines: dependence and rebound insomnia

**Panic Disorder**

**Introduction**
- A disorder characterized by episodic attacks of extreme fear, mostly unrelated to specific objects or situations
- Associated with multiple somatic and cognitive symptoms
- Each attack lasts for about 5 - 30 minutes
- Often begins abruptly
- Affects about 0.5 - 1.0% of the population

**Clinical features**
- A feeling of choking
- Pounding heart
- Chest pressure or pain
- Dizziness
- Shortness of breath
- Trembling
- Sweating
- Tingling or numbness in the hands or feet
- Hot flushes

**Differential diagnoses**
- Other causes of intense fear (phobias, obsessive-compulsive disorders, etc)
- Medical causes (e.g. hyperthyroid states, episodic hypoglycemia, etc)
- Seizure disorders

**Complications**
- Phobia
- Depression
- Suicide

**Investigations**
- As indicated to exclude medical aetiologies

**Treatment objectives**
- To reduce intensity and frequency of attacks
- To reduce anticipatory anxiety

**Non-drug treatment**
- Cognitive-behavioural treatment

**Drug treatment**
- Fluoxetine
  - Adult: initially 20 mg orally once daily, increased after two weeks (if necessary) to 20 - 60 mg once daily (maximum 80 mg)
- Elderly: 20 - 40 mg (maximum 60 mg for elderly) once daily
- Discontinue if no improvement within 10 weeks

**Child and adolescent under 18 years**
- Amitriptyline 50 - 150 mg orally/day

**Supportive measures**
- Psychotherapy
- Relaxation techniques

**Notable adverse drug reactions**
- Tricyclic antidepressants are cardiotoxic in overdose
- Increased risk of suicidal attempts by patients with panic disorder

**Prevention**
- No specific primary prevention measures

**Schizophrenia**

**Introduction**
- A serious psychotic disorder characterized by multiple impairments in emotional, behavioural, cognitive, social, and occupational domains (among others)
- Affects about 0.5% of the population
- Onset usually in late adolescence or early adulthood
- Strong genetic component to its etiology; environmental factors, including perinatal and obstetric factors, also implicated

**Clinical features**
- Disorders of:
  - Thought
  - Perception
  - Speech
  - Cognition
  - Behaviour
  - Motor function

**Differential diagnoses**
- Psychosis of other origin (including those due to organic factors)
- Affective psychosis
- Epilepsy, especially of temporal lobe origin
- Drug effect, e.g. amphetamine intoxication

**Complications**
- Chronicity
- Suicide
- Increased physical morbidity
- Increased mortality

**Investigations**
- To exclude organic causes of acute psychotic presentations

**Treatment objectives**
- Relieve acute symptoms
- Return to full functional status
- Rehabilitate
- Prevent relapse

**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
ACUTE NECROTIZING ULCERATIVE GINGIVITIS

Definition
A polymicrobial, endogenous infection

Aetiology
Fusiform and spirochaete bacteria

Epidemiology
In developing countries, seen almost exclusively in children
Related to poverty and malnutrition
In industrialized countries, most common in young adults with neglected mouths; smoking and stress have been associated

Clinical features
Crater ulcers striating at the tips of the interdental papillae
Ulcers spread along gingival margins
Gingival soreness and bleeding
Foul breath
Metastatic taste
Increased salivation
Cervical lymphadenopathy and fever in advanced cases

Differential diagnoses
Primary herpetic gingivo-stomatitis
HIV-associated acute ulcerative gingivitis
Gingival ulceration in acute leukemia or aplastic anaemia

Investigations
Smears from ulcers show predominantly spirochaetes and gram negative fusiform bacteria

Treatment objectives
Treat infection
Restore oral health

Drug treatment
Metronidazole
Adult: 200 mg orally 8 hourly 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
Adult: 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

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 ABSCESS

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 predominante, 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 abscess

Investigations
Radiographs (periapical)

Treatment objectives
Remove source of infection e.g. fish-bone, other foreign objects
Drain abscess using local anaesthesia
Treat residual infection

Non-drug treatment
Extraction (or endodontic treatment) i.e. root canal therapy

Drug treatment
Amoxicillin
Adult: 250 mg orally every 8 hours for 5 to 7 days
Child: up to 10 years 125 mg every 8 hours, doubled in severe infections
Metronidazole
Adult: 200 mg orally every 8 hours for 3 days
Child: 1 - 3 years: 50 mg orally 8 hourly for 3 days; 3 - 7 years: 100 mg every 12 hours; 7 - 10 years: half adult dose

ALVEOLAR OSTEITIS

Introduction
The most frequent painful complication of extractions
Caused by destruction of the clot that normally fills the socket

Predisposing factors
Excessive extraction trauma
Limited local blood supply
Local anesthesia
Oral contraceptives

Osteosclerotic disease
Radiotherapy

Clinical features
More common in women
Pain delayed for few days up to a week after extraction
Deep seated, throbbing pain
Mucosa around socket is red and tender
No clot in socket - bare whitish lamina dura exposed

Differential diagnosis
Osteomyelitis

Complication
Osteomyelitis

Treatment objective
Keep open socket clean and protect exposed bone

Non-drug treatment
Irrigate with mild warm saline and antiseptic

Warm saline mouth rinse

Co-amoxiclav
A polymicrobial, endogenous infection

- 1,000/200 mg intravenously every 8 hours
- 750/125 mg orally every 8 hours

Metronidazole: nausea, vomiting, unpleasant taste; disulfiram-like effect with alcohol.

Tooth mobility

- Severe dental infection with spreading cellulitis
- 250/125 mg orally every 8 hours for 5 days (dosedoubled in severe infections)

Chlorhexidene gluconate 2%
Ferrous sulfate
Ascorbic acid
Metronidazole: nausea, vomiting, unpleasant taste; disulfiram-like effect with alcohol.

- 10 mL for mouth washes three times daily

A localized collection of pus in the periapical region of a tooth

Investigations
Radiographs (periapical)

Drain abscess using local anaesthesia

Treat residual infection

Non-drug treatment
Extraction (or endodontic treatment) i.e. root canal therapy

Drug treatment
Amoxicillin
Adult: 250 mg orally every 8 hours for 5 to 7 days
Child: up to 10 years 125 mg every 8 hours, doubled in severe infections
Metronidazole
Adult: 200 mg orally every 8 hours for 3 days
Child: 1 - 3 years: 50 mg orally 8 hourly for 3 days; 3 - 7 years: 100 mg every 12 hours; 7 - 10 years: half adult dose

CELLULITIS

Definition
A rapidly spreading, poorly localized inflammation of the soft tissues particularly associated with streptococcal infection

Pathogenesis
rapid spread is most likely related to release of large amounts of streptokinase and hyaluronidase which are produced by most strains of streptococci

The fascial space infections may involve sublingual, submandibular and/or parapharyngeal spaces

Ludwig’s angina is bilateral cellulitis of the sublingual and submandibular spaces

Clinical features
Diffuse, tense, painful swelling of the involved soft tissues
Malaise
Elevated temperature

Ludwig’s angina causes airway obstruction which can quickly result in asphyxia

Suppuration and abscess formation may occur later if treatment is neglected or delayed

Complications
Extension towards the eyes, and risk of cavernous sinus thrombosis: cellulitis affecting maxillary teeth
Respiratory difficulty: cellulitis affecting mandibular teeth

Differential diagnoses
Ludwig’s angina is bilateral cellulitis of the sublingual and submandibular spaces

Investigations
Culture (blood and swab) and sensitivity testing

Drainage of the swelling to reduce pressure (oral drain may also be placed)

Secure the airway by tracheostomy if necessary

Drug treatment
Aggressive antibiotic treatment
- Intravenous co-amoxiclav (given over 3 to 4 minutes) in combination with intramuscular gentamicin for 5 days

Injection co-amoxiclavulatanate
Adult: 1,000/200 mg intravenously every 8 hours
Child: neonate and premature infants, 25 mg/kg every 12 hours; infants up to 3 months, 25 mg/kg every 8 hours, 3 months to 12 years, 25 mg/kg every 8 hours increased to 25 mg/kg every 6 hours in more severe infections

Injection gentamicin:
Adult: 3 - 5 mg/kg daily in divided doses every 8 hours
Child: up to 2 weeks: 3 mg/kg every 12 hours; 2 weeks - 12 years: 2 mg/kg every 8 hours

Precaution
Gentamicin may cause significant ototoxic and nephrotoxic effects

Prevention
Early treatment of carious teeth

DENTAL CARIES

Definition
A progressive bacterial damage to teeth exposed to the saliva

Classification
Enamel caries
Dentine caries
Root surface caries

Aetiology
Develops over time in the presence of certain interacting variables
Pathogenesis
- Enamel caries progresses in the following stages:
  - Early (sub-microscopic) lesion
  - Phase of non-bacterial enamel crystal destruction
  - Cavity formation
  - Bacterial invasion of enamel

Clinical features
- Cavity formation in affected tooth
- Starts as a white spot
- On exposure of the cavity to thermal changes or food particles

Complications
- Pulpitis
  - If not treated can cause apical periodontitis and dental/vascular abscess

Investigations
- Periapical radiographs
- Bitewing radiographs
- Electric pulp testers
- Thermal test

Non-drug treatment
- Amalgam filling, Glass Ionomer Cement (GIC) composite and Atraumatic Restorative Technique (ART) for enamel caries
- Amalgam filling, GIC for dentine caries
- Root Canal Therapy, pulp capping pulpotomy, pulpectomy for pulpal involvement

Drug treatment
- Analgesics pre-operatively
- Paracetamol 1 g - 6 hourly orally to a maximum of 4 g daily

Pain
- Nystatin suspension
- Adults: 100,000 units/mL 4 times daily , after food (usually for 7 days)
- Continue for 48 hours after lesions have healed
- Immunocompromised children: - 500,000 units 6 hourly for 7 days
- Metronidazole: nausea, vomiting and metallic taste
- Avoid alcohol during treatment with metronidazole, and for at least 48 hours after

Prevention
- Oral health education
- Scaling and polishing every six months

NEOPLASMS OF THE ORAL CAVITY refer to specialist care

PERICORONITIS

Introduction
- An inflammatory condition of the gum/flap around a partially erupted tooth
- Common around the lower last molars or wisdom teeth
- Upper canine may also be affected

Classification
- Acute
- Chronic
- Acute-on-chronic

Aetiology
- Food impaction and plaque accumulation under gum flap
- Trauma to gum flap from opposing tooth
- Ulcerative gingivitis
- Reduced resistance
- Anaerobes in plaque

Clinical features
- Soreness and tenderness around partially-erupted tooth
- Pain
- Swelling
- Enlargement of regional lymph nodes
- Fever
- Abscess formation

Investigations
- Radiographs
- Biopsy and histopathologic examination
- Swab sample for microscopy, culture and sensitivity
- Biopsy and histopathologic examination

Identify predisposing factors (including immunosupression)
- Define extent of involvement

Non-drug treatment
- Manage any underlying predisposing factors
- Replace worn dentures
- Proper counselling of patients as to use of dentures
- Diet modification and improvement
- Chlorhexidine mouthwash three times daily for 1 - 2 weeks

Drug treatment
- Topical anti-fungal medication e.g
- Nystatin suspension
- Adults: 100,000 units/mL 4 times daily , after food (usually for 7 days)
- Continue for 48 hours after lesions have healed
- Immunocompromised children: - 500,000 units 6 hourly for 7 days
- Or:
- Metronidazole oral gel 2%
- Adults: place 5 - 10 mL in the mouth after food and retain near lesions for 48 hours after lesions have healed
- Children under 2 years: 2.5 mL twice daily; 2 - 6 years: 5 mL twice daily; 6 - 12 years: 5 mL 4 times daily; 12 - 18 years: 5 - 10 mL 4 times daily
- Leave in the mouth after food and retain near lesions
- For neonates up to 2 weeks old: administer every 72 hours; 2 - 4 weeks old: administer every 48 hours

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 sequela 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 tooth
- 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

Plus:
- Tetracycline 250 mg orally daily for up to 21 days
- Child under 12 years: metronidazole and amoxicillin (or erythromycin for those sensitive to penicillin)

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 sequela 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
  - 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
- Aspirin in children less than 16 years as it may precipitate Reye's syndrome

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 fistulae
- Mucoceles and cysts
- Ranula

Sialadenitis
- Diseases which result from inflammation of the salivary glands
  - Mumps
  - Suppurative parotitis
  - Chronic sialadenitis

Sialoerostomia
- Dry mouth
  - It can be caused by the following:
    - Sjogren's syndrome
    - Irradiation
    - Dehydration
    - Psychogenic

- Drugs

TEMPORO-MANDIBULAR JOINT DISORDERS

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

Chapter 5: Dental and Oral Disorders

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
- Psychologic 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

Osteoarthritis
- 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

Chapter 6: Dermatology

BACTERIAL INFECTIONS

CELLULITIS

Introduction
- A suppurative 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 compromised adults are at higher risk
- Septicaemia
- Gangrene
- Metastatic abscesses
- Recurrent cellulitis may predispose to chronic lymphoedema

Investigations
- Blood culture
- Full Blood Count with differentials
- Fasting blood glucose
- HIV screening
- Wound swab for microscopy, culture and sensitivity
- Urinalysis

Treatment objectives
- Eradicate infection
- Treat underlying immunosuppression
- Prevent complications

Drug treatment
- Ampicillin/cloxacillin
- Adult: 500 mg - 1 g orally every 6 hours for 5 - 7 days
- Child under 5 years: a quarter adult dose; 5 - 10 years: half adult dose
- Or:
- Cloxacillin
- Adult: 500 mg orally every 6 hours for 5 - 7 days

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 immune suppression
- 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 all body sites 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

**Differential diagnoses**

Folliculitis
Cutaneous myiasis
Acme 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
Urinealysis

**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 - 10days

**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 coagulate 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**

Wound swab for bacteriology and sensitivity

**Treatment objectives**

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
  
  - Preferably taken as a single dose in the morning after breakfast
  
  - In severe disease: up to 60 mg orally daily, as a short course for 5-10 days

- Triamcinolone acetonide 40 mg by deep intramuscular injection, into gluteal muscle

**Criteria for systemic steroid therapy**

Failed maximal therapy; little improvement after

**Guidelines for the use of potent topical steroids in infants**

**Chapter 6: Dermatology**

**DERMATITIS AND ECZEMA**

**Introduction**

Inflammation of the superficial dermis and epidermis, leading to disruption of the skin

Dermatitis and eczema are used interchangeably

**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

**Differential diagnoses**

Seborrhoeic dermatitis (especially in the infant)

Irritant or allergic contact dermatitis

Nummular dermatitis

Scabies

Psoriasis (especially palmo-plantar)

In infants certain immunodeficiency syndromes

**Complications**

Bacterial infections of the skin

Eczema herpeticum

Complications of over 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**

- Strict personal hygiene
- Treat underlying skin disease(s)

**Notable adverse drug reactions**

Sulphonamide and co-trimoxazole: fixed drug eruption

**Standard Treatment Guidelines for Nigeria 2008**

- Supress 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
  
  - Preferably taken as a single dose in the morning after breakfast
  
  - In severe disease: up to 60 mg orally daily, as a short course for 5-10 days

- Triamcinolone acetonide 40 mg by deep intramuscular injection, into gluteal muscle

**Criteria for systemic steroid therapy**

Failed maximal therapy; little improvement after

**Smallpox vaccination is absolutely contraindicated**

**Systemic steroids for the use of potent topical steroids in infants**

- Do not use on the face, axillae, diaper area or flexures
- Do not use under occlusion
- Do not use for more than 2 weeks consecutively and do not give refills
- Do not dispense more than 50 g per week

**Always use sparingly**

**Adjunctive measures**

- Exclusive breastfeeding: milk substitute if need be
- Attention to cleanliness especially in the diaper region
- Avoid excessive bathing, vigorous rubbing, or chafing
- Avoid unduly heavy, tight, or soiled clothing
- Treat local infections
- Pat (rather than rub) skin dry after bath and immediately lubricate skin with petroleum jelly or emulsifying ointment
- Showers should be warm to cool, not hot
- Tub soaking is good, if followed by adequate lubrication
- Avoid unduly heavy, tight, or soiled clothing
- Treat local infections
- Pat (rather than rub) skin dry after bath and immediately lubricate skin with petroleum jelly or emulsifying ointment
- Showers should be warm to cool, not hot
- Tub soaking is good, if followed by adequate lubrication
CONTACT DERMATITIS

**Introduction**
An acute or chronic dermatitis that results from direct skin contact with chemicals or allergens

**These agents could be**
- Chemicals
- Animal or plant products
- Physical agents like heat, cold, ultraviolet rays or ionizing radiation

**Contact dermatitis is classified as:**
- Irritant dermatitis
- Acute irritant dermatitis
- Cumulative insult dermatitis
- Allergic contact dermatitis
- Phototoxic dermatitis
- Photo-allergic dermatitis

**Clinical features**
- Acute phase
- Tiny vesicles, weepy and crusted lesions
- Resolving or chronic contact dermatitis
- Scaling, erythema, and possibly thickened (lichenified) skin
- Itching, burning, and stinging may be severe

**Contact dermatitis is recognized by the distribution and configuration of the lesion which usually corresponds to the contactant e.g.**
- Face: cosmetics
- Photodermatitis: airborne allergens e.g. dust, fumes, sprays
- Neck: nickel necklace, perfume, and collars of garments

**EXFOLIATIVE DERMATITIS (Erythroderma)**

**Introduction**
Refers to the involvement of all or most of the skin surface by a scaly erythematous dermatitis

**Usually a secondary or reactive process to an underlying cutaneous or systemic disease**

**Some causes:**
- Contact dermatitis
- Atopic eczema
- Seborrhoeic dermatitis
- Drug eruptions
- Lichen planus and lichenoid eruptions
- Pediculosis corporis
- Dermatomyositis
- Psoriasis
- Pemphigus foliaceus
- Lichen planus
- Lichenoid eruptions
- Contact dermatitis
- Drug eruptions
- Lichen planus
- Lichenoid eruptions

**Clinical features**
- May be acute or chronic
- The irritating process is followed by a patchy erythema which spreads rapidly within 24 hours
- Itching, burning, and stinging may be severe
- Contact dermatitis is recognized by the distribution and configuration of the lesion which usually corresponds to the contactant e.g.
- Face: cosmetics
- Photodermatitis: airborne allergens e.g. dust, fumes, sprays
- Neck: nickel necklace, perfume, and collars of garments

**Prevention**
- Avoid over-treatment of skin diseases and polypharmacy, generally
- Do not abuse the skin with "medicated" soaps and herbal concoctions
- Get appropriate management of skin disease(s) from qualified personnel

**Drug treatment**
- Systemic steroids in high doses
  - Prednisolone 40 - 60 mg orally per day
- Treat impetiginization and septicemia as appropriate
- Further treatment depends on the cause of exfoliative dermatitis

**Adjuvant therapy**
- Adequate hydration
- Emollients for skin (see Atopic eczema)
- Keep warm
- Adequate nursing care
- Appropriate nutrition and haematics

**Investigation**
- None useful to management

**Treatment objectives**
- Eradicate the larvae
- Eradicate gut Strongyloides
- Treat impetiginization
- 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
**GUINEA WORM 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 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 mesentery, 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 be felt 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**
- Secondary infection
- Cellulitis
- Erysipelas
- Progressive lymphoedema

**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
- Prevent and treat complications

**Drug treatment**
- Metronidazole
  - Adult: 500 mg orally every 8 hours for 7 days
  - Child: 7.5 mg/kg orally every 8 hours
- Albendazole
  - Adult: 400 - 800 mg orally daily for 6 days
  - Child over 1 year: usually 100 mg orally twice daily for 3 days
  - Child over 2 years: 200 micrograms/kg orally as a single dose
- Ivermectin
  - Adult: 200 micrograms/kg orally as a single dose
  - Child: consult specialist companies

**Worm extraction**
- Traditionally:
  - Extract the worm slowly by winding it about a match stick or twig, removing 3 - 5 cm daily, with care not to rupture it
  - In the event of such an accident, the larvae escape into the tissues and produce fulminating inflammation
  - The process appears to be facilitated by placing the affected part in water several times a day

**Notable adverse drug reactions, caution and contraindications**
- Metronidazole
  - Avoid high dose regimens in pregnancy
  - Avoid drinking alcohol during treatment and at least 48 hours after
  - Ivermectin
  - Oxedea (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
- Caution in early pregnancy

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

**MYIASIS**

**Introduction**
- Invasion of mammalian tissue by fly larvae
- Furuncular myiasis may be caused by *Dermatobia hominis* or the Tumbu fly *Cordylobia anthropophaga*
- Larvae of *D. hominis* are often transferred by mosquitoes
- Usually host is cattle. People living near cattle-rearing areas are particularly vulnerable
- Eggs, living larvae, or both are deposited on the skin or mucous membranes or on clothing

**Clinical features**
- Furuncular myiasis looks like a furuncle (boil)
- Key feature is the presence of a tiny hole in the inflamed erythematous papule
- There may be a sensation of motion within the furuncle
- There may be intermittent stinging sensation

**Accidental myiasis**
- In accidental myiasis, there is a pre-existing lesion,
- Adult: Furuncular myiasis looks like a furuncle (boil)
- Child over 1 year: usually a leg ulcer, wound or ulcerated basal cell carcinoma

**Differential diagnoses**
- Furuncles and carbuncles
- Secondary bacterial infection

**Investigations**
- Nil

**Treatment objectives**
- Extract the maggot
- Treat or prevent bacterial infection

**Non-drug treatment**
- Apply petrolatum: the maggot crawls out to avoid asphyxiation
- Or:
- Extract the maggot by compressing simultaneously

**Drug treatment**
- Prevent bacterial infection with oral antibiotics if lesions are multiple
- Wound myiasis is flushed out surgically with antisepsics: surgical debridement

**Prevention**
- Iron clothes that are dried in the open air

**ONCHOCERCIASIS (River blindness)**

**Introduction**
- A common chronic filarial disease in tropical regions which frequently cause pruritus and blindness
- Causative organism is *Onchocerca volvulus*

**Investigations**
- Skin snips or punch biopsy for microfilariae
- Blindness
- Skin involvement
- Prednisolone 1 mg/kg orally should be started several
and nodules, numerous excoriations, secondary infections and even lymphadenopathy.
- The combination of excoriations, hyperpigmentation, healed scars and secondary impetiginization is quite typical and known as “vagabond’s skin”
- Noslowing and poor personal hygiene promote infestation
- Refugees, destitutes and vagrants are particularly vulnerable

**Pediculosis pubis:**
- Most often found in the pubic and axillary hairs
- Occasionally may be found on abdominal or trunk hairs
- On rare occasions may be seen on the scalp, eyebrows and even eyelashes
- Pruritus is also a symptom
- Classic clinical finding is the maculae ceruleae
- Indistinct blue-grey or slate-coloured macules ranging in size from several millimeters to several centimeters
- They result from the bite of the louse causing small intracutaneous haemorrhages
- The colour is due to blood whose haemoglobin has been altered by the saliva

**Differential diagnoses**
- **P. capitis:**
  - Seborrhoeic dermatitis
  - Pittiriasis amiantacea
  - Peripilar keratin
  - Hair casts
  - P. corporis:
  - Scabies
  - Atopic dermatitis
  - All pruritic dermatoses
  - P. pubis:
  - Scabies
  - Candidiasis
  - In the axillae trichomycosis axillaris

**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 louse or the nits on epilated hair strands (especially from behind the ears) under the microscope
  - P. corporis:
  - Examine the seams of clothing for nits andlice

**Treatment objectives**
- Eradicating the lice
- Prevent re-infection
- Treat complications

**Dermatitis**
- **P. capitis**:
  - 1% permethrin cream rinse
- **P. corporis**:
  - 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 dermatitis with antipruritics or corticosteroids
- Treat secondary infection with oral antibiotics

**Supportive measures**
- **P. capitis**:
  - All contact individuals should be examined and treated as necessary
  - Pillowcases should be disinfested as for clothing.

**Notable adverse drug reactions, caution**
- As stated under scabies
- **P. corporis**:
  - Eradicating lice from clothing by laundering in hot water or machine-drying at a high temperature, followed by ironing the seams
  - P. pubis:
  - Treatment is the same as for pediculosis capitis, with the exception that pediculosis of the eyelashes should be treated with an occlusive ophthalmic ointment applied to the eyelid margins for 10 days
  - Affected persons’ sexual contact(s) should be treated simultaneously

**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 excoriation and secondary infection on the skin

**Papulo-pustular eruptions with excoriation and impetiginized. Characteristic sites of predilection:**
- Interdigital spaces of the fingers
- Flexural surfaces of the wrist
- Extremesurfaces of the elbows and knees
- Anterior axillary area
- Nipples

**Standard Treatment Guidelines for Nigeria 2008**

- The phallus (especially in adults)
- General immune status and experience with *S. scabiei* play a role
- In a normal host, the initial infection is asymptomatic for about 3 - 6 weeks during which time the individual is incapable of transmitting the disease
- All family or living unit members must therefore be treated, not just the itching ones

**Crusted scabies (Norwegian scabies)**
- An uncommon variant of scabies
- Patient fails to mount a resistance and the mites proliferate dramatically
- May be found among HIV/AIDS patients, institutionalized inmates like prisoners, refugees, and psychiatric patients

**Differential diagnoses**
- Infantile acropustulosis
- Atopic dermatitis
- Papular acral dermatitis of childhood
- Dermatitis herpetiformis

**Complications**
- Secondary bacterial infection leading to acute glomerulonephritis

**Investigations**
- Burrow scraping on to a glass slide for microscopy
- Video dermatoscopy

**Treatment objectives**
- Treat the infestation
- Treat secondary bacterial infection
- Relieve pruritus

**Drug treatment**
- Scabicides:
  - Permethrin 5% cream
  - Benzyl benzoate
- Adult: apply over the whole body and wash off after 8-12 hours
- Child: supervision required with application and rinsing
- Benzyl benzoate 25% in emulsion
- Adult: apply over whole body; repeat without bathing next day and wash off 24 hours later
- If necessary apply a third time
- Child: Benzyl benzoate is an irritant and should be avoided in children
- Or: Precipitated sulfur 5 - 10% in petrolatum jelly
- Adult and child: apply over all the body daily for 7 - 10 days
- Antihelminthic:
  - Ivermectin
- Adult:
  - Single 200 microgram/kg oral dose for crusted scabies
  - Child: over 5 years: 200 micrograms/kg daily for 2 days
  - Chlorphenamine
  - Adult: 4 mg orally every 4 - 6 hours; maximum 24 mg a day
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
- Quindinide
- Gold
- Streptomycin
- Tetracycline
- NSAIDs
- Phenothiazines
- Hydrocortisone

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)
- Wickham'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 a 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
- For isolated or hypertrophic lesions apply corticosteroids under occlusion or use intralesional triamcinolone (see Psoriasis)
- Scalp lesions:

Psoriasis
- Lichen planus
- A variant, inverse pityriasis rosea also occurs
  - Believed to be commoner in blacks
  - Affects the face, neck, distal extremities and the flexures
  - Use of ampicillin early in the course of the eruption causes an explosive exacerbation of eruptions which become more inflammatory and urticarial
  - Lesions may become impetiginized
  - The disease persists for about 6 weeks but may last for 3 - 4 months
  - Healing may occur with postinflammatory hyper/hypopigmentation
  - Recurrences are uncommon (about 1%) but the lesions are usually mild and localized

Differential diagnoses
- Secondary syphilis
- Exanthematic or pityriasis rosea-like drug eruptions
- Lichen planus
- Guttate psoriasis
- Tinea corporis
- Tinea versicolor
- Seborrheic dermatitis
- Viral exanthems
- Pityriasis lichenoides chronica

Complications
- None

Investigations
- Non-specific
- VDRL
  - If secondary syphilis is suspected (e.g. lesions on palms and soles with/without lymphadenopathy)

Treatment objectives
- To relieve symptoms (if any)
- Reassure patients about the harmless, self-limiting nature of the eruption

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

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
- Ciclosporin
  - Adult and child over 16 years: 2.5 mg/kg daily in two divided doses
  - If good results not achieved within two weeks increase rapidly to maximum 5 mg/kg daily

Notable adverse drug reactions
- See Psoriasis
- Prevention
  - Avoid precipitating drugs

PITYRIASIS ROSEA

Introduction
A common, mild, inflammatory exanthem

Clinical features
- 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)
- The seasonal clustering and household concurrence are suggestive of an infective origin
  - Increasingly regarded as a delayed reaction to a viral infection (most likely Human Herpes Virus 7)

Complications
- None

Differential diagnoses
- VDRL
  - If secondary syphilis is suspected (e.g. lesions on palms and soles with/without lymphadenopathy)

Treatment objectives
- To relieve symptoms (if any)
- Reassure patients about the harmless, self-limiting nature of the eruption

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

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Notable adverse drug reactions
- See Psoriasis
- Prevention
  - Avoid precipitating drugs
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 (Koebner 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
- ß-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
- Linear
- Plexiform
- Erythema
- Annular
- Gyrate or serpiginous

Favoured sites are:
- Knees and elbows
- Scalp
- Palms and soles
- Nails

**Intertriginous regions** such as the gluteal cleft, groin, penis, labia, axillae, beneath the breasts and between the toes are involved (inverse psoriasis or psoriasis inversa)

There could also be other organ involvement e.g.
- psoriatic arthritis

- The disease runs a chronic and highly variable course (waxes and wanes)
- New lesions may replace older, regressing ones
- Unstable lesions may evolve into psoriatic erythroderma or generalized pustular psoriasis

**Coal tar solution** (for chronic psoriasis)

- Use either alone or in combination with exposure to ultraviolet light
- Apply 1 - 4 times daily, preferably starting with a lower strength preparation

**Small lesions and nail psoriasis**

- Use 100 mL in bath of tepid water and soak for 10 - 20 minutes
- Use once daily, to once every 3 days for at least 10 - 20 minutes, and for at least 10 baths
- Often alternated with ultraviolet (UVB) rays, allowing at least 24 hours between exposure and treatment with coal tar
- Urea 10% cream or ointment (for dry scaling and itching skin)
- Apply twice daily, preferably to damp skin

**Vitamin D analogue calcipotriol**

- Suitable for childhood psoriasis

- Combination therapy with calcipotriol and high-potency (Class I) steroids may provide:
  - Improved efficacy, and steroid sparing, allowing a shift to a less potent topical steroid or less frequent use of a Class I steroid

- Apply and leave under a shower cap at night and shampoo in the morning
- After shampooing and while the hair is still wet, wash hands thoroughly after use
- Avoid contact with eyes and healthy skin

**Fluocinolone acetonide 0.01% in oil**

- Suitable for childhood psoriasis

- May be combined with topical steroids for mild- to-moderate plaque psoriasis

- For patients who have not responded to standard UVB treatment

- For nail lesions inject triamcinolone in the region of the matrix and the lateral nail fold

**DPV A (psoralen plus ultraviolet A)**

- 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 Groeckner regimen

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

**Systemic therapy:**

- **Antibiotics** to eliminate streptococcal pharyngitis

- **Adalimumab**

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

- **For**

- **Pustular, erythrodermic and plaque types, and psoriatic arthritis**

- **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

- **β-20 mg orally once weekly**

- Intertriginous areas such as the gluteal cleft, groin, penis, labia, axillae, beneath the breasts and between the toes are involved (inverse psoriasis or psoriasis inversa)

- Trauma (Koebner phenomenon)

- May occasionally be provoked or exacerbated by drugs:

- ACE inhibitors
- Calcium channel blockers
- ß-adrenoceptor antagonists
- Chloroquine
- Lithium
- Non-steroidal Anti-inflammatory Drugs (NSAIDs)
- Terbinafine
- Lipid lowering drugs

- **Chapter 6: Dermatology**

**Differential diagnoses**

- Guttate psoriasis
- Pityriasis lichenoides et varioliformis acuta
- Pityriasis rosea
- Secondary syphilis (psoriasisform syphilis)
- Scalp, face, chest lesions:
  - Seborrhoeic dermatitis
  - Lupus erythematosus

- Chronic truncal psoriasis
- Nummular dermatitis
- Lichen planus
- Small plaque parapsoriasis
- Tinea corporis
- Pityriasis rubra pilaris

- Involves specific areas:
  - Candidiasis
  - Intertingue
  - Hailey-Hailey disease

- Nail:
  - Tinea unguium
  - Lichen planus
  - Trachonychia

- **Complications**

**Erythroderma**

**Arthritis mutilans**

**Infections**

- 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 petrolatum film, which may remain in place for 12 - 24 hours to augment effectiveness

- **Dithranol ointment 0.1% - 2%** (for moderately severe psoriasis)

- **Fluocinolone acetonide 0.01% in oil**

- **Apply and leave under a shower cap at night and shampoo in the morning**

- **After shampooing and while the hair is still wet, wash hands thoroughly after use**

- **Avoid contact with eyes and healthy skin**

- **Coal tar solution** (for chronic psoriasis)

- **Use either alone or in combination with exposure to ultraviolet light**

- **Apply 1 - 4 times daily, preferably starting with a lower strength preparation**

- **Coal tar bath**

- **Use 100 mL in bath of tepid water and soak for 10 - 20 minutes**

- **Use once daily, to once every 3 days for at least 10 - 20 minutes, and for at least 10 baths**

- **Often alternated with ultraviolet (UVB) rays, allowing at least 24 hours between exposure and treatment with coal tar**

- **Urea 10% cream or ointment** (for dry scaling and itching skin)

- **Apply twice daily, preferably to damp skin**

- **Vitamin D analogue calcipotriol**

- **Suitable for childhood psoriasis**

- **Combination therapy with calcipotriol and high-potency (Class I) steroids may provide:**
  - Greater response rates, fewer side effects, and steroid sparing, 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)

- **Tarazoterone 0.05% and 0.1% gels**

- **May be combined with topical steroids for mild-to- moderate plaque psoriasis**

- **Tacrolimus ointment 0.1% or 0.03%**

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

- **Small lesions and nail psoriasis**

- **Intra-lesional corticosteroid injections of triamcinolone are frequently used**

- **Triamcinolone acetonide suspension 10 mg/mL may be diluted with sterile saline to make a concentration of 2.5 - 5 mg/mL**

- **For nail lesions inject triamcinolone in the region of the matrix and the lateral nail fold**

- **Scalp**

- Soften scales with salicylic acid 3% in mineral/olive oil, massage in and leave on overnight

- **Then shampoo with a tar shampoo, and remove scales mechanically with a comb and brush**

- **Repeat daily until the scales are gone**

- **If 3% is not very effective, use 6% salicylic acid**

- **Or:**

- **Severe psoriasis unresponsive to outpatient UVL, may be treated in a day care centre with the Groeckner regimen**

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

- **Systemic therapy:**

- **Antibiotics** to eliminate streptococcal pharyngitis

- **Adalimumab**

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

- **For**

- **Pustular, erythrodermic and plaque types, and psoriatic arthritis**

- **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**

- **Cyclosporine**

- **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.
phototherapy or acitretin) should be instituted as the
cyclosporine dose is reduced
- TNF inhibitors (Efaluzimab)
  - Indicated for moderate-to-severe chronic plaque
    psoriasis unresponsive to, or intolerant of other systemic
    therapy or photochemotherapy
  - Initially 700 micrograms/kg by subcutaneous
    injection then 1 mg/kg weekly
  - Discontinue if inadequate response after 12 weeks
  - Not recommended for children and adolescents

**Adjutant therapy**
- Diet: Fish oils rich in ω-3 polyunsaturated fatty acids
  - Patient education
  - Emotional support

**Notable adverse drug reactions, caution and contraindications**
- Topical:
  - Coal tar:
    - Contraindicated in inflamed, broken or infected skin
    - May cause irritation, photosensitivity reactions
  - Tacrolimus:
    - Indicated for moderate-to-severe chronic plaque
      psoriasis unresponsive to, or intolerant of other systemic
      therapy or photochemotherapy
      - When first dose is reduced
      - Discontinue if inadequate response after 12 weeks
      - Not recommended for children and adolescents
  - Adjuvant:
    - Cyclosporine:
      - Other side effects: hypertrichosis, hyperuricaemia

**Standard Treatment Guidelines for Nigeria 2008**

**Chapter 6: Dermatology**

**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
  genera:
  - Microsporum
  - Trichophyton
  - Epidermophyton
- Can be acquired from humans, animals, soil or vegetable
  matter

**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, osteoporosis,
    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.

**Cyclosporin:**
  - Contraindicated in inflamed, broken or infected skin
  - May cause irritation, photosensitivity reactions
  - Hypersensitivity
  - Skin, hair, fabrics and bathtubs discoloured brown and
    smelly

**Dithranol:**
  - Irritant: avoid contact with eyes and healthy skin
  - Contraindicated in hypersensitivity; avoid use on face,
    acute eruptions, and excessively inflamed areas
  - Discontinue use if excessive erythema occurs or
    lesions spread

**Conjunctivitis following contact with eyes**
- Staining of skin, hair, and fabrics brown

**Vitamin D3 (calcipotriol):**
- May irritate the skin (stinging)
- Very expensive

**Urea:**
- Avoid application to face or broken skin; avoid contact
  with eyes
- May cause transient stinging and local irritation

**Steroids:**
- When extensive areas are treated or when there is
  erythrodermic psoriasis, sufficient may be absorbed to
  cause adrenal suppression
- May induce tachyphylaxis
- Rebond often occurs after stopping treatment, resulting in
  a more unstable form of psoriasis

**Intralesional injection may cause reversible atrophy at
the injection site**

**Salicylic acid:**
- Widespread application may lead to salicylate toxicity
  (ultraviolet light)
- Burning of skin may cause Koebner's phenomenon and
  an exacerbation
- Increased risk of skin cancer particularly in persons
  with fair complexion and albinos
- Examine one or more factors
- Use protective glasses to prevent cataracts
- Causes premature ageing of the skin

**Superficial Fungal Infections**

**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
  genera:
  - Microsporum
  - Trichophyton
  - Epidermophyton
- Can be acquired from humans, animals, soil or vegetable
  matter

**Common in tropical climate (which is hot and humid)**
- Infection could be spread by fomites
- The mycoses caused by dermatophytes are called
  dermatophytosis, tinea, or ringworm
- On certain parts of the body they have distinctive features
  characteristic of that particular site; therefore the tinea
  are divided into:
  - Tinea capitis (scalp)
  - Tinea barbae (beard)
  - Tinea faciei (face)
  - Tinea corporis (groin)
  - Tinea manuum (hand)
  - Tinea pedis (feet)
  - Tinea unguium or onychomycosis (nail)

**Clinical features**
- Varied: depending on the site of the body involved
- The steroid effect makes the lesions atypical hence,
  tinea capitis:
  - Scalp involvement is seen predominantly in children
  - Marked regional lymphadenopathy is the rule
  - Lesions present as severe, deep folliculitis with
    erythema, nodular infiltrates, scales and pustules
  - In the presence of immune suppression from underlying
    conditions, a more severe form of tinea capitis
    (kerion) may develop
- 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
  - Pruritus usually leads to excoriation of lesions and
    secondary bacterial infection

**Pruritus is a notable symptom**
- Sometimes associated with lichenification
- Avoid iatrogenic factors e.g. abrasions, scratches,
  harsh fibre bathing sponges, and the drugs listed above

**Prevention**
- Keep the feet dry; avoid tight-fitting covered shoes
- Aerate the feet as often as possible
- Keep the feet dry; avoid tight-fitting covered shoes
- Aerate the feet as often as possible
- Use good antiseptic powder on the feet after bathing e.g.
  Tolnaftate 1% powder
- Reduce perspiration and enhance evaporation from the
  perifungal area by wearing loose pants (e.g. boxer pants)
  made of absorbent cotton fabric
- Apply plain talcum powder or antifungal powders in the
  axillae and interdigital areas

**PITRAYSIS 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
  - Malaise
  - Stature
  - Poor hygiene
- Clinical features:
  - Hyperpigmentation
  - Hyperkeratosis
  - Clearing of lesions
  - Reducing irritation
- Treatment:
  - Topical
    - Ketoconazole
    - Miconazole
    - 2% cream apply twice daily
  - Fluconazole:
    - Oral: 150 mg weekly for 2-4 weeks
      - May induce tachyphylaxis
      - Rebound often occurs after stopping treatment,
        resulting in a more unstable form of psoriasis
    - Systemic
      - Oral: 50 mg orally daily for 2-4 weeks; up to 6 weeks
        - May induce tachyphylaxis
        - Rebound often occurs after stopping treatment,
          resulting in a more unstable form of psoriasis

**Tinea corporis:**
- Scaly borders on the upper inner aspects of the thighs
  - Commonly seen in tropical climate (which is hot and humid)
- Some appear diffuse and scaly and may involve the
  hair follicles
- Inflamed, pustular lesions (kerion) may develop when
  infection is from animal to man
- Pruritus usually leads to excoriation of lesions and
  secondary bacterial infection

**Pruritus usually leads to excoriation of lesions and
secondary bacterial infection**
- Marked regional lymphadenopathy is the rule
- Lesions present as severe, deep folliculitis with
  erythema, nodular infiltrates, scales and pustules
- In the presence of immune suppression from underlying
  conditions, a more severe form of tinea capitis
  (kerion) may develop
- 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
  - Pruritus usually leads to excoriation of lesions and
    secondary bacterial infection

**Pruritus is a notable symptom**
- Sometimes associated with lichenification
- Avoid iatrogenic factors e.g. abrasions, scratches,
  harsh fibre bathing sponges, and the drugs listed above

**Prevention**
- Keep the feet dry; avoid tight-fitting covered shoes
- Aerate the feet as often as possible
- Use good antiseptic powder on the feet after bathing e.g.
  Tolnaftate 1% powder
- Reduce perspiration and enhance evaporation from the
  perifungal area by wearing loose pants (e.g. boxer pants)
  made of absorbent cotton fabric
- Apply plain talcum powder or antifungal powders in the
  axillae and interdigital areas
Chapter 6: Dermatology

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 paresthesia
- Multidermatomal and disseminated forms may occur in immuno-compromised states especially HIV infection

The early rash is vesicular, later becomes pustular and then ulcerates
- The whole episode may last 2 weeks

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)
- Unilateral facial paralysis (Bell’s palsy)

Investigations

- Skin scraping for KOH microscopy
- Biopsy
- Viral culture
- Direct fluorescent antibody (DFA) staining
- Polymerase chain reaction (PCR)

Drug treatment

- Aciclovir: Topical: Apply 3-4 times daily
  - For adults: 3-4 times daily
  - For children: 3-4 times daily
- Oral: 10-20 mg/kg/day divided every 8 hours

Supportive measures

- Avoid hot, humid environments or clothes that promote perspiration
- Take cold showers after perspiration
- Use any of the above shampoo washes once a month if predisposed

VIRAL INFECTIONS

HERPES ZOSTER

Adults: apply 3-4 times daily

Child: may not be suitable for children because of its irritating 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

- Common in children
- Spread by direct human to human contact
- In adults it is often transmitted during sexual intercourse

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
- Consider HIV in adults

Differential diagnoses

- Viral warts
- Giant molluscum contagiosum may mimic basal cell epithelioma

Complications

- Secondary bacterial infection

Investigations

- Histopathology of the expressed pasty core
- Treatment objectives
- Eradicate the skin lesions

Non-drug treatment

- Light electrotherapy with a fine needle
- Cryotherapy with trichloroacetic acid 35% - 100%
- Curettage and paint with ichodine

Drug treatment

- Cimetidine: 10 mg/kg/day orally for 2 months
- Antibiotics to treat or prevent secondary bacterial infection

Supportive measures

- Avoid direct skin contact with an infected person

Notable adverse drug reactions, caution

- Aciclovir

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 cured 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

- Varicella minor
- Disseminated varicella in immunosuppressed patients
- Widespread papular urticaria
- Coxackie 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: administration after lesions have healed
- Child: not licensed for use in children less than 1 year. 1 month - 12 years: 5 - 10 mg/kg (maximum 400 mg) 4 times daily 12 - 18 years: 400 mg orally 4 times daily

- Antibiotics to treat or prevent secondary bacterial infection

Notable adverse drug reactions, caution

- Aciclovir

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- Adult: apply 3-4 times daily

- Child: may not be suitable for children because of its irritating 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

- Aciclovir

- Adult: 10 mg/kg/day orally for 2 months

- Antibiotics to treat or prevent secondary bacterial infection

- To prevent or treat 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)

**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**
- Growths with rough surface; round or irregular, greyish or brown
- Generally appear on areas that are frequently injured, such as the fingers, around the nails (periangual warts); knees, face and scalp

**Plantar warts**
- Growths develop on the soles of the feet, where they are usually flattened by the pressure of walking
- A reactive callus forms around lesions
- Multiple warts may coalesce, resembling a tile or mosaic floor (mosaic warts)
- May be extremely tender
- Unlike corns and calluses, plantar warts tend to bleed from many tiny spots, like pinpoints when pared down with a blade

**Filiform warts**
- Long, thin, small growths that usually crop up on the eyelids, face, neck, or lips
- People who chronically use corticosteroids as cosmetic bleaching creams are prone to multiple filiform warts

**Plane warts**
- More common in children and young adult
- Usually appear in groups as smooth, yellow-brown, 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)
- 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

**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)

**Hygiene**
- 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—Papanicolaou (PAP) smear to detect cervical dysplasia

**MISCELLANEOUS DISORDERS**

**ACNE VULGARIS (Pimples)**

**Introduction**
- One of the most common skin diseases
- A disorder of the pilosebaceous follicles
- Typically first appears during puberty when androgenic stimulation triggers excessive production of sebum
- Many factors interact to produce acne in a given patient
- Genetics
- Sebum production
- Hormones
- Bacteria
- Properties of the sebaceous follicle
- Immunologic
- Over-production of stratum corneum cells (hyperkeratosis) obstructs the hair follicles at the follicular mouth producing open comedones, or blackheads
- Just beneath the follicular opening in the neck of the sebaceous follicle it causes microcomedones (closed comedones, or whiteheads)
- There is an overgrowth of gram-positive bacteria in the obstructed follicle: Propionibacterium acnes or Staphylococcus epidermidis; distally Pitrosporum ovale
- Rupture of the comedonal contents into the dermis induces a foreign body reaction and inflammation

**Clinical features**
- Some drugs may produce acneiform eruptions
- Androgens
- Adrenocorticotropic hormone (ACTH)
- Glucocorticoids
- Hydantoins
- Isoniazid
- Halogens

**Complications**
- Psychosocial problems from cosmetic disfigurement
- Post-inflammatory pigmentation changes
- Pitted scars
- Keloids

**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)

**Standard Treatment Guidelines for Nigeria 2008**
- 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
- Tuberculosis verrucosa cutis
- Pemphigus vegetans
- Squamous cell carcinoma
- Seborrhoeic keratosis
- Hypertrophic lichen planus
- Keratoacanthoma
- Squamous cell carcinoma
- Seborrhoeic keratosis
- Hypertrophic lichen planus
- Tuberculosis verrucosa cutis
- Palmoplantar keratoderma
- Arsenical keratoses
- Epidermodysplasia verruciformis
- Syringomas
- Dermatosis papulosa nigra
- Lichen planus
- Lichen nitidus
- Cervical carcinoma from anogenital warts
- Obstructive laryngeal papillomatosis in babies infected through maternal birth canal
- Histopathology if in doubt
- Investigations
- Management
- Treatment objectives
- Non-drug treatment
- Laser surgery

**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**
- Long, thin, small growths that usually crop up on the eyelids, face, neck, or lips
- People who chronically use corticosteroids as cosmetic bleaching creams are prone to multiple filiform warts

**Complications**
- Some drugs may produce acneiform eruptions
- Androgens
- Adrenocorticotropic hormone (ACTH)
- Glucocorticoids
- Hydantoins
- Isoniazid
- Halogens

**Complications**
- Post-inflammatory pigmentation 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
    - **Adult:** apply thinly 1 - 2 times daily
    - **Or:**
      - Benzoyl peroxide
        - **Adult:** 2.5% or 5% water-based or alcohol-based gels, applied twice daily
        - **Child:** apply up to 3 times daily
      - Start with lower strength preparations
  - **Infantile acne:**
    - **Child 1 month to 2 years; neonate:** apply 1 - 2 times daily
    - **Child 12-18 years:** apply 1 - 2 times daily preferably after washing with soap and water
    - Start with lower strength preparations
  - **Clindamycin or erythromycin gel or solution twice daily**
    - **Adult and child:** apply twice daily
    - **Or:**
      - Azelaic acid 20% cream
        - **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 daily 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)**

**Adjuvant measures**

- Un-irritating cleansing agents to reduce facial sheen and bacterial flora
- Emotional support

**Severe acne**

- **Start with systemic antibiotics as above**
- **Oral isotretinoin (13-cis retinoic acid)**
  - **Adult:** 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 daily 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**

- Un-irritating cleansing agents to reduce facial sheen and bacterial flora
- Emotional support

**Comedonal extraction**

- Intralesional injection for deeper papules and occasional cysts
- Dilute suspensions of triamcinolone acetonide
  - 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/acetone-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 amoxicillin or tetracycline, 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
      - **Premature closure 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**

- **Check cholesterol and triglyceride levels every 2 - 4 weeks while on therapy**
- **Dapsone at such high doses is likely to cause methaemoglobinemia**
- **Where leprosy is still endemic (e.g. Nigeria), reserve treatment for leprosy**

**Prevention**

- **Avoid**
  - Oil-based cosmetics, hair styling mousse, face creams and hair sprays
  - **Medicines that may induce acne**

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**Chapter 6: Dermatology**

**Standard Treatment Guidelines for Nigeria 2008**

- **Comedone extraction**
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**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, pruritus due to dry skin may be particularly bothersome
- Psychologic trauma, stress, absence of distractions, anxiety, and fear may all enhance itching
- 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
- Excoriations are typically linear and occur where the patient can reach with his hands
- The middle of the back is typically spared except when 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
Chapter 6: Dermatology

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The activation of cutaneous mast cells and their release of mediators is the unifying feature of most urticaria

Mast cells are found in the immediate vicinity of blood vessels

- They release histamine, heparin and various enzymes) as well as newly manufactured ones (prostaglandins, leukotrienes)

A hive or urticarial lesion is the result of localized oedema in the dermis

Causes:

- Medications
- Food
- Aero-allergens
- Latex; seminal fluid (contact urticaria)
- Insect antigens (bees, wasps or hornet toxins)
- Infestations (parasitic, fungal, bacterial and viral)
- Foreign proteins (antibodies, vaccinations)
- Physical stimuli (pressure, heat, cold, cholinergic stimuli, water, light and irritations)
- Auto-immune disorders, enzyme defects (C1 esterase inhibitor deficiency)

Psychosocial conflicts (stress, depression)

Excessive mast cells (mastocytoma, urticaaria pigmentosa)

Pseudoallergy (mass cell degranulators e.g. NSAIDS; dyes, preservatives, contact urticaria)

Serum sickness

Malignancies

Idiopathic

Clinical features

- May be acute or chronic:
  - Acute urticaria is of sudden onset and lasts less than 6 weeks
  - Chronic urticaria persists for more than 6 weeks with:
    - Daily emergence of new wheals (chronic continuous)
    - Occasional hive-free periods (chronic recurrent)

The typical urticarial reaction is similar to the triple response of Lewis

- Initial erythema
- Next oedema (the hive)
- Finally an erythematous ring surrounding the hive

Urticarial lesions may:

- Vary in size and shape over minutes to hours
- Present an orange–skin appearance
- Become bullous

The pruritus associated with urticaria is usually extreme

Excoriations are extremely unusual because the lesions are almost invariably rubbed, not scratched

Urticaria/angioedema

Introduction

An eruption of evanescent wheals or hives which can result from many different stimuli on an immunologic or non-immunologic basis

The most common immunologic mechanism is hypersensitivity mediated by IgE

- Another mechanism involves activation of the complement cascade.

Ketotifen:

- not recommended because of associated burning
- Drowsiness; dry mouth; slight dizziness; CNS
- Driving, swimming and operating machines should be
- Activated charcoal:
  - Risk of aspiration in drowsy or comatose patients
  - Risk of intestinal obstruction in patients with reduced gastro-intestinal motility

Chapter 6: Dermatology

URTICARIA AND ANGIOEDEMA

Introduction

An eruption of evanescent wheals or hives which can result from many different stimuli on an immunologic or non-immunologic basis

The most common immunologic mechanism is hypersensitivity mediated by IgE

- Another mechanism involves activation of the complement cascade.

Cortisone

- Applied initially as 2 - 3 times daily
- Child: apply topically for child below 3 years; over 3 years: apply 2 - 3 times daily

Avonexic cream 0.75%

- Child: apply topically 3 - 4 times daily

Other drugs should be taken at least 1 hour before, or 4 -6 hours after colestyramine to reduce possible interference with absorption

Interferes with the absorption of fat-soluble vitamins
- Supplements of vitamins A, D and K may be required

Activated charcoal:

- Risk of aspiration in drowsy or comatose patients
- Risk of intestinal obstruction in patients with reduced gastro-intestinal motility
- May cause constipation and gastrointestinal discomfort
- Interferes with the absorption of fat-soluble vitamins
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Counsel patients

- To discontinue the use of the product if they experience:
  - Occasional nausea, rashes, and joint pain
  - Aquagenic pruritus, mastocytosis, and pruritus of neurofibromatosis
  - Pruritus without skin lesions suggests
  - 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
- Cholinergic pruritus (when the core temperature is increased and there is sweating)
- Allergy to bath sponge or soap
- Mechanical scratching 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

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As suggested by meticulous history and physical examination

Treatment objectives

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- Improve quality of life
- Prevent complications

Drug treatment

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  - 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,
Angiodema is the involvement of deeper vessels
Characterized by painless, deep, subcutaneous swelling
- Often involves periorbital, circumoral and facial regions: palms, soles and the genitalia
- May target the gastrointestinal and respiratory tracts, causing abdominal pain, corzyla, asthma and respiratory problems
- Respiratory tract involvement may cause airway obstruction
- Anaphylaxis and hypotension may also occur

**Differential diagnoses**
- Cyanotic erythema
- Urticarial vasculitis
- Mastocytosis
- Pityriasis rosea (early lesions)

- Bullous lesions:
  - Lymphomatous
  - Erythema multiforme
  - Fixed drug eruption

- Angioedema:
  - "Calabar swelling"
  - Cellulitis
  - Idiopathic scrotal oedema of children
  - Melkeren-Rosenthal syndrome

- Cold urticaria:
  - Cold urticaria
  - Cold urticarial purpura
  - Immune complex diseases
  - Systemic lupus erythematosus and other collagen vascular diseases
  - Macroglutinulenia
  - Mycosasplas infections (cold hemagglutinins)
  - Syphilis
  - Familial cold urticaria

- Acquired cold urticaria

**Complications**
- Emotional distress in chronic cases

**Investigations**
- Suggested by meticulous history and physical examination

**Treatment objectives**
- To alleviate symptoms
- Eliminate and treat cause

**Drug treatment**
- Chlorphenamine maleate
  - Adult: 4 mg orally every 4 - 6 hours (maximum 24 mg daily)
  - Child: 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

**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

**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
- A few may have hypopigmented skin between the depigmented and normal skin (trichrome vitiligo)

The distribution may be:
- Generalized (autoimmune type)
- Segmental (dermatomal type)

- The hairs on the patches eventually turn white (acquired poliosis)
- The generalized type may be symmetrically distributed in the extremities
- Generalized vitiligo continues to spread while new lesions develop for years
- Spontaneous repigmentation may occur
- Favoured sites are
  - Extensor surfaces of the extremities
  - Face and peri-orificial surfaces (around the mouth, eyes, nipples, umbilicus, penis, vulva, and anus)
- Focal vitiligo may affect one non-dermatomal site e.g. lips, vulva or penis
- Universal vitiligo applies to cases where the entire body surface is depigmented
- Generalized vitiligo may be associated with
  - Albinism
  - Hypothyroidism
  - Hyperpigmentation
  - Pernicious anemia
  - Diabetes mellitus
  - Addison’s disease

- Local loss of pigment may occur around a naevus and melasma, the so-called halo phenomena
- Vitiligo-like leucoderma occurs in about 1% of melanoma patients

- 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 other 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
  - Alopecia 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

- Post-burns depigmentation
- Tertiary stage of pinta
- Morphoea
- Lichen sclerosis
- Pityriasis alba
- Tinea versicolor
- Pielbalism
- Hypomelanosis of Itu

**Complications**
- Emotional problems due to cosmetic disfigurement

**Investigations**
- Exclude other autoimmune diseases if clinically suggestive
- See also notes on caution below

**Treatment objectives**
- Re-pigmentation
- Improve cosmetic appearance
- Emotional support

**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

- Psoralens
- 8-methoxypsoralen (MOP) 0.05% - 0.1% in combination with ultraviolet-A radiation (PUVA) for focal or limited lesions

- Tacrolimus
- 0.1% ointment twice daily for 24 weeks

- 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
- Referral otalgia

Complications
- Acute mastoiditis
- Facial nerve paralysis
- Infratemporal fracture

Investigations
- Ear swab for culture and sensitivity
- X-ray of the mastoids: shows sclerosis, hypopneumatization
- X-ray of nasopharynx
- X-ray of cholesteatomatous areas

Treatment objectives
- Systemic decongestant
- Pseudophedrine

Supportive measures
Bed rest and adequate fluids

Notable adverse drug reactions, caution
- Many preparations of psuedophedrine contain antihistamines and may cause drowsiness
- Avoid ear drops

Prevention
- Good general health and clean air environment to reduce incidence of upper respiratory infections (colds)

Acute mastoiditis
- 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
- Recurrent otitis media
- Pneumomastoid

Investigations
- Allergic tests
- Sinus tests
- X-ray of nasopharynx
- X-ray of cholesteatomatous areas

Treatment objectives
- To preserve or restore hearing as much as possible
- To control infection
- To treat concurrent infection

Non-drug treatment
- Adenoidectomy in severe cases

Drug treatment
- Decongestants
- Pseudophedrine

Chapter 7: Ear, Nose and Throat

Standard Treatment Guidelines for Nigeria 2008

months - 1 year: 125 - 250 mg for 5 - 7 days
- Systemic decongestant
- Pseudophedrine
- Adenoidectomy

- 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
- Many preparations of psuedophedrine contain antihistamines and may cause drowsiness
- Avoid ear drops

Prevention
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ADENOID DISEASE

Introduction
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- To control infection
- To treat concurrent infection

Non-drug treatment
- Adenoidectomy in severe cases

Drug treatment
- Decongestants
- Pseudophedrine

Chapter 7: Ear, Nose and Throat

Systemic 8-methoxypsoralen (or 5-methoxypsoralen)
- Systemic 8-methoxypsoralen (or 5-methoxypsoralen)
- Psuedoephedrine
- Psuedoephedrine syrup

Complications
- Pain is uncommon
- Acquired ochronosis
- Depigmentation at distant sites
- Unknown
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Depigmentation of at distant sites
- Unknown

Acquired ochronosis
- Depigmentation of at distant sites
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Unknown

- Systemic psoralen is contraindicated in:- Known photosensitivity
- Porphyria
- Liver disease
- Systemic lupus erythematosus
- Systemic 8-methoxypsoralen (or 5-methoxypsoralen)
- Psuedoephedrine
- Psuedoephedrine syrup

Complications
- Pain is uncommon
- Acquired ochronosis
- Depigmentation at distant sites
- Unknown
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Depigmentation of at distant sites
- Unknown

Acquired ochronosis
- Depigmentation of at distant sites
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Unknown

- Systemic psoralen is contraindicated in:- Known photosensitivity
- Porphyria
- Liver disease
- Systemic lupus erythematosus

50% of the body is affected

Systemic 8-methoxypsoralen (or 5-methoxypsoralen)
- Systemic 8-methoxypsoralen (or 5-methoxypsoralen)
- Psuedoephedrine
- Psuedoephedrine syrup

Complications
- Pain is uncommon
- Acquired ochronosis
- Depigmentation at distant sites
- Unknown
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Depigmentation of at distant sites
- Unknown

Acquired ochronosis
- Depigmentation of at distant sites
- Unknown

PUVA therapy should be supervised by an experienced dermatologist

Prevention
- Unknown

- Systemic psoralen is contraindicated in:- Known photosensitivity
- Porphyria
- Liver disease
- Systemic lupus erythematosus
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 actiology
- 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 NOSES
Introduce
- Children (most commonly) may aspirate pieces of play objects or food items accidentally into the airway
- May present as serious emergencies with imminent asphyxia
- The object if arrested at laryngeal level causes acute respiratory obstruction
- Sharp objects such as fish bone or pins may be impacted on the vocal cord and the resulting oedema causes progressive obstruction
- Small objects such as seeds may traverse the larynx and become arrested in the trachea or bronchus lower down
- Vegetables such as peanuts often cause severe reaction in the lungs with pneumonitis

Clinical features
- 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

Foreign Bodies in the Nose and Sinuses
Introduction
- Objects may remain undetected 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
- A common presentation in ENT emergency practice
- Children usually involved as they insert various objects into ears while playing: beads, plastic toys, seeds, etc
- Live insects may also crawl into the ear in adults/children

Clinical features
- Symptoms are often absent
- Little pain (sometimes)

Sensation of blockage may be reported by older children
- Object usually seen with good light in the ear canal

Differential diagnoses
- Impacted wax
- Otitis externa

Complications
- Otitis externa

Perforation of tympanic membrane from inexpert attempts at removal

Treatment objectives
- Remove object expeditiously without damage to ear structures or causing undue pain 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
A subperiosteal abscess forms behind the ear in a child with a discharging ear

**Clinical features**
- Fever
- Pain behind the ear
- Mucomucopurulent ear discharge
- Progressive inflammatory swelling over the mastoid region
- Swelling is tender and fluctuant

**Differential diagnosis**
- Suppurating post-aural lymphadenitis from otitis externa

**Complications**
- Spread of infection to cranial cavity with:
  - Extradural abscess
  - Meningitis
  - Brain abscess
  - 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
- Ear swab, taken properly for microscopy, culture and sensitivity

**Drug treatment**
- Large doses of parenteral antibiotics
  - **Amoxicillin**
    - **Adult:** 500 mg - 1 g intravenously every 6 - 8 hours for 7 days
    - **Child:** 50 - 100 mg/kg intravenously every 6 - 8 hours in divided doses daily for 7 days
    - **Ceftriaxone**
      - **Adult:** 1 g every 12 hours intravenously for 7 days
      - **Child:** by intravenous infusion over 60 minutes
      - **Neonates:** 20 - 50 mg/kg once daily, by deep intramuscular injection, intravenous injection over 2 - 4 minutes, or by intravenous infusion 1 month - 12 years (body weight under 50 kg) 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:** over 50 kg: same as adult dosing 6 - 12 years: 250 - 500 mg; 3 months - 5 years: 125 - 250 mg taken orally every 4 - 6 hours for 5 - 7 days

**Supportive measures**
- Bed rest: in-patient care
- Intravenous infusion as appropriate
- Adequate and timely treatment of acute otitis media

---

**NASAL ALLERGY**

**Introduction**
- Hypersensitivity of the nasal mucosa to various foreign substances, of the atopic type
- Manifests as recurrent episodes of sneezing, rhinorrhoea and nasal obstruction whenever patient comes in contact with the offending allergen

**Symptoms**
- 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**

**Diagnosis**
- Repeated episodes of sneezing
- Watery nasal discharge
- Nasal obstruction

**Complications**
- A common condition and affects all age groups
- May be familial, often associated with allergic asthma
- A common condition

**Investigations**
- Skin tests for allergens: intradermal or prick tests
- Smear of nasal secretions for eosinophilia
- Serological tests: radio-immunoassay for lgE antibodies
- Sinus X-rays

**Treatment objectives**
- 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
    - 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
  - **Oral decongestants**
    - **Promethazine**
      - **Adult:** 25 mg orally at night, increased to 25 mg twice daily

---

**OTITIS EXTERNA**

**Introduction**
- Infammation of the external ear
- May be:
  - Infective: bacteria or fungi
  - Reaction of the canal skin to chemical irritant(s)
  - Part of a generalized dermatitis
  - Localised otitis externa or furuncle (boil) is a Staphylococcal infection of a hair follicle in the canal
  - Diffuse otitis externa may be bacterial or fungal or reactive
  - May be acute or chronic
  - Bacterial infection often follows trauma from scratching the canal skin
  - Fungal otitis (otomycosis) commonly follows swimming in the tropics, usually infection by Aspergillus niger

**Clinical features**
- Pain and itching
- Ear discharge
- Sensation of blockage due to accumulated debris in canal
- Deafness is variable
- Canal is red and swollen, full of inflammatory debris

**Differential diagnoses**
- Otitis media
- Acute mastoiditis

**Complications**
- Acute perichondritis
- Ear swab, taken properly for microscopy, culture, and sensitivity

**Treatment**
- Antibiotics
  - Amoxicillin

**Adult:** 500 mg - 1 g orally every 8 hours for 5 - 7 days
- **Child:** 40 mg/kg orally every 4 - 6 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

---

**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 tonsillitis

**Clinical features**
- Follows an attack of acute tonsillitis
- Increasing pain, fever and dysphagia
- Trismus- spread of oedema and infection to pterygoid muscles
- Often referred pain to ipsilateral ear
- Difficulty in opening mouth for examination; mouth full of saliva
- Affected tonsil displaced downwards and medially, with swelling above and lateral to it, all inflamed and oedematous

**Diagnosis**
- Uvula pushed to opposite side

**Prevention**
- Parapharyngeal abscess
- Retropharyngeal abscess

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**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 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 4 - 6 hours for 5 - 7 days
  - **Neomycin/hydrocortisone ear drops**
    - Adult and child: instil 2 - 3 drops 3 - 4 times daily

**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; 3 months - 5 years: 125 - 250 mg taken orally every 4 - 6 hours

**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

**Tonsillar tumours**

- **Complications**
  - Septicaemia
  - Parapharyngeal suppurative 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*

**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

- **Supportive measures**
  - 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

**Clinical features**

- Rhinorrhoea
- 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

---

**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 as air pollution, smoking, dental sepsis and poor general health may be contributory
- Bacteriology is mixed: sometimes Gram negative and fungal organisms

**Clinical features**

- Rhinorrhoea
- 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**

- **Acute rhinitis (coryza)**
- **Allergic rhinitis**
- **Vasomotor rhinitis**
- **Orbital cellulitis (complicating ethmoidal sinusitis)**
- **Cavernous sinus thrombosis (sphenoidal sinusitis)**
- **Intracranial infection**
- **Subdural abscesses**
- **Meningitis**
- **Cerebral abscesses**
- **Dural vein thrombophlebitis**
- **Osteomyelitis of frontal or maxillary bones**
- **Chronic pharyngotonsillitis**
- **Chronic laryngitis and bronchitis**

**Investigations**

- Throat swab: microscopy, culture and sensitivity
- X-ray of paranasal sinuses
- X-ray of sinuses: four-view
- CT scan in complicated cases
- Nasal swab for microscopy, culture and sensitivity
- Steam inhalations with menthol
- Amoxicillin
  - Adult: 500 mg -1 g intravenously every 6 hours for 5-7 days
  - Child over 50 kg: 30 mg 3 - 4 times daily; 12 - 18 years: 60 mg 3 - 4 times daily
- Supportive measures
  - Paracetamol
  - 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 over 50 kg: same as adult dosing
    - 6 - 12 years: 250 - 500 mg; 3 months - 5 years: 125 - 250 mg taken orally every 4 - 6 hours for 7 - 14 days
    - 6 months - 5 years: 125 - 250 mg every 12 - 24 hours
    - 3 months - 6 weeks: 62.5 - 125 mg every 12 - 24 hours
- Other antibiotics
  - Ceftriaxone
  - Cotrimoxazole

**Supportive measures**

- Steam inhalations with menthol
- Treat contributory nasal pathology as appropriate
- Allergy, nasal polyps, septal deviations, dental pathology, etc

**Prevention**

- Avoid airway irritants, smoking, and alcohol
- Avoid air pollution
- Maintain good general health and nutrition

---

**TREATMENT OBJECTIVES**

- **Relief of pain and discomfort**
- **Rapid control of infection**
- **Restore adequate drainage of sinuses**
- **Control and eradicate infection**
- **Control symptoms by identifying and treating primary causes**

---

**NON-DRUG TREATMENT**

- **Surgery for obstructive nasal conditions**
- **Treat sinusitis**
- **Treat dental caries**
- **Treat contributory nasal pathology as appropriate**
- **Allergy, nasal polyps, septal deviations, dental pathology, etc**

**Notable adverse drug reactions**

- Amoxicillin
  - Minor gastrointestinal disturbance
  - Cotrimoxazole
  - Fixed drug eruption
  - Nausea and vomiting
  - Erythema multiforme
  - Steven-Johnson syndrome

---

**PHARYNGITIS (Sore Throat)**

**Introduction**

- An inflammatory condition of the palatine tonsils, most common in children
- In half or more cases infection is by beta-hemolytic 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
- Allergy, nasal polyps, septal deviations, dental pathology, etc

**Prevention**

- Avoid airway irritants, smoking, and alcohol
- Avoid air pollution
- Maintain good general health and nutrition

---

**PHARYNGITIS (Sore Throat)**

**Introduction**

- An inflammatory condition of the palatine tonsils, most common in children
- In half or more cases infection is by beta-hemolytic 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
Systemic upset and malaise
- Tonsils are swollen, inflamed and covered with purulent exudates
- Jugulo-digastic lymph nodes are enlarged and tender

**Differential diagnoses**
- Infectious mononucleosis
- Vincent's angina
- Agranulocytosis

**Complications**
- Quinsy: main common complication
- Parapharyngeal infection/abscess
- Rheumatic fever and nephritis following streptococcal tonsillitis

**Investigations**
- Throat swab for microscopy, culture and sensitivity
- Full Blood Count

**Treatment objectives**
- Control the infection
- Control pain
- Prevent further episodes

**Non-drug treatment**
- Oral hydration
- Salt/warm water gargle
- Tonsillectomy in chronic cases with frequent recurrent tonsillitis

**Drug treatment**
- **Antibiotics**
  - Amoxicillin
  - **Adult:** 250 - 500 mg orally every 8 hours for 5 - 7 days
  - **Child:** 40 mg/kg orally every 8 hours for 5 - 7 days
- The parenteral route may be required when there is vomiting or severe dysphagia
- **Analgesic**
  - 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; 3 months - 5 years: 125 - 250 mg taken orally every 4 - 6 hours for 5 - 7 days

**Supportive measures**
- Bed rest
- Intravenous infusion as necessary

**Notable adverse drug reactions**
- Cotrimoxazole
  - Fixed drug eruption
  - Nausea and vomiting
  - Erythema multiforme
  - Steven-Johnson syndrome

**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
- 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

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**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
- Removal with probe and cotton wool: for soft wax
- Warm olive oil
  - Or: Chlorobutanol 5% paradichlorobenzene 2%, arachis (peanut) oil 57.3%

**CHAPTER 8: ENDOCRINE SYSTE**

**DIABETES MELLITUS**

**Introduction**
- A group of metabolic diseases characterized by chronic hyperglycaemia
- Results from defects in insulin secretion, insulin action or both
- 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
Goals of dietary management of Type 2 diabetes mellitus

- The diagnosis of diabetes must be confirmed 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:
- Random venous plasma glucose ≥11.1 mmol/L or fasting venous plasma glucose ≥ 7.0 mmol/L
- Confirms the diagnosis of diabetes

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

### Diagnosis

- Straightforward in the majority of cases
- May pose a problem for those with a minor degree of hyperglycaemia, and in asymptomatic subjects
- In these circumstances, two abnormal blood glucose results on separate occasions are needed to make the diagnosis
- If the results of point blood glucose testing are equivocal, an oral glucose tolerance test should be performed
- If diagnosis remains in doubt maintain surveillance

### 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</td>
<td>&lt; 7.0</td>
<td>&lt; 110</td>
</tr>
<tr>
<td>AND</td>
<td>≥ 7.8 and &lt; 11.1</td>
<td>≥ 140 and &lt; 200</td>
</tr>
<tr>
<td>2 hour post-75 g glucose load</td>
<td>≥ 6.1 and &lt; 7.0</td>
<td>≥ 5.6 and &lt; 6.1</td>
</tr>
</tbody>
</table>

### Management

**Goals:**
- Early diagnosis
- Prevent and/or reduce short and long term morbidities
- Prevent premature mortality
- Improve quality of life and productivity of affected persons
- Promote self care practices and empowerment of people with diabetes
- Reduce the personal, family and societal burden of diabetes

**Achievement of these goals is dependent on:**
- Successful establishment of diabetes health care team, and infrastructure to support it, including provision of education for health care professionals and for people living with diabetes
- 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

### How to look after their feet and thus prevent ulcers and amputations

- 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 fiber, 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, swimming)
- 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
**Sulphonylureas**

- **Adult:**
  - 2.5 mg orally daily with, or immediately after breakfast, adjusted according to response; maximum 15 mg daily
  - Indicated for Type 2 diabetes, maturity-onset diabetes of the young, under specialist care

- **Child 10 - 18 years:**
  - Initial monotherapy in non-obese patients
  - Maintenance: 2.5 mg orally daily, or immediately after breakfast, adjusted according to response at intervals of not less than 1 week; maximum 15 mg daily
  - Indicated in:
    - Monotherapy in obese Type 2 diabetes mellitus
    - Combination therapy
    - Metabolic syndrome

**Contraindications**

- Impaired hepatic and renal function
- Congestive cardiac failure
- Contrast studies
- Chronic obstructive airways disease
- Alcoholism

**Important notes on Oral Glucose Lowering Agents (OGLAs)**

**Notable adverse drug reactions**

- Weight gain
- Hypoglycaemia
- Syndrome of inappropriate ADH secretion
- Blood dyscrasias
- Heart burn
- Abdominal pain

Copy right for: - The age - Socio-economic status - State of physical fitness - Lifestyle - Level of control

**Physical activity should:**
- Be regular (about 3 days/week)
- Last 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

**Proper foot wear must always be worn during exercise**

- For a prescribed formal activity, the exercise session should consist of:
  - A warm-up period of 5 - 10 minutes
  - The activity proper: 20 - 60 minutes
  - A cool-down period of 5 - 10 minutes

**In most parts of Africa, prescribing formal exercise in gyms or requiring special equipment is a recipe for non-adherence to the exercise regime**

- Patients should be encouraged to integrate increased physical activity into their daily routine
- The programme should impose minimum (if any) extra financial outlay in new equipment and materials

**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

**Standard Treatment Guidelines for Nigeria 2008**

- Sulphonylureas and biguanides are the agents most widely available
- Stocking these agents would meet the diabetes care needs of most diabetes facilities

**Important notes**

- Secondary failure of OGLAs is said to be common (5 - 10% of patients annually) although no reports from Africa are available

**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

**Time Course of Action of Insulin Preparations**

<table>
<thead>
<tr>
<th>Insulin Preparation</th>
<th>Onset of Action</th>
<th>Peak Action</th>
<th>Duration of Action</th>
<th>Injections per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very rapid acting</td>
<td>10 min</td>
<td>1 h</td>
<td>3 h</td>
<td>Immediately before meals</td>
</tr>
<tr>
<td>(insulin analogues)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-acting</td>
<td>30 min</td>
<td>2 - 5 h</td>
<td>5 - 8 h</td>
<td>30 min before meals</td>
</tr>
<tr>
<td>Intermediate-acting</td>
<td>1 - 3 h</td>
<td>6 - 12 h</td>
<td>16 - 24 h</td>
<td>Once or twice daily</td>
</tr>
<tr>
<td>(NPH or lente)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biphasic mixtures</td>
<td>30 min</td>
<td>2 - 12 h</td>
<td>16 - 24 h</td>
<td>Once or twice daily</td>
</tr>
<tr>
<td>(30/70; premixed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Referral to an endocrinologist should be considered if more than 30 units of insulin are required per day**
Diabetic non-ketotic hyperosmolar state

Introduction

Characterized by the insidious development of:
- Marked hyperglycaemia (usually > 50 mmol/L)
- Dehydration
- Pre-natal uraemia
- Significant hyperketonemia 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

Treatment

Rehydration
Insulin therapy
Electrolyte replacement
- In a manner similar to that used for diabetic ketoacidosis

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

Acute management

- Oral glucose if patient is conscious
- If patient is unconscious:
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 start
If hyperglycaemia 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 1,000 strength, subcutaneously start
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 diabetest
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)

Aetiology
Grave’s disease (80% of patients)
- Multinodular goitre
- Autoimmune functioning solitary thyroid nodule
- Thyroiditis (sub-acute or postpartum)
- Iodine induced - drugs such as:
  - Amiodarone
  - Radiographic contrast media
  - Iodine prophylaxis programmes
- Extra-thyroidal sources of thyroid hormone excess
  - Factitious hyperthyroidism
  - Struma ovarii
  - TSH-induced:
    - Inappropriate TSH secretion by the pituitary
    - Choriocarcinoma
    - Hydatid mole
  - Follicular carcinoma of the thyroid with metastasis

Clinical features
A goit may or may not be present
- May be diffuse or nodular
Dermatological:
- Increased sweating and pruritus
- Pigmentation, vitiligo
- Palmar erythema.

Cardiorespiratory:
- Angina and cardiac failure
- Dyspnoea on exertion
- Premature heart sound
- Kaussmaul breathing
- Tachypnoea

Gastrointestinal:
- Weight loss despite increased appetite
- Diarrhoea
- Steatorrhoea

Neuromuscular:
- Tremors, nervousness, irritability, emotional lability

Psychosis
- Muscle weakness and proximal myopathy

Reproductive
- Loss of libido, impotence
- Amenorrhoea/oligomenorrhoea

Infertility and spontaneous abortions

Ocular:
- Lid lag, lid retraction
- Grittiness, excessive laceration
- Exophthalmos diplopia
- Papilloedema

Others:
- Increased thirst
- Fatigue and apathy

Diagnosis
Simple goitre
Malignant tumours of the thyroid

Complications
Hyperthyroid crisis (thyroid storm)
Compression of the trachea

Hypothyroidism
- Coma
- Dehydration
- Tachycardia
- Fever
- Increased heart rate
- Hypothermia
- Hyporeflexia

Investigations
- Serum T₃, T₄ and TSH levels
- Measurement of I intake by the thyroid gland

Specific:
- Serum T₃, T₄ and TSH levels
- Measurement of I intake by the thyroid gland

Drug treatment
- Carbimazole

Adult: starting dose 30 - 60 mg orally in divided doses daily

Maintenance: 10 - 15 mg oral daily

Child: neonate, initially 250 micrograms/kg orally every 8 hours until euthyroid then adjust as necessary

1 month - 12 years: initially 250 micrograms/kg (maximum 10 mg every 8 hours) until euthyroid then adjusted as necessary

12 - 18 years: initially 10 mg every 8 hours until euthyroid then adjusted as necessary

- Higher initial doses occasionally required, particularly in thyrotoxic crisis

Child and carers to inform doctor immediately if sore throat, mouth ulcers, bruising, fever, malaise or non-specific illness develops

Propylthiouracil

Adult: starting dose 300 - 450 mg orally in divided doses daily

Maintenance: 100 - 150 mg orally in 2 or 3 divided doses daily

Child: neonate, initially 2.5 - 5 mg/kg orally every 12 hours until euthyroid; then adjusted as necessary

1 month - 1 year: initially 2.5 mg/kg every 8 hours until euthyroid;

1 - 5 years: 20 mg/kg 8 hours until euthyroid;

5 - 12 years: initially 50 mg every 8 hours until euthyroid;

12 - 18 years: initially 100 mg every 8 hours until euthyroid;

- Higher doses occasionally required particularly in thyrotoxic crisis

Duration of treatment usually is 18 - 24 months

β-adrenergic blocking drugs
- Propranolol 80 - 160 mg orally daily in divided doses
- Symptoms and signs of hypothyroidism due to

Cardiovascular:
- Cardiac failure
- Loss of visual acuity
- Infertility

Periodic paralysis

Prevention of diabetes
- General advice which includes (but not be limited to) the following:
  - Lose 5 - 10% weight
  - Eat a diet high in fruit and vegetables
  - Exercise for at least 30 minutes and should be undertaken at least three times a week
  - Reduce high alcohol intake

Other:
- 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
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 in 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

Supportive measures
- Treat anaemia, constipation and other complications as appropriate

Patients < 21 years who should not receive radio iodine
Persons who cannot tolerate other agents because of hypersensitivity, or for other reasons
Patients with very large goiters, having compressive symptoms or signs
Patients with toxic adenoma and multinodular goitres

Treatment
- May cause severe bone marrow suppression (including pancytopenia and agranulocytosis)
- They are contraindicated in breastfeeding mothers

HYPOTHYROIDISM (Myxoedema)
Introduction
Refers to subnormal amounts of thyroid hormones in the circulation, and the clinical features associated with this
Aetiology

Child 1 month - 2 years: initially 15 micrograms/kg orally once daily, adjusted in steps of 25 micrograms daily every 2 - 4 weeks until metabolism normalizes
2 - 12 years: initially 5 - 10 micrograms/kg once daily, gradually increased to 60 micrograms daily in 2 - 3 divided doses
2 - 18 years: initially 50 - 100 micrograms once daily, adjusted in steps of 50 micrograms daily every 3 - 4 weeks until metabolism normalizes (usual dose 100 - 200 micrograms daily)

Or:
- Liothyronine sodium (1-tri-iodothyronine sodium)

Child: neonate 0.1 - 0.3 mL orally every 8 hours; 1 month - 18 years: 0.1 - 0.3 mL every 8 hours

Thyrotoxic crisis:
- Thyrotoxicosis

ACUTE KERATITIS (Iritis)
Introduction
Inflammation of the iris (with or without the ciliary body)
- Usually occurs without any associated systemic inflammation
- Tends to recur

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 lumbrosacral segment) to exclude ankylosing spondilytis

Treatment
- Corticosteroids for treatment of inflammation
- Betamethasone sodium phosphate 0.1% - Apply eye drops every 1 - 2 hours until inflammation is controlled then reduce frequency
- 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

Prevention
- No real preventive measures

ACUTE ANTERIOR UVEITIS (Iritis)
Introduction
Inflammation of the iris (with or without the ciliary body)
- Usually occurs without any associated systemic inflammation
- Tends to recur

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 lumbrosacral segment) to exclude ankylosing spondilytis

Treatment
- Corticosteroids for treatment of inflammation
- Betamethasone sodium phosphate 0.1% - Apply eye drops every 1 - 2 hours until inflammation is controlled then reduce frequency
- 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

Prevention
- No real preventive measures
Clinical features
- May be associated with itchy ears and throat, or
sinusitis
- Brownish discoloration of the conjunctiva
- Eyelid oedema
- Red eyes occasionally, with watering when acute
- Follicles on the bulbar conjunctiva especially at the
limbus
- Papilla on the tarsal conjunctiva (seen on eversion of
the eyelid)
- Phlycten in tuberculosis- appears as a yellow nodule
with surrounding lash of engorged vessels

Antiseptics
- Exogenous allergens
- Topical drugs - atropine, penicillin
- Cosmetics
- Pollen from plants and flowers (hay fever or spring
allergy)
- House dust mite and animals

Phlyctenular conjunctivitis caused by tuberculosis-protein

Differential diagnoses
- Trachoma
- Other forms of conjunctivitis

Complications
- Pannus formation
- Keratoconus
- Corneal plaques

Investigation
Skin sensitivity test to detect allergen

Drug treatment
- Antiinflammatory preparations
  - Antazoline sulfate 0.5%, xylometazoline hydrochloride
  0.05%
  - Adult and child over 5 years: apply 2-3 times daily
  - Sodium cromoglicate eye drops
  - Adult and child: apply four times daily
  - Diclofenac sodium 0.1% eye drops
  - Adult and child: apply once daily

Phlyctenular conjunctivitis:
- Treat for tuberculosis using standard regimen

Caution
- Xylometazine is a sympathomimetic; use with caution
  in patients susceptible to angle closure glaucoma
- Systemic absorption of antazoline and xylometazine
  may result in interactions with other drugs

Prevention
Avoid allergen(s) as much as possible in cases where
it/they have been identified

EYE INJURIES
Introduction
- Injuries to the eye could be caused by blunt or sharp
objects or chemicals

Aetiology
- Blunt injuries e.g. a fist or a ball hitting the eye
- Sharp injuries e.g. glass, metal, broom stick, etc

Chapter 9: Eye Disorders

Standard Treatment Guidelines for Nigeria 2008

Hypopion, if associated with uveitis (no hypopion if
viral)
- Ulceration of cornea, which stains with fluorescein; no
ulcer in interstitial keratitis

Aetiology
- Exogenous
  - Marginal ulcers secondary to bacterial conjunctivitis
    (S. aureus)
  - Central ulcers (Pneumococcus, Herpes simplex, fungi)
  - Keratomalacia (Vitamin A deficiency)
- Exposure (7th cranial nerve palsy or dysthyroid eye
disease)

Differential diagnoses
- Infective conjunctivitis
  - Acute iritis
  - Acute glaucoma

Complications
- Corneal perforation
- Acute glaucoma

Investigations
- Corneal scraping for microscopy, culture and sensitivity

Drug treatment
- Antibiotic drops (if bacterial)
  - Chloramphenicol eye drops 0.5%
  - Apply 1 drop at least every 2 hours, and then reduce
    frequency as infection is controlled and continue for 48
    hours after healing
- Atropine drops
  - 1 drop up to 4 times daily
- Antivirals (if herpetic ulcer)
  - Idoxuridine 5% in dimethylsulfoxide

Adult and child over 12 years: apply to lesions 4 times
daily for 4 days, starting at first sign of attack
Child under 12 years: not recommended

Topical steroids
- Only for interstitial keratitis where there is no active
ulcer

Non-drug measures
- Lateral tarsorrhaphy for exposure keratopathy

Caution and contraindications to treatment
- Never use topical steroids in the presence of an active
ulcer

Prevention
- Treat initial infection or trauma promptly to avoid
progression to keratitis

ALLERGIC CONJUNCTIVITIS
Introduction
- Could occur on it own or in association with
generalized atopy (asthma, eczema, spring catarrh)

Clinical features
- Itching of the eyes with grittiness

- Chemicals e.g., alkali or acid
  - May be associated with itchy ears and throat, or
    sinusitis
  - Brownish discoloration of the conjunctiva
  - Eyelid oedema
  - Red eyes occasionally, with watering when acute
  - Follicles on the bulbar conjunctiva especially at the
    limbus
  - Papilla on the tarsal conjunctiva (seen on eversion of
    the eyelid)
  - Phlycten in tuberculosis- appears as a yellow nodule
    with surrounding lash of engorged vessels

- Exogenous allergens
  - Topical drugs - atropine, penicillin
  - Cosmetics
  - Pollen from plants and flowers (hay fever or spring
    allergy)
  - House dust mite and animals

- Endogenous allergens
  - House dust mite and animals

- Phlyctenular conjunctivitis caused by tuberculosis-protein

- Trachoma

- Other forms of conjunctivitis

- Pannus formation
- Keratoconus
- Corneal plaques

- Skin sensitivity test to detect allergen

- Antinflammatory preparations
  - Antazoline sulfate 0.5%, xylometazoline hydrochloride
  0.05%
  - Adult and child over 5 years: apply 2-3 times daily
  - Sodium cromoglicate eye drops
  - Adult and child: apply four times daily
  - Diclofenac sodium 0.1% eye drops
  - Adult and child: apply once daily

- Treat for tuberculosis using standard regimen

- Xylometazine is a sympathomimetic; use with caution
  in patients susceptible to angle closure glaucoma
- Systemic absorption of antazoline and xylometazine
  may result in interactions with other drugs

- Avoid allergen(s) as much as possible in cases where
  it/they have been identified

- Injuries to the eye could be caused by blunt or sharp
  objects or chemicals

- Blunt injuries e.g. a fist or a ball hitting the eye
- Sharp injuries e.g. glass, metal, broom stick, etc

- Chemical burns
  - Copious rinsing of eyeball and fornices with sodium
    chloride 0.9% or clean water at site
  - In hospital, copious rinsing again, to dilute offending
    agent
  - Remove particles from eye e.g. lime or cement
  - Antibiotic ointment
  - Roding of fornices with ointment to prevent
    syphilolopharon
  - Topical steroids for uveitis once cornea is re-epithelized
    Vitamin C (ascorbic acid)

- Caution and contraindications
  - Avoid the use of topical steroids in active corneal
    ulceration
  - Avoid the use of harmful traditional eye medications;
    may cause more complications

- Prevention
  - Wearing of appropriate protective eye goggles for sports,
    welding and when working with chemicals

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
  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
    vitreous; on the retina or even behind the eyeball after
doubly perforating the eye

- Differential diagnoses
  - Corneal abrasion
  - Endophthalmitis
  - Endophthalmitis
  - Orbital cellulitis

- Complications
  - Ruptured globe
  - Endophthalmitis
  - Reversible blindness (compression of optic nerve by
    orbital haemorrhage)
  - Irreversible blindness (optic nerve avulsion)
  - Corneal opacity/scarring

- Investigations
  - Orbital radiographs
  - Orbital ultrasound

- Management
  - Blunt injuries
  - Treat individual injury
  - Sharp injuries
  - Suture lacerations
  - Remove foreign bodies with magnet if possible, or by
    vitrectomy
  - Parenteral antibiotics, if infected
  - Evisceration (removal of the contents of the eyeball) if
    ruptured globe, or if infection not settling on antibiotics

- Chemical burns
  - Copious rinsing of eyeball and fornices with sodium
    chloride 0.9% or clean water at site
  - In hospital, copious rinsing again, to dilute offending
    agent
  - Remove particles from eye e.g. lime or cement
  - Antibiotic ointment
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    ulceration
  - Avoid the use of harmful traditional eye medications;
    may cause more complications

- Prevention
  - Wearing of appropriate protective eye goggles for sports,
    welding and when working with chemicals
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 gonorrhoeae
- Chlamydia
- Haemophilus influenzae
- Gonococcus: ophthalmia neonatorum

Complications
- Endophthalmitis

Investigation
- Conjunctival swab for microscopy, culture and sensitivity

Non-drug measures
- Dark glasses for photophobia

Drug treatment
- Antibiotic eye drops or ointments
- Chloramphenicol 0.5%
  - Apply one drop at least every 2 hours until infection is controlled then reduce frequency and continue for 48 hours after healing
- Amoxicillin 250 - 500 mg orally every 8 hours for 5 - 7 days
- Gentamicin sulfate 0.3% applied as stated above
- Ofloxacin 0.3% solution applied as stated above

Ophthalmia Neonatorum

Introduction
Infection in both eyes of a newborn baby in the first one month of life, without obstruction of the nasolacrimal ducts

Clinical features
- Swollen eyelids:
  - Corneal affection impossible to see the baby's eye because of the swelling
- Red eyes:
  - The conjunctivae are less inflamed in chlamydial infection
  - Pus:
  - Oozes out when the eyelids are opened
- Fever:
  - May or may not be present

Aetiology
- Bacterial:
  - Escherichia coli: starts within 3 days after birth
  - Chlamydia (usually starts 1 week after birth)
- Chemicals:
  - Others

Differential diagnosis
- Lid oedema following prolonged difficult labour

Complications
- Corneal perforation

Endophthalmitis

Investigation
- Conjunctival swab for microscopy, culture and sensitivity

Non-drug measures
- Copious irrigation to wash pus from the eyes with cooled boiled water or sodium chloride 0.9%

Drug treatment
- Topical antibiotics
  - Gentamicin 0.3% eye drops
  - Chloramphenicol 0.5% eye drops

OPHTHALMIA NEONATORUM

Introduction
Infection in both eyes of a newborn baby in the first one month of life, without obstruction of the nasolacrimal ducts

Clinical features
- Swollen eyelids:
  - Corneal affection impossible to see the baby's eye because of the swelling
- Red eyes:
  - The conjunctivae are less inflamed in chlamydial infection
  - Pus:
  - Oozes out when the eyelids are opened
- Fever:
  - May or may not be present

Aetiology
- Bacterial:
  - Escherichia coli: starts within 3 days after birth
  - Chlamydia (usually starts 1 week after birth)
- Chemicals:
  - Others

Differential diagnosis
- Lid oedema following prolonged difficult labour

Complications
- Corneal perforation

Endophthalmitis

Investigation
- Conjunctival swab for microscopy, culture and sensitivity

Non-drug measures
- Copious irrigation to wash pus from the eyes with cooled boiled water or sodium chloride 0.9%

Drug treatment
- Topical antibiotics
  - Gentamicin 0.3% eye drops

SCLERITIS/EPISCELITIS

Introduction
Inflammation of the sclera and episclera

Usually self-limiting but relapses may occur

Usually unilateral and associated with collagen disorders

Clinical features
- Dull, deep-seated pain in the eye

Localized conjunctival congestion

Differential diagnoses
- Pyerygium
- Phlyctenular conjunctivitis
- Trauma to the eye

Investigations
- Discourage the use of traditional eye medication

Complications
- Painful conjunctivitis
- Cavernous sinus thrombosis

Prevention
- No real preventive measures available

Management
- Topical steroids or NSAIDs for the duration of symptoms

STYE (HORDEOLUM)

Introduction
EXTERNAL STYE
- Infection of the lash follicle and its associated gland of Zeis or Moll

INTERNAL STYE (CHALAZION)
- Infection of the meibomian gland

Clinical features
- Painful lump growing on the eyelid
- Red swollen area on the eyelid (like a boil)
- Pain in the affected area of the eyelid

Differential diagnoses
- Various eyelid cysts and tumours

Complications
- Pre-septal cellulitis
- Orbital cellulitis
- Cavernous sinus thrombosis

Non-drug measures
- Apply warm wet pads for 15 minutes 4 times daily until the stye drains
- Incision and curettage (if there is still a chalazion lump), as soon as the infection settles

Drug treatment
- Antibiotic eye ointment to stop infection
- Systemic antibiotics
  - Amoxicillin 250 - 500 mg orally every 8 hours for 5 - 7 days

Caution
- Discourage the use of traditional eye medication

Prevention
- Clean eyelids regularly and thoroughly
- For recurrent styes, use baby shampoo to clean the eyelashes regularly

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Prevention
- No real preventive measures available

Management
- Topical steroids or NSAIDs for the duration of symptoms
Scleritis/episcleritis  
Trauma to the eye  
See relevant sections

**TRACHOMA**

**Introduction**
- Caused by *Chlamydia trachomatis*, an organism midway between a bacterium and virus
- The organism is found in the conjunctival as well as corneal epithelium and is responsible for two different conditions:
  - Trachoma (a severe disease)
  - Inclusion conjunctivitis (milder)
- Trachoma is commonly associated with poverty and unhygienic living conditions

**Clinical features**
- Acute phase:
  - Irritable red eye
  - Mucopurulent discharge
  - Eyelid oedema, pain, photophobia in severe cases
- Chronic phase:
  - Follicles on tarsal conjunctivae
  - Papillae
  - Superficial punctate keratitis
  - Pannus formation on superior cornea
- End stage:
  - Eyelid scarring with trichiasis, entropion
  - Conjunctival scarring
  - Limbal scarring with Herbert's pits
  - Corneal scarring

**Differential diagnoses**
- Other forms of infective conjunctivitis (especially viral)
- Allergic/vernal conjunctivitis
- Corneal scarring from other diseases

**Complications**
- Trichiasis
- Entropion
- Corneal scarring

**Investigations**
- Conjunctival scraping for microscopy
- Immunofluorescence or Eliza test
- Giemsa staining for trachoma inclusion bodies
- Drug treatment
- Topical: Tetracycline ointment applied 4 times a day for 6 weeks
- Systemic: Erythromycin, tetracycline (not recommended for young children) or the newer antibiotics e.g. azithromycin as appropriate
- Azithromycin

Adult: 500 mg orally once daily for 3 days  
Child over 6 months: 10 mg/kg (maximum 500 mg) orally once daily for 3 days; over 6 months (body weight 15 - 25 kg) 200 mg once daily for 3 days; body weight 25 - 36 kg: 300 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

**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

**XEROPHTHALMIA**

**Introduction**
- The spectrum of eye diseases under Vitamin A deficiency
  - Ranges from night blindness to conjunctival xerosis, to Bitot's spots, corneal xerosis and finally keratomalacia
- Clinical features
  - Night blindness
  - Dryness of the conjunctiva and cornea (xerosis)
  - Tearing
  - Bitot's spots
  - Corneal degeneration (keratomalacia)

**Differential diagnosis**
- Measles keratoconjunctivitis
- Complications
  - Corneal perforation
  - Corneal scarring
  - Blindness

**Investigations**
- Conjunctival impression cytology (where available)
- Serum Vitamin A levels

**Non-drug treatment**
- Nutrition education

**Drug treatment**
- Vitamin A capsules 200,000 IU orally daily for two days, then one capsule after one week
- Topical antibiotics and antivirals where applicable
- Padding the eye (for active corneal ulceration)

**Caution**
- Avoid the use of harmful traditional eye medication

**Prevention**
- Distribution of massive dose capsules of vitamin A to affected communities
- Nutrition and health education

**Fortification of foods with vitamin A**

**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)
  - Acute tubular necrosis (e.g. from ischemia)

- Intrinsic renal failure
  - Renovascular obstruction (e.g. renal vein thrombosis)
  - Glomerular disease e.g. glomerulonephritis
  - 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**
- Ureteric obstruction (from calculi, blood clots etc)
- Bladder neck obstruction from prostate hypertrophy
- Urethral obstruction (e.g. from strictures, congenital urethral valves)

**Clinical features**
- Thirst, dizziness, hypotension, tachycardia in pre-renal ARF
- Oliguria (not invariable)
- Bleeding tendencies
- Nocturia
- Serum Electrolytes, Urea and Creatinine
- Full Blood Count with differentials
- Abdominal ultrasound scan

**Complications**
- Volume overload
- Hyperkalaemia
- Metabolic acidosis
- Uraemic encephalopathy
- Hypertension

**Differential diagnoses**
- Acute-on-chronic renal failure
- Chronic renal failure

**Investigations**
- Urine microscopy: casts (granular, hyaline)
- Urinalysis: proteinuria, haematuria
- Serum Electrolytes, Urea and Creatinine
- Full Blood Count with differentials
- Abdominal ultrasound scan

**TREATMENT OBJECTIVES**
- Correct primary haemodynamic abnormality
- Correct biochemical abnormalities
- Prevent further renal damage

**Non-drug treatment**
- Fluid challenge (where indicated)
- Low potassium, low salt, low protein diet
- Avoid or discontinue nephrotoxic drugs

**Drug treatment**
- Antihypertensive drugs (see treatment of hypertension)
- Loop diuretics

Furosemide:
- Initially 250 mg by intravenous infusion over 1 hour at a rate not exceeding 4 mg/minute
- Give another 500 mg by intravenous infusion over 2 hours if urine output is satisfactory
- Effective dose can be repeated every 24 hours
- If no response, dialysis is probably required

**Supportive therapy**
- Regular intermittent haemodialysis
- Peritoneal dialysis

**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 nephrotoxic drugs)
- Adequate hydration and sodium loading in patients to be exposed to radiocgntast dye investigations (for example)

**CHRONIC KIDNEY DISEASE**
- 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

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 curtisi

Differential diagnoses
- Congestive heart failure
- Decompensated chronic liver disease
- Protein losing enteropathy

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
- Diuretics (furosemide at doses appropriate for clinical condition)
- Vitamin D and calcium supplements

Nephrotic Syndrome

Introduction
A clinical complex characterized by
- Proteinuria of ≥ 3.5 g per 24 hours
- Hypoaalbuminemia
- Generalized oedema
- Hyperlipidaemia; lipiduria
- Hypercoagulability

Aetiology
Idiopathic in a significant proportion of cases

Known causes include:
- Infectious diseases of the glomeruli (glomerulopathies)
- Viral infections e.g. Hepatitis B, HIV
- Immunologic disorders e.g. SLE

Allergies: insect bites, poisonous plants
- Intravenous drugs e.g. heroin
- Diabetes mellitus
- Carcinomas
- Amyloid deposition

Histologic types
- Minimal change disease
- Focal segmental glomerulosclerosis

SEXUALLY TRANSMITTED INFECTIONS

Membranous glomerulopathy
Mebrano-proliferative glomerulonephritis
Mesangio-proliferative glomerulonephritis

Clinical features
- Generalized body swelling
- Passage of frothy urine

Complications
- Peripheral arterial or venous thrombosis
- Acceleration of atherosclerosis
- Protein malnutrition
- Vitamin D deficiency
- Increased susceptibility to infections

Iron-resistant microcytic hypochromic anaemia

Investigations
Blood:
- Serum proteins
- Serum lipids
- Serum calcium and phosphate

Urine:
- Serum Electrolytes, Urea and Creatinine
- Creatinine clearance
- Full Blood Count; ESR

Abdominal ultrasound scan

Treatment objectives
- Serum Electrolytes, Urea and Creatinine
- Creatinine clearance
- Full Blood Count; ESR
- Serum lipids
- Serum proteins
- Serum calcium and phosphate

Abdominal ultrasound scan

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

Child: 1 month - 1 year: 120 mg 3 - 4 times daily with feeds; 1 - 6 years: 300 mg; 6 - 12 years: 600 mg; 12 - 18 years: 1.25 g; all 3 - 4 times daily prior to, or with meals and adjusted as necessary

Aluminium hydroxide:
- 300 - 600 mg orally 3 times a day with meals

Clinical features
- Adult:
- Child 5 - 12 years:
- Complications

Differential diagnoses
- Mesangio-proliferative glomerulonephritis
- Mesangio-proliferative glomerulonephritis

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The associated malodour is due to the release of amines produced by anaerobic bacteria that decarboxylate lysine to cadaverine, and arginine to putrescine

Predisposing factors are the use of antiseptic/antibiotic vaginal preparations or vaginal douching

Clavulanic acid
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
- Preterm 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

Or:
- Metronidazole 0.75% gel 5 g intravaginally, twice daily for 7 days

Notable adverse drug reactions, caution
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

If treatment is imperative in the first trimester of pregnancy
- Give metronidazole 2 g orally as a single dose

Notable adverse drug reactions, caution
Metronidazole; causes a disulfiram-like reaction with alcohol
Avoid high doses in pregnancy and breast feeding
May cause nausea, vomiting, unpleasant taste, furunculosis
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<td>- Treat symptomatic pregnant women</td>
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**CHANCROID (Ulcus 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.

**Persons** may present with chancroid outside endemic regions; sporadic outbreaks of infection occur in Europe and North America.

**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 prepuce, frenulum, glans, or shaft of the 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.

**Patient** may present with bubo, the initial ulcer having healed.

- Atypical lesions have been reported in HIV-infected individuals.
- More extensive, or multiple lesions sometimes accompanied by systemic manifestations such as fever and chills.

**Complications**

- Progressive ulceration and amputation of the phallus, particularly in HIV patients.
- Intra-abdominal spread leading to peritonitis.
- Lymphadenitis.
- Endocarditis.
- Ocular involvement.
- Inhalation leading to pneumonia.
- Neurological manifestations such as meningitis and encephalitis.

**Differential diagnoses**

- Syphilis
- Herpes
- Granuloma inguinale
- Lymphogranuloma venereum
- Fixed drug eruption
- Erythema multiforme
- Behcet's disease
- Trauma
- Tuberculobular chancre
- Canecours

**Investigations**

- Microscopy, culture and sensitivity of discharge from ulcer.
- Serological tests e.g. complement fixation (CF).
- Micro-immuno-fluorescence (MIF) test; PCR.

**Recommended regimen:**

**Ciprofloxacin**

500 mg orally every 12 hours for 3 days.

Or:

**Erythromycin**

500 mg orally every 6 hours for 7 days.

Or:

**Azithromycin**

1 g orally as a single dose.

**Alternative regimen:**

- Ceftriaxone, 250 mg by intramuscular injection, as a single dose.

**Adjuncttherapy**

- 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.

**CHLAMYDIAL INFECTION**

(Other than Lymphogranuloma venereum)

**Introduction**

The chlamydial occupy a special place between bacteria and viruses.

- They are a large group of obligate intracellular organisms.

**Chlamydia trachomatis** has a number of serovars and causes many different human infections.

- Eye: trachoma; inclusion conjunctivitis.
- Genital tract: lymphogranuloma venereum, non-gonococcal urethritis, cervicitis, salpingitis.
- Respiratory tract: pneumonia.

**Clinical features**

- Infections are asymptomatic, but when an incubation period can be determined, it is usually about 10 - 20 days.
- Co-infection with gonococci and chlamydiae is common.
- C. trachomatis is an important cause of non-gonococcal urethritis in men, and in females cervicitis, salpingitis, or pelvic inflammatory disease.
- Urethral or cervical discharge tends to be less painful, less purulent, and watery in chlamydial compared with gonococcal infection.
- On physical examination, the cervix may show contact bleeding in addition to the discharge.
- A patient with urethritis or cervicitis and absence of gram-negative diplococci on Gram stain and of N. gonorrhoeae on culture is assumed to have chlamydial infection.

**Complications**

- Epididymo-orchitis and sterility in males.
- Pelvic inflammatory disease (PID) and infertility in females.

**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 reinstituted for 2 weeks.

- It is important to treat the mother and her sexual partner.

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

- Doxycycline and tetracycline.
- Caution in patients with hepatic impairment, systemic lupus erythematosus and myasthenia gravis.
- Antacids, aluminium, calcium, iron, magnesium and zinc, salt, 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 hepato-toxicity; only erythromycin base or erythromycin ethylsuccinate should be used.
Chapter 10: Genito-Urinary System

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 infertility
Contaminated fingers or other fomites may also lead to infection of the eyes- gonococcal conjunctivitis
Haematogenous spread leading to meningitis, arthritis etc

Differential diagnoses
Urethral discharge:
Spermatorrhoea/prostatorrhoea (sexual arousal)
and can also be a common cause in the insertive male
In older men, where there may have been no risk of STIs, other general infections may be responsible, e.g.
Staphylococcus aureus
Cytomegalovirus infection, acute or chronic lymphocyticleukaemia
Candida albicans
Tuberculous epididymo-orchitis, secondary to lesions elsewhere, especially in the lungs or bones
Escherichia coli, Klebsiella spp. or Pseudomonas aeruginosa
Non-infectious causes of scrotal swelling:
Hydrocoele of the tunica vaginalis
Varicocele
Inguinocrotal 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
- Trichomonas vaginalis
- Candida albicans
- Escherichia coli, Klebsiella spp. or Pseudomonas aeruginosa
- Haematogenous spread leading to meningitis, arthritis etc

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
About 3 - 6 weeks post-contact a uni-or bilateral massive inguinal lymphadenopathy (bubo) appears. The glands elongate along the Poupart's ligament to become sausage shaped. Buboes progress to involve the glands above and below the ligament, so that the depression formed by the ligament which separates these two groups of glands gives the “sign of the groove”. Pain in the gland is usual, and as the glands are matted together, the overlying skin develops an erythematous or violaceous hue. The glands eventually become fluctuant, break down and discharge.

Inguinal lymphadenopathy occurs in only 20 - 30% of patients, or posterior urethra, which drain to the deep iliac nodes.

Incubation period ranges from 10 - 40 days. The early lesion is a papule or nodule which soon becomes ulcerated and has an offensive discharge. The floor of the ulcer may be covered with a dirty grey material; its walls may be overhanging, or a papillomatous fungating mass may arise from the growth of vegetations. Progressive indolent, serpiginous ulceration of the groins, pubis, genitals and anus may form. Pain on walking may be excrutiating. Persisting sinuses and hypertrophic depigmented scars are fairly characteristic. Regional lymph nodes are not enlarged but with cicatrization, the lymph channels may be blocked causing pseudo-lymphangitis of the genitalia. Both the fibrotic scarred and elephantiasis-like lesion could cause obstructed labour. Subcutaneous extension and abscesses may occur and form a pseudo-bubo in the inguinal region.

Healing is unlikely without treatment; the locally destructive lesion may eventually involve the groins, pubis and anus. A squamous cell carcinoma may arise from chronic lesions.

Differential diagnoses
Syphilis
Chancroid
Lymphogranuloma venereum
Lupus vulgaris
Deep mycosis
Amebic ulcer
Pyoderma gangrenosum
Squamous cell and basal cell carcinoma

Complications
Obstructed labour
Squamous cell carcinoma
Impairment of the lymphatic drainage from fibrotic nodes - This may produce symptoms of lower abdominal or back pain.

Therapy should be continued until the lesions have resolved. Recommended regimen: Ciprofloxacin - 1 g orally on first day, then 500 mg orally, once a day.

Differential diagnoses
Granuloma inguinale (Donovanosis; Granuloma venereum)

Introduction
A chronic mildly contagious disease caused by Klebsiella granulomatis. Currently rare in several parts of Africa. Endemic in Southeast Asia, Southern India, the Caribbean and South America.

Clinical features
A chronic mildly contagious disease with a potentially progressive and destructive character.

Chapter 10: Genito-Urinary System

Standard Treatment Guidelines for Nigeria 2008

All treatment should be for a minimum of 14 days.

Note
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.

Lymphogranuloma Venereum (C climatic bubo; lymphogranuloma inguinale; lymphopathia venerae; 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.

Secondary stage
About 3 - 6 weeks post-contact a uni-or bilateral massive inguinal lymphadenopathy (bubo) appears. The glands elongate along the Poupart's ligament to become sausage shaped.

Buboes progress to involve the glands above and below the ligament, so that the depression formed by the ligament which separates these two groups of glands gives the “sign of the groove”. Pain in the gland is usual, and as the glands are matted together, the overlying skin develops an erythematous or violaceous hue.

The glands eventually become fluctuant, break down and discharge.

Inguinal lymphadenopathy occurs in only 20 - 30% of women with LGV.

There is primary involvement of the rectum, vagina, cervix, or posterior urethra, which drain to the deep iliac or perirectal nodes.

- This may produce symptoms of lower abdominal or back pain.

Systemic symptoms usually present with:
- Fever
- Malaise
- Arthritis
- Loss of weight
- Skin manifestations (erythema nodosum, papulo-pustular lesions and photodermatosis).
- Raised ESR

Late stage
Spontaneous remission is common, though some patients enter the late stage.

Characterized by disfiguring and destructive sequelae. Impairment of the lymphatic drainage from fibrotic scarring leads to distal oedema and gross elephantiasis of the genitalia.

- There could be associated anorectal and vaginal strictures.

Complications
Systemic spread of C. trachomatis in the secondary stage resulting in arthritis, pneumonia, hepatitis or rarely pericarditis.

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.
**Prevention**

Counselling, Compliance, Condom use and Contact treatment

**Drug treatment**

**Recommended regimen:**

- Benzathine benzylpenicillin
  - 4 g (2.4 million units) by intramuscular injection, at a single session

- *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*

**Drug treatment for pregnant patients**

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

- *Notable adverse drug reactions, caution and contraindications:*
  - Benzylpenicillin (Penicillin G)
  - Caution in patients with history of allergy; atopic patients; in severe renal impairment, neurotoxicity; high doses may cause convulsions
  - Contraindicated in penicillin hypersensitivity
  - May cause hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction, rarely intestinal nephritis, haemolytic anaemia, leucopenia, thrombocytopenia and coagulation disorders

- *Other antibiotics*
  - Tinidazole
  - 500 mg orally every 12 hours for 14 days

- *Other 5-nitroimidazoles are also effective, both in single and in multiple dose regimens*

**Drug treatment for pregnant patients**

- *Erythromycin*
  - 500 mg orally every 12 hours for 14 days

**Prevention**

Counselling, Compliance, Condom use and Contact treatment

**Drug treatment**

**Recommended regimen:**

- Tinidazole
  - 2 g orally in a single dose

- *Alternative regimen:*
  - Metronidazole
  - 400 mg or 500 mg orally every 12 hours for 7 days

- *Additional regimen:
  - Tinidazole*
  - 500 mg orally every 12 hours for 5 days

**Drug treatment**

**Recommended regimen:**

- Tinidazole
  - 2 g orally in a single dose

**Prevention**

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*
### Differential diagnoses

- Vulval oedema
- Erosions and crusting on the adjacent intertriginous skin

### Characteristics

- Other causes of vaginal discharge: see Gonorrhoea in the infection, and dyspareunia
- Very serious emotional problems in a non-sexually active person wrongly “accused” by parents, spouse or health care providers

### Treatment objectives

- Cure the infection
- Prevent recurrence

### Drug therapy

**Recommended regimen for balanoposthitis**

- Insert 5 g at night as a single dose; may be repeated once if necessary
- Clotrimazole 1% cream apply twice daily for 7 days
- Clotrimazole 500 mg intravaginally, as a single dose
- Fluconazole 150 mg orally, as a single dose

**Recommended regimen for male urethral infections:**

- Clotrimazole 1% cream apply twice daily for 7 days
- Miconazole 2% cream twice daily for 7 days
- Miconazole 2% intravaginal cream
- Insert 5 g at night as a single dose; may be repeated once if necessary

### Notable adverse drug reactions, caution and contraindications

- 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

#### Clinical features

- Lower urinary tract symptoms
- Irritative symptoms:
  - Frequency
  - Urgency
  - Nocturia
- Obstructive symptoms:
  - Poor stream
  - Haematuria
  - Recurrent urinary tract infections
  - Progressive renal failure

#### Digital rectal examination:

- Enlarged prostate; firm and symmetrical
- Terminal dribbling

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- Serum Urea, Electrolytes and Creatinine
- Prostate Specific Antigen (PSA)
- Trans-retinal 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 dilatation
  - Transurethral vaporization of the prostate
  - Intermittent self-catheterization

#### Drug treatment

- Alpha-adrenergic blockers
  - Phenoxybenzamine
  - Prazosin, doxazosin, tamsulosin
  - Dutasteride
- 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, syncopal attacks, tachycardia
- Should therefore to 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
Chapter 10: Genito-Urinary System

Haematuria
- 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
- Urinary retention
- Urinary tract infection
- Hydronephrosis
- 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
- Cryoablation 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 prostatism
  - Impotence
  - Diethyl stilbestrol:
  - Fluid retention
  - Hypertension
  - Thrombo-embolic disease
  - Loss of libido
  - Gynecomastia
- 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 gynecomastia
- 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

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-corporeal administration of:
- Prostaglandin E₂
  - 5 - 15 microgram
- 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
  - Phosphodiesterase 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: herniorrhaphy, orchidopexy, urethral surgeries, etc
- Examination:
  - Gynaecomastia
  - Penis: epispidias, hypospadias, penile deformities
  - Scrotum: absence of testis, small sized testis, varicoceles, hard and irregular epididymis

Investigations
- Semen analysis x 3

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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:
  - Vasoepididymostomy
  - Vasovasostomy
  - Epididymo-vasotomy
- 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
- Hydronephrosis
- Progressive renal impairment
- Failure to thrive

Investigations
- Urinalysis
- 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
- Sexually transmitted infections

Acute bacterial prostatitis
Reactions from direct spread of ascending urethral infection or reflux of infected urine into the prostatic ducts
- E. coli is the main causative organism. Others are klebsiella, pseudomonas, Streptococcus faecalis and Staph aureus

Chronic bacterial prostatitis
Caused by E. coli, Klebsiella, Mycoplasma and Chlamydia

Non-bacterial prostatitis
An inflammation of indeterminate cause

Acute prostatitis
Systemic features
- Fever
- Chills
- Malaise
- Nausea
Local features
- Dysuria
- Frequency
- Haematuria
- Urethral discharge
Rectal examination:
- Hot boggy, swollen and very tender prostate

Chronic prostatitis
Voiding symptoms: dysuria, frequency, urgency, haematuria
Poor stream
Urethral discharge
Low back pain

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

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:
- In those with undescended testes
- Bring testis down and fix it in the scrotum

Prostate cancer
- Rectal examination: enlarged, tender, firm prostate

Surgical treatment:
- Apocrine prostatic urethra or prostatic apex
- Full bladder, Full Blood Count, Intracystic prostatic capsule

Antiprostatic testis
The testes, if palpable cannot be manipulated into the scrotum

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

Abdominal incision
- Absence of the cremasteric reflex
- Normal lie of the testis on the opposite side

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- Tenderness. Pain can be increased by lifting the testicle up

Absence of the cremasteric reflex
- Normal lie of the testis on the opposite side
**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

**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

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**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

**Clinical features**
- Dysuria
- Frequency
- Urgency
- Poor stream
- Straining
- Hesitancy

**Non-drug treatment**
- Serial dilatation
- Bouginage

**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

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**URINARY SCHISTOSOMIASIS**

**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

Grows to the urinary tract through the blood vessels after penetrating the skin

**Clinical features**
- Pricking sensation and itching (cercarial dermatitis)
- Four weeks later:
  - Intermittent fever, malaise, urticaria and cough

---

**URETHRAL TRACT CALCULI**

**Introduction**
Occurrence of stone(s) in the kidney, ureter, bladder or urethra

Incidence in Nigeria is 7 - 34 per 100,000

Stones are different with respect to their composition

Factors promoting stone formation:
- Oxalate stones, phosphate stones, uric acid stones and cystine stones

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**Obstruction to urine outflow**

**Infection in the urinary tract**

**Crystallization on foreign bodies**

**Dehydration**

**Change in pH**

**In-born errors of metabolism**

**Clinical features**

**Renal and ureteric stones:**
- Sudden onset loin pain radiating to the groin
- Haematuria
- Nausea and vomiting

**Stones in the bladder:**
- Frequency
- Urgency
- Difficulty in passing urine

**Stones in the urethra:**
- Urinary retention

**Differential diagnoses**

**Acute pyelonephritis**

**Renal tumour**

**Acute appendicitis**

**Other causes of urinary obstruction e.g. enlarged prostate, urethral strictures**

**Complications**

**Recurrent and intractable urinary tract infection**

**Secondary hydronephrosis**

**Progressive renal failure**

**Periurethral abscess/urethral fistula**

**Investigations**

**Urine culture**

**Serum calcium, phosphate and albumin**

**Intravenous urography (IVU)**

**Ultrasonography**

**Computerized tomography (non-contrast enhanced)**

**Treatment objectives**

**Relieve symptoms**

**Remove stones**

**Prevent recurrence**

**Non-drug treatment**

**Increased fluid intake**

**Endoscopic Short Wave Lithotripsy (ESWL)**

**Endoscopic removal of stones**

**Open surgical removal**

**Drug treatment**

**Analgesics**

**Antibiotics to treat infections**

**Drugs used to prevent recurrence:**
- Thiazide diuretics
- Hydrochlorothiazide 5 mg orally daily

**Or:**
- Potassium citrate
  - 60 mEq orally daily

**Or:**
- Allopurinol 100 mg orally daily
CHAPTER 11: INFECTIOUS DISEASES/INFESTATIONS

FEVERS: MANAGEMENT APPROACH

Introduction
A leading cause for seeking medical care

In health, temperature is controlled within limits (in adults at a mean of 36.8°C) with diurnal variations of about 0.5°C.

'Fever' is elevation of body temperature that exceeds the normal daily variation and occurs in conjunction with an increase in hypothalamic set point.

In children younger than 5 years of age:
- Arectal temperature greater than 38°C
- Oral temperature above 37.8°C
- Axillary temperature above 37.2°C

Important points in the history are:
- Chronology of symptoms
  - Occupational history
  - Travel history
  - Geographic region
  - Family history

Physical examination:
- Vital signs (axillary temperatures are unreliable)
- Skin, lymph nodes, eyes, nail beds, CNS, chest, abdomen, cardiovascular, musculo-skeletal and nervous systems
- Rectal examination is imperative
- The penis, prostate, scrotum and testes (for men)
- Pelvic examination (for women)

Investigations

The number of investigations will depend on the clinical circumstances. On occasions, patients may need to be extensively investigated.

General:
- Full Blood Count
- Differential white blood cell count
- Urinalysis with examination of the urinary sediment
- Examination of any abnormal fluid collection

Microbiology:
- Smears and culture of specimens from the throat, urethra, anus, cervix, and vagina (as indicated)
- Sputum smears; culture
- Blood culture
- Urine microscopy, culture and sensitivity
- Cerebrospinal fluid examination
- Abnormal fluid collection: specimens for microscopy, culture and sensitivity testing

Cerebrospinal fluid examination
- Abnormal fluid collection: specimens for microscopy, culture and sensitivity testing

Other investigations as may be indicated in the clinical circumstances

Complications
- Heat stroke in adults
- Febrile convulsions in children
- Complications associated with underlying cause(s) of fever

Treatment Objectives
- To lower the temperature
- To treat underlying causes

Non-drug treatment
- Tepid sponging
- Liberal oral sips of water (if clinical state is not a contraindication)

Drug treatment
- Paracetamol
  - Adult: 500 mg - 1 g orally every 4 - 6 hours; maximum 4 g daily
  - Child: 3 months - 1 year: 60 - 125 mg; 1 - 5 years: 120 - 250 mg; 6 - 12 years: 250 - 500 mg; repeated every 4 - 6 hours if necessary to a maximum of 4 doses in 24 hours
  - Infants under 3 months should not be given paracetamol unless advised by a doctor

Aspirin: (acetylsalicylic acid)
- Adult: 300 - 900 mg orally (with or without food) very 4 - 6 hours if necessary; maximum 4g daily
- Child: under 16 years, not recommended because of the risk of Reye's syndrome

Notable adverse drug reactions, caution
- Paracetamol:
  - Liver damage (and less frequently, renal damage) following over dosage
  - Aspirin
    - Gastrointestinal discomfort, nausea
    - Ulceration with occult bleeding
    - Hearing disturbances such as tinnitus (rarely deafness)

Use with caution in the following clinical conditions:
- Asthma
- Allergic disease
- Impaired renal or hepatic function
- Pregnancy
- Breastfeeding
- Elderly

Dehydration

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:

Other infections:...
Helminthiasis

Introduction
Parasitic worm infestations can arise from different groups:
- **Nematodes (round worms)**
  - Ascaris
  - Enterobius (pinworm)
  - Trichuris (whipworm)
  - Enterobius (pinworm)
- **Cestodes (flat worms/tapeworms)**
- **Trematodes (flukes)**
- **Schistosoma haematobium**
- **S. mansoni**
- **T. solium** and **T. saginata**

Clinical features
- Depends on the infecting helminth:
  - Ascaris
    - Lung phase:
      - Irritating, non-productive cough
      - Burning substernal discomfort, aggravated by coughing or deep inspiration
  - Dyspnoea
  - Blood-tined sputum
- Intestinal phase:
  - Usually no symptoms
  - Pain
  - Features of small bowel obstruction
  - Features of perforation
  - Intussusception
  - Volvulus
- Bilary tree occlusion: biliary colic, cholecystitis, cholangitis, pancreatitis, intrahepatic abscesses

Effects of migration of an adult worm up the oesophagus:
- Coughing
- Oral expulsion of the worm

Hookworm
- Mostly asymptomatic
- Maculo-papular dermatitis
- Mild transient pneumonitis
- Epi gastric pain, often with post-prandial accentuation
- Diarrhoea
- Weakness
- Shortness of breath
- Skin depigmentation

Enterobiasis
- Perianal pruritus, worse at night owing to the nocturnal migration of the female worms
- Skin excoriation and bacterial superinfection

Trichuriasis
- Abdominal pain
- Weight loss
- Vulvo-vaginitis
- Necrotising granulomas

Strongyloidiasis
- Distinctive by its ability to replicate in the human host
- Can thus persist for decades without further exposure of the host to exogenous infective larvae
- Recurrent urticaria: buttocks and wrists
- Pruritic raised erythematous skin lesions: advance as rapidly as 10 cm/hour along the course of larval migration
- The pathognomonic serpiginous eruption
- Mid-epigastric abdominal pain
- Nausea
- Diarrhoea
- Gastrointestinal bleeding
- Mild chronic colitis
- Weight loss
- Small bowel obstruction

Disseminated strongyloidiasis in patients with unsuspected infection who are given glucocorticoids can be fatal

- 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
- 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 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

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- Mebendazole
  - Adult and child: 100 mg orally every 12 hours for 3 days
  - Iron supplementation may be given if anaemia is present
- Albendazole
  - Adult and child: 400 mg orally every 12 hours for 3 days

- Pyrantel embonate
  - Adult and child: 10 mg/kg orally once
  - Repeat dose 2 weeks later; several treatments may be necessary
- Praziquantel
  - Adult: 40 mg/kg given orally at once
  - Provides up to 80% cure rates
  - Child over 4 years: 20 mg/kg followed after 4 - 6 hours by a further dose of 20 mg/kg
  - Praziquantel is effective in all human cases caused by all schistosomes
- Mebendazole
  - Adult and child: 100 mg orally every 12 hours for 3 days
  - Enterobius
    - Pyrantel embonate
    - Adult and child: 10 mg/kg orally once
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- Praziquantel
  - Adult: 40 mg/kg given orally at once
  - Provides up to 80% cure rates
  - Child over 4 years: 20 mg/kg followed after 4 - 6 hours by a further dose of 20 mg/kg (20 mg/kg 3 times daily for one day for S. japonicum infections)

Notable adverse drug reactions, caution and contraindications
- Avoid mebendazole in pregnant women
- Side effects of praziquantel include abdominal pain, headache, dizziness and skin rashes
**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.

**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
- Herpes labialis
- 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 1: 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 1: bedridden < 50% of the day during last month.

Clinical Stage IV:
- HIV wasting syndrome¹
- 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 encephalopathy¹
- And/or performance scale 4: bedridden < 50% of the day during last month.

**WHO Improved Clinical Staging**

<table>
<thead>
<tr>
<th>Laboratory indices</th>
<th>Clinical stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocytes</td>
<td></td>
</tr>
<tr>
<td>CD4</td>
<td>Stage 1</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Stage 3</td>
</tr>
<tr>
<td>Stage 4</td>
<td></td>
</tr>
<tr>
<td>A &gt; 2000</td>
<td>1A</td>
</tr>
<tr>
<td>1000 - 2000</td>
<td>2A</td>
</tr>
<tr>
<td>&lt; 1000</td>
<td>3A</td>
</tr>
<tr>
<td>B 500</td>
<td>2B</td>
</tr>
<tr>
<td>200 - 500</td>
<td>3B</td>
</tr>
<tr>
<td>C &lt; 200</td>
<td>4B</td>
</tr>
</tbody>
</table>

**CDC classification**

<table>
<thead>
<tr>
<th>CD4</th>
<th>Stage A</th>
<th>Stage B</th>
<th>Stage C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage A</td>
<td>Asym. PGL</td>
<td>Symp. not A or C</td>
<td>AIDS indicator condition</td>
</tr>
<tr>
<td>&gt; 500</td>
<td>A1</td>
<td>B1</td>
<td>C1</td>
</tr>
<tr>
<td>200 - 500</td>
<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
### Standard Treatment Guidelines for Nigeria 2008

**Diagnosis of HIV**

- To be made by identifying HIV DNA using 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 <20% to assist in decision making

**Options**

- WHO Paediatric Stage I (asymptomatic) and CD4 <20%
- If HIV-seropositive status is not virologically proven but CD4 cell assays are available, ART can be initiated when the child has:
  - WHO Stage II or III disease and CD4 <20%
  - In such cases, HIV antibody testing must be repeated at age 18 months to definitively confirm that the child is HIV infected
  - Only children with confirmed infection should have ARV therapy continued
  - HIV-seropositive children aged >18 months

#### Preferred first line regimens

<table>
<thead>
<tr>
<th>ART</th>
<th>Adult dosage</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zidovudine (ZDV)</strong></td>
<td>250 - 300 mg orally twice daily</td>
<td>1.25 g orally twice daily</td>
</tr>
<tr>
<td><strong>Stavudine (d4T)</strong></td>
<td>40 mg orally twice daily</td>
<td>If weight &lt;60 kg: 30 mg twice daily</td>
</tr>
<tr>
<td><strong>Nevirapine (NVP)</strong></td>
<td>200 mg orally once daily; 800 mg once daily when using anti-tuberculosis drug</td>
<td>1.25 g orally twice daily</td>
</tr>
<tr>
<td><strong>Efavirenz (EFV)</strong></td>
<td>600 mg orally once daily; 800 mg once daily when using anti-tuberculosis drug</td>
<td>1.25 g orally twice daily</td>
</tr>
<tr>
<td><strong>Zalcitabine (d3T)</strong></td>
<td>300 - 400 mg orally twice daily</td>
<td>40 mg orally twice daily</td>
</tr>
<tr>
<td><strong>Stavudine (d4T) + 3TC + NVP</strong></td>
<td>500 mg orally three times daily</td>
<td>150 mg orally twice daily</td>
</tr>
<tr>
<td><strong>Lamivudine (3TC)</strong></td>
<td>150 mg orally twice daily</td>
<td>150 mg orally twice daily</td>
</tr>
</tbody>
</table>

**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 testing is unavailable:
  - WHO Stage IV disease irrespective of CD4 cell count
  - WHO Stage III disease with CD4 cell counts < 350/mm³
  - WHO Stage I or II disease with CD4 cell counts ≥ 200/mm³

- If CD4 testing is unavailable:
  - WHO Stage IV disease irrespective of total lymphocyte count (TLC)
  - WHO Stage III disease irrespective of TLC
  - WHO Stage II disease with a TLC ≥ 1200/mm³
  - TLC of ≥ 1200/mm³ does not predict a CD4 cell count of ≥ 200/mm³ in asymptomatic patients
  - TLC of ≥ 1200/mm³ may not be used as criterion for the initiation of therapy in asymptomatic patients (WHO Stage I disease)

- Children

  - Children are monitored using CD4 percentage (CD4 %) i.e. percentage of lymphocytes that are CD4 cells
  - CD4% of an HIV-negative child is around 40%
  - Diagnosis depends on the age of the child and availability of virological testing
  - Children < 18 months

  - Serological diagnosis is unreliable as maternally-derived antibodies may persist for up to 15 - 18 months

#### Alternative first line regimens

- ddl/3TC/NVP or EFV
  - ddl for children and above; avoid liquid formulations

- ddI/3TC/NVP or EFV
  - ddI for children and above; avoid liquid formulations

- TDF/3TC/NVP or EFZ
  - TDF for children and above; avoid liquid formulations

- ABC/3TC/NVP or EFZ
  - ABC for children and above; avoid liquid formulations

**First line recommendations for HIV/TB patients**

- (ZDV or d4T) + 3TC + NVP or non-rifampicin-containing continuation phase
- (ZDV or d4T) + 3TC + EFV during rifampicin-containing intensive or continuation phase

**Criteria for initiating ART based on Nigerian ART guidelines**

- Children with tuberculosis require rifampicin-containing regimen for TB treatment
- Children with tuberculosis require rifampicin-containing regimen for TB treatment
- Children with tuberculosis require rifampicin-containing regimen for TB treatment

**Management of virological treatment failure**

- The three drugs reserved for the first line regimens are replaced with three totally new drugs-second line regimens
- Where resistance testing is available, the failing drug may be identified and replaced
### Recommended second line regimens

<table>
<thead>
<tr>
<th>Adults and adolescents</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line</strong></td>
<td><strong>Second line</strong></td>
</tr>
<tr>
<td>d4T or ZDV/3TC/NVP or EFV</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>TDF/FTC/NVP or EFV</td>
<td>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>
<tr>
<td>ABC/3TC/NVP or EFV</td>
<td>TDF/FTC/IDV/r or SQV/r or LPV/r</td>
</tr>
</tbody>
</table>

**Note**
- The dose of ddl 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

- **Didanosine (ddl)**
  - 2 - 8 weeks: 100 mg/m² orally twice daily.
  - > 8 weeks: 120 mg/m² twice daily.
- **Lamivudine (3TC)**
  - < 1 month: 2 mg/kg orally twice daily.
  - > 1 month: 4 mg/kg orally twice daily.
- **Adolescents < 50 kg:** 2 mg/kg orally twice daily.
- **Stavudine (d4T)**
  - 1 mg/kg orally twice daily up to a maximum of 40 mg per dose.
- **Zalcitabine (ddC)**
  - Not available.
- **Zidovudine (ZDV)**
  - 160 mg/m² orally every 6 hours.
- **Efavirenz (EFZ)**
  - Taken orally once daily.
- **Tenofovir (TDF)**
  - < 1 month: 5 mg/kg orally once daily for 14 days, then 120 mg/m² twice daily for 14 days, and 200 mg/m² twice daily.
  - 1 month - 13 years: 120 mg/m² twice daily for 14 days, then 200 mg/m² twice daily.
- **Tenofovir (TDF)**
  - 1 - 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.
  - > 1 month - 13 years: 120 mg/m² twice daily for 14 days, then 200 mg/m² twice daily.

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**Reactions:**
- Gastrointestinal
- Hepatic transaminis especially in patients with chronic hepatitis B or C
- Hyperlipidaemia
- Fat accumulation
- Stomatitis

**GIT intolerance in 5 - 30% leading to:**
- Nausea
- Abdominal pain
- Diarrhoea

**Note:**
- Children
- **First line**
  - d4T or ZDV/3TC/NVP or EFV
  - ddl/3TC/NVP or EFV
  - LPV/r requires secure cold chain.
- **Second line**
  - ddl/3TC/NVP or EFV
  - ZDV/3TC/LPV/r (preferred) or NFV

**Recommended second line regimens**

- **Adults and adolescents**
  - **First line**
    - d4T or ZDV/3TC/NVP or EFV
  - **Second line**
    - TDF/FTC/IDV/r or SQV/r or LPV/r

**Recommended second line regimens**

- Hallucinations
- Insomnia
- Abnormal dreams
- Somnolence
- Anemia
- Abnormal thinking
- Confusion
- Euphoria

**For these reasons, EFV is contraindicated in patients who already have psychiatric manifestations:**
- Foetal abnormalities observed in animal models.
- Efavirenz should not be used in pregnant women or women who might become pregnant while on therapy.

**Zidovudine (ZDV):**
- Bone marrow suppression resulting in:
  - Anaemia with macrocytosis
  - Thrombocytopaenia
  - Leucocytopenia
  - Gastro-intestinal intolerance is fairly common:
    - Hypersalivation, nausea, abdominal discomfort.

**Stavudine (d4T):**
- Peripheral neuropathy presenting with painful sensations in the lower limbs more than the upper limbs.
  - Lactic acidosis with hepatic steatosis.
  - Stop treatment or switch to a drug less toxic to mitochondria (worse when d4T is used in combination with ddl).

**Peripheral fat atrophy:**
- Ascending motor weakness resembling Guillain-Barre syndrome.

**Lamivudine (3TC):**
- No major side effect but class side effects may occur:
  - Unconjugated hyperbilirubinaemia
  - Gastrointestinal effects
  - No effect on lipids

**Ritonavir (RTV):**
- Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.

**Abacavir (ABC):**
- Life-threatening hypersensitivity in 3 - 9% of patients.

**Tenofovir (TDF):**
- Infrequent; not more than what is observed in placebo controlled trials.
- Renal insufficiency and bone deminerlization.

**Nevirapine (NVP):**
- Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.

**Efavirenz (EFV):**
- Morbilliform rash may appear; usually not life-threatening.

**Child dosages**

- Didanosine (ddl)
  - 2 - 8 weeks: 100 mg/m² orally twice daily.
  - > 8 weeks: 120 mg/m² twice daily.
- Lamivudine (3TC)
  - < 1 month: 2 mg/kg orally twice daily.
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  - 1 mg/kg orally twice daily up to a maximum of 40 mg per dose.
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- Efavirenz (EFZ)
  - Taken orally once daily.
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  - 1 month - 13 years: 120 mg/m² twice daily for 14 days, then 200 mg/m² twice daily.

**Mechanisms with anticipated (potential) merit:**
- Prophylactic AZT/NVP or HAART.
- Unconjugated hyperbilirubinaemia.
- No effect on lipids.

**Note:**
- Refer to standard texts for possible drug-drug interactions in all cases.

**Prevention**

- Mechanisms with established merit:
  - Prevention of mother-to-child transmission (PMTCT).
  - Abstinance.

- Prophylactic AZT/NVP or HAART.
- Caesarian section.
- Infant feeding choices (Exclusive Formula).
- Safe sex (condom use).
- Post exposure prophylaxis following sexual exposure (rape).
- Needle exchange programmes for IVUs.
- Sexually transmitted infections (STIs).
- Voluntary counselling and testing (VCT).
- Infant feeding choices (Exclusive Formula).
- Safe sex (condom use).
- Post exposure prophylaxis following sexual exposure (rape).
- Needle exchange programmes for IVUs.
- Sexually transmitted infections (STIs).
- Voluntary counselling and testing (VCT).

**Mechanisms with anticipated (potential) merit:**
- Reduction of viral load with HAART.
- Non-nucleoside reverse transcriptase inhibitors (NNRTI).
- Protease inhibitors (PI).
- Combination therapy.
- Cure of infection.
- Prevention of mother-to-child transmission (PMTCT).
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- Abstinance.
- Prophylactic AZT/NVP or HAART.
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- Infant feeding choices (Exclusive Formula).
- Safe sex (condom use).
- Post exposure prophylaxis following sexual exposure (rape).
- Needle exchange programmes for IVUs.
### 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
Principal mode of spread: bites from infected female Anopheles mosquitos
Peak feeding times are usually dusk and dawn, but also throughout the night
Other uncommon modes are:
- Blood transfusion
- Mother-to-child transmission

#### 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
- 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
dengue
- 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
- In pregnancy
- Anaemia
- Preterm contractions/preterm labour
- Abortions
- Low birth weight
- Intrauterine deaths
- Congenital malaria
- Late
- Hyperreactive malaria splenomegaly
- Quartan malaria nephropathy
- Possibly, Burkitt’s lymphoma

#### Investigations
- Blood smear for malaria parasites
- Packed cell volume; haemoglobin concentration
- White cell count with differentials
- Blood sugar
- Urinalysis
- Electrolytes and Urea; Creatinine
- Stool microscopy for ova; occult blood
- Chest radiograph
- Cerebrospinal fluid biochemistry; microscopy, culture and sensitivity

#### Treatment objectives
- Eradicate parasitaemia
- Prevent severe malaria
- Attend to the immediate threats of life
- Prevent complications
- Provide personal protection against malaria
- Provide chemoprophylaxis in susceptible groups

#### Drug treatment
Uncomplicated malaria
It is vital to prevent severe disease, therefore as soon as a presumptive diagnosis of malaria is made:
Insert artemesin 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: 40 mg/kg; 40 - 59 kg: 400 mg (one 400 mg suppository); 60 - 80 kg: 800 mg (two 400 mg suppositories); >80 kg: 1,200 mg (three 400 mg suppositories)
- Child: 30 - 39 kg: 300 mg (three 100 mg suppositories); 20 - 29 kg: 200 mg (two 100 mg suppositories); 9 - 19 kg: 100 mg (one 100 mg suppository); 5 - 8.9 kg: 50 mg (one 50 mg suppository)
- Dose should be given ONCE and followed as soon as possible by definitive therapy for malaria
Artemisin-based combination therapy is recommended
- Monotherapy with dihydroartemisinin or other artemisinin derivatives is not recommended
- 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 twice 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)
- Adult: 4 standard tablets every 12 hours
- Child: 1 - 2 standard tablets orally every 12 hours
- Adjusted according to age or body weight

Severe malaria
- Quinine or artemisinin derivatives given parenterally are the drugs of choice
- Quinine:

#### Standard Treatment Guidelines for Nigeria 2008

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Treatment Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child</td>
<td>Adult</td>
</tr>
<tr>
<td>&lt;=50 kg</td>
<td>300 mg</td>
</tr>
<tr>
<td>51 - 70 kg</td>
<td>400 mg</td>
</tr>
<tr>
<td>71 - 100 kg</td>
<td>500 mg</td>
</tr>
<tr>
<td>101 - 150 kg</td>
<td>600 mg</td>
</tr>
<tr>
<td>&gt;150 kg</td>
<td>800 mg</td>
</tr>
</tbody>
</table>

- 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
- Blood glucose levels should be checked every hour 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 12 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
Or:
- Where intravenous access is not possible, give quinine hydrochloride 20 mg/kg salt as loading dose, diluted to 60 -100 mg/ml intramuscularly or intravenously in different sites
- 8 hours after loading dose, give 10 mg/kg every 8 hours until patient is able to take orally
- Thereafter, change to tablets 10 mg/kg every 8 hours for 7 days or give a full dose of artemether-lumefantrine

#### Supportive measures
- Paracetamol (oral/rectal) for symptomatic relief of fever
- If temperature is >38.5°C, wipe with wet towel, and fan to lower the temperature
- If no urine within the next 24 hours, refer for peritoneal or haemodialysis

#### Investigations
- Give fluids if patient is dehydrated: 20 ml/kg of sodium chloride injection 0.9%, and challenge with furosemide 1 - 2 mg/kg
- Catheterize to monitor urinary output
- Encourage Partner Disclosure and Voluntary Confidential Couple Counselling (VCCCT)
- Promote the rights and protection of children and women
Non-drug treatment
- Do not suture immediately

Drug treatment
- Provide active immunization with the vaccine
- Antiserum
- Immunoglobulin

Child:
- Washed for several minutes with soapy water
- Disinfected and dressed simply

Adult:
- Unimmunized persons or those whose prophylaxis is probably incomplete
- Rabies (cell mediated) vaccine
  - 1 ml by deep subcutaneous or intramuscular injection in the deltoid region on days 0, 3, 7, 14 and 30
- Plus:
  - Rabies immunoglobulin given on day 0

Post-exposure prophylaxis (PEP)
- Same as for adult

For fully immunized persons:
- Rabies (cell mediated) vaccine
  - 1 ml by deep subcutaneous or intramuscular injection in the deltoid region on days 1 and 3
- Child: same as for adult

For fully immunized persons:
- Rabies (cell mediated) vaccine
  - 1 ml by deep subcutaneous or intramuscular injection in the deltoid region on days 0, 7, 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 tetanosspasmin, a powerful protein toxin elaborated by <i>Clostridium tetani</i>
- The bacteria are found in the soil, inanimate environment, animal feces and occasionally in human faeces

Prevention
- Timberframe stumps
- 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
Chapter 11: Infectious Diseases/Infestations

**Differential diagnoses**
- Notable adverse drug reactions, caution and prevention
- Treat intercurrent infections

**Treat intercurrent infections**

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

**Diazepam** is adsorbed from plastics of infusion bags and giving sets; causes drowsiness and light headedness; hypotension.

**Benzyl penicillin**:
- Hypersensitivity reactions

**Metronidazole**:
- Taste disturbances

**Phenobarbital**:
- In renal and hepatic impairment

**Drug treatment**

**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**

**TRYPANOSOMIASIS (Sleeping sickness)**

**Introduction**
- African trypanosomiasis is an acute or chronic disease caused by *Trypanosoma brucei* primarily.
- *T. brucei rhodesiensis* (East Africa)
- *T. brucei gambiense* (West Africa)

**Clinical features**
- (Gambian Sleeping Sickness)
  - Two clinical stages:
    - Early stage:
      - CNS stage
    - Late stage:
      - Anaode or chancre following a bite

**Mortality** is high.

**Prognosis** is excellent.

**Control of muscle spasm**
- As determined by clinical situation

**Treatment** objectives

**Non-drug treatment**
- Admit patient 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**
- Follows head injury or ear infection
- Trismus
- Dysfunction of one or more cranial nerves, often the 7th nerve
- Mortality is high

**Diagnosis**
- Entirely clinical

**Differential diagnoses**
- Alveolar abscess
- Strychnine poisoning
- Dystonic drug reactions
- Hypocalcaemic tetani
- Meningitis/encephalitis
- Acute abdomen

**Complications**
- Autonomic dysfunction
- Labile or sustained hypertension
- Tachycardia
- Dysrhythmias
- Hyperpyrexia
- Profuse sweating
- Peripheral vasoconstriction
- Cardiac arrest
- Aspiration pneumonia
- Fractures
- Muscle rupture
- Deep vein thrombophlebitis
- Pulmonary emboli
- Decubitus ulcers
- Rhabdomyolysis

**Investigations**
- Urine should be examined for casts and protein before and after treatment with suramin
- Suramin
- Melarsoprol

**TUBERCULOSIS**

**Introduction**
- One of the oldest diseases known to affect humans, globally
- Nearly one third of the global population (i.e. 2 billion) are infected with *Mycobacterium tuberculosis* and at risk of developing the disease
- More than 8 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, neglected 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 cavitatory 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

**Skeletal 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

**Pericardial TB**
- Fever
- Dull retrosternal pain
- Friction rub
- Cardiac tamponade

**Military TB**
- Fever
- Night sweats
- Anorexia
- Weakness
- Weight loss
- Cough
- Hepatomegaly
- Splenomegaly
- Lymphadenopathy
- Cardial 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
  - Bronchiectasis
  - Whooping cough
  - Inhaled foreign body
  - Cardiac disease
  - Carcinomas
  - Intracranial space-occupying lesions
  - Osteoarthritis, etc

**Investigations**
- Sputum for AFB, microscopy, culture and sensitivity
- Chest radiograph
- Full Blood Count; ESR
- HIV screening
- Liver function tests
- Nearly always a complication of advanced cavitatory pulmonary TB
- Asthma
- Bronchiectasis
- Whooping cough
- Inhaled foreign body
- Cardiac disease
- Carcinomas
- Intracranial space-occupying lesions
- Osteoarthritis, etc

**Complications**
- Lung abscess
- Destroyed lung syndrome
- Pressure effects from enlarged lymph nodes
- Obstructive uropathy
- Chronic kidney disease
- Infertility
- Skeletal deformities (varum 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

**TYPHOID 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)

**Signs and Symptoms**
- Incubation period ranges 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:**
- Infection (exogenous factors)
- Diarrhoea or constipation
- Genitourinary TB
- Abdominal pain
- Investigations
  - Rash (rose spots)
  - Hepato-splenomegaly
  - Epistaxis
  - Relative bradycardia

**Neuropsychiatric symptoms**
- Intestinal perforation
- Gastro-intestinal haemorrhage
- Pancreatitis
- Hepatitis
- Splenic abscesses
- Meningitis
- Nephritis
- Pneumonia
- Osteomyelitis
- Chronic carrier state

**Investigations**
- The probability of contact with a case of TB
- The intimacy and duration of that contact
- 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**
- 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
- Dullness to percussion

**Investigations**
- There are no diagnostic tests other than positive cultures

**Non-specific**
- 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
**CHAPTER 12: MUSCULOSKELETAL SYSTEM**

**BACK PAIN**

**Introduction**
A common complaint which most adults will have had at some 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:**
- Spondylosis
- Intra-spinal abscesses
- Tumours (primary or secondary)
- Osteoporosis
- Osteomyelitis
- Trauma
- Pregnancy

**Clinical features**
- Patients will complain of aches, pains, or sometimes a peppy 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 apophyseal 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 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
- Alcoholic gastritis
- Aortic aneurysms
- Tuberculosis inflammation of the pleura, pericardium
- Metastatic bone disease
- Psychosomatic disorders
- Pelvic inflammatory disease

**Complications**
- Complications of underlying cause(s) or pressure effects on the spinal cord and nerve roots

**Investigations**
- Full Blood Counts; ESR
- C-Reactive Protein
- Calcium, phosphate, alkaline phosphatase levels
- Radiograph of the lumbar sacral spine, myelogram
- CT Scan
- MRI
- Bone densitometry

**Treatment objectives**
- Treat underlying cause
- Relieve pain
- Treat complications

**Drug treatment**
- Paracetamol
- NSAIDs
- Morphine 10 mg orally every 4 hours (if necessary)
- Antidepressants
- Amitriptyline initially 25 mg orally daily

**Back pain**
- Nausea and vomiting; constipation; drowsiness; loss of appetite; anorexia, anaemia
- Associated with radicular pain
- Associated with structural abnormalities such as kyphosis or scoliosis
- Sudden onset of pain in a joint: usually the ankles, foot, or knee

**Prevention**
- Not recommended for children or adolescents

**Non-drug treatment**
- Nursing care
- Enteral or parenteral nutrition

**Eliminate Salmonella by effective treatment of cases, improved sewage management, improved water treatment and improved food hygiene (production, transit, storage and utilization)**

**Typhoid immunization is recommended for those at risk**

**Identify, and treat chronic carriers with amoxicillin or ciprofloxacin daily for 4 - 6 weeks**

**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**

**Standard Treatment Guidelines for Nigeria 2008**

**Full Blood Counts; ESR**

**C-Reactive Protein**

**Calcium, phosphate, alkaline phosphatase levels**

**Radiograph of the lumbar sacral spine, myelogram**

**CT Scan**

**MRI**

**Bone densitometry**

**Treatment objectives**
- Treat underlying cause
- Relieve pain
- Treat complications

**Drug treatment**
- Paracetamol
- NSAIDs
- Morphine 10 mg orally every 4 hours (if necessary)
- Antidepressants
- Amitriptyline initially 25 mg orally daily

**Prevention**
- Not a substitute for scrupulous personal and environmental hygiene

**Identify, and treat chronic carriers with amoxicillin or ciprofloxacin daily for 4 - 6 weeks**

**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**

**Non-drug treatment**
- - Parenteral fluid administration
- - Treatment objectives

**Eliminate Salmonella by effective treatment of cases, improved sewage management, improved water treatment and improved food hygiene (production, transit, storage and utilization)**

**Typhoid immunization is recommended for those at risk**

**Identify, and treat chronic carriers with amoxicillin or ciprofloxacin daily for 4 - 6 weeks**

**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**
Chapter 12: Musculoskeletal System

Standard Treatment Guidelines for Nigeria 2008

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
Clinical 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
Anaemia
Hepatosplenomegaly

Differential diagnoses
Systemic Lupus Erythematosus
Polyarticular gout

OSTEOARTHRITIS

Introduction
A heterogenous 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.

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.
- Presenting features are:
  - Peaks
  - 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
Ocupational therapy
Intra-articular lavage

Drug treatment
Paracetamol
- 500 mg -1 g orally every 8 hours
- NSAIDs
- Orally or local application
- Ibuprofen
- 400 - 800 mg orally every 8 hours

Narcotic analgesics
- Naproxen
- 500 mg orally every 12 hours
- Diclofenac sodium
- 25 - 75 mg orally daily in divided doses or as a single dose at bedtime
- Capsaicin cream
- 0.075% cream, apply small amounts up to 3 - 4 times daily

OSTEOARTHRITIS

Introduction
A heterogenous 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.

Clinical features
Affects mostly females 40 years and above. If less than 40 years, underlying causes e.g. trauma or repetitive

- 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:
- Probenecid
- 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
  - Hypersensitivity rashes
  - Reduce dose in renal insufficiency
- Probenecid
  - 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

Prevention
Avoid alcohol
Prevent/treat obesity
Avoid drugs that elevate serum uric acid

Fibromyalgia syndrome
Sjogren's syndrome
Osteoarthritis
Hepatitis B

Complications
Chronic pain
Joint instability and deformity
Pulmonary fibrosis
Ischaemic heart disease
Eye involvement
Malignancies: lymphoma

Investigations
Full Blood Count; ESR
Rheumatoid factor
Synovial fluid analysis
Radiographs of affected joints

Treatment objectives
Reduce pain and disability
Limit joint damage
Improve quality of life

There is no cure

Non-drug treatment
- Education
- Physiotherapy
- - Improve mobility
- - Increase muscle power
- - Reduce pain and disability

Drug treatment
- Paracetamol
  - Adult: 500 mg orally three times daily

Child 1 - 3 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)

Non-steroidal anti-inflammatory drugs
- Ibuprofen
  - Adult: 400 - 800 mg orally every 8 hours

Child 1 - 3 months: (and body weight >5 kg), 5 mg/kg orally 3 - 4 times daily preferably after food; in severe conditions and weight >5 kg, maximum 30 mg/kg in 3 - 4 divided doses

- 3 months - 1 year and body weight >5 kg: 50 mg 3 - 4 times daily; in severe conditions up to 30 mg/kg in 3 - 4 divided doses

- 1 - 4 years: 100 mg every 6 - 8 hours daily; in severe conditions up to 30 mg/kg in 3 - 4 divided doses

- 4 - 7 years: 150 mg every 8 hours; in severe conditions up to 30 mg/kg in 3 - 4 divided doses, maximum 2.4 g daily

- 7 - 10 years: 200 mg every 8 hours; in severe conditions up to 30 mg/kg in 3 - 4 divided doses, maximum 2.4 g daily

- 10 - 12 years: 300 mg every 8 hours; in severe conditions up to 30 mg/kg in 3 - 4 divided doses, maximum 2.4 g daily

- 12 - 18 years: 300 - 400 mg very 6 - 8 hours daily, preferably after food, increased if necessary to maximum 2.4 g daily
- Diclofenac potassium
  Adult: 25 - 50 mg orally every 8 hours
  Child 14-18 years: 75-100 mg daily in 2-3 divided doses
- Corticosteroids
- Prednisolone: low dose, up to 15 mg orally daily
- Azathioprine and methotrexate
- Methotrexate
  Adult: 10 - 25 mg orally once weekly
  Child 1 month - 14 years: 10 - 15 mg/m² once weekly,
  increased if necessary to a maximum of 25 mg/m² once weekly:
  by oral, subcutaneous or intramuscular route
  - Azathioprine
  Adult: 50 - 150 mg orally daily
  Child 1 month - 18 years: initially 1 mg/kg daily, adjusted
  according to response to a maximum of 3 mg/kg daily
  (Consider withdrawal if no improvement within 3 months)
  - Hydroxychloroquine sulphate
  Adult: initially 400 mg orally daily in divided doses;
  maintenance 200 - 400 mg (but not exceeding 400 mg)
  daily or
  Child 1 month - 18 years: 5 - 6.5 mg/kg orally (maximum
  400 mg) once daily
- Chlorquine base
  Adult: 150 mg orally daily (maximum 2.5 mg/kg daily)
  Child: up to 3 mg/kg orally daily
  - To be administered on expert advice
  In unresponsive cases, refer for specialist care

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

- NSAIDs
- May cause severe gastrointestinal side effects e.g.
  peptic ulceration, bleeding, perforation
- Renal and cardiac failure especially in elderly persons
  (should be used with caution)
- DMARDs
- Bone marrow suppression
- May also cause lymphoma
- Methotrexate
- Pulmonary fibrosis, hepatotoxicity
- Regular Full Blood Count including differentials, renal
  and liver function tests are required
- Concomitant administration of folic acid may reduce
  mucosal and gastrointestinal side effects

**SEPTIC ARTHRITIS**

**Introduction**
An inflammation of synovial tissues by bacteria, with
production of pus into the joint space
Also variously called suppurative, purulent or infective arthritis

**Clinical features**
- Frequency in most studies is about 2 - 10 cases per
  100,000
- May occur on its own, or in association with other forms of
  arthritis such as gout, rheumatoid arthritis and osteoarthritis
- Causative organisms are mostly S. aureus, and
  streptococci. Other organisms include H.influenzae,
  Neisseria gonorrhoeae

**Treatment objectives**
- Initiate appropriate antibiotics therapy early to prevent
  joint damage
- Prevent septicemia arising from the joint

**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
  - Joints infected with N. gonorrhoeae respond to 1 week
  of intravenous ceftriaxone followed by ciprofloxacin

**500 mg orally twice a day for another 1 week**

**Surgical measures**
- Needle aspiration
- Arthroscopic drainage and lavage
- Open drainage and lavage

**Prevention**
- Effective treatment of the primary infective agents and
  other predisposing disease states e.g. sickle cell disease,
  complicated fractures
- Attention to asepsis in joint manipulation procedures
  and during intra-articular diagnostic/therapeutic

**SYSTEMIC LUPUS ERYTHEMATOSUS**

**Introduction**
A chronic, multisystemic, auto-immune inflammatory
Disease that affects virtually any organ in the body
Typically runs a relapsing and remitting course

**Clinical features**
- Fever
- Hot, painful and distended joint with pus
- Markedly decreased range of motion
- Occasionally, septic arthritis may present with a
  migratory polyarthritis and dermatitis, especially with
  gonococcal infection
- Constitutional symptoms such as nausea, vomiting,
  headaches, loss of weight, loss of appetite may also be
  seen

- **Differential diagnoses**
  - Malaria fever
  - Acute gouty arthritis
  - Osteoarthritis
  - Rheumatoid arthritis
  - Septic arthritis
  - Osteomyelitis
  - Soft tissue injury

**Investigations**
- Full Blood Count and differentials
- ESR
- Blood cultures
- Urethral, cervical and rectal cultures
- Synovial fluid analysis
- Main radiographs of affected regions
- Ultrasonography

**Treatment objectives**
- Initiate appropriate antibiotics therapy early to prevent
  joint damage
- Prevent septicemia arising from the joint

**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
  - Joints infected with N. gonorrhoeae respond to 1 week
  of intravenous ceftriaxone followed by ciprofloxacin
ABORTION

Introduction

- Expulsion from the mother's uterus of a growing and developing embryo or foetus prior to the stage of viability (about 20 weeks), with foetal weight less than 50 g
- One of the leading causes of maternal mortality and morbidity in Nigeria
- May be:
  - Spontaneous
  - Occurring from natural causes
  - Induced
  - Brought about purposefully by drugs or mechanical means
- Accidental
- Due to a fall, blow or other injury
- Complete
- With complete expulsion or extraction from the mother of a foetus or embryo, and of any other products of conception
- Incomplete
- Parts of the products of conception have been expelled but some (usually the placenta) remain in the uterus
- Illegal (criminal)
- Termination of a pregnancy without legal justification
- Legal
- With or without medical justification but done in a manner that is legal
- Solitary
- A single experience of an abortion
- Habitual
- When a woman has had three or more consecutive, spontaneous abortions

Clinical features

- Threatened abortion:
- Cramp like pains
- Slight show of blood
-May or may not be followed by the expulsion of the foetus
- Occurs during the first 20 weeks of intrauterine life (‘pre viability’/period)
- Imminent/incipient/impending abortion:
- Copious vaginal bleeding
- Uterine contractions
- Cervical dilation
- Inevitable abortion:
- Rupture of the membranes in the presence of cervical dilation in a pre-viable pregnancy
- Ampullar/tubal abortion:
  - Abortion of pregnancy in the ampulla of the fallopian tube or the tube itself
  - Rupture of an oviduct, the seat of ectopic pregnancy
  - Extrusion of the products of pregnancy through the fimbriated end of the oviduct

Differential diagnoses

- Antepartum haemorrhage
- Ectopic pregnancy
- Hydatidiform mole
- Carcinoma of the cervix
- Rape

Investigations

- Pelvic ultrasound scan
- Abdominal radiograph
- Chest radiograph
- Microscopy, culture and sensitivity test of vaginal discharge
- Uralysis; urine microscopy, culture and sensitivity

Full Blood Count
Blood Group

Complications

- Endometritis
- Parametritis
- Peritonitis
- Haemorrhage
- HIV infection
- Secondary infertility
- Perforation of the uterus and/or intestines
- Rupture of the bladder

Treatment objectives

- Restore haemostasis
- Prevent/treat complications
- Provide health education

Drug treatment

- Treat infection(s)
- Replace fluid, electrolyte, and blood losses
- Complete incomplete abortion
- Surgical correction of complication(s)

Prevention

- Promote personal and family understanding of basic reproductive health
- Universal basic education
- Girl child education
- Moral instruction
- Protect vulnerable groups (young females) from undue exposure to their male folks
- Obstetric complications
- Malaria
- Treating hypertension adequately
- Correcting dyslipidaemia
- ACE inhibitors (to limit renal damage)

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
- Prenatal diagnosis and management of foetal abnormality
- Diagnosis and management of perinatal complications
- Decisions regarding timing and mode of delivery
- Parental education regarding pregnancy and childbirth

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
- A critical 25% of women will usually fall under this category

Schedule of visits during pregnancy

Previously, antenatal visits were:
- 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
Chapter 13: Obstetrics and Gynaecology

**ANAEMIA IN PREGNANCY**

**Introduction**
- 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
  - Haemoglobin concentration less than 11 g/dL or a haematocrit less than 33% in peripheral blood
- 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
- Loss of energy
- Easy fatigability
- Headaches
- Dyspnoea on mild exertion
- Ankle swelling

**Signs**
- Pallor
- Jaundice may or may not be present
- Pedal oedema
- Tachycardia
- Easy fatigability
- Headaches
- Dyspnoea on mild exertion
- Ankle swelling

**Investigations**
- Urine: proteinuria; only in nullipara, hypertension, pre-eclampsia/eclampsia
- Haemoglobin genotype
- Blood group
- HIV screening
- VDRL
- Haemoglobin concentration/packed cell volume
- Specific investigations that require specialized care
  - Urinalysis for bacteriuria, proteinuria and glycosuria
- Haemoglobin genotype
- Blood group
- HIV screening
- VDRL
- Haemoglobin concentration/packed cell volume

**Interventions**
- Iron
- Folic acid
- Malaria prophylaxis
- Antimalarials

**Interventions**
- Iron
- Folic acid
- Malaria prophylaxis
- Antimalarials
- Maintain complete records: clinic as well as ANC card records
- 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: pallor, oedema
  - Blood pressure
  - SFH

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- Urinalysis for bacteriuria, proteinuria; only in nullipara, hypertension, pre-eclampsia/eclampsia
- Haemoglobin concentration/packed cell volume
- Assess for referral
  - Iron
  - Folic acid
  - Malaria prophylaxis
  - Advice, questions and answers; scheduling next appointment
- Maintain complete records: clinic as well as ANC card records

**Malaria treatment for breakthrough episodes**
- Quinine is safe and can be used in all trimesters
- Artemisinin-based combinations are safe in the 2nd and 3rd trimesters
- Artemether-lumefantrine is considered safe
- Should hold within 1 week postpartum
- Offer contraception
- Complete tetanus prophylaxis with tetanus toxoid
- Continue interventions: iron, folic acid and malaria prophylaxis

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- Pallor
- Jaundice may or may not be present
- Pedal oedema
- Tachycardia
- Haemic murmurs
- Pseudo-toxaemia
- 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
- Antepartum haemorrhage
- Bone marrow pathologies
- Miscellaneous: e.g. bleeding duodenal ulcer

**Complications**
- Maternal
- Abortion
- Cardiac failure
- Reduced ability to tolerate anaesthesia
- Diminished resistance to infection
CANCER OF THE CERVIX

Introduction
The second most common malignancy and the leading cause of death among women in developing countries. 75% of the patients present in advanced stages; lack of organized screening programmes for detection of the preclinical stages in many countries.

Aetiology/risk factors
Aetiology not known but several risk factors have been implicated:
Early sexual exposure
Multiple sexual partners
A promiscuous male partner
History of sexually transmitted infections particularly Human Papilloma Virus infection;
Herpes simplex type 2; chlamydiae
Early first child birth
High parity

Prevention
Counselling on contraception; adequate spacing of pregnancies
Malaria prophylaxis in pregnancy
Chemoprophylaxis against helminthiasis
Prompt and appropriate treatment of febrile illnesses in pregnancy
Improvement in the socioeconomic status of the people
Provision of accessible and affordable maternity care facilities

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

Low socio-economic status
Smoking
Micronutrient deficiency
Oral contraceptive usage
Poor sexual hygiene

Clinical features
Two age groups with highest incidence: 35 - 40 years; 45 - 55 years
May be asymptomatic
- Picked up in the early stage by routine PAP smear screening
Abnormal vaginal bleeding
- Postcoital
- Contact
- Spontaneous
- Inter-menstrual
- Post-menopausal
Vaginal discharge
- Becomes offensive in advanced disease
Pyometria with uterine enlargement
Haemorrhagic, ulcerative or fungating lesion on the cervix, with extension on to the vagina wall in advanced stages
Vesico-vaginal fistula in advanced stages
Recto-vaginal fistula in advanced stages
Cachexia
- The presence of a lesion on the cervix

Presumptive Diagnosis
Based on:
- Typical history of risk factors
- Histological confirmation of malignancy
Different diagnoses
Endometrial cancer
Endometrial hyperplasia
Endometrial polyps
Endometritis; particularly atrophic
Choriocarcinoma
Cervicitis
Cervical polyps
Cervical erosion
Vaginal lesions: vaginitis, vaginal malignancy
Functioning tumours of the ovary leading to endometrial hyperplasia and vaginal bleeding
Iatrogenic: hormonal drugs and IUCD in-situ
Blood disorders: bleeding dyscrasias, leukaemia

Treatment objectives
Correct haematoctrit
Treat underlying cause(s)
- See differential diagnoses
Foetal surveillance
- Of growth and wellbeing for IUGR and intrauterine asphyxia
Correction of haematoctrit

Oral haematetics
- For mild and moderate anaemia
Ferrous sulfate
- 200 mg daily and folic acid 5 mg daily
Vitamin C (ascorbic acid)
- 100 mg three times daily
Parenteral iron: indicated in
- Mild to moderate anaemia, near term
- Malabsorption of oral iron, or when it causes serious gastroenteritis
Administration:
Calculate haemoglobin deficit
For each 1 g/dL deficit, 250 mg of iron dextran injection is required
Additionally, 50% of the total calculated is added onto the deficit value to take care of the iron stores
Administer by deep intramuscular injection into the gluteal muscle, by slow intravenous injection or by intravenous infusion (after a negative test dose)

Intramuscular injection
- 250 mg daily; after a negative test dose of 25 mg
Intravenous
- If the total calculated dose of iron dextran is less than 1,500 mg it can be given over 8 hours in one litre of sodium chloride 0.9%
- If greater than 1,500 mg, it should be given in divided doses daily, not exceeding 1,500 mg/day Antithamine (chlorphenamine injection), epiinephrine and hydrocortisone injection must be available; iron dextran could cause severe anaphylaxis
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
Indications:
Severe anaemia irrespective of gestational age
Cardiac failure
Moderate anaemia detected in labour or during an abortion, or co-existing with other conditions such as sepsis, renal failure, haemorrhage or eclampsia

Prevention
Aetiology not known but several risk factors have been implicated:
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Administer by deep intramuscular injection into the gluteal muscle, by slow intravenous injection or by intravenous infusion (after a negative test dose)
- 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.

- Class 1 - No limitation of physical activity
- Class 2 - Slight to moderate limitation of physical activity: ordinary day-to-day activities cause dyspnea
- Class 3 - Marked limitation of activity. Minimal exertion causes dyspnea
- Class 4 - Symptoms at rest; unable to carry out any physical activity without dyspnea; orthopnea 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 S1, S2, S3, and S4

**Complications**

- Maternal mortality
- Risk of maternal death
- Possible reduction of maternal life expectancy
- Risk of foetus developing congenital heart disease;
  - Tetralogy of Fallot
  - Eisenmenger's syndrome
- Oliguria
- Hypertension
- Hypertensive syndrome
- Worsening proteinuria

**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**

Worldwide range reported to be 1 in 100 - 1 in 3,448 pregnancies

**Diagnosis**

- 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
  - Eisenmenger's syndrome
- 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

- Anti-coagulation
- 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
- Best option in severe debilitating cases

**Echocardiographic Failure**

- Manage as if non-pregnant (in conjunction with a cardiologist)

**Foetal surveillance:**

- Ultrasound scan particularly for cardiac anomaly at 22 weeks
- Delivery:
  - Either for maternal or foetal indications
  - Cardiac surgery in pregnancy if indicated

**Management of labour in women with cardiac disease**

- Avoid induction of labour if possible
- Prophylactic antibiotics to prevent bacterial endocarditis
- Careful fluid balance
- Avoid the supine position
- Epidural anesthesia by a senior anesthetist

**Complications**

- Maternal mortality
- 25 - 50% in Eisenmenger's syndrome; 5% in tetralogy of Fallot; 1% in rheumatic heart disease
- Gestational cardiac failure
- 10 - 15% chance of baby having congenital heart disease

**Clinical features**

- Generalized tonic-clonic seizures, usually heralded by:
  - Headaches
  - Dizziness and blurring of vision
  - Nausea and vomiting
  - Epigastric pain
  - Rapidly progressive oedema

**Different diagnoses**

- Idiopathic epilepsy: sometimes accompanied by transient proteinuria
- Cerebral malaria: sometimes accompanied by hypertension and albuminuria
- Pneumococcal meningitis
- Hyper and/or hypo-glycaemia, particularly among diabetics
- Terminal phase of severe anaemia

**Investigations**

- Haemoglobin concentration/haematocrit
- Serum Electrolytes, Urea and Creatinine
- Urinalysis
- Blood Glucose
- Echocardiography (Doppler)
- Electrocardiography
- Serial blood cultures (if infective endocarditis is suspected)

**Supportive measures**

- Haemoglobin genotype
- Platelet count
- Blood Group
- Serum Urea and Electrolytes; Creatinine
- Liver function tests
- Urinalysis

**Management**

- Manage in conjunction with the physician

**Treatment objectives**

- Stabilise the patient
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) convulsion. 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/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 convulsion, 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 70kg
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 rate 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:
Labetalol
- 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 in cases of elevated blood pressure that accompany expulsive efforts at this stage in labour
Emergency Caesarean section is indicated when:
- 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 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
- Rapidity 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
- Sub-acute ectopic gestation
- 75% of cases
- “Silent” ectopic/chronic ectopic gestation
Acute Ectopic Gestation
Amenorrhoea
Features of acute abdomen particularly lower abdominal pain
Vaginal bleeding or brownish discharge
Severe pallor
Shoulder tip pain
Difficulty with sitting on hard surfaces
Features of shock with cardiovascular collapse: hypotension and tachycardia
The uterus is slightly enlarged with tenderness on one side
- Some advice that examination should be avoided if there is a strong suspicion of an ectopic pregnancy
- Positive cervical excitation tenderness
Sub-acute Ectopic Gestation
Slow-bleeding ectopic prior to rupture, with most of the signs and symptoms of acute ectopic gestation but in the mildest form
“Silent”/Chronic Ectopic Gestation
Asymptomatic
- May just be picked up during a pelvic examination in the course of booking or antenatal clinic, or found on ultrasound for another pelvic pathology
Complications
Shock
Sterility (with the loss of both tubes)
Often requires blood transfusion (with its attendant cost and risk of blood-borne infections)
5 - 20% risk of having another ectopic gestation
Fatality
Diagnosis
Requires a high index of suspicion particularly in the case of atypical, slow-bleeding or chronic ectopic gestation where diagnosis could be difficult
Differential diagnoses
For unruptured ectopic pregnancy:
Acute pelvic inflammatory disease
Adnexial torsion
Incomplete abortion
Endometriosis
Degenerating uterine fibroid
Acute appendicitis
Accidented ovarian cysts
Investigations
Haemoglobin concentration/packed cell volume
Blood grouping and cross matching
Urine analysis
Ultrasound scan of the pelvis/abdomen
Serum ß-hCG (where available) especially in silent cases
Paracentesis abdominis (should be considered)
Laparoscopy
- Final arbiter when the diagnosis is in doubt
Treatment objectives
Depend on the clinical subset
Preserve maternal life
Acute ectopic
Immediate resuscitation (fluids/blood)
Stop haemorrhage; by surgery
Replace lost blood
General principles and treatment modalities
Surgery
- Salpingectomy (total or partial) for ruptured ectopic pregnancy
- Partial salpingectomy if the remaining segment of the tube is about 4 cm long; this could be used for reconstructive surgery subsequently
- Salpingostomy for unruptured cases
Non-surgical options
- Used in unruptured cases: expectant management and medical agents
Expectant management
- Monitor pregnancy by ß-hCG levels
- Vaginal scans: spontaneous resorption can occur provided gestation sac is < 4 cm and hCG is < 1,500 IU
Medical treatment
- Methotrexate
- Administered systemically or locally to induce
HYPERTREMESIS 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.

Clinical features
- Persistent and severe vomiting that leads to electrolyte and nutritional derangements.
- 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
  - Cholecytitis
  - Urinary tract disorders: pyelonephritis

Complications
- Biochemical abnormalities
- Usually sequel to vomiting, starvation and dehydration
- Ketosis, electrolyte imbalance (alkalosis and hypokalaemia); vitamin deficiencies
- In neglected or poorly managed cases:
  - Severe weight loss
  - Tachycardia
  - Hypotension
  - Oliguria
  - Neurologic disorders from vitamin B deficiency
  - Retinal haemorrhages
  - Jaundice (from hepatic necrosis)
  - Oesophageal 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
- Administer:
  - Strict 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

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.

Clinical features
- Persistent and severe vomiting that leads to electrolyte and nutritional derangements.
- 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
  - Cholecytitis
  - Urinary tract disorders: pyelonephritis

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- Biochemical abnormalities
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- Increased serum lipids
- Prothrombin time, transaminases and bilirubin are unaltered in normal pregnancy
- Jaundice occurs in about 1 in 1,500 - 2,000 pregnancies

Aetiology

Aetiology peculiar to pregnancy

- Hyperemesis gravidarum
- Pre-eclampsia and eclampsia as seen with HELLP syndrome

Acute yellow atrophy (acute fatty liver in pregnancy; acute hepatic failure)

- Intra-hepatic cholestasis of pregnancy
- Cholestasis in pregnancy
- Gallstones

Aetiology not 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
  - It is not as a rule associated with maternal complications

Histology

- Portal 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

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
- Presents commonly in late third trimester, after 36 weeks
- Clinically significant because of its association with IUGR and IUFN (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 wellbeing (CTG) monitoring
- If all is well induce at 38 weeks

Management of associated pruritus

- (Difficult to manage)
- Topical agents offer little help
- Antihistamines
  - To bind bile salts
  - Vitamin K
  - To decrease bleeding tendencies
  - (Colestyramine binds fat soluble vitamins)
  - May offer brief respite

Bile acids and cholestyramine (orally)

Prophylactic treatment

- Ursodeoxycholic acid and cholestyramine (orally)

Pelvic Inflammatory Disease

Introduction

- Ascending pelvic infection involving the upper genital tract
- Usually involves sexually transmitted organisms e.g. Neisseria gonorrhoeae and Chlamydia trachomatis
- It 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 peritoneal 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

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
- Ecopic 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
- Ultrasonic scan: to exclude cystis, ectopic gestation, adnexal mass (e.g. ovarian mass)

Indications for admission

- Uncertain diagnosis
- Intolerance of oral medication or non-response to outpatient therapy
- Presence of a pelvic mass
- Presence of an intrauterine device
- Upper abdominal pain
- Adherence to therapy
- Pregnancy
- Nulliparity

Treatment objectives
- Rehydrate adequately
- Eradicate 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
- Out patient therapy while awaiting culture results:
  - Ceftriaxone (or equivalent cephalosporin)
  - 1 g intramuscularly stat
  - Plus:
    - Doxycycline
    - 100 mg orally every 12 hours for 14 days
    - Plus or minus:
      - Metronidazole
      - 400 mg orally every 12 hours for 14 days
      - If no response in 48 - 72 hours
      - Admit, re-evaluate and give appropriate intravenous therapy

Inpatient triple therapy
- Ceftriaxone/doxycycline/metronidazole
- 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

Clinical features
Indirect presentation
- Vague symptoms
- Physical features:
  - Perineal pain
  - Bleeding per vaginam
  - Bruised face/body
  - Arthritis
  - Disordered gait
- Psychological symptoms/disorders
  - Sadness
  - Depression
  - Refusal to respond to simple questions
  - Avoidance of eye contact
  - School/work absenteeism

Differential diagnoses
- Vaginitis
- Threatened abortion
- Domestic violence
- Alcoholism
- Drug abuse
- Depression

Investigations
- Early
  - Vaginal/perineal swab for microscopy, culture and sensitivity
  - Semen: DNA analysis
- Late
  - Urinalysis; urine microscopy, culture and sensitivity
  - Pregnancy test (blood)
  - HIV screening

Treatment objectives
- Evaluate safety of the patient
- Assess and treat physical injuries
- Provide emotional support
- Assess and deal with the risk of sexually transmitted infections and pregnancy
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
Fulminant presentation in children with:
- Fever
- Irritability
- Cough
- Dysphonia
- Airway occlusion
- Dyspnea
- Drooling
- Stridor

Adults’ symptoms are less fulminant, presenting with:
- Sore throat
- Dysphagia
- Dyspnea
- Absence of hoarseness distinguishes acute epiglottitis from acute laryngitis.

Differential diagnoses
Acute laryngitis
Laryngo-tracheo-bronchitis (Croup)

Complications
Complete airways obstruction and asphyxiation

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)

Drug treatment
Nebulized epinephrine
Child: 400 micrograms/kg (maximum 5 mg)
- Repeat after 30 minutes if necessary
Glucocorticoids
- Dexamethasone
Child 1 month - 18 years: 10 - 100 micrograms/kg orally daily in 1 - 2 divided doses, adjust sted according to response up to 300 micrograms/kg daily especially in emergencies
- Give parenterally in more severe cases
- May repeat dose after 12 hours if necessary

Caution
Effects of nebulized epinephrine last 2 - 3 hours; the child should be monitored carefully for recurrence of the obstruction.

ACUTE RHINITIS (Common cold)

Introduction
Inflammation of the mucosal surface of the nose, most commonly due to infection with respiratory viruses.

Clinical features
Tickling sensation in the nose associated with itching of the nose and palate

Wet cough: unproductive, or productive of scanty sputum

Ceftriaxone: rashes, fever, gastrointestinal disturbances

 Effects of nebulized epinephrine last 2 - 3 hours; the child should be monitored carefully for recurrence of the obstruction.

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

Differential diagnosis
Complete airways obstruction

Complication
Respiratory obstruction

Investigations
Radiograph of the neck (postero-anterior view)

Prevent asphyxiation

Treat inflammatory oedema

Drug treatment
- Analgesics
  - Paracetamol
Adult: 1 g orally three times daily to relieve headaches or fever
Child 1 - 5 years: 120 - 250 mg; 6 -12 years: 250 - 500 mg; 12 - 18 years: 500 mg 4 - 6 hourly (maximum 4 doses in 24 hours)
- Antibiotics
- Only if secondary bacterial infection occurs

Supportive measures
- Steam inhalation with a drop of eucalyptus oil
- 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

Standard Treatment Guidelines for Nigeria 2008

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Clinical features
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Wet cough: unproductive, or productive of scanty sputum

Ceftriaxone: rashes, fever, gastrointestinal disturbances

 Effects of nebulized epinephrine last 2 - 3 hours; the child should be monitored carefully for recurrence of the obstruction.
Chronic management is based on severity:

**Intermittent symptoms**
- Inhaled salbutamol on as-needed basis

**Mild persistent asthma**
- Inhaled salbutamol
  - Adult: 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 (for occasional use only)
- Plus:
  - Inhaled corticosteroid
  - Beclomethasone dipropionate 100 microgram 3 - 4 times daily

**Moderate persistent asthma**
- Inhaled salbutamol
  - Adult: 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 (for occasional use only)
- Plus:
  - Inhaled corticosteroid
  - Beclomethasone dipropionate
  - Adult: 100 microgram 3 - 4 times daily
  - 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
- Plus:
  - Long-acting β2 agonist
    - Salmeterol
  - Adult: 50 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

**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
- Long-acting β2 agonist
  - Adult: 50 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
  - Oral corticosteroid
  - Prednisolone
- Adult: 40 - 50 mg orally daily for a few days, and then gradually reduce
- Child: 1 - 2 mg/kg orally once daily for 3 - 5 days

**Supportive measures**
- Supplemental oxygen
- Hydration
- Education on care and precipitating factors

**Notable adverse reactions, caution**
- In all cases, prescribers/dispensers should consult product literature to confirm the strength of various aerosol preparations
- Aminophylline
  - Do not exceed 500 mg in 24 hours because of the risk of cardiac arrhythmias
  - Induce CNS stimulation with insomnia and confusions
- Steroids
  - Immunosuppression, metabolic derangements, etc
  - Care should be taken in withdrawing steroids

**Prevention**
- Avoid precipitating factors
- Appropriate use of medicines
- Training of patients in the techniques of the proper use of aerosols/spacer devices is important

**BRONCHIECTASIS**

**Introduction**
- 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
  - Purulent fetid sputum
  - Haemoptysis
  - Pleuritic chest pain
  - With or without a history of preceding pneumonic illness
- Digital clubbing
- Crepitations, rhonchi and wheezes
- Cor pulmasure 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 pulmasure and right ventricular failure

**Investigations**
- Chest radiograph: cystic spaces with air-fluid levels
- Bronchography: saccular, cylindrical or varicos

**CHRONIC OBSTRUCTIVE AIRWAYS DISEASE**

**Introduction**
- A pulmonary disorder of adults characterized by chronic airflow limitation in the small airways
- Complicated 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, with purulent offensive sputum
Fever, chills
Night sweats
Weight loss
Pleural chest pain
Signs:
Digital clubbing
Crepitations
Pleurale friction rub
Cough suppressants: for dry, unproductive cough

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
- Acid reflux
Lower airways:
- Inflammation
- Viral bronchitis
- Bronchiectasis
- Bacterial infection
- Bronchial asthma
- Endobronchial tuberculosis
- Bronchial infiltration/compression
- Parenchymal lung disease
- Pneumonia
- Infections
- Lungs abscesses
- Interstitial or endobronchial oedema due to heart disease
- Drugs:
  - ACE inhibitors
- Invasive workup:
  - Macropscopic and microscopic examination of sputum
  - Sputum culture
- Other treatment will depend on the underlying/precipitating cause

Dyspnoea
Introduction
An abnormal and uncomfortable awareness of breathing
Effort of breathing is out of proportion with exertion
Patients often have difficulties in describing the discomfort of dyspnoea

Differential diagnoses
- Pulmonary:
  - Obstructive airways disease: asthma, chronic bronchitis, emphysema
  - Parenchymal lung disease: pneumonia, pneumoconiosis, pulmonary fibrosis
- Cardiogenic:
  - Congestive cardiac failure
  - Left ventricular failure
- Metabolic:
  - Diabetic ketoacidosis
  - Neurogenic:
  - Anxiety neurosis

Treatment objectives
Treat cause(s) of dyspnoea
Restore normal respiration

Non-drug treatment
Oxygen in appropriate concentration

Other treatment will depend on the underlying/precipitating cause

Lung Abscess
Introduction
Suppuration of the lung parenchyma
May be due to:
Infection by aspirated oro-pharyngeal anaerobes
Inadequately treated pneumonia caused by Staphylococcus aureus, Mycobacterium tuberculosis
Bronchial obstruction

Clinical features
Symptoms are indolent lasting several weeks:
Cough, with purulent offensive sputum
Fever, chills
Night sweats
Weight loss
Pleural chest pain
Signs:
Digital clubbing
Crepitations
Pleural friction rub
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Treatment objectives
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Non-drug treatment
Oxygen in appropriate concentration

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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

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
- Pulmonary embolism

Complications
Lung abscess

Investigations
- Chest X-ray
- Blood cultures
- Sputum culture
- Arterial blood gas analysis

Pneumococcal vaccine
Haemophilus influenzae vaccine

Treatment objectives
- Eliminate the infection
- Restore normal lung function

Drug treatment
- Antibiotics
- Co-amoxiclavulanate

Adult:
- 1 g/200 mg orally every 12 hours for 5 - 7 days
Child:
- neonate and premature infants, 25 mg/kg every 12 hours; infants up to 3 months, 25 mg/kg every 8 hours, 3 months to 12 years, 25 mg/kg every 4 hours increased to 25 mg/kg every 6 hours in more severe infections

Or:
- Benzyl penicillin
  - Adult: initially 1.2 g (2 million units) intravenously every 6 hours
  - Child: preterm and neonate under 7 days, 25 mg/kg by intramuscular injection or by slow intravenous infusion every 12 hours; dose doubled in severe infection

Supportive measures
- Hospitalization may be necessary in severe infection
- Adequate hydration
- Supplemental oxygen

Notable adverse drug reactions, caution and contraindications
- Co-amoxiclavulanate: nausea, diarrhoea, skin rashes
- Cefuroxime: nausea, vomiting, abdominal discomfort,

headaches
- Rarely, antibiotic-associated colitis

Prevention
Pneumococcal vaccine
Haemophilus influenzae vaccine

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

Small volume pulse
- Tachycardia

Recorded investigations
- Electrocardiography
  - Sinus tachycardia
  - Atrial fibrillation
  - Right bundle branch block
  - Right axis deviation <90°
  - T wave inversion
  - Q waves in leads III, AVF, V3

Clinical features
Massive embolus in main pulmonary artery:
- Sudden death
- Sudden onset dyspnoea

Supportive measures
- Analgesics
- Anticoagulants
- Antibiotics

Drug treatment
- Heparin
  - Adult: 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
- 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

Or:
- Enoxaparin
  - Adult: 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 - 18 months: 1 mg/kg twice daily

- Warfarin
  - Adult: initially 10 mg orally daily for 2 days

Child: neonate (under specialist advice), 200 micrograms/kg once daily as a single dose on first day, then on the following 2 days

1 month - 18 years: 200 micrograms/kg (maximum 10 mg) as a single dose on first day, reduced to 100 micrograms/kg (maximum 5 mg) once daily for following 2 days
- Usual maintenance dose: 100 - 300 micrograms/kg once daily
- Subsequent doses depend on prothrombin time (INR)
- Thrombolytic agents
- Recombinant tissue plasminogen activator

Adult: 10 mg by intravenous injection given over 1 - 2 minutes; then intravenous infusion of 90 mg given over 2 hours
- Not exceeding 1.5 mg/kg in persons less than 65 kg
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
- Insects
- Marine invertebrates such as the jellyfish, corals, scorpions and anemones
- The microbiology of bite wound infections reflects the oro-pharyngeal flora of the biting animal
- Organisms from the soil, skin of the animal and victims, animal feaces may also be present

Clinical features

- Depend on the type of injury, and the delay before presentation in hospital
- 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, paphyomonas species
  - Capnocytophaga canimorsus
  - 15 - 20 % of wounds become infected
  - Lower limbs are most commonly affected
- 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. mutocida and those ones following dog bites
- Rats, mice, gerbils and animals that prey on them
  - May transmit Streptobacillus moniliformis or Spirillum minus
  - Usually affect hunters or laboratory handlers of rats
- Manifests as:
  - Fever
  - Chills

CHAPTER 15: INJURIES AND ACUTE TRAUMA

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:
- Enterobacteriacae
- Staphylococcus aureus
- Escherichia coli
- Pseudomonas aeruginosa
- Serratia marcescens
- Klebsiella pneumoniae
- Morganella morganii
- Proteus vulgaris
- Enterococcus faecalis
- Clostridium tetani,
- Clostridium welchi, causing gas gangrene
- The symptoms that follow bee stings are those due to anaphylaxis to their venom

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
- Crotalinae (the New World vipers, Asian pit vipers)
- Viperinae (the Old World vipers)
- Capnocytophaga canimorsus

Stings often occur from:
- Elapidae (e.g. cobras)
- Colubridae (e.g. boomslang)
- Bees, wasps and other insects
- Marine invertebrates such as the jellyfish, corals, scorpions and anemones

HIV, HBV have been reported due to human bites

Inhibition of peripheral nerve impulses
- Neurotoxic effects
- Snake bite wounds may become secondarily infected with:
  - Clostridium tetani, causing tetanus
  - Clostridium welchi, causing gas gangrene

Indications for antivenom treatment
- Hypotension
- Vomiting
- Hand or foot bite swellings extending beyond the wrist or ankle within 4 hours of the bite
- Electrocardiograph abnormalities
- Sharks and crocodiles
- Cause death by:
  - Tissue destruction
  - Crush syndrome
  - Haemorrhage
  - Infection
- Bees and wasps
  - Are the most common causes of stings
  - They leave their stinging apparatus behind in the skin
  - The symptoms that follow bee stings are those due to anaphylaxis to their venom
- Marine invertebrates
  - Have specialized organs called nematocysts for poisoning and capturing prey
  - May cause serious ill health and death

Initial assessment
- Careful history
- Contact local authorities to determine if the specie is rabid; if possible locate animal for observation
- Antibiotic allergy, immunization of patient and other morbid condition(s) should be documented
- Inspect wound for evidence of infection.
- Conduct general physical examination, including vital signs

Investigations
- Depend on the type of injury, the clinical presentation and the onset/type of complications:
  - Full Blood Count
  - Electrolytes and Urea
  - Blood clotting profile
  - Arterial blood gas estimations
  - Chest radiographs
  - Wound and blood cultures

Treatment objectives
- Neutralize envemonation
- Limit systemic effects
- Local wound care
- Prevent onset of complications

Standard Treatment Guidelines for Nigeria 2008

Inhibition of peripheral nerve impulses
- Multisystem effects
- Rhabdomyolysis
- Haemolysis
- Blood vessel damage
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Treatment objectives
- Neutralize envemonation
- Limit systemic effects
- Local wound care
- Prevent onset of complications
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 fasciectomy for compartment syndrome may become necessary

Drug treatment
- Administration of high flow oxygen
- Intraosseus fluid administration to maintain circulation: use colloids or crystalloids as clinically appropriate

- Treatment of anaphylaxis with antihistamines (H1, H2, H3, blocks), epinephrine (adrenaline) and corticosteroids

- Antitetanus 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

- Rabies immune globulin
  - Adult and child: 20 units/kg body weight by infiltration in and around the cleaned 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, angoedema, urticaria, diarrhea and vomiting, spontaneous bleeding, adult respiratory distress syndrome, adult renal failure, etc

- Electrocardiogram 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

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**Chapter 15: Injuries and Acute Trauma**

**Standard Treatment Guidelines for Nigeria 2008**

- 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

**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 cather, 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

**Prevention**
- Essential the evolution and implementation of strategies to prevent or mitigate the impact of disasters
**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
- A representative of the Hospital Manager

**Preparation**
Involves system upgrade, overhaul, protocol design, implementation and quality assessment for disaster management.

**Response**
Involves the interaction of the various emergency response agencies to the disaster to save as many casualties as possible; quick transfer to hospitals, coordination of the hospitals and creation of temporary shelters.

**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 stake holders 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.

**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.

**HEAD INJURY**

**Introduction**
The term refers to any injury to the head.

- Includes bruises and lacerations to the scalp
- For practical purposes it is preferable to talk of:
  - Traumatic brain injury (TBI)
  - Craniofacial injury
  - Craniofaciocerebral injury
- Present in up to 50% of multiply injured patients
- Isolated TBI is uncommon
- In up to 50% of cases of severe TBI there is multisystem trauma

**Classification**
Can be considered from the point of view of:
- Mechanism of injury
- Severity of injury
- Morphology
- Blunt or penetrating
- Depends on the patient's position on the Glasgow Coma Scale (GCS).

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>13-15</td>
<td>Mild</td>
</tr>
<tr>
<td>9-12</td>
<td>Moderate</td>
</tr>
<tr>
<td>8 or less</td>
<td>Severe</td>
</tr>
</tbody>
</table>

**Pathophysiology**
The brain is covered by the meninges: dura, arachnoid and pia mater with the subdural and subarachnoid spaces.

- Normal CBF is 800 mL/min or 20% of total cardiac output.
- CBF = CPP/CVR = 50 mL/100 g of brain tissue/min
- CPP is Cerebral Perfusion Pressure
- CVR is Cerebral Vascular Resistance
- MAP = MAP - ICP
- MAP is Mean Arterial Pressure
- ICP is Intracranial Pressure

**Extradural haematomata**
- 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 haematomata**
- 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
- Late:
  - Chronic subdural haematoma
  - Infections such as meningitis and brain abscess
  - Hydrocephalus
  - Epilepsy
  - CSF leaks
  - Carotico-cavernous fistulae
  - Traumatic aneurysms
  - Chronic headaches
  - Personality changes

- 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

**Promotions of TBI:**
- A lucid interval (often occurs in extradural haematoma)
- Post injury, the patients maintain a satisfactory level of consciousness until suddenly consciousness is lost

**Training and retraining is essential**
Primary survey
- Relayed in the format, preferably before the patient's arrival to enable adequate preparation to be made beforehand: Mechanism of injury
- Prevention: Indications for CT scan: Treatment given e.g. cervical collar, intravenous fluids etc
- Quick survey to identify life threatening injuries and treat
- Intracranial pressure monitoring: Airway
- Breathing: Check the breathing, respiratory rate, oxygen saturation. Examine the chest:- Tension pneumothorax? Haemothorax? Flail chest etc
- 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 necessary monitoring for inotropes, calcium, urea, grouping and cross matching; pregnancy tests
- Focused Assessment using Sonography in Trauma (FAST)
- Disability and Neurology

Multiple Injuries
- 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
- Health education
- Better motor engineering
- Good road designs
- Safety procedures at work and a good EMS and trauma system

Identification of life threatening injuries and treat
- Airway
- Talk? 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? Haemothorax? Flail chest?
- Chest tube decompression?
- Always obtain a chest radiograph before decompression if possible
- Perform arterial blood gas estimations
- Circulation:
- Control ventilation to a pCO of 35 mmHg
- Volume resuscitation
- Maintain normal blood pressure
- Narcotic sedation
- Neuromuscular blockade
- Bolus mannitol (1 g/kg)
- See Meningitis

Endotracheal intubation
- Head up tilt at 30 degrees
- Controlled hypothermia
- Often indicated in head injury for the evacuation of intracranial haematoma or elevation of depressed skull fractures
- Indications 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
- Drugs in TBI:
- Duretics to reduce intracranial pressure e.g. mannitol (see Meningitis)
- Sedatives e.g. diazepam (see Tansus)
- Muscle relaxants e.g. diazepam, suxamethonium
- Opioids if appropriate e.g. phenotoin, phenobarbital (see Epilepsy)
- Antibiotics as appropriate

Meningitis
- Anticonvulsants e.g. phenytoin, phenobarbital (see Epilepsy)
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Stroke
- 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:
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- Burr holes
- Craniotomy
- Craniectomy
- Elevation of depressed skull fractures
- Drugs in TBI:
- Duretics to reduce intracranial pressure e.g. mannitol (see Meningitis)
- Sedatives e.g. diazepam (see Tansus)
- Muscle relaxants e.g. diazepam, suxamethonium
- Opioids if appropriate e.g. phenotoin, phenobarbital (see Epilepsy)
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)
  - Check for scalp haematomas, lacerations, skull fractures, CSF leaks (rhinorrhea, otorhhea); 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 haematomas, 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 sacrum checking for deformity, swellings, stings, 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
- Acute abdominal pain
  - Note the following:
    - Location
    - Onset and progression
    - Nature and character
    - Aggravating and relieving factors
    - Abdominal distension
  - A past history of similar pain suggests complication of an underlying condition
  - In typhoid perforation, fever precedes abdominal pain, while the reverse is true for acute appendicitis
  - Nausea and vomiting:
    - A frequent finding
    - Common in intestinal obstruction
  - 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
  - Bleeding Graffian follicle
  - Twisted ovarian cyst
  - Ectopic pregnancy

Medical:
- 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)
- Pallor

Chapter 15: Injuries and Acute Trauma

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.

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 viscera 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
  - Ectopic pregnancy

- Salpingitis
  - Degenerating fibroids
  - Non-specific abdominal pain:
    - Includes a variety of conditions that do not come under the above causes
    - Medical:
      - There should always be borne in mind so as to avoid unnecessary surgery

Metabolic disorders:
- Diabetes mellitus
- Porphyria

Haematologic conditions:
- Sickle cell disease
- Leukaemia

Infectious and infestations:
- Lower lobe pneumonia
- Gastroenteritis
- Malaria

Parasitic infestations

Standard Treatment Guidelines for Nigeria 2008
Evidence of adequate resuscitation
- Central venous pressure
- Pulmonary capillary wedge pressure
- Urine output, volume, colour
- Hydration status
- Skin turgor
- Sensorium

Surgical site infection is a rather common, but undesirable occurrence in this environment. Surgical site infection tends to increase postoperative morbidity and may lead to mortality. Medical conditions: Consult a physician as appropriate, to treat the condition accordingly.

**ANTIMICROBIAL PROPHYLAXIS IN SURGERY**

*Introduction*
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. Antibiotic prophylaxis is not a substitute for adherence to basic principles of surgical asepsis and meticulous attention to technical details.

*Objective of antibiotic prophylaxis*
To prevent postoperative infection in susceptible patients.

**Principles of antibiotic prophylaxis**

- Should be used only where there is a high risk of bacterial contamination.
- Intravenous route is preferred to achieve optimum effect.
- Should be given not > 2 hours before surgical incision.
Chapter 16: Surgical Care and Associated Disorders

- Strangulated external hernias (e.g. inguinal hernia), internal hernias - Volvulus - Peritoneal adhesions and bands - Intraperitoneal masses (e.g. lymph nodes, tumours) - Intramural (due to causes within the wall of the intestine): - Intussusception - Intestinal atresia and stenosis - Strictures - Hirschsprung's disease - Intestinal tumours - Intraluminal (due to causes within the lumen of the intestine): - Impacted faeces - Impacted worms (e.g. ascaris lumbricoides) - Foreign bodies - Pedunculated polyps - Non-mechanical (adynamic, paralytic ileus): - Electrolyte derangements - Hypokalaemia - Septicaemia (especially in neonates and infants) - Diabetes mellitus - Other metabolic conditions e.g. uraemia

Pathophysiology

Simple obstruction

- Vascular compromise has occurred and may progress to gangrene and/or perforation

Strangulated obstruction

- Vascular compromise has occurred and may progress to gangrene and/or perforation

Closed loop obstruction

- A segment of the intestine is blocked at 2 ends (e.g. colonic obstruction with competent ileocaecal valve, intestinal volvulus)
- Dangerous because the risk of perforation is high
- Irrespective of the cause or type of obstruction, the symptoms, signs and physiologic consequences are the result of the following:
  - Stasis proximal to the level of obstruction (gases, fluid)
  - Dilatation above level of obstruction
  - Increased secretion from the involved segment(s)
  - Compression of the veins and later arteries leading to ischaemia, gangrene, necrosis and perforation

The end results are:
- Dehydration
- Electrolyte derangements
- Anaemia
- Peritonitis
- Septicaemia

Clinical features

- Symptoms:
  - Colicky abdominal pain: not a prominent symptom in adynamic obstruction
  - Abdominal distension

- Vomiting: usually bilious and occurs early in small intestinal obstruction
- A late symptom in large intestinal obstruction
- May be faeculent in advanced obstruction

Constipation: occurs early in large intestinal obstruction and late in small intestinal obstruction
- Obstipation (non-passage of faeces or flatus) signifies complete obstruction
- Stools may be blood-stained (intussusception, volvulus, strangulation)
- Diarrhoea: may be present in the face of obstruction (spurious diarrhoea)
- Fever: signifies strangulation or perforation

Signs:
- General:
  - Dehydration
  - Pyrexia
  - Pallor

Cardiorespiratory: assess the following
- Lung fields
- Pulse rate
- Blood pressure

Abdomen:
- Distension: usually marked in large intestinal obstruction
- Visible peristalsis
- Only the intestinal lumen is affected; there is no evidence of strangulation
- Tympanic percussion notes
- Bowel sounds: increased, diminished or absent
- Rectal examination
- Perianal soilage
- Empty or full rectum
- Any palpable mass
- Examine finger for faeces, blood, mucus

Complications

- Fluid and electrolyte derangements (especially hypokalaemia)
- Intestinal gangrene
- Intestinal perforation
- Peritonitis
- Septicaemia and septic shock

Investigations

- Plain radiographs
- Abdomen
- Supine:
  - Dilated bowel loops
  - Should identify affected bowel (jejunum, ileum, large intestine)
- Upright (erect):
  - Multiple fluid levels
- Chest
  - To identify gas under diaphragm (suggests perforation)
  - To identify gas under diaphragm (suggests perforation)

Haematological:
- 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

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

General measures

- Resuscitate:
  - Urethral catheterization to monitor urine output
  - Broad-spectrum intravenous antibiotics (anaerobes, gram negatives, gram positives)

Most of the causes will require laparotomy

Treat identified cause on its merits:
- Gangrenous or perforated bowel: resect
- Re-anastomose if patient is fit
- Bring ends out as stomas if patient is too ill

Large intestine:
- Vomiting: usually bilious and occurs early in small intestinal obstruction
- Non-mechanical (adynamic, paralytic ileus):
  - Re-anastomose if on right side
  - Bring ends out as stomas if on left side
  - Evacuate any peritoneal collection
  - Suspicious lesions: take specimens for histopathology

Symptoms:
- Constipation: occurs early in large intestinal obstruction and late in small intestinal obstruction
- Obstipation (non-passage of faeces or flatus) signifies complete obstruction
- Diarrhoea: may be present in the face of obstruction (spurious diarrhoea)
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Non-mechanical (adynamic) obstruction

Treat accordingly

Surgery is not required

Diarrhoea: may be present in the face of obstruction

PREOPERATIVE EVALUATION and POSTOPERATIVE CARE

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

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

Clinical evaluation

Efforts should be made to identify the following by history and physical examination:

Cardio-pulmonary 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, tetracyclines, estroprogestin etc., NSAIDs)
- Drug history:
  - Propranolol, diuretics, steroids and other hormonal 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

Metabolic:
Airways management

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.

Nursing position

The patient may still be under some effect of anaesthesia - Airways need to be kept patent. Prevent the tongue from falling backwards by positioning the patient in the left lateral position - The neck should be prevented from falling on itself as this can occlude the airway.

Prevent the tongue from falling backwards by positioning the patient in the left lateral position.

Analgesia

The neck should be prevented from falling on itself as this can occlude the airway. The surgeon should be conversant with the specific positions and give appropriate instructions.

Pain is a most undesirable effect of surgery.

Consent for surgery

Adequate analgesia will ensure early ambulation and mobilization.

Any associated medical condition should be treated / controlled before embarking on surgery - This should be done in conjunction with the physician as much as possible - Patients who require nutritional rehabilitation - If surgery is elective reschedule it, and give adequate time to achieve improved nutritional status, otherwise morbidity and mortality may be increased - High-risk patients: - At high risk of developing postoperative complications - Deliberate and meticulous efforts should always be made to adequately evaluate them and ensure optimal fitness for surgery - Elderly patients (age >60 years): - risk of deep vein thrombosis, atelectasis - Obese (usually risk of deep vein thrombosis, atelectasis, haemorrhage) - Women on oral contraceptive pills-risk of deep vein thrombosis - Co-existing chronic medical conditions-risk of wide ranging complications - Sickle cell anaemia-risk of sickling crises, deep vein thrombosis

Consent for surgery

Details of the surgery should always be explained to the patient (or relatives) in very simple language before surgery - Should include a mention of the possible/common complications - A signed consent should be obtained, in the presence of a witness (usually a nurse). Obtaining consent should be done by the surgeon himself.

Postoperative Care

Introduction

Meticulous and efficient care in the postoperative period is paramount for adequate patient recovery and success of surgery.

A well-planned and supervised postoperative care ensures a smooth recovery, and helps to prevent or limit postoperative morbidity and mortality.

Preoperative, intraoperative and postoperative care is a continuum and interlinked.

- Many of the instructions and therapy started in the preoperative period may need to be continued into the postoperative period.

The surgeon himself must be involved in the postoperative care and not leave it to others, who may not have much ideas or information about the surgery.

Initial recovery

Care of the oral cavity and nutrition:

- The first 4 - 6 hours after a major surgery and general anaesthesia are critical.

Fluid and electrolyte balance

- Ensure that the patient receives adequate amounts of intravenous fluids if oral intake is prohibited.

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Initial recovery

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- The first 4 - 6 hours after a major surgery and general anaesthesia are critical.

Fluid and electrolyte balance

- Ensure that the patient receives adequate amounts of intravenous fluids if oral intake is prohibited.
Complications of massive blood transfusion

- Early complications:
  - Immune reactions
  - ABO incompatibility
  - Rhesus incompatibility
  - Febrile reactions
  - Allergic reactions
  - Reactions to plasma proteins

- Biochemical complications:
  - Hyperkalaemia
  - Citrate toxicity (hypocalcaemia)
  - Haemoglobinaemia

- Infective complications:
  - Bacteremia
  - Transfusion of parasites (e.g. malaria)
  - Transfusion of viruses (HIV, Hepatitis B, C, D)

- Physical complications:
  - Volume overload
  - Air embolism
  - Hypothermia

Complications of massive blood transfusion

- Massive transfusion refers to the single transfusion of 50 - 100% of the equivalent of an individual's blood volume in less than 24 hours
- 2.5 - 5 litres in adults and 40 - 80 mL/kg body weight in children

- The complications are related to:
  - Volume overload
  - Transfusion of old blood
  - Electrolyte derangements (especially potassium and calcium)
  - Transmission of infections
  - Delayed complications:
    - Haemosiderosis
    - Post transfusion purpura

Autologous transfusion

- Transfusion of the patient's own blood

Advantages

- Reduced risk of transmitting communicable diseases
- Overcomes the problem of shortage of blood

Types and methods

- Pre-deposit blood
  - Usually best done in conjunction with haematology staff
  - The patient donates one unit of blood at a time (e.g. weekly) several weeks before the elective surgery
- Following donation, the patient is given haematinics, and sometimes erythropoietin to enhance bone marrow function; the blood is stored for later use
- Pre-operative isovolaemic haemodilution
  - Just before elective surgery, 1 - 2 units of blood are taken from the patient and replaced by volume expanders such as Ringer's lactate, sodium chloride 0.9%, or colloid
  - The blood taken is transfused intraoperatively after all haemostasis has been secured
  - Intraoperative blood salvage

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
- Prodromal stage: 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

Associated lymphadenopathy

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
Chapter 17: Paediatric Perspectives

POLIOMYELITIS

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 facially-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

Complications
- Multiple intestinal erosions
- Acute gastric dilatation
- Hypertension
- Hypercalcaemia
- Nephrocalcinosis
- Vascular lesions
- Myocarditis
- Pulmonary oedema

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, papilloedema and cranial nerve palsies

Prevention
- Vaccination
  - The only effective method of prevention
  - Given at:
    - Birth
    - 6 weeks
    - 10 weeks
    - 14 weeks
  - Highly effective
  - 50% immune after 1 dose
  - >95% immune after 3 doses

- Active and passive motions as soon as pain disappears
- Anticipation and treatment of complications
- Prepare the child and family for a prolonged management of permanent disability if it seems likely

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Progresses to paralysis
- Location of paralysis depends on region affected
  - Abnormal sensation
  - Hyperaesthesia
  - Difficulty in initiating micturition
  - Constipation
  - Bladder and abdomen
  - Dysphagia
  - Muscle spasms
  - Drooling
  - Dysphonia
  - Irritability
  - Positive Babinski's sign

Complications
- Multiple intestinal erosions
- Acute gastric dilatation
- Hypertension
- Hypercalcaemia
- Nephrocalcinosis
- Vascular lesions
- Myocarditis
- Pulmonary oedema

Non-drug treatment
- 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
- Oral Polio Vaccine
  - Given at:
    - Birth
    - 6 weeks
    - 10 weeks
    - 14 weeks
  - Highly effective
  - >95% immune after 1 dose
  - >95% immune after 3 doses

Pulmonary embolism
- Paralysis of limbs, muscles of respiration and swallowing which can be fatal

Investigations
- Viral isolation from stool, pharynx or cerebrospinal fluid
- If the virus is isolated from a person with acute flaccid paralysis, it must be tested further, using fingerprinting or genomic sequencing to determine if it is the wild type or vaccine type
- Serology: a fourfold rise in antibody may be demonstrated

Cerebrospinal fluid examination:
- Raised white cell count, 10 - 200 cells/mm³ (primarily lymphocytes)
- Mild increase in protein: 40 - 50 mg/mL

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

Hysteria and malingering
- Conditions causing pseudoparalysis
- Unrecognized trauma

Introduction
- Acute osteomyelitis
- Acute rheumatic fever
- 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
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- There was an increase in global cases as a result of an epidemic in India, and increase in cases in Nigeria
Treatment objectives

- Inactivated Polio Vaccine
  - Useful because iron deficiency can affect the metabolism of vitamin A
- Serum albumin
  - Levels are indirect measures of levels of vitamin A
  - If anaemia, infection, or sepsis is a possibility
- Full Blood Count with differentials
- Vitamin A
  - To evaluate nutritional status
- Liver function tests
- Radiographs of the long bones
- Inactivated Polio Vaccine
  - To evaluate bone growth and excessive deposition of periosteal bone
  - Clinical testing for dark-adaptation threshold

VITAMIN A 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 retinylaldehyde) and acid (retinio 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 deficiency syndromes. The most widely affected group includes up to 10 million severely 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 diarrhoea 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 2 years' 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)**
- 30 micrograms
- 100 micrograms

**Child 1 - 3 years**
- 75 micrograms
- 250 micrograms

**Child 4 - 6 years**
- 125 micrograms
- 400 micrograms

**Child 7 - 10 years**
- 250 micrograms
- 700 micrograms

**All males older than 10 years**
- 1000 micrograms

**All females older than 10 years**
- 800 micrograms

**Aetiology**

Malnutrition

- The commonest cause of VAD in this part of the world

**Clinical features**

VAD may be asymptomatic

Increased risk of respiratory and diarrhoeal infections

Decreased growth rate

Retarded bone development

Increased fatigue as a manifestation of VAD anaemia

Bitot spots

Poor dark adaptation (nyctalopia)

Dry skin

Dry hair

Puritus

Broken fingernails

Keratomalacia

Xerophthalmia

Follicular hyperkeratosis (phrynoderma) from blockage of hair follicles with plugs of keratin

Excessive deposition of periosteal bone secondary to reduced osteoclastic activity

Anemia

Keratinization of mucous membranes

**Differential diagnoses**

Cataract

Refractive errors

Zinc deficiency

**Complications**

Blindness

Corneal ulceration

**Investigations**

Serum retinol

- Costly but is a direct measure
- A value of less than 0.7 mg/L in children younger than 12 years is considered low

Serum RBP

- Easier and less expensive to perform than retinol
- Less accurate because levels are affected by serum protein concentrations; types of RBP cannot be differentiated

Serum zinc

- Useful because zinc deficiency interferes with RBP production

**Aetiology**

- Inadequate intake
- Malabsorption
- Deficiency of vitamin A
- Other deficiencies of fat-soluble or water-soluble vitamins

**Investigations**

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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

**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 males older than 30 microgram (10,000 IU) orally once daily
- All females older than 50 microgram (10,000 IU) orally once daily

**Serum RBP**
- 60,000 microgram (200,000 IU) orally for a minimum of 2 days
- Has been shown to reduce child mortality rates by 35 - 70%

**Noteable adverse drug reactions, caution**

Risk of teratogenicity increases in pregnant women at a dose >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
Hemoptysis
Restlessness
Wheezes
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 gases
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 1or 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
Child: 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
  Note: Do not exceed 100% as increase in partial pressure
  of oxygen may precipitate acute changes in cardiac
  function

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
caucasians
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

Prevention
Adequate control of hypertension
Inflammatory, infiltrative, neoplastic and degenerative
processes
Fluids and electrolyte imbalances
Drugs and other substances of abuse
Sudden infant death syndrome

Clinical features
Usually sudden collapse
Unrecordable blood pressure
Loss of peripheral pulses
Cessation of respiration
May be asymptomatic
Complaints may be non-specific
Presentation may be that of underlying cause

Differential diagnoses
Syncope
Seizures

Complications
Death
Sequele 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
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)
- 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
event

Advanced life support
Intubation with an endotracheal tube
Defibrillation/cardioversion for patients with
ventricular fibrillation/ventricular tachycardia
Clinical features
- If alive, patient is unconscious and not breathing
- Hypoxemia and tissue hypoxia
- Acidosis
- Hypothermia
- Pneumonia
- Acute renal failure
- Hemolysis

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

Investigations
- Full Blood Count; ESR
- Chest radiograph
- Electrolytes, Urea and Creatinine
- Liver function tests
- Acid base status evaluation
- Arterial blood gases
- Skull and spine radiographs
- CT Scan (if available)

Treatment objectives
- Immediate resuscitation and stabilization to prevent or minimize complications
- Non-drug measures
- Airway management
  - Immobilize the cervical spine, as trauma may be present
  - Treat hypothermia vigorously
  - Endotracheal intubation with mechanical ventilation
  - 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
- Infuse an intravenous infusion with 0.9% saline or lactated Ringer's solution
- Manage pulmonary complications with the administration of 100% oxygen initially, titrated thereafter by reviewing arterial blood gases
- Bronchodilators if bronchospasm is present
- Manage metabolic acidosis: give NaHCO₃ if pH is persistently less than 7.2

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
- Failing 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 ingested

Drug treatment
- Sodium bicarbonate
- 1 mEq/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 bradycardia rhythms or asystole:
- Continue CPR
- Insert intravenous line

Prevention
- Family and community basic support education

The Standard Treatment Guidelines for Nigeria 2008

- The measures are aimed at:
  - Promoting potassium loss
  - Limiting exogenous potassium intake
  - Discontinuation of anti-kaliuretic drugs
  - Shifting potassium into cells

Drug treatment
- Calcium gluconate
  - 10 ml of 10% solution intravenously over 2-3 minutes
  - 10-20 units of regular insulin plus 25-50 g of glucose
- Other alternatives to cause influx of potassium:
  - Sodium bicarbonate (134 mmoles/L) if there is metabolic acidosis
  - See Cardiac Arrest
- Other:
  - Parenteral/nebulised salbutamol (see Bronchial asthma)
  - Removal of potassium with diuretics (loop plus thiazide diuretics in combination)

Sodium polystyrene sulphate (a cation exchange resin)
- For cardiac arrest secondary to bradyarrhythmias or asystole
- Repeat defibrillation
- Insert intravenous line
- Monitor arterial blood gases

Chapter 18: Emergencies

- Defibrillate with 200 J shock. Additional shock up to 360 J may be required
- Epinephrine (adrenaline) 1 mg intravenously after failed defibrillation
- Repeat defibrillation
- Insert intravenous line
- Monitor arterial blood gases

Treatment objectives
- Defibrillate with 200 J shock. Additional shock up to 360 J may be required
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Contributory factors
- Swimming in deep waters
- Failing 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

- Treat cerebral oedema
  - Ventilate with 100% oxygen
  - Hyperhydration
  - Intravenous mannitol (1 - 2 g/kg every 4 hours)
- Appropriate management of pulmonary oedema

Prevention
- Teach the unskilled to stay away from water
- Teach persons not to swim beyond skill level
- Parental/caregiver supervision of children
- Diving only under suitable conditions
- Education/public awareness
  - Appropriate management of pulmonary oedema
  - Teach cerebral oedema
  - Ventilate with 100% oxygen
  - Hyperhydration
  - Intravenous mannitol (1 - 2 g/kg every 4 hours)

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Pathophysiology
- Inhalation of water results in ventilation-perfusion imbalance with hypoxaemia and pulmonary oedema
- Absorption of hypotonic fresh water results in collapse
Chapter 18: Emergencies

**Calculation of potassium requirement**

**Caution**

**Hyponatraemia**

- **Intravenous potassium** (given in an infusion)
  - Do not exceed 20 mmoles/L
  - Calculations of potassium requirement
    - Deficit body weight (kg) = 0.3
    - 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
- **Deficit body weight (kg) = 0.3**
- Add daily requirement of potassium and correct over 3 days

**Hypertensive emergencies**

**Introduction**

**Clinical features**

- **Specific clinical features**
  - **Neurologic** (e.g. altered consciousness)
  - **Renal deterioration**
  - **Fundoscopic abnormalities**
  - **Hypertensive encephalopathy**
  - **Eclampsia**
  - **Malignant hypertension**

**Aetiology**

- Improperly managed hypertension
- Renal vascular disease
- Pheochromocytoma
- Accelerated essential hypertension

**Clinical features**

- Severe elevated blood pressure (>200/120 mmHg)
- Headaches, malaise, vomiting, dizziness, blurred vision, chest pain, palpitations, dyspnoea, oliguria
- Funduscopic changes
- Evidence of left ventricular failure
- Changes in level of consciousness

**Complications**

- Target organ damage
- Cerebrovascular accident
- Myocardial infarction
- Cardiac failure
- Renal failure
- Dialysis

**Investigations**

- Plain chest radiograph
- Echocardiography
- Full Blood Count
- Urea, Electrolytes and Creatinine
- Urinalysis
- Echocardiography

**Treatment objectives**

- Prompt but gradual reduction in mean arterial pressure
- Further reduction of BP to (not less than) 160/100 mmHg within 2 to 6 hours
- Lower pressures may be indicated for patients with aortic dissection
- Initiate/re-initiate long term therapy to normotensive levels

**Drug treatment**

- Sodium nitrpusside
  - 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, hyperventilation, arrhythmias, acidosis
- Reduce infusion over 15 - 30 minutes to avoid rebound effect when stopping
- Use sodium nitroprusside with caution in ischaemic heart disease, renal impairment, raised intracranial pressure and impaired pulmonary function

**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-beta cell tumours/insulinoma

**Clinical features**

- The two types are neuroglycopenic and neurogenic
- Neurogenic manifestations:
  - Palpitations
  - Tremors
  - Anxiety
  - Sweating
  - Hunger
Principles of management of poisoning

Management

Reduction in T synthesis/action and restoration to normal values

Other tests to identify precipitating factors

Prevention of complications

Drug treatment

Propylthiouracil

Adult: 600 mg loading dose; 200 - 300 mg orally every 6 hours nasogastric tube or per rectum

Child 5 - 12 years: Initially 50 mg orally 3 times daily until euthyroid then adjusted as necessary

12 - 18 years: Initially 100 mg 3 times daily administered until euthyroid then adjusted as necessary; higher doses sometimes required

Saturated Solution of Potassium Iodide (SSKI)

Adult: 5 drops every 6 hours; to be commenced 1 hour after the first dose of propylthiouracil

Child 1 month - 1 year: 0.2 - 0.3 mL orally 3 times daily

- Dilute with milk and water

Propranolol

Adult: 40 - 60 mg orally every 4 hours or 2 mg intravenously every 4 hours

Child: neonate, initially 250 - 500 micrograms/kg every 6 - 8 hours, adjusted according to response; doses up to 1 mg/kg may be required; maximum 40 mg every 8 hours

Dexamethasone

- 2 mg intravenously every 6 hours

Antibiotics (if infection is present)

Supportive measures

Adequate hydration with intravenous fluids and cooling

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.

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 central nervous and respiratory 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, relations 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

Paresthesia

Neuropathic manifestations:

Confusion

Fatigue

Seizures

Loss of consciousness

Death

Diagnosis

The Whipples's triad provides a framework for diagnosis of hypoglycaemia:

- Low plasma glucose concentration (<2.5 mmol/L)

- Alleviation of hypoglycaemic symptoms after glucose administration

Differential diagnoses

- Other causes of primary hypoglycaemia

- Secondary (iatrogenic) causes

Investigations

- Random blood sugar on presentation

- Other tests to confirm the cause of hypoglycaemia

Treatment objectives

- Prompt restoration of normal blood glucose level

- Prevention of rebound or recurrent hypoglycaemia

- Prevention of occurrence of neural damage or death

Treatment

- Urgent treatment must be given if irreversible complications are to be avoided

- Oral glucose tablets or glucose drinks if tolerated (and if patient is conscious)

- Intravenous fluid therapy

If there is neuroglycopenia preventing the use of oral glucose, give 5% glucose (dextrose)

- 50 mL/25 g in double dilution intravenously followed by 5 - 10% glucose (dextrose) for at least 48 hours in hypoglycaemia secondary to sulphonylurea therapy

- Intravenous glucagon 1 mg stat (give subcutaneously if intravenous route is impractical)

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

- Hyperthermia

Investigations

- Thyroid function tests

- Thyroid hormones

- Radio iodine uptake

- Thyroid ultrasonography

- Other investigations

Precaution

- Glucagon is not effective in glycogen-depleted individuals e.g. those with alcohol induced-hypoglycaemia

MYXEDEMA COMA

Introduction

A life-threatening complication of hypothyroidism

Follows a background of long-standing hypothyroidism

Clinical features

May be precipitated by exposure to cold, infection, trauma and CNS suppressants

- Coma with extreme hypothermia, temperatures 24 - 32°C

- Seizures

- Areflexia

- Pupillary dilation

- Hypothermia

- Bradycardia

- Hypotension

- Respiratory failure

- Death

Diagnosis

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

Initial manifestations (occur 3 - 6 hours after an overdose of >150 mg/kg):
- Vomiting
- Sweating
- Tachycardia
- Hyperventilation
- Tinnitus
- Fever
- Leukopeny
- Confusion
- Respiratory alkalosis
- Impaired renal function
- Increased anion gap

Severe poisoning:
- Coma
- Respiratory depression
- Seizures
- Cardiovascular collapse
- Cerebral and pulmonary oedema

Investigations

- FBC, ESR
- Electrolytes, Urea and serum Creatinine
- Random Blood Glucose
- LFTs including prothrombin time
- Blood aspirin levels

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

To restore normal metabolic functions

- Acetylcysteine may cause nausea, vomiting and diarrhoea may occur
- To restore normal metabolic functions
- Intravenous NaHCO to alkalinize urine (see Cardiac arrest or hypotension for cardiac therapy)

Notable adverse drug reactions

- Flumazenil with tricyclic antidepressants can cause seizures

Specific poisons

**Paracetamol**

Toxicity often occurs following an acute ingestion (within 24 hours) of =10 - 15 g (20 - 30 tablets) or 150 mg/kg

- 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

Severe poisoning:

- Coma
- Respiratory depression
- Seizures
- Cardiovascular collapse
- Cerebral and pulmonary oedema

Investigations

- FBC, ESR
- Electrolytes, Urea and serum Creatinine
- Random Blood Glucose
- LFTs including prothrombin time
- Blood aspirin levels

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

To restore normal metabolic functions

- Acetylcysteine may cause nausea, vomiting and diarrhoea may occur
- To restore normal metabolic functions
- Intravenous NaHCO to alkalinize urine (see Cardiac arrest or hypotension for cardiac therapy)


**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, hypotension, and pulmonary oedema may occur

Nicotinic effects:

- Twitching
- Weakness
- Hypertension
- Tachycardia
- Paralysis in severe cases

**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

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

**Drug treatment**

- Oxygen administration
- Respiratory support
- Monitoring liver, renal and myocardial function
- Correct metabolic abnormalities

**Antibiotics for aspiration pneumonia**

**Drug treatment**

- Oxygen administration
- Respiratory support
- Monitoring liver, renal and myocardial function
- Correct metabolic abnormalities

**Non-drug treatment**

- Remove contaminated clothing
- Wash skin with soap and water

**Supportive measures**

**Drug treatment**

- Oxygen administration
- Atropine

**Adul**: 0.5 - 2 mg intravenously every 5 - 15 minutes until bronchial and other secretions have dried

**Child**: 20 micrograms/kg (maximum 2 mg) intramuscularly or intravenously depending on the severity of poisoning, every 5 - 10 minutes until the skin becomes flushed and dry, pupils dilate and tachycardia develops

- Effective for muscarinic symptoms

**Plus**

- Pralidoxine

- Diluted to 10 - 15 mL with water for injection and administered by slow intravenous injection over 5 - 10 minutes

**Adult**: 1 - 2 g; can be repeated in 30 minutes

**Child**: initially 30 mg/kg, then either 30 mg/kg every 4 hours or by intravenous infusion, 8 - 10 mg/kg/hour (usual maximum 12 g in 24 hours)

Treat seizures with intravenous diazepam 10 mg stat

**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**

**Investigations**

- 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
- 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 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

**Drug treatment**

- Oxygen administration
- Respiratory support
- Monitoring liver, renal and myocardial function
- Correct metabolic abnormalities

**Drug treatment**

- Antibiotics for aspiration pneumonia
- Age (especially in children)
- Gender
- Address of patient
- Hospital number

Elements specifying medication:
- Name of medication (generic name)
- Strength (metric units) and quantity
- Dosage
- Frequency
- Duration
- Directions for use (drug- and patient-specific)
- Refill instructions
- Waiver of requirements for child-proof containers
- Additional labelling instructions

Prescriber's signature and other identification data e.g. code. Prescriptions may be hand written or computer-based:
- Hand written prescriptions should be written in indelible ink and the hand writing should be legible (important, to avoid medication errors)
- Any alteration(s) made in a computer-issued prescription should be duly endorsed

Abbreviations

Only standard, official abbreviations should be used. The following are some notable abbreviations:
- a.c. 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
- If >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
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. Diphtheria
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 1

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
Lineal gingival erythema
Extensive molluscum contagiosum
Recurrent oral ulceration
Unexplained persistent parotid enlargement
Hemorrhage zoster
Recurrent or chronic upper respiratory tract infections (otitis media, otitis media, sinusitis, tonsilitis)

Clinical Stage 3 (I)
Unexplained moderate malnutrition or wasting not adequately responding to standard therapy
Unexplained persistent diarrhoea (14 days or more)
Unexplained persistent fever (above 37.6 °C, intermittent or constant, for longer than one month)
Oral hairy leukoplakia
Acute necrotizing ulcerative gingivitis or periodontitis
Lymph node tuberculosis
Pulmonary tuberculosis
Severe recurrent bacterial pneumonia
Symptomatic lymphoid interstitial pneumonia
Chronic HIV-associated lung disease including bronchiectasis
Unexplained anaemia (<8.0 g/dl), neutropenia (<0.5 x 10^9/L3) 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; (orolabal 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-tuberculosis mycobacteria infection
Cerebral or B cell non-Hodgkin lymphoma
Progressive multifocal leukoencephalopathy
HIV-associated cardiomyopathy or nephropathy

(I) Unexplained refers to where the condition is not explained by other causes

(ii) Some additional specific conditions can be included in regional classifications (e.g. Disseminated Pencilliosis 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>Telephone:</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? No Yes
2. History of 3 or more consecutive spontaneous abortions? No Yes
3. Birthweight of last baby < 2500g? No Yes
4. Birthweight of last baby > 4500g? No Yes
5. Last pregnancy: hospital admission for hypertension or pre-eclampsia/eclampsia? No Yes
6. Previous surgery on reproductive tract? (Myomectomy, removal of septum, cone biopsy, classical CS, cervical cerclage) No Yes

CURRENT PREGNANCY

7. Diagnosed or suspected multiple pregnancy? No Yes
8. Age less than 16 years? No Yes
9. Age more than 49 years? No Yes
10. Immunisation Rh (-) in current or in previous pregnancy? No Yes
11. Vaginal bleeding? No Yes
12. Pelvic mass? No Yes
13. Diastolic blood pressure 90mm Hg or more at booking? No Yes

GENERAL MEDICAL

14. Insulin-dependent diabetes mellitus? No Yes
15. Renal disease? No Yes
16. Cardiac disease? No Yes
17. Known substance abuse (including heavy alcohol drinking)? No Yes
18. Any other severe medical disease or condition? Please specify No Yes

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 No Yes

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</th>
<th>Height</th>
<th>Body Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kg</td>
<td>lb</td>
<td>cm</td>
</tr>
<tr>
<td>Newborn*</td>
<td>3.5</td>
<td>7.7</td>
<td>50</td>
</tr>
<tr>
<td>1 Month*</td>
<td>4.2</td>
<td>9</td>
<td>55</td>
</tr>
<tr>
<td>3 Month*</td>
<td>5.6</td>
<td>12</td>
<td>59</td>
</tr>
<tr>
<td>6 Month</td>
<td>7.7</td>
<td>17</td>
<td>67</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>22</td>
<td>76</td>
</tr>
<tr>
<td>3 years</td>
<td>15</td>
<td>33</td>
<td>94</td>
</tr>
<tr>
<td>5 years</td>
<td>18</td>
<td>40</td>
<td>108</td>
</tr>
<tr>
<td>7 years</td>
<td>23</td>
<td>51</td>
<td>120</td>
</tr>
<tr>
<td>12 years</td>
<td>39</td>
<td>86</td>
<td>148</td>
</tr>
</tbody>
</table>

* 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-trimoxazole</td>
<td>Teratogenic risk (trimethoprim - a folate antagonist)</td>
</tr>
<tr>
<td>Cytarabine</td>
<td>Avoid (teratogenic in animal studies)</td>
</tr>
<tr>
<td>Dactinomycin</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>Sulfadione/pyrimethamine</td>
<td>Possible teratogenic risk (pyrimethamine is a folate antagonist)</td>
</tr>
<tr>
<td>Hydroxocobalamin(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>Phenytoin</td>
<td>Congenital malformation (screening advised)</td>
</tr>
<tr>
<td>Trimethoprim</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>Amodidine</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>Amitriptylline</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Amlodipine</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Amoxicillin</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, oral</td>
<td>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>Antipsychotics</td>
<td>Avoid unless absolutely necessary</td>
</tr>
<tr>
<td>Apomorphine</td>
<td>Manufacturer advises avoid</td>
</tr>
<tr>
<td>Atenolol</td>
<td>Toxicity due to beta-blockage. Avoid or use with caution (monitor infant)</td>
</tr>
<tr>
<td>Atropine</td>
<td>Manufacturer advises caution</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-trimoxazole</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>Indomethacin</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>Lithoprol</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>Phenoxybarbital</td>
<td>Avoid when possible</td>
</tr>
<tr>
<td>Phenytin</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>Tinzidazole</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>
<tr>
<td>Vitamin K</td>
<td>Manufacturers advise avoid</td>
</tr>
</tbody>
</table>
# National Pharmacovigilance Centre (NPC) Nigeria

## Form for Reporting of Suspected Adverse Drug Reactions

**IN STRICT CONFIDENCE**

**National Agency for Food and Drug Administration & Control (NAFDAC), Headquarters Office**

Plot 2032 Olusegun Obasanjo Way

Wuse Zone 7 Abuja

Tel: 08086899571 or Fax: 09-5241108

### 1. Patient's Details

<table>
<thead>
<tr>
<th>Full Name or Initials:</th>
<th>Patient Record No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE/DATE OF BIRTH:</td>
<td>SEX: M [ ] F [ ] WEIGHT (kg):</td>
</tr>
<tr>
<td>HOSPITAL/Treatment Centre:</td>
<td></td>
</tr>
</tbody>
</table>

### 2. Adverse Drug Reaction (ADR)

#### A. Description

<table>
<thead>
<tr>
<th>C. Outcome of Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovered fully (Specify)</td>
</tr>
<tr>
<td>Recovered with disability (Specify)</td>
</tr>
<tr>
<td>Congenital Abnormality (Specify)</td>
</tr>
<tr>
<td>Life Threatening (Specify)</td>
</tr>
<tr>
<td>Death</td>
</tr>
<tr>
<td>Others (specify)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE Reaction Started</th>
<th>DATE Reaction Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### B. Was Patient Admitted Due to ADR

<table>
<thead>
<tr>
<th>Yes [ ]</th>
<th>No [ ]</th>
</tr>
</thead>
</table>

If Already Hospitalized, Was it Prolonged Due to ADR

<table>
<thead>
<tr>
<th>Yes [ ]</th>
<th>No [ ]</th>
</tr>
</thead>
</table>

Duration of Admission (days): 

**Treatment of Reaction:**

### 3. Suspected Drug (Including Biologicals Traditional/Herbal Medicines & Cosmetics)

#### A. Drug Details

<table>
<thead>
<tr>
<th>State name and other details if available / Attach product label / Sample (if available)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Brand Name:</th>
<th>Generic Name:</th>
<th>Batch No:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NAFDAC No:</th>
<th>Expiry Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name &amp; Address of Manufacturer:</th>
</tr>
</thead>
</table>

#### B. Indications for Use

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Route of Administration</th>
<th>Date Started</th>
<th>Date Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4. Concomitant Medicines

<table>
<thead>
<tr>
<th>All medicines taken within the last 3 months including herbal and self medication</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Brand or Generic Name</th>
<th>Dosage</th>
<th>Route</th>
<th>Date Started</th>
<th>Date Stopped</th>
<th>Reason for Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 5. Source of Report:

<table>
<thead>
<tr>
<th>Name of Reporter:</th>
<th>Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional:</td>
<td>Signature:</td>
</tr>
</tbody>
</table>

**Tel No/E-mail:**

**MANDATORY FIELDS**