

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH & STUDIES
(Deemed to be University under section 3 of the UGC Act 1956)

Ph.D ADMISSION TEST (MR-PAT)

Ph.D. in Physiotherapy

Module 1: Applied Physiotherapeutics

- 1.1. Exercise Physiology
- 1.2. Responses and Adaptations of various systems to Exercise and training.
- 1.3. Assessment and training for endurance and strength (Anaerobic and aerobic power)
- 1.4. Environmental influence on Performance.
- 1.5. Exercise prescription for health and fitness. Considerations of age and sex in exercise and training.
- 1.6. Pathological & Radiological investigations and their interpretation, including imaging techniques.
- 1.7. Physical fitness assessment - Body composition, ETT, Field Test, 6 Minute walk test etc., Flexibility, Muscle strength, endurance, Skills, Testing of agility- balance, co-ordination. Effect of aerobic, anaerobic, Isometric, Isotonic and Isokinetic exercises on muscle and cardio-pulmonary function.
- 1.8. Posture and Gait analysis.
- 1.9. Physiotherapy for health and stress management.
- 1.10. Physiotherapy modalities, techniques, approaches and advances.
- 1.11. Aging: Physiological changes and Physiotherapy management.
- 1.12. Aids and appliances, adaptive functional devices to improve movement dysfunction.
- 1.13. Physiotherapy in Disaster management.
- 1.14. Integration of Yoga in Physiotherapy for Health promotion and Dysfunction.
- 1.15. Aquatic Therapy
- 1.16. Clinical decision making in Physiotherapeutics.

Module 2: Musculoskeletal and Sports Physiotherapy

- 2.1. Musculoskeletal Dysfunctions of the Upper Quadrant and Sports:
- 2.2. Musculoskeletal Dysfunctions of the Lower Quadrant and Sports:
- 2.3. Musculoskeletal Dysfunctions of the Spine and Sports:
- 2.4. Sports Rehabilitation:
- 2.5. Sports philosophy, physiology, psychology & pharmacology
- 2.6. Biomechanics and patho-mechanics of sports and other condition.
- 2.7. Sports injury- Principles of injury prevention, diagnosis, treatment & rehabilitation.
- 2.8. Sports for special populations
 - Disabled population
 - Elderly population

Module 3: Neurology Physiotherapy

- 3.1. Paediatric Neurophysiotherapy
- 3.2. Gross and fine motor development
- 3.3. Developmental Reflexes
- 3.4. Theories:
 - A) Theories of motor development of normal child,
 - B) Theories of motor control
 - C) Theories of motor learning.
 - D) Stages of Learning
- 3.5. Paediatric Neurological Disorder and Physical Therapy:

- 3.6. Autism Spectrum Disorder and Physical Therapy
- 3.7. Pathological and radiological investigations/interpretations in paediatric neurological conditions
- 3.8. Advanced skills in assessment of paediatric, neuropsychological and neurosurgical conditions. Etc.
- 3.9. Surgical procedures related to neuro-paediatric disorders, including recent advances in neurological surgeries. (Hydrocephalus, Spina bifida, etc) and its preoperative and post-operative complete physiotherapy management
- 3.10. Advanced Physiotherapy approaches – Neurophysiological principles
- 3.11. Clinical decision making and evidence-based practice are used to formulate an effective assessment and treatment program.
- 3.12. Assessment and management of posture and gait in paediatric neurological conditions. Physiotherapy management in paediatric neurological conditions:
- 3.13. Role of Physiotherapy in Neonatal & Paediatric Intensive Care Units.
- 3.14. Pharmacotherapeutics in neurological conditions and their relevance in physiotherapy.
- 3.15. Clinical decision making and evidence-based practice to formulate an effective assessment and treatment program for adult Neurophysiotherapy.
- 3.16. Advance skills in assessment of adult Neurological, Neurosurgical & Neuropsychological conditions.
- 3.17. Advanced Neuro-therapeutic skills for management
- 3.18. Pathophysiology, clinical features and Physiotherapy management of CNS,ANS and Peipheral Nervous System conditions and disorders
- 3.19. Social integration of disabled person in community – measures to ensure – attitudinal, environmental, manpower, assistive technology, legislation and support.
 - Adaptive equipment for physically challenged individuals.
 - Orthotics and Prosthetics.
- 3.20. Recent advances in the Technology, Physiotherapy management of Neurological conditions

Module 4: Cardiorespiratory Physiotherapy

- 4.1. Respiratory Physiotherapy
- 4.2. Assessment, Interpretation, application of Investigations, Patho physiology and clinical features of all neonatal, paediatric, adult, geriatric and Critically ill patients associated with dysfunctions of the respiratory system and thorax and Pulmonary surgeries.
- 4.3. Clinical reasoning in physiotherapeutic evaluation & management of all neonatal paediatric, adult and geriatric dysfunctions of the respiratory system and thorax in acute care and in rehabilitation.
- 4.4. Complete physiotherapy management of all neonatal, paediatric, adult, geriatric and Critically ill patients associated with dysfunctions of the respiratory system and thorax and Pulmonary surgeries.
- 4.5. Special Physiotherapy techniques used for Bronchial hygiene and other acute and chronic respiratory disorders with recent advances
- 4.6. Pulmonary rehabilitation.
- 4.7. Cardiovascular Physiotherapy: Assessment, Interpretation, application of Investigations, Patho physiology and clinical features of all neonatal, paediatric, adult, geriatric and Critically ill patients rehabilitation related to cardiovascular dysfunction and cardiovascular surgeries.
- 4.8. Advances in functional diagnostic procedures & various outcome measures relevant to assess intervention to dysfunctions of cardiovascular and peripheral vascular system.
- 4.9. Complete physiotherapy management features of all neonatal, paediatric, adult, geriatric and Critically ill patients rehabilitation related to cardiovascular dysfunction and cardiovascular surgeries
- 4.10. Cardiac Rehabilitation, Peripheral Vascular rehabilitation, Cardio-Respiratory fitness testing and training in sports and diseases. Knowledge and skill of basic & advanced life support.

Module 5: Community Health Physiotherapy

- 5.1. Community Physiotherapy: Legal issues – National & International (WHO) Rehabilitation acts, Legislation laws for persons with disability.
- 5.2. Community Based Rehabilitation
- 5.3. Evaluation of Disability as per ICF
- 5.4. Appropriate Technology, Assistive devices used for Stability & Mobility to enhance functional independence
- 5.5. Disaster Management
- 5.6. Women's Health, Industrial Health and Geriatric Health
- 5.7. Geriatric Rehabilitation
- 5.8. Women's, Health: Women's reproductive health care.
- 5.9. Industrial Health: Occupational Health, Occupational Hazards, Industrial Hygiene, Vulnerable workers
- 5.10. Ergonomics, Principles, Issues related to hand tools, posture, material handling and lifting.
- 5.11. Evidence Based Practice in Community Health

Suggested Readings:

1. McArdle, W. D., Katch, F. I., & Katch, V. L. (2010). *Essentials of exercise physiology* (4th ed.). Wolters Kluwer/Lippincott Williams & Wilkins.
2. American College of Sports Medicine. (2021). *ACSM's guidelines for exercise testing and prescription* (11th ed.). Wolters Kluwer.
3. Magee, D. J. (2014). *Orthopedic physical assessment* (6th ed.). Saunders/Elsevier.
4. Norkin, C. C., & White, D. J. (2016). *Measurement of joint motion: A guide to goniometry* (5th ed.). F.A. Davis Company.
5. Winter, D. A. (2009). *Biomechanics and motor control of human movement* (4th ed.). Wiley.
6. Kisner, C., & Colby, L. A. (2017). *Therapeutic exercise: Foundations and techniques* (7th ed.). F.A. Davis Company.
7. Brotzman, S. B., & Manske, R. C. (2011). *Clinical orthopedic rehabilitation: A team approach* (3rd ed.). Elsevier.
8. Umphred, D. A. (2013). *Neurological rehabilitation* (6th ed.). Elsevier Health Sciences.
9. Shumway-Cook, A., & Woollacott, M. H. (2016). *Motor control: Translating research into clinical practice* (5th ed.). Lippincott Williams & Wilkins.
10. Frownfelter, D. L., & Dean, E. (2012). *Cardiovascular and pulmonary physical therapy* (5th ed.). Elsevier.