

Theme base Curriculum for AIPHDCET July - 2021

SYLLABUS

Basic Sciences as applied to Orthopaedics:

1. Basic Sciences

- Anatomy and function of joints
- Bone structure and function
- Growth factors and fracture healing
- Cartilage structure and function
- Structure and function of muscles and tendons
- Tendon structure and function
- Metallurgy in Orthopaedics
- Stem Cells in Orthopaedic Surgery
- Gene Therapy in Orthopaedics
- PRP in orthopaedic surgery

2. Diagnostic Imaging in Orthopaedics

(Should know the interpretation and Clinical Correlation of the following): -

- Skiagrams
- Digital Subtraction Angiography (DSA)
- MRI and CT in Orthopaedics
- Musculoskeletal USG
- PET Scan
- Radio-isotope bone scan

3. Systemic Complications in Orthopaedics

- Shock
- Crush syndrome
- Disseminated Intravascular Coagulation (DIC)
- Acute Respiratory Distress Syndrome (ARDS)

4. Biomaterials

- Orthopaedic metallurgy
- Bio-degradable implants in Orthopaedics
- Bone substitutes
- Bone Banking

5. Wound healing and repair including skin grafting

6. Normal respiratory function, respiratory failure and principles of management

7. *Nutritional requirements and the methods of nutritional support*
 8. *Normal renal functions, renal failure, hemodynamic and musculoskeletal effects of acute and chronic renal failure*
 9. *Function of blood, blood coagulation, blood transfusions*
 10. *Pathophysiology of inflammatory process and its natural history*
 11. *Cellular characteristics of infecting organisms, natural habitat and methods of production of infection, toxins, and characteristics of human infection*
 12. *Theories of aetiology of neoplasia, normal controls of cellular growth, spread of tumor, tumor grading and staging systems*
 13. *Principles of neoplasm therapy including radiotherapy, immunotherapy and chemotherapy*
 14. *Normal immunological function and diseases of the Neuro muscular system related to abnormal immune function*
 15. *General features of transplantation and rejection and the immunological factors relating to bone and joint transplantation*
 16. *Describe common inheritance patterns in musculoskeletal diseases*
 17. *Describe the metabolic response to trauma, its variations and management*
 18. *Pharmacological actions of drugs commonly used in orthopaedics surgery (Antibiotics, Chemotherapeutic agents, analgesics, sedatives, anaesthetics agents and drugs used in cardiovascular and respiratory disease)*
 19. *Describe the pathophysiology and principles of management of – Common Cardiac arrhythmias, heart failure, haemorrhage and shock.*
 20. *Describe normal gastro intestinal function and its abnormalities as related to musculoskeletal system*
 21. *Principles of injury, its mechanism and mode, its clinical presentation and plan the investigations and management of musculoskeletal injured patient*
 22. *Principles of biostatistics and research methodology.*
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Traumatology and Rehabilitation:

1. General

Initial management of major multiple system trauma

- *Establishment of treatment priorities*
- *Systemic effects of trauma*
- *Patterns of injury*
- *Major bleeding*
- *Assessment and management of major multiple extremity injuries*

2. Fracture and Fracture-Dislocations

General considerations

- **Definitions, types, grades, patterns and complications of fractures including Fat**

embolism, Deep Venous Thrombosis, Pulmonary embolism

- Pathology of fractures and fracture healing
- Clinical and Radiological features of fractures and dislocations
- General principles of fracture treatment
- *AO Principles of internal fixation including*
- Locking plate Osteosynthesis
- *Less Invasive Stabilisation System (LISS)*
- *Principles of external fixation*
- Ilizarov technique
- Bone grafting and bone graft substitutes
- Open fractures and soft tissue coverage in the lower extremity including Hip, Femur Intracapsular, Extra capsular, Subtrochanteric, Femur Shaft, Distal Femur, Knee Ligaments & Dislocations, Patella Fractures & Dislocations Menisci, Tibia Plateau, Tibial Shaft, Distal Tibia, Ankle Fractures, Ligament Injuries & Dislocations, Foot-Tarsal (Fractures & Dislocations), Sub-Talar Dislocation, Calcaneum Fractures, Tarsal Fractures, Tarsal Metatarsal Dislocation, Metatarsal & Phalange Fracture.
- Compartment syndrome
- Fractures of the upper extremity and shoulder girdle including Glenohumeral Joint, Proximal Humerus, Humeral shaft, Distal Humerus, Olecranon, Radial Head and Neck, Forearm and Elbow, Radius and Ulna, Distal Radioulnar Joint, Carpal and Hand Injuries
- Fractures of the lower extremity
- Fractures of the hip and pelvis
- Malunited fractures
- Delayed union and non union of fractures
- **Spinal trauma:** Fractures/dislocations and fracture - dislocations of spine, diagnosis and management including various types of fixations

- i. Rehabilitation of paraplegics/quadriplegics
- ii. Management of a paralyzed bladder
- iii. Prevention of bed sores and management of established bed sores
- iv. Exercise programme and activities of daily living (ADL)
- v. Psycho sexual counselling

3. Paediatric Fractures and dislocations including injuries of

- A. Hand
- B. Wrist
- C. Forearm Fractures in Children
- D. Fractures and Dislocations About the Elbow
- E. Fractures of Humeral Shaft and Shoulder

- F. Spinal Injury in Children
- G. Pelvic Fractures in Children
- H. Fractures and Dislocations About the Hip in Children
- I. Fractures of the Femoral Shaft
- J. Fractures about the Knee in Children
- K. Fractures and Dislocations of the Patella in Children
- L. Fractures of the Tibia and Fibula
- M. Fracture and Dislocation of the Foot
- N. Pathological Fractures
- o. Epiphyseal plate injury, differences in fractures between children and adult, birth fractures, fractures in child abuse

4. Traumatic Disorders of Joints Dislocations and Subluxations

- Acute dislocations
- Old unreduced dislocations
- Ankle injuries
- Knee injuries
- Shoulder and elbow injuries
- Wrist and hand injuries

5. Amputations and Disarticulations

- Amputations and disarticulations in the lower limb
- Amputations and disarticulations in the upper limb

6. Triage, Disaster Management, BTLS and ATLS

7. Peripheral Nerve Injuries

- *Investigations for peripheral nerve injury*
- Traumatic
- Entrapment Neuropathies
 - Exercise programme and Activities of Daily Living (ADL)
 - Psychosexual counselling

Orthopaedic Diseases:

1. Metabolic Bone Diseases

- Rickets and Osteomalacia
- Osteoporosis
- Scurvy
- Mucopolysaccharidoses
- Fluorosis
- Osteoporosis

2. Endocrine Disorders

- Hyperparathyroidism
- Gigantism, Acromegaly

3. Bone and Joint Infections

- Pyogenic Haematogenous Osteomyelitis - Acute and Chronic
- Septic arthritis
- Fungal infections
- Miscellaneous infections
- Gonococcal arthritis
- Bone and joint brucellosis
- AIDS and the Orthopaedic Surgeon (universal precautions)
- Musculoskeletal Manifestations of AIDS
- Pott's spine
- Tubercular synovitis and arthritis of all major joints

4. Poliomyelitis

- General considerations
- Polio Lower limb and spine
- Management of Post Polio Residual Palsy (PPRP)

5. Orthopaedic Neurology

- Cerebral Palsy
- Myopathies



6. Diseases of Joints

- Osteoarthritis
- Calcium Pyrophosphate Dehydrate (CPPD), Pseudo Gout, Gout
- Collagen diseases
- Rheumatoid arthritis, Sero-negative spondylo Arthropathy, reactive arthritis, Neuropathic joint, Haemophilic arthritis, Transient synovitis, sickle cell disease and arthritis

7. Bone Tumors

- Benign bone tumors
- Malignant bone tumors
- Tumor like conditions
- Metastatic bone Tumors

8. Regional Orthopaedic Conditions of Adults and Children

- The spine – Spine diseases, cervical Spondylosis and disc disease, lumbar disc, mechanical instability, degenerative spine disease (spinal stenosis central and lateral), Spondylolysis/Spondylolisthesis, Lumbar Spondylosis, Ankylosing Spondylitis,

Spinal fusion: various types and their indications

- The shoulder – Impingement syndrome, rotator cuff injury, instability
- The elbow – Epicondylitis, instability
- The hand – General, Rheumatoid arthritis and osteoarthritis, congenital anomalies, paralytic, infections and tumors
- The wrist – Kienbock's disease, dequervain's disease, compound palmer ganglion
- The hip – Snapping hip
- The knee – Meniscus and ligament, patellar mal alignment, instability, abnormal

tracking

- The foot and ankle – Flat foot, pes cavus, neuropathic foot (diabetic charcot), paralytic, rheumatoid
- The pelvis – Adductor tendinitis, pubic Symphysis

9. Arthodesis

- Arthodesis of lower extremity and hip
- Arthodesis of upper extremity
- Arthodesis of spine

10. Arthroplasty

- Biomechanics of joints and replacement of the following joints.
- Knee
- Ankle
- Shoulder
- Elbow

11. Rehabilitation - Prosthetics and Orthotics

12. Paediatric orthopaedics:

- a. Perthes' disease
- b. Slipped capital femoral epiphysis
- c. Neuromuscular disorders – Spinal dysraphism, Diastematomyelia, Neurofibromatosis
- d. **Congenital Disorder of the Upper Limb –**
 - Sprengels deformity
 - Cleidocranial dysostosis
 - pseudarthrosis of the clavicle
 - ankylosis of the elbow
 - Radioulnar synostosis
 - dislocation of the radial head
 - Madelung 's deformity

- Polydactyly
- Syndactyly
- Camptodactyly
- clasped thumb
- macrodactyly
- clinodactyly
- brachydactyly
- symphalangism
- trigger finger or thumb
- Poland's syndrome
- Reduction deformities (including club hand, cleft hand, phocomelia, amputations, etc)
- Brachial plexus palsy

e. Congenital disorders of the Lower Limb -

- Pes Planus
- Pes Cavus
- Leg Deformities – Angular, Leg Length Inequality
- **Clubfoot**
- Metatarsus Varus
- Tarsal Coalition
- Developmental (Congenital) Dislocation of the Hip DDH
- Congenital Dislocation of the Knee
- Vertical Talus
- Proximal Femoral Focal Deficiency
- Reduction Deformities
- Coxa Vara
- Pseudarthrosis of the Tibia

f. Miscellaneous Congenital Disorder

- Constricting Bands
 - Arthrogyposis
 - Marfans Syndrome
 - Ellis-van Creveld Syndrome
 - Nail-Patella Syndrome
 - Ehlers-Danlos Syndrome
 - Trisomy-21 (Down's Syndrome)
 - Turners Syndrome
 - Klinefelters Syndrome
 - Mucopolysaccharidoses
 - Achondroplasia
 - Larsen's Syndrome
 - Klippel Trenaunay syndrome
 - Parkes Weber syndrome.
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Recent Advances in Orthopaedics + General Surgery as applied to Orthopaedics:

1. Recent advances in orthopaedics

- a. Autologous chondrocytes implantation
- b. Mosaicplasty
- c. Video assisted Thoraco scopy (VATS)
- d. Endoscopic spine surgery
- e. Metal on metal arthroplasty of hip
- f. Surface replacements of joints
- g. Microsurgical techniques in Orthopaedics
- h. Designing a modern orthopaedic operation theatre
 - Sterilization
 - Theatre Discipline

- Laminar air flow
- Modular OTs

2. Minimally Invasive Surgery

(MIS) Arthroscopy

- General principles of Arthroscopy
- Arthroscopy of hip, knee and ankle
- Arthroscopy of shoulder and elbow and wrist

3. Recent advances in Shoulder, Elbow, Wrist and Ankle Arthroplasty

4. Recent advances in Ring Fixation Techniques

5. Recent advances in spinal surgery including endoscopic spinal surgery

6. General surgery topics related to Orthopaedics –

- a. Management of Urinary bladder and urethral injury in pelvic fracture
- b. Management of various types of Pneumothorax and its complications
- c. Management of Vascular complications in pelvic fractures
- d. Venous thrombosis and orthopaedics surgery
- e. Arterial thrombosis and its differentiation with venous thrombosis and radiculopathy
- f. Assessment of Head Injury and emergency management
- g. Various types head injury assessment skill and its role in polytrauma management