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Textbook of Medicine

with relevant physiology and anatomy

TEXTBOOK OF MEDICINE

WITH RELEVANT PHYSIOLOGY AND ANATOMY

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EDITORS' FOREWORD

The scope of this series has increased since it was first established, and it now serves a wide range of medical, nursing and ancillary professions, in line with the present trend towards the belief that all who care for patients in a clinical context have an increasing amount in common.

The texts are carefully prepared and organised so that they may be readily kept up to date as the rapid developments of medical science demand. The series already includes many popular books on various aspects of medical and nursing care, and reflects the increased emphasis on community care.

The increasing specialisation in the medical profession is fully appreciated and the books are often written by Physicians or Surgeons in conjunction with specialist nurses. For this reason, they will not only cover the syllabus of training of the General Nursing Council, but will be designed to meet the needs of those undertaking trainings controlled by the Joint Board of Clinical Studies set up in 1970.

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PREFACE

The aim of this book is to provide a comprehensive text of medicine which is set out in a manner which helps the reader to understand and assimilate facts and to be able to revise the subject either for review in a clinical situation or for examination purposes.

An ideal comprehensive medical text is one which contains more than the conventional subjects of the standard textbook. Those subjects omitted by convention have been included here, subjects such as geriatrics, ionising radiations, psychiatry, skin diseases, infectious diseases, medical disorders of the eye and ear, and therapeutics. The reader is thereby helped to see medicine as a whole and, where interest is stimulated or special information is required, reference may be made to larger and more specialised texts.

Physiology, anatomy and some pathology applied to symptoms, signs and treatment are included in this text, as they form an integral part of our knowledge in clinical practice today. Indeed, physiology and anatomy, as a basis for explaining disease, is now a requirement of the General Nursing Council.

Standard International (S.I.) units are coming into use throughout much of the world and these, with the old units in parentheses, have been incorporated in the text.

GLOSSARY

The index should be referred to for words not given in the glossary.

A-, an-	negative; e.g. anuria, no urine formed
Achlorhydria	lack of gastric hydrochloric acid
Acholuric	no bile in the urine
Acro-	an extremity
Acromegaly	large hands and feet
Adenitis	inflammation of a gland
Aden(o)-	gland
Adenoma	tumour of a gland
-aemia	blood
Aerophagy	swallowing air
Aetiology	causation
Agnosia	inability to recognise the meaning of sensory perceptions
Agranulocytosis	no (or few) granular leucocytes (polymorphs)
Albumin	a blood protein
-algia	pain
Allergen	a substance provoking allergy
Allergy	hypersensitivity, abnormal response to a substance
Alopecia	baldness
Alpha, *α*	Greek letter *a*
Amnesia	loss of memory
Anaemia	deficiency of red blood cells or haemoglobin
Anaerobic	life without air
Anaphylaxis	acute severe allergy
Angio-	vessel
Angiogram	radiography of vessels injected with radio-opaque material
Angioma	tumour of blood or lymphatic vessel
Anion	an ion with a negative electrical charge
Anorexia	loss of appetite
Anoxia	lack of oxygen
Ante-	before
Ant(i)-	against
Antibody	a substance antagonising injurious particles
Antigen	a substance causing the production of antibody or antitoxin
Antitoxin	a substance antagonising injurious soluble material
Aphasia	loss of speech due to brain disease
Aphonia	loss of voice (due to laryngeal disease)
Apraxia	inability to understand the use of things, due to brain damage
Arthr(o)-	joint

Arthropathy	joint disease
Ascites	fluid in the peritoneal cavity
-ase	enzyme
Ataxia	inco-ordination of muscular action
Atopy	inherited hypersensitivity
Atrophy	wasting
Attenuated	reduced in force
Aur-	ear
Autism	morbid day-dreaming with failure of social contact and language
Auto-	self
Auto-immunity	the presence of an immune reaction against one's own tissues
Bacillus	rod-shaped bacterium
Bacterium	a unicellular micro-organism
Base	a substance neutralising an acid
Beta, β	Greek letter *b*
Blepharitis	inflamed margin of the eyelid
Bronchiolitis	inflamed bronchioles
Bronchitis	inflamed bronchi
Bruit	a noise
Cachexia	malnutrition
Carcinoma	cancer of epithelial tissue
Cardiac	pertaining to, or near, the heart
Casts	small protein bodies formed in renal tubules
Cataract	opacity of the lens of the eye
Cation	an ion with a positive electrical charge
Cephal-	head
Chelating agent	a drug combining with, and detoxifying, a metal
Cholangitis	inflamed bile ducts
Chole-	bile
Chromosomes	structures in cell nuclei which carry genes, the units of heredity
Claudication	limping
Coagulate	clot
Coarctation	narrowing
Collagen	the main constituent of connective tissue
Congenital	present at birth
Contagious	disease spread by contact
Coombs test	a test which detects antibody attached to red cells
Cost(al)-	rib
Crepitus	crackling
Cyanosis	blueness
Cyst	sac containing fluid
Cyt(e)	cell
Cytotoxic	cell-damaging

Delirium temporary mental disturbance
Delta, δ Greek letter *d*
Delusion false belief
Dementia lack of coherent thought
Derm(is) skin
Dermatitis inflamed skin
Desquamation scaling
Diabetes to pass through
Dialysis separation of substances in solution using membranes
Diastole relaxation of the heart between beats
Dilatation expansion of a hollow organ or part
Diplopia double vision
Dys- bad, painful, difficult
Dysarthria faulty articulation
Dyscrasia a fault
Dysgenic faulty genes, causing hereditary abnormality
Dyskinesia faulty movement
Dyslexia inability to read due to brain damage
Dysmenorrhoea painful menstruation
Dyspepsia painful digestion
Dysphagia difficult swallowing
Dysphasia difficulty in speaking due to brain disease
Dysphonia defective voice (as in laryngeal disease)
Dyspnoea difficult breathing
Dystrophy defective nutrition
Dysuria difficult or painful urination

-ectomy cutting out
Eczema allergic inflammation of the skin
Effusion the pouring out, usually of fluid from the blood into the tissues or body cavities
Electrolyte a substance which, in solution, forms ions and conducts electricity
Embolism a circulating substance which may obstruct a blood vessel
Emesis vomiting
Emphysema puffed up (with air)
Empyema a collection of pus
Encephal(on) brain
Encephalitis inflamed brain
Endo- within
Endocardium inner lining of the heart
Endotoxin toxin liberated by degenerating bacteria
Enter(on) intestine
Enterology study of the intestine
Enzyme a substance which speeds a biochemical reaction
Eosinophilia an increased number of eosinophils in the blood

Epistaxis	nose-bleed
Eryth(ro)-	red
Erythema	redness
Erythrocyte	red blood cell
Euphoria	sense of well-being
Ex(o)-	out, outside
Exostosis	bony outgrowth
Exotoxin	toxin released by live bacteria
Fibroma	tumour of fibrous tissue
Fistula	a tube joining two epithelial surfaces
Flaccid	limp
Fusiform	spindle-shaped
Gamma, γ	Greek letter *g*
Gamma globulin	protein in the blood consisting of antibodies
Gangrene	death of tissue due to loss of its blood supply
Gast(ric)	stomach
Gastritis	inflamed stomach
Gene	the carrier of an hereditary characteristic
Gland	specialised epithelium with secretory action
Glossal	pertaining to the tongue
Gluco-, glyco	glucose
Glycosuria	glucose in the urine
Goitre	a swelling in the neck
Granulation	new tissue formed in healing wounds
Granulocyte	polymorph leucocyte
Granuloma	tumour of granulation tissue
Haem	blood
Haematemesis	vomiting blood
Haematocrit	red cell volume as a percentage of whole blood
Haematuria	blood in the urine
Haemodialysis	dialysis of blood
Haemoglobin	the red protein, in the red blood cell, which carries oxygen
Haemolytic	blood dissolving
Haemoptysis	coughing up blood
Hallucination	a perception without any external object
Hemi-, semi	half
Hemiparesis	partial paralysis of one side of the body
Hemiplegia	paralysis of one side of the body
Hepatic	pertaining to the liver
Hepatomegaly	enlarged liver
Hereditary	passed on by an ancestor
Hilum	a fissure where vessels, nerves and ducts enter or leave an organ

Hirsute	hairy
Homo	same
Hormone	a substance secreted directly into the blood by an endocrine gland
Hydro-	water
Hydrocephalus	water head, i.e. excessive cerebrospinal fluid in the skull
Hyper-	over-, excess
Hyperglycaemia	high blood sugar
Hyperkalaemia	high blood potassium
Hypersensitivity	oversensitive; allergic
Hypertension	high blood pressure
Hypo-	under, less
Hypochromia	low colour (haemoglobin)
Hypoglycaemia	low blood glucose
Hypokalaemia	low potassium level in the blood plasma
Hyponatraemia	low sodium level in the blood plasma
Hypotension	low blood pressure
Hypothermia	low body temperature
Hypotonia	reduced muscle tone
Hypovolaemia	low blood volume
Illusion	false perception
Immunise	produce immunity
Immunity	exemption from burden or disease
Immunogenesis	production of immunity
Immunology	the science of immunity
Infarct	death of tissue due to loss of its blood supply
Inflammation	heat, swelling, redness and pain
Inter-	between
Intra-	within
Ion	an electrically charged particle
Iritis	inflammation of the iris of the eye
Ischaemia	lack of blood supply
Iso-	same
Isotonic	same strength
-itis	inflammation
Jaundice	yellowness
Kernicterus	bile-staining of the basal ganglia in the brain
Kernig's sign	pain on extending the leg with the thigh flexed to a right angle
Ketosis	presence of excessive ketones
Koilonychia	hollow nail
Kyphosis	humpback

Larynx	voice box
Leuc(o)-	white
Leucocyte	white blood cell
Leucocytosis	increased numbers of normal white cells in the blood
Leucopenia	low numbers of white cells in the blood
Leukaemia	excessive and abnormal white cells in the blood
Lipoma	a benign tumour of fat
Lith(os)	stone
Lumbago	backache
Lysis	breaking down
Macro-	large
Macule	a flat spot
Mediastinum	the part of the chest between the two pleurae
Melaena	black stools due to blood
Melanoma	tumour pigmented with melanin
Mellitus	honey
Meninges	the membranes covering the brain and spinal cord
Meningioma	a benign tumour of the meninges
Metabolism	the physical and chemical processes constantly taking place in a living organism
Metabolite	a chemical product of metabolism
Metastasis	spread of disease from one part of the body to another
Micro-	small
Microcyte	small cell
Mono	one
Monoplegia	paralysis of one part of the body
Morph	shape
Myalgia	painful muscle
Myasthenia	weak muscle
Myelin	fatty sheath surrounding medullated nerve fibres
Myelitis	inflammation of the spinal cord
Myeloid	pertaining to the marrow or spinal cord
Myeloma	tumour of plasma cells
Myo-	muscle
Myocarditis	inflamed heart muscle
Myocardium	heart muscle
Myositis	inflamed muscle
Myxoedema	hypothyroidism
Naevus	a congenital mole (birthmark)
Necrosis	death of tissue
Neo-	new
Neoplasm	abnormal tissue growth, tumour
Nephr(ic)	kidney
Nephritis	inflammation of the kidney

Nephropathy any disease of the kidney
Neuralgia painful nerve
Neurofibroma fibrous tumour of a nerve
Neuroma nerve tumour
Neuropathy any disease of nerves
Neurosis mental disorder without physical disease of nerves

Occlude close, shut
Oedema excess of fluid in the extracellular tissue
Oligo- few, scanty
Oliguria scanty urine formation
-ology knowledge, study of
-oma tumour
Oophoritis inflamed ovary
Ophthalmic pertaining to the eye
Optic disc the optic nerve where it enters the retina
Orchis testis
Orchitis inflamed testis
Ortho- straight, upright
Orthopnoea upright breathing, i.e. difficult breathing on lying down, relieved by sitting up
-osis a state or condition
Osteitis inflamed bone
Oste(o)- bone
Osteoma benign tumour of bone
Osteoporosis reduced density of bone due to loss of calcium
-ostomy, otomy cutting an opening

Papilloedema swelling of the optic disc
Papule pimple
Para- around
Paraesthesia abnormal sensation; e.g. tingling, burning
Paraplegia paralysis of the lower part of the body, especially the lower limbs
Parasite an organism that lives on, and obtains nourishment from, another
Paresis partial paralysis
Parotitis inflamed parotid gland
Patho- disease
Pathogenic disease-producing
Pathology the science of disease
Paul-Bunnell test a blood test for glandular fever
Pedunculated having a stalk
Pellagra a disease due to nicotinamide deficiency
Per- through
Peri-, circum- around

pH	an expression (the negative logarithm) of the hydrogen ion concentration. The pH of water is 7 (neutral), above 7 is alkaline, below 7 is acid.
Phleb(o)-	vein
Photophobia	dislike of light
-plegia	paralysis
Pleura	the serous membrane covering the lungs, thorax and upper surface of the diaphragm
Pleurisy	inflamed pleura
Plexus	a network
Plumbism	chronic lead poisoning
Pneumon	lung
Pneumonitis	infection of lung
-pnoea	breath
Poly-	many
Polyarthritis	many joints inflamed
Polymorph	granulocyte, one type of leucocyte
Polyp, polypus	a tumour
Post-	after
Pre-	before
Pre-natal	before birth
Presbycusis	impaired hearing due to old age
Presbyopia	long-sightedness
Pro-	before
Proct(o)-	rectum
Proctitis	inflamed rectum
Prodromal	before the onset of symptoms and signs
Prothrombin	a blood-clotting factor
Protozoa	small unicellular organisms
Pruritus	itching
Ptosis	drooping upper eyelid
Purpura	purple spots in the skin due to extravasated blood
Pustule	pimple containing pus
Putrefy	to decay with foetid odour
Pyel(os)	renal pelvis
Pyelitis	inflamed renal pelvis and calyces
Pyo-	pus
Pyrexia	fever
Quinsy	peritonsillar abscess
Reticulocyte	young red blood cell
Retro-	behind
Rhesus factor	a blood group factor
Rhin-	nose

Rigor	stiffness, shivering
-rrhoea	discharge, flow
Sarcoma	malignant tumour of connective tissue
Sclerosis	hardening
Splenomegaly	enlarged spleen
Spondyl(os)	vertebra
Spondylitis	inflamed vertebrae
Steatorrhoea	fatty stools
Stenosis	narrowing
Stoma	mouth
Stupor	stunned mental faculties
Stools	faeces
Sub-	under
Submental	below the chin
Suppurate	to generate pus
Supra-, super-	above
Suprarenal	above the kidney, adrenal
Symptom	what the patient complains of
Syncope	faint
Syndrome	a group of symptoms and signs having more than one cause
Synovitis	inflamed synovium
Synovium	the membrane lining the joints
Systole	the contraction phase of the heartbeat
Tachy-	swift
Tachycardia	rapid heartbeat
Tachypnoea	rapid respirations
Thrombocyte	platelet
Thrombocytopenia	a low blood-platelet count
Thrombus	clot of blood
Thrush	Monilia (Candida) fungus infection
Trans-	across
Transplant	to remove and plant in another place
Tremor	tremble
Tumour	a swelling
Ulcer	sore, local loss of surface tissue
Ultra-	beyond
Ultrasound	sound waves having a frequency above audibility
Uraemia	excess urea and other urinary constituents in the blood
-uria	urine
Urobilin	a brownish pigment in the urine, derived from bilirubin in the gut
Urticaria	nettle rash, itching wheals in the skin

Uvea the pigmented layer of the eye
Uveitis inflamed uvea

Vaccine an inoculable immunising agent
Ventricle a cavity in the body, as in brain and heart
Vital capacity the maximum amount of air that can be inhaled in one breath

CONTENTS

1 INTRODUCTION

Medicine is the study of disease, its cause, effects and treatment. Diseases have many causes:

1 Heredity, due to genes inherited from parents, e.g. haemophilia.
2 Trauma (injury), e.g. mechanical, chemical, thermal (burns, scalds, frostbite), electrical, radiations.
3 Inflammation, due to infection (e.g. mumps) or allergy (e.g. eczema, urticaria, asthma).
4 Neoplasm (growth, tumour), an overgrowth of tissue cells.
5 Malnutrition, such as deficiency of vitamin D causing rickets.
6 Degeneration, e.g. due to wear (osteoarthrosis), ischaemia (deficient blood supply), poisons.
7 Metabolic defects may cause the accumulation of unwanted metabolites, e.g. uric acid which causes gout.
8 Endocrine, due to undersecretion or oversecretion of hormones by the endocrine glands, e.g. overproduction of thyroxine by the thyroid gland causes thyrotoxicosis.
9 Congenital abnormalities are present at birth. They may be hereditary and due to abnormal genes, e.g. mongolism, or acquired in the uterus, e.g. rubella (German measles) in the mother may damage the fetus and cause congenital heart disease and cataract.
10 Psychological. Few diseases are due to psychological factors but emotional stress, e.g. anxiety, may cause diarrhoea or the taking of an overdose of drugs. Many mental diseases have a physical cause, e.g. dementia may be due to atherosclerosis, myxoedema, or vitamin B deficiency; depression occurs in many illnesses, e.g. influenza, cancer.
11 Poisons. Industrial accidents, accidental ingestion or inhalation of insecticide, chronic alcoholism.

Many diseases have more than one cause, often an hereditary predisposition plus an environmental precipitating cause, e.g. the predisposition to one form of diabetes mellitus is inherited but the disease often does not appear unless the subject over-eats (environmental) and becomes obese. Infectious disease, e.g. tuberculosis, is predisposed by malnutrition.

Iatrogenic disease is illness due to treatment, e.g. infection due to corticosteroid therapy, anaemia due to phenylbutazone or chloramphenicol, rashes due to one of many drugs.

Heredity, the environment and neoplasms are now discussed. Details of trauma may be obtained from surgical books. The other causes of disease mentioned above are dealt with in the appropriate chapters.

HEREDITY

A cell consists of a nucleus surrounded by cytoplasm, all contained within the cell membrane (*Fig. 1.1*). The cytoplasm contains numerous tiny structures (mitochondria, endoplasmic reticulum and ribosomes) required in cellular metabolism.

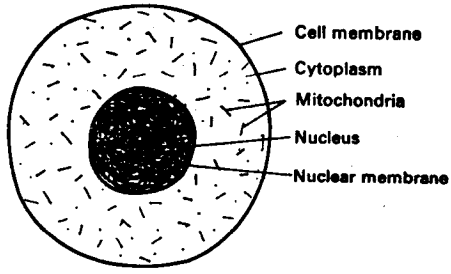

FIG. 1.1 A cell

The nucleus contains chromosomes consisting of deoxyribonucleic acid (D.N.A.), and in humans there are 46 chromosomes. Half the chromosomes are inherited from each parent, thus there are 23 pairs of chromosomes. Twenty-two pairs are autosomes, one pair are the sex chromosomes. In the female this pair is XX, in the male it is XY.

The female egg cell (ovum) and the male germ cell (spermatozoon) have only 23 single (unpaired) chromosomes, all the ova contain an X chromosome, but half the spermatozoa have an X and half have a Y chromosome. During the division of the primary germ cells from 46 to 23 chromosomes some genetic material may interchange between a pair of chromosomes. This is one form of mutation and results in a difference in the offspring. During conception the 22 X ovum may be fertilised by a 22 X sperm producing a 44 XX (= female) offspring, or by a 22 Y sperm, producing a 44 XY (= male) offspring.

On each chromosome there are about 100,000 genes and since the chromosomes are in pairs the genes are also paired. Each gene pair is responsible for the production of one enzyme (an enzyme is a protein which has one specific chemical action).

Inheritance may be: (1) dominant or (2) recessive, and (3) sex-linked or (4) autosomal. If one gene of a pair has a stronger influence than the other it is termed 'dominant', the less effective gene being 'recessive'. Thus if one gene of a pair determines blue and the other brown eyes the eyes will be brown since brown is dominant. The inheritance of characteristics due to genes on the sex chromosomes is sex-linked, and on one of the other 44 chromosomes is autosomal.

Inherited diseases are the results of abnormalities of genes. Genetic faults are known to be caused by ionising radiation such as X-rays, certain viruses, and chemicals. The chromosome containing the abnormal gene usually appears normal under the microscope; e.g. in renal rickets and phenylketonuria, but sometimes is visibly abnormal and shows: