A RATIONALE FOR THE CHEST

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A guide to the diagnosis of diseases that may cause thoracic symptoms.
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Chest Symptoms Diagnostic Chart
A chart that leads the user through the location of chest symptoms to possible diagnoses.

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Symptoms involving the chest and the conditions that may be responsible

SECTION THREE
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The symptoms, signs, investigation and treatment of medical conditions that may cause thoracic symptoms.

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INTRODUCTION

This book is designed for both the medical student and the doctor who is not a specialist in respiratory or cardiac medicine.

It will take the user through a logical rationale in order to diagnose, and then treat, virtually every condition causing chest symptoms likely to be encountered outside a specialist practice.

There are two ways to reach a diagnosis, using the chart in Section One, or the Diagnostic Algorithms in Section Two.

In Section One, a the chart will guide the user through the location of presenting symptoms for most chest conditions to a selection of possible diagnoses.

As an alternative, the algorithms in Section Two will indicate the diagnoses possible with a variety of chest presenting symptoms.

Once a diagnosis has, or number of differential diagnoses have been made, a detailed explanation of the various diagnoses can be found in the largest part of the book, Section Three. This has been written in a style that should be easy to understand by even junior medical students, with technical terms explained in each monograph, but should still be useful to the non-specialist doctor. The symptoms, signs, investigations and treatment of a very wide range of appropriate conditions are explained, along with pictures of the more common conditions.

I trust that you will find it useful.

Warwick Carter
Brisbane

OTHER BOOKS IN THIS SERIES

A Rationale for Rashes
A Rationale for Eyes
A Rationale for the Abdomen
A Rationale for the Brain
Section ONE

CHEST
SYMPTOMS
DIAGNOSTIC CHART
A RATIONALE FOR THE CHEST

COMMON CAUSES OF PAIN IN REGIONS OF THE CHEST

A  Lower anterior neck
Myocardial ischaemia, angina, thyroiditis, tracheitis.

B  Shoulder and upper arm
Myocardial ischaemia, angina, Pancoast syn.

C  Right upper anterior
Myocardial ischaemia, pneumothorax, Tietze syn., Pancoast syn.

D  Upper mediastinum
Myocardial ischaemia, angina, pulmonary embolus, pericarditis, reflux oesophagitis, oesophageal foreign body, pneumo mediastinum.

E  Left upper anterior
Myocardial ischaemia, angina, pneumothorax, Tietze syn., Pancoast syn.

F  Right lower anterior
Cholecystitis, pneumonia, pleurisy, vertebral neuralgia, pancreatitis, Tietze syn., slipping rib syn.

G  Lower mediastinum
Myocardial ischaemia, dissecting aneurysm, reflux oesophagitis, hiatus hernia, oesophageal carcinoma, oesophageal foreign body, pulmonary embolus, pericarditis, xiphoid syn., vertebral neuralgia.

H  Left lower anterior
Splenial injury or inflammation, pneumonia, pleurisy, pericarditis, vertebral neuralgia, Tietze syn., slipping rib syn., psychogenic pain.
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J Epigastrium
Myocardial ischaemia, dissecting aneurysm, xiphoid syn., peptic ulcer, pancreatitis.
See Abdominal Pain.

K Lateral upper back
Vertebral neuralgia, muscular strain.

L Central upper back
Myocardial ischaemia, thoracic spinal dysfunction, whiplash injury.

M Left central back
Thoracic spinal dysfunction, peptic ulcer, pyelonephritis, splenic inflammation.

N Central back
Dissecting aneurysm, pericarditis, Scheuermann’s disease, ankylosing spondylitis, peptic ulcer.

P Right central back
Thoracic spinal dysfunction, pyelonephritis, peptic ulcer, cholecystitis, pancreatitis.
Section Two

DIAGNOSTIC ALGORITHMS FOR CHEST SYMPTOMS
## DIAGNOSTIC ALGORITHMS FOR CHEST SYMPTOMS AND SIGNS

### FORMAT

**Presenting Symptom**

(Alternate Name) 

Explanation of terminology

System or other group of symptoms

Diagnoses that may present with this symptom

[alternate name of diagnosis] (other symptoms of each diagnosis, or a discussion of the diagnosis)

Other entries to consider

**Clinical Sign**

(Alternate Name) [Abbreviation]

**Exp:** An explanation of the sign, with its methodology described in sufficient detail to enable the practitioner to perform the test.

**Int:** The interpretation of the sign.

(+) The diseases, syndromes etc. that should be considered if the test is positive

(++) The interpretation of an exaggerated or grossly positive test

(–) Ditto for a negative test result

(AB) Ditto for an abnormal test result

**Phys:** The pathophysiology of the sign to enable its significance to be better understood

Other entries to consider

### Adenitis and Lymphadenopathy

Inflamed and enlarged lymph nodes in axilla and chest

**Infections**

- Localised spread of viral or bacterial infection (superficial infective site, tenderness, erythema, fever)
- Septicaemia (fever, malaise, major organ infection)
- Tuberculosis [scrofula] (cough, haemoptysis, pustular lymph nodes)
- AIDS or primary HIV infection
- Actinomycosis (discharging sinuses, painless)
- Cytomegalovirus (fever, arthralgia, hepatomegaly)
- Filariasis (fever, oedema, orchitis)
- Toxoplasmosis (varied symptoms)
- Trypanosomiasis (apathy, neurological signs)
- Measles (rash, cough, coryza)
- Infectious mononucleosis (fever, malaise, splenomegaly)
- Tularaemia (papule inoculation, fever, nausea)
- Tuberculosis (scrofula) (cough, haemoptysis, pustular lymph nodes)
- AIDS or primary HIV infection
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**Syndromes**

- AIDS (splenomegaly, fever, cachexia, skin lesions)
- Chronic fatigue syndrome (weakness, fever)
- Idiopathic lymphadenopathy syndrome (homosexual)
- Kawasaki syndrome (rash, fever)
- Letterer-Siwe syndrome (fever, rash, infant)

**Other**

- Rheumatoid arthritis (joint pain)
- Systemic lupus erythematosus [SLE]
- Leukaemia, chronic (pallor, malaise)
- Hand-Schuller-Christian disease (eczema, infections)
- Sarcoidosis (splenomegaly, skin lesions)
- Hodgkin's disease (fever, fatigue, pruritus)
- Thyrotoxicosis (sweating, heat intolerance)
- Immunisation
- Serum sickness
- Lymphomas
- Metastatic carcinoma
- Branchial cyst and other developmental remnants may be confused with glands
- Drugs (eg. phenytoin)

### Adson's Test

**Exp:** Patient is seated with hands on thighs, and takes and holds a very deep breath. The
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neck is then hyperextended, and the head turned from side to side. Positive if radial pulse on one side is obliterated

Int:  (+) Cervical rib syndrome, thoracic outlet syndrome, scalenius anticus syndrome

Phys:  Compression of subclavian artery against abnormal cervical rib or scalenius anticus

Amphoric Breathing

Exp:  High pitched, metallic toned, bronchial breathing heard on auscultation

Int:  (+) Open pneumothorax, tuberculous cavities

Phys:  Named after Greek amphora (pottery vessel), as breath sounds similar to blowing over the top of a bottle

Areolar Pigmentation

Darkening of areola and nipple

Present or past pregnancy

Sex hormone therapy

Familial

Racial

Arrhythmias, Cardiac

See Bradycardia; Extrasystolic Beats; Gallop Rhythm; Tachycardia

Atrial Fibrillation

Irregularly irregular pulse. Abnormal f waves on ECG.

Ischaemic heart disease

Myocardial infarct

Mitral valve disease

Rheumatic valve disease

Congestive cardiac failure

Cardiomyopathies

Myocarditis

Pericarditis

Pulmonary embolism

Hyperthyroidism

Severe hypertension

Phaeochromocytoma

Cardiac amyloidosis

Wolff-Parkinson-White syndrome

Cardiac trauma

Thoracic tumours

Thoracic surgery

Familial.

Predisposing factors eg. (alcohol, caffeine, obesity, sleep apnoea)

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Austin-Flint Murmur

Exp:  When listening to the cardiac apex, a murmur is heard that has its onset associated with a 3rd heart sound, is loudest at mid-diastole and may have some presystolic accentuation

Int:  (+) Aortic regurgitation

Phys:  The full opening of the mitral valve is prevented by the regurgitant jet from the aortic valve defect and the more rapid rise in the left ventricular than the left atrial
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Back and Vertebral Pain

**Back pain at chest level**

**Musculoskeletal**
- Disc lesions (radiating pain)
- Scoliosis
- Osteomalacia
- Paget's disease (headaches, skull enlargement)
- Osteomyelitis (malaise, tenderness, fever)
- Spondylolisthesis
- Fibrositis or myositis
- Vertebral fractures
- Rheumatoid arthritis (extension from small joints)
- Tuberculosis (miliary form)
- Ankylosing spondylitis (limited movement, uveitis)
- Osteoarthritis (radiating pain)
- Trauma or strain to muscles or ligaments
- Discitis (often diabetic or child, vague symptoms)
- Osteoporosis (pathological fractures)
- Metastatic carcinoma (e.g. prostate, breast)
- Scapulocostal syndrome (neck and arm pain)

**Other**
- Peptic ulceration (epigastric tenderness, nausea)
- Multiple myeloma (malaise, anaemia, weight loss)
- Cushing syndrome (central obesity, hirsute, plethora, ecchymoses)
- Aortic aneurysm (check distal pulses)
- Vascular insufficiency
- Psychogenic causes (widespread pain, inappropriate responses to examination)
- Bacterial and viral infections (e.g. meningitis, influenza, brucellosis)
- Hyperparathyroidism (polyuria, polydipsia, nausea)
- Steele-Richardson-Olszewski syndrome (axial rigidity, dementia)
- Syphilis (varied symptoms)
- Postural

**Bad Breath**

See Halitosis

**Barrel Chest**

Exp: Chest fixed in inspiration. Increased anteroposterior diameter to give impression of a cylindrical chest

Int: (+) Emphysema, asthma

**Phys:** Permanent overinflation of distal air spaces due to chronic infections or expiratory airway obstruction

*See also Pink Puffer*

**Blue Bloater**

Exp: Oedematous patient with cyanosis at rest, warm extremities, generalised plethora, shortness of breath, productive cough, polycythaemia and a large heart

Int: (+) Bronchitic chronic obstructive airways disease

Phys: Greatly increased airways resistance and cardiac failure

*See also Pink Puffer*

**Bradycardia**

**Slow heart rate below 60 per minute**

Healthy athlete

Elderly

Fright

Hypothermia

Postinfective states

Increased intracranial pressure

Serious liver disease

Cerebral tumours

Hypothyroidism

Electrolyte imbalances

Syncope

Anaphylaxis

Myocardial infarct

Heart block

Sick sinus syndrome

Congestive cardiac failure

Stokes-Adams syndrome

Romano-Ward syndrome

Vasovagal syndrome

Septicaemia

Drugs (e.g. digitalis, beta-blockers, narcotics, verapamil, diltiazem, amiodarone)

**Breast, Abnormal**

See Breast, Atrophic or Atresic; Breast Lump; Breast Pain; Gynaecomastia; Discharge, Nipple, and Galactorrhoea

**Breast, Atrophic or Atresic**

Adrenogenital syndrome (acne, hirsute, amenorrhoea)

Menopausal syndrome (menstrual changes, flushes)
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Turner syndrome  (genital hypoplasia, amenorrhoea)

**Breast Enlargement**
See Gynaecomastia

**Breast Lump**
Breast carcinoma (pain, erythema, firm, fixed)
Hormonal dysplasia (fluctuating, cyclical pain)
Fibroadenoma (asymptomatic)
Mastitis (hot, tender, erythema)
Blocked milk duct during lactation
Cysts
Fat necrosis or fibrosis after trauma
See also Gynaecomastia

**Breast Pain**
Breast carcinoma (lump, erythema, firm, fixed)
Hormonal dysplasia (fluctuating, cyclical, lump)
Mastitis (erythema, fever, tender, hot)
Abscess (tender mass, erythema, often lactating)
Dysmenorrhea (pelvic fullness and pain)
Pregnancy (breast fullness, amenorrhoea)
Trauma
Menopausal syndrome (flushes, menstrual changes)
Premenstrual tension syndrome (headache, irritable)

**Breathing, Abnormal**
See Barrel Chest; Blue Bloater; Bronchial Breathing; Cavernous Breathing; Cheyne-Stokes Respiration; Cough; Crepitations, Pulmonary; Dyspnoea; Haemoptyysis; Hyperventilation; Hypoventilation;
Kussmaul's Breathing or Sign; Orthopnoea; Pink Puffer; Pleural Effusion; Rhonchi; Wheeze

**Breathing, Difficult**
See Dyspnoea; Orthopnoea; Stridor; Wheeze

**Bronchial Breathing**
Exp: Harsh, clear, breath sound that is equal in inspiration and expiration
Int: (+) Pneumonia, pulmonary tumours, TB, pulmonary consolidation
Phys: Suppression of vesicular component of breath sound when alveoli not working results in bronchial breathing

**Bronchospasm**
See Wheeze

**Bruit**
See Murmur, Cardiac; Thrill, Cardiac

**Cardiac Displacement**
See Apex Beat Displacement

**Cardiomegaly**
See Apex Beat Displacement; Cor Pulmonale

**Cavernous Breathing**
Exp: Hollow quality, low toned breath sound that is equal in inspiration and expiration
Int: (+) Open pneumothorax, lung cavities (eg. TB, bronchiectasis, pulmonary abscess)
Phys: Due to lung cavity surrounded by partially consolidated lung tissue

**Central Venous Pressure**
See Jugular Venous Pressure

**Chest Pain**

**Cardiac**
Pericarditis (worse supine, friction rub)
Myocardial infarct (shock, arrhythmias, pressure ache)
Angina pectoris (radiates, sudden, exertion related)
Pericardial effusion (dyspnoea, dysphagia)
Aortic aneurysm (symptoms vary with site)
Congenital heart disease (dyspnoea, fatigue, cyanosis)
Myocarditis (dyspnoea, vertigo, asthenia)
Anaemia (pallor, fatigue, dyspnoea)
Mitral valve prolapse (midsystolic click, late systolic murmur)

**Pulmonary**
Pleurisy (inspiratory pain and friction rub)
Pneumonia (cough, fever, foul sputum)
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Bronchiectasis (dyspnoea, haemoptysis, recurrent infection)
Pulmonary embolism (cough, dyspnoea, haemoptysis)
Pneumothorax (sudden dyspnoea)
Pneumomediastinum (sudden substernal pain)
Tracheitis (cough, fever)
Hyperventilation (tetany)
Other pulmonary diseases and infections

Gastrointestinal
Oesophagitis (burning pain, dysphagia, waterbrash)
Indigestion (burping, food excess)
Oesophageal carcinoma (dysphagia, weight loss)
Oesophageal foreign body
Hiatus hernia (heartburn, worse recumbent)
Cardiospasm (dysphagia, bloating)
Peptic ulcer (nausea, epigastric tenderness)
Cholecystitis (RUQ tender, nausea, jaundice)
Pancreatitis (sudden, nausea, shock, abdomen tender)
Dysphagia (see separate entry)

Musculoskeletal
Trauma, superficial infections and viral myalgia
Vertebral arthritis (back pain and tenderness)
Vertebral malignancy

 Syndromes
Boerhaave syndrome (ruptured oesophagus)
Bornholm syndrome
Chinese restaurant syndrome (face pain, nausea)
Intermediate coronary syndrome (variable angina)
Irukandji syndrome (jellyfish sting, pulmonary oedema, severe pain)
Meigs syndrome (hydrothorax, ascites)
Mendelson syndrome (pneumonitis, bronchospasm)
Pancoast syndrome (arm pain, lung cancer)
Slipping rib syndrome (lower chest pain)
Tietze syndrome (costochondral pain and tenderness)
Xiphoid syndrome (sternal pain, nausea)

Other
Cardiac neuroses and other emotional disorders
Herpes zoster (shingles) (unilateral, radicular, rash)
Thoracic malignancy
Sarcoidosis
Hypothyroidism (dry skin, myalgia, cold intolerance)
Melioidosis (cough, skin abscesses)
Mediastinal and thymic tumours
See also Heartburn; Breast Pain; Dyspepsia

Cheyne-Stokes Respiration
Exp: Respirations that gradually decrease in frequency until a temporary cessation occurs. Respiration then restarts and the frequency builds to a maximum before the cycle repeats itself
Int: (+) CVA, meningitis, uraemia, narcotic or barbiturate overdose, advanced cardiac disease (eg. left ventricular failure), terminal stage of many chronic diseases, cerebral tumours, raised intracranial pressure
Phys: Damage to cerebral respiratory centre. One full cycle equates to twice the circulation time

Coin Test
Exp: When a coin on the chest wall is struck by another coin, a metallic noise is heard through a stethoscope placed on the chest wall at a distance from the coin. Two sides of chest should be compared
Int: (+) Pneumothorax
Phys: Conduction of sound is altered by the partial collapse of a lung

Consolidation of Lung
See Dull Percussion Note, Thoracic

Cor Pulmonale
Exp: Pulmonary arterial hypertension and right ventricular enlargement. Confirmed by ECG and chest X-ray
Int: (+) Chronic obstructive airways disease, pulmonary vascular disease, multiple pulmonary emboli, diffuse interstitial pulmonary disease, sleep apnoea, kyphoscoliosis, neuromuscular diseases of chest wall, Pickwickian syndrome, high altitude sickness
Phys: Primarily a sign of obstructed circulation of blood through the lungs, and not cardiac disease. Congenital heart disease and left heart disease must be excluded

Corrigan's Sign
Exp: Vigorous, jerky pulsation of major arteries causing ears to move or head to nod
Int: (+) Aortic regurgitation, patent ductus arteriosus, ventricular septal defect
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Cough

Respiratory Tract
Coryza (rhinitis, sore throat, malaise)
Influenza (fever, myalgia, headache)
Sinusitis (face pain, catarrh)
Rhinitis (allergic or vasomotor)
Postnasal drip (pharyngitis, halitosis)
Q fever and other rickettsioses
Pertussis (infant, coryza, anaemia)
Other respiratory tract bacterial and viral infections
Laryngeal tumour or oedema (dyspnocoea, dysphagia, hoarseness)
Laryngeal foreign body (stridor, hoarseness, gagging)

Pulmonary
Bronchitis (sputum, rhonchi, fever)
Pneumonia (fever, pain, foul sputum)
Tuberculosis (malaise, fever, haemoptysis)
Bronchiectasis (purulent sputum, haemoptysis, rales)
Bronchial foreign body (wheeze, history)
Bronchogenic carcinoma (wheeze, haemoptysis, malaise)
Pulmonary oedema (crepitations, dyspnocoea)
Asthma (expectoratory wheeze, dyspnocoea)
Hyperreactive airways disease (allergy-like symptoms)
Alveolitis (arthralgia, dry cough)
Silicosis (history, chronic respiratory infections)
Asbestosis (occupational exposure)
Pulmonary abscess
Pleurisy (pain, friction rub)
Allergic alveolitis (eg. farmer's lung, bird fancier's lung)
Emphysema (wheeze, dyspnocoea, barrel chest)
Sarcoidosis (dyspnocoea, malaise)
Pulmonary thromboembolism (pain, dyspnocoea, haemoptysis)
Cystic fibrosis (steatorrhoea, viscid sputum)
Anthrax (dyspnocoea, headache, animal contact)
Legionnaire's disease (influenza-like, diarrhoea)
Tularaemia (tick bite)
Brucellosis (fever, sweating, headache)
Hydatid disease (abdominal mass)
Plague
Psittacosis (fever, epistaxis, myalgia, bird contact)
Smoking (active or passive)
Inhaled irritants

Syndromes
Eosinophilia-myalgia syndrome (arthralgia)
Goodpasture syndrome (haemoptysis, dyspnocoea, anaemia)

Immotile cilia syndrome (infertility, recurrent infections)
Kartagener syndrome (dextrocardia, sinusitis)
Loeffler syndrome (wheeze, fever, pulmonary eosinophilia)
Louis-Bar syndrome (telangiectasia of face and flexures)

Other
Congestive cardiac failure (dyspnocoea, fatigue, orthopnoea)
Mitrval valve disease (dyspnocoea, atrial fibrillation)
Otitis media (ear pain and discharge, fever)
Diaphragmatic irritation (eg. abscess, peritonitis)
Gastro-oesophageal reflux (burping, nonproductive cough, chest pain)
Aortic aneurysm (bruit, pain)
Pericarditis (cardiac failure, pain)
Goitre
Measles (rash, conjunctivitis, coryza)
Ascariasis (urticaria, haemoptysis, colic)
Histoplasmosis and other pulmonary mycotic infections
Melioidosis (chest pain, skin abscesses)
Actinomycosis (fever, dyspnocoea, malaise)
External auditory canal stimulation (eg. excess wax, foreign body)
Anaphylaxis
Psychogenic
Drugs (eg. beta-blockers, ACE inhibitors)
See also Haemoptysis; Wheeze

Crepitations, Pulmonary
(Moist Rales)
Exp: Moist sounds on chest auscultation that vary from bubbling (coarse) to crackling (medium) and inspiratory tinkling (fine)
Int: (Coarse +) Bronchiectasis, bronchitis
(Fine +) Pneumonia, TB, pulmonary collapse, pulmonary oedema, pulmonary embolism, elderly
Phys: Due to passage of air through fluid (mucus, pus, oedema fluid, exudate, etc.)

See Stridor

Croup

Diastolic Murmur
Mitrval stenosis
Aortic incompetence
Ventricular septal defects
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Hyperdynamic conditions (eg. anaemia, thyrotoxicosis)
Pulmonary incompetence
Patent ductus arteriosus
Tricuspid stenosis
Carcinoid syndrome

Pharyngeal abscess (dyspnoea, fever, pain)
Multiple sclerosis (various neurological symptoms)
Systemis lupus erythematous [SLE]
Polymyositis
Chagas' disease
Iron deficiency anaemia (pallor, fatigue, dyspnoea)
Goitre (thyroid enlargement from any cause)
Thyrotoxicosis (sweating, headache)
Head injury
Motor neurone disease (weak, myalgia)
Pericardial effusion (dyspnoea, ache)
Aortic aneurysm (dyspnoea, hoarse, pain)
Scleroderma (arthritis, Raynaud's phenomenon)
Dermatomyositis (proximal weakness, rash)
Myasthenia gravis (diplia, ptosis)
Cervical osteoarthritis
Globus hystericus (psychogenic, common)
Radiotherapy
See also Mucous Membranes, Dry; Odynophagia

Discharge, Nipple
See Nipple Discharge

Displacement of Heart
See Apex Beat Displacement

Dull Percussion Note, Thoracic
Exp: One index finger is laid flat on the chest wall and is struck firmly with the other index finger. Lower than normal pitch of percussion is dullness
Int: (+) Pneumonia, fibrosis, consolidation, TB, pleural effusion, extensive carcinoma.
Phys: Solid lung tissue does not reflect sound as readily as aerated lung
See also Tympany, Thoracic; Pectoriloquy, Whispering; Pleural Effusion

Dysphagia
Thoracic causes for difficulty in swallowing
Gastrointestinal
Carcinoma of oesophagus or pharynx (pain, regurgitation, wasting)
Achalasia (dysergia, regurgitation, pain)
Stricture (regurgitation, dehydration)
Hiatus hernia (pain, reflux, waterbrash)
Oesophageal diverticulae (halitosis, foul taste, regurgitation)
Buccal or oesophageal candidiasis (white plaques)
Oesophageal spasm
Oesophageal peptic ulcer
Oesophageal herpes
Foreign body (regurgitation, pain)

Syndromes
Boerhaave syndrome (ruptured oesophagus)
Guillain-Barré syndrome (paralysis, polyneuritis)
Plummer-Vinson syndrome (oesophageal web, splenomegaly)
Sjögren syndrome (dry eyes and mouth)

Other
Cervical masses (eg. lymph nodes, ectopic thymus)
Cerebrovascular accident

Dyspnoea
Shortness of breath
Respiratory Tract
Pharyngeal abscess (dysphagia, fever, pain)
Laryngeal tumour or oedema (hoarse, cough, dysphagia)
Obstructive sleep apnoea (snoring)
Severe rhinitis

Pulmonary
Asthma (expiratory wheeze, cough)
Pneumothorax (pain, sudden onset)
Pneumonia (cough, fever, pain, expectoration)
Bronchiolitis (child, wheeze, cough)
Croup (child, characteristic cough)
Chronic obstructive airways disease
Bronchiectasis (pain, malaise, haemoptysis)
Pressure on larynx from abscess, haematoma, neoplasm, etc.
Emphysema with bronchitis (wheeze, cough, barrel chest)
Atelectasis (cyanosis, fever, sudden onset)
Anthrax (animal contact, cough, congestion)
Sarcoidosis (cough, malaise)
Thromboembolism (pain, cough, haemoptysis)
Pleural effusion (pain)
Allergic alveolitis (cough, fever)
Histiocytosis X (smoker, young male)
Hydatid disease (abdominal mass)
Pulmonary haemorrhage
Pulmonary embolus

Cardiovascular
Myocardial infarct (pain, pallor, nausea)
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Congestive cardiac failure (paroxysmal nocturnal dyspnoea)
Mitral stenosis (fatigue, paroxysmal and nocturnal)
Congenital heart disease (fatigue, cyanosis)
Pericardial effusion (dysphagia, ache)
Myocarditis (asthenia, pain, nausea)
Aortic aneurysm (pain, dysphagia, hoarse)
Hypotension (faint, vertigo, pallor)
Anaemia (pallor, fatigue, palpitations)
Cerebrovascular accident
Pulmonary hypertension
Cardiac arrhythmias

Syndromes
Eosinophilia-myalgia syndrome (cough, arthralgia)
Falloh's tetralogy (cyanosis, cardiac lesions)
Goodpasture syndrome (haemoptysis, anaemia, cough)
Guillain-Barré syndrome (muscle weakness)
Hamman-Rich syndrome (interstitial fibrosis)
Irukandji syndrome (jellyfish sting, severe pain, tachycardia)
Pickwickian syndrome (obese, cardiac lesions)
Respiratory distress syndrome, neonate and adult (hypoxia, tachypnoea)
Shock syndrome (pallor, hypotension, oliguria)

Other
Exertion or emotion (hyperventilation)
Hypoparathyroidism (tetany, wheeze, stridor)
 Mediastinal tumour (substernal pain)
Gastro-oesophageal reflux (burping)
Kyphoscoliosis
Acidosis
 Neuromuscular disorders
Hyperthyroidism (fatigue, sweating, weight loss)
Poliomyelitis (fever, paralysis)
Psychogenic causes
Carbon monoxide poisoning
Electrolyte imbalance (eg. hyper- or hypokalaemia)
Rib fracture or other trauma
Obesity
See also Orthopnoea; Stridor; Wheeze

Ectopic Beats
See Extrasystolic Beats

Engorgement, Venous
See Jugular Venous Pressure

Extrasystolic Beats
Occasional heart beat irregularities
Idiopathic
Stress
Exercise
Anoxia
Myocardial infarct
Hypertension
Cardiomyopathy
Anaphylaxis
Rheumatic heart disease
Valve prostheses
Hypokalaemia
Hyperthyroidism,
Drugs (eg. tobacco, caffeine, alcohol, digoxin, sympathomimetics)
May be associated with all forms of heart disease

Flint-Austin Murmurs
See Austin-Flint Murmur

Fremitus
See Vocal Fremitus

Friction Rub, Pericardial
Exp: Cardiac auscultation reveals a localised or generalised grating sound associated with each contraction
Int: (+) Pericarditis, pleurisy, rheumatic fever, pneumonia, TB, myocardial infarct, uraemia, dissecting aortic aneurysm
Phys: Friction between the two pericardial layers in the presence of an exudate

Friction Rub, Pleural
Exp: Chest auscultation reveals a grating sound associated with each breath
Int: (+) Pleurisy, pulmonary thrombosis, lung cancer, empyema
Phys: Friction between the two inflamed layers of pleura

Galactorrhoea
See Nipple Discharge
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Gallop Rhythm
(Triple Rhythm)
Exp: Cardiac auscultation reveals a triple rhythm with a 3rd or 4th heart sound
Int: Protodiastolic 3rd sound – Distended heart, mitral incompetence or stenosis, left ventricular failure, alveolitis, constrictive pericarditis, physiological.
Presystolic 4th sound – Left ventricular failure, aortic stenosis, atrial hypertrophy, prolonged PR interval.
Phys: Various flow and valve movement abnormalities

Goitre
Thyroid gland enlargement
Simple endemic goitre (asymptomatic)
Thyrotoxicosis (weak, sweaty, weight loss)
Thyroid carcinoma (painless, normal function)
Thyroid cysts and nodules
Hypothyroidism (dry skin, myalgia, psychoses)
Iodine deficiency (diffuse, painless)
Hashimoto’s thyroiditis
De Quervain’s thyroiditis (painful)
Grave’s disease
Laryngeal tumours and sacs
Cervical lymphadenitis
Pregnancy
Drugs (eg. Interferon, lithium, amiodarone)
See also Thyroid Lump

Graham Steell Murmur
Exp: Soft, high pitched murmur heard in the 2nd left intercostal space on early diastole
Int: (+) Pulmonary hypertension or pulmonary artery dilatation in association with severe mitral stenosis or septal defects
Phys: Pulmonary vascular regurgitation

Gynaecomastia
Breast enlargement, male
Old age
Puberty (male and female)
Neonate
Thyrotoxicosis (sweaty, fatigue, weight loss)
Hepatic disease (eg. cirrhosis)
Renal failure
Adrenal tumours
Testicular tumours and disease
Male breast cancer

Drugs (eg. cimetidine, ketoconazole, oestrogens, spironolactone, alkylating cytotoxics, anabolics)

Haemoptysis
Coughing blood
Bronchitis (cough, fever)
Bronchiectasis (purulent sputum, cough, rales)
Pneumonia (dyspnoea, chest pain, cough)
Lung abscess (purulent sputum, fever, malaise)
Tuberculosis (cough, malaise, fever)
Bronchial carcinoma (wheeze, cough, malaise)
Pulmonary thromboembolism (pain, cough, dyspnoea)
Cystic fibrosis (failure to thrive, lung infections)
Laryngeal tumour (dyspnoea, hoarse, pain)
Pulmonary oedema (crepitations, dyspnoea)
Mitrail stenosis
Bleeding diatheses (easy bruising)
Coagulopathy
Chest trauma
Aspergiloma
Granulomatous vasculitis (multiple organs involved)
Ascariasis (cough, colic, fever)
Hookworm (pruritus, diarrhoea, fatigue)
Melioidosis (chest pain, cough, skin lesions)
Foreign body in respiratory tract

Syndromes
Behçet syndrome
Goodpasture syndrome (dyspnoea, haematuria, anaemia, cough)
Henoch-Schönlein syndrome (purpura, abdominal pain)
See also Cough

Halitosis
Bad breath
Smoking
Chronic nasal and sinus infections
Dental caries (pain, discolouration)
Gum infections and poor oral hygiene
Tonsillitis (pain, fever)
Systemic infections (fever)
Lung infections and abscesses (cough, fever)
Peritonitis (pain, rigid abdomen)
Appendicitis (RIF pain, anorexia, nausea)
Gastro-oesophageal reflux (retrosternal pain, waterbrash)
Pharyngeal diverticulum
Other gastrointestinal diseases
Renal failure (ammonia smell)
Diabetes (acetone smell)
Fetor hepaticus of advanced liver disease
Stomatitis
Xerostomia
Periodontal disease (sore gums)
Oral or laryngeal carcinoma
Ozaena (chronic rhinitis)
Tuberculosis (cough, malaise, haemoptysis)
Syphilis (diverse symptoms)
Lung carcinoma (cachexia, cough)
Ketoacidosis (nausea, fatigue)
Agranulocytosis (chills, fever, sore throat)
Bronchiectasis (purulent sputum, cough, haemoptysis)
Salivary gland dysfunction (eg. Sjögren syndrome)
Quinsy (severe throat pain, fever)
Vincent's angina (gums painful and bleeding)
Hiatus hernia (burping, heartburn)
Pyloric stenosis (gastric fullness, nausea)
Gastric carcinoma (epigastric pain, dyspepsia)
Gastrointestinal infections
Leukaemia (malaise, anorexia, fever, pallor)
Dehydration (poor skin turgor, dry mucous membranes)
Oesophageal diverticula (dysphagia, regurgitation)
Drugs (eg. lithium, griseofulvin, penicillamine)

Harrison's Sulcus
Exp: Diagonal groove on anterior and lateral side of chest along line of attachment of diaphragm
Int: (+) Asthma, rickets
Phys: Chest deformity from over exertion of diaphragmatic muscle

Hyperventilation
Rapid respiratory rate
Anxiety
Pain
Fever
Hysteria
Pulmonary embolism
Metabolic acidosis (diabetic ketoacidosis, renal disease)
Most infections
Cerebral haemorrhage
Pneumothorax
Anoxia
Congenital heart lesions
Drugs (eg. adrenaline)

Heartburn
(Pyrosis)
Reflux oesophagitis (worse recumbent, waterbrash, cough)
Hiatus hernia (waterbrash, burping)
Peptic ulcer (tender, nausea, epigastric pain)
Stomach carcinoma (nausea, fullness, burping)
Over eating (flatulence, fullness)
Pregnancy
Excess alcohol use
See also Chest Pain

Hypertrophy, Cardiac
See Apex Beat Displacement

Hering-Breuer Reflexes
Exp: The desire to inspire when the breath is held in expiration, and vice versa
Int: No clinical significance
Phys: Activated through receptors sensitive to stretch and deflation

Hiccups
(Heicough)
Repetitive spasm of diaphragm
Phrenic nerve irritation from any cause
Reflux oesophagitis and hiatus hernia
Cardiorespiratory disorders (eg. pneumonia, infarct)
Gastrointestinal disorders (eg. indigestion)
Emotional stress
Aerophagia
Encephalitis
Meningitis (neck stiff, headache, fever)
CNS infarct, tumour or abscess
Uraemia (fatigue, headache, thirst)
Diaphragnatic irritation (eg. subphrenic abscess)
Oesophageal obstruction (dysphagia)
Small bowel obstruction
Aortic aneurysm
Mediastinal mass
Foreign body in ear canal
Hyponatraemia
Hypocalcaemia
Addison's disease (skin pigmentation)
Sudden temperature change
Excess alcohol intake
Smoking
Psychogenic
Rett syndrome
See also Kussmaul's Breathing or Sign

Hypoventilation
Low respiratory rate
Asthma
Pneumonia
Pneumothorax
Bronchiectasis
Raised intracranial pressure (eg. tumour, abscess, haemorrhage)
Pleural effusion
Pulmonary collapse
Neuromuscular disease
Kyphoscoliosis
Drugs (eg. sedatives)

Irregularly Irregular Pulse
Pulse totally random in rate and volume
Atrial fibrillation
Multiple extrasystoles
Thyrotoxicosis
See also Atrial Fibrillation

Jacobsen-Holdsnedt Phenomenon
Exp: Expiratory and inspiratory chest X-rays taken. Positive if mediastinum displaced away from affected side on expiration
Int: (+) Unilateral obstructive emphysema
Phys: Valve-like mechanism allows air to enter lung but not escape. May be due to foreign body or tumour

Janeway Lesion
Exp: Small purplish/red nodule on palms or soles
Int: (+) Infective endocarditis
Phys: Infected embolic lesion
See also Osler's Nodes; Splinter Haemorrhages

Jugular Venous Pressure
[JVP]
Exp: With patient reclining at 30°, the distance that a distended jugular vein rises vertically above the horizontal level of the sternal angle is noted. Normally veins are collapsed above this level
Int: High – Congestive cardiac failure, constrictive pericarditis, tricuspid stenosis, pulmonary stenosis, cardiomyopathies, superior mediastinal tumour, enlarged thymus, obstructed superior vena cava, increased intrathoracic or intra-abdominal pressure
Low – Shock, dehydration, severe infections
Phys: Increased back pressure due to obstructed flow through the right side of the heart causes an increase in systemic venous pressure. Blood loss or vasodilatation causes it to drop

Kerley B Lines
Exp: A plain AP X-ray of the chest shows fine horizontal lines in the lower zones of the lungs, lateral to the down curve of the diaphragm
Int: (+) Interstitial pulmonary oedema
Phys: Perilymphatic oedema

Kussmaul's Breathing or Sign
Exp: An increased depth and frequency of respirations associated with increased respiratory effort. Often described as hissing respiration
Int: (+) Diabetic acidosis, uraemia, other causes of acidosis, neurogenic hyperpnoea, midbrain and upper pontine brain lesions

Lactation, Failure of
Sheehan syndrome (failure of lactation after postpartum haemorrhage)
Anxiety and stress
Malnutrition

Lung Consolidation
See Dull Percussion Note, Thoracic; Tracheal Displacement

Lymph Nodes
(Lymphadenitis)
See Adenitis and Lymphadenopathy

Machinery Murmur
Continuous murmur that waxes and wanes
Patent ductus arteriosus (maximal in aortic and pulmonary areas)
Arteriovenous fistula
A RATIONALE FOR THE CHEST

Aortic coarctation
Aortopulmonary septal defect

Mastalgia
See Breast Pain

Mediastinal Mass
Mass detected in mediastinum by X-ray or CT scan
Superior mediastinum
Bronchogenic cyst
Retrosternal goitre
Ectopic thyroid tissue
Oesophageal enterogenous cyst

Inferior mediastinum
Hiatus hernia
Abscess
Pericardial cyst

Posterior mediastinum
Neurogenic tumours
Neurofibroma
Neuroblastoma
Paravertebral abscess
Aortic aneurysm

Anterior mediastinum
Thymic tissue
Thymoma
Ectopic thyroid tissue
Germ cell tumour
Teratoma
Dermoid cyst
Aortic aneurysm

Varied position in mediastinum
Sarcoidosis
Tuberculosis [TB]
Lymphoma
Hodgkin's disease
Metastatic carcinoma

Oral contraceptives
Hormonal therapy and other drugs (eg. methyldopa, reserpine, phenothiazines, metoclopramide, digoxin, H2 receptor antagonists, spironolactone, tricyclic antidepressants)

Breast stimulation
Breast carcinoma (lump, pain, bloody discharge)
Intraductal papilloma (painless lump)
Mammary dysplasia (pain, cyclical, lumps)
Pituitary tumour (headache, neurological signs)
Prolactinoma
Masilitis (red tender breast)
Renal failure
Thyroid disease (eg. hypothyroidism, thyroid cancer)
Acromegaly (large hands, feet and jaw, amenorrhoea)
Adrenal tumours (Cushing syndrome)
Newborn infant ('witch's milk')

Nipple Discharge
(Galactorrhoea)
Pregnancy and lactation

Nipple Pigmentation
See Areolar Pigmentation

Oedema, Pulmonary
See Pulmonary Oedema

Orthopnoea
Shortness of breath while supine
Mitrail stenosis (fatigue)
Left ventricular failure (dyspnoea, cough, fatigue)
See also Dyspnoea

Pectoriloquy, Whispering
Exp: Auscultation of the chest while the patient whispers (often the phrase 'ninety-nine' is repeated). If intense broncophony is present, individual syllables can be identified
Int: (+) Lung consolidation or cavitation, TB, pneumonia
Phys: Solid lung tissue conducts sound better than normally aerated tissue

Pemberton's Sign
Exp: When patient raises both hands above head, dyspnoea, vertigo, facial flushing, dysphagia and syncope occur
Int: (+) Large intrathoracic goitre
A RATIONALE FOR THE CHEST

Phys: Superior mediastinal pressure on the trachea, oesophagus and surrounding veins and arteries

**Percussion**
See Dull Percussion Note, Thoracic; Tympany, Thoracic

**Pericardial Friction Rub**
See Friction Rub, Pericardial

**Pink Puffer**
Exp: Underweight patient who is very breathless on exertion, has markedly pink mucous membranes and an overinflated chest. Narrow heart on X-ray
Int: (+) Emphysematous chronic obstructive airways disease
Phys: Overinflation and underperfusion of lungs
See also Blue Bloater; Barrel Chest

**Pleural Effusion**
Exp: Restricted chest wall movement, reduced vocal fremitus, dullness on percussion, and decreased breath sounds may be noted. May be found by chest X-ray
Int: **Transudate** – Cardiac failure, hepatic cirrhosis, nephrotic syndrome, Meigs syndrome, constrictive pericarditis
**Exudate** – Primary or metastatic pleural malignancy, lymphoma, TB, pulmonary infarct, infection, subphrenic abscess, pancreatitis, SLE, rheumatoid disease, trauma, hypothyroidism, postmyocardial infarct, drugs (eg. methysergide)
Phys: Exudate and transudate distinguished biochemically after thoracocentesis
See also Vocal Fremitus; Dull Percussion Note, Thoracic

**Pleural Friction Rub**
See Friction Rub, Pleural

**Pneumothorax**
Presence of gas in pleural space
Spontaneous
Traumatic

Asthma
Bacterial pneumonia
Whooping cough
Cystic fibrosis
Emphysema
Chronic bronchitis
Congenital bullae
Positive pressure assisted ventilation
Tuberculosis [TB]
Oesophageal rupture
Pleural malignancy
Subphrenic abscess
Tuberculous sclerosis
Histiocytosis X
Sarcoidosis
Iatrogenic (eg. biopsy of lung, aspiration cannula)

**Pulmonary Nodule**
_Pulmonary nodule seen on chest X-ray_
Lung cancer
Metastatic carcinoma
Lymphoma
Mesothelioma
Tuberculosis [TB]
Abscess
Localised pneumonia
Benign tumour (eg. haemangioma, chondroma, carcinoid)
Bronchogenic cyst
Hydatid cyst
Wegener granulomatosis
Arteriovenous malformation
Pulmonary infarct
Rheumatoid nodule

**Pulmonary Oedema**
_Fluid in the lungs_
Left ventricular failure
Atrial fibrillation
Mitral stenosis
Hypertensive heart disease
Fluid overload
Severe asthma
Smoke inhalation
Lymphatic blockage
Diffuse pulmonary infections
Aspiration pneumonia
Shock
Adult respiratory distress syndrome
Various neurogenic causes
Organophosphate poisoning
Snake bite
Heroin toxicity
A RATIONALE FOR THE CHEST

Head injury
Altitude sickness

Rales
See Crepitations, Pulmonary; Rhonchi

Rhonchi
(Dry Rales)
Exp: Musical wheezing sounds caused by air flow through narrowed or congested bronchi, heard on chest auscultation. Deeper pitched sonorous rhonchi originate in large bronchi. Higher pitched sibilant rhonchi originate in smaller bronchi
Int: (+) Bronchitis, tracheobronchitis, asthma, pulmonary tumours, bronchial oedema or spasm
Phys: Air passing through the narrowed part of a tube becomes turbulent and produces a sound
See also Crepitations, Pulmonary

Rib Notching
Exp: A plain AP X-ray of the chest shows notching on the lower surface of the 4th to 8th ribs posteriorly. Usually bilateral
Int: Congenital coarctation of aorta

Rosary, Thoracic
Exp: Nodular swelling of costochondral junctions of the ribs bilateral to the sternum in a child
Int: (+) Rickets
Phys: Calcium deficient diet

Scoliosis
Lateral curvature of spinal column
Structural abnormality
Developmental abnormality
Disc prolapse
Coffin-Lowry syndrome (coarse face, prominent lips)
Marfan syndrome (arachnodactyly, kyphoscoliosis)
Roussy-Levy syndrome (ataxia, hypotonia)
See also Arthritis and Arthralgia; Back and Vertebral Pain

Shortness of Breath
See Dyspnoea

Shoulder Tip Pain
Blood, pus or air under diaphragm
Inflammation of subphrenic organs (eg. liver, spleen) Peptic ulceration (epigastric pain, tender, nausea)
Ruptured viscus (shock, abdominal pain)
Intraperitoneal bleeding from any cause
Diaphragmatic irritation from any cause
Local musculoskeletal trauma or disease
After abdominal operations in which air may have been introduced (eg. laparoscopy)
See also Kehr's Sign

Sounds, Heart
See Murmur, Cardiac

Split Heart Sounds
Exp: Double heart sound in which the two elements are very close together
Int: 1st sound split – Not pathological
2nd sound split – Normal in inspiration, left bundle branch block, atrial septal defect, aortic valve stenosis, patent ductus arteriosus, left ventricular failure due to hypertension or ischaemia
Phys: Asynchronous closure of mitral and tricuspid valves (1st sound) or pulmonary and aortic valves (2nd sound)

Steell Murmur
See Graham Steell Murmur

Still's Murmur
Exp: Musical or vibrating soft early to mid-systolic murmur in a child heard maximally over third left intercostal space, that becomes more noticeable with a fever
Int: (+) Innocent murmur of no clinical significance
Phys: Left ventricular outflow murmur
See also Systolic Murmur

Stridor
Harsh whistling with inspiration
Laryngotracheobronchitis (child, catarrh, fever)
Epiglottitis (acute, fever, dyspnoea)
Laryngitis (nocturnal, fever)
A RATIONALE FOR THE CHEST

Croup (cough, hoarse)
Infectious mononucleosis (adenitis, fever)
Diphtheria (dyspnoea, membrane, fever)
Foreign body in larynx or trachea
Laryngeal papillomata
Congenital cysts, tumours and membranes
Laryngomalacia (congenital, worse on exertion)
Retropharyngeal abscess (rare)
Subglottic haemangioma
See also Cough; Wheeze

Systolic Murmur
Murmur between 1st and 2nd heart sounds
Physiological
Exercise
Mitral valve incompetence
Atrial and ventricular septal defect
Patent ductus arteriosus
Severe anaemia
Aortic stenosis
Dilatation of base of aorta
High fever
Hyperthyroidism
Pulmonary stenosis
Aortic coarctation
Tricuspid incompetence
Carcinoid syndrome
Cardiomyopathies
See also Still’s Murmur

Tachycardia
Rapid heart rate
Exercise
Emotion
Pain
Shock
Infections
Sarcoidosis
Thyrotoxicosis and other hypermetabolic disease
Endocarditis
Hypotension
Cardiac failure
Atrial flutter and fibrillation
Paroxysmal tachycardia
Pacemaker and conductive anomalies
Nodal tachycardia
Sick sinus syndrome
Anaphylaxis
Pulmonary oedema
Phaeochromocytoma
Venous hypertension
Mitral valve disease
Coronary artery disease
Pulmonary thromboembolism
Polyarteritis nodosa
Other connective tissue diseases
Dumping syndrome
Irukandji syndrome
Serotonin syndrome
Drugs (eg. alcohol, adrenaline, atropine, amphetamines, cocaine)
See also Torsades de Pointes

Thoracic Pain
See Chest Pain

Threat, Cardiac
Exp: Vibration that emanates from the heart or great vessels felt by the palpating hand.
Analogous to murmur
Int: Systolic thrill -
Aortic stenosis, aortic aneurysm, pulmonary stenosis, infundibular stenosis, ventricular septal defect, mitral regurgitation, patent ductus arteriosus, other arteriovenous aneurysms
Diastolic thrill -
Mitral stenosis, patent ductus arteriosus, pulmonary incompetence
Phys: Rapid movement of blood through abnormally narrowed or dilated passage
See also Diastolic Murmur; Systolic Murmur

Torsades de Pointes
(Twisting of the Points)
Exp: Variant of ventricular tachycardia characterised by bursts of ventricular tachycardia complicating a junctional bradycardia. On an ECG, the bradycardia element shows a long QT interval, and the ventricular tachycardia shows a swinging axis (‘twisting of the points’) in a series of ectopic QRS complexes that vary in their form. Abnormal T waves may be present in bradycardia phase
Int: (+) Complete heart block, acute myocardial infarction, myocarditis, hypokalaemia, congenital, drugs (eg. phenothiazines, tricyclics, some antiarrhythmics)
Phys: Abnormality in ventricular repolarisation. Normally self-terminating condition, but may terminate in syncope or sudden death
**A RATIONALE FOR THE CHEST**

**Tracheal Displacement**

*Exp:* Deviation of the trachea from the midline to the suprasternal notch

*Int:* **Towards lesion** - Pulmonary fibrosis, TB, pulmonary collapse

**Away from lesion** - Pleural effusion, pneumothorax

*Phys:* Base of the trachea moved laterally by variations in the normal volume of the chest contents

*See also Dull Percussion Note, Thoracic*

**Triple Rhythm**

*See Gallop Rhythm*

**Tympany, Thoracic**

*Exp:* One index finger is laid flat on the chest and is struck firmly with the other index finger. Higher than normal pitch of percussion note is tympany

*Int:* (+) Pneumothorax, overinflation of lungs (e.g., asthma, emphysema), cavitation of lungs

*Phys:* Large air masses reflect sound more readily

*See also Dull Percussion Note, Thoracic*

**Vertebral Pain**

*See Back and Vertebral Pain*

**Vocal Fremitus**

*Exp:* Ulnar border of hand is used to detect variations in the vibrations transmitted from the larynx through the airways and lungs to the chest wall when a patient repeats a phrase (e.g., `ninety-nine`)

*Int:* (–) Feeble voice, blocked bronchus from foreign body, bronchial tumour, pleural effusion, pneumothorax, collapsed lung

(+ +) Pneumonia, consolidation around major bronchus, TB

*Phys:* Variations depend on the degree of interference of vibration conduction through lung tissue

*See also Pleural Effusion*

**Wheeze**

Bronchial or tracheal foreign body (cough)
Asthma (dyspnoea, cough, prolonged expiration)
Anaphylaxis
Acute left ventricular failure (cough, oedema)
Bronchitis (cough, fever, chest pain)
Bronchial carcinoma (cough, haemoptysis, malaise)
Bronchiectasis (foul sputum, chest pain)
Emphysema (dyspnoea, cough, barrel chest)
Hypoparathyroidism (tetany, stridor, polyuria)
Bronchiolitis (fever, tachypnoea, overinflation, child)
Echinococcosis (urticaria, jaundice)
Cystic fibrosis (recurrent lung infections)
Aspergillosis
Alpha1-antitrypsin deficiency (child)
Gastro-oesophageal reflux
Pneumonitis

**Syndromes**

Carcinoid syndrome (flush, abdominal cramps, diarrhoea)
Churg-Strauss syndrome (vasculitis)
France’s triad (aspirin sensitivity, rhinitis)
Loeffler syndrome (cough, fever, pulmonary eosinophilia)
Mendelson syndrome (pneumonitis, bronchospasm)

*See also Cough; Dyspnoea; Stridor*

**Whispering Pectoriloquy**

*See Pectoriloquy, Whispering*
Section Three

MEDICAL CONDITIONS WITH CHEST SYMPTOMS
A RATIONALE FOR THE CHEST

MEDICAL CONDITIONS

Common diseases that cause thoracic symptoms
(including heart, lungs, oesophagus, breasts, muscles, vertebrae)

ACHALASIA

Oesophageal achalasia is a loss of muscle contractions in the lower two thirds of the gullet (oesophagus), due to degeneration of the nerves supplying the muscles of the oesophagus that usually starts between 25 and 60 years of age.

Patients experience gradually worsening difficulty in swallowing that initially affects solids more than liquids, fullness and discomfort behind the breast bone (sternum), regurgitation of unswallowed food (particularly at night), weight loss and cough. Inhalation of regurgitated food can cause a cough, lung damage and infections, and there is an increased risk of cancer in the oesophagus.

A barium swallow x-ray is diagnostic, while endoscopy (passing a flexible tube down the oesophagus) can further evaluate the severity of the disease and allow pressure measurements to be made in the oesophagus.

Dilation of the narrowed section of the oesophagus using a balloon can be performed, and medications (eg. nifedipine - a calcium channel blocker) that relax the lower oesophagus may be prescribed. Surgery is performed in intractable cases.

ACQUIRED IMMUNE DEFICIENCY SYNDROME

See AIDS

ACTINOMYCOSIS

Actinomycosis (lumpy jaw) is an uncommon infection of the skin, particularly the face, caused by the bacteria *Actinomycoses* which normally lives in the mouth and assist with food digestion. If the bacteria enters into damaged tissue in other parts of the body they may cause an infection.

The symptoms include hard, inflamed lumps in the skin that develop into abscesses and discharge pus. Other areas that may be infected include tooth sockets after an extraction, and the gut. Other symptoms include a fever, and constant severe pain in any infected area.

Swabs are taken from the discharging pus in an attempt to identify the responsible bacteria, but the bacteria are often difficult to identify.

The infection is resistant to simple treatments, and a 6-week or longer course of penicillin and other antibiotics, initially by injection, is necessary. Abscesses are surgically drained and affected tissue may need to be excised (cut out). Cure is difficult, but usually possible, although permanent scarring may be left behind.

ACUTE CORONARY SYNDROME

See ANGINA; INTERMEDIATE CORONARY SYNDROME
ADHESIVE PERICARDITIS
Adhesions may form within the pericardium (the sac surrounding and supporting the heart) or between the layers of the pericardium, or between the pericardium and surrounding tissues. All these forms of adhesion have the potential to restrict the movement and contractions of the heart which can lead to heart failure. The adhesions usually form after an attack of pericarditis or an infection within the chest cavity.
See also CARDIAC TAMponade; PERICARDITIS

ADRENOGENITAL SYNDROME
See CONgenital ADRENAI HYPERPLASIA

AIDS
AIDS is an acronym for the acquired immune deficiency syndrome, which is an infection caused by a retrovirus known as the human immunodeficiency virus (HIV) which destroys the body’s defence mechanisms and allows severe infections and cancers to develop. In the very early days of research into the virus responsible for AIDS, it was described as human T-cell lymphocytotrophic virus 3 (HTLV3).

The story begins in central Africa, where it is now believed a form of AIDS has existed in apes for thousands of years. These animals come into close contact with humans in this area, and are butchered and eaten by the local population. At some stage in the early part of the 1900s, the virus spread from apes to humans. In apes, due to natural selection over many generations, the virus causes few or no symptoms, and is harmless.

The AIDS virus has been isolated from old stored tissue samples dated in the 1950's, found in Kinshasa hospital, Zaire. From Africa, AIDS spread to Haiti in the Caribbean. Haiti was ruled by a vicious dictator (Papa Doc Duvalier), and many Haitian Negroes fled to Africa to avoid persecution.

Once "Papa Doc" and his son "Baby Doc" were removed from power, these exiles returned, bringing AIDS with them. The virus mutated in humans and became more virulent, causing a faster and more severe onset of symptoms. Viruses mutate routinely (eg. different strains of influenza virus every year).

American homosexuals frequented Haiti because it was very poor, and sexual favours could be bought cheaply. A man known as “patient zero" by the US Centre for Disease Control has been identified as the person who introduced AIDS to the United States. He was an airline steward who infected more than 50 other men before dying of AIDS in 1984. It has spread around the world from the USA since then. The first cases were diagnosed in California in 1981, although cases occurred in Sweden in 1978 in the family of a sailor who had visited Haiti, but the disease was not identified as AIDS until years later. There may also have been some movement of the disease directly through Africa to Algeria and France.

Fortunately for most of us, it is a relatively hard disease to catch. AIDS is spread by the transfer of blood and semen from one person to another. It was initially only a disease of homosexuals and drug addicts, but although these remain the most affected groups in developed countries, it is promiscuous heterosexual contact that is the most common method of transmission in poorer countries. In the early days of the disease, some unfortunate recipients of blood transfusions and other blood derived medications were inadvertently given the AIDS virus. Tests are now available to allow blood banks to screen for AIDS.

AIDS can NOT be caught from any casual contact, or from spa baths, kissing, mosquitoes, tears, towels or clothing. Only by homosexual or heterosexual intercourse with a carrier of the
disease, by using contaminated needles, or blood from a carrier, can the disease be caught. If someone does come into sexual or blood contact with an AIDS carrier, it is possible for the virus to cross into their body. The body’s defence mechanisms may then fight off the virus and leave the person with no illness whatsoever, or the AIDS virus may spread throughout the body to cause an HIV infection.

Studies have shown that circumcised men (those whose foreskin has been removed) are six to eight times less likely to be infected with the HIV virus that causes AIDS because of biological reasons and not less risky behaviour. The protection is due to the removal of the foreskin, which contains cells that have HIV receptors which scientists suspect are the primary entry point for the virus into the penis.

In 2005 there were 42 million people in the world with an HIV infection, over 30 million of them in sub-Saharan Africa, 8 million in Asia (over 5 million of these in India) and 95% in developing countries. There are 7 million deaths worldwide every year from AIDS, and every day 20,000 people are infected with HIV. The incidence of HIV infection varies from 10 in every 100,000 people in China, to 115 in Australia, 2100 in Thailand, 20,000 in Uganda and over 50,000 in every 100,000 people in Botswana (the world’s highest rate). Almost 1% of the entire adult population of the world is infected by HIV. The rate of infection is increasing in under developed countries in Africa and Asia, but dropping in developed western countries.

Those who are infected with the human immunodeficiency virus are said to be HIV positive. Once the HIV virus enters the body it may lie dormant for months or years. During this time there may be no or minimal symptoms, but it may be possible to pass the infection on to another sex partner, and babies may become infected in the uterus of an infected mother.

The disease has been classified into several categories. A patient can progress to a more severe category but cannot revert to less severe one. The categories are:

- HIV category 1 - a glandular fever-like disease that lasts a few days to weeks with inflamed lymph nodes, fever, rash and tiredness.
- HIV category 2 - no symptoms.
- HIV category 3 - persistent generalised enlargement of lymph nodes.
- HIV category 4 (AIDS) - varied symptoms and signs depending on the areas of the body affected. May include fever, weight loss, diarrhoea, nerve and brain disorders, severe infections, lymph node cancer, sarcomas, and other cancers. Patients are very susceptible to any type of infection or cancer from the common cold to pneumonia, septicaemia and multiple rare cancers (eg. Kaposi sarcoma) because the body’s immune system is destroyed by the virus.

Blood tests are positive at all stages of HIV infection, but there may be a lag period of up to three months or more from when the disease is caught until it can be detected.

There is no cure or vaccine available for AIDS or HIV infection at present. Prevention is the only practical way to deal with AIDS. Condoms give good, but not total, protection from sexually catching the virus, and drug addicts may be educated not to share needles.

Once diagnosed as HIV positive patients should not give up hope, because they may remain in the second stage for many years. Prolonging this stage can be achieved by the regular long term use of potent antiviral and immunosupportive medications, stopping smoking, exercising regularly, eating a well-balanced diet, resting adequately and avoiding illegal drugs. The antiviral drugs used to treat AIDS include abacavir, delavirdine, didanosine, efavirenz, indinavir, lamivudine, nelfinavir, nevirapine, ritonavir, saquinavir, stavudine, tenofovir, zalcitabine and zidovudine.
Patients may remain at the category 2 level for many years, possibly even decades. Up to half of those who are HIV positive do not develop category 4 disease for more than ten years. On the other hand, no one with category 4 HIV (AIDS) has lived more than a few months, and sufferers develop severe infections and cancers that eventually kill them.

**ALPHA 1-ANTITRYPsin DEFICIENCY**
Alpha 1-antitrypsin (A1AT or AAT) is a protein produced in the liver. The amount present in the blood may be measured in the assessment of liver and lung diseases. The normal value range is 1.8 to 3.6 g/L.

Lower levels may occur with liver damage (hepatic necrosis), severe protein loss from body through faeces or urine, emphysema (serious lung damage) or a congenital inability to produce the protein (birth defect).

The amount of alpha1-antitrypsin can also be measured in faeces in the investigation of bowel inflammation. The normal amount present is less than 1.5 mg/g dry weight of faeces. Higher levels occur with a protein losing enteropathy (inflammatory bowel disease). Alpha1-Antitrypsin may leak into the bowel when it is inflamed but blood loss into intestine may give a false high reading.

**ALTITUDE SICKNESS**
Altitude or mountain sickness (called soroche in Peru and Bolivia) is caused by lack of oxygen from ascending rapidly to heights over 3000m. A slow ascent is less likely to cause problems than a rapid one. It is impossible to predict who will be affected, how rapidly or at what altitude. Ascending at a rate of no more than 300m a day at altitudes over 3000m is less likely to result in problems. An extra rest day with every 1000m above 2500m is also useful.

Symptoms starts with a headache, shortness of breath, and excessive tiredness, followed by inability to sleep, nausea, vomiting, diarrhoea, abdominal pains and a fever. Fluid fills the lungs, patients start coughing up blood, the heart races, and they may eventually drown as blood fills the lungs. Permanent lung and other organ damage may result from a severe attack.

A rapid descent to a lower altitude is the only effective treatment for severe cases, although mild cases may recover with rest at high altitude. Fluid removing drugs (diuretics) may be used in an emergency to remove fluid from the lungs, and acetazolamide (125 mg. twice a day from the day before ascent for three days after ascent) or dexamethasone (4 mg. twice a day from the day before ascent for three days after ascent, then 2 mg a day for two days) may be given during the climb for prevention. Oxygen in cylinders is used by very high altitude climbers.

The condition may be life-threatening unless a lower altitude can be reached.

**ALVEOLITIS**
See **IDIOPATHIC PULMONARY FIBROSIS**

**ANAEMIA**
Anaemia is a term indicating a low level of haemoglobin in the blood. Haemoglobin is a complex compound that is found in red blood cells, gives these cells their colour, and is used to transport oxygen in the blood from the lungs to the organs. A major component of the haemoglobin molecule is iron.
There are many different types of anaemia that vary widely in their cause and severity. Symptoms include tiredness and weakness due to insufficient oxygen reaching the organs, pins and needles in the arms and legs, palpitations, abnormally curved fingernails, dizziness and shortness of breath. Skin and eye colour are poor guides to the severity of anaemia.

The level of haemoglobin in a blood sample can be measured by a pathology laboratory. Further blood tests (eg. iron levels, vitamin B12, mean corpuscular haemoglobin) determine the type of anaemia present.

Treatment depends on the type of anaemia and its cause, but a blood transfusion may be necessary in severe cases.

ANGINA

Angina pectoris (acute coronary syndrome) is pain caused by an inadequate blood supply (ischaemia) to part of the heart muscle due to a narrowing of one or more of the three small arteries that supply blood to the heart muscle. This narrowing may be due to hardening of the arteries, or a spasm of the artery caused by another disease, smoking, excitement, heavy meals or stress. Angina may lead to a heart attack, or a heart attack may cause angina, but they are two different problems. In a heart attack, part of the heart muscle dies.

The classical symptoms are a pressure-like, squeezing pain or tightness in the chest, usually central, that starts suddenly, often during exercise, and settles with rest, but may occur at almost any time and may extend into the left arm, neck, upper abdomen and back. It is uncommon during sleep. About 5% of all patients with angina will have a heart attack each year, and half of these will die from that heart attack. Heart failure can gradually affect those remaining, reducing their mobility and eventually leading to premature death. High blood pressure, diabetes and an irregular heart beat are unfavourable findings and will also lead to an early death.

Diagnosis may be difficult, as the pain has usually subsided when the patient sees a doctor, and all blood tests and electrocardiographs (ECG) may be normal. Sometimes a stress ECG must be performed under strict medical supervision to recreate the pain and observe the abnormal ECG pattern. Coronary angiography is a type of X-ray that can detect narrowed arteries around the heart. A more sophisticated test involves injecting radioisotopes into the bloodstream, and measuring their uptake by the heart muscle.

Prevention involves tablets (antianginals) or skin patches (eg. nitrates, beta-blockers or calcium channel blockers) that are used regularly to keep the arteries as widely dilated as possible. Smokers must stop smoking.

Treatment of an acute attack involves immediately resting, and spraying glyceryl trinitrate under the tongue, or placing a tablet containing nitroglycerine, nifedipine or a similar drug under the tongue to dilate the heart arteries and relieve the attack.

If a narrowed artery can be found it can be bypassed by a coronary artery bypass graft (CABG) operation. Balloon angioplasty is a technique that involves passing a tiny deflated balloon through the arteries in the leg or arm, into the heart, and then into the small narrowed arteries around the heart, then inflating it to enlarge the narrowed artery. Sometimes a stent (tube shaped metal grid) is left behind to ensure that the artery does not close down again.

Most people with angina can have their symptoms prevented and relieved by medication, and many patients with narrowed arteries can be successfully treated by surgery.

See also INTERMEDIATE CORONARY SYNDROME; MYOCARDIAL INFARCT; PRINZMETAL ANGINA
ANKYLOSING SPONDYLITIS

ankylosing spondylitis (AS or Marie-Strümpell disease) is a long-term inflammation of the small joints between the vertebrae in the back. More common in men, and usually starts in the late twenties or early thirties, but progresses very slowly. The cause is unknown.

Symptoms start gradually with a constant backache that may radiate down the legs. Stiffness of the back becomes steadily worse, and eventually the patient may be bent almost double by a solidly fused backbone in old age (kyphosis). AS may be associated with a number of apparently unrelated conditions, including arthritis of other joints, heart valve disease, weakening of the aorta and inflammation of the eyes (uveitis). It is diagnosed by x-rays of the back and specific blood tests.

Anti-inflammatory drugs such as indomethacin, naproxen, aspirin and (in resistant cases) phenylbutazone are prescribed. Etanercept and infliximab (a specific monoclonal antibody) are newer treatments for severe and rapidly progressive cases. Regular physiotherapy can help relieve the pain and stiffness even in advanced cases.

AS may settle spontaneously for a few months or years, before progressing further. No cure is available, but treatment can give most patients a full life of normal length.

ANTHRAX

Anthrax is a bacterial skin, lung or intestinal infection that usually occurs in farmers, meat workers, veterinarians and others who come into close contact with animals. Infection of humans is uncommon.

The bacterium Bacillus anthracis which is found in cattle, horses, sheep, goats and pigs, is responsible. It may be caught by bacteria entering the body through scratches and grazes, or rarely by swallowing or inhalation into the lungs. Anthrax spores may remain inactive in the soil for decades, but it cannot be transmitted from one person to another. The natural incidence in western countries is about one in 100 million people every year.

There are three different types of anthrax infection in humans :-

- Cutaneous anthrax - A sore appears at the site of entry (which may be in the mouth), then nearby lymph nodes become inflamed, a fever develops, followed by nausea, vomiting, headaches and collapse.
- Inhalation anthrax (woolsorter’s disease) - After an incubation period of one to five days the patient develops flu like symptoms with muscle aches and fever. This is followed two to five days later by difficulty in breathing, sweating, fever, rapid pulse and blue tinged skin. The patient collapses quickly with a severe form of pneumonia results. It may also spread into the bloodstream.
- Gastrointestinal anthrax - Incubation period of one or two days, then nausea, vomiting, fever, loss of appetite, belly pain and bloody diarrhoea develop.

The diagnosis is confirmed by microscopic examination of smears from the skin sores, or from sputum samples. Specific blood tests may also be positive.

Treatment involves antibiotics such as ciprofloxacin or doxycycline by mouth or injection. A vaccine is available, but is only used by those who are at high risk because of their involvement with infected animals, and numerous boosters are required.

Treatment clears the skin and gastrointestinal forms of the disease effectively in most cases, but anthrax pneumonia is very serious, and a significant proportion of these patients die.

See also PNEUMONIA
A RATIONALE FOR THE CHEST

AORTIC ANEURYSM
The aorta is the main large artery that takes blood from the heart to the abdomen and legs, and is between 2 and 3 cm. in diameter. If the thick wall of the aorta develops a weak spot, sometimes due to deposits of hard cholesterol in its wall, the artery may start to balloon out at one point to form a firm, pulsing lump known as an aneurysm. This aneurysm is at imminent danger of bursting, and if this occurs there is severe pain, and even in the best hospitals, half the patients die. Surgical correction of an aortic aneurysm at the earliest opportunity is therefore vital.

AORTIC REGURGITATION
See AORTIC VALVE INCOMPETENCE

AORTIC STENOSIS
See AORTIC VALVE STENOSIS; COARCTATION OF THE AORTA

AORTIC VALVE INCOMPETENCE
Aortic valve incompetence (aortic regurgitation) is a leak of the aortic valve in the heart that sits between the left ventricle and the aorta, and normally stops blood that has been pumped out to the body from running back into the heart. The valve damage may be caused by rheumatic fever, endocarditis, high blood pressure, syphilis or a birth defect.

If only a slight leak is present, there will be no symptoms, but if the leak worsens, the patient will become short of breath, develop chest pain, and become very tired. There may be significant leakage before symptoms occur, and then the patient may deteriorate rapidly with heart failure. The defect is diagnosed by echocardiography (ultrasound) or passing a catheter through an artery and into the heart.

Medications to reduce blood pressure may give relief, but if possible, surgical correction should be undertaken once symptoms are present. The prognosis depends on the severity, but is good if regurgitation is mild or surgical replacement of the valve is possible.

See also RHEUMATIC FEVER

AORTIC VALVE STENOSIS
Aortic valve stenosis is the narrowing of the aortic valve in the heart which sits between the left ventricle and the aorta, and normally stops blood that has been pumped out to the body from running back into the heart. An aortic valve stenosis prevents the blood from being easily pumped from the heart into the aorta and therefore to the rest of the body.

The problem may be congenital (present at birth), or may develop because of rheumatic fever or hardening of the valve from high blood pressure and/or high cholesterol levels.

Symptoms are often absent in mild cases, but when more serious, chest pain (that may progress to angina), fainting with exercise and an irregular heartbeat occur. Heart failure or a heart attack due to the excessive load placed on the heart muscle may occur in advanced cases.

The stenosis is diagnosed by hearing a typical murmur produced by the blood rushing through the narrowed valve, echocardiography (ultrasound) or passing a catheter through an artery and into the heart.
Once symptoms occur, surgery to correct the narrowing should be performed. There are good results if surgery is possible, but half those with symptoms will die within three years without surgery.

See also COARCTATION OF THE AORTA; RHEUMATIC FEVER

**ARTERIOVENOUS FISTULA**

An arteriovenous fistula is an abnormal connection (fistula) between an artery and a vein. It may be congenital (developmental abnormality), or due to an injury or cancer. Sometimes a fistula is surgically created in the forearm for insertion of a shunt used for kidney dialysis.

The symptoms depend upon the site and severity. An abnormal pulsating lump may be seen or felt, or the fistula may reduce the blood supply to vital organs, and affect their function. Sometimes a blood clot can form in the turbulent blood flow in a fistula, and travel through the veins to the heart and lungs to cause a pulmonary embolus.

It is diagnosed by arteriography (x-ray of blood vessels) in which a dye is injected into an artery and its movement through the fistula into the vein recorded.

Surgical closure or destruction of the fistula is the only treatment, and results are usually very good.

See also PULMONARY EMBOLUS

**ASBESTOSIS**

Asbestosis is a lung disease caused by the inhalation of fine asbestos particles over a prolonged period of time. Asbestos particles are long, thin filaments, that easily become trapped in the small air tubes (bronchioles) of the lung. The lower part of the lungs is most commonly affected, and it occurs almost exclusively in asbestos factory workers, processors and miners who inhale free-floating particles of asbestos in their workplace. Swallowing small amounts of asbestos or touching asbestos in any form is harmless, but smoking will aggravate the condition.

Sufferers develop shortness of breath, cough, and in advanced cases, blue lips and swollen finger tips. As the disease progresses the patient may have no exercise tolerance and suffer symptoms similar to severe asthma or emphysema. It is easily diagnosed on chest x-ray.

No treatment is available other than removing the person from exposure to further asbestos dust and performing regular chest x-rays to detect mesothelioma as early as possible. Mesothelioma is a rapidly progressive form of lung cancer that occurs almost exclusively in asbestosis victims. 7% of those with asbestosis develop mesothelioma. Others suffer from varying degrees of lung impairment.

See also EMPHYSEMA; LUNG CANCER; MESOTHELIOMA; SILICOSIS; TALCOSIS

**ASCARIASIS**

The roundworm *Ascaris lumbricoides* is one of a group of roundworms (known as nematodes) that may infest the human gut. Infestations are common in Indonesia, Southeast Asia and other less developed countries.

Adult roundworms are between 20 and 40 cm long, and live in the small intestine. After fertilisation, the females release a large number of microscopic eggs that pass out in the faeces and can survive for many years in the soil. In areas where human faeces is used as a fertiliser, it is easy for them to be swallowed again on food; or if sewerage contaminates the water supply, they may be swallowed in a drink. Once swallowed, the eggs hatch into larvae.
that burrow through the gut wall into the bloodstream and move through the heart into the lungs. There they penetrate into the small air tubes (bronchioles) of the lung, wiggle their way up through larger airways to the back of the throat from where they are swallowed again to enter the small intestine and grow into mature adults that may live for up to a year.

At all stages the larvae and worms can cause symptoms including a cough, shortness of breath, fever, wheezing, chest pain, abdominal pains and discomfort, nausea and gut obstruction. If severe infestations are left uncontrolled, the worms may move into the gall bladder and pancreas, rupture the bowel, and cause other severe complications that may result in death. The diagnosis is confirmed by finding eggs in the faeces.

A number of drugs (eg. dithylcarbemazine) are available to treat the disease, but they often have side effects. If patients are given the correct treatment at a relatively early stage of the disease, full recovery is normal.

**ASPERGILLOSIS**

*Aspergillus* is a widespread fungus that is essential for recycling carbon and nitrogen in the environment. Without its action to break down dead vegetable matter the world would soon be covered in many metres of rotting plant material.

On the other hand, *Aspergillus* can also uncommonly invade humans to cause an aspergillosis, an infection of a wide range of tissues in the body including the ears, lungs, sinuses and skin (particularly burns) that is normally a minor irritation, but in patients who have poor immunity (eg: AIDS or taking chemotherapy for cancer), it may become critically serious if internal organs such as the lungs are infected. There are several different species of *Aspergillus*, but the one that causes 90% of human infections is *Aspergillus fumigatus*. Once a human has been infected, the fungus passes easily from one person to another.

The diagnosis is confirmed by examining sputum or other secretions that are infected, and by a specific antibody test on the blood.

Aspergillosis is often a very minor problem, and may cause no symptoms, but an allergy to the fungus may occur which causes asthma like symptoms with a wheeze and cough (farmer’s lung), or hay fever.

Treatment depends on the severity. If internal organs are involved, high doses of potent antifungal drugs such as amphotericin B and voriconazole are used. Normally infection is not a problem, but half of the immunocompromised patients with lung aspergillosis will die, even in the best centres.

**ASTHMA**

Asthma (known as wheezy bronchitis decades ago) is a temporary narrowing of, and excess production of phlegm in, the small airways (bronchioles) through which air flows into and out of the lungs. The narrowing is caused by a spasm in the tiny muscles that surround the bronchioles. One in ten people in western countries suffers from some degree of asthma, but it is uncommon in developing countries.

The absolute cause is unknown, but certain triggers (eg. colds and other viral infections, temperature changes, allergies, exercise, smoke, dust and other irritants) may start an attack in susceptible individuals. Because it is more common in countries with good hygiene, there is a theory that exposure to bacteria, viruses and dirt in various forms at an early age gives some protection against asthma. The tendency to develop asthma runs in families along with hay fever and some forms of eczema to give a 15 times greater chance of developing the condition.
A RATIONALE FOR THE CHEST

Asthmatics have more trouble breathing out than breathing in. Attacks may build up slowly over many weeks and the individual may be barely aware of the deterioration in lung function, or a severe attack may start within a minute or two of exposure to a trigger. The narrowing of the airways causes shortness of breath and wheezing, coughing, particularly in children, and tightness and discomfort in the chest. Patients rarely can die rapidly from a sudden, severe asthma attack or status asthmaticus (prolonged severe asthma).

Asthma is diagnosed by respiratory function tests, which involve blowing into a number of different machines which either draw a graph or give an electronic reading. The patient's response to medication is also checked on these machines. Once diagnosed it is important to identify any trigger substances if possible by trial and error, or with blood and skin tests.

The first-aid of asthma in an emergency situation can be difficult. Most asthmatics carry medication with them and have been instructed how to manage an attack, and this medication must be used if available. Ask other people who may be nearby if they have asthma medication, as many asthmatics carry medication with them. If no medication is available sit the victim upright in a chair or leaning over a table or pillow. Reassure them and make sure they have plenty of fresh air. Unless the attack is very short-lived it is essential to get expert medical assistance.

The management of asthma is divided into two areas - prevention and treatment:
- Prevention - all but the mildest asthmatics should be using steroid or anti-allergy inhalations or tablets (eg. montelukast, zafirlukast) to prevent attacks. Severe asthmatics may need to use prednisone tablets to both prevent and treat their attacks. Those who react to specific substances may benefit from allergen desensitisation.
- Treatment - the best method is by aerosol inhalations that take the medication directly into the lungs where they act to dilate the airways and liquefy the thick mucus. Many of these can have their effectiveness and ease of use improved, particularly in children, if a spacing device or machine nebuliser is used. Mixtures and tablets are also available, but they work more slowly and have greater side effects. Very severe attacks may require oxygen by mask and injections of adrenaline, theophylline or steroids.

Asthma cannot be cured, but doctors can control the disease very effectively in the vast majority of patients.

See also HYPER-REACTIVE AIRWAYS DISEASE; LÖFFLER SYNDROME; STATUS ASTHMATICUS

ATELECTASIS

Atelectasis is the collapse of one part of the lung so that the affected part contains no air. The patient is breathless and may have a cough and fever may develop as the collapsed lung becomes infected. Listening to the chest with a stethoscope reveals an area with no breath sounds. A chest x-ray can demonstrate the exact location of the collapsed part.

Atelectasis may be caused by a pneumothorax, obstruction to the airway supplying the affected area of lung by pus (eg. pneumonia) or a foreign body, or a tumour inside or outside the lung that puts pressure on an airway.

If the affected part is not too large, the unaffected lung will eventually expand and replace most of the collapsed part of the lung.

See also PNEUMONIA; PNEUMOTHORAX
A RATIONALE FOR THE CHEST

ATRIAL FIBRILLATION
The heart has two small chambers (atria) which receive blood from the lungs and body through large veins, and two large chambers (ventricles) which pump blood out through arteries to the lungs and body. Atrial fibrillation occurs if the atria beat in a rapid uncoordinated manner, and as a result the ventricles (main pumping chambers of the heart) will receive only an intermittent blood supply from the atria, and will beat in a very irregular rhythm. If the atria beat rapidly, but not fast enough to cause irregular contractions by the ventricles, the condition is atrial flutter.

It may occur in normal people at times of stress, but more commonly as a reaction to heart damage such as a heart attack or infection. Other causes include an overactive thyroid gland, heart valve damage, severe high blood pressure, lung damage that restricts blood flow (e.g. emphysema), or because of imbalances in body chemistry.

Patients have a very irregular pulse, tiredness due to low blood pressure, palpitations and sometimes chest pains, shortness of breath and fainting. An embolism (blood clot) that may cause a stroke or death if it travels through arteries to the brain may occur due to the formation of a clot in the heart with the irregular pressure patterns caused by the fibrillation. There is also an increased risk of heart failure and heart attack.

It is diagnosed with an electrocardiograph (ECG), but doctors can usually make the diagnosis by analysing the irregular heart beat rhythm.

Numerous medications or electric shock treatments to the heart (electrocardioversion) are available to control the heart rhythm. If the atrial fibrillation remains uncontrolled, an anticoagulant (e.g. warfarin) should be used to prevent an embolism.

Most cases can be controlled by medication, but if persistent there is a small mortality rate due to complications.

See also ATRIAL FLUTTER

ATRIAL FLUTTER
Atrial flutter is a rapid (over 250 per minute), but regular, contraction of the atria (upper chambers of the heart). The larger ventricles (lower chambers of the heart) are unable to contract at such a rapid rate, and so contract irregularly when they are able to do so. Atrial flutter differs from atrial fibrillation in that in flutter more blood is moved from the atria to the ventricles, and in fibrillation the atrial contraction rate exceeds 350 beats a minute.

See also ATRIAL FIBRILLATION

ATRIAL SEPTAL DEFECT
An atrial septal defect (ASD) is a congenital hole in the membrane (septum) between the two atria (smaller upper chambers) in the heart that creates an abnormal blood flow within the heart.

The symptoms are very variable depending on the size of the hole. Often there are no symptoms in an infant, but as the child grows symptoms may include blue tinged skin (cyanosis) from poor circulation of blood through lungs, thickened finger tips (clubbing) because of poor oxygen supply, slow growth rate, increased incidence of lung infections, tiredness and weakness. Complications include atrial fibrillation, cor pulmonale (high blood pressure in lungs), heart failure and the defect maybe associated with mitral valve stenosis.

A characteristic murmur can be heard through a stethoscope. An electrocardiogram (ECG), echocardiogram (ultrasound of heart), and cardiac catheterisation (passing a pressure measuring tube through an artery or vein into the heart) all demonstrate heart abnormalities.
Very small holes may close spontaneously, but open-heart surgery to close defect must be performed if symptoms occur. This operation is very successful.
See also COR PULMONALE; VENTRICULAR SEPTAL DEFECT

**ATRIAL TACHYCARDIA**
See PAROXYSMAL ATRIAL TACHYCARDIA

**ATYPICAL PNEUMONIA**
Patients with a form of pneumonia that has symptoms that are milder and not typical of normal pneumonia may be described as having atypical pneumonia. The most common cause is a *Mycoplasma* bacteria.
See also *MYCOPLASMA INFECTION; PNEUMONIA*

**AUTOIMMUNE DISEASES**
Autoimmune diseases are a large group of diverse conditions that cause the body to inappropriately reject some specific types of its own tissue in the same way that transplanted organs or tissue may be rejected. The reaction is due to disorders of the immune system. For example, in rheumatoid arthritis, the synovial membrane lining a joint is rejected.

Antigens in the body’s own tissue inappropriately stimulate the production of antibodies (autoantibodies) against the tissue. Almost any tissue type in the body may become involved in an autoimmune reaction, and the symptoms (and disease diagnosis) depend upon which tissues are involved.

The absolute cause of autoimmune diseases is unknown, but they often follow physical or emotional stress, or viral infections.

Examples of autoimmune diseases (and the affected tissue) include Devic disease (optic nerve and spine), halo naevus (skin moles), Hashimoto thyroiditis and some forms of hyperthyroidism (thyroid gland), idiopathic pulmonary fibrosis (lungs), the Koebner phenomenon, pemphigoid, pemphigus, pyoderma gangrenosum, scleroderma and psoriasis (different layers within the skin), relapsing polychondritis and rheumatoid arthritis (joints), scleritis (the eye), temporal arteritis (arteries), thrombocytopenia (blood cells), transverse myelitis (spinal cord), polymyalgia rheumatica and myasthenia gravis (muscles), the nephrotic syndrome (kidneys), polyglandular autoimmune syndromes (glands throughout the body), Schmidt syndrome (adrenal and thyroid glands), collagenous colitis (large bowel) and the more generalised rejection of connective tissue that occurs with mixed connective tissue diseases, Sjögren syndrome, systemic lupus erythematosus and Churg-Strauss syndrome.

**BARRETT SYNDROME**
Also known as Barrett oesophagitis, this condition causes narrowing at the lower end of the oesophagus (gullet) from long term reflux of acid from the stomach up into the oesophagus. It occurs in 10-15% of people with acid reflux.
The syndrome is named after the English surgeon Norman Barrett, who noted this abnormality in the early 1950s.
Reflux oesophagitis causes inflammation and ulceration of the lower part of the oesophagus, and if left untreated for years, repeated irritation causes scarring and narrowing. The patient suffers from difficult and painful swallowing as well as the symptoms of reflux oesophagitis. The diagnosis is confirmed by a barium meal x-ray or preferably by gastroscopy and biopsy of the affected tissue.
Medication can be used to control the acid reflux, or the stricture can be dilated by passing gradually larger dilators down the throat while the patient is anaesthetised. Occasionally more radical surgery is required. The syndrome predisposes to cancer of the oesophagus.
See also HIATUS HERNIA; OESOPHAGEAL CANCER; REFLUX OESOPHAGITIS

BOERHAAVE SYNDROME
Boerhaave syndrome is the spontaneous rupture of the oesophagus (gullet), often following gluttonous overeating. Patients have sudden severe chest pain and then collapse, and sometimes die. Gastroscopy reveals the rupture. Surgical repair of oesophagus is essential, but there may be a permanent stricture (narrowing) at the site of repair.
The condition is named after the Dutch physician Herman Boerhaave (1668-1738).

BORNHOLM DISEASE
Also known as pleurodynia, Bornholm disease is a Coxsackie virus infection that attacks the pleura at the point where the diaphragm attaches to the ribs at the back of the chest. The pleura is the smooth membrane that surrounds the lungs within the chest. The disease is named after a Danish island.
Patients experience sudden, severe, lower chest pain that is aggravated by chest movements such as a deep breath or cough. Other symptoms include a fever, headache, nausea, and sore throat. There is marked tenderness of the lower ribs.
Unfortunately no cure is available. The patient is given rest and aspirin until the disease settles, usually after two or three weeks.

BRANCHIAL CYST
A branchial cyst (branchial cleft cyst) is a cyst that forms from the branchial clefts on the side of the pharynx in the neck and is a developmental abnormality. The branchial clefts serve no purpose in humans and other mammals, but in fish they develop into gills. They are briefly present in the human embryo.
Affected children have a smooth, painless, mobile, round lump, high up on the side of the neck. The cyst may become infected and painful. Ultrasound and CT scans can define the extent of the cyst, which may be surgically removed to cure the problem.

BREAST CANCER
Mammary carcinoma is the technical name for this all too common cancer that affects one in every eleven women at some time in their life.
The absolute cause is unknown but it is more common in women who have a close relative (mother, sister, daughter) with the disease, in women who have not had a pregnancy, have not breast fed, have had a first pregnancy after 35 years, in white women, those who have had uterine cancer, and in higher socio-economic groups. On the other hand, women who start their periods late and those who have an early menopause have a lower incidence of
breast cancer. About 2% of all breast cancers occur in men as they have a tiny amount of breast tissue present just under the nipple.

The symptoms are a hard, fixed, tender lump in the breast. The nipple skin itself can become cancerous (Paget’s disease of the nipple) causing a thick, firm, rubbery feeling to the nipple. There are many other causes of lumps in the breast and less than one in ten breast lumps examined by a doctor is cancerous.

One method of detecting breast cancer is monthly self-examination. The diagnosis is confirmed by an x-ray mammogram, ultrasound scan of the breast and needle biopsy.

The most common form of treatment is a lumpectomy in which only the cancer itself is removed, but if it is too large for this procedure a simple mastectomy, in which only the breast is removed, may be performed, leaving a cosmetically acceptable scar and scope for later plastic reconstruction of the breast. Often the lymph nodes under the arm will be removed at the same time. A course of radiotherapy and/or chemotherapy (drugs) may also be given. Tamoxifen, letrozole, cyclophosphamide, 5-fluorouracil, anastrozole, trastuzumab and toremifene are some of the antineoplastic drugs that may be considered. Preventive chemotherapy with medications such as tamoxifen or transtuzumab may be continued for years.

A radical mastectomy in which the breast, underlying muscle and all the lymph nodes in the armpit and other nearby areas are all removed is done rarely, and only for very advanced cancer.

More than 3/4 of all patients with breast cancer can now be cured. In early cases the cure rate rises to over 90%. In advanced cases the cancer may spread to nearby lymph nodes, the lungs and bones.

See also FIBROADENOMA OF THE BREAST; PAGET’S DISEASE OF THE NIPPLE

**BRONCHIECTASIS**

Bronchiectasis is a disease is due to scarring and permanent over dilation of damaged air carrying tubes (bronchi) within the lungs. The bronchi may be damaged from birth by cystic fibrosis or childhood immune deficiencies, or may develop in adult life due to recurrent attacks of bronchitis, pneumonia or the inhalation of toxic gases, but smoking is by far the most common cause.

A constant cough that brings up large amounts of foul phlegm is the main symptom. Patients may cough up blood, become anaemic and lose weight. An X-ray of the chest reveals characteristic changes and can confirm the diagnosis.

Treatment involves regular physiotherapy to clear the chest of sputum, and antibiotics when necessary to control infection. Other medications to open up the clogged airways (bronchodilators), liquefy sputum (mucolytics) and assist the coughing (expectorants) may be necessary. It is essential for smokers to stop. In severe cases where a limited part of the lung is badly affected, that section may be surgically removed.

The disease is usually very slowly progressive, but aggressive treatment slows this process.

See also BRONCHITIS, CHRONIC; EMPHYSEMA; IMMOVILE CILIA SYNDROME; PNEUMONIA

**BRONCHIOLITIS**

The respiratory syncitial virus (RSV) is responsible for bronchiolitis, a lung infection of children under two years of age. The infant develops a cough and wheeze, shortness of
breath and a runny nose. In severe cases, the child may be very weak, blue around the mouth and dehydrated.

Antibiotics cannot cure this viral condition but are sometimes given to prevent pneumonia. Bronchodilator medications may be used but often are of little help. Placing the child in a warm room with a humidifier, or in a steam tent may give relief. More severe cases will require hospitalisation, where steroids are given and oxygen may be administered into a steam tent to assist with breathing. Tribavirin is an antiviral medication that was introduced 1999 to treat severe bronchiolitis.

The vast majority of cases settle without complications in a few days to a week.
See also BRONCHITIS, ACUTE

**BRONCHITIS, ACUTE**

Bronchitis is a very common infection of the major tubes (bronchi) that carry air within the lungs, but it occurs in two very different forms, acute and chronic.

The acute form is commonly caused by viruses, occasionally by bacteria, and rarely by fungi. It spreads easily from one person to another on the breath. The symptoms include a fever, chest aches and pains, headache, tiredness, and a productive cough with dark yellow or green mucus. The diagnosis is confirmed by listening to the chest through a stethoscope. In early stages, X-rays may be normal, but later show characteristic changes. Sputum may be cultured to identify any bacteria present, and the correct antibiotic to treat it.

Viral infections settle with time, rest, inhalations, bronchodilators (open up the bronchi) and physiotherapy. If a bacteria is responsible, antibiotics can be prescribed. Bacterial infections settle rapidly with antibiotics, but viral bronchitis takes about ten days to fade in most patients, but may persist for several weeks in the elderly or debilitated.
See also BRONCHITIS, CHRONIC; PNEUMONIA; TRACHEOBRONCHITIS

**BRONCHITIS, CHRONIC**

This form of bronchitis is a long-term inflammation of the larger airways (bronchi) in the lungs. The cause may be repeated attacks of acute bronchitis, long-standing allergies, or constant irritation of the bronchi by noxious gases, particularly those found in tobacco smoke (most common cause).

Patients have a persistent moist cough, shortness of breath (particularly with exertion), constant tiredness, blue lips and swollen (“clubbed”) finger tips. The thickened and scarred bronchi, and poor air entry to the lungs, show up quite markedly on a chest X-ray.

Physiotherapy, bronchodilators (medications to improve air flow), anticholinergic inhalers (eg. tiotropium) and antibiotics to for any infection are the main treatments. It is a semi-permanent condition for which there is no effective cure, but treatment can keep the condition under control for many years. Sometimes it may progress to emphysema.
See also BRONCHITIS, ACUTE; EMPHYSEMA; PNEUMONIA

**BUBONIC PLAGUE**

Also known as the “black death” when it devastated Europe in the fourteenth century, bubonic plague is a severe generalised bacterial infection that is very rare in developed nations, but still present in many poorer Asian and African countries.

The cause is the bacterium *Yersinia pestis* (named after the French bacteriologist Alexandre-Emile Yersin - 1863 to 1943). It normally infects rats, and passes from one rat to another, or from rat to humans, by the bite of a flea. The symptoms include large, pus-filled
glands (buboes) in the neck, groin and armpit; accompanied by a high fever, severe muscle
pain, headache, rapid heart rate, profound tiredness and eventually coma. The infection may
spread to the blood and cause black spots (bruises - thus the “black death”) under the skin.

The diagnosis can be confirmed by special blood tests and cultures from the discharging
glands.

A vaccine is available against *Yersinia pestis* and two injections are required at an interval
of one to four weeks. A third injection is necessary for children under twelve and additional
booster doses are required every six months. It is only given to residents and visitors to an
area where plague occurs. The side effects of the vaccine are minimal but may include a
fever, muscle spasms, loss of appetite and rarely brain inflammation, speech disorders and
muscle wasting.

Treatment involves isolation in hospital, antibiotics and intravenous drip-feeding. It may be
prevented by the plague vaccine, or taking tetracycline tablets every day. In good hospitals
virtually all patients will recover, but untreated the death rate exceeds 50%, and death may
occur more commonly and within a few hours in patients who are malnourished or in poor
health. Complications such as meningitis and pneumonia are fatal without excellent medical
care.

**BUNDLE BRANCH BLOCK**

Bundles of nerves are responsible for transmitting the impulses from the heart pacemaker
to the main chambers of the heart (the ventricles) to stimulate their contraction. The main
bundle running from the pacemaker to the top of the ventricles is the bundle of His. This then
divides into left and right bundles to the left and right ventricles respectively. A blockage to
the transmission of nerves along a nerve bundle in the heart is referred to as a bundle branch
block (BBB).

The condition may be diagnosed by a characteristic abnormality on an ECG (electrocardiogram). The usual causes are a heart attack (myocardial infarct) and narrowing
of the coronary arteries supplying the heart muscle, but a BBB may also follow heart surgery
or be caused by a heart tumour (eg. a myxoma). A pacemaker can be implanted to overcome
the BBB if it is causing significant symptoms.

**CARCINOID SYNDROME**

Carcinoid syndrome (argentaffinoma) is a rare cancer that starts in argentaffin cells inside
the small intestine, stomach or lung. Argentaffin cells are responsible for producing a
number of essential hormones (eg. serotonin) for the functioning of the gut and body in
general. When these cells become cancerous, they produce excessive amounts of these
hormones, which causes unusual symptoms.

The syndrome may develop very rapidly, and patients can become severely ill in a few
days. Symptoms include hot flushes of the face, swelling of the head and neck, diarrhoea and
stomach cramps, asthma and bleeding into the skin. Blood or urine tests can be carried out to
find the high levels of serotonin and other hormones. The site of the cancer is often very
difficult to find, as it is usually very small and slow growing. It also tends to spread at an early
stage to other areas, so even if the original is removed, the syndrome may continue due to
the production of hormones in high levels by newly formed and very small cancers in multiple
sites.
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Prednisone (a steroid) is used in the emergency treatment of the disease, and other medications are given to control the other symptoms. Drugs such as interferon can sometimes be used to destroy the cancer cells.

Because of its slow growth rate, it may take 10 or 15 years for the disease to progress from the stage of being a nuisance that requires constant medication, to being life-threatening.

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CARDIAC FAILURE

See HEART FAILURE

CARDIAC TAMPONADE

The heart is contained within a firm fibrous sac, the pericardium. If fluid (eg. blood) enters the pericardial sac and gradually increases in volume, it puts pressure on the heart, preventing the ventricles (main chambers of the heart) from filling with blood between each contraction. The heart starts to beat inefficiently, resulting in a poor blood supply to the rest of the body. This condition is called cardiac tamponade.

Common causes include pericarditis (inflammation of the pericardium), bleeding into the pericardium during heart surgery, uraemia (kidney failure) and a cancer of the heart or pericardium. It may also be a side effect of anticoagulant (eg. warfarin) overdose, and investigative procedures (eg. biopsy) on the heart or pericardium.

Cardiac tamponade is a very serious condition that may be rapidly fatal if not adequately treated. Its symptoms include a low and falling blood pressure, increasing venous blood pressure (jugular venous pressure), pulsus paradoxus (a pulse that becomes weaker while taking a deep breath), shortness of breath and faint heart sounds. Often these signs come on very slowly and subtly and are difficult to detect.

The diagnosis is confirmed by echocardiography (ultrasound of the heart), and treatment involves surgical drainage of the fluid from inside the pericardium, usually by passing a
A RATIONALE FOR THE CHEST

catheter into the accumulated fluid. The cause of the cardiac tamponade must also be treated.
See also ADHESIVE PERICARDITIS; PERICARDITIS

CARDIOMYOPATHY
Hypertrophic cardiomyopathy means enlarged heart muscle disease (“hypertrophic” means over developed, “cardio” refers to the heart, “myo” to muscle, and “pathy” to disease). Diseases and weakness of the heart muscle such as this are very common in older people due to the ageing process.

Almost any disease from an infection to a heart attack can cause cardiomyopathy, and so the term may be used when the exact nature of the heart disease present is unknown. Drugs, tumours and high blood pressure may also be responsible.

Cardiomyopathy may be a trivial illness that is barely noticed by the patient, or may cause tiredness, weakness, shortness of breath and chest pains (angina). It can be a progressive disease that leads inevitably to death or the need for a heart transplant. The condition is diagnosed by chest x-ray demonstrating an enlarged heart, ECG (electrocardiogram) and echocardiogram.

Medications such as digoxin, captopril, disopyramide, sotalol and a number of others, may be prescribed to strengthen the heart muscle and make it contract more efficiently.

The prognosis depends on the cause, but in most cases can be controlled reasonably.
See also ANGINA; CONGESTIVE CARDIAC FAILURE

CCF
See CONGESTIVE CARDIAC FAILURE

CEREBROVASCULAR ACCIDENT
A stroke is an accident involving the blood vessels in the brain, and is technically known as a cerebral infarct or cerebrovascular accident (CVA). If a clot, or piece of material from elsewhere in the body, blocks an artery in the brain (cerebral thrombosis), or if an artery bursts in the brain, a stroke may occur. The risk of stroke is higher in those who smoke, have high blood pressure, high cholesterol levels, are diabetic, and drink alcohol to excess.

Any blood vessel in the brain may be involved, so any part of the brain may be damaged, and the area damaged determines the effects on that person's body. The symptoms can therefore be very varied. If a motor area of the brain, which controls movement is affected, the patient becomes paralysed down the opposite side of the body because the nerves supplying the body cross over to the opposite side at the base of the brain (the right side of the brain controls the left arm and leg). Other patients may lose their memory, power of speech, become uncoordinated, unbalanced, start fitting, have strange smells, hear abnormal noises or any of dozens of other possibilities. The area of the brain affected may increase as a blood clot extends along an artery, or bleeding into the brain continues.

The cause of the stroke can be determined by using special X-rays, CT scans, MRI (magnetic resonance imaging), blood tests, tests on the fluid around the brain, and measuring the brain waves electrically (EEG).

A wait-and-watch attitude is adopted in most cases, with medication given to prevent the stroke from worsening and to protect other organs. Surgery to a bleeding or blocked artery in the brain may be appropriate in some cases. Physiotherapists, speech pathologists and occupational therapists will assist in recovery. Further strokes can often be prevented by the
long-term use of low dose aspirin or warfarin, which prevent blood clots. Patients who are at a high risk can also use these medications.

It will be several days or even weeks before doctors can give an accurate prognosis. The brain does not repair itself, but it can often find different ways of doing a task and bypassing damaged areas. Most improvement occurs in the first week, but full recovery may take months. Patients who become unconscious during a stroke generally have a poorer outcome than those who do not. Strokes are the third major cause of death in developed countries after heart disease and cancer.

See also HYPERTENSION

CERVICAL RIB SYNDROME
See NAFFZIGER SYNDROME

CHAGAS DISEASE
Chagas disease (American trypanosomiasis) is an infestation by the protozoan (single celled) parasite Trypanosoma cruzi that is widespread in tropical America from Texas to Bolivia. It is transmitted from wild animals to humans by bug bites to the skin or bug faeces in the eye.

The disease goes through three stages - acute, latent and chronic. Initially a sore develops on skin at the site of a bite or in the eye, and in many patients, no other symptoms ever occur until after a latent stage lasting 10 to 30 years when a chronic stage with heart disease occurs causing irregular heart rhythm, congestive heart failure, and pulmonary thromboses (blood clots in lung). A minority of patients go through an acute illness, which causes enlarged lymph nodes near the bite, fever, tiredness, headache, and enlarged liver and spleen. Acute heart or brain infection may be rapidly fatal. Long-term infection may cause severe heart disease. The disease is diagnosed by specific blood tests, but may be undetectable in the latent stage.

Treatment is generally unsatisfactory. Medications may be tried in the acute stage, but are of no use in the chronic stage.

Chagas disease is fatal in 10% of acute illnesses, and death from heart disease may occur in the chronic stage.

The condition is named after the Brazilian physician Carlos Chagas (1879-1934).

See also TRYPANOSOMIASIS.

CHINESE RESTAURANT SYNDROME
The Chinese restaurant syndrome is an abnormal reaction to food preservatives caused by the overuse of monosodium glutamate in food and aggravated by alcohol. Victims develop facial pressure, a headache, nausea, chest pain and a burning sensation of the head and chest. It settles spontaneously after 12 to 48 hours, while the symptoms may be eased by aspirin or paracetamol.

CHOLECYSTITIS
Cholecystitis is an infection or inflammation of the gall bladder that almost always occurs in the presence of gallstones. Many different bacteria can be responsible for the infection.

Patients develop pain in the upper right abdomen and behind the lower right ribs that often goes through to the back. They also have a fever, indigestion, nausea and sometimes irregular bowel habits.
Ultrasound scans can detect gallstones, and sometimes thickening of the wall of the gall bladder, which is characteristic of infection. Rarely there may be spread of the infection to the liver and other surrounding tissues, and sometimes an abscess forms in or around the gall bladder. Blood tests are often normal, but sometimes show non-specific signs of infection or liver stress.

Antibiotics are used to settle the gall bladder infection, then surgery is necessary to remove the stones (cholecystectomy).

**CHRONIC FATIGUE SYNDROME**

Chronic fatigue syndrome (CSF) has been given many different names in various places, including myalgic encephalomyelitis (ME), postviral syndrome, Royal Free disease (named after a London hospital), and Tapanui flu (in New Zealand). It is characterised by a persistent tiredness and easy fatigue that persists for many months for no obvious reason.

The condition is may be caused by a virus, but some patients find that certain foods aggravate the condition. It is possible that it is actually several diseases that overlap with their symptoms, and may be due to a combination of infection, immune deficiencies, autoimmune type condition (where the body rejects its own tissue), chronic inflammation, stress and psychiatric disturbances. It is a matter of debate whether the distressing symptoms cause the psychological problems, or vice versa.

The diagnosis can only be confirmed if in the following list both major criteria are met, plus six symptoms and two signs from the minor criteria

**MAJOR CRITERIA**
- New persistent or intermittent, debilitating fatigue severe enough to reduce or impair average daily activity below 50% of normal activity for a period of more than 6 months
- Exclusion of all other causes by thorough clinical evaluation, and blood tests

**MINOR CRITERIA - SYMPTOMS**
- Generalised fatigue lasting more than 24 hours following levels of exertion that would have been easily tolerated previously
- Vague headache
- Unexplained general muscle weakness
- Muscle pains
- Arthritis that moves from joint to joint without any apparent damage to the joint
- One or more of the following problems :-
  - avoidance of bright lights
  - forgetfulness
  - irritability
  - confusion
  - poor concentration
  - depression
  - intermittent visual disturbances
  - difficulty thinking
  - Inability to sleep, or excessive sleepiness
  - Rapid onset over hours or days of major criteria
A RATIONALE FOR THE CHEST

MINOR CRITERIA - SIGNS - documented by a physician on at least two occasions a month apart
- Mild fever greater than 38.6°C
- Sore throat with no pus present
- Tender enlarged lymph nodes in neck or arm pit

There are no specific diagnostic tests, but numerous blood tests may show minor abnormalities. Tests are always performed to exclude any other possible cause.

There is no specific treatment available, but patients can benefit by having an understanding doctor who may use antidepressants, anti-inflammatory medication, steroids and other drugs that may be helpful. Although there is no cure, with time, most cases slowly improve, but some patients are left with long term tiredness so severe that they are unable to return to work or undertake normal daily activities.

CHRONIC OBSTRUCTIVE AIRWAYS (PULMONARY) DISEASE
Chronic obstructive airways (pulmonary) disease is a term that covers a group of irreversible conditions (chronic bronchitis, emphysema, pneumoconiosis) that permanently affect the lung and its function.

See also BRONCHITIS, CHRONIC; EMPHYSEMA; PNEUMOCONIOSIS

CHURG-STRAUSS SYNDROME
The Churg-Strauss syndrome is an inflammatory condition of the lungs and other organs. The cause is unknown, but it may be an autoimmune condition.

The symptoms are varied and may include asthma, generalised inflammation of blood vessels in two or more organs other than the lungs, and high levels of eosinophils (cells characteristic of allergy reaction) in the blood. Some patients also have inflamed nerves in the arms and legs giving strange sensations and pain, heart disease, bleeding into the lung, normal lung tissue replaced by fibrous tissue, diarrhoea, a rash and glomerulonephritis (kidney inflammation). Permanent organ damage may occur.

Blood levels of eosinophils are high, other blood cell and enzyme abnormalities are present and biopsies of the lung and other affected organs are abnormal.

Medications such as prednisone, cyclophosphamide and azathioprine are used in treatment. The prognosis is guarded and long term follow-up essential.

See also AUTOIMMUNE DISEASES

CMV
See CYTOMEGALOVIRUS INFECTION

COARCTATION OF THE AORTA
Coarctation of the aorta (aortic stenosis) is a congenital (present since birth) narrowing of the aorta, which is the main artery running from the heart through the chest and down the back of the abdomen. Only a short segment is normally affected and the severity of symptoms depends on the degree of narrowing. The condition is usually diagnosed at birth or shortly afterwards, although milder cases may not be detected until the child undergoes rapid growth in the early teenage years. It is more common in boys than girls, and often associated with abnormalities of the aortic heart valve.

Children with aortic stenosis develop headaches, leg pain with exercise and frequent nosebleeds. The blood pressure is high in the arms, but low in the legs. Severe coarctation
can restrict blood flow to the lower half of the body and cause heart failure as it strives to pump the blood past the obstruction. It is usually discovered by hearing a characteristic murmur when listening to the chest, caused by the blood rushing through the narrowed section of the aorta. The diagnosis can be confirmed by an ultrasound scan.

Surgical correction of the narrowing with a synthetic patch to open up the aorta to its correct diameter is the only treatment. The results of surgery are very good, but without surgery, 75% of babies die in the first year of life.

See also AORTIC VALVE STENOSIS

COFFIN-LOWRY SYNDROME
The Coffin-Lowry syndrome is a developmental abnormality affecting multiple organs that has sex-linked inheritance, and affects only boys, but females act as carriers.

Patients have prominent lips, coarse facial features, tapering fingers, reverse eye slant, intellectual disability and excess curvature of the spine (kyphosis and scoliosis).

There are no specific diagnostic tests, no treatment is available, and there is no cure.

COLD, COMMON
A common cold (coryza is the technical term) is a very common viral infection of the upper respiratory tract. One or more of several hundred different rhinoviruses may be responsible. A cold is a distinct entity from influenza, which is caused by a different group of viruses.

Colds spread from one person to another in droplets of moisture in the breath, in a cough or in a sneeze. Once inhaled, the virus settles in the nose or throat and starts multiplying rapidly. Crowds, confined spaces (eg. buses, aircraft) and air conditioners that recycle air are renowned for spreading the virus. Most adults have a cold every year or two, usually in winter. Children, because they have not been exposed to these viruses before and so have no immunity to them, may have ten or more infections a year.

A sore throat and nose, runny and/or blocked nose, sneezing, cough, phlegm in the back of the throat, headache, intermittent fever and tiredness are the main symptoms. A secondary bacterial infection may cause pharyngitis or sinusitis.

No cure or prevention is possible. The symptoms can be eased by aspirin or paracetamol for headache and fever, and medications for the cough, sore throat, runny nose and blocked sinuses. The more the patient rests, the faster the infection will go away. Many vitamin and herbal remedies are touted as cures or preventatives, but when subjected to detailed trials, none can be proved to be successful.

Colds usually last about a week, but some people have a briefer course, while in others the first cold may lower their defences so that they can catch another one, and then another, causing cold symptoms to last for many weeks.

COMPLETE HEART BLOCK
Complete heart block is a total inability of electrical impulses to pass through the nerves supplying the heart muscles, leading to independent rates of contraction of the upper (atria) and lower (ventricles) chambers of the heart. The output of the heart is significantly reduced by this inefficient form of heart contraction.

CONGENITAL ADRENAL HYPERPLASIA
Congenital adrenal hyperplasia (or the adrenogenital syndrome) is a condition affecting the adrenal glands, which sit on top of each kidney, in which they are over stimulated to produce
abnormal steroids in the body which affect sexual development. The condition is familial (runs in families), but both parents must be carriers for the condition to be present.

In girls the clitoris becomes enlarged, high blood pressure occurs, and at puberty the breasts are very small, pubic hair pattern is masculine, hair may develop excessively on the body, and female characteristics are reduced. A rare form causes excessive development of male characteristics in boys. The diagnosis is confirmed by specific blood and genetic tests.

Surgical correction of abnormal genitalia can be performed, and medication is given to correct hormonal imbalances. Infertility and confused gender assignment can occur if treated late, but there are good results if treated very early. Patients have a relatively normal life expectancy.

**CONGESTIVE CARDIAC FAILURE**

Congestive cardiac failure (CCF) is also known as congestive heart failure or left ventricular failure. It is a failure of the heart to pump blood effectively.

Many conditions may be responsible for CCF, including heart attacks, heart infection (endocarditis, myocarditis, pericarditis), narrowing or leaking of heart valves, high blood pressure, narrowing of the aorta (aortic stenosis), irregular heart rhythm, alcoholic heart damage, severe anaemia and an overactive thyroid gland (hyperthyroidism). In many elderly patients, there can be a multitude of causes, or no specific cause at all for heart failure. In these cases, the condition is treated as a disease in itself.

Patients complain of being short of breath when exercising or climbing stairs, or in more advanced cases they may be short of breath constantly or only when lying down at night (paroxysmal nocturnal dyspnoea). Other symptoms include a hard dry cough, passing excess urine at night, general tiredness and weakness, a rapid heart rate, weight loss, chest and abdominal discomfort and swelling of the feet, ankles and hands. Severely affected patients may be unable to speak a full sentence without taking a breath and a blue tinge develops on and around the lips. Angina and a heart attack may occur.

The diagnosis can often be made without resorting to any tests. The exact cause of the CCF may be found by blood tests, chest X-rays and electrocardiograms (ECG). Echocardiograms and cardiac catheterisation (passing a tube through a vein into the heart) are sometimes undertaken if surgical treatment is being contemplated.

Treatment involves correction of any specific cause for the heart failure if possible, lowering high blood pressure and controlling any irregular heart rhythm. Sometimes surgical correction of a heart valve deformity is possible. A diet low in salt, and avoiding strenuous exercise can often be beneficial. Medications to remove excess fluid from the body (diuretics) and to strengthen the action of the heart (eg. digoxin, ACE inhibitors) are in common use. More sophisticated drugs are available for use in difficult cases. Oxygen may be supplied to seriously ill patients.

Unless an underlying correctable cause can be found, heart failure cannot be cured, only controlled. The condition usually slowly worsens with time, but it may take many years before serious incapacitation or death occurs.

See also ANAEMIA; AORTIC VALVE STENOSIS; COR PULMONALE; ENDOCARDITIS; HYPERTENSION; HYPERTHYROIDISM; MYOCARDITIS; PERICARDITIS

**CONGESTIVE HEART FAILURE**

See CONGESTIVE CARDIAC FAILURE
A RATIONALE FOR THE CHEST

CONSTRUCTIVE PERICARDITIS
See PERICARDITIS

COR PULMONALE
Cor pulmonale is also known as pulmonary hypertension or right heart failure. It results in enlargement of the right side of the heart (which pumps blood through the lungs), and increased blood pressure in the lungs. It is primarily a sign of obstructed circulation of blood through the lungs, and not heart disease, although congenital heart disease and left heart disease must be excluded.

Lungs damaged by emphysema, smoking, inhaled coal dust or asbestos, recurrent lung infections or a number of rarer lung diseases may be so abnormal that the blood has difficulty in passing through them. The right side of the heart must work harder to force the blood through the damaged lungs, which causes a significant rise in the blood pressure in the right heart and lungs. This causes further damage to arteries and worsens the disease. The heart muscle thickens and enlarges, and because of the lung damage, inadequate oxygen enters the blood, which further compounds the problem.

Patients have a cough that produces clear or bloodstained phlegm, a wheeze, shortness of breath with any exertion and general weakness. In advanced cases the ankles may be swollen, nausea and indigestion may occur, and the liver enlarges. Patients are more susceptible to lung infections such as bronchitis and pneumonia.

The diagnosis can be made by a chest X-ray and an electrocardiogram (ECG). Other investigations include cardiac catheterisation (passing a tube through a vein into the heart to measure the blood pressure), echocardiography and angiography.

Medication (eg. bosentan) can be prescribed to strengthen the heart, open the lungs and cure any lung infection. Physiotherapy can help drain phlegm from the lungs, and oxygen may be used to relieve the shortness of breath.

Unfortunately, no cure is possible and patients steadily deteriorate over many years to eventually die from heart attacks, pneumonia or other complications of the disease.

See also CONGESTIVE CARDIAC FAILURE; EMPHYSEMA

CORYZA
See COLD, COMMON

CROUP
Croup (or stridor) causes a harsh whistling when breathing in, and is usually followed by a cough.

By far the most common cause is a minor viral respiratory infection of children under five years of age, affecting the pharynx (lower throat). If a constant high fever occurs, and the child becomes particularly lethargic, bacteria may be responsible. The condition may be very distressing to both child and parents, but is rarely serious.

Affected children have a seal-like barking cough, difficulty with taking a breath in, and excessive chest movement with breathing. There is usually only a slight fever, and minimal throat pain. Very rarely, the child may develop severe swelling in the throat that totally obstructs breathing, which is a critical emergency.

Medications and steam will ease the symptoms. Nurse the child in a warm, moist, steamy environment (eg. use a vaporiser). Paracetamol is given for fever or discomfort, and lots of fluid to prevent dehydration. In more serious cases, prednisone is prescribed and a steam and
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oxygen tent may be used in hospital to assist breathing. The vast majority of children recover spontaneously within a day or two.

There are many other causes of croup including:
- Epiglottitis. The epiglottis is a piece of cartilage that sticks up at the back of the tongue to stop food from entering the windpipe (trachea) when swallowing. If this becomes infected by bacteria (eg. *Haemophilus influenzae B* - Hib), it can swell up rapidly and cause a very sore throat, fever and obvious illness.
- Glandular fever (infectious mononucleosis) is caused by the Epstein-Barr virus. Patients usually have a sore throat, raised temperature, croupy cough, large glands in the neck and other parts of the body, extreme lethargy, and generally feel absolutely lousy for about a month.
- The incidence of diphtheria in children is now low due to vaccination. It causes a sore throat, thick grey sticky membrane across the throat, fever, nasal discharge, croup, hoarse voice and obvious illness, with overwhelming tiredness and muscle aches.
- Foreign bodies (eg. peanut, small toy), polyps, cysts, tumours, bruising, an abscess and other growths in the larynx or throat may irritate the area to cause a croupy cough.
- Laryngomalacia is a rare condition of children in which the cartilage of the larynx (voice box) is softened, and collapses when the patient breathes in heavily with exercise, to cause croup.

**CUSHING SYNDROME**

Cushing syndrome is also known as adrenocortical hyperfunction and hyperadrenocorticism. It is a syndrome resulting from excessive amounts of steroids in the blood.

The hypothalamus is the part of the brain that decides how much natural steroid is required. It sends nerve messages to the pituitary gland, which sits under the centre of the brain and it in turn sends a chemical message to the adrenal glands that sit on top of each kidney. The adrenals produce the steroids required by the body. Tumours or overactivity (may be triggered by pregnancy or stress) in the hypothalamus, pituitary gland or adrenal gland can result in the overproduction of steroids.

Cushing syndrome may also be due to taking excessive amounts of steroids (eg. prednisone) for medical reasons.

Patients develop a fat face (moon face), fatty deposits on the upper back (called a buffalo hump), obesity of the abdomen and chest with thin arms and legs, high blood pressure, impotence, cessation of menstrual periods, skin infections and pimples, headaches, backache, excess hair growth on the face and body, mood changes, excessive bruising, thinning of the bones (osteoporosis - which can cause bones to fracture easily), stretch marks on the breasts and abdomen, kidney stones, and generalised weakness. Strokes, heart attacks, broken bones, diabetes, increased susceptibility to infections (particularly of the skin and urine), and psychiatric diseases may be complications.

Complex blood and urine tests can confirm the diagnosis, but finding the cause of the syndrome can be very difficult, and CT scans and magnetic resonance imaging (MRI) may be used to find very small tumours.

If a tumour can be found in the adrenal or pituitary gland, it is surgically removed. Other treatments include irradiation of the pituitary gland, or removal of both adrenal glands. Drug
A RATIONALE FOR THE CHEST

treatment is generally unsuccessful, but if both adrenal glands are removed it is necessary to supply steroids and other hormones by taking tablets or having injections regularly. If the Cushing syndrome is due to taking steroid medication, the dosage of this should be reduced if possible. Nelson syndrome (skin and tongue pigmentation, and enlargement of the pituitary gland under the brain) is a complication of treatment.

The prognosis depends on the cause. Some tumours of the adrenal or pituitary glands are very aggressive and spread to other areas to continue the syndrome, and these patients have a poor life expectancy. In others, a lifelong cure may be obtained by removing a localised tumour. If caused by excessive steroid medication, the syndrome is cured by stopping the medication, but the patient may require the steroids for control of asthma, rheumatoid arthritis or other diseases, and they must tread a very narrow path between the side effects of the medication and the necessary treatment of a disease.

Harvey Cushing (1869-1939) was an American neurosurgeon and physiologist.

CVA
See CEREBROVASCULAR ACCIDENT

CYSTIC FIBROSIS

Cystic fibrosis (fibrocystic disease or pancreatic fibrosis) is an inherited disease of all mucus glands in the body due to a recessive gene. It occurs in one in every 2000 children, and there is nothing parents can do to prevent the condition.

The symptoms are extremely varied because it is a disease of mucus glands throughout the body, but particularly those in the lungs and gut. In the lungs, the mucus becomes thick and sticky, the lungs clog up, become infected, and the lung tissue is destroyed. In the gut, excess mucus is produced, food cannot be absorbed correctly, and diarrhoea occurs. At birth, there may be a bowel obstruction (meconium ileus) caused by thick sticky secretions in the small intestine. Because the glands in the reproductive organs are involved, these patients are usually sterile, and so cannot pass the disease on to their children. Glands in the skin produce sweat that is far saltier than that of normal people. Severe lung infections, lung damage and heart failure may eventually occur.

A blood test for the level of trypsin in blood is normally carried out on all babies at birth to detect the disease and allow early treatment to be commenced. The diagnosis is confirmed by measuring the amount of chloride (salt) in sweat, chest x-rays, abnormal lung function tests, and faeces tests. The condition cannot be detected before birth, but screening of parents to see if they are potential carriers is possible and should be performed if there is a history of cystic fibrosis in either family. One in every 25 people is a carrier for the cystic fibrosis gene.

Treatment with physiotherapy several times every day to clear the lungs is critical. Antibiotics (eg. sodium fusidate) are used to treat lung infection, and medications to open up the airways (bronchodilators) and loosen the thick mucus (mucolytics) are prescribed. Regular vaccination against lung infections are essential. As a final solution, a heart and lung transplant may be performed.

There is no cure, and the outcome depends on the patient's dedication to following a comprehensive treatment program. Many survive into their 30s with continued intensive therapy, and with lung and heart transplants, a long life is possible.
A RATIONALE FOR THE CHEST

CYTOMEGALOVIRUS INFECTION
A cytomegalovirus (CMV) infection is an extremely common viral infection affecting between 10% and 25% of the entire population at any one time. Infection rate may be in excess of 80% in homosexual men. It may be a serious illness in patients who have reduced immunity due to treatment with cytotoxic drugs for cancer, have suffered other serious illnesses, are anaemic, suffering from AIDS or other immune affecting diseases, or who are extremely run-down from stress or overwork.

The virus passes from one person to another in saliva or as droplets in the breath, but may also spread through blood transfusions or sexual contact. In all but a tiny percentage of infected people, there are absolutely no symptoms, and they appear and feel totally well. Adults with reduced immunity develop a fever, headaches, overwhelming tiredness, muscle and joint pains, enlarged lymph nodes and a tender liver. In patients with severely reduced immunity, pneumonia and hepatitis may develop.

If a pregnant woman with reduced immunity acquires a significant CMV infection, her baby may be affected in the womb and be born with liver damage (jaundice), enlarged liver and spleen, poor ability to clot blood, bruises, intellectual disability, and one in six are deaf.

The infection can be detected by specific blood tests, and the virus may be found in sputum, saliva, urine and other body fluids.

There is no specific treatment. Aspirin and/or paracetamol are used to control fever and pain, and prolonged rest is required for recovery. It is not necessary to exclude children from school.

An uneventful recovery is expected in normal patients. In immune compromised patients, pneumonia and hepatitis may be fatal.

de QUERVAIN THYROIDITIS

De Quervain thyroiditis (or subacute thyroiditis) is a relatively common form of thyroid gland inflammation that occurs most commonly in women between 25 and 45, and is thought to be the result of a viral infection.

Patients experience painful swelling of the thyroid gland at the front of the neck, pain around the neck to the ears, difficulty in swallowing and symptoms of hyperthyroidism such as rapid heart rate and excess sweating.

The condition is diagnosed by blood tests and biopsy of the thyroid gland, but there is no specific cure available. Aspirin usually relieves the pain and swelling, and propranolol controls the thyrotoxicosis. Complications may include heart damage from the excess production of thyroid hormone.

Satisfactory control of the thyroid inflammation is usually possible, and it settles spontaneously with time.

See also HYPERTHYROIDISM

DERMATOMYOSITIS

Dermatomyositis is a rare disease that combines a persistent rash with muscle weakness. When it occurs without the rash (which is present in only 40% of cases) it is called polymyositis. The cause is unknown, but it commonly attacks those in late middle-age.

Patients experience a gradually progressive weakness and pain of the muscles in the neck, upper arms, shoulder, buttocks and thighs. Patients may also develop a dusky red rash on the cheeks and nose, shoulders and upper chest and back. The eyelids are often swollen and appear bruised.
Unusual symptoms include redness and bleeding under the nails, cold hands, and a scaly rash over the knuckles.

The condition is diagnosed by blood tests, muscle biopsy and by measuring the muscle's electrical activity.

Drugs such as steroids, methotrexate and azathioprine are commonly used in treatment. Para-amino benzoic acid is sometimes used on the skin.

One in ten patients risk developing cancer, but there is no cure. Most patients can lead a relatively normal life, although a minority are disabled by muscle weakness.

See also POLYMYOSITIS

DERMOID CYST
A dermoid cyst is a trapped infolding of skin that forms a cyst. It may occur during development as an embryo, often on the front of the neck, on the midline of the nose, or around the eye and in the mouth. A dermoid cyst may also be due to an injury to skin that allows a tiny piece of skin to be trapped and continue to grow and develop beneath the normal skin.

Those affected develop a hard, smooth, small, painless lump under the skin. No treatment is normally necessary as they are harmless, but the cyst may be surgically removed for cosmetic reasons if so desired by the patient.

In the USA, a teratoma (an uncommon and unusual form of cancer that occurs in the ovaries or testes) is referred to as a dermoid cyst.

DEXTROCARDIA
Dextrocardia is a congenital condition in which the heart is located on the right side of the chest instead of the left.
See also KARTAGENER SYNDROME

DIABETIC KETOACIDOSIS
Ketoacidosis is a severe complication or initial presentation of diabetes mellitus. It is due to a build-up of waste products and glucose in the bloodstream because of untreated or under-treated diabetes. Patients who are careless about their treatment, diet and self-testing may be affected. Almost invariably, it is the juvenile insulin dependent diabetics that develop this complication.

The symptoms include mental stupor, nausea, vomiting, shortness of breath and eventually coma. Blood sugar levels are very high and other blood and urine tests are abnormal.

Treatment involves the emergency injections of insulin, but urgent hospital treatment is necessary to control the situation adequately. If left untreated, death will occur due to kidney, heart or brain damage.

The prognosis is good with prompt medical care, but permanent organ damage may occur if treatment is delayed.

DIAPHRAGMATIC HERNIA
See HIATUS HERNIA

DIPHTHERIA
Diphtheria is a childhood respiratory infection that is now rare in developed countries.
It is caused by infection of the throat and trachea (the tube leading to the lungs) by the bacterium *Corynebacterium diphtheriae* which releases a toxin that is responsible for most of the symptoms and complications. It spreads from one person to another in the breath, and the incubation period is two to seven days.

Symptoms include a sore swollen throat, fever, nasal discharge, hoarse voice, overwhelming tiredness, weakness and muscle aches. A thick, grey, sticky discharge forms a membrane across the throat that the patient constantly fights to clear. The diagnosis is confirmed by throat swabs, and heart involvement by an electrocardiograph (ECG).

Rapid, early treatment is critical and involves diphtheria antitoxin injection, antibiotics (kill the bacteria but do not remove the toxin), and medications to control or prevent complications. In severe cases a tracheotomy (cut into the front of the throat) is performed to allow air into the lungs.

Diphtheria can be totally prevented by vaccination. These vaccinations were first introduced in the 1930s. It is normally given in combination with the tetanus vaccine (and sometimes other vaccines) at two, four, six and eighteen months of age, then at four years and every ten years through life.

Severe cases may affect the heart, nose, skin and nerves. Survivors may be affected for life by damage to the heart or lungs.

The death rate varies from 10% to 30%, and most deaths occur within the first day or two. Survivors improve in a few days, but must be kept at rest for at least three weeks to prevent complications, as it will take this time to for all the toxin to be removed from the body.

See also WHOOPING COUGH

**DISCITIS**

Discitis is an inflammation and/or infection of one of the intervertebral discs that separate the vertebra in the back from one another. The infection may spread through the bloodstream, often from the kidneys or bladder, or may come from an injury to the disc. The inflamed disc enlarges and pushes forward to pinch the spinal cord.

Patients experience pain at the site of the disc inflammation in the back, and limited movement of that section of the back. Pain is often eased by bending the neck or back forward. A CT scan will show the damaged disc and surrounding inflammation.

Urgent surgery to remove the pressure on the spinal cord caused by the bulging disc is necessary. Antibiotics are also used.

In some cases, pressure on the spinal cord may cause permanent damage to the cord and limited sensation and movement below that level of the back.

The prognosis is good if treated early, but discitis may result in paraplegia or quadriplegia (depending on level in the back involved) if left untreated.

**DOUBLE PNEUMONIA**

Pneumonia occurs when bacteria enter the tiny air bubbles that make up the lung, and starts multiplying to cause an infection. Usually only one part of the lungs, often at the bottom of the lung, is affected at first, but the problem soon spreads to other parts of the lung.

Usually only one lung is affected, but if the patient is particularly unlucky and both lungs are affected, the patient is said to be suffering from double pneumonia.

See also PNEUMONIA
ECHINOCOCCOSIS
See HYDATID DISEASE

EMPHYSEMA
Emphysema is a form of chronic obstructive airways disease caused by permanent destruction of the small air absorbing sacs (alveoli) in the lungs. It is caused by smoking, exposure to other noxious gases, or recurrent attacks of bronchitis or pneumonia. With these irritants the alveoli break down into larger cavities, which are surrounded by scar tissue and have less surface area to absorb oxygen. About 3% of the population develop emphysema, and most are smokers.

The symptoms are a constant shortness of breath and repetitive coughing, a barrel shaped chest and excessive sputum. Because of their constant exertion to breathe patients become wasted and emaciated and may develop recurrent attacks of bronchitis and pneumonia, right heart failure (cor pulmonale) and pneumothorax.

It is diagnosed by a chest X-rays and by breathing into machines (eg. spirometer, peak flow meter) that analyse lung function. There may also be changes in blood tests and electrocardiograms (ECG).

Treatment involves physiotherapy to make the damaged lung work as effectively as possible, drugs by tablet, inhaler (eg. tiotropium) or spray (eg. salmeterol) to open up the lungs to their maximum capacity, and antibiotics to treat infection. In severe cases, steroids by inhalation or tablet are given, and as a last resort oxygen is used, while vaccination against influenza and pneumonia may prevent a fatal illness. Smokers must stop their habit.

No cure is possible and the condition is slowly progressive with the complications eventually causing death.

See also BRONCHITIS, CHRONIC; COR PULMONALE; LUNG CANCER; PINK PUFFER; PNEUMONIA; PNEUMOTHORAX

EMPYEMA
An empyema is an abscess, usually within the pleura, the membrane that surrounds the lungs.

ENDOCARDITIS
Endocarditis is a bacterial or fungal infection inside the heart, usually on the heart valves. It normally develops slowly over many weeks or months in an already damaged heart, or may rarely cause sudden illness in a previously healthy person. The heart valves may be malformed from birth, damaged by disease (eg. rheumatic fever), distorted by cholesterol deposits, scarred by heart attacks or an artificial heart valve may have been inserted to replace a damaged valve.

The symptoms are many and varied, and some patients, particularly the elderly, may have almost no early symptoms. Most patients have a fever, and other complaints include night sweats, fatigue, tiredness, palpitations, rapid heart rate, loss of appetite, chills, joint pains, muscle pains, weight loss, swollen joints, paralysis, headache, chest pain, nose bleeds and other minor problems. Small, transient, red, raised, tender patches on the finger tips (Osler’s nodes) may be diagnostic. The infection causes clumps of bacteria to grow inside the heart, and pieces can break off and travel through the arteries to cause severe problems elsewhere in the body. In the brain they can block an artery and cause a stroke, while in other organs they may cause blindness, kidney failure, joint damage and bowel problems. Almost any part
of the body may be affected. Further complications such as heart attack and stroke can occur years after the disease appears to have been cured.

It is diagnosed by taking blood and culturing it in the laboratory in order to detect any bacteria, while other blood tests and an ECG (electrocardiograph) may also be diagnostic.

Urgent hospital treatment is essential, where large doses of antibiotics, often penicillin, are given by injection for several weeks. Other treatments include correction of anaemia and controlling the damage done to other organs. Major heart surgery is sometimes required, particularly if the infection is fungal. Prevention is better than cure, and patients who have had rheumatic fever or any other heart disease should have a preventative course of penicillin before and during an operation or dental procedure.

60% of patients with endocarditis recover completely, another 30% survive but with significant restrictions on their lifestyle caused by damage to the heart or other organs, while in about 10% of cases death occurs. Untreated, death is inevitable. When a fungus is responsible (most commonly in intravenous drug abusers), the outcome is far worse.

See also RHEUMATIC FEVER; SUBACUTE BACTERIAL ENDOCARDITIS

EOSINOPHILIA-MYALGIA SYNDROME

The eosinophilia-myalgia syndrome is a food intolerance triggered by ingestion of a large amount of the protein L-tryptophan in a sensitised person. Severe muscle and joint pain, cough, shortness of breath, swelling of feet and ankles, thick skin, rashes and nerve pain occur, and a large number of reactive white blood cells (eosinophils) are seen in a blood sample. There is no specific treatment, but sufferers must avoid eating L-tryptophan. Most patients recover quickly, but one in a hundred die within a few hours.

EPIGLOTTITIS

The epiglottis is a piece of cartilage that sticks up at the back of the tongue to stop food from entering the windpipe (trachea) when swallowing.

Epiglottitis is an uncommon bacterial infection (most commonly by *Haemophilus influenzae* B - HiB) of the epiglottis that is an acute medical emergency requiring urgent hospitalisation, as it can swell up rapidly and block the throat. Infection is most common in children under five years of age who develop a very sore throat, fever and obvious illness. In young children, if the epiglottis swells excessively, or is disturbed by trying to eat solids or by the tongue depressing stick of a doctor examining the mouth, it can cover the windpipe completely and
rapidly cause death through suffocation. For this reason a doctor will give the throat only a cursory examination before arranging the immediate transfer of the child to hospital. If the airway is obstructed in hospital, an emergency tracheotomy (an operation to make a hole into the wind pipe through the front of the neck) is performed to allow the child to breathe.

The diagnosis is confirmed by a side-on X-ray of the neck that show the swollen epiglottis. Throat swabs are taken to identify the infecting bacteria, and sometimes blood tests are also performed.

Antibiotics are given to cure the infection and paracetamol to reduce fever and pain. Some hospitals routinely anaesthetise children and put a tube through the mouth or nose and down the throat to prevent the airway from blocking. The infection usually settles in a few days, and provided there has been no airway obstruction, the outcome is excellent. A series of vaccinations against Haemophilus influenzae B (HiB) is now routinely given to all children starting at two months of age.

**FALLOT’S TETRALOGY**

Fallot tetralogy is a developmental abnormality of the heart of no known cause that is present at birth and results in four defects:-

- there is a hole between the lower chambers (ventricles) of the heart
- narrowing of the artery leading to the lungs (pulmonary artery)
- the opening of the heart into the aorta is shifted from the left side of the heart to the right
- enlargement of the right side of the heart occurs

If the aorta abnormality is missing, it is known as Fallot trilogy.

The baby is blue, very short of breath, very weak, and fails to thrive. The diagnosis is confirmed by special X-rays of the heart and chest, echocardiograms (ultrasound pictures of heart function), electrocardiographs (ECG), measurement of oxygen concentration in blood, and catheters inserted into heart through veins. Open heart surgery, often on several occasions, is necessary, but most patients respond well to the surgery and can lead a normal life.

See also PATENT DUCTUS ARTERIOSUS; VENTRICULAR SEPTAL DEFECT

**FIBROADENOMA OF THE BREAST**

A fibroadenoma of the breast is a common benign growth of the breast, often affecting young women. The cause is usually unknown, but it may be the result of an injury to the
A RATIONALE FOR THE CHEST

breast. It is possible to feel one or more round, firm (but not hard) lumps within the breast tissue that are hard to catch hold of and tend to slide out from between the fingers when squeezed (thus sometimes known as a breast mouse) and are therefore not attached to surrounding tissue. They are not usually tender or painful.

Mammography (breast x-ray) and ultrasound may be used initially, but in most cases a needle biopsy is necessary to confirm the diagnosis. If the diagnosis is confirmed to be benign, they may be left untreated, but if there is any doubt, they should be surgically removed. They persist long term if not removed.

See also BREAST CANCER

FILARIASIS

Filariasis (elephantiasis) is a disease of the lymphatic system (waste drainage ducts) that occurs in tropical Asia, Africa and America, caused by a microscopic worm (the filarial nematode *Wuchereria bancrofti*) that is transmitted from one person or animal to another by mosquito bites.

Inflammation of the lymph nodes occurs and a fever develops. After repeated attacks, the lymph channels of the lymphatic system that carry waste products become blocked by the worm, wastes cannot escape from the legs, arms and scrotum, and they slowly enlarge to a huge size to give the characteristic appearance of elephantiasis.

It is diagnosed by seeing the infecting worm in a drop of blood under a microscope.

Treatment involves elevation of the affected limb, medication (eg. diethylcarbemazine) to kill the worm, and surgery to remove the swollen tissue. Amputation of a limb is sometimes necessary. Filariasis is difficult to treat, the effective use of damaged limbs may never return, and long-term medication may be necessary. Residents of affected areas should avoid mosquito bites and take medication constantly to prevent the disease.

FRIEDLÄNDER'S PNEUMONIA

Friedländer’s pneumonia is a form of pneumonia caused by the bacteria *Klebsiella pneumoniae*. It is a relatively common form of pneumonia, but has a higher than average mortality rate as it is more likely to cause a lung abscess. The onset is usually sudden, with fever, blood stained sputum with coughing and chest pain.

See also PNEUMONIA

GLANDULAR FEVER

See INFECTIOUS MONONUCLEOSIS

GLOBUS HYSTERICUS

Globus hystericus is an intermittent spasm of the muscles in the oesophagus (gullet) that occurs in emotionally stressed people, particularly women. Patients have the sensation of a constant lump in the throat that they feel will interfere with swallowing, but usually does not. All investigations of the oesophagus and throat are normal.

The condition usually settles after some months in most patients with time and reassurance, but sometimes anti-anxiety medication is necessary.

GOITRE

A goitre (goiter in the USA) is any enlargement of the thyroid gland, which lies in the front of the neck just below the Adam's apple. This gland releases a hormone (thyroxine) into the
blood stream, which acts as an accelerator for every cell in the body. If there is too much thyroxine in the blood stream, the cells (and the tissue they form) will work too fast (resulting in diarrhoea, palpitations, sweating, weight loss etc.), while a lack of thyroxine causes cell function to become too slow (resulting in constipation, slow heart rate, dry skin, weight gain etc.).

An enlarged thyroid gland indicates that it is malfunctioning either by producing too much (hyperthyroidism) or too little (hypothyroidism) of the hormone thyroxine. A goitre can also be an inherited characteristic, due to the development of cysts or tumours in the gland, or a lack of iodine in the diet (iodine is essential for the production of thyroxine).

Thyrotoxicosis (hyperthyroidism or Basedow’s goitre) is a goitre associated with excessive production of thyroxine. Surgery is usually necessary to cure the problem, but medication may slow down the effects in the short term.

Myxoedema (hypothyroidism) is the opposite, as there is a lack of thyroxine being released into the blood, and feedback mechanisms make the gland swells in an attempt to make more of the hormone. Thyroid hormone can be given in tablet form on a regular basis to overcome this defect.

Cysts may form in the thyroid gland, and are usually of no consequence unless they enlarge sufficiently to cause an obvious deformity.

Other causes of a goitre include thyroid cancer (a hard lump in the gland), Hashimoto’s thyroiditis (inflammation of the thyroid gland), Pendred syndrome and de Quervain thyroiditis (rare condition that results in a painful goitre).

Sometimes, swelling of tissue behind the thyroid gland, may push it forward to make it appear that a goitre is present. Examples include enlarged lymph nodes in the neck, and tumours and cysts of the larynx (wind pipe).

Blood tests can determine the activity of the thyroid gland and the amount of thyroxine being produced and an ultrasound or radionucleotide scan will show any tumours or cysts.

The treatment of a goitre depends on the cause - surgery for an overactive gland or thyroid supplements for an underactive one. In most developed countries a goitre due to a lack of iodine has been eliminated since the introduction of iodised table salt, bread and milk. The enlargement usually settles with appropriate treatment.

See also HYPERTHYROIDISM; HYPOTHYROIDISM

GOODPASTURE SYNDROME

Goodpasture syndrome is a rare failure of the body’s immune system that results in shortness of breath, coughing, recurrent nose bleeds, significant anaemia, kidney damage and iron deposition in vital organs throughout the body. The cause is unknown, but it can be diagnosed by blood tests and a lung biopsy. Treatment is often unsatisfactory, and involves potent medications, artificial cleaning of the blood by dialysis, and kidney transplantation.

GRAVE’S DISEASE

See HYPERTHYROIDISM

HAMMAN-RICH SYNDROME

The Hamman-Rich syndrome (also known as idiopathic diffuse interstitial fibrosis) is a rare disease that causes lung destruction. The cause is a progressive generalised replacement of the lungs with fibrous tissue that may be triggered by acute pneumonia.
Patients experience worsening shortness of breath to the point where breathing becomes impossible. The condition is diagnosed by chest X-ray and lung biopsy, but no treatment is available, and it is usually fatal.

See also PNEUMONIA

HAND-SCHUELLER-CHRISTIAN DISEASE
Hand-Schueler-Christian disease is one of a group of congenital diseases known as histiocytosis X or Langerhans cell histiocytosis, that occur in children. The disease causes diabetes insipidus, patchy bony absorption in the skull, protruding eyes, lung damage and outer ear inflammation. Other symptoms may include skin rashes and gum inflammation and in advanced cases numerous organs may fail.

The diagnosis can be made by skull x-rays, biopsy of skin rashes, bone marrow biopsy and chest x-rays, then treatment involves irradiation of the bone lesions, very potent medications to prevent further bone and lung damage and conventional management of the diabetes insipidus, but no cure is possible.

See also HISTIOCYTOSIS X; LETTERER-SIWE DISEASE

HASHIMOTO THYROIDITIS
Hashimoto thyroiditis is an inflammation of the thyroid gland in the front of the neck that occurs for no known reasons, but is possibly an autoimmune disease. It may occur at any age, but tends to run in families and is far more common in women.

Patients have a gradual enlargement of the thyroid gland (goitre) over many months or years, and the gland becomes firm, but not tender or painful. Many patients have no other symptoms, and the gland enlargement may be barely noticeable, but in others the gland may gradually cease to function and the patient becomes tired, listless and has other symptoms of hypothyroidism. A rapidly progressive form of the disease is also known.

It is diagnosis is made by blood tests (eg. antithyroid peroxidase antibodies) and treated by taking thyroid hormone tablets (thyroxine) on a daily basis indefinitely. The long-term outcome is usually very good with normal life expectancy.

See also HYPOTHYROIDISM

HEART FAILURE
Heart failure (cardiac failure) occurs when the heart is no longer capable of pumping blood around the body effectively. Many conditions can cause heart failure including heart attacks (which damage the heart muscle), endocarditis (heart infection), narrowing or leaking of heart valves, high blood pressure, narrowing of the aorta (aortic stenosis), irregular heart rhythm, alcoholic heart damage, severe anaemia (inadequate oxygen being transported by the blood) and an overactive thyroid gland (increased rate of body activity results in greater demands for blood).

Patients with cardiac failure complain of being short of breath when exercising or climbing stairs, but as the condition worsens they are constantly out of breath, particularly when lying down at night. Other symptoms include a hard dry cough, having to get out of bed to pass urine at night, general tiredness and weakness, a rapid heart rate, chest and abdominal discomfort and swelling of the feet, ankles and hands. These patients may be noticed by others to be losing weight, unable to speak a full sentence without taking a breath, and in advanced cases a blue tinge develops on and around the lips.
A RATIONALE FOR THE CHEST

The diagnosis can often be made by a doctor without resorting to any sophisticated tests, but it is important to discover the cause of the heart failure, particularly in younger patients, and this may involve extensive investigations over a considerable period. Blood tests (eg. brain natriuretic peptide), chest X-rays and electrocardiograms are the main tests performed. Further tests may be indicated after the results of these are obtained. Echocardiograms and cardiac catheterisation (passing a tube through a vein into the heart) are sometimes undertaken if surgical treatment of a heart defect is being contemplated.

Treatment involves correction of any specific cause for the heart failure if possible. If the thyroid is overactive or the patient is anaemic, these can be treated and the heart failure may disappear. Correction of high blood pressure, controlling an irregular heart rhythm and treating heart infections are other methods of dealing with a specific cause of heart failure. Sometimes surgical correction of a heart valve deformity is also possible.

A diet low in salt, and avoiding strenuous exercise can often be beneficial. Medications to remove excess fluid from the body (diuretics) and to strengthen the action of the heart (e.g. digoxin, ACE inhibitors, beta-blockers, proscillaridin) are in common use. Digoxin is derived from digitalis, which in turn is found in the foxglove plant. The foxglove has been used as a folk remedy for heart disease since the Middle Ages. A number of more sophisticated drugs are available for use in resistant or difficult cases. Oxygen may be supplied to seriously ill patients.

In many elderly patients, there can be a multitude of causes, or no specific cause at all for the heart failure. In these cases, the condition is treated as a disease in itself. Unless an underlying correctable cause can be found, heart failure cannot be cured, only controlled. As the years pass, the condition usually slowly worsens and becomes steadily harder to control. Some patients succumb to heart attacks, while others become more and more incapacitated so that they cannot leave a bed, and develop pneumonia. The actual outcome in any individual is very difficult to predict, but it may take many years before serious incapacitation or death occurs.

See also CARDIAC TAMPOANDE; CARDIOMYOPATHY; CONGESTIVE CARDIAC FAILURE; COR PULMONALE

HENOCH-SCHÖNLEIN SYNDROME

The Henoch-Schönlein syndrome (anaphylactoid purpura) is a generalised inflammation of small blood vessels resulting in the formation of small red spots in the skin (Henoch-Schönlein purpura). It may be a complication of a number of different diseases (eg. after a Streptococcal bacteria infection), but its cause is often unknown, although it is more common in children.

Small, slightly raised dilated blood vessels (purpura) appear on the skin as red or purple patches about five to ten millimetres across. There may also be bleeding into the intestine, lungs, kidneys and joints to cause belly pain, coughing of blood, blood in the urine and arthritis.

It is diagnosed by biopsy of one of the purpura in the skin, but no treatment is normally necessary as the condition is self-limiting and usually settles without serious long-term problems in one to six weeks. If the kidneys become involved medical treatment is necessary, as long-term kidney damage may occur.

Eduard Henoch (182-1910) and Johannes Schönlein (1793-1864) were German physicians.
HEROIN

Narcotics including codeine, pethidine, morphine and oxycodone, are all derived from heroin and can be abused if taken regularly or excessively. Addicts normally use heroin as an injection directly into a vein, but it may also be inhaled or eaten, when it has a much slower effect.

Heroin is refined from the milky juice of the opium poppy. Most abusers have personality disorders, antisocial behaviour, or are placed in situations of extreme stress. Possibly one in every 100 people in developed countries is dependent upon illicit drugs, while far higher percentages have experimented with them at one time or another.

It causes exaggerated happiness, relief of pain, a feeling of unreality, and a sensation of bodily detachment, and contracted pupils that do not respond to light are a sign of use. Tolerance develops quickly, and with time, higher and higher doses must be used to cause the same effect.

Heroin is often combined with abuse of alcohol, smoking and synthetic drugs. Physiological problems include vomiting, constipation, brain damage (personality changes, paranoia), nerve damage (persistent pins and needles or numbness), infertility, impotence, stunting of growth in children, difficulty in breathing (to the point of stopping breathing if given in high doses) and low blood pressure.

Withdrawal causes vomiting, diarrhoea, coughing, twitching, a fever, crying, excessive sweating, generalised muscle pain, rapid breathing and an intense desire for the drug. These symptoms can commence within 8 to 12 hours of the last dose, and peaks at 48 to 72 hours after withdrawal. Mild symptoms may persist for up to six months.

As sterile techniques are often not followed when self-injecting, the veins and skin at the injection site become infected and scarred. Blood and urine tests can detect the presence of narcotics.

The treatment options available for heroin or other narcotic addiction are:-
- Gradual withdrawal while receiving counselling and medical support.
- Immediate drug withdrawal (“cold turkey”) while hospitalised in a specialised unit, sometimes combined with other drugs that are used temporarily to reduce the symptoms associated with the drug withdrawal.
- Substitution of heroin with a prescribed medication (eg. methadone) on a medium to long-term basis before it is slowly withdrawn.
- Naltrexone may be used to flush heroin from the body, and relieve the addiction, within a few days, a process that must be undertaken under strict supervision in a specialised clinic. Naltrexone may also be used long term to reduce the desire for heroin.
- Halfway houses that remove the patient from the environment in which drug taking is encouraged.
- Individual or group psychotherapy.
- Education of intravenous drug users of the dangers associated with their habit (eg. the development of AIDS or hepatitis B).

One quarter of heroin addicts will die within ten years of commencing the habit as a direct result of the heroin use, and a rising proportion will die from complications of the intravenous injections such as AIDS, septicaemia and hepatitis B, C and D.

A heroin overdose can be treated by doctors who give regular injections of naltrexone, a medication that counteracts the effects of the heroin.
HIATUS HERNIA

In a hiatus hernia, part of the stomach slips up through the hole in the diaphragm where the oesophagus passes from the chest to the abdomen. They may be caused by increased pressure in the abdominal cavity from heavy lifting, obesity, and tension (muscle spasm occurs), or slack ligaments in the diaphragm in the elderly.

There are two types of hiatus hernia:

- Paraoesophageal hiatus hernias occur when a pocket of stomach slips up through the hole in the diaphragm beside the oesophagus. Most are small, but sometimes a large proportion of the stomach may push up into the chest.

- Sliding hiatus hernias (90% of hiatus hernias) result from the stomach sliding up into the chest, pushing the oesophagus further up into the chest.

Patients usually describe heartburn (usually worse at night when lying down, or after a meal), excessive burping, a bitter taste on the back of the tongue (waterbrash), difficulty in swallowing and sometimes pain from ulceration inside the hernia or pinching of the hernia. Further symptoms may include a feeling of fullness, and palpitations if a large hernia pushes onto the heart. Bleeding may occur from ulcers that form in the damaged part of the stomach.

A barium meal x-ray or gastroscopy is used to confirm the diagnosis.

Paraoesophageal hiatus hernias should be surgically repaired, often in a procedure known as fundoplication, unless the patient is elderly or in poor health, while sliding hiatus hernia can usually be treated with medications that reduce the amount of acid secreted by the stomach or increase the emptying rate of the stomach and strengthen the valve at the lower end of the oesophagus, posture and diet. Frequent small meals, rather than three large meals a day, and a diet low in fat and high in protein is beneficial. Obese patients must lose weight.

Medications are usually very successful in controlling symptoms, and the results of surgery are generally good.

See also REFLUX OESOPHAGITIS

HIGH BLOOD PRESSURE
See HYPERTENSION

HISTIOCYTOSIS X

Histiocytosis X or Langerhans cell granulomatosis, are a group of diseases of no known cause that result in replacement of lung, bone and intestinal tissue by fibrous scar tissue. Hand-Schueeller-Christian disease and Letterer-Siwe disease are the main types of histiocytosis X. They tend to occur in young smokers to cause worsening shortness of breath, chronic cough, and gradual destruction of the lungs, with a spontaneous pneumothorax being a possible complication. The diagnosis can be confirmed by chest x-ray, CT scan and lung biopsy.

Patients must stop smoking. Numerous treatments have been tried with varying success including medications normally used for asthma, the drug penicillamine (not the antibiotic penicillin), irradiation and lung transplant. The condition is usually slowly progressive despite treatment.

See also HAND-SCHUELLER-CHRISTIAN DISEASE; LETTERER-SIWE DISEASE

HISTOPLASMOSIS

Histoplasmosis is an uncommon infection of the lungs caused by the fungus *Histoplasma capsulatum*, which is present in soil and can be inhaled to cause a form of pneumonia. Most
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cases are very mild and may pass unnoticed or cause mild flu-like symptoms, but sometimes a moderately severe lung infection may develop, and in rare cases a severe and fatal pneumonia occurs. It is most common in Southeast Asia, South America and Africa, and very rare in developed countries.

The symptoms depend on the severity of the infection but in severe cases resemble those of a normal pneumonia with a cough, wheeze, shortness of breath, marked tiredness and a fever. The lung damage from a severe pneumonia may be permanent.

It is diagnosed after examining a sample of sputum and culturing it to determine the infecting organism. There is also a specific blood test, and X-rays of the chest show a characteristic pattern. Minor cases require no treatment, but more severe ones are treated with specific antifungal medications. With correct treatment, only the elderly or invalids are likely to die or develop long-term complications.

See also PNEUMONIA

HODGKIN’S DISEASE
See HODGKIN’S LYMPHOMA

HODGKIN’S LYMPHOMA

Hodgkin’s lymphoma or disease is a form of cancer of the lymph nodes. The cause is unknown, but it tends to occur more in males, young adults and the elderly, and there may be a genetic tendency. The group of lymphomas that do not fulfil all the criteria to be called Hodgkin’s disease are called “non-Hodgkin's lymphomas”.

Patients develop painless swellings of the lymph nodes, often in the neck, armpit and groin. Other symptoms include tiredness, fever, weight loss, night sweats and a generalised itch, and it may spread to other lymph nodes and organs in other parts of the body. The diagnosis is confirmed by removing an involved lymph node and examining it under a microscope.

Most patients can be classified into different stages (1 to 4) depending upon the degree of spread of the disease. The treatment varies depending on the stage of the disease and involves various combinations of irradiation, cytotoxic (anticancer) drugs (eg. lomustine, procarbazine), and surgery. Survival depends upon the staging, and the higher the staging the worse the outcome.

The condition is named after the English physician and pathologist Thomas Hodgkin (1798-1866).

HOOKWORM

One quarter of the entire population of the world is affected by hookworm (Ancylostomiasis), which is an infestation of the gut by the nematode worm *Ancylostoma duodenale*. The eggs of the adult hookworm, which is 1 cm long, pass out in the faeces, and if the faeces fall onto moist ground, the larvae will hatch from the eggs. The larvae remain active in moist soil for up to a week, and during that time, a larva may penetrate the skin of the foot of any person who treads on it. The larva then migrates through the bloodstream to the lung, where it breaks into the air-carrying passageways of the lung. From there it is carried with sputum up into the throat, where it is swallowed, enters the gut, develops into an adult worm and starts the process all over again. It may be caught in all the tropical countries of the world.

Patients develop an itch at the site of skin penetration, a cough, wheeze and fever while the larvae are in the lung, and mild abdominal discomfort and diarrhoea when there are a
A RATIONALE FOR THE CHEST

large number of worms in the gut, but only in patients who are otherwise ill or malnourished
does a hookworm infestation cause significant problems
Examination of a sample of faeces under a microscope reveals the worm or its eggs, and
drugs are available to successfully destroy the worms.

HYDATID DISEASE
Hydatid disease or echinococcosis, is an infestation of human tissue by the larva of the
tapeworm *Echinococcus*. The normal life cycle of *Echinococcus* requires infested meat to be
eaten by a dog or other carnivore. The larva enters the gut and grows into a tapeworm, which
then passes eggs out in the faeces to contaminate grass and soil. The normal hosts are
cattle, sheep and other grazing animals, which eat the contaminated grass and are eventually
killed by the *Echinococcus* infestation in their body. This allows the carcass to be eaten by
meat-eating animals, and the life cycle of the parasite starts again. If a human eats food that
has been contaminated by the faeces of an infected animal (usually dogs or other meat-eating
animals), the larva migrates to the liver, lung, spleen or brain, where it forms a cyst that
remains lifelong. The disease is rare in developed countries, but widespread in South
America, around the Mediterranean, in east Africa and central Asia.

After the cyst forms in the body, it usually remains dormant for many years, often causing
no symptoms. Over a decade or more the cyst slowly enlarges, until the pressure it exerts on
its surroundings causes problems. With liver cysts, there may be pain in the upper part of the
abdomen, nausea, vomiting and jaundice. In the lung, the cysts may cause part of the lung to
collapse, pain and shortness of breath. In the brain symptoms occur earlier, and even a small
cyst may cause convulsions or severe headaches. If a cyst ruptures, the reaction in the body
to the sudden release of a large number of larvae may cause sudden death or severe illness
and the formation of multiple cysts in other parts of the body. If multiple cysts are present, the
long-term outlook is grave.

The condition is diagnosed by seeing the cyst on a CT or ultrasound scan. Specific
antibody blood tests can be performed to determine whether or not a person has a cyst
somewhere in their body, but discovering the actual site of the cyst may then prove very
difficult. The blood test remains positive long term after an infection.

If possible, a cyst should be removed surgically. It is vital for the surgeon not to rupture the
cyst during its removal, because the spilled larvae can then spread through the body. In other
cases, or as an additional form of treatment, potent medications (eg. albendazole) may be
prescribed to kill the larvae, but the cyst will remain. Provided the disease is not widespread,
the results of treatment are good. Dogs in affected areas can be treated regularly to prevent
them carrying the disease.

HYPERPARATHYROIDISM
Four small parathyroid glands sit behind the thyroid gland in the neck and secrete the
hormone calcitonin, which controls the amount of calcium in the bones and blood. If these
glands become overactive (hyperparathyroidism), excess calcitonin is secreted, resulting in
calcium being taken out of the bones and into the blood. It is a rare disease that may be
caused by a tumour or cancer in one of the parathyroid glands, but often no cause can be
found.

The bones become brittle and painful and break easily, and the high levels of calcium in
the blood cause kidney stones and damage (which can result in thirst and the passing of large
quantities of urine), high blood pressure, constipation and peptic ulcers in the stomach. Damage to the kidneys may occur, and they may eventually fail.

The diagnosis is confirmed by finding high levels of calcium in the blood and urine, and CT scans are used to determine the site of the affected gland.

Delicate surgery is necessary to remove the overactive gland and patients must take copious amounts of fluid to flush out the kidneys. There are no drugs that can be used. The surgery is successful in most cases, but without treatment, the disease will steadily progress until serious complications result.

**HYPER-REACTIVE AIRWAYS DISEASE**

Hyper-reactive airways disease is an inflammatory lung condition similar to asthma that often follows a viral infection of the upper airways or lungs, or may be due to inhalation of irritant gases or an allergy. The symptoms are persistent wheezing, cough and shortness of breath. There are more allergy type symptoms and less phlegm production than in asthma, and lung function tests and chest x-ray are usually normal. Inhaled steroids (eg. beclomethasone, budesonide, fluticasone) or anti-inflammatories (eg. ipratropium) are used in treatment. Rarely, in persistent cases, prednisone tablets are prescribed. The condition settles spontaneously eventually, but responds well to treatment.

See also ASTHMA

**HYPERTENSION**

Hypertension is high blood pressure, an excessive pressure of blood within the arteries that occurs in 20% of adults over 40 years of age.

The heart contracts regularly to pump blood through the arteries under high (systolic) pressure. When the heart relaxes between beats, the blood continues to flow due to the lower (diastolic) pressure exerted by the elasticity of the artery walls. Hypertension occurs when one, or both, of these pressures exceed a safe level. Blood pressure readings are written as systolic pressure/diastolic pressure (eg. 125/70) and are measured with a sphygmomanometer. The numbers are a measure of pressure in millimetres of mercury.

Blood pressure varies with exercise, anxiety, age, fitness, smoking and drinking habits, weight and medications. In a very elderly person 160/90 may be acceptable, but in a young woman, 110/60 would be more appropriate. A blood pressure of 140-160/90-100 would be watched carefully for a couple of months, then treatment started once a persistently high level confirmed. Levels above 160/90 are usually treated sooner, and over 200/120 immediate treatment is necessary.

When treating a patient, doctors will try to keep blood pressure below 140/85, but even lower figures may be desirable in diabetics and those with a bad family or personal history of heart disease. Life insurance companies generally require the blood pressure to be under 136/86 for the person to be acceptable at normal rates.

The arteries of a person with high blood pressure will become hardened, brittle and may eventually rupture, causing a stroke, heart attack or other serious injury to vital organs.

The majority of patients have "essential" hypertension, for which there is no single identifiable cause. The identifiable causes include smoking, obesity, kidney disease, oestrogen-containing medications (eg. the contraceptive pill), hyperparathyroidism, phaeochromocytoma and a number of other rare diseases. High blood pressure may also be a complication of pregnancy (pre-eclampsia), when it can lead to quite serious consequences.
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The majority of patients have no symptoms for many years, but those who do have symptoms complain of headaches and tiredness, although only when the blood pressure is very high (malignant hypertension) do the further symptoms of nausea, confusion, and disturbances in vision occur.

Once diagnosed, blood and urine tests are performed to see if there is any specific cause, and x-rays of the kidneys and an electrocardiogram (ECG) may also be performed.

Hypertension is prevented by keeping weight within reasonable limits, not eating excessive amounts of salt, not smoking, and by exercising regularly.

There is no cure, but hypertension can be successfully controlled by taking antihypertensive tablets regularly lifelong. A wide range of medications are available (eg, diuretics, alpha blockers, beta-blockers, calcium channel blockers, ACE inhibitors etc.), but it takes days or weeks for the tablets to work. Regular checks are essential until the correct dosage is determined, then blood pressure checks every 3 to 6 months are necessary. Severe life threatening high blood pressure may be treated with diazoxide injections.

Untreated high blood pressure causes strokes and heart attacks at an earlier age than would be expected with normal blood pressure. Other complications may include kidney damage and bleeding into an eye. A rapidly progressive condition, known as malignant hypertension, can sometimes develop and cause remarkably high levels of blood pressure.

Once controlled, there is no reason why the patient should not lead a full and active working, sporting and sexual life. Untreated, most patients with only moderate hypertension die within 20 years.

See also MYOCARDIAL INFARCT; PHAEOCHROMOCYTOMA; PORTAL HYPERTENSION

HYPERTENSION, PULMONARY
See COR PULMONALE

HYPERTHYROIDISM

Hyperthyroidism is overactivity of the thyroid gland, which sits in the front of the neck and is responsible for secreting a hormone called thyroxine. More severe forms may be called thyrotoxicosis or Grave’s disease or Basedow’s goitre.

Thyroxine acts as the accelerator for every cell in the body. If the level of thyroxine is high, the cells function at an increased rate - if the level of thyroxine is low, the cells function at a less than normal rate. The most common cause is an autoimmune disease, in which antibodies attack the thyroid gland and over stimulate it, but there are numerous other rarer causes.

Patients sweat excessively, lose weight, are nervous, tired, cannot tolerate hot weather and have a mild diarrhoea. Other effects include a rapid heart rate, slightly protruding eyes, warm skin, and a slight tremor. Patients also tend to fidget, dart quickly in their activity, and speak rapidly. The thyroid gland may be grossly enlarged (a goitre) or normal size.

The complications are serious. The weight loss and muscle wasting may become permanent, liver damage and heart failure may be fatal, psychiatric disturbances may lead to hospitalisation, eye scarring may lead to blindness, and infertility may occur.

The level of thyroxine and gland activity can be measured by blood tests, antibodies (eg. TRAB) can be detected in the patient’s blood and abnormalities may also be seen on an electrocardiogram (ECG).
The overactivity can only temporarily be controlled by medication (e.g. propylthiouracil), but a cure can be obtained by surgically removing most of the thyroid gland or destroying it by giving the patient radioactive iodine (sodium iodide or iodine 131), which concentrates in the gland as it is an essential component of thyroxine.

Because there is usually insufficient thyroid gland left behind after these procedures to produce adequate amounts of thyroxine, it is necessary for most patients to take thyroxine tablets on a daily basis.

If treated early, the prognosis is excellent, but if treatment is delayed until complications occur the outcome is far less favourable.

**HYPERVENTILATION**

Hyperventilation (tachypnoea) is excessively rapid breathing, generally above 35 breaths per minute in adult.

There are many possible causes including anxiety, pain, fever, hysteria, a blood clot in the lungs (pulmonary embolism), infection, stroke, pneumothorax, a lack of oxygen (e.g. high altitude, suffocation), heart disease and medications (e.g. adrenaline).

**HYPOPARATHYROIDISM**

The four parathyroid glands behind the thyroid gland in the neck regulate the amount of calcium in the blood and bones. In hypoparathyroidism, the glands secrete inadequate amounts of the hormone calcitonin, which results in excessive amounts of calcium to be taken from the blood and into the bones. It is a rare condition that may occur after thyroid gland surgery, or may be spontaneous for no apparent reason.

Symptoms may include spasms of the small muscles in the hands and feet, tingling lips, tiredness, wheezing, muscle cramps, fungal infections, abdominal pains, anxiety attacks, and behavioural alterations. If present for some time, the nails will become thin and brittle, the teeth will be deformed, cataracts may develop in the eyes, and the skin becomes dry and scaly. Untreated, it may cause irregular heartbeat, reduced growth in children, anaemia and intellectual disability.

The diagnosis is confirmed by measuring the amount of calcium in the blood, and x-rays show very dense bones and calcium deposits in abnormal areas (e.g. brain).

Treatment may be an emergency in serious cases. Calcium injections and tablets, and vitamin D tablets are used, and once stabilised on treatment, the long-term outlook is good, but damage already done to eyes, teeth and other tissues may be irreversible. Very regular blood tests, follow-up visits, and lifelong medication are essential.

See also HYPERPARATHYROIDISM

**HYPOTHYROIDISM**

Hypothyroidism is underactivity of the thyroid gland, which sits in the front of the neck and is responsible for secreting a hormone called thyroxine. This acts as the accelerator for every cell in the body. If the level of thyroxine is high, the cells function at an increased rate - if the level of thyroxine is low, the cells function at a less than normal rate. In children, hypothyroidism causes cretinism. The thyroid gland tends to fail with advancing age, particularly in women, it may be associated with an enlarged thyroid gland (goitre), and less commonly cysts or tumours may destroy the gland tissue.

Tiredness, weakness, muscle cramps, constipation, dry skin, headaches, nervousness, intolerance to cold weather and a hoarse voice are the most common symptoms. In more
severe cases additional symptoms may include thinning of the hair, skin thickening, brittle nails, weight gain, shortness of breath, a thick tongue and a slow heart rate. The symptoms are referred to as myxoedema. The drop in thyroxine levels is usually gradual over many years and the symptoms may be overlooked until the disease is quite advanced. It is diagnosed by blood tests that measure the amount of thyroxine, and other thyroid-related substances.

Thyroxine or liothyronine tablets are taken long term to replace that not being produced by the gland. Patients usually notice a remarkable improvement in their quality of life as the thyroxine replacement tablets start to work. With adequate treatment the patient should lead a normal active life, but untreated, there is an increased risk of developing severe infections and heart failure, and premature death will occur.

**IDIOPATHIC PULMONARY FIBROSIS**

Idiopathic pulmonary fibrosis (cryptogenic fibrosing alveolitis) is an uncommon (1 in 10,000 people) condition of middle aged and elderly people in which normal lung tissue is replaced by fibrous tissue. The cause is unknown, but it may be a form of autoimmune disease in which the body rejects its own tissue.

Patients develop progressively worsening shortness of breath, crackling breath sounds, coughing and attacks of bronchitis. Pneumonia and heart failure may also develop. It is diagnosed by chest x-ray, nuclear scans, lung function tests, lung biopsy and blood tests.

Lung transplantation may help some patients, steroids may slow the progress of the disease, and a number of innovative medications are being used experimentally, but the condition is usually slowly progressive until the lungs and/or heart fail. Patients without treatment survive 2 to 4 years after diagnosis.

See also AUTOIMMUNE DISEASES

**IMMOTILE CILIA SYNDROME**

The immotile cilia syndrome is a rare inherited disorder involving a defect in the structure of the microscopic hairs (cilia) lining ducts and tubes in the lungs, nose, sinuses, Fallopian tubes and vas deferens (sperm tube). The syndrome can be diagnosed by examining cilia under an electron microscope.

Patients develop recurrent, severe lung and sinus infections. Severe lung infections (eg. pneumonia), bronchiectasis (chronic lung infection) and reduced fertility in both sexes may be complications. Treatment involves medications to improve lung function (eg. prednisone, inhaled steroids) and antibiotics for infections. There is no cure, but control of symptoms is reasonable.

See also BRONCHIECTASIS

**INFECTIOUS MONONUCLEOSIS**

Glandular fever (infectious mononucleosis or the kissing disease) is a very common viral infection of the lymph nodes (incorrectly called glands) in the neck, armpit, groin and belly, that almost invariably occurs in teenagers or in the early twenties. It is caused by the Epstein-Barr virus (EBV) which is passed from one person to another through the breath. The patient is infectious while s/he has the tender lymph nodes, and good personal hygiene is important to prevent further spread.

Patients have a sore throat, raised temperature, large lymph nodes in the neck and other parts of the body, extreme tiredness, and generally feel miserable. It usually lasts about four
A RATIONALE FOR THE CHEST

weeks, but in some patients it may persist for several months. Some antibiotics (eg. penicillin) can cause a widespread rash if taken while glandular fever is present. Other complications are very uncommon, but include secondary bacterial infections, infected spleen, or in even rarer cases the liver, heart and brain may be involved.

A specific antibody blood test can prove the diagnosis, but may not turn positive until ten days after the onset of the symptoms. The test is unreliable in children before puberty.

There is no specific cure, and patients must rest as much as possible, take aspirin or paracetamol for the fever and aches, and use gargles for the sore throat. Recurrences are possible in the following year or two at times of stress or lowered resistance.

INFLUENZA

Influenza (the flu or grippe) is a debilitating generalised viral infection caused by one of the more than 80 known strains of the influenza virus. Influenza was originally a disease of pigs and ducks, that passed to humans only after these animals were domesticated seven thousand years ago. It was once thought to be due to “influences in the atmosphere”, thus giving its name. The various flu virus strains are named after the places where they were first isolated. It spreads by microscopic droplets in a cough or sneeze from one person to another.

Muscular aches and pains, overwhelming tiredness, fever, headache, cough, runny nose, stuffed sinuses, painful throat and nausea are the main symptoms. It can be a very serious disease, but deaths are now rare except in the elderly and debilitated.

The diagnosis of influenza, and the specific form present, can be confirmed by a blood test that detects a specific immunoglobulin antibody. The test is not routinely performed as it does not change the treatment and often serves no useful clinical purpose.

Influenza can now be cured, but only if the antiviral medication (zanamivir or oseltamivir) is given within the first 36 hours of symptoms developing. Otherwise rest and time, aspirin, anti-inflammatory drugs and medications to help the phlegm and cough are given. A light nutritious diet that contains minimal fat, and a higher than normal fluid intake are sensible.

Influenza can be prevented by an annual vaccination in autumn, which gives more than 80% protection from contracting the infection, but only for one year as the formulation varies every year to match the strains of flu virus present in the community. Two injections a month apart are required for a first vaccination if under 18 years of age. It is not designed to be used in pregnancy, but no adverse effects are expected if a vaccination given inadvertently. It may be used in breastfeeding, but is used in children only if specifically indicated. Do not have a flu vaccine if suffering from Guillain-Barré syndrome, AIDS a high fever or if allergic to eggs, poultry products, neomycin, polymyxin or gentamicin. Side effects may include local discomfort and redness at the injection site, and uncommonly fever and muscle pain.

Influenza vaccine gives only limited protection, but this increases with subsequent doses. It should be given to persons over 65 years, persons with debilitating illness, persons with chronic diseases (eg. of the lung, heart, kidneys etc.), persons undergoing immunotherapy, all health and medical personnel and anyone who wishes to avoid catching the flu that season.

Unfortunately the vaccine does not prevent the common cold, and many people who complain that their flu shot has not worked are suffering from a cold caused by yet another group of viruses.

Amantadine tablets will prevent type A influenza while they are being taken. Secondary bacterial infections of the throat, sinuses, lungs and ears may occur, which can be treated with antibiotics.
A RATIONALE FOR THE CHEST

Influenza normally lasts for seven to ten days, and the vast majority of patients recover without complications.
See also COLD, COMMON

INSECTICIDE POISONING
Stronger insecticides that contain organophosphate chemicals (eg. parathion, paraquat, fenthion and malathion) may cause poisoning in humans by swallowing, inhaling or touching. Wheezing, contracted pupils, excessive sweating, nausea, vomiting, watery eyes, and diarrhoea are the common symptoms, and blood tests show serious abnormalities. In severe cases, symptoms can progress to muscle weakness, convulsions, coma and death.

First-aid is vital. If the poison has been swallowed, the patient must be made to vomit, and then given milk. The patient must be thoroughly washed to remove any poison from the skin, and contaminated clothing must be removed. Mouth-to-mouth resuscitation and external cardiac massage may be necessary. Those giving first aid must be careful not to contaminate themselves. In hospital emergency treatment and medication to neutralise the poison can be given.

The prognosis depends upon the type of poison, its dosage, and the age and fitness of the patient.

INTERMEDIATE CORONARY SYNDROME
The intermediate coronary syndrome (acute coronary syndrome or unstable angina) is an intermediate stage between angina and myocardial infarct (heart attack). It is caused by damage to the arteries supplying the heart muscle from high blood pressure, excess cholesterol in the blood and other causes.

Patients experience chest pain (angina) that varies in nature, severity, duration, spread, timing and cause from one attack to another or even during attacks. Sometimes these attacks may develop into a heart attack.

Rest, nitrates under the tongue or inhaled, and medications to prevent attacks are used in treatment. If possible, coronary artery bypass graft surgery is performed. There is a worse prognosis than normal angina with a mortality rate of 15% per annum.

See also ANGINA; MYOCARDIAL INFARCT

IRON DEFICIENCY ANAEMIA
Iron deficiency anaemia is the most common form of anaemia. Iron is essential for the manufacture of haemoglobin, which transports oxygen in the blood. If iron levels are low, haemoglobin levels drop and the body becomes starved of oxygen. It is usually found in women who have very heavy periods or are pregnant, and in those with an iron deficient diet. Serious causes include slow bleeding into the gut from a peptic ulcer or cancer.

Tiredness, weakness and pallor are the main symptoms. Anaemia is diagnosed by appropriate blood tests, then the cause of the anaemia must be determined by more extensive investigations.

Iron supplements by mouth are the main treatment. Iron is found in many foods including meat, poultry, fish, eggs, cereals and vegetables. Vitamin C and folic acid assist in the absorption of iron from the gut into the blood, and because of this, iron tablets often contain folic acid, and sometimes vitamin C as well. Some patients with severe degrees of anaemia due to lack of iron, or to intestinal diseases that reduce the absorption of iron, may require

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iron injections, but usually they can return to tablets, and then a good diet, after only a few shots.

**IRUKANDJI SYNDROME**

The Irukandji syndrome is named after an Aboriginal tribe that lived north of Cairns, Australia, and is an excessive and abnormal response to the sting of the tiny transparent jellyfish *Caukia barnesi* (named after the Cairns doctor, Jack Barnes, who discovered it) that is found in the waters of tropical Australia.

The lungs fill with fluid causing severe shortness of breath, and patients experience excruciating widespread pain, a rapid heart rate, profuse sweating, generalised shaking and very high blood pressure. Narcotic pain killers and other pain killers in high doses are given through a drip, diuretics (fluid removing drugs) are prescribed and machine ventilation through a tube into the throat may be necessary. Permanent brain damage and death are rarely possible, but most patients recover, although some may have long-term nerve damage and pain.

**ISCHAEMIC HEART DISEASE**

Ischaemic heart disease (IHD) is any damage to the heart caused by a poor blood supply to the heart muscle.

See also ANGINA; INTERMEDIATE CORONARY SYNDROME; MYOCARDIAL INFARCT

**KARTAGENER SYNDROME**

Kartagener syndrome is an inherited abnormality of organ position in which the heart is on the right side of the chest (dextrocardia) instead of the left, and recurrent sinus and lung infections (bronchiectasis) occur. In some patients, the organs in the abdomen (liver, spleen, gut etc.) are also reversed in position (situs inversus). An X-ray of the chest will show the abnormal heart position. Sometimes surgical correction of defects if required, but in most cases it is merely necessary to use antibiotic and symptomatic treatment of lung and sinus problems. There is no cure, but most problems can be corrected or controlled.

See also BRONCHIECTASIS; IMMOTILE CILIA SYNDROME

**KAWASAKI SYNDROME**

Kawasaki syndrome (or mucocutaneous lymph node syndrome) is an uncommon generalised inflammatory condition of infants with no known cause. Affected babies are lethargic, develop high fevers, inflamed mouth, widespread rash, conjunctivitis, enlarged lymph nodes in the neck, artery inflammation and damage, and redness and peeling of the skin on the hands and feet. Patients may also have diarrhoea and heart artery complications. Blood tests show abnormalities but are not diagnostic.

There is no effective treatment, but aspirin may be used for inflammation.

Serious heart complications occur in 30% of survivors and it is fatal in 3% of cases. Others have a prolonged illness.

**KESHAN DISEASE**

Selenium is an essential trace element in the human diet. It is found in very high levels in Brazil nuts, and in modest levels in kidneys, cereals, prawns, beans, meat, fish and eggs. Selenium deficiency is more common in Finland, New Zealand and northeast China (Keshan province). A lack of selenium in the diet causes Keshan disease.
Patients develop nausea, vomiting, muscle weakness, chest pain and heart failure (cardiomyopathy). Sudden death may occur due to heart damage. A severe form of arthritis and retarded growth in children, Kaschin-Beck disease, can also occur with selenium deficiency. An increased incidence of infection due to a poorly functioning immune system, and an increased incidence of cancer, particularly of the lung, prostate and liver, are other possible effects.

Blood tests can accurately measure the amount of selenium in the body, and selenium can also be measured in hair samples.

Selenium supplements in small doses control the condition successfully. Excess selenium is toxic, so doses of supplements must be carefully monitored.

See also CARDIOMYOPATHY; SELENIUM; SELENOMETHIONINE

**KIDNEY FAILURE, CHRONIC**
See RENAL FAILURE, CHRONIC

**LARYNGOMALACIA**
Laryngomalacia is a rare congenital condition of the throat in children in which the cartilage of the larynx (voice box) is softened, and collapses easily. When the patient breathes in heavily with exercise, a croupy cough and shortness of breath occur. It is diagnosed by laryngoscopy (looking down the throat with an instrument) and treated by surgical bracing of the larynx. There is no cure, but treatment allows a relatively normal life, although the voice may be permanently distorted.

**LEGIONNAIRE’S DISEASE**
Legionnaire’s disease (Legionella pneumonia) is a serious form of bacterial pneumonia caused by the bacterium Legionella pneumophila. It is usually spread by contamination of air-conditioning systems in large buildings with water cooling towers, and is named because of an epidemic that occurred at a Legionnaire’s (ex-serviceman’s) convention in the USA in 1976. Once an epidemic occurs, it is essential for the responsible building and air-conditioning system to be identified so that it can be thoroughly cleaned and disinfected. Victims inhale the Legionella bacteria into their lungs in microscopic droplets of water.

The symptoms are variable but may include a fever, productive cough and chest pains. Some patients may develop only a mild infection and recover without treatment, but others (particularly smokers) will rapidly deteriorate. Permanent lung damage such as chronic bronchitis and emphysema may also occur.

It is diagnosed by listening to the chest with a stethoscope, chest X-rays, blood tests and tests on the sputum, to differentiate legionnaire's disease from other types of pneumonia. The antibiotic erythromycin will slowly cure most cases, but ancillary treatment, such as physiotherapy and expectorant medications, are also necessary.

Even with good hospital care up to 15% of patients will die, particularly if they are elderly, smokers or have other lung disease.

See also BRONCHITIS, CHRONIC; EMPHYSEMA; PNEUMONIA

**LETTERER-SIWE DISEASE**
Letterer-Siwe disease is one of a number of rare diseases grouped together as histiocytosis X, which are lung diseases in which normal tissue is replaced by abnormal fibrous tissue. The cause is unknown, but it occurs in infants under two years of age who
develop a fever, muscle wasting, a raised itchy rash, enlarged lymph nodes in the neck, armpit and groin, and enlargement of the liver and spleen. There are three stages of the disease, depending on its severity. The outcome is very good in stage one of the disease, but worsens in the other two stages, with a 70% mortality rate in stage three when it may spread to bone.

It is diagnosed by x-rays, CT scans and blood tests, and treatment involves potent chemotherapy drugs and radiotherapy.

**LEUKAEMIA, CHRONIC LYMPHOCYTIC**

Chronic lymphocytic (lymphatic) leukaemia is a very slowly progressive form of white blood cell cancer found almost exclusively in the elderly. Most patients have only vague symptoms of tiredness or enlarged lymph nodes. The liver and spleen may enlarge, and in severe cases bleeding from nose and gums and into the skin may occur. The diagnosis is frequently made after a routine blood test for another reason.

Because of its slow progress many patients are given no treatment, but if it becomes more active, steroid and cytotoxic drugs are given. Severe anaemia or excessive bleeding may require an operation to remove the spleen. The disease is slowly but relentlessly progressive, with an average survival time of eight years, but because the patients are elderly, they frequently succumb to other diseases before the leukaemia.

See also LEUKAEMIA, CHRONIC MYELOID

**LEUKAEMIA, CHRONIC MYELOID**

Chronic myeloid leukaemia (CML) is a slowly progressive form of white blood cell cancer that occurs in middle-aged to elderly people. Patients complain of an intermittent fever, tiredness, excessive sweating and fullness in the abdomen. The spleen may also be enlarged. It is often discovered incidentally on a routine blood test, then the diagnosis is confirmed by further blood tests and a bone marrow biopsy.

There is no great urgency in treatment until blood test results reach certain levels, then cytotoxic or immunosuppressive drugs are given. Medication does not cure the disease, but slows its progress and makes the patient feel better. Another form of treatment is bone marrow transplantation but finding a compatible donor is difficult.

Once blood tests deteriorate to the point where treatment is necessary, on drug therapy alone the average survival time is four years. If a donor can be found and marrow can be transplanted, 60% of patients can be cured.

See also LEUKAEMIA, CHRONIC LYMPHOCYTIC

**LÖFFLER SYNDROME**

Löfller (or Loeffler) syndrome (also known as PIE syndrome) is a form of allergy reaction affecting the lungs. The underlying cause may be a reaction to drugs, an allergy reaction to a huge variety of substances, visceral larva migrans and other worm infestations. Asthmatics are more prone to this syndrome.

The main characteristic is technically called pulmonary infiltrates with eosinophilia, which gives the syndrome its alternative acronym name of PIE syndrome. In plain English this means that the lungs have too many allergy response cells, which results in a wheeze, cough and fever. Allergy reactions may also occur in other organs and areas of the body.
A lung biopsy is abnormal, and blood tests show very high levels of eosinophils (allergy response cells). Doctors treat the underlying cause if possible, but otherwise treatment is same as asthma. The prognosis depends on the cause, but is usually good.

See also ASTHMA

LOUIS-BAR SYNDROME
The Louis-Bar syndrome is a rare form of rapidly progressive brain deterioration due to degeneration of the cerebellum (lower back portion of brain) and spinal cord. The symptoms include dilated capillaries on the whites of the eyes, the face and areas of skin flexion (eg. arm pit, behind knee); intellectual disability; recurrent infections of lungs and ears, and poor coordination that steadily worsens. Late symptoms include twitching movements of the eyes and abnormal writhing movements of the arms and legs. There is an above average incidence of cancer.

Numerous blood tests are abnormal, including very low immunoglobulin levels.

No treatment is available and death in teenage years is usual.

LUNG ABSCESS
A lung (pulmonary) abscess is a localised collection of pus within the lung that may be a complication of pneumonia or a wound that penetrates into the lung. The symptoms may include chest pain, shortness of breath, fever, a cough and collapse. Permanent scarring of lungs, uncontrolled spread of infection and rarely death may also occur.

A chest X-ray or CT scan shows the presence and location of an abscess, then surgery is performed to drain the abscess and potent antibiotics are prescribed. Recovery is often stormy, but treatment is usually successful.

See also PNEUMONIA

LUNG CANCER
The terms lung cancer, bronchial carcinoma and bronchogenic carcinoma describe any of several different types of cancer affecting lung tissue. The incidence of this type of cancer is steadily increasing, particularly in women, and it is the most common form of internal cancer.

Smoking causes 90% of all lung cancers, but this effect of smoking is usually delayed until the patient is 55 or older. Other causes of lung cancer include asbestos dust, irradiation and chrome dust.

There are several different types of lung cancer, depending on the cells within the lung that are affected. The common types are:

- Squamous cell carcinoma is a relatively common form, in which symptoms usually occur early, but the cancer doubles in size every three months on average, and spreads early to lymph nodes.
- Oat cell (small cell) carcinomas are far more serious, double in size every month on average, spread rapidly to other parts of the body, and are almost impossible to cure.
- Adenocarcinomas and large cell carcinomas develop at the edge of the lung, have few symptoms, are not easily detected, double in size every three to six months, but spread early to distant parts of the body.
- Secondary cancers are the spread of cancer from other parts of the body to the lungs. These are common, but they are not caused by smoking, and their treatment involves the treatment of the original cancer as well as that in the lung.
Many other rarer types of lung cancer are known. The early warning signs are weight loss, recurrent chest infections (bronchitis), a persistent cough, a change in the normal type of cough, coughing blood, chest pain and worsening breathlessness. Later symptoms include loss of appetite, chest pain, hoarseness and enlarged tender lymph nodes in the armpit. Spread of the cancer to other organs is the next stage, most commonly to bone and the brain, and blockage of the veins draining the head and arms (superior vena cava syndrome). One quarter of patients have no symptoms when the diagnosis is made, often by a routine chest X-ray, so smokers should consider having a routine chest X-ray every few years.

The cancer is diagnosed by chest X-rays, CT scans, sputum examination and a biopsy of the tumour using a bronchoscope if possible.

Prevention is always better than cure, and that means stop smoking. Even in heavy smokers, after five years of non-smoking, the risk of developing lung cancer will reduce to near normal.

Treatment involves major surgery, irradiation and potent drugs (chemotherapy), depending on the type of cancer present. Radiation may be used to shrink the original tumour, but is primarily used to treat cancers that have spread to other organs.

The prognosis is poor. Fewer than 15% of all patients with lung cancer survive more than five years from diagnosis. Those with small cell (oat cell) carcinoma usually die within a year, while those with squamous cell carcinoma tend to live longer than average.

See also ASBESTOSIS; MESOTHELIOMA; PANCOAST SYNDROME; PANCOAST TUMOUR; SUPERIOR VENA CAVA SYNDROME

**LUPUS ERYTHEMATOSUS**
See SYSTEMIC LUPUS ERYTHEMATOSUS

**LYMPHOMA**

Lymphomas are any form of cancer involving the lymphatic system, stem cells, white blood cells and lymph nodes.

See also HODGKIN’S LYMPHOMA; LEUKAEMIA

**MAMMARY DYSPLASIA**

Mammary dysplasia is also known as chronic cystic mastitis and fibrocystic disease of the breast. It is a common cause of breast lumps and cysts, and breast discomfort in middle-aged women, and is caused by overactivity of the ovaries in producing too much oestrogen. It is often an inherited characteristic.

Affected women develop multiple, tender, painful, small lumps in the breasts that vary in size and severity with the monthly hormonal cycle. They are usually worse just before a menstrual period. Large cysts may form permanently in the breast, and persistent pain and discomfort may significantly affect the woman’s lifestyle.

Mammography (breast x-ray) and ultrasound may be used initially, but in most cases needle or surgical biopsy is necessary to confirm the diagnosis.

Initially a firm bra should be worn day and night. Individual cysts may be drained through a needle when they become too large or uncomfortable. Medical treatment involves using drugs such as the contraceptive pill to regulate the menstrual cycle, nonsteroidal anti-inflammatories, danazol and progestogens. Avoiding caffeine helps some patients. The condition often persists until menopause, when it naturally subsides.
A RATIONALE FOR THE CHEST

See also BREAST CANCER; FIBROADENOMA OF THE BREAST

MARFAN SYNDROME

Marfan syndrome is an uncommon inherited condition that affects the skeleton, heart and eye, and occurs in all races but only in one out of every 20,000 people.

Its characteristics include very long thin bones in the arms, legs, fingers and toes (arachnodactyly), a tall skull, excessive joint movement, a high foot arch and a humped back. Half the patients have an eye lens that is in the wrong position, and they may develop keratoconus (protruding eye surface) and a detached retina (the light-sensitive area at the back of the eyes), which results in partial or total blindness. An abnormality in the elastic tissue of the heart valves and major arteries causes these to fail and the pumping of the heart to be inefficient. The main artery of the body, the aorta, becomes overly dilated and distorted and may eventually rupture, and heart infections (endocarditis) are common. Most patients do not have all these symptoms, as there is great variation between them. Some may be totally unaware that they are affected and just appear to be very tall and thin.

It is diagnosed by the characteristic appearance of the long bones on X-ray, and by assessing the heart abnormalities with echocardiograms. The problems in the heart and aorta are controlled and corrected by both medication and surgery, but death in middle age is common unless corrective surgery is successful.

See also ENDOCARDITIS

MASTITIS

Mastitis (milk fever) is an infection of the breast tissue, almost invariably in a breastfeeding woman. It usually occurs if one of the many lobes in the breast does not adequately empty its milk, and may spread from a sore, cracked nipple. Women nursing for the first time are more frequently affected.

The breast becomes painful, very tender, red and sore, and the woman may become feverish, and quite unwell. Antibiotic tablets such as penicillin or a cephalosporin usually cure the infection rapidly and the woman can continue breast feeding, but if an abscess forms, an operation to drain away the accumulated pus is necessary. In recurrent cases, bromocriptine may be used to stop or reduce breast milk production.

See also MAMMARY DYSPLASIA

MEASLES

Measles (technically called morbilli or rubeola) is a highly contagious Morbilli virus infection that is contagious from five days before the rash appears until it disappears. The incubation period is 10 to 14 days. It was originally a disease of cattle that was only passed to humans after these animals were domesticated many thousands of years ago.

It starts with the cold-like symptoms of a snuffy nose, cough and red eyes. A rash develops about four days later, starting in the mouth where tiny white spots appear on the lining of the cheeks. Dark red blotches then develop on the face and gradually spread across the body, remaining for a week or more before gradually fading. Other symptoms include a high fever and eye discomfort with bright lights. The patient often starts to feel better once the rash has reached its maximum spread.

The diagnosis can be confirmed by blood tests if necessary, and previous exposure to the measles virus or vaccine can also be confirmed by specific antibody blood tests.
There is no specific treatment. Rest, paracetamol and medication are used to relieve the cold symptoms, and vitamin A supplements appear to reduce the severity of an attack. Children must be excluded from school for at least four days after the appearance of the rash.

Measles may be prevented by a vaccination, which is usually given at one and four years of age in combination with the mumps and rubella (German measles) vaccine, and with widespread vaccination, it is becoming a rare infection in developed countries, and may be totally eradicated by 2020.

Complications include encephalitis (a serious brain infection), pneumonia, ear infections and damage, and possibly the increased risk of developing multiple sclerosis later in life. Immediately after an attack patients are susceptible to other infections, and a significant number will develop tonsillitis, ear and lymph node infections.

The prognosis is usually very good, but significant complications occur in one in every 200 cases, and death occurs in one in every 5000 cases in developed countries, while in third-world countries one in ten children or adults who catch measles will die.

**MEIGS SYNDROME**
Meigs syndrome (Demons-Meigs syndrome) is a fibrous growth in an ovary that causes abnormal levels of sex hormone production and swelling of the belly from fluid retention. Surgical removal of the ovarian tumour is necessary and infertility is a complication.

**MELIOIDOSIS**
Melioidosis is an uncommon infection of the lungs caused by the bacterium *Pseudomonas pseudomallei*, which occurs throughout south and East Asia, and has been reported in Aboriginal communities in northern Australia. It is widespread in soil, and is caught by inhaling dust, while person-to-person spread is rare. Occasionally wounds, the gut and other internal organs can be infected by dirt contamination of a wound or food.

It is usually a low-grade persistent infection with minimal symptoms, but in a minority it develops rapidly with symptoms similar to pneumonia such as a cough, fever, muscle pains, loss of appetite and chest pain. It is diagnosed by examination of sputum and specific blood tests.

Treatment is only necessary if the patient has symptoms, and involves long-term use of antibiotics and relapses after treatment has been completed may occur. No form of prevention or vaccination available. The prognosis is good with appropriate treatment, but without treatment, patients who develop pneumonia usually die.

See also PNEUMONIA

**MENDELSON SYNDROME**
Mendelson syndrome is a complication of unconsciousness or anaesthesia due to acid from the stomach coming up the oesophagus, into the throat, and then being inhaled into the lungs. The result is severe spasm and inflammation of airways in the lungs similar to, but more serious than, a severe asthma attack. A chest x-rays shows the lung damage.

Treatment involves passing a breathing tube into the lungs to give artificial respiration, oxygen, drugs to open the airways and reduce inflammation (eg. steroids), antibiotics and a drip to control body fluids and chemistry.

Permanent lung damage may occur, but most patients recover satisfactorily.
MESENTERIC ADENITIS

The mesentery is a thin membrane that connects the small intestine within the abdomen to the back wall of the abdomen and contains the arteries, veins and nerves that supply the intestine. Scattered through the mesentery are numerous lymph nodes that may become infected or inflamed to cause mesenteric adenitis.

It is almost invariably a viral infection that is far more common in children than adults, and is often preceded by another infection such as a bad cold or bronchitis. The symptoms are identical to those of appendicitis, and many patients at operation for acute appendicitis are found to have mesenteric adenitis. Blood tests are unable to differentiate between the two diseases, as an infected appendix causes the same changes in the blood as infected lymph nodes. Both cause severe abdominal pain, nausea, diarrhoea and fever.

No specific treatment is available and symptoms usually settle without treatment after five to ten days.

MESOTHELIOMA

Mesothelioma is a serious form of lung cancer caused by inhalation of asbestos fibres, smoking, or because of the long term inhalation of other irritants (eg. talc dust, coal dust). Up to 7% of patients with asbestosis develop mesothelioma, but half the time it occurs in non-asbestosis sufferers. The average age of onset is 60, and the latent period between exposure to asbestos and development of mesothelioma can be up to 40 years. It has a very insidious onset, with symptoms little different to asbestosis itself.

X-ray changes may not be apparent until the disease is quite advanced, and CT scans are more useful in making the diagnosis in suspicious cases. A biopsy of the cancerous area is the only way to make a definite diagnosis.

Treatment with surgery, drugs and radiation has been tried, but with virtually no success as the cancer is extremely virulent and spreads rapidly. Three quarters of victims die within a year of the diagnosis, and 98% within two years.

See also ASBESTOSIS; LUNG CANCER

METABOLIC ACIDOSIS

The acidification of blood is known as acidosis. If the acidosis is due to metabolic (chemical) processes in the body, rather than changes in breathing, it is called metabolic acidosis. Acidosis is defined as a blood pH of less than 7.4. Causes include starvation and severe diabetes mellitus, when fat is broken down to give energy to the body, rather than sugars. Other causes include severe diarrhoea, kidney failure and heart failure.

MITRAL REGURGITATION

See MITRAL VALVE INCOMPETENCE

MITRAL VALVE INCOMPETENCE

A leak of the mitral valve between the upper and lower chambers on the left side of the heart is called incompetence or regurgitation. The valve receives its name because its two halves resemble a bishop's mitre. The leak may be caused by rheumatic fever, endocarditis, heart tumours (eg. myxoma) or Marfan syndrome. When the large left ventricle (lower heart chamber) contracts, blood is forced not only into the aorta (where it should go), but also back through the damaged valve and up into the smaller left atrium (upper heart chamber) from where it has just come. This puts pressure back into the lungs and patients develop shortness
of breath and abnormal fatigue. An irregular heartbeat, lung failure and infections of the damaged valve are possible complications.

It is diagnosed by echocardiography (ultrasound scan) or passing a catheter through an artery into the heart.

Patients with only minimal symptoms require no treatment, but if complications or progressive symptoms develop, surgical repair or replacement of the valve is necessary, and has very good results.

See also ENDOCARDITIS; MARFAN SYNDROME; MITRAL VALVE STENOSIS; RHEUMATIC FEVER

MITRAL VALVE STENOSIS

A narrowing of the mitral valve between the upper and lower chambers on the left side of the heart is called a stenosis. Rheumatic fever is the cause in most patients, but this is becoming a rare disease in developed countries. The symptoms include shortness of breath, tiredness, an irregular heartbeat (caused by atrial fibrillation), coughing of blood, and cor pulmonale. The most significant complication is an embolism (blood clot) that may cause a stroke or death if it travels through arteries to the brain.

The stenosis is diagnosed by echocardiography (ultrasound scan) or passing a catheter through an artery into the heart. Patients with only minimal symptoms require no treatment, but if complications or progressive symptoms develop, medications to control heart rate and surgical repair or replacement of the valve are necessary. Anticoagulants (eg. warfarin) are given to prevent emboli. Very good results are obtained by surgery, but the irregular heart rate may be difficult to control.

See also ATRIAL FIBRILLATION; COR PULMONALE; MITRAL VALVE INCOMPETENCE

MORBILLI

See MEASLES

MOTOR NEURONE DISEASE

Motor neurone disease is a horribly insidious disease of no known cause that affects the nerves that supply the muscles of the body.

Nerves are divided into two main groups - sensory nerves that feel heat, cold, touch and pain; and motor nerves that take the signals from the brain to the muscles and instruct the muscles to contract or relax. Motor neurone (neurone means nerve) disease is a steadily progressive degeneration of the motor nerves in the body, or the areas in the brain that control motor nerves. It normally affects adults between 35 and 70 years of age.

Muscles in various parts of the body become steadily weaker until complete paralysis results, but the muscles affected, and therefore the symptoms, vary between patients. Common symptoms include difficulty in swallowing and talking, drooling of saliva, inability to cough effectively, reduced tongue movement, and weakness of the arms and legs. As the disease progresses, weakness of the muscles required for breathing cause severe shortness of breath occur and lung infections such as pneumonia develop, and often lead to death. Some muscles may go into spasms that cause jerking movements and speech.

Electrical tests of the motor nerves to determine how well they are functioning, and a nerve biopsy are used to confirm the diagnosis.

No cure is available, and treatment is aimed at relieving muscle spasm, assisting feeding, preventing infections, aiding breathing and making the patient as comfortable as possible.
The medication riluzole is now being used in some countries to slow the progress of the disease. Physiotherapy on a very regular basis is essential. It is steadily progressive to death within three to five years.

**MULTIPLE MYELOMA**

Multiple myeloma (myelomatosis) is a cancer of the cells in the bone marrow of the elderly that causes destruction of the marrow and damage to the surrounding bone. Patients develop bone pain (back, ribs and thighs are the most common sites), tiredness from anaemia, and recurrent infections because of reduced immunity. Further symptoms include fractures of weakened bones, and kidney and heart failure caused by the toxic by-products of the marrow and bone destruction. The blood becomes excessively thick and viscous, which leads to a wide range of other symptoms including dizziness, vomiting, bleeding gums, mental changes and partial blindness.

Because bone is being destroyed by the marrow cancer, calcium is released, and very high levels of calcium are found on blood tests. The diagnosis can be confirmed by detecting Bence-Jones proteins in the urine, specific tests on the blood, a biopsy of bone marrow, and X-rays show a “moth-eaten” appearance of the bone in areas where it has been eaten away, particularly in the skull, ribs and long bones of the arms and legs.

There is no cure, but potent cytotoxic drugs, thalidomide and radiotherapy are used to reduce the symptoms and prolong life. Patients usually survive for one to four years after diagnosis, depending upon their age, the aggressiveness of the cancer, and their general health.

**MULTIPLE SCLEROSIS**

Multiple sclerosis (MS) or disseminated sclerosis, is an uncommon disease of the brain and spinal cord that interferes with the brain’s ability to control the body.

The cause is not known precisely, but there are several theories. It is possibly due to an unidentified virus, it may be that the body becomes allergic to itself and starts attacking its own cells in an immune response, it may be related to low vitamin D levels in the mother during pregnancy, or it may start as a transverse myelitis. Scattered parts of the brain and spinal cord are damaged at random, the affected areas fail to function properly, and nerve messages from the brain to the muscles do not flow smoothly. Sometimes the message cannot get through at all, and paralysis results, while at other times the message may go to the wrong place, causing abnormal movement or a tremor. MS often attacks people in the prime of life rather than old age, it is more common in women with western European ancestry, and is rare in the tropics between 30°S and 30°N. It is not contagious or preventable.

Symptoms vary greatly from one patient to another, but usually include vision problems, unusual forms of paralysis, tremor, loss of balance, poor coordination, general tiredness and numbness. Patients may experience difficulty in controlling an arm or leg, cannot talk, or may have periods of blindness. Symptoms also change in a patient because damaged tissue can repair itself and start functioning again, while other nerves becomes damaged, causing yet another set of symptoms. Pressure to skin areas and bacterial infections of various organs may occur due to lack of movement.

The diagnosis can be difficult to confirm. Electroencephalograms (EEG), electromyograms (EMG), blood tests (no specific test is diagnostic) and magnetic resonance imaging (MRI) are all used.
There is no effective treatment available, but some medications (eg: beta interferon, steroids) can slow its progress, control acute attacks and bring about remissions. Tizanidine is a muscle relaxant medication used as a tablet to treat muscle spasm caused by multiple sclerosis. Physiotherapists, speech therapists and occupational therapists are also used.

The disease goes through a series of attacks and remissions, and periods of good health between attacks can last for months or years. Most patients can lead independent, active and satisfying lives and take care of their own needs for many years after the diagnosis is made. The life span of victims is not significantly altered.

**MYASTHENIA GRAVIS**

Myasthenia gravis is an uncommon condition characterised by varying weakness of the muscles that control the eyelids, the movement of the eyes and swallowing. Signals from the nerves that supply affected muscles are blocked, for which there may be an immunological cause when antibodies that normally fight off infection, actually attack nerve tissue (autoimmune response). It may occur at any age, but is most common in young women and may be associated with rheumatoid arthritis, systemic lupus erythematosus, thymus and thyroid disease.

Drooping eyelids (ptosis), double vision and difficulty in swallowing are the main symptoms. In severe cases the muscles used in breathing and walking are also affected. Muscle weakness may vary in severity during the day and can disappear entirely for days or weeks before recurring, but over a period of months or years, the attacks become more severe. Unless adequate treatment is obtained, death eventually results from breathing difficulties.

The diagnosis is confirmed by the patient’s reaction to an anticholinergic drug. which immediately reverses all the muscle weakness or measurement of the anti-skeletal muscle antibodies or anti-acetylcholine receptor (Anti-AChR) antibody titre.

Treatment involves surgically removing the thymus gland, which is the source of most of the antibodies in the blood, and using anticholinesterase drugs (eg. distigmine, neostigmine) on a regular basis to control the muscle weakness. Steroids can be used in patients who respond poorly to other treatments.

There is no cure and patients require treatment for the rest of their lives, but some have lengthy periods when the disease is inactive, during which they may be able to cease their medication.

See also AUTOIMMUNE DISEASES; RHEUMATOID ARTHRITIS; SYSTEMIC LUPUS ERYTHEMATOSUS

**MYCOPLASMA INFECTION**

The bacterium *Mycoplasma pneumoniae* may cause a particularly insidious form of pneumonia, which tends to attack teenagers and young adults, and often occurs in summer rather than winter.

The symptoms in lung infections are frequently mild at the beginning and slowly worsen over many weeks. A wheeze, persistent cough, tiredness, intermittent fever and loss of appetite are most common and it is often confused with asthma or viral infections.

A chest X-ray shows a typical pneumonia pattern, and a sputum sample can then be cultured to determine the bacteria present. Blood tests show the presence of infection, but not the type. Antibiotics such as erythromycin (a macrolide) and tetracycline are successfully used in treatment.

See also ATYPICAL PNEUMONIA; PNEUMONIA
MYOCARDIAL INFARCT

A heart attack (myocardial infarct, MI) is caused by a blockage of the arterial blood supply to heart muscle for sufficient time to cause the affected muscle to die and be replaced by fibrous scar tissue. All the blood to the heart muscle passes through three small coronary arteries. If one of these is blocked, one part of the heart muscle cannot obtain sufficient blood and dies. The arteries may be blocked by fatty deposits because the patient is overweight or has high cholesterol levels, by clots or fat globules breaking off from damaged blood vessels elsewhere in the body, or by damage to the artery from high blood pressure. The severity of a heart attack depends on the amount of heart muscle damaged, and its position in the heart. A small amount of damage in a vital area may cause death, while significant damage in a less important area will not be fatal. In angina the blood supply to the heart muscle is reduced but not completely cut off, so no permanent damage occurs, but angina may lead to a heart attack in some cases.

A severe crushing pain is felt in the chest and shortness of breath is experienced. The pain builds up rapidly in waves, and then persists for some time before gradually fading. It may be accompanied by sweating, weakness, anxiety, dizziness, cough, nausea and vomiting. Some heart attacks create minimal discomfort, and may be dismissed by the patient as a passing attack of severe indigestion. Long-term complications include angina, an irregular heartbeat, heart failure and a heart aneurysm.

It is diagnosed by an electrocardiogram (ECG) and blood tests (eg. troponin T, troponin I, creatine kinase). These tests may be negative for a couple of hours after the start of a heart attack, so a doctor’s clinical judgement is vital. A chest X-ray and echocardiogram may also be performed. After the initial recovery period, echocardiography, coronary angiography and nuclear scans may be performed to find the cause of the heart attack and to determine further surgical or medical treatment.

If someone is having a heart attack, call an ambulance and if necessary carry out mouth-to-mouth or cardiopulmonary resuscitation. If the victim is conscious, help them into a position in which they are comfortable, and loosen clothing around the neck, chest and waist. Give them a soluble aspirin to suck in the mouth, as aspirin reduces the rate at which blood clots, and so can protect against the worsening of a heart attack. If the victim is breathing but unconscious, place them on their side in the coma position.

Once the patient is under the care of a doctor, their chance of survival is good, because medication can be given to stop an abnormal heartbeat, relieve pain and ease the intense anxiety of the patient. Once in hospital, treatment in a coronary care unit will include drugs to break up the blood clot blocking the coronary artery and a complex cocktail of other medications given through a drip into a vein to regulate the functioning of the heart. After a few days, the patient is moved to a normal ward and after 10 to 14 days they can go home for a further six or more weeks rest. The patient will be put on long-term medication (eg. beta-blockers and aspirin) to prevent another attack. Gradually increasing levels of exercise are undertaken over many weeks in order to slowly strengthen the heart. If a particular artery is blocked, coronary artery bypass graft (CABG) surgery may be performed.

Statistically 20% of patients die within the first hour of a heart attack, a further 10% will die in hospital, 5% will die within three months of leaving hospital and another 3% in every year thereafter, but the death rate is significantly lowered by the use of long-term medication.
A person can prevent a heart attack by keeping their weight reasonable, have their blood pressure checked and treated if necessary, avoiding excess cholesterol in the diet, exercising regularly, and not smoking.

See also ANGINA; INTERMEDIATE CORONARY SYNDROME; STOKES-ADAMS SYNDROME

MYOCARDITIS

Myocarditis is an uncommon but serious bacterial, viral (most common), parasitic (rarest) or fungal (most serious) infection of the muscle in the heart wall. Patients usually remember another infection a week or two prior to the onset. Myocarditis may also be due to an inflammation of the heart muscle caused by poisons (eg. arsenic), toxins, irradiation and potent drugs (eg. cytotoxics used in cancer treatment).

Chest pain is a common symptom, and may be accompanied by a rapid pulse, tiredness, shortness of breath, swollen ankles and a cough. Heart failure may develop, as damaged heart muscle cannot contract normally. The diagnosis is confirmed by an electrocardiogram (ECG), blood tests (eg. troponin T, creatine kinase) and an echocardiogram.

Treatment depends upon the cause. Bacterial infections can be cured by antibiotics, but there is no specific treatment for viral myocarditis which tends to persist for many months and then slowly resolve. Permanent heart damage is a common result.

See also ENDOCARDITIS; HEART FAILURE; PANCARDITIS; PERICARDITIS

NAFFZIGER SYNDROME

Naffziger syndrome (named after American surgeon Howard Naffziger, 1884-1961) is also known as the cervical rib syndrome, scalenus anticus syndrome and thoracic outlet obstruction syndrome. The cause is the congenital presence of an additional rib in the lower neck above the normal first rib. Nerves and arteries can be compressed between this extra cervical rib and the scalenus anticus muscle in the neck. The abnormal pressure on the ulnar nerve causes pain and pins and needles sensation in the arm and hand, muscular weakness of small hand muscles, and altered sensation in forearm and hand. In severe cases patients have cold blue hands, and reduced pulsation and blood flow in the radial and ulnar arteries in the arm.

An X-ray of the neck shows the extra cervical rib and the Adson neck extension test can be performed to detect the syndrome.

Rest, neck traction, and surgical excision of extra rib are the possible treatments. The condition is usually slowly progressive, with an intermittent course, but good result are obtained from surgery.

See also SCAPULO-COSTAL SYNDROME; SUBCLAVIAN STEAL SYNDROME

NEPHROTIC SYNDROME

The nephrotic syndrome is a form of kidney failure resulting in symptoms that are a result of the kidney's inability to remove fluid and waste products from the body. It is usually caused by glomerulonephritis, but may be a complication of diabetes, multiple myeloma, poisons or other diseases. It is far more common in places where there are poor standards of nutrition and hygiene.

Symptoms include a dramatic swelling (caused by fluid) of the body - the feet, abdomen and hands being the most commonly affected areas. If the chest is affected, the patient becomes very short of breath. Other symptoms include high blood pressure, stretch marks...
A RATIONALE FOR THE CHEST

(striae) on the skin of the swollen belly, loss of appetite and a pale complexion. The patient is obviously very ill and may deteriorate rapidly.

The diagnosis is confirmed by urine and blood tests, and a biopsy of the kidney is often performed to determine the severity of the damage.

No specific treatment is available, but prolonged bed rest, usually in a hospital, is essential. Steroids are often prescribed to limit further damage, and if a specific cause for the disease is present (eg. diabetes), this can be treated. Total kidney failure may require kidney transplantation or dialysis.

The outcome in children is far better than in adults, and the majority recover after a few weeks, but in adults, long-term kidney problems are more likely.

NEUROBLASTOMA

A neuroblastoma is a highly malignant and aggressive form of cancer that can arise from nerve tissue anywhere in the body, but they often occur in the kidney. One form of neuroblastoma in the adrenal glands is called Pepper syndrome. They metastasise (spread) widely at an early stage, usually to lymph nodes, the lungs and bone.

The symptoms are very varied depending on the site of the tumour, and they are notoriously difficult to diagnose until they are well advanced. If found before they metastasise they can be treated with surgery, while at more advanced stages irradiation and chemotherapy (eg. daunorubicin) are used. The progress of the tumour can be followed by serial measurement of the amount of homovanillate or dopamine in the blood. Cures are uncommon, but some neuroblastomas suddenly mature, become benign, and stabilise.

NEUROFIBROMA

A neurofibroma is a benign fibrous tumour that arises from nerve tissue. They form hard lumps anywhere on or in the body that can be surgically removed if they cause symptoms or are unsightly.

OESOPHAGEAL CANCER

Excess alcohol (particularly whisky) consumption, smoking, eating very large quantities of pickled vegetables, maize overcooked in iron pots and persistent reflux of stomach acid (Barrett syndrome) are known risk factors for cancer of the gullet (oesophagus). It is uncommon in western society, but relatively common in central Asia and southern Africa.

Patients develop difficulty and pain with swallowing that steadily worsens, and there is associated weight loss. Food that the patient attempts to swallow may be vomited and inhaled, causing pneumonia.

It is diagnosed by oesophagoscopy (passing a flexible tube into the oesophagus), or a barium swallow x-ray, then radical surgery may be performed to remove the cancer. The prognosis is unfortunately very poor with only 5% surviving five years.

See also BARRETT SYNDROME; REFLUX OESOPHAGITIS

OESOPHAGEAL DIVERTICULUM

See ZENKER DIVERTICULUM

OESOPHAGEAL SPASM

Spasms of the oesophagus can cause a severe pain behind the breast bone (sternum). Because this type of chest pain may be due to sinister causes, it is necessary for the doctor to
exclude any heart or lung disease that may be responsible for the pain. Common causes of oesophageal spasm include an injury to the oesophagus from hot foods, reflux oesophagitis, cancer or sometimes stress and anxiety may be responsible (globus). A gastroscopy is normally performed as part of the investigation.

Once the diagnosis is established, the problem may be treated with a number of medications. Glyceryl trinitrate or isosorbide dinitrate are used under the tongue for acute attacks, while hyoscine butylbromide or benzodiazepines may be used regularly to prevent attacks. If the spasms are uncontrolled, surgery to release the tension in the muscle ring at the lower end of the oesophagus may be performed.

OESOPHAGEAL VARICES

Varicose veins can occur not only in the legs, but also in the lower oesophagus (gullet), when liver disease (eg: cirrhosis from alcohol or hepatitis) increases the pressure in the veins that drain from the gut into the liver. The dilated veins in the oesophagus (oesophageal varices) can be damaged and bleed torrentially because of vomiting, reflux of acid into the oesophagus (eg: with a hiatus hernia when part of the stomach slips up into the chest), straining with heavy lifting, or swallowing hard or sharp objects.

The varices can be treated in an emergency with a Sengstaken-Blakemore tube, and at a later time they can be removed surgically.

OESOPHAGITIS

Oesophagitis (esophagitis in the USA) is an inflammation of the oesophagus (gullet) due to any one of a number of diseases. The usual symptom is a burning pain behind the breast bone. The most common cause is reflux oesophagitis in which acid in the stomach comes up into the oesophagus to damage its lining. Irritation from a tube that is introduced through the nose and into the stomach to allow feeding (nasogastric tube) is another possible cause.

See also BARRETT SYNDROME; OESOPHAGEAL SPASM; PLUMMER-VINSON SYNDROME; REFLUX OESOPHAGITIS

ORGANOPHOSPHATE POISONING

See INSECTICIDE POISONING

OSTEOARTHRITIS

Osteoarthritis is a degeneration of one or more joints that affects up to 15% of the population, most of them being elderly. The cartilage within joints breaks down, and inflammation of the bone exposed by the damaged cartilage occurs, which is then aggravated by injury and overuse of the joint. There is also a hereditary tendency to develop osteoarthritis.

Symptoms are usually mild at first, but slowly worsen with time and joint abuse. The knees, back, hips, feet, and hands are most commonly affected. Stiffness and pain that are relieved by rest are the initial symptoms, but as the disease progresses, swelling, limitation of movement, deformity and partial dislocation (subluxation) of a joint may occur. A crackling noise may come from the joint when it is moved, and nodules may develop adjacent to joints on the fingers in severe cases. X-rays show characteristic changes from a relatively early stage, and repeated X-rays are used to follow the course of the disease. There are no diagnostic blood tests.
Patients should avoid any movement or action that causes pain in the affected joints, such as climbing stairs and carrying loads (obese patients should lose weight). Paracetamol, aspirin, heat and anti-inflammatory drugs may be used to reduce the pain in a damaged joint, and physiotherapy, acupuncture and massage have also been found to be useful. Surgery to replace affected joints is very successful, with the most common joints replaced being the hip, knee and fingers. Surgery to fuse together the joints in the back is sometimes necessary to prevent movement between them, as they cannot be replaced. Steroid injections into an acutely inflamed joint may give rapid relief, but they cannot be repeated frequently because of the risk of damage to the joint.

The prognosis depends on the joints involved and the disease severity. Cures can be achieved by joint replacement surgery, while other patients achieve reasonable control with medications. The inflammation in some severely affected joints can sometimes “burn out” and disappear with time.

See also RHEUMATOID ARTHRITIS

OSTEOMALACIA

Osteomalacia is the adult form of the bone disease rickets (which occurs only in growing children, and results in softening of the bones). The cause is a lack of calcium, usually due to overactivity of the parathyroid gland (which controls the calcium balance of the body) in the neck. Other causes include a deficiency in vitamin D or phosphate (both are essential to control calcium activity within the body), kidney failure, Fanconi syndrome, alcoholism and other poisons.

The symptoms of osteomalacia may be very mild, or the patient may have muscle weakness, tiredness, and bone pain. Fractures are only slightly more common than would normally be expected. The condition is diagnosed by blood tests, X-ray and bone biopsy. Treatment involves improving the diet, prescribing vitamin D, giving calcium supplements and taking medications that force calcium into the bones. A further deterioration of bone strength is unlikely with correct treatment.

OSTEOMYELITIS

Osteomyelitis is a serious but uncommon infection of a bone that is more common in children. The femur (thigh bone), tibia (shin bone) and humerus (upper arm bone) are most commonly affected, but any bone in the body may be involved. Often there is no obvious cause and the infecting bacteria reaches the bone through the blood, but any cut or injury that penetrates through to the bone leaves it open to infection.

The infected bone becomes painful, tender and warm, the tissue over it is red and swollen, and the patient is feverish and feels ill. Complications may include septicaemia, permanent damage to the bone and nearby joints, bone death and collapse, persistent infection and damage to the growing area of a bone in a child.

X-rays show bone damage, but often not until several days after the infection has started. Blood tests for the presence of bacteria, plus the appearance of the patient, are usually sufficient to allow the commencement of treatment using potent antibiotics, which are often given by injection for several weeks. Once the infecting bacteria have been correctly identified, the antibiotic may be changed. Strict bed rest is also necessary, and if pus is present in the bone, an operation to drain it is essential. The majority of osteomyelitis cases are controlled and cured by correct treatment.

See also SEPTICAEMIA
OSTEOPOROSIS
Osteoporosis is a common bone condition affecting one quarter of women over the age of 50, in which there is a reduction of bone mass. There is normally a balance between the amount of bone being made and the amount being resorbed. In osteoporosis this balance is lost and less bone is manufactured than required, and bone resorbing cells become overactive.

The basic constituent of bone, calcium, drops to a dangerously low level, and the bones soften and may bend, break or collapse. Calcium is found in all dairy food (particularly cheese), sardines, shellfish, beans, nuts and tripe. Adults require up to 800 mg. of calcium, and children and pregnant women up to 1400 mg. a day. The structure of bones is being constantly renewed, and a lack of calcium over many years leads to a gradual deterioration in bone strength. Once women reach the menopause, the drop in hormone levels accelerates the loss of calcium from bones. It may be hereditary and is more common in petite, small-boned women.

Over the age of 50, half of all women will have a fracture due to osteoporosis, and one third of men over 70 will develop the same problem. Many of these fractures, particularly those in the vertebrae of the back, may have no symptoms.

Most patients do not know they have the disease until they fracture a bone (particularly the hip or a vertebra) with minimal injury, or on a routine X-ray their bones are seen to be more transparent than normal. A procedure similar to an X-ray, dual photon densitometry, can diagnose osteoporosis at an early stage. A urine test for deoxypyridinoline may also be useful. Deformity of the back, severe arthritis, and neuralgia caused by the collapsing bones pinching nerves, can occur in due course.

Prevention involves adding calcium to the diet before menopause, and by taking calcium supplements and hormone replacement therapy after menopause. Regular exercise is important, as the minor stresses on the bones keep them stronger. In more serious cases, sophisticated, very effective medications (eg. alendronate, calcitriol, disodium etidronate) that force calcium into bones to strengthen them, may be prescribed to be taken daily for several years. Other factors that can help are reducing the intake of coffee and alcohol, and stopping smoking. Control is good once the condition is diagnosed, but reversal of existing damage is difficult.

PAGET’S DISEASE OF BONE
Sir James Paget (b.1814) was a London surgeon after whom a number of diseases, tests, tissues and structures were named. In Paget’s disease of bone (osteitis deformans), bone in scattered parts of the body becomes thickened and soft, causing compression of nerves and collapse of those bones that support weight. There is no known cause, but it is unusual under 60 years of age.

The disease has a very insidious onset, and may be quite advanced before diagnosis, and can vary from very mild to rapidly progressive. The skull, thighbone (femur) and shinbone (tibia) are often involved, giving a characteristic head appearance and bowing of the legs as they bend under the body’s weight. Skull enlargement causes pressure on nerves and constant headaches, while fractures may occur in long bones with only slight injury, and the back becomes bent, painful and deformed.

The diagnosis made on the characteristic X-ray appearance, and blood tests show specific chemical imbalances, including excess calcium. The excess calcium may cause kidney
damage, extra blood flow to the bones can cause circulatory and heart problems, and a small number of patients develop a form of bone cancer.

Medications such as disodium etidronate, disodium pamidronate or tiludronate are taken regularly for the rest of the patient's life to control the disease. The injection salcatonin may also be used in some patients. Drugs slow the disease progress, but there is no cure, and the earlier it occurs in life, the more likely it is to be severe.

**PAGET’S DISEASE OF THE NIPPLE**

Paget’s disease of the nipple (nipple cancer) is an uncommon type of cancer that starts in the milk ducts of the nipple, and may spread rapidly along these ducts, deep into the breast. The cause is unknown, but it is uncommon, occurring in only one in every 100 breast cancers.

There are often very few symptoms until the cancer is well advanced, and no lump is felt. Symptoms include itching and irritation of the nipple, a thickening of the nipple and in advanced cases an ulcer may form. The cancer may spread to breast tissue and nearby lymph nodes. The diagnosed is confirmed by biopsy of the nipple.

Surgery to remove the nipple and the affected part of the breast is performed, followed by radiotherapy and chemotherapy when necessary. The more advanced the cancer when first treated, the poorer the survival rate.

See also BREAST CANCER

**PANCOAST SYNDROME**

Pancoast syndrome is a complication of lung cancer that occurs in patients with cancer in the top part of the lung, and is a sign that the cancer is progressing very rapidly. As with other forms of lung cancer, smoking is by far the most common cause, but asbestos exposure and toxic fumes may also be responsible. A chest x-rays may show the cancer, but it may be hidden by the shoulder blades, and a CT scan is often necessary to reveal the tumour. The syndrome symptoms consist of shoulder, arm and chest pain with an associated Horner syndrome (a drooping eyelid, lack of sweating on one side of the face and a contracted pupil in the eye). Death usually follows soon after the syndrome is diagnosed as the diagnosis is usually made late.

See also LUNG CANCER; PANCOAST TUMOUR

**PANCOAST TUMOUR**

Lung cancer occurring at the very top of the lung is known as a Pancoast tumour, after the Philadelphia radiologist Henry Pancoast (b.1875). As with other forms of lung cancer, smoking is by far the most common cause, but asbestos exposure and toxic fumes may also be responsible.

Pain in the shoulder may be the only symptom until the cancer is well advanced. Other possible symptoms include shortness of breath, weight loss and coughing blood. The cancer may spread to nearby bones early, and later to the liver and other organs. Chest x-rays may show the cancer, but it may be hidden by the shoulder blades, and a CT scan is often necessary to reveal the tumour.

Radiotherapy is the main form of treatment, but early cancers may be removed surgically. Unfortunately the prognosis is usually poor, as diagnosis is usually made late.

See also LUNG CANCER; PANCOAST SYNDROME
PANCREATITIS

Pancreatitis is a well recognised but uncommon complication of alcoholism causing inflammation or infection of the pancreas gland, which sits in the centre of the abdomen directly behind the navel. Its main task is to produce the digestive enzymes that attack food. A tiny duct leads from the pancreas to the bile duct and then to the small intestine to transport enzymes to the food.

In pancreatitis the gland may become infected, damaged by excess alcohol intake, injured in an accident, or the duct leading from it may be blocked by a gallstone. The digestive enzymes then leak out of the pancreas ducts and start dissolving the gland itself, the intestines and other abdominal organs.

Patients develop excruciating pain in the centre of the abdomen that may also be felt in the back and sides, nausea, vomiting, weakness, fever and sweats. Recurrences of attacks, particularly in alcoholics, are common. The diagnosis can be confirmed by specific blood tests.

Treatment is difficult, and often involves long hospital stays for resuscitation, prolonged bed rest and pain relief. The cause of the pancreatitis must also be treated, with antibiotics and occasionally surgery. Despite the best treatment, there is a significant death rate, which rises with subsequent attacks.

PARAPERTUSSIS

Parapertussis is a bacterial infection of the nose, throat and lungs that resembles, but is far milder than, pertussis (whooping cough). It is caused by the bacteria Bordetella parapertussis, and the symptoms include fever, cough and a sore throat. It is treated in the same way as whooping cough.

See also WHOOPING COUGH

PAROXYSMAL ATRIAL TACHYCARDIA

Paroxysmal atrial tachycardia (a form of supraventricular tachycardia) is a sudden, irregular, rapid beating of the heart, that is relatively common in women, and may be triggered by hormonal, emotional or other factors. Most attacks last only a few minutes and cause minimal discomfort, but often significant anxiety.

The diagnosis is confirmed by an electrocardiogram (ECG) while an attack is present, but the ECG is normal at other times. Holter monitoring (long term ECG) may be necessary to confirm the diagnosis.

If the attacks last for long periods or occur frequently, medication (eg. beta-blockers such as propranolol and sotalol, or digoxin) can be given to prevent them. Firm massage of the eyeballs, holding the breath and dunking the face in icy water may also stop an attack.

They are not harmful, and most attacks settle spontaneously within a couple of hours.

PATENT DUCTUS ARTERIOSUS

Patent ductus arteriosus (PDA) is a failure of an artery near the heart that bypasses the lungs, to close immediately after birth.

A foetus inside the mother's womb (uterus) does not breathe, but obtains its oxygen directly from the mother's blood. The foetal blood is diverted away from the lungs through an artery (ductus arteriosus) that connects the pulmonary artery to the aorta. Immediately after birth, this special artery contracts and closes, diverting the full supply of blood into the lungs, which assists in their expansion, and enables the newborn baby to obtain its oxygen
requirements by breathing. If the ductus arteriosus remains open after birth ("patent") it will divert unoxygenated blood away from the lungs and into the general circulation. This prevents sufficient oxygen from reaching the body, and eventually the baby may become blue.

There are no early symptoms, but as the heart has to work harder it will gradually enlarge, and over a period of several months or years, the heart will gradually fail because of the extra work it is required to undertake. There may also be other serious malformations of the heart present.

Babies have a characteristic heart murmur that can be heard through a stethoscope. The diagnosis is confirmed by sophisticated X-rays of the heart, electrocardiographs and other specialised tests.

The drug indomethacin, commonly used for treating arthritis, causes a patent ductus arteriosus to close in most cases, but sometimes surgery is necessary. In some patients, the ductus arteriosus may be partially closed, and the problem is not significant enough to warrant treatment. In others, the dilated patent ductus arteriosus may be life threatening. Patients have a normal life expectancy once the ductus arteriosus has been closed.

See also FALLOT’S TETRALOGY

PECTUS EXCAVATUM
A chest in which the breast bone (sternum) is abnormally depressed is described as pectus excavatum or funnel chest. It does not interfere with the function of the heart or breathing, but if extreme may be surgically corrected for cosmetic reasons.

PEPTIC ULCER
Ulcers of the duodenum (first part of the small intestine), stomach or pylorus (muscle ring separating the stomach and duodenum) are known as peptic ulcers. A gastric ulcer is an ulcer of the stomach.

Ulcers are caused by hydrochloric acid, which is a potent acid naturally produced in the stomach to aid food digestion. The stomach protects itself with a layer of thick mucus. If there is excess acid or insufficient mucus present, the acid may eat into the stomach wall. The most common causes for excess acid or reduced mucus are smoking, stress, anxiety, alcohol, aspirin and the nonsteroidal anti-inflammatory drugs used to treat arthritis. The bacterium Helicobacter pylori may damage the mucus lining of the stomach to allow an ulcer to form.

An ulcer may penetrate into a blood vessel to cause bleeding, anaemia and weakness before any pain is felt. Most ulcers cause pain high up in the belly, which is often worst just before a meal and relieve by eating. Other symptoms include a feeling of fullness, excess burping and indigestion.

The diagnosis can be proved by a barium meal x-ray or gastroscopy. During gastroscopy a biopsy can be taken of an ulcer to exclude cancer, and a test can be performed to identify the presence Helicobacter pylori. The bacteria can also be detected by a test on a sample of
A RATIONALE FOR THE CHEST

breath (carbon-14 urea breath test) that is collected in an airtight container, and there is also a blood test, but this is less accurate.

A sensible diet, stopping smoking and relaxation can all help. If *Helicobacter pylori* is detected, a specific course of antibiotics and anti-ulcer medication (triple therapy) can be given to eradicate it, heal the ulcer, and prevent a recurrence. Numerous tablets are available to control and often cure peptic ulcers, and because of the effectiveness of these medications, surgery for peptic ulcers is now rarely required.

Excessive bleeding from an ulcer can cause serious anaemia, and a very small percentage of ulcers can be cancerous.

**PERICARDITIS**

Pericarditis is an uncommon inflammation or infection of the pericardium, the fibrous sack that surrounds the heart. It may be caused by a viral (common - often secondary to mumps, hepatitis or influenza) or bacterial (rare) infection, and may also occur if the pericardium is affected by the spread of cancer cells from the lung, lymph nodes or other organs. Other causes include heart attacks, tuberculosis, kidney failure and irradiation.

All forms cause chest pain, shortness of breath and a fever. The secretion of fluid by the damaged pericardium into the tiny space between the pericardium and heart (pericardial effusion) puts pressure on the heart, and scarring of the pericardium from infection may contracts and constricts the heart. In both these cases, the heart may not be able to expand fully between each beat, and becomes steadily more constricted (constrictive pericarditis), causing the heart to fail as a pump.

It is diagnosed by a combination of X-ray, CT scan, electrocardiogram (ECG), blood tests and biopsy examinations.

There is no specific cure for a viral infection, and treatment involves aspirin, anti-inflammatory drugs and prednisone. Bacterial pericarditis can be treated with antibiotics. A pericardial effusion (collection of fluid within the pericardial sac) can be treated by inserting a long needle through the chest wall and draining the fluid. Patients with constrictive pericarditis (fibrous sack becomes scarred and contracts tightly around the heart) may require surgery on the heart to cut away the scarred part of the pericardium.

The prognosis depends upon the cause and severity of the infection, and the age and health of the patient. Death occurs in a significant number of cases, particularly if the patient is elderly or debilitated.

See also ADHESIVE PERICARDITIS; ENDOCARDITIS; HEART FAILURE; MYOCARDITIS

**PERTUSSIS**

See WHOOPING COUGH
A RATIONALE FOR THE CHEST

PHAEOMOCYTOMA
A phaeochromocytoma is a rare black-celled tumour in the adrenal glands (which sit on top of each kidney), which releases a substance into the blood stream that causes very high blood pressure (hypertension). It is sometimes a hereditary tendency, but most arise for no apparent reason.

Patients have extremely high blood pressure, severe headaches, palpitations of the heart, abnormal sweating, nausea and vomiting, abdominal pains, blurred vision, and brain damage that may result in loss of speech, blindness or unconsciousness. Other symptoms may include increased appetite, nervousness and irritability, shortness of breath, weight loss, light-headedness and chest pain (angina). Some patients have multiple tumours in other parts of the body, and an unexplained sudden death may be due to a heart attack caused by an undiagnosed tumour. Some forms are associated with cancer, but a phaeochromocytoma is not a cancer itself.

The diagnosis is confirmed by special blood tests that measure excessive levels of catecholamines (the chemical released by the tumour). A CT scan or a magnetic resonance imaging scan (MRI) is performed to locate the tumour.

Controlling the high blood pressure with medication is the initial aim of treatment, and then surgically removing the tumour. Long-term management with medication, but without surgery, is not practical.

The prognosis depends on the damage caused by the high blood pressure before diagnosis, and how many tumours are present. If the tumour is removed early, a complete recovery is expected. Without treatment, the disease is invariably fatal, and even in the best medical centres, a small percentage of patients will die from complications of the disease or the surgery.

See also HYPERTENSION

PICKWICKIAN SYNDROME
The Pickwickian syndrome is named after the extraordinarily obese Dickens character, and is a complication of being seriously obese that usually occurs in women. Patients have significant shortness of breath, gross obesity, tiredness, blue skin (cyanosis), shallow breathing, cor pulmonale, high blood pressure (hypertension) and heart failure. Pneumonia and other serious infections are common.

Blood tests show abnormal levels of acidity, oxygen, carbon dioxide and red blood cells, and respiratory function tests and a chest X-ray show abnormal results.

The only treatment is significant weight loss while medications are used to control heart failure and hypertension. The prognosis is poor unless the patient succeeds in losing a large amount of weight.

See also COR PULMONALE; HYPERTENSION

PLEURISY
Pleurisy is an infection, while pleuritis is inflammation, of the pleura, which is the smooth, slippery, shiny membrane that lines the inside of the chest cavity and allows the lung to move freely within the chest as it contracts and expands with every breath. The pleura is covered with a very thin layer of fluid that acts as a lubricant.
A RATIONALE FOR THE CHEST

Pleurisy may be caused by a viral infections of the chest, a fractured rib that damages the pleura, and bacterial infections associated with acute bronchitis, pneumonia and tuberculosis.

Patients experience severe pain that can often be localised to one point on the chest or back and is worse with breathing, sneezing, coughing, laughing or any movement of the chest. A pleural effusion may be a complication. A chest x-ray may show an area of fluid accumulation or inflammation on the lung.

Viral and inflammatory pleurisy will settle with rest and minor pain killers or anti-inflammatory drugs (eg. indomethacin), while bacterial pleurisy associated with pneumonia requires antibiotics and stronger painkillers. The prognosis is generally good, but depends on the underlying cause.

See also BRONCHITIS, ACUTE; PNEUMONIA

PLUMMER-VINSON SYNDROME

The Plummer-Vinson syndrome is known as the Paterson-Brown-Kelly syndrome in the United States. It is an inflammatory condition of gullet (oesophagus) of no known cause, but it tends to occur in middle-aged women. Patients develop difficulty and pain on swallowing, fibrous web formation across the oesophagus, an enlarged spleen, iron deficiency anaemia, inflamed mouth, their finger nails curve upwards, and in some patients the lips are thin and the mouth is beak shaped. It often leads to cancer of the oesophagus.

An X-ray barium swallow and oesophagoscopy (passing a flexible tube down the oesophagus) are both abnormal, and blood tests show anaemia.

Treatment involves swallowing oesophageal dilators under sedation, iron supplements, and a good diet, but the problem often recurs after treatment.

See also OESOPHAGEAL CANCER

PNEUMOCONIOSIS

Pneumoconiosis (anthracosis or coal miner’s lung) is the replacement of normal lung tissue by fibrous scar tissue and is a form of chronic obstructive airways disease caused by long-term inhalation of fine coal dust particles in underground coal miners. It is aggravated by cigarette smoking.

There are no symptoms until the condition is quite advanced, when patients become short of breath, and a chest X-ray shows numerous small pellets of coal dust concentrated in the lungs. The upper part of the lung is more affected than the lower. There is no treatment available, and lung infections such as pneumonia are common.

See also ASBESTOSIS; PNEUMONIA; SILICOSIS; TALCOSIS

PNEUMOMEDIASTINUM

Pneumomediastinum is the presence of air in the mediastinum (the central part of the chest) due to leakage of air from the lungs with disease, severe coughing, asthma, an injury or pneumothorax.

PNEUMONIA

Pneumonia is a bacterial, or rarely fungal, infection of the lung alveoli (tiny air bubbles that form the major part of the lung and enable the oxygen to cross into the bloodstream), which fill with pus. Usually only one part of the lungs, often at the bottom of the chest, is affected, but it may spread to other parts of the lung. Once one type of bacteria are present, a second type may also infect the lungs as well to cause double pneumonia. Almost invariably the bronchi
(main air tubes) are also infected, so the disease should correctly be called bronchopneumonia. The infection starts when bacteria are inhaled into the lungs, and overcome the body's defence mechanisms, particularly if the patient is tired, run-down, overworked, elderly, bedridden or suffering from other illnesses. Aspiration pneumonia occurs if phlegm, vomit or other material is inhaled into the lungs. The symptoms of pneumonia may be obvious with fever, productive cough and chest pains, but some infections are more insidious and cause minimal symptoms for some months while the patient feels tired, short of breath and has intermittent sweats.

Chest X-rays are diagnostic, and are repeated at regular intervals to ensure that the infection is resolving. A sample of sputum is taken before treatment is started, and is sent to a laboratory to identify the infecting bacteria. There are many different types of pneumonia, defined by the different bacteria responsible for the infection. These include *Streptococcus pneumoniae* (also known as pneumococcal pneumonia), *Streptococcus pyogenes*, *Mycoplasma pneumoniae* (the usual cause of atypical pneumonia), *Staphylococcus aureus*, *Klebsiella pneumoniae* (Friedländer's pneumonia), *Pseudomonas aeruginosa* and *Haemophilus influenzae*. Rarer forms of pneumonia may be caused by *Legionella pneumophilia* (Legionnaire's disease), *Bacillus anthracis* (anthrax) and *Bacteroides*. One or more antibiotics are given by tablet, injection or drip into a vein to treat the infection. Expectorants to open up the airways and loosen the phlegm are also prescribed, along with cough mixtures and painkillers. Regular physiotherapy is very important to drain phlegm and pus out of the chest, while rest and the cessation of smoking are vital. Occasionally oxygen is required for seriously ill patients, and in rare cases, surgery to drain out collections of pus or remove areas of chronically infected lung is required. Some forms of pneumonia can be prevented by a vaccine (Pneumovax).

Inadequately treated pneumonia can cause chronic ill health, an abscess may form in the lung and lead to permanent lung damage. Once the lung is damaged, the chances of developing a subsequent attack of pneumonia is increased, and smoking will accelerate this process. Pneumonia puts a great strain on the heart, and it may fail in older or debilitated patients.

With correct treatment the majority of patients recover in a couple of weeks, but some may take months, and there is a small mortality rate amongst the elderly and debilitated, even in the best hospitals. Up to half of all patients affected died before the advent of modern antibiotics in the 1940s.

See also ANTHRAX; ATYPICAL PNEUMONIA; BRONCHITIS, ACUTE; DOUBLE PNEUMONIA; EMPHYSEMA; FRIEDLÄNDER'S PNEUMONIA; LEGIONNAIRE'S DISEASE; LUNG ABSCESS; MELIOIDOSIS; PSITTACOSIS

**PNEUMONITIS**

Pneumonitis is inflammation of the lungs without infection. The usual cause is a reaction to inhaled irritant gases, smoke, dusts, moulds, compounds (eg. vanadium) or chemicals. It causes a persistent dry cough. It is treated by oxygen given through a mask and corticosteroids (eg. prednisone).

**PNEUMOTHORAX**
A pneumothorax is the presence of air between the lung and its surrounding pleura. The lung lies in a smooth, slippery sack (the pleura). If the lung develops a puncture, air will leak into the pleural sack around the lung and is unable to escape. More and more air accumulates in the sack, causing pressure on the lung, which eventually collapses. It often occurs for no apparent reason (spontaneous pneumothorax), or may be due to a chest injury, and lung diseases such as asthma, tuberculosis, cancer or cystic fibrosis.

The patient develops worsening shortness of breath and chest pain, and a chest X-ray will show the partly collapsed lung.

A small pneumothorax may be observed and its progress checked by regular X-rays, but if the pneumothorax is large or growing larger, a tube is placed through the chest wall to remove the escaped air, which allows the lung to expand. The outside end of the tube is placed under water to stop air re-entering the lungs.

Patients who have repeated attacks of spontaneous pneumothorax, may require surgery to repair the damaged area of lung. All patients must stop smoking.

A tension pneumothorax, may be fatal in a few minutes, as every breath pumps large amounts of air out of the lungs and into the pleural cavity. The pressure in the pleural cavity builds up rapidly and causes the lungs to collapse. A large needle or tube must be immediately pushed through the chest wall into the pleural cavity to save the patient’s life.

Complete recovery in a few hours or a day or two is normal with correct treatment.

**PNEUMONOLUMTRAMICROSCOPICISILICOVOLCANIOSIS**

The above word (I can’t be bothered typing it again in lower case) is the longest word used in medicine, and for obvious reasons it is used rarely. It is a lung disease caused by breathing in the microscopic particles of ash emitted by a volcano.
POLYARTERITIS NODOSA

Polyarteritis nodosa (PAN or periarteritis nodosa) is an inflammation of small to medium-sized arteries. The damaged artery may become weakened and balloon out to several times its normal diameter, it may scar and shrink down, or the blood passing through the inflamed section of artery may clot and completely block the artery (a thrombosis). The arteries affected may be anywhere in the body, but the gut, liver, heart, testes, kidney, and muscles are most commonly involved. The cause is unknown, but it is more common in drug abusers and in patients with hepatitis B. Rarely it may be a side effect of medication. Men are three times more likely to develop the disease than women, and it is most common in young adults.

The symptoms are very varied, depending on which arteries and organs are involved. The patient is usually feverish, and has pain in the area involved. Specific complaints may include muscle pain, palpitations, arthritis, skin ulcers, spots in the vision, abdominal pain, nausea, vomiting, diarrhoea and high blood pressure.

There are no diagnostic blood tests, and the diagnosis must be confirmed by a biopsy (sample) taken from an involved artery. Taking steroids (eg. prednisone) in high doses for a long period of time is the main treatment, and immunosuppressive drugs may also be used.

The prognosis varies markedly from one patient to another, depending upon the areas and arteries involved. Some patients do recover, but the majority slowly deteriorate to die within a few months or years.

POLYMYOSITIS

Polymyositis is the inflammation of many muscles in varied parts of the body. It is usually accompanied by swelling (oedema), pain, muscle tenderness, weakness and sweating. The cause is often never found, but it may be due to a viral infection, autoimmune response or metastatic cancer. If the skin is also involved it is called dermatomyositis.

See also AUTOIMMUNE DISEASES

PRINZMETAL ANGINA

Chest pain caused by a spasm, rather than a blockage, of the coronary arteries that supply blood to the heart, is referred to as Prinzmetal angina. It has symptoms identical to normal angina with severe central chest pain, but usually eases faster and can be differentiated from angina by an ECG (electrocardiograph). It is treated in the same way as angina.

Myron Prinzmetal (1908-1994) was an American cardiologist.

See also ANGINA

PSITTACOSIS

Psittacosis (bird fancier’s lung or ornithosis) is a rare form of pneumonia caught from birds. It is caused by the bacteria-like organism *Chlamydia*, which is normally an infection of parrots, pigeons, chickens and ducks, but may very occasionally be transmitted to humans, although it rarely passes from one person to another.

There is a gradual onset of fever, headache, muscle pains, tiredness, dry cough and nose bleeds. Some patients develop skin spots, shortness of breath, and abdominal pains. Spread of the infection to the heart or brain is possible, and sometimes a second bacterium may cause double pneumonia. The incubation period is one to two weeks after exposure to an infected bird. The diagnosis may be suspected in bird fanciers, chicken farmers and
A RATIONALE FOR THE CHEST

veterinarians and confirmed by sputum culture or a specific blood test. A chest X-ray can show the presence of pneumonia, but not that the pneumonia is caused by psittacosis.

See also PNEUMONIA

PULMONARY EMBOLISM

A pulmonary embolism occurs when a blood clot or other substance (embolus - eg. fatty plaque from high cholesterol levels in the blood) travels through bloodstream and the pulmonary artery to a small artery in the lung, which it then blocks. The tissue beyond the blockage dies (pulmonary infarct).

Blood clots may occur in the veins of leg muscles (deep venous thrombosis), but may also arise in other parts of the body. They travel through veins to the right side of the heart, and then into the lungs where they cut off the blood supply to a segment of lung, which will collapse and die. Emboli are more common after major surgery, in patients who are bedridden for long periods, and in the elderly.

The symptoms may include chest pain, shortness of breath, coughing of blood, fainting, heart rate increases, and a fever. Increased back pressure of blood on the heart may lead to right heart failure (cor pulmonale), and an extending clot can cut off more arteries in the lung, and destroy a larger area of lung tissue.

The condition is diagnosed by a chest X-ray, ventilation-perfusion (V/Q) scan, CT scan or angiography. Blood tests can show signs of clotting within the body, and an electrocardiogram (ECG) shows strain on the heart. Specialised tests of lung function are sometimes necessary, and an X-ray in which dye is injected into the veins and can be seen moving through the arteries in the lung may be performed in cases of doubt.

Treatment must start as soon as possible to prevent extension of the clot and further damage to the lung. Anticoagulants drugs that prevent blood clotting (eg. heparin) are initially given as an injection, and later as tablets (eg. warfarin, aspirin). Regular blood tests are performed throughout treatment with anticoagulants to check the dosage required. Anticoagulant therapy is continued for some months after the attack, but in high-risk patients it may be continued for life. In severe cases thrombolytics (clot dissolving drugs) are injected directly into the involved veins. In rare circumstances, surgery to remove the clot from the lungs or leg is undertaken, or a filter is inserted surgically into the main vein of the body leading from the legs to the heart, to filter out any blood clots that may form in the future. Blood clots in the legs can be prevented by using pressure stockings during long operations, early mobilisation after surgery, physiotherapy to keep leg muscles active, and elevation of the legs in bed-bound patients.

Rapid death occurs in 10% of patients who have a large area of lung involved, but the majority of patients recover provided appropriate treatment is given quickly.

See also COR PULMONALE

PULMONARY FIBROSIS, IDIOPATHIC

See IDIOPATHIC PULMONARY FIBROSIS

PULMONARY HYPERTENSION

See COR PULMONALE

PULMONARY INFARCT

See PULMONARY EMBOLISM
PULMONARY VALVE INCOMPETENCE
Leakage of the pulmonary heart valve, which controls the flow of blood from the right ventricle (right lower chamber) of the heart to the pulmonary artery, which goes to the lungs, is called pulmonary incompetence or regurgitation. It is an uncommon form of heart valve disease that is often a result of endocarditis or cor pulmonale. No significant symptoms are usually present, and the problem is usually found by accident when listening to the heart for other reasons. No treatment is normally necessary for the valve, but the cause must be treated.

See also COR PULMONALE; ENDOCARDITIS

PULMONARY VALVE STENOSIS
Narrowing of the pulmonary heart valve, which controls the flow of blood from the right ventricle (right lower chamber) of the heart to the pulmonary artery, which goes to the lungs is called stenosis. It is usually a birth defect, and a mild stenosis causes no symptoms. Severe stenosis may cause chest pain, fainting on exertion, and shortness of breath and must be corrected surgically. It is diagnosed by echocardiography (ultrasound scan). If left untreated, sudden death or heart failure may occur.

Q FEVER
Q fever is a lung infection by primitive bacteria of the genus *Rickettsia*, which was unidentified for many years. The disease may derive its name from the fact that doctors were constantly questioning (Q) the cause of the fever, or Q may stand for Queensland, where the disease was very common and first researched.

*Coxiella burnetti* is the responsible Rickettsia. It is a parasite of sheep, cattle and goats, and passes from these animals in the milk and faeces, then droplets and dust containing the bacteria may be inhaled by humans, but it does not spread from one human to another. Farmers, shearers and abattoir workers are at a high risk. The incubation period is one to three weeks.

It often causes very mild, barely noticeable symptoms, but in more severe cases the patient will develop a fever, weakness, headache, muscle pains and a dry cough. In advanced cases, jaundice (yellow skin) and stomach pains occur and rarely heart and brain involvement is possible. A specific immunoglobulin antibody blood test can diagnose the disease, and a chest X-ray may show lung abnormalities in severe cases.

Tetracyclines (antibiotic) is used to suppress the infection, but it does not always eliminate the disease completely. It may be prevented by a vaccination given to those who are at high risk such as abattoir workers, veterinarians and laboratory workers. A single injection gives long-term immunity, but an additional inadvertent vaccination may cause significant allergic or other adverse reactions.

Treatment is not completely satisfactory, and relapses are common, but death is rare unless the heart becomes involved.

See also BRUCELLOSIS

REFLUX OESOPHAGITIS
Reflux oesophagitis (gastro-oesophageal reflux disease - GORD) is the back flow of acid from the stomach up through a normally closed muscle ring into the lower end of the oesophagus (gullet). It most commonly occurs in babies and overweight elderly men. Some
infants have a defect or temporary weakness in the muscle ring at the bottom of the oesophagus. In adults, factors such as obesity, smoking, overeating, a hiatus hernia, rapid eating, alcohol, stress, anxiety, and poor posture may cause the excessive production of acid in the stomach and/or slackness in the muscle ring.

Infants with reflux are in pain, with crying and irritability the main symptoms. Adults experience a burning sensation behind the breast bone (heartburn), a bitter taste on the back of the tongue and burping as gas escapes easily from the stomach. It is often worse at night after a large meal when the patient is lying down. If attacks are regular, ulcers may develop. Complications include scarring and narrowing of the lower end of the oesophagus to the point where it may be difficult to swallow food (Barrett syndrome), severe bleeding from ulcers in the oesophagus, and cancer of the oesophagus.

The reflux can be proved by gastroscopy or a barium meal x-ray.

Most children will grow out of the problem, but to ease the symptoms position the child with head elevated while feeding, give small frequent thickened feeds, burp the baby regularly, loosen the nappy before feeds and do not allow the child to lie flat after a feed. If not adequately helped, preventive medication is given as a mixture.

Treatment in adults involves weight loss, raising the head of the bed, having the main meal in the middle of the day, avoiding bending and heavy lifting, stopping smoking and reducing alcohol. Antacids to reduce the acid concentration in the stomach, and medication to empty the stomach faster (eg. prokinetic agents such as cisapride) and reduce acid production (eg. H2 receptor antagonists and proton pump inhibitors). In resistant cases it is necessary to resort to quite major surgery (eg. fundoplication).

See also BARRETT SYNDROME; HIATUS HERNIA

RENAI FAILURE, CHRONIC

Chronic kidney (renal) failure, or uraemia, is a slow, gradual failure of kidney function. Old age is the most common cause, but it may also be due to many other conditions including a damaged blood supply to the kidney from hardened arteries (arteriosclerosis), poisons, infections, the body trying to reject the kidney in autoimmune conditions such as systemic lupus erythematosus, and many rarer diseases.

Because of its slow onset, patients may not present to a doctor until the condition is well advanced, by which time they have weakness, tiredness, lack of appetite, weight loss, nausea, headaches, passing urine frequently and at night, and in advanced cases itchy skin,
vomiting, high blood pressure and anaemia. Abnormal blood and urine tests are diagnostic, but further investigations are carried out to discover any specific cause.

It is necessary to treat any cause of the condition if possible, followed by a strict diet (low in protein), and control of all fluids that are drunk. Unless the cause can be corrected, long-term treatment with an artificial kidney machine (dialysis), or a kidney transplant operation is necessary. Patients must also be very careful with medications, as they are likely to be far more effective, last longer in the body than normal, have more side effects and may be toxic.

Kidney transplants have an 80% cure rate, while dialysis can be continued for many years if necessary.

**RESPIRATORY DISTRESS SYNDROME, ADULT**

The adult respiratory distress syndrome (ARDS) is difficulty in breathing in association with severe shock, very low blood pressure, significant blood loss or serious injury. The symptoms include anxiety, shortness of breath, rapid breathing, excess fluid in the lungs and a blue tinge may develop in the skin (cyanosis). Specific blood tests are performed to measure oxygen levels in the blood.

It is managed in a hospital intensive care unit. Doctors must control any bleeding and replace lost blood, give oxygen, ventilate mechanically if necessary, manage body fluids by a drip into a vein and fluid removing medications (diuretics), and prescribe antibiotics to prevent infection.

The prognosis depends on the cause, but recovery is normally expected, although permanent organ damage may occur.

See also **RESPIRATORY DISTRESS SYNDROME, INFANT**

**RESPIRATORY DISTRESS SYNDROME, INFANT**

Hyaline membrane disease, or infantile respiratory distress syndrome, is a lung disease that occurs only in very premature babies. The more premature the infant, the greater the risk of developing the condition. Of babies born 8 weeks premature, 75% will be affected.

Surfactant is a fluid essential within the lungs to enable them to open and fill with air after birth. It is not produced in adequate quantity in some premature babies, so their lungs do not open and they cannot obtain sufficient air and oxygen. The hyaline membrane that lines the tiny airways within the lungs is responsible for producing surfactant. Hyaline membranes are not anatomical structures but restrictive membranes, formed by proteins exuded from the tiny blood vessels in the immature lungs of premature babies, which decrease the elasticity of the lungs and make breathing more difficult.

The condition develops some hours after birth, when the baby starts to breath rapidly, grunt with each breath, and has very marked movements of the chest and abdomen as it tries to breathe. The baby will become blue in colour, and lapse into a coma.

The diagnosis is confirmed by a chest X-ray while a special test performed on a sample of the amniotic fluid in which the baby floats in the womb can assess the risk of developing the disease before birth. It can be prevented if the mother is given an injection of a steroid at least 48 hours before the birth. Every effort is made to delay a birth until the 48 hours has elapsed.

Once the disease is present, oxygen is given in a humidicrib. Death is common without treatment, but if the baby survives for 48 hours, it is almost certain to recover. A small number of children have permanent lung damage.

See also **RESPIRATORY DISTRESS SYNDROME, ADULT**
RHEUMATIC FEVER

Rheumatic fever is a damaging inflammation of the heart valves that follows some types of bacterial infections and was common before antibiotics were readily available, but is now rare in developed countries.

Patients have two or more of a number of widely different symptoms, so every case is completely different. Symptoms include inflammation of the heart and its valves, a rapid pulse, irregular heart beat, irregular shaped red patches and rings on the skin, chorea (uncontrolled twitching of the arms, legs and face), fever, and arthritis that moves from one large joint to another. In 70% of patients it causes permanent damage to heart valves that leak and fail in later life, and are susceptible to infection (endocarditis). All patients who have had rheumatic fever must take antibiotics whenever they have any dental treatment or operation.

The diagnosis is confirmed by blood tests (eg. anti-deoxyribonuclease-B titre - Anti-DNase-B), and an electrocardiogram (ECG), then antibiotics (commonly penicillin) are given to remove any remaining bacterial infection, aspirin to reduce fever and joint pains, and strict bed rest is ordered for several weeks or months.

The condition may last a few weeks to months, with children taking far longer to recover than adults. A significant number of patients have recurrences for years afterwards. 98% of patients recover from the first attack, but multiple repeat attacks may lead to death from heart damage.

See also ENDOCARDITIS

RHEUMATOID ARTHRITIS

Rheumatoid arthritis is an inflammatory autoimmune disease that affects the entire body, and is not limited to the joints. The immune system is triggered off inappropriately, and the body starts to reject its own tissue. The main effect is inflammation (swelling and redness) of the smooth moist synovial membrane that lines the inside of joints. Those most affected are the hands and feet.

It tends to run in families from one generation to the next, and the onset may be triggered by a viral infection or stress. It occurs in one in every 100 people, females are three times more frequently affected than males, and usually starts between 20 and 40 years of age. A juvenile form is known as Still’s disease.

Initial symptoms are very mild, with early morning stiffness in the small joints of the hands and feet, loss of weight, a feeling of tiredness and being unwell, pins and needles sensations, sometimes a slight intermittent fever, and gradual deterioration over many years. Occasionally the disease has a sudden onset with severe symptoms flaring in a few days, often after emotional stress or a serious illness. As the disease worsens, it causes increasing pain and stiffness in the small joints, progressing steadily to larger joints, the back being only rarely affected. The pain becomes more severe and constant, and the joints become swollen, tender and deformed. Additional effects can include wasting of muscle, lumps under the skin, inflamed blood vessels, heart and lung inflammation, an enlarged spleen (Felty syndrome) and lymph nodes, dry eyes and mouth, and changes to cells in the blood.

It is diagnosed by specific blood tests, X-rays, examination of joint fluid and the clinical findings. The level of indicators in the blood stream can give doctors a gauge to measure the severity of the disease and the response to treatment. Blood tests that may be used in the investigation of rheumatoid arthritis include rheumatoid factor, anti-deoxyribonucleic acid titre, antinuclear antibodies, Beta-2 microglobulin, complement, C-reactive protein, DNA
autoantibodies, erythrocyte sedimentation rate, extractable nuclear antigen autoantibodies, HLA-DR4 and latex agglutination.

The condition requires constant care by doctors, physiotherapists and occupational therapists. The severity of cases varies greatly, so not all treatments are used in all patients, and the majority will only require minimal care.

In acute stages, general physical and emotional rest, and splinting the affected joints are important. Physiotherapists undertake regular passive movement of the joints to prevent permanent stiffness developing, and apply heat or cold as appropriate to reduce the inflammation.

In chronic stages, carefully graded exercise under the care of a physiotherapist, are used. Medications for the inflammation include aspirin and other anti-inflammatory drugs. Steroids such as prednisone give dramatic, rapid relief from all the symptoms, but they may have long-term side effects (eg. bone and skin thinning, fluid retention, weight gain, peptic ulcers, lowered resistance to infection, etc.), and their use must balance the benefits against the risks. In some cases, steroids may be injected into a particularly troublesome joint. A number of unusual drugs are also used, including gold by injection or tablet (auranofin), antimalarial drugs (eg. chloroquine), penicillamine (not the antibiotic), etanercept (a tumour necrosis factor antagonist) and cell-destroying drugs (cytotoxics). Surgery to specific painful joints can be useful in a limited number of patients.

There is no cure, but effective controls are available for most patients, and the disease tends to burn out and become less debilitating in old age. Some patients have irregular acute attacks throughout their lives, while others may have only one or two acute episodes at times of physical or emotional stress, while yet others steadily progress until they become totally crippled by the disease.

RICKETS
Rickets is a rare disease in developed countries, but growing children in poorer countries may develop rickets if they have an inadequate intake of vitamin D. This vitamin is essential for the body to absorb calcium, which is the main constituent of bone. Vitamin D is obtained from dairy products (milk, cheese, yoghurt, etc.), eggs and fish, and can also be formed in the body by the action of sunlight on certain substances in the skin. In adults the same condition is known as osteomalacia.

Children with rickets have soft bones and grow slowly. The legs tend to bow outwards because of walking on the soft long bones of the legs, and there are abnormalities in the growth of the ribs, and excessive enlargement of the forehead may occur. Patients may also be “double-jointed”, with slack ligaments around the joints, and may have weak muscles. Any bone deformity that occurs may become permanent, resulting in premature arthritis.

Measurement of calcium and vitamin D levels in the blood, and x-rays of long bones can be used to confirm the diagnosis. it is easily treated by supplying adequate amounts of vitamin D in the diet. No further damage is likely once a good diet is started.

ROMANO-WARD SYNDROME
Romano-Ward or Ward-Romano syndrome is an abnormality of nerve electrical conduction in the heart. Patients have an elongation of the time taken from the first electrical depolarisation of the heart at the start of a contraction, to the repolarisation of the heart muscle at the end of a contraction. These changes in electrical potential of the heart muscle are measured on an electrocardiograph (ECG) and the different waves are named by the
letters from P to T. The gap between the Q and T waves on the ECG is lengthened in this syndrome. The problem is inherited and usually starts in infancy.

Patients experience episodes of sudden collapse and unconsciousness due to irregularities in the heart rhythm. Sudden death is possible due to the abnormal heart rhythm. An ECG shows prolonged QT interval and medications can be given to regulate the heart rhythm.

ROUSSY-LEVY SYNDROME
The Roussy-Levy syndrome or disease is a familial (inherited) developmental defect of nerves in the arms and legs. Sufferers have poor coordination, curvature of the spine and hump back (kyphosis), thin arms and legs with very weak muscles. The tendon reflexes in the arms and legs are absent, no treatment is available and the condition is slowly progressive.

SARCOIDOSIS
Sarcoidosis is an uncommon disease that causes damage and inflammation to a wide range of organs within the body, but most commonly to the lungs. The cause is unknown, but women are more commonly affected than men, and the usual age of onset is 40 to 60 years.

The symptoms can be very varied and sometimes bizarre because almost any part of the body may be involved as affected tissues fail to function correctly. Patients may have a fever, tiredness, shortness of breath, rashes, enlarged glands, liver or spleen enlargement, pain, arthritis, pins and needles sensation and heart failure. Gradual destruction of the lungs and other organs may occur.

Blood tests and lung x-rays show abnormalities, but cannot specifically diagnose sarcoidosis. A definitive diagnosis requires the microscopic examination of a biopsy (Kveim test).

Steroids are used to reduce the inflammation, but the disease is slowly progressive and cannot be cured, although control is usually sufficient to give the victim a relatively long life.

SCALENUS ANTICUS SYNDROME
See NAFFZIGER SYNDROME

SCAPULO-COSTAL SYNDROME
The scapulo-costal syndrome is one of the thoracic outlet group of syndromes and is a cause of shoulder, head, arm and neck pain. It may be due to muscle fatigue associated with long-term faulty posture.

Patients develop pain in the back of the neck spreading to the back of the head, the inside edge of the shoulder blade (scapula) and down the inside of the arm to the little finger. It may be associated with tenderness along the inside edge of the scapula, shoulder stiffness, and tender muscles down the back. There are no specific diagnostic tests.

Treatment involves posture correction, exercise, anti-inflammatory medications, and local anaesthetic and steroid injections. The syndrome usually settles with time, rest and treatment. See also NAFFZIGER SYNDROME; SUBCLAVIAN STEAL SYNDROME

SCLERODERMA
Scleroderma (progressive systemic sclerosis) is an inflammatory condition most commonly affecting the skin and gut, then the oesophagus (gullet), lungs, heart and other internal organs. It is an autoimmune disease, in which the body inappropriately rejects its own tissue,
and usually starts between 30 and 50 years of age, with women being more commonly affected.

Symptoms vary widely but include thickening of the skin, arthritis that moves between joints, patchy changes in skin colouration, poor circulation to the hands, difficulty in swallowing, lung infections, fevers and diarrhoea. Damage to vital organs such as the heart may occur.

Blood tests show abnormalities but are not diagnostic, and a biopsy (sample) of skin or other affected tissue must be taken to confirm the diagnosis.

Medications can relieve the symptoms, but there is no cure, and the disease is slowly progressive over many years. Men and the elderly deteriorate more rapidly.

See also AUTOIMMUNE DISEASES

SCOLIOSIS

Scoliosis is abnormal lateral (side to side) curvature of the spine. Kyphosis is excessive antero-posterior (front to back) curvature of the spine. The two conditions can be combined in kyphoscoliosis. Spinal curves are usually double. If there is a curve in one direction, there must also be a curve in the opposite direction further up or down the spine. If this were not so, the shoulders would tilt to one side.

The easiest way to detect curvature is to have the child touch their toes. When looking along their back, one side will be seen to rise higher than the other, even though the spine may appear relatively straight when erect. If scoliosis is detected, the cause must be determined.

Minor degrees of both kyphosis and scoliosis are seen in many teenagers at puberty and in children as they go through rapid growth spurts, particularly if they have poor posture, which accentuates the deformity. Only significant curvature warrants medical attention. This is the type that must be watched most carefully to prevent permanent deformity.

If one leg is shorter than the other due to injury or other causes, the pelvis will be tilted, and the spine will curve to compensate.

Abnormal vertebrae in the back that may have been present since birth or damaged by a severe injury, or a collapse of one or more of the discs between vertebrae (slipped disc), may also lead to scoliosis.

Diseases of the muscles that support the vertebral bones are another cause. This occurs in patients with polio, muscular dystrophy or quadriplegia. Spasm of the same muscles in spastics can pull the backbone out of shape.

Rare causes of scoliosis include Marfan syndrome (long limbs and fingers, thin body, heart defects), Coffin-Lowry syndrome and Roussy-Levy syndrome.

Once diagnosed, careful measurements are taken, and the patient is then checked at regular intervals to assess the progress of the scoliosis. If there is deterioration or the curvature exceeds 15-20 degrees, treatment is necessary, by means of physiotherapy, structured exercises, braces, or in severe cases surgery. Surgical techniques include the insertion of steel rods into the back to keep it straight, or fusing several vertebrae together in a straight line to prevent them from moving. The younger the onset of the problem, the greater the need for concern, but babies nearly always recover spontaneously. With proper medical care severe deformity is almost unknown.
SEPTICAEMIA
Septicaemia, or blood poisoning, is a bacterial infection of the blood. The infection usually starts in another part of the body, such as the lungs, tonsils (quinsy) or after childbirth (now very rare), but in some cases the origin of the infection may never be found. Many different bacterial infections have septicaemia as a complication. Patients are usually very ill, with a high fever, prostration and generalised aches and pains. A small number will have an overwhelming infection with resistant bacteria, which leads to death.

Many different bacteria may be responsible for the infection, and it is important to identify them by blood tests before antibiotic treatment commences. Potent antibiotics are given by mouth, injection or drip infusion in hospital to cure the infection. The original site of infection must also be treated if possible.

Provided an appropriate antibiotic can be found, most patients can be cured.

SERUM SICKNESS
Serum sickness is an uncommon reaction to a blood or serum (liquid part of blood without the cells) transfusion, or use of a blood product (eg. globulin or proteins). Uncommonly it may be caused by the use of a drug. The reaction may be immediate, or delayed for up to two weeks after a transfusion.

The patient feels unwell, tired, nauseated and feverish; lymph nodes in the neck, armpit and groin become enlarged, an itchy rash develops, cramps occur in the belly, and joints may become painful.

No tests are diagnostic, but blood tests show generalised abnormalities characteristic of an allergy.

Antihistamines are given to counteract the allergy reaction, and steroids or adrenaline are prescribed to treat the results of the reaction. The reaction can vary widely in severity from being so mild that it passes almost unnoticed, to a very severe condition that can lead to death in a few hours.

SHEEHAN SYNDROME
Also known as post partum pituitary necrosis, Sheehan syndrome is damage to the pituitary gland under the brain due to a sudden drop in blood pressure with massive blood loss after childbirth. It causes a failure of breastfeeding and many varied other hormonal disorders.

It is named after the British pathologist Harold Sheehan (1900-1988).

SHINGLES
Shingles (varicella) is an infection of nerves and skin by the Herpes zoster virus, which is the same virus that causes chickenpox, and is usually caught as a child. The virus never leaves the body, but migrates to the roots of nerves along the spinal cord, where it remains inactive lifelong. At times of stress, the virus may reactivate and move along the nerve to cause the skin and other tissues to become very painful. Shingles is far more common in older people, and uncommon in children. You cannot catch shingles from another person, but a child who has not had chickenpox may catch this from a person who has active shingles.

An acutely tender blistering rash develops, often in a belt-like line on one side of the body, and even the slightest touch causes severe shooting pain. Any nerve may be affected, and it can occur on the abdomen or chest (most common sites), or on the face or legs. Occasionally the rash leaves permanent scars, particularly on the face. A small number of elderly people
can develop chronic inflammation in the nerve, and pain that persists for years (post-herpetic neuralgia). The worst complication occurs if nerves around the eye and ear are involved, when dizziness, ear noises and rarely blindness may occur (Ramsay-Hunt syndrome).

No investigations are normally necessary, but if required the diagnosis can be confirmed by taking special swabs from a sore.

Shingles can be cured by specific antiviral tablets, but only if treatment is started within 72 hours of the rash first appearing. If treatment is neglected until after three days from the onset of the rash, the only treatment is painkillers, drying antiseptic lotions and mild sedatives. Steroids may be used in severe cases.

The rash dries out slowly and disappears over several weeks, usually healing completely. The pain is slower to disappear, and may last a month longer than the rash, but the vast majority of patients make an excellent recovery.

**SHOCK**

In a medical context, shock has a different meaning to that of fright or startle. Medically, any condition in which there is inadequate circulation of blood around the body can be described as shock (or shock syndrome). There are many serious causes including loss of blood from a major injury, severe burns, several fractures, extensive bleeding into the gut from an ulcer or other disease, massive diarrhoea, various forms of heart damage and failure, lung disease (eg. thrombosis or embolism), heart valve disease or septicaemia.

The patient collapses, is obviously very ill, pale, sweaty, has a weak thready pulse, the blood pressure is very low, and may become unconscious. Further symptoms depend on the cause, and may vary from pain to shortness of breath and fever. Extensive blood, urine, x-ray and other tests may need to be performed in order to determine the cause.

First aid involves lying the patient flat with legs raised (Trendelenburg position) if conscious to improve blood flow to the brain, or lying down flat and on the side if unconscious, controlling any bleeding, maintaining body temperature by the use of warm blankets, splinting fractures, protecting burnt areas, and if the patient deteriorates, mouth-to-mouth resuscitation and external cardiac massage may be necessary. In a hospital intensive care unit fluids or blood are given through a drip into a vein, and oxygen and painkilling injections are given when appropriate. Further treatment depends on the cause and may include a wide range of drugs and possibly surgery.

Permanent damage to almost any organ (including the brain and heart) may occur due to poor blood supply or blood clots (thrombosis).

The prognosis depends upon a multitude of factors including the cause of the shock, the patient's age and general health, and the speed with which medical assistance can be obtained.

See also RESPIRATORY DISTRESS SYNDROME, ADULT

**SICK SINUS SYNDROME**

The sick sinus syndrome (SSS) is an abnormality of heart rhythm, due to failure of the heart pacemaker (sinus node) or nerve conduction within the heart. Patients have a variable heart rate from brief standstill or very slow (sinus bradycardia) to markedly rapid beat or atrial fibrillation and resultant fainting or collapse. Heart attack and death may rarely occur. A continuous ECG reading (Holter monitor) for 24 hours will be abnormal and can be used to make the diagnosis.
A RATIONALE FOR THE CHEST

Treatment involves an artificial pacemaker and drugs to stabilise heart rhythm, which give good control once diagnosed.
See also ATRIAL FIBRILLATION

SILICOSIS
Silicosis is a form of permanent lung damage caused by the long-term inhalation of tiny silica dust particles by workers involved in rock quarrying, stone cutting, tunnelling, pottery and in those who use diatomaceous earth. Multiple small hard round nodules develop in the lung.
There are no symptoms in early stages of the disease, but in advanced cases patients develop shortness of breath, and a poor tolerance to exercise. Lung infections such as pneumonia may be a complication.
Chest X-ray shows characteristic abnormalities, but there is no treatment, no cure, and the condition is slowly progressive over many years.
See also ASBESTOSIS; LUNG; PNEUMOCONIOSIS; SIDEROSIS; TALCOSIS

SJÖGREN SYNDROME
Sjögren syndrome is a chronic widespread autoimmune inflammatory condition in which the body inappropriately rejects its own tissue. It is closely related to rheumatoid arthritis, but affects more organs.
Common symptoms include widespread arthritis, dry eyes, dry mouth, dry skin and dry throat. Other symptoms may include difficulty in swallowing, decaying teeth, loss of taste and smell, and a hoarse voice. Nearly all patients are women, and it usually commences in the fifth decade. Complications may involve inflammation of the pancreas, thyroid and other organs. It is diagnosed by specific blood tests.
Patients are prescribed anti-inflammatory drugs, steroids (eg. prednisone), and a number of unusual drugs such as gold by injection or tablet, antimalarial drugs (eg. chloroquine) penicillamine (not the antibiotic), and cell-destroying drugs (cytotoxics). Artificial tears and skin moisturisers, and good dental hygiene are also necessary.
There is no cure, but reasonable long-term control is usually possible.
See also AUTOIMMUNE DISEASES; RHEUMATOID ARTHRITIS

SLE
See SYSTEMIC LUPUS ERYTHEMATOSUS

SLEEP APNOEA
A cessation of breathing (apnoea) during sleep most commonly occurs in overweight middle-aged men due to a complete relaxation of the small muscles at the back of the throat. The throat tissue becomes very soft, flabby and collapses as the patient breathes in, closing off the throat and preventing breathing. Snoring is caused in the same way. In elderly men with high blood pressure there may be a suppression of the urge to breathe by the brain during very deep sleep.
In sufferers breathing stops for periods from 10 to 60 seconds on many occasions during the night while asleep, resulting in tiredness during the day, morning headaches, personality changes, poor concentration, bed-wetting and impotence. The sleeping partner complains about the patient’s loud snoring and thrashing restless sleep. Minor brain damage may occur
A RATIONALE FOR THE CHEST

with every episode of apnoea, and this eventually leads to a noticeable deficit in brain function.

The diagnosis is best made in a sleep laboratory, where the patient's sleep and breathing pattern can be monitored through an entire night.

Treatment involves weight loss, and avoiding alcohol, sedatives and smoking. In persistent cases a small mask is fitted to the patient's nose, and air is blown up the nose at a slightly increased pressure with a small electrically driven blower (continuous positive airway pressure - CPAP). In severe cases surgery to the back of the throat and nose to remove the uvula and part of the soft palate opens the airway. A significant deterioration in the quality of life may occur unless successfully treated.

SLIPPING RIB SYNDROME

The slipping rib syndrome is an abnormality of the lower ribs caused by an injury to the chest or a developmental abnormality. The cartilage that normally attaches the end of the tenth rib to the lower end of the breast bone (sternum), becomes unattached and overrides the rib above causing pain. An abnormal chest X-ray is diagnostic.

Usually no treatment is required, but if the problem is particularly annoying it can be injected with a mixture of a steroid and local anaesthetic, or the cartilage can be removed by surgery. It is usually a nuisance rather than serious.

See also TWELFTH RIB SYNDROME

SNAKE BITE

Snakes usually retreat from humans intruding into their habitat unless surprised or cornered., and most non-venomous snakes do not bite (the carpet python is an exception). A bite from a snake is more serious in a child than an adult because the proportion of venom relative to body size is greater.

Signs of envenomation may include nausea, vomiting, headache, giddiness, double vision, drowsiness, tightening in the chest, diarrhoea, sweating, difficulty in breathing, and there may be reddening, swelling, bruising or persistent bleeding at the site of the bite. Symptoms may occur from 15 minutes to two hours after the bite. Ulceration and permanent damage to tissue around site of bite may be complications.

FIRST AID FOR SNAKE BITE

- keep the victim calm and move them as little as possible to prevent spread of poison.
- apply pressure directly to the bite.
- if the bite is on a limb, apply pressure immobilisation by bandaging the limb firmly starting at the bitten area and working to the fingers or toes, then back up the limb to the armpit or groin.
- immobilise the limb with a splint (eg. a small branch) or by bandaging it to the other limb.
- check the victim's breathing and pulse regularly, and give mouth-to-mouth resuscitation if breathing stops, and cardiopulmonary resuscitation if the pulse stops.
- get medical assistance as soon as possible.

NEVER cauterise the bite or try to suck the venom out - this will cause the victim's blood to flow more swiftly as it hurried to plug the wound, and will only spread the poison.
A RATIONALE FOR THE CHEST

The responsible snake can be identified by taking swabs from around the bite site, then an antivenene is given (these are available for all poisonous snake bites), and specific blood and other tests are used to monitor a patient’s progress in hospital. In developed countries with good health care, only 2% of bites from potentially deadly snakes are now fatal.

SPONDYLOLISTHESIS
Spondylolisthesis is an abnormality of the vertebrae in the lower back in which one vertebra moves forward in the back in relation to the adjacent vertebrae causing nerves to be pinched. It may be present from birth, or caused by injury or degeneration (arthritis).

Sufferers develop significant back pain that spreads to the buttocks and down the legs (sciatica). Severe nerve pinching may cause muscle spasm or weakness.

It is diagnosed by x-ray and CT scan, and treated by physiotherapy, anti-inflammatory drugs, and in intractable cases, surgery (spinal fusion). The management often difficult, but in most cases surgery is eventually successful.

STATUS ASTHMATICUS
A patient who has persistent severe asthma that is unrelieved by their normal medications is said to be suffering from status asthmaticus. If left untreated the patient may become cyanosed (blue). lose consciousness and die.

Urgent hospitalisation is essential so that oxygen and appropriate inhaled and intravenous medications can be given to relieve the symptoms and reverse the attack.

See also ASTHMA

STOKES-ADAMS ATTACK
A Stokes-Adams attack (Adams-Stokes syndrome) is a sudden slowing of the heart rate due to an electrical problem within the heart, resulting in inadequate blood supply to the brain. It often occurs after a heart attack, may have no apparent cause, or may be due to a side-effect of medication.

The patient faints suddenly, convulses, and has a slow heart rate or multiple missed heart beats. Facial flushing occurs for a minute or so on recovery. Rarely an attack may cause permanent damage to heart leading to further heart complications.

The diagnosis of a series of unexplained faints can be made by monitoring the heart electrical activity for a prolonged period (Holter monitor), while maintaining a normal lifestyle, until an attack occurs, and the heart electrical problem can be identified. Once diagnosed, appropriate medications can be prescribed to regulate the heart rhythm or surgical implantation of an electrical pacemaker can be performed.

Recovery from a sudden attack is usually rapid, but recurrences may be frequent. Attacks are usually well controlled by appropriate treatment once cause identified, and patients get good result from a pacemaker.

See also MYOCARDIAL INFARCT

STROKE
See CEREBROVASCULAR ACCIDENT

SUBCLAVIAN STEAL SYNDROME
The subclavian steal syndrome restricts the blood supply to the left arm and head. It is caused by pressure from one of the thoracic outlet syndromes (eg. Naffziger syndrome,
A RATIONALE FOR THE CHEST

scapulocostal syndrome) on the left subclavian artery or innominate artery, which supply blood to the left side of the head and the left arm. It eventually results in a restricted blood supply to the brain. Significant brain damage may occur if the correct diagnosis is not made.

Patients have arm pain, particularly with exercise, and varying brain symptoms similar to a transient ischaemic attack. Angiography (x-ray of arteries after injection of a dye) is abnormal and confirms the diagnosis. Surgical bypass of the affected artery is necessary when there are significant symptoms.

See also NAFFZIGER SYNDROME; SCAPULO-COSTAL SYNDROME

SUPERIOR VENA CAVA SYNDROME

The superior vena cava syndrome may be a complication of any form of cancer in the chest (eg. lung cancer) that puts pressure on the superior vena cava (the main vein draining into the heart from the head and arms) blocking the return of blood from the head to the heart.

Patients develop a firm swelling (brawny oedema) and flushing of head and neck, and dilated neck and arm veins. Venography (x-ray of veins) shows the blocked superior vena cava. Treatment is urgent or heart failure occurs and involves potent anticancer drugs and chest irradiation. The prognosis is very poor as the cancer is usually inoperable by the time this syndrome occurs.

See also LUNG CANCER

SYPHILIS

In the 18th. and 19th. Centuries, syphilis was called the French pox by the English, and the English pox by the French.

Syphilis is an infection that is usually sexually transmitted, and which passes through three main stages over many months or years. It is relatively uncommon in developed countries, but still widespread in poorer societies. The cause is the spirochete bacterium Treponema pallidum, which is transmitted by heterosexual or homosexual contact, sharing injecting needles, blood transfusions, or from a mother to her child during pregnancy (congenital syphilis). The same bacteria also cause yaws and bejel, which are transmitted by close body contact, but not necessarily sexual contact.

The symptoms are totally different in each of the three stages:-

- **First stage** syphilis causes a painless sore (chancre) on the penis, the female genitals, or around the anus of homosexuals, which heals after three to six weeks. There may be painless enlarged lymph nodes in the armpit and groin that also disappear.

- **Second stage** syphilis starts a few weeks or months later with a widespread rash, mouth and vaginal ulcers, and a slight fever. The patient is highly infectious but will usually recover and enter a latent period that may last many years.

- **Third (tertiary) stage** syphilis develops years later with tumours (gumma) in the liver, major arteries, bones, brain, spinal cord (tabes dorsalis), skin and other organs. Symptoms vary depending on organs involved but may include arthritis, bone weakness, severe bone pain, paralysis, strokes, heart attacks, internal bleeding from aneurysms, blindness, headaches, jaundice (liver failure), muscle spasms, skin ulcers, scars, nodules in the larynx and lungs, vomiting, confusion, insanity and death.
- **Congenital syphilis** occurs in newborn infant who have teeth abnormalities, deafness, misshapen bones, deformed saddle nose, pneumonia, and intellectual disability.

It can be diagnosed at all stages by specific blood tests (eg. fluorescent treponemal antibodies, syphilis IgG enzyme immunoassay), or by finding the responsible bacteria on a swab taken from a genital sore in the first stage of the disease. All pregnant women should be routinely tested.

The first stage and second stages are treated by antibiotics such as penicillin (often as an injection), tetracycline or erythromycin. In the third (tertiary) stage antibiotics are also used, but can merely prevent further deterioration, as organ damage is irreversible. A child suffering from congenital syphilis is infectious when born and is treated with antibiotics.

There are many complications associated with a syphilis infection. In the first stage there are usually none, but in second stage syphilis there may be spread of the infection to involve the joints, brain, liver and kidney which may be severely damaged. In the third (tertiary) stage almost any organ can be seriously damaged. Infants with congenital syphilis may develop more serious problems if the condition is not treated aggressively.

A course of antibiotics for a few weeks almost invariably cures the disease in its first two stages, but there is no cure for tertiary or congenital syphilis. Plastic surgery may correct the more obvious congenital deformities.

**SYSTEMIC LUPUS ERYTHEMATOSUS**

Systemic (or disseminated) lupus erythematosus (SLE) is a relatively common inflammatory condition affecting joints, skin, liver, and kidney most commonly, but almost any tissue in the body may be involved. 85% of cases occur in women (usually young), and it is more common in Negroes than Caucasians.

Lupus is an autoimmune disorder in which the body inappropriately rejects normal tissue for no known reason. Attacks may be precipitated by stress, some medications or chemicals. There is also a familial tendency.

Common symptoms are arthritis of several joints, a red scaly rash across both cheeks and the bridge of the nose ("butterfly rash"), rashes on other areas that are exposed to sunlight, mouth ulcers, poorly functioning kidneys and anaemia. Additional symptoms may include a fever, loss of appetite, tiredness, weight loss, damaged nails, loss of hair and painfully cold fingers. Less common complaints include conjunctivitis, blurred vision, chest pain, pneumonia, heart failure, belly pain, constipation, depression and convulsions. The symptoms vary significantly from one patient to another, and none will have them all. Many patients are free of symptoms for months before a recurrence. After each attack, there is slightly more permanent liver, kidney or heart damage, and eventually these problems accumulate to the point where the disease becomes life threatening. In rare cases it proceeds relentlessly to death within a relatively short time.

Specific blood tests can diagnose the condition (eg. lupus anticoagulant antibody, ANCA, anti-Smith antibodies, anti-DNA, anti-dsDNA).

Treatment depends upon the severity of the disease, and with mild symptoms, no treatment is required. Sun exposure should be avoided, and all non-essential medications ceased. In severe cases, a wide range of drugs, including steroids, cytotoxics, immunosuppressives and antimalarials may all be used. Regular blood tests follow the course of the condition, which is very variable, from a mild arthritic complaint to a rapidly progressive
disease. There is no cure, but with careful management, compliance with treatment, and regular check-ups, 90% of patients are alive more than ten years after the diagnosis is made.

**TALCOSIS**
Talcosis is the replacement of normal lung tissue by fibrous scar tissue due to long-term inhalation of fine talcum powder in the milling and rubber industries. It is aggravated by cigarette smoking.

There are no symptoms until the condition is quite advanced, when patients become short of breath, or develop lung infections such as pneumonia. A chest X-ray shows scar tissue in lungs.

No treatment or cure is available, but it is only slowly progressive, and the disease does not necessarily lead to lung cancer in the same way as asbestosis.

See also ASBESTOSIS; PNEUMOCONIOSIS; SILICOSIS

**THORACIC OUTLET SYNDROME**
See NAFFZIGER SYNDROME; SCAPULO-COSTAL SYNDROME; SUBCLAVIAN STEAL SYNDROME

**THYROGLOSSAL DUCT CYST**
In the foetus, the thyroid gland develops under the chin, and migrates down to the lower front of the neck before birth along the thyroglossal duct. The duct normally degenerates and disappears, but sometimes a cyst can develop in the thyroglossal duct.

A smooth, painless lump may be discovered anywhere in the midline on the front of the neck, that moves up and down with swallowing. It may become infected and form an abscess, and may contain active thyroid gland tissue. Ultrasound and CT scans are used to assess the size and contents of the cyst. It is normally cured by surgery.

**THYMOMA**
A thymoma is a rare cancerous or benign tumour of the thymus gland, which is a small irregular strip of glandular tissue that lies behind the upper part of the breast bone and extends up into the front of the neck. The thymus is proportionally much larger and more important in children, and reaches its maximum size at puberty. It plays a major role in the development and maintenance of the immune system, produces specific types of white blood cells that are vital in allowing the body to become immune to infection, and secretes a hormone that maintains the cells it produces.

Patients develop a vague discomfort in neck, cough, shortness of breath and tiredness. If the tumour becomes cancerous it may spread to nearby tissues. A CT or MRI scan of neck and chest shows the tumour.

Surgical removal is the only treatment. The prognosis is very variable depending on the type of tumour present and the stage at which surgery is performed.

**THYROID CANCER**
There are several different types of cancer of the thyroid gland, which sits in the front of the neck between the Adam's apple (larynx) and the top of the breast bone, and produces hormones that control the metabolic rate of the body. Their cause is unknown, but they are more common in elderly women. Cancers may also spread from other organs to the thyroid.
The cancer is usually felt as a painless lump in the gland that steadily enlarges. It does not normally interfere with the workings of the gland until it is very advanced, and there are no other symptoms in the early stages. An advanced cancer may spread to surrounding lymph nodes, bone, liver and other organs. Any hard lump in the thyroid gland is considered to be a cancer until proved otherwise.

The proof usually involves scanning the thyroid gland with radioactive iodine, an ultrasound scan, taking a biopsy of the lump, or removing the lump surgically. It cannot be detected by a blood test.

Surgery to remove the gland (thyroidectomy) is the main treatment. Irradiation (eg. using sodium iodide) and cytotoxic drugs may be added in some cases.

Several different types of cancer occur in the thyroid, and outcome will depend upon the type present. Anaplastic carcinoma of the thyroid has the worst prognosis and usually proceeds rapidly to death, while papillary tumours are rarely fatal.

**THYROTOXICOSIS**

See HYPERTHYROIDISM

**TIEZE SYNDROME**

Tietze syndrome (anterior chest wall syndrome; costochondral syndrome; costochondritis) is a harmless, relatively common chest wall condition, which tends to mimic the pain of a heart attack. Patients are usually middle aged, and there is normally only one attack, and the cause is unknown.

The ribs sweep around the chest from the vertebrae in the back towards the breast bone (sternum) but stop a few centimetres short. The ribs are joined to the sternum by a strip of cartilage (costal cartilage). Inflammation occurs at the point where the cartilage joins onto the rib (costochondral junction). The second rib is most commonly involved, but any rib, and any number of ribs may be affected.

Patients develop painful, tender swellings of one or more costal cartilages just under the skin on the front of the chest to either side of the sternum. Anti-inflammatory drugs, steroid injections and painkillers may be used in treatment.

The syndrome settles spontaneously in two weeks to six months.

See also XIPHOIDALGIA

**TOXOPLASMOSIS**

*Toxoplasma gondii* is a single-celled animal that is found world-wide as a parasite of cats, other animals and birds, from whom it may spread to humans. The eggs pass out in the faeces of the animal and may then enter a human mouth (eg. after careless handling of cat litters or soil contamination of fingers or food). Once in the gut, the microscopic egg hatches and multiplies into millions of single-celled animals.

In many patients, the symptoms are so mild that they are ignored, but in severe cases the patient complains of a low-grade fever, tiredness, muscle aches, joint pains, headache, sore
thorax, a mild rash and enlarged glands. In the rare severe cases, the liver, spleen, lungs, eye, heart and brain may be involved.

Patients usually recover without treatment in four to eight weeks. If symptoms are significant or complications develop, medications are available (e.g. pyrimethamine) to destroy the infection.

The worst complication of toxoplasmosis occurs in women who are pregnant. The infection may cause miscarriages, still birth, and deformities in the baby (e.g. small head, hydrocephalus, mental retardation, fits, blindness). The disease can be detected by a specific immunoglobulin blood test, and this test is often routinely performed during antenatal blood examinations. If toxoplasmosis is detected in pregnancy, treatment will be given to cure the disease. Unfortunately, because the disease has already occurred, there may still be some damage to the foetus.

There is no vaccination or other form of prevention available. Pregnant women should not associate closely with cats.

TRACHEITIS
Tracheitis is infection of the trachea (windpipe), usually by viruses, but sometimes by bacteria. The infecting viruses or bacteria are inhaled from the breath of someone who has some form of respiratory tract infection (eg. common cold, bronchitis, sinusitis).

Symptoms may include painful breathing, persistent dry cough, pain in the chest behind the upper end of the breast bone, fever and tiredness. The infection may spread up to the throat to cause laryngitis, or down into the lungs to cause bronchitis.

Antibiotics can cure tracheitis if it is caused by bacteria, but viral infections can only be treated with aspirin and other anti-inflammatory medications, cough suppressants, and paracetamol for pain. In severe cases inhaled steroids may be used to settle the inflammation, which may persist for two or more weeks before settling.

See also BRONCHITIS, ACUTE

TRACHEOBRONCHITIS
Tracheobronchitis is inflammation and/or infection of the trachea and bronchi in the lungs. It is a combined form of tracheitis and bronchitis.

See also BRONCHITIS, ACUTE; TRACHEITIS

TRICUSPID VALVE INCOMPETENCE
Tricuspid incompetence, or regurgitation, is leaking of the three-leafed tricuspid valve, which controls the flow of blood between the upper chamber (the atrium) and lower chamber (the ventricle) on the right side of the heart. Causes include cor pulmonale, heart attack, heart tumours (eg. myxoma), or endocarditis.

Patients develop distended neck veins, an enlarged liver, fluid accumulates in the belly and around the lungs, and the ankles and feet become
swollen. In severe cases, the reduced outflow of blood from the heart to the lungs may lead to heart failure or attack.

It is diagnosed by hearing a characteristic heart murmur through a stethoscope, abnormal electrocardiograph (ECG), echocardiography (ultrasound scan) or passing a catheter through a vein and into the heart.

Symptoms are often controlled by medication rather than surgery, which is performed only in severe cases.

See also COR PULMONALE; ENDOCARDITIS; MYOCARDIAL INFARCT

TRICUSPID VALVE STENOSIS

Tricuspid stenosis is a narrowing of the three-leafed tricuspid valve, which controls the flow of blood between the upper chamber (the atrium) and lower chamber (the ventricle) on the right side of the heart. It is uncommon in developed countries and usually occurs as a result of rheumatic fever.

Symptoms include fluid accumulation in the belly, a large liver, shortness of breath, fatigue, dilation of the veins in the neck and a redness in the neck and face as blood finds it difficult to progress from the body and into the heart. Heart failure may occur in severe cases.

It is diagnosed by hearing a characteristic heart murmur through a stethoscope, and an abnormal electrocardiograph (ECG) and echocardiography (ultrasound scan).

Surgical correction is necessary for the narrowed heart valve, which has a very good prognosis.

See also RHEUMATIC FEVER

TRYPANOSOMIASIS

Trypanosomiasis is an infestation with one of the parasites in the genus *Trypanosoma*, which can cause diseases such as Chagas disease and sleeping sickness.

Infection with *Trypanosoma* can be detected by specific antibody tests, but false positive results are common.

See also CHAGAS DISEASE

TUBERCULOSIS

Tuberculosis (TB, consumption or phthisis) was originally a disease of cattle that only passed to man after these animals were domesticated many thousands of years ago. It is now a bacterial infection that affects one third of the people on the planet.

Infection usually occurs in the lungs (pulmonary tuberculosis), but may attack bone, skin, joints, lymph nodes, kidney, gut, heart and membranes around the brain (meningeal tuberculosis). It is uncommon in developed countries, but widespread in poorer parts of Asia, Africa and South America. Because cattle and other animals may carry TB, its total eradication is difficult.

The responsible bacterium, *Mycobacterium tuberculosis*, passes from one person to another in moist droplets with every breath. When inhaled the bacteria may infect the lung and the surrounding lymph nodes, or may lie dormant for years, and then start multiplying to cause an initial or subsequent attack of the disease at a time when the patient's resistance is down.

Patients develop a productive cough, night sweats, loss of appetite, fever, weight loss and generalised tiredness. The infection may gradually spread to almost every other organ in untreated patients, when symptoms depend upon which areas are affected. Miliary
tuberculosis is a form of the infection in which tiny seeds of infection are found throughout the body in many different organs and tissues.

Chest x-rays show a characteristic pattern, and the infection may be confirmed by collecting sputum samples and identifying the bacteria through a microscope. Skin tests can determine whether the person has ever been exposed to tuberculosis.

Treatment involves a combination of different antibiotic and antituberculotic medications for a year or more. Patients must be hospitalised and isolated until they are no longer infectious. All the other members of the patient's family must be investigated for early signs of the disease, and may be given treatment as a routine preventative measure. The BCG vaccine gives lifelong protection, and is given routinely at birth to babies in many poorer countries.

With effective treatment regimes, a complete cure can be expected, and most recurrences are due to patients failing to complete the full course of treatment. Without treatment, death occurs in a significant proportion of victims.

**TULARAEMIA**

Tularaemia is (rabbit fever) a bacterial infection of rats and rabbits that can spread to humans through a tick bite or direct contact with an infected animal. Symptoms include a fever, headache, enlarged lymph nodes, tender spleen and vomiting. A sore can usually be found at the site where the bacteria entered the body. Diarrhoea and pneumonia may occur in severe cases, and meningitis, bone and heart infection are rare serious complications.

The diagnosis can be confirmed by a blood culture, then antibiotics are given in high doses by injection or intravenous drip. Most patients recover.

**TURNER SYNDROME**

The Turner syndrome (XO syndrome) is a rare defect in sex chromosomes. The person is born with only one X chromosome (XO), and no matching X or Y sex chromosome. The sex chromosomes are named X and Y. Normally two X chromosomes (XX) occur in a female, and one of each (XY) in a male.

Patients look female, but are really asexual, as they do not develop testes or ovaries and are infertile. At puberty, the breasts and pubic hair fail to develop, the genitals remain childlike in appearance, and menstrual periods do not start. Other signs are short stature and a web of skin that runs from the base of the skull down the neck and onto the top of the shoulder. Complications may include eye disorders (eg. keratoconus), heart valve defects, narrowing of the aorta (main body artery), a stocky chest, the early development of diabetes and thin frail bones (osteoporosis).

The diagnosis can be confirmed by blood and cell tests that show the abnormal chromosome structure.

Female hormones (oestrogens) are given in a cyclical manner from the time of expected puberty to encourage the development of female characteristics, growth hormone can be used to improve height, and surgery can correct the heart defects and neck webbing.

Patients can function as females in every way except fertility, and can lead a normal life.

**TWELFTH RIB SYNDROME**

The twelfth rib syndrome causes pain due to damage to the lowest (twelfth) rib. The lateral arcuate ligament in the side of the chest and abdomen becomes trapped under the 12th rib, usually after an injury or strain to the chest. Patients have loin (side) pain aggravated by movement and pressure on 12th rib. X-rays and all other scans are normal.
A RATIONALE FOR THE CHEST

Treatment involves anti-inflammatory medications, steroid injection into the damaged ligament, and sometimes surgery.
See also SLIPPING RIB SYNDROME; Tietze Syndrome

URAEMIA
See RENAL FAILURE, CHRONIC

VASOVAGAL SYNDROME
The vasovagal syndrome may be the cause of repeated fainting attacks. Triggers may include stress, anxiety, or significant emotional or physical upset. Past stresses may cause an attack by the recall of a memory at times when there is another minor stress or possibility of fainting.

Patients experience recurrent episodes of fainting, low blood pressure, a pale complexion and slow heart rate. There is always the possibility of injury from falling during an attack.

Doctors may detect low blood pressure, a slow pulse and abnormal ECG (electrocardiograph) during an attack.

Patients should avoid precipitating causes (e.g. prolonged standing), lie down or bend forward with the start of symptoms, and use aromatic inhalations.

VENTRICULAR SEPTAL DEFECT

A ventricular septal defect (VSD) is a congenital abnormal opening between the two main chambers (ventricles) in the heart, the most common form of "hole in the heart" and the usual cause of a "blue baby". This defect is often combined with other heart and other organ developmental defects. Heart defects can be diagnosed by ultrasound examination (echocardiography).

The symptoms of a VSD depend on the size of the abnormal opening. The infant may have no symptoms or in severe cases may cause congestive cardiac failure, cor pulmonale (lung failure), shortness of breath, blue tinged skin (cyanosis), chest pain, fainting attacks, coughing up blood and numerous other symptoms related to the heart and lungs.

Small holes may close spontaneously, but open heart surgery is used to close larger holes that cause any symptoms. Usually there are good results from treatment, but if the defect is very severe, death in infancy before surgery can be performed is possible.

See also ATRIAL SEPTAL DEFECT; CONGESTIVE CARDIAC FAILURE; COR PULMONALE; FALLOT’S TETRALOGY

WEGENER GRANULOMATOSIS

Wegener granulomatosis is a rare condition of no known cause that causes inflammation of the blood vessels and kidneys, and ulcerating sores in the lungs, larynx, nose and sinuses.
The diagnosis is often difficult but it may be detected on a chest X-ray, or by taking a biopsy (sample) of one of the sores. The symptoms include a fever, weakness, sinusitis, shortness of breath, cough, chest pain, coughing up blood and joint pain. Permanent damage to the involved organs may occur. Cyclophosphamide is the drug of choice in treatment. The condition is invariably fatal without treatment, but good results have been obtained with treatment.

**WHOOPING COUGH**

Whooping cough (pertussis) was originally an infection of ducks that only passed to humans after these birds were domesticated many thousands of years ago. It is now a preventable bacterial infection of the respiratory tract that may be very serious in children. A much milder form of the disease (parapertussis) is also known, against which the pertussis vaccine gives no protection.

The cause is the bacterium *Bordetella pertussis*, which is widespread in the community. In adults an infection merely has the symptoms of a cold, but in young children the disease is more severe, and spreads from person to person in the microscopic droplets exhaled or coughed out in the breath of a patient, so an adult with minimal symptoms may carry the disease from one infant to another. The incubation period is one to two weeks.

It starts in a child as a cold that lasts a week or two, but then the cough becomes steadily more severe and occurs in increasingly distressing spasms, characterised by a sudden intake of breath before each cough. Coughing spasms may last up to 30 minutes, and leave the child exhausted, then another spasm starts after only a few minutes. As the infection worsens, the child may become blue, lose consciousness, and thick stringy mucus is coughed up and vomited. The patient has no appetite and rapidly loses weight. Severe coughing may cause bleeding in the lungs, throat and nose, that may be severe enough to cause suffocation. If the child survives, the spasms start to ease after a few weeks, but mild recurrences may occur for months. Permanent lung damage is also possible.

The diagnosis can be confirmed by analysis of a sputum or throat swab. Pertussis IgA antibodies are normally not present, but a positive result indicates a recent or current pertussis infection. A swab taken from the nose and/or throat (the nasopharynx) is tested. The result is positive early in infection, but short lasting. The equivalent blood test (pertussis IgA antibodies) increase late, and persist long term, but only occur with infection, not vaccination.

No cure is available, but the disease may be completely prevented by a vaccination that is usually combined with those for tetanus, diphtheria and other vaccinations, and is given three times before six months of age, and again at 18 months, and five years of age. The vaccination was first used in the 1930s. The vaccine should not be given if suffering from acute illness, significant fever or epilepsy or if previously infected with whooping cough. The side effects are normally minimal but may include local redness and tenderness at the injection site, a persistent lump, fever, tiredness, irritability and a faint.

The treatment of whooping cough involves oxygen, sedatives and careful nursing isolated within a hospital for several weeks. Antibiotics can be used to prevent the spread of the disease to others.

Even in good hospitals about 2% of patients die, and up to 10% have long term complications. In poorer countries, the mortality rate is much higher.

See also PARAPERTUSSIS

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A RATIONALE FOR THE CHEST
**WOLFF-PARKINSON-WHITE SYNDROME**

The Wolff-Parkinson-White (WPW), ventricular pre-excitation or the accelerated conduction syndrome, may be congenital or develop later in life. It is due to an abnormal nerve pathway in the heart, which allows a short circuit between the upper (atria) and lower (ventricles) chambers of the heart.

Patients have a very abnormal heart rhythm and distressing palpitations, and an electrocardiograph (ECG) shows a typical abnormal pattern. Rarely, sudden death may occur.

Acute attacks are treated by medications (eg. verapamil, propranolol, procainamide) injected into a vein and cardioversion (electric shock to heart). Long-term prevention of further attacks involves the regular use of medication and sometimes surgery on the heart to cut abnormal nerve pathways.

**XIPHOIDALGIA**

The xiphoid or xiphisternum is a piece of cartilage at the bottom end of the breast bone (sternum) that sticks down into the gap between the ribs on either side. Xiphoidalgia (xiphoid syndrome) is inflammation of the xiphoid, which occurs for no known reason.

Significant pain and tenderness of the xiphoid cartilage occurs, that is worse with chest movement (eg. deep breath, cough). Irritation of the stomach that lies behind the xiphisternum may cause nausea and vomiting. Anti-inflammatory medications, anti-inflammatory and anaesthetic injections, or steroids can be used for treatment. The pain settles with time and treatment.

See also Tietze Syndrome

**XIPHOID SYNDROME**

See Xiphoidalgia

**ZENKER DIVERTICULUM**

A Zenker or oesophageal diverticulum is a rare condition in which a weak area at the top end of the oesophagus forms an outpocketing due to the pressure on the area from swallowing. It is usually due to a congenital weakness in the side wall of the oesophagus.

A lump appears in the side of the neck that may change in size as food and fluids fill and then leave the pocket. Patients suffer severe bad breath due to the rotting food in the pocket, difficulty in swallowing, regurgitation and neck discomfort. Ulceration of the pocket and increases in size that compress the oesophagus can result in severe illness.

Investigation of a suspected diverticulum is by an endoscope that is passed through the mouth and down the oesophagus, but extreme care must be taken not to perforate the diverticulum. The diverticulum should be surgically removed when diagnosed.
APPENDICES

Syndromes
Heart sounds
Antihypertensive choice
Cardiac cycle
Respiratory function tests
Smoking
A RATIONALE FOR THE CHEST

THORACIC SYNDROMES

Cardiac Associated Syndromes

Barlow syndrome (mitral valve prolapse)
Carcinoid syndrome (flush, abdominal cramps, diarrhoea)
Carney complex (atrial myxoma, mucosal pigmentation)
Conradi-Hunermann syndrome (ventricular septal defect, patent ductus arteriosus)
Down syndrome (typical facies, mental retardation)
Dressler syndrome (post infarct, pericarditis)
Edwards syndrome (micrognathia, rocker-bottom feet)
Eisenmenger syndrome (patent ductus arteriosus, pulmonary hypertension)
Ellis-van Creveld syndrome (atrial and ventricular septal defects)
Fallot's trilogy, tetralogy and pentalogy
Hunter syndrome (gross facies, hepatomegaly, arthritis)
Hurler syndrome (dwarf, arthralgia, gross facies)
Hypoplastic left heart syndrome (neonate, cyanosis)
Jaccoud syndrome (rheumatic heart disease)
Kartagener syndrome (dextrocardia, sinusitis)
Leopard syndrome (multiple spots, abnormal ECG)
Lown-Ganong-Levine syndrome (atrial arrhythmia)
Marfan syndrome (aortic & mitral valve lesions)
Maroteaux-Lamy syndrome (bone dysplasia, cataracts)
Morquio syndrome (bone dysplasia, cataracts)
Noonan syndrome (short, webbed neck, pulmonary stenosis)
Patau syndrome (polydactyly, cleft lip)
Patent ductus arteriosus (machinery murmur)
Pickwickian syndrome (cardiac failure, obese, cyanosis)
Pompe syndrome (abnormal ECG, hypotonia)
Romano-Ward syndrome (prolonged QT interval)
Rubinstein-Taybi syndrome (patent ductus arteriosus, hypoplastic maxilla)
Sick sinus syndrome (variable heart rate, syncope)
Toxic shock syndrome (cardiac failure, diarrhoea)
Turner syndrome (amenorrhoea, genital hypoplasia)
Waterhouse-Friderichsen syndrome (prostration, petechiae)
Wolff-Parkinson-White syndrome (paroxysmal arrhythmia)

Oesophageal Associated Syndromes

Barrett syndrome (reflux, ulcers)
CREST syndrome (Raynaud's phenomenon, calcinosis, sclerodactyly)
Denervation syndrome (bloated, diarrhoea, oesophageal surgery)
Spinal Abnormality Associated Syndromes

Brown-Sequard syndrome (hemisection of cord)
Kugelberg-Welander syndrome (lordosis, shoulder girdle weak)
Maroteaux-Lamy syndrome (bone dysplasia)
Morquio syndrome (bone dysplasia, cataracts)
Scheie syndrome (recurrent respiratory infections, kyphosis)
Sly syndrome (recurrent respiratory infections, kyphosis)

HEART SOUNDS

First sound – Closure of mitral and tricuspid valves at beginning of systole
Second sound – Closure of aortic and pulmonary valves at end of systole
Third sound – Rapid ventricular filling in early diastole
Fourth sound – Atrial contraction in late diastole

ANTIHYPERTENSIVE CHOICE

Medical treatment rationale for hypertension:

<table>
<thead>
<tr>
<th>Hypertension and -</th>
<th>Use first</th>
<th>Use Second</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac failure</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>C,D</td>
<td>A</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Renal disease</td>
<td>B,C</td>
<td>D</td>
</tr>
<tr>
<td>L. ventricular diastolic failure</td>
<td>A</td>
<td>B,C</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Conduction disease</td>
<td>A</td>
<td>D,C</td>
</tr>
<tr>
<td>Hyperlipidaemia</td>
<td>A,C</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>A,C</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>A,C</td>
<td>D</td>
</tr>
<tr>
<td>Constipation</td>
<td>A,B</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>A,C</td>
<td>D</td>
</tr>
<tr>
<td>Impotence</td>
<td>A,C</td>
<td></td>
</tr>
<tr>
<td>Venouse hypertension</td>
<td>A,D</td>
<td>B</td>
</tr>
<tr>
<td>Raynaud's phenomenon</td>
<td>C</td>
<td>A,D</td>
</tr>
<tr>
<td>Gout</td>
<td>A,C</td>
<td></td>
</tr>
</tbody>
</table>

A = ACE inhibitor   B = Beta-blocker   C = Calcium antagoist   D = Diuretic
CARDIAC CYCLE

ECG

Pressure (mm Hg)

Valves

Sounds

Closed Valve

Left Atrium Pressure

Left Ventricular Pressure
Pulmonary (respiratory) function tests (PFT) are used to measure how effectively the lungs are working. These tests are useful in determining the severity of diseases such as asthma, chronic bronchitis, emphysema and cystic fibrosis. A wide range of tests are available, ranging from simple ones performed by a general practitioner (eg. spirometry) to very complex ones undertaken in special units or hospitals (eg. blood gas analysis).
SMOKING

If beetroot and rhubarb, just for instance, were found not only to cause cancer in 10% of their heavy consumers, but eventually to bring 25% to an early death, no-one would consume them, and the government would long ago have legislated against growing them. Sadly, this is just what cigarette smoking does, but the sale of cigarettes is permitted, cigarettes have been heavily promoted by advertising, and large profits are made from their sale.

Over the centuries, since the introduction of tobacco to Europe in the 1590s, more and more people have become addicted to nicotine. Women started smoking in public only during the First World War, and the habit reached a peak during the Second World War when 75% of the adult population of most western countries were smokers. When today's grandparents were children, they were warned against smoking because “it stunts the growth” (something it only does to the babies of smoking mothers), but generally it was not regarded as harmful, at least for adults. Cigarettes, cigars, lighters, pipes, ashtrays, etc., were standard gifts at Christmas and birthday for a generation. Vast factories poured out billions of cigarettes that were made, packed, wrapped and boxed untouched by human hand. Multinational tobacco corporations gained enormous profits, and became powerful friends of government as tax payers and revenue earners. Governments even subsidised the growth of tobacco in some areas.

Then came the crunch. It was found that smoking tobacco killed people. There was a long delay, and more than half the smokers escaped, but there was little doubt about it - for many people smoking was lethal.

Nicotine is a very powerful and toxic substance, which acts initially as a stimulant on the central nervous system, but this effect is followed by a reduction of brain and nervous system activity. Nicotine causes narrowing of blood vessels, which then affects the circulation and causes blood pressure to rise. This is why regular absorption of nicotine through smoking can cause chronic heart problems and increases the possibility of heart attacks. In addition to nicotine, tobacco smoke contains many other chemicals, which are harmful, including tar and carbon monoxide. Tar released in the form of particles in the smoke is the main cause of lung and throat cancer in smokers and also aggravates bronchial and respiratory disease.

We now know that 11% of smokers will get lung cancer, and 90% of these patients will die. Coronary heart disease will kill many prematurely. Chronic lung disease will cripple a large proportion of the remainder. Women smokers have an increased risk of cancer of the cervix.

Smoking is known to increase the incidence of a wide range of medical problems including:

- lung cancer
- heart attacks
- angina
- emphysema
- chronic bronchitis
- asthma
- cancer of the cervix
- depression
A RATIONALE FOR THE CHEST

strokes
high blood pressure
bladder cancer
throat cancer
tongue cancer
oesophageal cancer
kidney cancer
pancreatic cancer
small and sicker babies of pregnant women
sinusitis
viral and bacterial infections of the throat and lungs (eg. influenza, tonsillitis)
poor circulation to feet and hands (Buerger disease)
pneumothorax
mouth ulcers
peptic ulcers
reflux oesophagitis
suicide

It also alters the actions of many medications from beta-blockers to asthma inhalers. Many of the effects above may affect not only the smoker, but also those who live and work with smokers (passive smokers).

Cigarette smoke contains hundreds of chemicals. Amongst the worst are:-

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>MAY CAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar</td>
<td>Cancer</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>Suffocates and blocks oxygen uptake</td>
</tr>
<tr>
<td>Nicotine</td>
<td>Stimulation and addiction</td>
</tr>
<tr>
<td>Aromatic hydrocarbons</td>
<td>Cancer</td>
</tr>
<tr>
<td>Phenol</td>
<td>Tissue irritant</td>
</tr>
<tr>
<td>Arsenic</td>
<td>Poison</td>
</tr>
<tr>
<td>Carbazole</td>
<td>Accelerates cancer growth</td>
</tr>
<tr>
<td>Hydrocyanic acid</td>
<td>Cancer</td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>Slows function of cilia (fine hairs) in airways</td>
</tr>
<tr>
<td>Ammonia</td>
<td>Tissue irritant</td>
</tr>
<tr>
<td>Nitrosamine</td>
<td>Cancer</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Stops phlegm clearance from airways</td>
</tr>
<tr>
<td>Indole dyes</td>
<td>Accelerates cancer growth</td>
</tr>
<tr>
<td>Vinyl chloride</td>
<td>Cancer</td>
</tr>
</tbody>
</table>

If governments actually recorded these substances officially, they would have to ban the sale of cigarettes, as no other product that contained these substances would be allowed on the market.

The medical facts are conclusive - smoking is the biggest health problem in the Western world. It contributes to more deaths than alcohol and illicit drugs together, and costs the economies of these countries millions of dollars a year. If nobody smoked, there would be 30% less cancer.
A RATIONALE FOR THE CHEST

<table>
<thead>
<tr>
<th>SMOKING BEHAVIOUR</th>
<th>YEARS OF LIFE GAINED - MEN</th>
<th>YEARS OF LIFE GAINED - WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never smoked</td>
<td>10.5</td>
<td>8.9</td>
</tr>
<tr>
<td>Quit aged 35</td>
<td>8.5</td>
<td>7.7</td>
</tr>
<tr>
<td>Quit aged 45</td>
<td>7.1</td>
<td>7.2</td>
</tr>
<tr>
<td>Quit aged 55</td>
<td>4.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Quit aged 65</td>
<td>2.0</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Compared with lifelong smokers.

Smokers just can’t win in any way. In a Boston study smokers were found to have 50% more traffic accidents and 46% more traffic violation convictions than non-smokers.

SMOKING IN PREGNANCY

There is no doubt that the babies of mothers who smoke are smaller (by 200 g on average) than those of non-smoking mothers. There is also an increased rate of premature labour (delivering the baby too early), miscarriage and stillbirth in these women. After birth, babies of smoking mothers continue to suffer both directly and indirectly from their mother’s smoking. The smoking by the mother appears to reduce their resistance to disease, in particular to infection, so that babies born to smoking mothers die in infancy more often than average. By inhaling the smoke from either of their parents, these infants have more colds, bronchitis and other respiratory problems than babies in non-smoking homes.

Any woman who smokes should ideally cease before she falls pregnant, but certainly should do so when the pregnancy is diagnosed. This is far easier said than done, but if her partner stops at the same time, support and encouragement is given by family and friends, and assistance is obtained from the family doctor, women who are motivated to give their baby the best possible chance in life will succeed in kicking this very addictive habit.

SMOKING CESSATION

Smoking addiction can be divided into two components - addiction to nicotine and habit. Those who are addicted will find it harder to stop than those who merely smoke out of habit. Usually it is not just addiction or habit, but a mixture of the two.

Addiction is characterised by:-
- desire to smoke immediately on waking
- difficulty in not smoking in places where it is forbidden
- smoking larger quantities of cigarettes
- smoking more often in the first two hours of each day
- smoking despite being ill
- becoming depressed if unable to smoke

Before anyone can stop smoking, they must really want to stop. No one who is half-hearted about wanting to stop will ever succeed. Once you have decided to stop, set a time and date for the event. Tell everyone you know of your intentions, and take side-bets if you can to reinforce your incentive. Make lists of reasons why you must stop, and leave them everywhere at home and at work. Make sure that from the moment you stop, you have no cigarettes available to you, and resist the temptation to buy or beg for more. Start a savings account with the money you save by not smoking, and if you don’t succeed, pay the balance to the Cancer Fund! Nicotine-containing gum or patches can be used to ease the craving for cigarettes.

If these incentives are not sufficient, see a doctor. They can prescribe a medication (bupropion) that can reduce the craving for nicotine. Group therapy sessions, hypnotherapy,
A RATIONALE FOR THE CHEST

psychological counselling, support groups, rewards at the end of each successful week and reinforcement visits to a doctor can all help win the fight. Antidepressant medication may be useful in smokers who are very addicted.

At present, 26% of the adult population in Western Europe smokes, but this figure is decreasing every year. The lowest rate of smoking in the world is in Australia where less than 18% of adults indulge, but two out of three smokers in Australia are women. In 1945 75% of Australian males smoked and 26% of females, demonstrating how much has changed in the past 60 years. It will soon become so antisocial that it will only be permitted for consenting adults in private!

In developing countries smoking is seen as a status symbol - the smoker can afford to burn money - and smoking rates of over 70% are found in countries like Turkey.

SELECTED NATIONAL ADULT SMOKING AVERAGES

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>% SMOKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>17</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>19</td>
</tr>
<tr>
<td>Singapore</td>
<td>19</td>
</tr>
<tr>
<td>New Zealand</td>
<td>22</td>
</tr>
<tr>
<td>Sweden</td>
<td>23</td>
</tr>
<tr>
<td>Malaysia</td>
<td>23</td>
</tr>
<tr>
<td>Belgium</td>
<td>25</td>
</tr>
<tr>
<td>USA</td>
<td>25</td>
</tr>
<tr>
<td>Portugal</td>
<td>27</td>
</tr>
<tr>
<td>Ireland</td>
<td>28</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>28</td>
</tr>
<tr>
<td>Canada</td>
<td>29</td>
</tr>
<tr>
<td>Thailand</td>
<td>29</td>
</tr>
<tr>
<td>Italy</td>
<td>30</td>
</tr>
<tr>
<td>Netherlands</td>
<td>33</td>
</tr>
<tr>
<td>Norway</td>
<td>35</td>
</tr>
<tr>
<td>Spain</td>
<td>36</td>
</tr>
<tr>
<td>Denmark</td>
<td>36</td>
</tr>
<tr>
<td>Greece</td>
<td>37</td>
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<tr>
<td>Japan</td>
<td>37</td>
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<tr>
<td>Korea</td>
<td>38</td>
</tr>
<tr>
<td>Poland</td>
<td>40</td>
</tr>
<tr>
<td>Bangla Desh</td>
<td>45</td>
</tr>
<tr>
<td>Russia</td>
<td>48</td>
</tr>
<tr>
<td>China</td>
<td>60</td>
</tr>
<tr>
<td>Turkey</td>
<td>71</td>
</tr>
</tbody>
</table>

PASSIVE SMOKING

Almost everyone is forced to inhale fumes containing toxins such as formaldehyde, acetone, arsenic, carbon monoxide, hydrogen cyanide and nicotine at some time. You have no choice in the matter and have to suffer the consequences, because these chemicals are just a few of the scores of irritants found in cigarette smoke. Fortunately for most of us, the
result of passive involuntary smoking is only a minor itch of the nose, a cough or a sneeze, but some people can develop life-threatening asthma attacks or have their heart condition aggravated by inhaling tobacco smoke. Being trapped in a vehicle or other enclosed space with a smoker can be a nightmare experience for such people. In some situations the non-smoker may be more affected than the smoker, because the smoke coming directly from a cigarette contains more toxins, nicotine and carbon monoxide than that inhaled by the smoker, which has been more completely burnt and passed through a filter.

The most unfortunate victims of passive smoking are the children of smokers. The incidence of pneumonia and bronchitis and the severity of asthma in children whose parents smoke are far higher than in the children of non-smokers. In babies of women who smoke, health problems caused by passive smoking begin before birth (see above).

In the workplace, more and more offices are becoming smoke-free zones. Unfortunately some people still smoke at work, and if their subordinates have adverse reactions to passive smoking, they may have to put up with it or change jobs. This situation may change in the future, as more and more workers are successfully claiming workers compensation payments for complications of passive smoking at work.

The non-smoking spouse or partner of a smoker is also at great risk. They have a significantly increased risk of lung cancer, reduced lung capacity, a higher incidence of asthma, and more respiratory infections than those whose spouses or partners do not smoke.

Smokers should now be aware of the health risks that they are taking every day, and they can no longer claim personal freedom to smoke where and when they like, as their habit is adversely affecting the health of those around them. All smokers should have the courtesy to only light up when there is no possibility of others inhaling the resultant toxic fumes. Legal suits by passive smokers against smokers for causing bodily harm have been successful in the United States.

**DISEASES CAUSED BY SMOKING**

As well as slowing wound healing after injury or surgery, there are many diseases that may be caused or aggravated by smoking including asbestosis, amblyopia, aneurysm, angina, asthma, bronchiectasis, bronchitis, Buerger disease, cataract (post-nasal drip), cervical cancer, common cold, cor pulmonale, emphysema, histiocytosis X, high cholesterol, hypertension, laryngitis, laryngotracheobronchitis (infection of airways from throat to lungs), Legionnaire’s disease, lung cancer, mesothelioma, mouth cancer, oesophageal cancer, osteoporosis, peptic ulcer, pneumoconiosis, pneumonia, reflux oesophagitis, sleep apnoea, snoring, tachycardia, talcosis, thrombosis and many others.