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**GUIDELINES FOR COMPETENCY BASED  
POSTGRADUATE TRAINING  
PROGRAMME FOR MD IN  
PHYSICAL MEDICINE AND  
REHABILITATION**

# GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHYSICAL MEDICINE AND REHABILITATION

## **Preamble:**

The **goal** of the postgraduate training programme in Physical Medicine and Rehabilitation (PMR) is to bring uniformity in its teaching and practice at the postgraduate level across all medical colleges.

Physical Medicine and Rehabilitation (PMR), also called physiatry, (pronounced fizz ee at tree), is **an independent clinical discipline** which emphasizes on providing integrated comprehensive care by the prevention, diagnosis, treatment and rehabilitation of disorders, particularly those of the neuro-musculo-skeletal, cardiovascular, and pulmonary systems, that may produce temporary or permanent activity limitation, disability, or participation restriction. It has a vast scope since these disabilities from acquired or congenital conditions can appear at any stage in life from pediatric to geriatric phases. This specialty focuses on the restoration of the impaired functions of patients to optimum level. To achieve this, a multi-disciplinary team approach is used for education and counseling, prescription of medicines, therapeutic exercises and/or use of equipment (mobility aids, orthotic-prosthetic appliances, assistive technology, physical agents and modalities, etc.), surgical interventions for correction of deformities etc. These treatment modalities are carried out either in institution-based (out-door and in-door/wards/ICUs/Nursing Homes/Old-Age Homes etc.), out-reach (Camps, Mobile Units), or community-based settings (CBR), based on the evaluation of the patient under consideration. The Department of PMR also is involved in disability prevention, evaluation and certification, in addition to the development, monitoring and supervision of the rehabilitation plan of the patient.

The purpose of this document is to provide teachers and learners detailed guidelines to achieve the defined outcomes through learning and assessment. This document has been prepared by subject-content specialists. The Expert Group has attempted to render uniformity without compromising the purpose and content of the document. This has necessitated retention of “domains of learning” under the heading “competencies”.

## ***SUBJECT SPECIFIC GOALS***

The goals of the MD in Physical Medicine & Rehabilitation postgraduate training program are:

- (a) The overall objective is to impart a thorough and comprehensive training to a medical postgraduate so that at the end of this training he/she becomes a knowledgeable, skilled, and competent Physical Medicine and Rehabilitation (PMR) specialist, capable of discharging his/her duties as expected under different settings, in an ethical manner.
- (b) The student should be able to investigate, diagnose, confirm, evaluate, prognosticate, certify, treat, and rehabilitate if and when a person is suffering from a temporary or permanent limitation in function, disability, or restriction in participation.
- (c) The student should also be able to plan, prescribe, monitor, supervise and lead the execution of rehabilitation plan through an integrated, multi-disciplinary team involving various medical, nursing, paramedical or allied health professionals such as therapists (occupational therapists, physiotherapists etc.), counselors, technicians etc.
- (d) The student should be able to interpret reports and plan research, teach medical and paramedical personnel, educate the person with disability, family, rehabilitation team members and community.
- (e) The student should be well versed with recent advances in the speciality, administrative, financial, statistical, ethical and legal aspects related to the speciality.

## ***SUBJECT SPECIFIC LEARNING OBJECTIVES***

Upon completion of the training and successfully qualifying in the MD (Physical Medicine and Rehabilitation) examinations, the student should be able to demonstrate:

1. **Theoretical knowledge:** The student should be able to demonstrate possession of basic knowledge of: (1) various branches of medical sciences such as Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Molecular Biology etc. as related to Physical Medicine and Rehabilitation/Rehabilitation Medicine/Physiatry; (2) factors which may disturb structure or function and result in disability; and (3) different bed-side and operative/invasive/interventional procedures (diagnostic and therapeutic).

The student should also have adequate theoretical knowledge of other medical, surgical, paramedical and allied rehabilitation fields required for management of patients in a Physical Medicine and Rehabilitation department.

2. **Teaching-Training:** The student should be able to plan educational programmes in Physical Medicine and Rehabilitation in association with his/her senior colleagues/Faculty and be familiar with the modern methods of teaching and evaluation; teach and/or deliver lectures to medical students, residents, other health professionals and persons with disabilities and their family members etc. and hold clinical demonstrations for them; write and discuss a topic for seminar or a symposium and critically discuss it; methodically summarise published articles according to prescribed instructions and critically evaluate and discuss each selected article etc.
3. **Clinical/Practical skills:** The student should understand and develop competence in executing common general procedures employed in diagnosis, investigations and management of conditions encountered in Physical Medicine and Rehabilitation. He/she should be able to practice and handle independently most of the day-to-day problems as encountered in Physical Medicine and Rehabilitation in a safe, effective and ethical manner. He/she should be able to plan a comprehensive rehabilitation service independently. He/she should be able to demonstrate understanding of the fabrication and competence in prescription and check out of orthoses and prostheses, assistive technology, the principles, prescription and supervision of physiotherapy, occupational therapy, speech therapy, and psycho-socio-vocational counseling. He/she should be able to practice rehabilitation medicine at the door step of person with disability in the community. He/she should be familiar with the common problems occurring in the urban, semi-urban, and rural areas and deal with them effectively, should be able to organize, conduct, and supervise surveys in rural, urban and industrial communities and in specified groups of population; organise and conduct camps for disability prevention and rehabilitation of persons with disabilities, and guide rehabilitation workers at the peripheral level for rehabilitation of persons with disabilities.

4. **Research:** The student should be able to recognise a research topic, state the objectives in terms of what is expected to be achieved in the end, plan a rational approach with full awareness of the statistical validity, spell out the methodology and carry out most of the technical procedures required for the study, accurately and objectively. The student should be able to record on systematic lines the results and observations made, analyse the data using appropriate statistical approach, interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what remains to be done, draw conclusions which should be reached by logical deduction and he should be able to assess evidence both as to its reliability and its relevance, write a thesis in accordance with the prescribed instructions, and be familiar with the ethical aspects of research etc.

### ***SUBJECT SPECIFIC COMPETENCIES***

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain), and skills (psychomotor domain) as given below:**

#### **A. Cognitive domain:**

1. Acquire knowledge of basic medical sciences such as Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Forensic Medicine and Toxicology, Molecular Biology etc. as related to Physical Medicine and Rehabilitation.
2. Acquire knowledge on factors which may result in disability.
3. Acquire knowledge of basic principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation.
4. Understand philosophy, history, scope and need of Physical Medicine and Rehabilitation.
5. Acquire knowledge of basic concepts in Physical Medicine and Rehabilitation - definitions, rehabilitation team, team members, scope, role and responsibilities of different members.
6. Acquire knowledge of clinical Gait analysis in Physical Medicine and Rehabilitation.
7. Acquire knowledge of principles of evaluation and rehabilitation management of social problems.

8. Acquire knowledge of principles of evaluation and rehabilitation management of vocational problems.
9. Understand disability prevention & management- levels and examples.
10. Understand epidemiology of disability.
11. Understand the outcome measures in Physical Medicine and Rehabilitation.
12. Acquire knowledge of Impairment Rating and Disability Evaluation.
13. Acquire knowledge of Integrative Medicine and Physical Medicine and Rehabilitation.
14. Understand Assistive Technology related to Physical Medicine and Rehabilitation.
15. Acquire knowledge of basic principles of rehabilitative surgeries.
16. Acquire knowledge of Pediatric Rehabilitation including children with Autism Spectrum Disorders, learning disabilities, multiple disabilities etc.
17. Acquire knowledge of Geriatric Rehabilitation.
18. Acquire knowledge of interlink between Evidence-based Medicine and Physical Medicine and Rehabilitation.
19. Acquire knowledge of Electrodiagnostic Medicine in the treatment of patients with potential/suspected impairment of nervous, neuromuscular and/or muscular symptoms: basic principles, clinical methods, interpretation.
20. Acquire knowledge of the pharmacological aspects of drugs/ medicines used in treatment of patients as applied to Physical Medicine and Rehabilitation.
22. Understand the principles, prescription and supervision of physiotherapy, occupational therapy, speech therapy, Orthotics-Prosthetics, and medico-socio-vocational-psychological counselling.
23. Acquire knowledge to take Informed Consent from the patient/patient's relatives.
24. Understand Legislation in relation to disability- National and International.

**B. Affective Domain:**

The postgraduate student:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis, treatment, or opinion.
2. Discuss all available options of treatment and rehabilitation, including the advantages and disadvantages of each investigation and treatment with the patient and relatives accurately and non-directively.

3. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient/persons with disabilities including the right to information and second opinion.
4. Acquire communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical/allied health care staff.
5. Acquire communication skills to be able to debate & deliver a scientific lecture and participate in panel discussions, hold group discussions and be able to deliver the knowledge while teaching the undergraduates.
6. Acquire adequate communication skills to counsel and support the patient and family of the patient. Regular clinical rounds and academic presentations during the teaching program should help the trainees to develop patient-centric and family-centric attitudes, knowledge, and communication skills.
7. Establish effective communication with the patient's caregivers, including appropriate counseling for sickness, disability, care and terminal illness.
8. Be able to communicate and work effectively with a multi-disciplinary team and understand the role of other team members, including nurses, therapists, dieticians and others.
9. Respect patient confidentiality and autonomy at all times in verbal and written communication.

### **C. Psychomotor domain**

**By the end of the MD in Physical Medicine & Rehabilitation course, the postgraduate student should acquire the following clinical/practical competencies:**

- Evaluate a patient thoroughly (history, clinical examination), order relevant investigations, and interpret them to reach a diagnosis and plan of management.
- The trainee would be provided with an opportunity *to learn, assist and perform* operations commonly required for rehabilitation of persons with disability, including post-operative care under the supervision of PMR faculty members.
- Demonstrate knowledge of the pharmacological aspects of drugs/ medicines used in various forms and through various routes, in Physical Medicine and Rehabilitation.
- Manage and treat all types of cases in Physical Medicine and Rehabilitation that occur commonly.

- Competently handle and execute safely all the routine/ essential rehabilitative surgical procedures.
- Demonstrate understanding of the fabrication and competence in prescription and check out of orthoses and prostheses as well as various assistive devices and mobility aids.
- Organize and conduct surveys in rural, urban and industrial communities and in specified groups of population.
- Organize and conduct camps for disability prevention and rehabilitation.
- Guide rehabilitation workers at the peripheral level for rehabilitation of persons with disability.
- He/ she should be familiar with the current developments and recent advances in Physical Medicine and Rehabilitation.
- The student should be able to examine the patient comprehensively and accurately, exercising good judgement in the selection of examination techniques.
- The student should acquire competencies to teach and train medical students, junior doctors, and other health/ rehab professionals and patients/ persons with disability etc. and hold clinical demonstrations of various procedures/ skills for them.
- Be able to assess disability in the community settings, prevent it and initiate or plan rehabilitation.
- Should be able to advise, manage, treat, rehabilitate patients with spinal cord injury, stroke, traumatic brain injury, neurological disorders etc.
- The trainee should acquire competency in common rehabilitative surgical procedures and other techniques/interventions/ procedures given below:
  - a) Plaster of Paris application techniques, strapping, splinting
  - b) Joint aspirations
  - c) Intra-articular injections
  - d) Nerve Blocks and Chemodenervation
  - e) Botulinum toxin injection
  - f) Peripheral and Neuraxial blocks including Epidural Injections etc.
  - g) Rehabilitative surgery in Post Polio residual Paralysis and other paralytic disorders
  - h) Club Foot correction
  - i) Corrective surgeries in acquired and congenital common musculoskeletal



- disorders seen in PMR practice with deformities/ contractures
- j) Surgical Procedures in Spinal Injuries and Spinal Cord Lesions
  - k) Surgical procedures required in rehabilitation of persons with Cerebral Palsy, Hemiplegia, stroke, traumatic brain injury, nerve injuries
  - l) Cystoscopy, cystolitholapaxy etc. in Neurogenic bladders
  - m) Amputations- for congenital anomalies and revision amputations
  - n) Skin grafting, Pressure sore debridement, flaps, and closure surgery
  - o) Neuro-prosthetic implants etc.

**(The details are given under Syllabus).**

## *Syllabus*

### **Course Contents**

#### **A: Cognitive domain**

The course contents for MD (Physical Medicine and Rehabilitation) is divided into four broad sections, covering four theory papers. However, certain degree of overlapping may occur among different sections. The content would include the following:

#### **Section A:**

- 1) Anatomy and Physiology of the Musculoskeletal (including Biomechanics), Urogenital, Cardio-pulmonary and nervous systems, etc.
- 2) Biochemical aspects of Calcium and Vit. D metabolism, osteoporosis, diabetes mellitus etc.
- 3) Pathological processes causing diseases and disabilities, healing etc.
- 4) Principles of Pharmacology as applied to the conditions encountered in Physical Medicine and Rehabilitation.
- 5) Principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation.
- 6) Philosophy, history, scope and need of Physical Medicine and Rehabilitation.
- 7) Basic concepts in Physical Medicine and Rehabilitation - definitions, rehabilitation team, team members, scope, role and responsibilities of different members etc.
- 8) Principles of evaluation and rehabilitation management of social problems,
- 9) Principles of evaluation and rehabilitation management of vocational problems,

- 10) Planning, organisation and administration of Physical Medicine and Rehabilitation services.
- 11) Disability concepts: Impairment, disability, participation restriction, International Classification, ICF, models of disability etc.
- 12) Disability Prevention- levels and examples,
- 13) Epidemiology of disability, magnitude, causes, changing trends etc.
- 14) Gait Analysis - Terminology, types, Clinical applications.
- 15) Electrodiagnostic Medicine -basic principles, clinical methods, interpretation etc.
- 16) Outcome Measures in Physical Medicine and Rehabilitation.
- 17) Impairment Rating and Disability Evaluation.

**Section B:**

- 18) Therapeutic exercises- principles, types, indications, contraindications.
- 19) Physical agents/modalities - principles, types, indications, contra-indications, precautions.
- 20) Manipulation, traction, massage- principles, types, indications, contra-indications, precautions.
- 21) Electrical stimulation- principles, types, indications, contra-indications, precautions.
- 22) Principles and scope of Occupational Therapy.
- 23) Rationale of A.D.L. (Activities of Daily Living) in various conditions.
- 24) Integrative Medicine and Physical Medicine and Rehabilitation.
- 25) Assistive Technology related to Physical Medicine and Rehabilitation.
- 26) Upper limb orthotic devices – principles, types, materials and indications.
- 27) Lower limb orthotic devices – principles, types, materials and indications.
- 28) Spinal orthoses – principles, types, materials and indications.
- 29) Upper limb prosthetics and amputee rehabilitation.
- 30) Lower limb prosthetics and amputee rehabilitation.
- 31) Mobility aids, wheel chairs and seating systems.
- 32) Low back pain and Physical Medicine and Rehabilitation.
- 33) Musculoskeletal trauma and Physical Medicine and Rehabilitation.
- 34) Comprehensive Rehabilitation of persons suffering from:
  - Arthritis, including Rheumatoid Arthritis, Osteoarthritis, Ankylosing Spondylitis etc.

- Spinal deformity
- Neck pain, shoulder pain etc.
- Osteoporosis
- Sports Injury
- Burns Injury
- Spinal Cord Injury (traumatic and non-traumatic).

35) Rehabilitation of persons:

- with obesity, dyslipidemia etc.
- after Arthroplasty, Arthroscopic procedures
- after POP cast, fracture treatment, surgical intervention.

36) Principles of Sports Medicine, including prevention, evaluation, management and rehabilitation of Sports injuries

37) Basic principles of rehabilitative surgeries such as indications, contra-indications, special precautions, assessment of stump of a person with amputation, Deformities proximal joints, assessment of readiness of stump for prosthesis, short term and long term complications of stump, conservative and surgical management of stump and joint contractures, diabetic foot management of pre-ulcer stage, assessment of diabetic ulcer, excision of callus and corns, paring, management of ulcers by dressing, drainage, including vacuum, total contact casting and weight relieving measures etc., deformity correction in poliomyelitis, cerebral palsy, clubfoot, contractures, revision of amputation stump, closure of pressure sore, tendon transfers, post-operative care etc.

### **Section C:**

38) Comprehensive Rehabilitation of persons suffering from:

- Plexus or Nerve Injury
- Traumatic Brain Injury
- Stroke
- Parkinsonism, Multiple sclerosis, Ataxia, neurodegenerative disorders etc.
- Neuropathy, Bell's Palsy etc.
- Hansen's Disease

- Diseases of muscle e.g. myopathy, motor-neuron disease, Myasthenia gravis etc.
- Cerebral Palsy
- Spasticity
- Poliomyelitis and its sequelae
- Cardiovascular Disease e.g. CAD, MI, CABG Surgery, Angioplasty, Cardiac transplantation etc.
- Pulmonary Disease e.g. COPD, Bronchiectasis, Cystic fibrosis, COVID-19 pneumonia etc.
- Cancers and PMR related issues
- Swallowing disorder
- Bladder dysfunction
- Bowel dysfunction
- Vertigo
- HIV/AIDS
- Chronic Pain
- Neural tube defects like meningomyelocele and hydrocephalus etc.

39) Rehabilitation of persons:

- after Organ Transplantation
- in Emergency, Trauma care, and ICU settings.

40) Pediatric Rehabilitation including children with Autism Spectrum Disorders, learning disabilities, multiple disabilities etc.

41) Geriatric Rehabilitation,

42) Principles of evaluation and rehabilitation management of persons with:

- visual impairment
- mental retardation
- hearing /speech impairment
- psychological problems or mental illness.

43) Medical Emergencies in Physical Medicine and Rehabilitation

44) Sexuality and Disability.

**Section D:**

45) Evidence-based Medicine and Physical Medicine and Rehabilitation,

46) Legislation in relations to disability- National and International,

47) Schemes and benefits extended to persons with disabilities by the Government,

48) Barrier-free environment and access related issues including Accessible India Campaign,

49) Computers and Artificial Intelligence in Physical Medicine and Rehabilitation,

50) Assistive Technologies, mobility aids, including wheelchairs, classifications, components, indications etc.

51) Biomedical Waste Management in Physical Medicine and Rehabilitation,

52) Recent Advances related to Physical Medicine and Rehabilitation.

**B: Psychomotor domain: the details of procedures the postgraduate should perform independently/under supervision, assist or observe are given below:**

S. No.	Independently able to do/ DIRECTLY OBSERVED	Assisted	Observed By PG student	Advanced (Good to see, assist or perform)
<b>External/ Non-invasive Interventions</b>				
	CPR, BLS, ACLS, ATLS			Nascent Nitrogen, Ozone or CO <sub>2</sub> intra-articular/ intra-discal instillation
	Impairment Rating, Disability evaluation and certification			FES
	Nebulization, Inhaler administration			Robotics-testing/ training
	Manipulation, Ponsetti technique			Hyperbaric oxygen

				therapy
	Massage, Credes' maneuvers			Vacuum Assisted Closure (VAC)
	Postural drainage			Robotic Interactive Therapy
	Manual lymphatic drainage			Virtual Reality
	Skin Traction			Ambient Intelligence
	Dressing of pressure ulcers and wounds			
	Bandaging			
	Transfer activities			
	Self-help basic ADLs			
	Gait training			
	Crutch gait training			
	Wheel chair activities/ manoeuvres			
	Neuro developmental Therapy, Proprioceptive Neuromuscular Facilitation, CIMT			
	Counseling			
	Behaviour therapy			
	Aquatic therapy			
	Electrical stimulation			
	Strapping			
	Splinting – measurement, materials, indications, options			
	Orthoses – types, materials, measurements, indications, fabrication, check-out, training etc.			
	Immediate Post Op Prosthesis, indications, fabrication, check-out,			

	training etc.			
	Physical agents and Electrotherapeutic equipment like Cold, Heat, Diathermy, Ultrasound, LASER – their indications, contraindications, special precautions, application, follow-up etc.			
	Plaster of Paris application techniques, precautions, check-out			
<b>Invasive interventions</b>				
	Joint aspirations	Club Foot correction by Surgery	Skull traction	Neuro-prosthetic implants etc.
	Intra-articular injections	Stem cells therapy	Arthroscopy-diagnostic and therapeutic	Sacral Anterior Root Stimulation
	Peri-articular injections	Spinal injections e.g. epidural injection	Cystoscopy in neurogenic bladder	Spinal Cord Stimulation
	Tendon-sheath injections	Botulinum toxin injections	Coeliac plexus nerve blocks	
	Intra-articular injections including visco-supplementation	Ultrasound/image guided injections	Excision arthroplasty	
	Bursa aspiration/injections	Penile injections	Insertion of wires, K wire, pins and rods	
	Ganglion decompression	SI joint injections	External fixator – Ilizarov, JESS	
	Trigger point injections	Regional nerve blocks	Osteotomies e.g. for Genu valgum / varum, hip related problems etc.	
	Platelet rich plasma injections	Stellate ganglion blocks	CTEV - bony correction	
	Prolotherapy	Release of compressive	Synovectomy	

		neuropathies, repositioning of nerves		
	TM joint injections	Tendon transfers	Excision arthroplasty	
	Nerve Blocks e.g. Phenol, Lignocaine	Amputation/ Revision amputation	Urethral Dilatation	
	Motor point blocks		Urethral Repair	
	Debridement of pressure sores	Skin grafting	Sphincterotomy	
	Tenotomy- subcutaneous, open	Skin flaps rotation	Sphincter Stent Prosthesis	
	Tendon lengthening	Joint stabilization/ Arthrodesis	Baloon Dilation	
	Release of pulleys in hand	Congenital anomalies correction, amputation	Penoscrotal Fistula repair	
	Proctoscopy		Intravesical instillation of anti-cholinergics	
	Soft tissue release		Radio-frequency ablation	
	Anaesthetic foot surgeries e.g. TA lengthening, ulcer management			
	Contracture release like at hip, knee, elbow, wrist, hand			
	Excision of ganglion etc.			
<b>Miscellaneous</b>				
	Endotracheal suction	Endo-Tracheal Intubation		
	Nasogastric tube insertion	Central venous line insertion and care		
	Flatus tube insertion	Insertion of intercostals drainage tube		
	Catheterization – per urethral, supra-pubic	Vital stim for dysphagia management		
	Digital evacuation	Supra Pubic		



		Catheterization		
	Stoma care			
	Venti mask/ nasal prong			
	Arterial blood sample			
	Monitoring of vital signs			
	Venesection			
	Incision and drainage of abscess			
	Pulse Oximetry			
	Tourniquet application			
	Brain death identification			
<b>Diagnostic Interventions</b>				
	Musculoskeletal Ultrasound	EMG, NCV and other electrodiagnostic tests	Isokinetic Exercise Testing	
	Clinical Gait Analysis	Urodynamic Evaluations	Driving and work simulation	
	Foot pressure analysis	Instrumental Gait Analysis	Electro-magnetic articulography	
	Dynamic post-urography	Tests for autonomic dysfunction	Esophageal manometry	
	Trans cutaneous Oximetry	Doppler test		
	Cutaneous Thermography			
	Spondylometry			
	Body composition analysis			
	Instrumental ADL assessment			
	Dynamometry			
	Goniometry			
	Exercise Testing			

	Pulmonary Function Testing			
	Biofeedback			
			Body weight Supported treadmill testing/ training	
			Audiometry	
			Video fluoroscopic evaluation of swallowing	
			Modified Barum swallow	
			Cine Palato Esophagogram	
			Fiber optic endoscopy examination of swallow	
			Instrumental Swallowing assessment	
			Ultrasound Evaluation of Swallowing	
			Intraluminal pharyngeal manometry	

## ***TEACHING AND LEARNING METHODS***

### **General principles**

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They

shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

### **Teaching-Learning methods**

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited/restricted to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.**

**A. Lectures:** Didactic lectures should be **used sparingly**. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements. All the postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per requirements of PMR specialty
2. Recent advances in PMR specialty
3. Research methodology and biostatistics
4. **Salient features of Undergraduate/Postgraduate medical curriculum**
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

**B. Journal Club:** Minimum of once in 2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

**C. Student Seminar/Symposium:** Minimum of once every 2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar/Symposium as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by all the faculty.

**D. Clinics/ Bedside Teaching/ Laboratory works:** Minimum - once every 2 weeks.

Clinics/bedside teaching/ Lab Work (Gait Lab, Pulmonary Function Testing Lab, Exercise Testing Lab etc.) should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in Skill Labs., and Case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

**E. Interdepartmental colloquium**

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases; e.g., combined clinical round with Radiology, Pathology etc.

**F. a. Rotational clinical / community / institutional postings**

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. The suggested schedule of postings (total 26 weeks) are:

- Orthopedics (Four weeks)
- General Medicine (Two weeks)
- Pediatrics (Two weeks)
- Pediatric Surgery (Two weeks)
- Emergency Medicine (One week)
- Pulmonary Medicine (One week)
- Trauma Centre (Two weeks)
- Geriatrics (One week)
- Neurology (Two weeks)

- Neurosurgery (One week)
- Intensive care Unit (Two weeks)
- Medical Oncology (One week)
- Cardiology (One week)
- Pain Clinic (One week)
- Community Medicine (Two weeks)
- Infectious Diseases Department/Unit (One week)

#### **G b. Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MS/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> Semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

**Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.**

#### **H. Teaching research skills**

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to

the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

### **I. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

### **J. Log book**

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

- a) help maintain a record of the work done during training,
- b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students

will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A Proficiency Certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

**K. Course in Research Methodology:** All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

#### **Other aspects**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, Seminars and conferences) once a year or more, if possible.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

**During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.**

## ***ASSESSMENT***

## **FORMATIVE ASSESSMENT, i.e., assessment to improve learning**

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.**

### **General Principles**

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

### **Quarterly assessment during the MD PMR training should be based on:**

- Case presentation, case work up, case handling/management : once a month
- Journal Club : once a month
- Seminar : once a month
- Case discussions : once a month

**Note:** These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (1 to 2 during the entire PG program)

**The student to be assessed periodically as per categories listed in the postgraduate Student Appraisal Form (Annexure I).**

## **SUMMATIVE ASSESSMENT, i.e., assessment at the end of training**

### **Essential pre-requisites for appearing for examination include:**

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
2. **Preferably two presentations** at national level conference. One research paper should be published / accepted in an indexed journal. **(It is suggested that the local or University Review committee assess the work sent for publication).**



The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The postgraduate examination shall be in three parts:

**1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**2. Theory examination**

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3<sup>rd</sup> academic year.

There shall be four theory papers (as per the NMC PG Regulations).

**Paper I:** Basic Health Sciences (Anatomy, Physiology, Pharmacology, Pathology etc.), and Basic Concepts as applied to Physical Medicine and Rehabilitation, Public Health, Nutrition, Therapeutic Exercises, Basic concepts of Disability, ICF, CBR, Biomechanics and Kinesiology, Electrodiagnostics and therapeutics, Aids and Appliances, Assistive Technology, and Basics of medical and surgical practice etc.

**Paper II:** Principles and Practice of Physical Medicine and Rehabilitation as applied to Medical, Pediatric, Geriatric conditions, Non-Communicable Diseases, Neurological, Cardio-pulmonary, Cancers, Pain, Rheumatological conditions,

Mental illnesses, Developmental disorders, Osteoporosis, Multiple disabilities etc.

**Paper III:** Principles and Practice of Physical Medicine and Rehabilitation as applied to Surgical, Orthopedic, Trauma conditions (Musculoskeletal, Spinal Cord Injury, Traumatic Brain Injury, Sports Medicine, Amputations, Gynaecological and Obstetric related, Speech and Hearing, Vision related disorders, Organ Transplantation etc.)

**Paper IV:** Recent Advances as applied to Physical Medicine and Rehabilitation including Legislation, Disability Assessment and Certification, Assistive Technology, Environment and Accessibility related issues, etc.

### **3. Practical/clinical and Oral/viva-voce examination**

#### **Practical examination**

Practical examination should include various major components of the syllabus focusing mainly on the psychomotor domain.

The emphasis may be laid on the pattern of Objective Structured Clinical Examination (OSCE), where feasible.

Practical examination would be conducted as per the following pattern:

Long Case - One

Short Cases - Three

Viva-Voce involving:

X-Ray/CT Scan/MRI /DXA Scan/Bone Scan Films/PFT/EMG-NCV

Rehabilitation Surgery Instruments

Physical Medicine Instruments/Equipment/Electrically operated modalities etc.

Orthotic-Prosthetic Appliances

Assistive Technologies and related products

**Oral/Viva voce examination** on defined areas should be conducted by each examiner separately or collectively. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domains.

**The final clinical examination in PMR should include:**

- Cases pertaining to major systems (e.g., one long case and three short cases)

- Stations for clinical, procedural and communication skills including disability etiquettes
- Log Book Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the PMR subject

## **Recommended Reading:**

### **Books (latest edition)**

1. Braddom's Physical Medicine and Rehabilitation, Author David X Cifu, Elsevier.
2. DeLisa's Physical Medicine and Rehabilitation: Principles and Practice. Lawrence R. Robinson, Walter R Frontera, Joel A. DeLisa, John Chase, John Chae. Lippincott Williams and Wilkins Lippincott.
3. Physical Medicine and Rehabilitation Board Review, Sara J Cuccurullu, Springer Publishing Company.
4. Spinal Cord Medicine - Principles and Practice. Steven Kirshblum, Vernon W. Lin, Demos Medical Publishing.
5. Campbell's Operative Orthopaedics, Elsevier.
6. Fundamentals of Musculoskeletal Ultrasound, Jon A Jacobson, Elsevier.
7. Atlas of Interventional Pain Management, Steven Waldman, Elsevier.

### **Journals**

PMR Specialty related prominent 3-5 International Journals and 2 National (all indexed) journals.

<b>Student Appraisal Form for MD in Physical Medicine &amp; Rehabilitation</b>											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic Aptitude and Learning</b>										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc)										
1.4	Documentation of acquisition of competence										
	(e.g. Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Care of the patient</b>										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										



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