

DIPLOMA IN MRI TECHNICIAN 1ST YEAR

GENERAL ANATOMY & PHYSIOLOGY

Scope of Anatomy and physiology.

Structure of cell, function of its components with special reference to mitochondria and microsomes.

Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

Skeletal System: Structure and function of Skeleton .

Composition of blood, functions of blood elements and Blood group.

Name and functions of lymph glands.

Cardiovascular System: Structure and functions of various parts of the heart .Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording.

Respiratory system: Various parts of respiratory system and their functions,

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney.

Central Nervous System: Various parts of central nervous system, brain and its parts, functions .

Anatomy and physiology of automatic nervous system.

Sensory Organs: Elementary knowledge of structure and functions of the organs of taste, ear, eye and skin.

Digestive System: names of various parts of digestive system and their functions. structure and functions of liver.

Endocrine System: Endocrine glands and Hormones. Their hormones and functions. pituitary, thyroid. Adrenal and pancreas

Reproductive system: Physiology and Anatomy of Reproductive system.

RADIO ANATOMY & SURGICAL MAK. BASIC PHYSICS, PHYSICS OF MRI, ELECTRONIC MANAGEMENT

Magnetisation Properties, Types of Magnetic characteristics of the Nucleus, Nuclear Magnetic properties of the elements, Larmor Equation, Geometric Orientation. Resonance and excitation, Free induction decay: T2 Relaxation, Return of Equilibrium : T1 Relaxation, Comparison of T1 and T2. Angiography and magnetization transfer contrast, Time of flight (TOF)

Spin echo, Fast spin echo, Parts of MRI, Artifacts, Machine dependent artifacts, Motion artifacts, Motion artifacts, Chemical shift artifacts, Magnet, Resistive magnet, Superconductive magnet, Permanent Magnet, Safety and Bio-effects. Pulse sequences, Time of repetition and partial saturation-(i) T1 Weighting (ii) Spin (proton density) weighting (iii) T2 weighting (iv) Inversion recovery (v) Short tau inversion recovery (STIR) (vi) Fluid attenuated Inversion recovery (FLAIR). Gradient recall echo (GRE), Perfusion weighted MRI, Diffusion weighted MRI, Magnetization transfer contrast. MRS, Tractography, DTI

Patient preparation and positioning

Pathologies as seen on MRI

Recent Advances –3T MRI, MR angio, MRCP, MRS, Tractography, DTI

Slice Anatomy-Brain, Neck Thorax, Abdomen, Pituitary, Orbit, P.N.S., Limbs, Vertebra in C.T. Scan. Axial, Coronal & Saggital. Anatomy of Body---Radiological Anatomy

MRI safety, Do's and don't's of MRI Indication and contraindication of MRI Non Ionic & Ionic Contrast NEGATIVE & POSITIVE CONTRAST Contrast Reaction and its Management. ROUTES OF CONTRAST

ONLY BASICS OF REVELATION PATHOLOGY, PHARMACOLOGY & MICROBIOLOGY & DRUG USED DURING CT SCAN

Inflammation and repair

Wounds, ulcers, sinuses

Bones:-fracture, types of fractures, healing of fractures, factors affecting the healing of fractures, delayed union, common fractures of upper and lower extremity, methods of fixation, complications.

Joints:-dislocation of the major joints of upper and lower extremities-displacement, fixation, complications,

internal derangement of knee, sacroiliac strain, Synovitis, acute and chronic Osteo-Arthritis, Rheumatoid Arthritis

Muscles-sprain, wounds, rupture, scars, burns, amputations, fibrositis, Myalgia, Myositis

Nerves-inflammation and repair, degeneration, lesions of upper motor neuron, hemiplegia, paraplegia, lesions of lower motor neuron-acute anterior polio myelitis, facial palsy, neuritis, neuralgia.

Deformities of upper and lower extremities, Sprengel shoulder, Dupuytren's Contracture, Genu Valgum, Genu Varum, Flat foot, Metatarsalgia

Drug Pharmacokinetics, Pharmacology-adverse reaction, factors modifying drug effects

Drug Activity of CNS : Introduction, Alcohols, Sedatives & Hypnotics, Anti-convulsants.

Drugs acting on peripheral nervous system: Adrenergic, Cholinergic.

Drug therapy in Parkinsonism

Skeletal muscle relaxants

Vitamin D, Calcium, Phosphorus, Magnesium.

Analgesics & Drugs used in Gout & Rheumatoid Arthritis

Psycho Therapeutics

General anesthetic, Local anesthetic

Characteristics of bacteria, virus, fungus

Sources of infection.

Mode of spread.

Destruction of bacteria.

Control of infection.

Inflammation, healing and repair

Infection, wounds, ulcers, blisters, boils, fractures, burns, scalds, gangrene and haemorrhage

HAND HYGIENE & PREVENTION OF CROSS INFECTION BLS.CPR

Introduction

Materials & methods

Discussion

Conclusion

Hand hygiene involves behavioural changes

Incorporation of hand hygiene in examination checklist of OSCE stations

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ANATOMY & RADIOLOGICAL ANATOMY

Introduction to Nervous System (C.N.S., P.N.S., A.N.S.)

Brain

Cerebrum

Basal Ganglia

Thalamus

Hypothalamus

Ventricles

Cerebro Spinal Fluid and pathway

Brain Stem

Cerebellum

Spinal Cord

Digestive System & GIT

Visceral & solid organs of abdomen
Nasopharynx, oropharynx & pharyngeal spaces
Mesentery & peritoneum
Oesophagus
Stomach
Small Intestine
Large Intestine
Salivary Glands
Diaphragm
Hepatobiliary
Bones and muscles of limbs
Introduction to Circulatory System
Heart
Pulmonary Circulation
Systemic Circulation
Aorta, IVC with branches
Review of Respiratory System
Nose
Pharynx
Trachea
Bronchus & bronchioles
Lungs
Details of Genito Urinary System
Kidneys
Ureters
Urinary Bladder
Urethra
Orbit
ACE & PNS
ENT
Temporal Bone
Neck and larynx
Major nodes of body with classification
Basic course of major nerves, arteries, veins and lymphatic channels

PATIENT PREPARATION & POSITING

MRI Brain
MRI Neck
MRI P.N.S
MRI Thorax
MRI Abdomen & MRCP
MRI of Spine
MRI limbs
MRI Orbit
MRI JOINTS & MUSCULOSKELETAL

PHOTOLOGIES AS SEEN ON C.T

Cranio Cerebral & body including musculoskeletal Trauma

Epidural / Subdural Haematoma

Subarachnoid Haemorrhage

Congenital brain lesions

Hydrocephalus

Stroke, Cerebral Infarction

OVERVIEW OF Brain Tumours

COMMON Body Tumours----BENIGN & MALIGNANT

Pneumonia/pneumothorax/ pleural effusion05Spine-disc herniations, congenital lesions and spinal tumors

Tuberculosis—lung / bone /genito urinary/Brain/ pleura /GIT

Carcinomas-----Hepatocellular carcinoma/,renal cell / bronhogenic,Gall bladder/ pancreatic head/ ub mass

Bone, Musculoskeletal tumors and avascular necrosis

Ring lesions in brain

COMMON Abdominal & Pelvic masses (inflammatory and malignant)

COMMON Vascular lesions

MRI/ RECENT ADVANCES/ REFUSION MRI/ PHYSICS

1.5 TESLA/ 3TESLA / 8 TESLA MRI

MR ANGIO / M R C P /DIFFUSION/PERFUSION

MR SPECTROSCOPY

MR TRACTOGRAPHY