

# **DIPLOMA IN PHYSICAL MEDICINE & REHABILITATION – (DPMR)**

## **SYLLABUS**

### **Basic Sciences as applied to Physical Medicine & Rehabilitation**

#### **1. Anatomy ( 40 hours of lectures and demonstrations)**

- a) Musculo-skeletal system – Osteology and Myology, Functional Anatomy,
- b) Kinesiology and Anthropology.
- c) Neuroanatomy - Brain, Spinal Cord, Peripheral Nerves, Autonomic Nervous
- d) System.
- e) Cardiovascular system
- f) Respiratory system
- g) Histology of bones, cartilage, muscles, nerves and skin

#### **2. Physiology (30 hours of lectures and demonstrations)**

- a) Muscle – Ultra structure and chemical composition, contraction, fatigue, changes in denervated muscle.
- b) Nerve – properties of peripheral nerve, membrane potential and depolarization, nerve impulse, nerve conduction, neuromuscular transmission, motor unit, muscle spindle, electro- diagnosis.
- c) Central nervous system – sensations and volition, co-ordination of movement and regulation of posture, special senses, language and speech.
- d) Autonomic nervous system
- e) Cardiovascular system
- f) Respiratory system – including assessment of pulmonary function
- g) Endocrine system -
- h) Renal functions, control of micturition
- i) Temperature regulation
- j) Physiology of exercise

#### **3. Biochemistry (10 hours of lectures and demonstrations)**

- a) General metabolism and nutrition
- b) Acid base balance
- c) Calcium and Phosphorus metabolism

#### **4. Biophysics as applied to Physical Medicine (30 hours of lectures and demonstrations)**

- a) Biomechanics of human movement.
- b) Properties of physical agents used in Physical Medicine – heat, cold, light, electromagnetic spectrum, electricity and ultrasound.

**5. Pathology (35 hours of lectures and demonstrations)**

- a) Degenerations, circulatory disturbances, inflammation and repair.
- b) Infections of bones and joints, Rheumatoid arthritis and allied disorders ( in detail).
- c) Neuropathology- trauma to central nervous system, degenerations of CNS, infections, cerebrovascular accidents.
- d) Cardiovascular diseases with emphasis on congenital heart diseases, valvular heart diseases, hypertension and peripheral vascular disorders.
- e) Respiratory diseases with emphasis on infections, restrictive and obstructive Disorders.
- f) Diseases of the kidney and urinary tract.
- g) Major endocrine disorders like Hypothyroidism, and Obesity.
- h) Nutritional deficiencies.
- i) Diseases of muscles.
- j) Genetic disorders.
- k) Pathology of aging.

**6. Pharmacology (20 hours of lectures and demonstrations)**

- a) Drugs acting on the adrenergic system.
- b) Drugs acting on the peripheral nervous system (somatic) including skeletal muscle relaxants.
- c) Local anaesthetics
- d) Autocoids and related drugs
- e) Drugs for COPD and Asthma
- f) Oxygen Therapy
- g) Hormones
- h) Drugs affecting calcium balance
- i) Sedatives, hypnotics
- j) Anticonvulsants
- k) Antispasticity agents
- l) Anxiolytics
- m) Nonopiod Analgesics and Nonsteroidal Antiinflammatory Drugs
- n) Opioids
- o) Hypolipidaemic agents and Plasma Expanders
- p) Steroids
- q) Antihypertensive agents
- r) Drugs acting on the neurogenic bladder
- s) Drugs acting on the bowel
- t) Antirheumatic agents
- u) Antibiotics
- v) Antidepressants
- w) Immunosuppressants
- x) Anti-cancer agents
- y) Drugs in diabetes

**Clinical Physical Medicine & Rehabilitation (175 hours)**

1. History and scope of the specialty, definitions and terminology

2. Diagnostic application of physical agents
3. Treatment modalities used in Physical Medicine- general properties and detailed clinical use of each
  - a) Heat – general physiological properties and mode of action as a treatment agent, indications and contraindications, forms of heat therapy – superficial and deep heating including treatment techniques. Emphasis will be given to Infrared, Hydro collator, Paraffin Wax bath, convection heating devices, short-wave diathermy, microwave diathermy and ultrasonic therapy.
  - b) Cold as a therapeutic agent
  - c) Ultraviolet radiation – physiological properties of U.V.R., mode of application in clinical use with indications, contraindications and side effects.
  - d) Therapeutic electricity – Low voltage currents, low and high frequency currents.
  - e) Hydrotherapy
  - f) Prescription of physical modalities and their applications in medical, surgical and gynaecological disorders.
4. Clinical use of massage, manipulation, stretching and traction
5. General principles of therapeutic exercises (for muscle strength, endurance, power, motor re-education, co-ordination and joint mobility), maintenance of physical fitness through optimum exercise
6. Prescription of exercise therapy and other supportive measures
7. Analysis of gait – kinetics and kinematics, normal and pathological gaits
8. Energy costs of functional activities in health and disease, experimental and clinical use of ergometry in Physical Medicine
9. Principles of occupational therapy, training in activities of daily living for rehabilitation, self-help devices, instrumental activities of daily living
10. Electro diagnosis and electromyography and application of electrophysiological testing of muscles and nerves for diagnostic and prognostic purposes
11. Disability evaluation
12. Sports Medicine- fitness training, rehabilitation of the injured athlete
13. Rehabilitation management of cases with various systemic disorders
  - a) Neuromuscular disability – with particular emphasis on strokes, post-polio paralysis, cerebral palsy, spinal cord injuries, muscular dystrophies, spinal muscular atrophy, disorders of the neuromuscular junction.
  - b) Orthopaedic disability- arthritis and joint deformities, postural problems and amputations.

- c) Cardiovascular disability
- d) Pulmonary disability
- e) Urological problems
- f) Cancer
- g) Problems of the vestibular system

#### 15. Prosthetics and Orthotics

- a) General definitions – evolution of the field with emphasis on the Indian scene.
- b) Indications for amputations – classical amputations- influence of prosthetic technology on amputation techniques – ideal stump – stump complications and their management.
- c) Recent advances in amputation surgery and prosthetic science – myoelectric control for prostheses.
- d) Clinical examination of the amputees, and prescription of prosthesis.
- e) Types of lower extremity prostheses – biomechanical considerations – knee and foot mechanics, alignment and fit, check-out.
- f) Immediate post-operative fitting of prostheses.
- g) Type of upper extremity prostheses - functional considerations, cosmetic considerations.
- h) Bracing – Indications and preliminary considerations on pre-orthotic preparation and post- orthotic training.
- i) Types of common braces and corrective shoes – prescription criteria and checkout procedures in fitting – lower extremity, upper extremity and spinal orthoses.
- j) Common materials used in prosthetics and orthotic manufacture.
- k) Equipment necessary for prosthetic and orthotic fabrication, organization of prosthetic & orthotic workshop.

#### 16. Psychosocial and psychiatric problems in rehabilitation and their Management

#### 17. Epidemiology of disability

#### 18. Principles of rehabilitation nursing

#### 19. Principles of management of communication impairments

#### 20. Special principles in the rehabilitation management of children

#### 21. Management of the geriatric patient

#### 22. Rehabilitation management of the injured “industry” worker

#### 23. Orientation on the socio–economic and vocational aspects of rehabilitation

- a) Principles of vocational guidance, training and placement
- b) Social integration of the disabled
- c) Elimination of architectural barriers for the handicapped in relation to housing, transportation and employment

- d) Mobilizing community resources for rehabilitation
  - e) Role of voluntary agencies
24. Principles of the “Team approach” towards rehabilitation, members of the “Team” and the role of each.
25. Organization and administration of Rehabilitation facilities in
- a) Teaching hospitals
  - b) Large general hospitals
  - c) Specialized treatment centers
  - d) Rural rehabilitation services
26. Issues of sexuality in Rehabilitation Medicine , rehabilitation of sexual problems
27. Community Based Rehabilitation

### **Allied Disciplines**

#### **1. Medicine including Neurology and Rheumatology (80 hours)**

- a) General metabolic and endocrine disorders including diabetes and Dyslipidaemia.
- b) Common infectious diseases prevalent in India
- c) Disorders of nutrition
- d) Degenerative diseases and special problems in the elderly
- e) Common cardiovascular diseases
- f) Common respiratory diseases
- g) Rheumatoid and allied diseases including classification, etiology, pathogenesis, clinical manifestations, diagnosis, differential diagnosis and management.
- h) Genetics.
- i) Neurological disorders
  - Congenital disorders of the nervous system
  - Hereditary – familial, degenerative, demyelinating, neoplastic diseases
  - Progressive disorders
  - Language disorders
  - Epilepsy
  - Cerebrovascular accident
  - Spinal Cord Injury- Paraplegia and tetraplegia
  - Autonomic disturbances
  - Disorders of peripheral nerves
  - Assessment of intelligence – Mental retardation
  - Traumatic Brain Injury

#### **2. Surgery including Orthopaedic Surgery (60 hours)**

- a) Shock and its management
- b) Management of burns

- c) Wound infections and their management
- d) Pressure sores - aetiology and management and prevention
- e) Principles of emergency resuscitation
- f) Common orthopaedic injuries and principles of their management
- g) Diseases of bones and joints (congenital, infective, metabolic, degenerative and neoplastic)
- h) Orthopaedic problems resulting from neuromuscular diseases – pathogenesis, clinical picture, diagnosis and principles of management including surgical techniques
- i) Amputation surgery

### **3. Community Medicine (20 hours)**

Identification of community needs for health services, including rehabilitation services, utilization of the epidemiological approach and statistical methodology

- b. Principles of comprehensive health care, integrating rehabilitation practices with general health services (candidates are expected to acquire clinical practice through rural and urban health units)
- c. Preventive rehabilitation approach in medical care at the grass root and intermediate community levels
- d. Immunization practices
- e. Health education practices

### **4. Paediatrics (20 hours)**

- a) Normal growth and development.
  - i. Prenatal
  - ii. Neonatal to adolescence (gross motor, fine motor, reflex maturation, cognitive, social and personality).
- b) Developmental delay and mental subnormality.
- c) Behavioural disorders and their relationship to organic diseases.
- d) Planning education programs for disabled children.
- e) Common congenital and hereditary disorders of children.
- f) Common childhood diseases (including poliomyelitis, cerebral palsy,
- g) meningitis, rheumatic fever and neoplasms).
- h) Childhood disability.

### **5. Psychiatry and Clinical Psychology (20 hours)**

- a) Mental status, intelligence and personality assessment.
- b) Behavioural disturbances due to organic brain damage.
- c) Overt psychopathologic reactions – neurotic, psychotic or sociopathic states (latter including addiction, alcoholism and sexual disturbances).
- d) Emotional disturbances – anxiety, depression.
- e) Psychological responses to illness and disability.

**6. Cardiology (10 hours)**

- a) Common disorders of the cardiovascular system with particular emphasis on the congenital, rheumatic, hypertensive and ischemic diseases.
- b) Assessment and classification of functional status of the heart and work capacity –application of data for rehabilitation – recent advances.
- c) Rehabilitation of patients with cardiac illnesses – post-myocardial infarction, CABG, cardiac transplantation, cardiomyopathy and valvular heart disease, protocols in exercise testing (Bruce, Naughton and others).

**7. Chest diseases (10 hours)**

- a) Allergic, infective, neoplastic, obstructive and restrictive disorders of the respiratory system
- b) Respiratory assistance therapy, oxygen therapy, chest physiotherapy

**8. Radiology and Cancer (15 hours)**

- a) Interpretation of radiological findings on common diseases
- b) Common diagnostic radiological procedures
- c) Contrast studies and their significance
- d) Principles of nuclear medicine
- e) Principles of radiotherapy
- f) Principles of anti-cancer chemotherapy
- g) Palliative care

**9. Neurosurgery (10 hours)**

- a) Management of trauma to the central nervous system.
- b) Congenital, infective, degenerative and neoplastic diseases of the brain or spinal cord including aetiology, pathogenesis, diagnosis and management.
- c) Peripheral nerve injuries.

**10. Plastic Surgery (7 hours)**

- a) Methods and techniques of skin grafting
- b) Principles of reconstructive surgery for correction of deformities
- c) Surgical treatment of decubitus ulcers
- d) Principles of hand surgery, tendon transfers in upper and lower limbs

**11. Urology (6 hours)**

- a) Evaluation and management of the neurogenic bladder
- b) Upper and lower urinary tract infections – aetiology, diagnosis and treatment

**12. E.N.T (10 hours)**

Common E.N.T disorders, including speech and hearing impairments and their management

**13. Obstetrics and Gynecology (6 hours)**

- a) Pelvic infections
- b) Urogenital prolapse
- c) Role of exercise therapy in Obstetrics and Gynaecology practice
- d) Women's issues in rehabilitation

**14. Ophthalmology (10 hours)**

Common ophthalmological disorders, causes of blindness, prevention and management, and disability evaluation

**15. Law in relation to disability including PWD Act, 1995 and RCI Act 1992 (6 Hours)****16. Rehabilitation of patients with organ transplants (3 hours)****Clinical work and practical training**

- 2 months should be spent in Surgery and allied specialties.
- 2 months should be spent in General Medicine and allied specialties.
- 20 months should be spent in Physical Medicine and Rehabilitation.

**Text Books recommended:**

1. Text book of Rehabilitation Medicine by Howard, A.Rusk
2. Physical Medicine and Rehabilitation- Braddom R L
3. Muscle Testing and Function - Kendall F.P
4. Hutchison's Clinical Methods- Swash M
5. Sports Injury Assessment and Rehabilitation- Reid, David.C
6. Therapeutic Exercises - Basmajian
7. Kelly's Text book of Rheumatology- Ruddy, Harris and Sledge
8. Medical Ethics –Schwartz
9. Spinal Cord Medicine –Denise J C, Delisa J
10. Physiological Basis of Rehabilitation Medicine- Downey and Darling
11. The Physiology of the Joints, Vol. I, II, III- Kapandji.I.A
12. Exercise and the Heart- Froelicher and Myers
13. Turek's Orthopaedics: Principles and Applications- Weinstein S L, Buckwalter J.
14. Apley's System of Orthopaedics and Fractures- Apley A, Solomon L
15. The Internet and Health Communication- Rice and Katz
16. Amputations and Prosthesis- May
17. Radiology and Imaging for Medical Students- Sutton
18. Geriatric Medicine- Schrier
19. Computers in Medicine- Javitt
20. Practice Manual of PMR- Tan
21. EMG Secrets- Tan
22. Ultrasound Scanning, Principles, Protocol- Tempkin
23. How to write health science papers, dissertations- Thomas et al



24. Textbook of Rehabilitation Medicine- Delisa
25. Principles of Hospital Administration- Sakharker
26. Ergonomics at Work- Osborne
27. Management in Rehabilitation- Schuch and Sekarak
28. Clinical Biomechanics- Valmassy
29. Psychology- Westen
30. Clinical Neuophysiology- Mishra U K, Kalita J
31. Handbook for Research Methods in Health Sciences- Sullivan M
32. A Manual on Clinical Surgery - Somen Das.
33. Pain Management in Rehabilitation- Monga & Grabois
34. Disability Evaluation- Demeter, Anderson & Smith
35. Basic and Clinical Pharmacology - Katzung B.G

### **Journals Recommended**

1. Indian Journal of PMR
2. Archives of Rehabilitation Medicine
3. Scandinavian Journal of Rehabilitation Medicine
4. Spinal Cord
5. Prosthetics Orthotics International
6. Indian Journal of Orthopaedics
7. Stroke
8. Arthritis and Rheumatism
9. Indian Pediatrics
10. Neurology India
11. Indian Journal of Disability and Rehabilitation
12. Sports Training, Medicine & Rehabilitation
13. Journal of Rehabilitation Research and Development
14. National Medical Journal of India
15. American Journal of Physical Medicine and Rehabilitation

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