الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Physical Medicine and Rehabilitation

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بسم الله الرحمن الرحيم

PURPOSE OF THE CURRICULUM

The primary goal of this document is to enrich the training experience of postgraduate trainees by outlining the learning objectives to become independent and competent physiatrists.

This curriculum may contain sections outlining some regulations of the training; however, such regulations must be consistent with the most up-to-date “General Bylaws” and “Executive Policies” of the Saudi commission of health specialty (SCFHS), which can be accessed online through the official SCFHS website.

NB. This curriculum is up-to-date at the time of approval and printing.

To enhance the training and development of the medical specialty, SCFHS may modify, add, or delete relevant rules and regulation at any time. For updates, please consult the concerned training program director or the SCFHS.

https://www.scfhs.org.sa/en/education/TrainingAndRecognition/HighEduProgs/GeneralSpecialties/Rehabilitation/Pages/default.aspx

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FORWARD

The (SCFHS) provides registration, training, and continuing education for all health specialties throughout all career stages. One of the residency training programs is for physical medicine, and rehabilitation (PM&R). Trainers and trainees are committed to providing high-quality PM&R care to individuals and communities in Saudi Arabia. The SCFHS selects, trains, accredits, and supports medical practitioners (physiatrists) in the management of functional loss, activity limitation, or participation restrictions arising from illness or injury.

An acute illness or injury can limit a person's quality of life and ability to interact or function. Rehabilitation is defined as goal-oriented, time-bound, interdisciplinary processes that maximize the physical, psychological, and social function of a person with impairment. PM&R, also referred to as physiatry, is a branch of medicine focusing on the prevention, evaluation, diagnosis, management, and rehabilitation of people of all ages living with physical and/or cognitive impairments and functional limitations from illnesses or injuries.

PM&R is a unique medical specialty. It focuses on a holistic approach, rather than a singular body system, organ, or tissue. PM&R is also practiced through an interdisciplinary team approach, which includes various medical, nursing, and paramedical healthcare professionals. This specialty involves the diagnosis and treatment of patients with painful or functionally limiting conditions, the management of comorbidities and co-impairments, diagnostic and therapeutic injection procedures, electro diagnostic medicine, and emphasis on prevention and reduction of complications from secondary conditions. Physiatrists apply a variety of remedies to improve quality of life (QOL), reduce the effect of disabilities, and reintegrate productive citizens into their societies. Such common diagnoses include, but are not limited to, chronic pain, stroke, spinal cord injuries, cardiac diseases, amputations, acquired brain injuries, and neuromusculoskeletal disorders.

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INTRODUCTION

Context of Practice

Global History

The PM&R specialty matured early in the 20th century, but its fundamentals started with the ancient Chinese, Greek, and Roman physicians who used exercises and other interventions for pain management and rehabilitation of soldiers.

Early in the 1980s, people used physical modalities, such as water, heat, cold, massage, light, and exercise, to manage injuries and illnesses. In 1904, Professor Robert Tait McKenzie was one of the first physicians in physical education and physical therapy at the University of Pennsylvania. He taught medical students the principles of exercise, massage, and hydrotherapy. The polio epidemic and World War I and II are milestones that had an enormous impact on the advancement of physiatry. Doctors realized the need for hospitals geared towards the rehabilitation and treatment of people with disabilities, including veterans.

Academically, the first university Department of PM&R was founded at Temple University Medical School in 1929. In 1938, there was the first annual meeting of the American Congress of Physical Therapy, which is now the American Congress of Physical Medicine and Rehabilitation. In 1947, Dr. Frank H. Krusen published the first comprehensive PM&R textbook, *Physical Medicine.* Three years later, the American Board of PM&Rwas established. Finally, in the 1990s PM&R practices expanded to include pain, brain injury, pediatric, spinal cord injury, and sports medicine.

Following an outbreak of poliomyelitis in the early 1960s that disabled many children and adults, modern medical rehabilitation emerged in Saudi Arabia. Most of the survivors had some sort of mobility disability. Because there was no medical rehabilitation department in the few hospitals available at that time, the government sent most of the patients abroad for surgical correction of deformities and/or fittings for walking braces. Others, particularly those living in major cities, received some sort of physiotherapy. In the early 1970s, the government launched a few prosthesis and orthotic centers in some of the Ministry of Health (MOH) hospitals, but these centers only focused on braces or caliper fitting. In the early 1980s, the Ministry of Defense and Aviation commissioned many medical rehabilitation centers within military hospitals. Some private hospitals also allocated some rehabilitation beds for people who held social insurance and who had sustained work-related disabilities. Only in the beginning of the 21st century were real medical rehabilitation centers opened in a few MOH hospitals. In addition, some private, not-for-profit centers opened, including Sultan Bin Abdul-Aziz Humanitarian City. Currently, there are many rehabilitation hospitals and centers in large cities. In Riyadh, there is the Rehabilitation Unit at Prince Sultan Military Medical City, the Rehabilitation Unit of King Abdul-Aziz Medical City, the Rehabilitation Hospital of King Fahad Medical City, the Riyadh Medical Complex, Riyadh, the Rehabilitation Hospital of Alhada Military Hospital (Taif), and the Riyadh Care Hospital (Private). Additionally, the Disabled Children's Association has 11 centers and they provide medical, rehabilitation, psychosocial, and vocational services for children. Moreover, most MOH hospitals in different regions of Saudi Arabia have a medical rehabilitation department with limited medical services.

Some hospitals, like Prince Sultan Military Medical City (PSMMC), have worked toward training of Saudi trainees to specialize in Rehabilitation Medicine and Physical Medicine & Rehabilitation. In 2000, a memorandum of understanding (MOU) was signed between PSMMC and the Australasian Faculty of Rehabilitation Medicine (AFRM). According to that MOU, the AFRM recognized the first four years (of six) of the residency training in rehabilitation medicine at the rehabilitation department of PSMMC; to be eligible for the exit

examination, the last two years of training were to be spent in Australia. In 2010, the Saudi Commission of Health Specialties (SCFHS) established the Saudi Board of Physical Medicine and Rehabilitation. The first groups of trainees were enrolled in October 2011. Currently, there are four training centers; three in Riyadh and one in Taif.

Physiatry can be practiced in an outpatient or inpatient setting. It is also done through specialized home health programs, such as rehabilitation in the home or day care rehabilitation centers. Physiatrists manage patients with diseases or injuries affecting all tissues, organs, or systems in the body that have functional limitations. The rehabilitation usually starts with goals and objectives to be achieved within a specific duration of time. These goals could be pain reduction, psychological support, physical well-being, increased function, and QOL improvements. Physiatrists treat patients of all ages afflicted with functional limitations and/or painful conditions affecting the cardiopulmonary, musculoskeletal, and central and peripheral nervous systems. This includes, but is not limited to, disorders of the spine, peripheral joints, soft tissues, bone injuries, sprains/strains, disc herniation, rheumatologic conditions, and athletic injuries. PM&R specialists also diagnose and treat degenerative, developmental, acquired, and traumatic conditions of the upper and lower limbs, spinal cord, and brain. This unique blend of education, training, and experience makes the PM&R specialist an ideal primary or consulting physician for patients with occupational or sports-related musculoskeletal or neuromuscular injuries. This multidisciplinary training also makes the PM&R physician the most qualified specialist to lead a team of medical professionals and rehabilitation therapists. Beyond their basic qualifications as licensed physicians, PM&R specialists are specially trained to prescribe therapeutic exercise, orthotic, prosthetic, and other rehabilitation equipment and modalities. They are experts in the performance and interpretation of electro diagnostic studies, including electromyography, nerve conduction studies, and evoked potentials. PM&R specialists use routine laboratory and imaging studies, but they are also trained in the interpretation of more sophisticated diagnostic studies that evaluate musculoskeletal and neuromuscular systems, such as computerized tomography (CT), myelography, bone scan, bone density, magnetic resonance imaging (MRI), and musculoskeletal ultrasound. PM&R physicians are trained to perform injection techniques, such as soft tissue and joint injections, trigger point injections, and injections of botulinum toxin. Many PM&R specialists perform fluoroscopically directed spinal and joint procedures, such as inter-laminar and transforaminal epidural injections, sympathetic blockade, discography, zygapophysial joint injections sacroiliac joint intra-articular injections, and other advanced neuromodulator interventional pain management techniques. Many PM&R specialists are also skilled in manual medicine and acupuncture.

Worldwide rehabilitation needs are increasing in tandem with global population growth, population aging, and higher survival rates for people with severe health conditions and disability. According to the World Health Organization (WHO), about 15% of the world's population lives with some form of disability. Two to four percent experience significant difficulties in functioning. The global disability prevalence is higher than previous WHO estimates, which date from the 1970s and suggest a figure of around 10%. In Saudi Arabia, it is estimated that the prevalence of people with disabilities is 7.1%. Additionally, in Saudi Arabia, the ratio of physiatrists to population is 1:10,000. There is no density of physiatrist's data available from the African Region, although it is estimated to be less than 1:1,000,000 in the Eastern Mediterranean and South-East Asia regions. In 2019, there were 180 physiatrists in the SCFHS (consultants, senior registrars, and registrars). The estimated ratio of physiatrists to the population was 5:1,000,000. According to the General Authority for Statistics, the total population is 34,218,169. As of 2020, there are approximately 220

physiatrists at different levels of medical ranking registered in the Saudi Commission for Health Specialties. Due to rapid population growth, consanguinity, trauma, and chronic disease, physiatrists are in high demand in the Kingdom of Saudi Arabia; the estimated needs ratio of physiatrists to the population is 1.5:100,000.

To advance the field of physiatry, physiatrists should focus their efforts in several directions: (a) in addition to using classical compensatory techniques, physiatrists must make efforts to treat the impairment itself, (b) there must be a focus on building a close connection and systematic hierarchy among physiatrists working at the tertiary and primary rehabilitation hospitals, and (c) physiatrists must participate in the development of future technologies and new markets in the health and wellness fields. Historically, physiatrists have been accustomed to dealing with secondary functional disturbances caused by neurological, musculoskeletal, and cardiovascular diseases. As the population matures, people devote more attention to exercise therapy for promoting health and well-being; this is the domain of physiatrists. Therefore, physiatrists must strengthen their competitive power by deepening this knowledge area. Physiatrists must also lead interdisciplinary teams concerned with maximal restoration or improvement of physical, psychological, social, occupational, and vocational functions for people with disabilities recovering from disease, trauma, congenital disorders, or pain.

Goal and Responsibility of curriculum implementation

First year trainee (R1) in PM&R may face some challenges. The size and the complexity of the specialty may seem overwhelming. Therefore, an organized approach to learning is essential. This curriculum attempts to provide the trainees with a framework for learning, and the essential information needed during the training program. It is a guide for trainees to become competent in their specialty.

Please note that the rules and regulations of SCFHS available on www.scfhs.org (4) in regards to all aspects of the residency training program must be applied even if they contradict the information provided in this booklet.

As *"adult learners,"* trainees must demonstrate full and proactive engagement. Demonstrations include careful understanding of learning objectives, self-directed learning, openness to reflective feedback and formative assessments, self-awareness, and support seeking when needed. The program director plays a vital role in successful implementation of this curriculum. The Training Committee members, and particularly the program administrator and the chief trainee, also significantly impact program implementation. Trainees must share responsibility for curriculum implementation. The SCFHS will apply the best models of training governance to achieve the best quality of training. Academic affairs in the training centers and regional supervisory training committee will have a major role in training supervision and implementation. The Specialty Scientific Council will be responsible for making sure that the content of this curriculum is regularly updated to match the best-known standards in postgraduate education.

What is new in this edition?

- A competency-based curriculum, with explicit representation of learning domains (knowledge, skills, and behavior).
- Focus on the graded responsibilities of the trainee, with clearer demarcations of what should be achieved at each stage of training (milestone).
- Improved supervisory frameworks that support independent learning within a formal structure and enriched formative assessment.

Policies and Procedures

This curriculum outlines the means, materials, and learning objectives required of trainees and trainers to achieve the identified educational outcomes. The SCFHS has a full set of "General

Bylaws" and "Executive Policies" (published on the official SCFHS website) that regulate all processes related to training. General bylaws of training, assessment, and accreditation, as well as executive policies on admission, registration, continuous assessment, promotion, examination, trainees' representation, support, duty hours, and leave are examples of regulations that must be applied. Trainees, trainers, and supervisors must apply this curriculum in compliance with the most updated bylaws and policies available on the official SCFHS website.

PROGRAM STRUCTURE

Program Entry Requirements

Please refer to the updated executive policy of SCFHS on admission and registration.
Website: www.scfhs.org.sa

Program Duration:

The PM&R program is a four year program (48 months including a total of four weeks of annual leave each year).

Program Rotations:

Year	Mandatory core rotations*		Elective rotations**		Selective rotations***	
	Rotation name	Duration	Rotation name	Duration	Rotation name	Duration
R1	Internal Medicine General Rehabilitation Orthopedic (Pediatric) Orthopedic (Spine) SCI Rehabilitation Stroke Rehabilitation Annual Leave	2 months 2 months 1 month 1 month 2 months 2 months 1 month			Internal medicine Cardiology Critical care medicine	1 month
R2	Neurosurgery Psychiatry	1 month 1 month	Elective	1 month		

	Adult Neurology Pediatric Neurology Pediatric Rehabilitation Traumatic Brain Injury Annual Leave	2 months 2 months 2 months 2 months 1 month				
R3	EMG/NCS Orthotics & Prosthetics Rheumatology SCI Rehabilitation General Rehabilitation Stroke Rehabilitation Annual Leave	2 months 2 months 2 months 1 month 2 months 2 months 1 month				
R4	Pediatric Rehabilitation Traumatic Brain Injury SCI Rehabilitation Orthotics & Prosthetics Annual Leave	2 months 2 months 2 months 1 month 1 month			Selective (core rehab + pain)	4 Months

**Mandatory core rotation:* *Mandatory set of rotations that re*
Present program core competencies.
***Elective rotation: Set of rotations that are related to the specialty, as determined by the scientific council/committee. The trainee is required to do some of them.*
****Selective rotation: Set of other rotations that is selected by trainee (directed by mentor/program director)*
To enhance competency acquisition of the specialty.

LEARNING AND COMPETENCIES

Physical Medicine, and Rehabilitation Competencies

Trainees are expected to progress from novice to mastery in a set of professional competencies. The SCFHS has endorsed the Canadian Medical Education Directives for Specialists' (CanMED) framework of articulating professional competencies. The following is a general outline of each competency.

(Adopted from the Royal College of Physicians and Surgeons of Canada 2020) (5)

Medical Expert

Definition:

As Medical Experts, physiatrists integrate all of the CanMED roles, applying medical Knowledge, clinical skills, and professional values to their high-quality and safe Patient-centered care. A Medical Expert is the central physician role in the CanMED Framework and defines the physician's clinical scope of practice.

Key and Enabling Competencies: Physiatrists are able to:

1. **Practice medicine within their defined scope of practice and expertise**
    - 1.1. Demonstrate a commitment to high-quality care of their patients
    - 1.2. Integrate the CanMED intrinsic roles into their practice of physiatry
    - 1.3. Apply knowledge of the clinical and biomedical sciences relevant to physiatry
        - 1.3.1. Anatomy and physiology of the musculoskeletal system:
            - 1.3.1.1. Bones
            - 1.3.1.2. Bursae
            - 1.3.1.3. Epiphyses
            - 1.3.1.4. Joints and capsules
            - 1.3.1.5. Myofascial trigger points
            - 1.3.1.6. Spine and skull
            - 1.3.1.7. Tendons
        - 1.3.2. Anatomy and physiology of the nervous system:
            - 1.3.2.1. Brain, including brain stem and cranial nerves
            - 1.3.2.2. Meninges
            - 1.3.2.3. Spinal cord
            - 1.3.2.4. Cerebral and spinal vasculature
            - 1.3.2.5. Nerve roots, peripheral nerves, neuromuscular junction, and associated muscles
            - 1.3.2.6. Autonomic nervous system, including bladder, and bowel innervation
            - 1.3.2.7. Other systems
                - 1.3.2.7.1. Motor
                - 1.3.2.7.2. Sensory
                - 1.3.2.7.3. Vestibular
                - 1.3.2.7.4. Motor points
                - 1.3.2.7.5. Neurotransmission
                - 1.3.2.7.6. Speech and swallowing
                - 1.3.2.7.7. Memory, learning, and behavior
                - 1.3.2.7.10. Pain
        - 1.3.3. Anatomy and physiology of the cardiovascular, endocrine, gastrointestinal, Genitourinary, hematologic, hepatobiliary, immunologic, and respiratory systems
        - 1.3.4. Normal growth and development, including developmental milestones
        - 1.3.5. Effect of physiologic responses and adaptations to exercise on the Cardiovascular, hematologic, musculoskeletal, neurologic, and respiratory systems

1.3.6. Principles of ergonomics and their application to clinical care
1.3.7. Principles of kinesiology and kinematic studies as they relate to gait analysis
1.3.8. Biomechanics in sport and exercise
1.3.9. Clinical and molecular genetics of commonly encountered hereditary neuromuscular conditions
1.3.10. Aging and its effects on physiology and biomechanics, and the impact of aging on people living with a physical or cognitive impairment
1.3.11. Effects of immobility on body systems
1.3.12. Microbiology of infections, especially of the musculoskeletal and nervous systems
1.3.13. Principles of nerve injury and recovery
1.3.14. Principles of pharmacology:
    1.3.14.1. Pharmacokinetic and pharmacodynamics changes that occur with physical impairments
    1.3.14.2. Impact of pharmacologic agents on patients with physical, cognitive, and behavioral impairments
    1.3.14.3. Symptom management, including acute and chronic pain, agitation, and neurologic recovery post acquired brain injury
    1.3.14.4. Substance abuse and withdrawal
    1.3.14.5. Antimicrobial treatment and antibiotic stewardship
    1.3.14.6. Medication reconciliation
1.3.15. Imaging modalities used in musculoskeletal and neurological conditions, including indications, contraindications, and choice of modality
1.3.16. Clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications, and functional consequences of:
    1.3.16.1. Amputations
    1.3.16.2. Arthritis
    1.3.16.3. Brain injury
    1.3.16.4. Cerebrovascular disease
    1.3.16.5. Disability due to cardiorespiratory diseases
    1.3.16.6. Disability due to complex medical conditions, including obesity,
    Thermal injuries, cancer, organ transplantation, and multiple medical comorbidities
    1.3.16.7. Disorders of nerve and muscle
    1.3.16.8. Disorders of the spinal cord
    1.3.16.9. Immobility
    1.3.16.10. Musculoskeletal injuries
    1.3.16.11. Musculoskeletal and neurologic disabilities of childhood
    1.3.16.12. Pain syndromes
1.3.17. Components of a comprehensive physiatrist assessment and plan, including the principles of functional inquiry relevant to the clinical presentation
1.3.18. Principles of rehabilitation potential in the full breadth of clinical presentations and patient populations
1.3.19. Principles of emergent and urgent medical management in people with disabilities
    1.3.19.1. Altered levels of consciousness
    1.3.19.2. Altered neurological status
    1.3.19.3. Anaphylaxis
    1.3.19.4. Autonomic dysreflexia
    1.3.19.5. Post-traumatic agitation
    1.3.19.6. Post-traumatic seizures
    1.3.19.7. Pressure wounds
    1.3.19.8. Pulseless limb
1.3.20. Principles of physiatrist management for the following rehabilitation-specific issues:
    1.3.20.1. Contractures
    1.3.20.2. Dysarthria
    1.3.20.3. Dysphagia
    1.3.20.4. Heterotopic ossification

1.3.20.5. Medical comorbidity management and/or surveillance
1.3.20.6. Neurogenic bladder
1.3.20.7. Neurogenic bowel
1.3.20.8. Osteoporosis
1.3.20.9. Pain
1.3.20.10. Seizure
1.3.20.11. Sexual and reproductive health and dysfunction
1.3.20.12. Spasticity
1.3.20.13. Wounds
1.3.20.14. Driving
1.3.20.15. Falls
1.3.20.16. Fitness/well-being
1.3.20.17. Hobbies/avocation
1.3.20.18. School needs
1.3.20.19. Vocation

1.3.21. Principles of secondary prevention, including behavior modification, for People with acquired brain injuries, amputations, and complex medical conditions
1.3.22. Principles of perioperative and post-operative functional optimization
1.3.23. Principles of post-operative care in musculoskeletal and neurological-based surgeries
1.3.24. Principles of impairment, activity limitation and participation restriction, and the health components of functioning and disability
1.3.25. Principles of exercise prescription in patients with musculoskeletal, neurological, or other medical presentations
1.3.26. Principles of prescription and management of limb prostheses and spinal and limb orthoses
1.3.27. Indications and contraindications for interventional procedures, and appropriate use of image guidance
1.3.28. Principles of mental health and psychosocial issues as they contribute to activity limitation and/or participation restriction
1.3.29. Principles of neuropsychology
1.3.30. Principles of dietetics
1.3.31. Principles of coping with acute, chronic, or progressive impairment and disability

1.4. Perform appropriately timed clinical assessments with recommendations that are Presented in an organized manner
1.4.1. Perform a comprehensive physiatry assessment, including an assessment Of the medical, functional, cognitive-behavioral, and socio-environmental Domains
1.4.2. Provide an expert opinion about a patient's medical fitness, readiness, and Ability to participate actively in an inpatient or outpatient rehabilitation program
1.4.3. Provide effective consultation services with respect to third-party requests And/or medical-legal opinions

1.5. Carry out professional duties in the face of multiple competing demands
1.6. Recognize and respond to the complexity, uncertainty, and ambiguity inherent in practice

2. Perform a patient-centered clinical assessment and establish a management plan

2.1. Prioritize issues to be addressed in a patient encounter
2.2. Elicit a history, perform a physical exam, select appropriate investigations, and Interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
2.2.1. Synthesize elements of history from multiple sources that may include patient, family, medical team members, community partners, and available written documentation
2.2.2. Elicit a comprehensive functional history, including an assessment of Activities of daily living (ADL), instrumental activities of daily living, socioeconomic determinants of health, and barriers of access to medical care and resources

2.2.3. Perform a physical exam with emphasis on the neurologic and musculoskeletal systems
2.2.3.1. Perform screening assessments for mood and cognition, including mental status examination
2.2.3.2. Assess gait patterns, transfer techniques, use of mobility aids, and wheelchair seating
2.2.3.3. Assess the need for ADL aids
2.2.4. Adapt the clinical assessment to a child's age and developmental stage
2.2.5. Develop a differential diagnosis for patients presenting with undifferentiated neuromusculoskeletal issues
2.2.6. Select and interpret the results of diagnostic tests including:
2.2.6.1. Blood tests
2.2.6.2. Fluid analysis, including cerebrospinal and synovial fluid
2.2.6.3. Cardiorespiratory testing, including sleep studies
2.2.6.4. Gait analysis, including kinetic and kinematic data
2.2.6.5. Interventional diagnostic procedures for pain
2.2.6.6. Intrathecal drug trials
2.2.6.7. Intraventricular shunt assessment
2.2.6.8. Medical imaging
2.2.6.9. Nerve conduction studies and electromyography
2.2.6.10. Psychometric testing
2.2.6.11. Swallowing assessment
2.2.6.12. Urodynamic testing
2.2.7. Formulate a comprehensive medical, functional, and psychosocial problem List based on the international classification of functioning (ICF) framework
2.3. With patients and their families, establish the goals of care, which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation
2.3.1. Integrate evidence-informed prognostic factors related to diagnosis, pre- And post-injury/incident functional levels and comorbidities into discussions about the appropriate level of rehabilitation and therapeutic interventions
2.3.2. Establish medical and rehabilitation goals of care with input from the patient and their family
2.3.3. Assist patients and families in developing care directions that align with their values, beliefs, and goals of care
2.4. Establish a patient-centered management plan
2.4.1. Develop, implement, and monitor patient-centered medical and Rehabilitation management plans, including prognostication of function, expected outcomes, and an estimated treatment duration for patients with:
2.4.1.1. Amputations
2.4.1.2. Arthritis
2.4.1.3. Brain injury
2.4.1.4. Cerebrovascular disease
2.4.1.5. Disability due to complex medical conditions
2.4.1.6. Disorders of nerve and muscle
2.4.1.7. Disorders of the spinal cord
2.4.1.8. Complications of immobility
2.4.1.9. Musculoskeletal injuries
2.4.1.10. Musculoskeletal and neurologic disabilities of childhood
2.4.1.11. Pain syndromes
2.4.2. Triage access to therapy, based on urgency and established protocols or criteria
2.4.3. Manage emergencies that arise during rehabilitation and Treatment; determine when urgent surgical and medical consultation are warranted
2.4.4. Apply accepted recommendations for primary and secondary prevention measures relevant to physiatry
2.4.5. Tailor health promotion and disease prevention strategies to people with disabilities

2.4.6. Address driving risk and propose a management plan in conjunction with the patient and family, as appropriate
2.4.7. Provide recommendations about community reintegration, including return to vocational and avocational activities
2.4.8. Address caregiver stress and burnout using an interprofessional approach
2.4.9. Manage requests for medical assistance in dying using an interprofessional approach

3. Plan and perform procedures and therapies for the purpose of assessment and/or management

3.1. Determine the most appropriate procedures or therapies
3.1.1. Preventive and therapeutic interventions:
3.1.1.1. Assistive devices
3.1.1.2. Mobility aids
3.1.1.3. Orthoses
3.1.1.4. Prostheses
3.1.1.5. Exercise prescriptions
3.1.1.6. Physical modality prescriptions
3.1.1.7. Rehabilitation therapies
3.1.1.8. Pharmacotherapies
3.1.2. Interventional therapeutic procedures for pain:
3.1.2.1. Epidural injections
3.1.2.2. Intrathecal drug delivery
3.1.2.3. Medial branch nerve blocks of facet joints
3.1.2.4. Percutaneous high frequency neurotomy
3.1.2.5. Deep brain and spinal stimulators
3.1.2.6. Neuro-ablative procedures
3.1.2.7. Other image-guided interventions
3.2. Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy
3.3. Prioritize procedures or therapies, taking into account clinical urgency and available resources
3.4. Perform procedures in a skillful and safe manner, adapting to unanticipated findings, or changing clinical circumstances
3.4.1. Arthrocentesis
3.4.2. Intra-articular injections
3.4.3. Soft tissue injections
3.4.4. Superficial surgical debridement of wounds
3.4.5. Chemo denervation

4. Establish plans for ongoing care and, when appropriate, timely consultation

4.1. Implement a patient-centered care plan that supports ongoing care, follow-up Investigations, response to treatment, and further consultation
4.1.1. Provide ongoing, supportive rehabilitation care in conjunction with, medical And surgical specialists, primary care practitioners, and other health care professionals
4.1.2. Provide ongoing surveillance for medical issues or manifestations that may Present in rehabilitation population groups
4.1.3. Determine the need for and timing of referral to other medical or surgical Specialties, other health professionals, and community-based partners
4.1.4. Engage medical and surgical specialists during the course of rehabilitation Treatment, as required
4.1.5. Engage, community partners, social services, primary care practitioners, And other health professionals to facilitate discharge planning
4.1.6. Assess the need for and timing of transfer to another level of care

4.1.7. Detect and manage patient difficulty in coping with disability
4.1.8. Detect and manage caregiver stress and burnout

5. Actively contribute, as an individual and as a member of a team providing care To the continuous improvement of health care quality and patient safety

5.1. Recognize and respond to harm from health care delivery, including patient safety Incidents
5.1.1. Identify patterns of falls and provide fall prevention recommendations
5.1.2. Identify missed diagnoses, incidental findings, and gaps in care during Transitions of care to determine the most appropriate management approach
5.2. Adopt strategies that promote patient safety and address human and system factors
5.2.1. Adhere to electrical and other safety protocols related to the electro diagnostic laboratory
5.2.2. Apply best practices for pressure ulcer prevention
5.2.3. Provide anticipatory guidance for people with disabilities undergoing Invasive interventions or procedures to reduce or mitigate the risk of adverse events and outcomes, and to optimize post-procedure function

Communicator

Definition:

As communicators, physiatrists form relationships with patients and their families that Facilitate the gathering and sharing of essential information for effective health care.

Key and Enabling Competencies: Physiatrists are able to:

1. Establish professional therapeutic relationships with patients and their families

1.1. Communicate using a patient-centered approach that encourages patient trust and Autonomy and is characterized by empathy, respect, and compassion
1.1.1. Demonstrate empathy for the psychosocial, cultural, and economic Implications of a patient's disability and its context
1.1.2. Address the impact that impairment, activity limitation, and participation Restriction may have on a patient and their family
1.1.3. Set expectations with the patient and their family regarding the boundaries Associated with third-party assessments
1.2. Optimize the physical environment for patient comfort, dignity, privacy, Engagement and safety
1.2.1. Apply strategies to put people sitting in wheelchairs at ease
1.3. Recognize when the perspectives, values, or biases of patients, patients' families, Physicians or other health care professionals may impact the quality Of care; modify approach to the patient accordingly
1.3.1. Demonstrate sensitivity to issues of gender, ethnicity, sexuality, and social Bias in dealing with patients, families, and people with disabilities
1.4. Respond to a patient's non-verbal behaviors to enhance communication
1.5. Manage disagreements and emotionally charged conversations
1.6. Adapt to the unique needs and preferences of each patient and to their Clinical condition and circumstances
1.6.1. Use strategies specific to the clinical presentation and circumstances to Optimize communication with patients with receptive and/or Expressive communication issues, cognitive impairment, or behavioural Disturbances

2. Elicit and synthesize accurate and relevant information, incorporating the Perspectives of patients and their families

2.1. Use patient-centered interviewing skills to effectively gather relevant biomedical And psychosocial information

2.1.1. Apply strategies to elicit an accurate history in situations where patients May be under- or over-representing symptoms, such as third-party, driving Risk and return to play assessments

2.2. Provide a clear structure and manage the flow of an entire patient encounter

2.2.1. Use appropriate strategies to manage the flow of an encounter for people With communication, cognitive, and/or behavior issues

2.3. Seek and synthesize relevant information from other sources, including the Patient's family, with the patient's consent

3. Share health care information and plans with patients and their families

3.1. Provide information and explanations that are clear, accurate, and timely, while Assessing for patient and family understanding

3.1.1. Use appropriate strategies for explanation and planning for people with Communication, cognitive, and/or behavioral issues

3.1.2. Convey prognostic information on functional recovery in a compassionate And respectful manner

3.1.3. Discuss concerns and legal restrictions related to driving, in a Compassionate and respectful manner

3.1.4. Discuss return to play parameters in a clear and structured manner

3.2. Disclose harmful safety incidents to patients and their families

4. Engage patients and their families in developing plans that reflect the patient's Health care needs and goals

4.1. Facilitate respectful, non-judgmental, and culturally safe discussions with patients and their families

4.2. Assist patients and their families to identify, access, and use information And communication technologies to support their care and manage their health

4.3. Use communication skills and strategies that help patients and their families make Informed decisions regarding their health

5. Document and share written and electronic information about the medical Encounter to optimize clinical decision-making, patient safety, confidentiality, And privacy

5.1. Document clinical encounters in an accurate, complete, timely, and accessible Manner, in compliance with regulatory and legal requirements

5.1.1. Provide clear, concise, and timely reports of electro diagnostic studies

5.1.2. Document outcomes of discussions related to driving risk and Recommendations

5.1.3. Provide effective third-party and medico-legal reports

5.2. Communicate effectively using a written health record, electronic medical record, Or other digital technology

5.3. Share information with patients and others in a manner that enhances Understanding and that respects patient privacy and confidentiality

Collaborator

Definition:

As collaborators, physiatrists work effectively with other health care professionals to Provide safe, high-quality patient-centered care.

Key and Enabling Competencies: Physiatrists are able to:

1. Work effectively with physicians and other colleagues in the health care Professions

1.1. Establish and maintain positive relationships with physicians and other colleagues To support relationship-centered collaborative care

1.1.1. Display behavior in keeping with attitudes that value the professional Contributions of the other health care professionals in the team

1.2. Negotiate overlapping and shared responsibilities in episodic and ongoing care with other colleagues
    1.2.1. Apply knowledge of the scope of practice, and associated therapeutic Interventions, of other health care professionals, including physiotherapists, Occupational therapists, nurses, speech-language pathologists, psychologists, social workers, orthotists, prosthetists, and community health care workers
    1.2.2. Ensure team members' individual roles and responsibilities are clear when there is Overlap in their scopes of practice
    1.2.3. With the primary health care provider, clarify the roles and responsibilities of the physiatrist in the context of shared ongoing and continuing care
1.3. Engage in respectful shared decision-making with physicians and other colleagues In the health care professions
    1.3.1. Contribute expertise to interprofessional rehabilitation teams
    1.3.2. Consult with other physicians on patients' medical and surgical issues
    1.3.3. Work effectively with government agencies and third parties on issues Related to impairment, activity limitations, and participation restrictions

2. Work with physicians and other colleagues in the health care professions to Promote understanding, manage differences, and resolve conflicts
2.1. Show respect toward collaborators
2.2. Implement strategies to promote understanding, manage differences, and resolve Conflict in a manner that supports a collaborative culture
    2.2.1. Apply knowledge of the principles of team dynamics, functioning, and Conflict management
    2.2.2. Manage differences of opinion with rehabilitation team members as they Relate to:
        2.2.2.1. Determining fitness and ability to participate in a formal rehabilitation program
        2.2.2.2. Discharge planning or transition to a different level of care

3. Hand over the care of a patient to another health care professional to facilitate Continuity of safe patient care
3.1. Determine when care should be transferred to another physician or health care Professional
3.2. Demonstrate safe handover of care, using both oral and written communication, During a patient transition to a different health care professional, setting, or stage Of care
    3.2.1. Facilitate transfer of care of patients from the inpatient setting to the Outpatient rehabilitation setting
    3.2.2. Identify and manage gaps in care for patients transferred from acute care Or the community into the rehabilitation setting
    3.2.3. Facilitate transfer of patients with emergent or urgent issues from The rehabilitation setting to the acute care setting
    3.2.4. Provide accurate and timely information to other health care professionals; Describe the patient's medical status and levels of ability, function, And independence to plan and modify goals of care and to assist With discharge planning
    3.2.5. Provide support to primary care providers for the ongoing management of People with disabilities
    3.2.6. Facilitate the transition of people with disabilities from the pediatric to the Adult rehabilitation system, with the appropriate supports and services

Leader

Definition:

As leaders, physiatrists engage with others to contribute to a vision of a high-quality health Care system and take responsibility for the delivery of excellent patient care, through Activities as clinicians, administrators, scholars, or teachers.

Key and Enabling Competencies: Physiatrists are able to:

1. **Contribute to the improvement of health care delivery in teams, organizations, And systems**
   - 1.1. Apply the science of quality improvement to systems of patient care
     - 1.1.1. Participate in practice mock scenarios to address inpatient or outpatient treatment Quality and safety domains, including efficacy, effectiveness, patient Satisfaction, patient safety, access to care, and equitable care
   - 1.2. Contribute to a culture that promotes patient safety
   - 1.3. Analyze patient safety incidents to enhance systems of care
   - 1.4. Use health informatics to improve the quality of patient care and optimize patient Safety

2. **Engage in the stewardship of health care resources**
   - 2.1. Allocate health care resources for optimal patient care
     - 2.1.1. Balance effectiveness, efficiency, and access to resources for people with Disabilities
   - 2.2. Apply evidence and management processes to achieve cost-appropriate care

3. **Demonstrate leadership in health care systems**
   - 3.1. Demonstrate leadership skills to enhance health care
     - 3.1.1. Describe the structure and function of the health care system as it relates to:
       - 3.1.1.1. The management and administration of hospitals, clinical programs, academic institutions, and licensing bodies
       - 3.1.1.2. Patients with functional impairments, activity limitations, and participation restrictions, and their community support and advocacy groups
     - 3.1.2. Evaluate the impact of health care economics on patients' (and their families') access to care
     - 3.1.3. Evaluate the impact of health care economics on residency education, Medical staff and other health professionals
   - 3.2. Facilitate change in health care to enhance services and outcomes
     - 3.2.1. Advise hospital and university administration on issues, such as impairment, Activity limitations, participation restriction, accessibility, and the role of The interprofessional rehabilitation team

4. **Manage career planning, finances, and health human resources in a personal Practice**
   - 4.1. Set priorities and manage time to integrate practice and personal life
   - 4.2. Manage personal professional practice(s) and career
     - 4.2.1. Perform managerial and administrative functions in an efficient and Organized manner
   - 4.3. Implement processes to ensure personal practice improvement

Health Advocate

Definition:

As health advocates, physiatrists contribute their expertise and influence as they work with Communities or patient populations to improve health. They work with those they serve to Determine and understand needs, speak on behalf of others (when required), and support the Mobilization of resources to effect change.

Key and Enabling Competencies: Physiatrists are able to:

1. **Respond to an individual patient's health needs by advocating with the patient Within and beyond the clinical environment**
   - 1.1. Work with patients to address determinants of health and patient access to necessary services or resources
     - 1.1.1. Facilitate timely patient access to health and social services and community resources, including patient support groups

1.1.2. Identify socioeconomic barriers to adopting healthy lifestyle changes in People with disabilities
1.1.3. Optimally utilize local, provincial, federal, and third-party resources and agencies To advocate for personal support services, community services, and Equipment to enhance function and independence

1.2. Work with patients and their families to increase opportunities to adopt healthy Behaviors
1.2.1. Discuss return to regular fitness activities once formal rehabilitation goals Have been met

1.3. Incorporate disease prevention, health promotion, and health surveillance into Interactions with individual patients
1.3.1. Counsel patients on the following, as appropriate:
1.3.1.1. Adopting healthy lifestyle changes, including optimizing nutrition, Regular fitness activities and smoking cessation
1.3.1.2. Secondary prevention strategies for cerebrovascular disease, Including smoking cessation, and cholesterol and blood pressure Control
1.3.1.3. Other secondary prevention strategies, including injury prevention
1.3.1.4. Risk and harm reduction as they relate to alcohol abuse and Recreational drug use

2. Respond to the needs of the communities or populations they serve by Advocating for systemic change in a socially accountable manner

2.1. Work with a community or population to identify the determinants of health that Affect them
2.1.1. Identify and respond to issues of gender, ethnicity, sexuality, and socioeconomic bias when engaging with people with disabilities
2.1.2. Manage barriers and gaps in hospital and community services in Rehabilitation population groups to ensure equitable access to such services
2.1.3. Promote a heightened awareness of the challenges and abilities of people With disabilities, including environmental and attitudinal barriers

2.2. Improve clinical practice by applying a process of continuous quality improvement To disease prevention, health promotion, and health surveillance activities
2.2.1. Perform regular practice audits to ensure optimal access to inpatient and Outpatient rehabilitation services

2.3. Contribute to a process to improve health in the community or population they serve
2.3.1. Discuss the role of local and national organizations in shaping public policy Around care for people with disabilities and disability prevention
2.3.2. To optimize the ongoing care of people with disabilities, facilitate a link between primary health care providers and other physicians
2.3.3. Identify and respond to unmet health care needs in rehabilitation patient groups

Scholar

Definition:

As scholars, physiatrists demonstrate a lifelong commitment to excellence in practice Through continuous learning, and by teaching others, evaluating evidence, and contributing To scholarship.

Key and Enabling Competencies: Physiatrists are able to:

1. Engage in the continuous enhancement of their professional activities through Ongoing learning

1.1. Develop, implement, monitor, and revise a personal learning plan to enhance Professional practice
1.1.1. Participate in the Royal College of Physicians and Surgeons of Canada's Maintenance of certification program and track continuing education

1.2. Identify opportunities for learning and improvement; regularly reflect on and Assess performance using various internal and external data sources

1.3. Engage in collaborative learning to continuously improve personal practice and contributions to collective practices

2. Teach students, trainees, the public, and other health care professionals

2.1. Recognize the influence of role-modeling and the impact of the formal, informal, And hidden curriculum on learners
2.2. Promote a safe and respectful learning environment
2.3. Ensure patient safety is maintained when learners are involved
2.4. Plan and deliver learning activities
2.5. Provide feedback to enhance learning and performance
2.5.1. Contribute to a positive learning environment to facilitate giving And receiving feedback
2.6. Assess and evaluate learners, teachers, and programs in an educationally Appropriate manner
2.6.1. Use a systematic education planning approach to create and evaluate new and existing learning activities

3. Integrate best available evidence into practice

3.1. Recognize uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that can address them
3.2. Identify, select, and navigate pre-appraised resources
3.3. Critically evaluate the integrity, reliability, and applicability of health-related research and literature
3.4. Integrate evidence into decision-making practices

4. Contribute to the creation and dissemination of knowledge and practices applicable to health

4.1. Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care
4.2. Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and considering vulnerable populations
4.2.1. Identify and respond to relevant ethical issues in research methodology and data presentation, storage, and analysis regarding people with disabilities
4.3. Substantively contribute to a research program
4.4. Pose questions amenable to scholarly investigation and select appropriate methods to address them
4.4.1. Conduct scholarly work
4.5. Summarize and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry

Professional

Definition:

As professionals, physiatrists are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behavior, accountability to the profession and society, physician-led regulation, and maintenance of personal health.

Key and Enabling Competencies: Physiatrists are able to:

1. Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards

1.1. Exhibit appropriate professional behaviors and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality
1.2. Demonstrate a commitment to excellence in all aspects of practice
1.2.1. Recognize the limits of professional competence

1.3. Recognize and respond to ethical issues encountered in practice
    1.3.1. Apply an ethical framework in decision-making when working with people with disabilities
    1.3.2. Consider patient and family autonomy when there are decisions that may put the patient at risk
    1.3.3. Manage ethical issues encountered in the clinical setting, including appropriateness and timing of genetic testing, enteral feeding in people with progressive dysphagia, care directions, and end-of-life issues
1.4. Recognize and manage conflicts of interest
1.5. Exhibit professional behaviors in the use of technology-enabled communication

2. Demonstrate a commitment to society by recognizing and responding to societal expectations in health care
2.1. Demonstrate accountability to patients, society, and the profession; respond to societal expectations
    2.1.1. Provide a rationale for care and involvement in hospital and community settings in which such involvement does not exist or may not be perceived to exist
    2.1.2. Highlight the scope of a physiatrist's expertise as it pertains to people with disabilities in clinical and non-clinical contexts, such as in a court
2.2. Demonstrate a commitment to patient safety and quality improvement

3. Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation
3.1. Fulfill and adhere to professional and ethical codes, standards of practice, and laws governing practice
    3.1.1. Provide mandatory reporting of fitness to drive in accordance with provincial guidelines and legislation
    3.1.2. Complete requests for confirmation of impairment and disability in a timely and professional manner
3.2. Recognize and respond to unprofessional and unethical behaviors by physicians and other colleagues
3.3. Participate in peer assessment and standard setting

4. Demonstrate a commitment to physician health, and well-being to foster optimal patient care
4.1. Exhibit self-awareness and manage influences on personal well-being and professional performance
    4.1.1. Demonstrate a commitment to safe practices to minimize occupational risk
    4.1.2. When dealing with people with disabilities, identify risk factors and signs of compassion fatigue and burnout
4.2. Manage personal and professional demands for sustainability throughout the physician life cycle
4.3. Promote a culture that recognizes, supports, and responds effectively to colleagues in need

PM&R Rotation's Specific Goals and Objectives
Non-Core Topics

Internal Medicine, Cardiology, Critical Care Medicine

Knowledge

By the end the Internal Medicine rotation, Physiatrists will be able to:

- Describe the etiologies and pathophysiology of common medical conditions affecting the central nervous system (CNS), cardiovascular system, endocrine system, metabolic system including acid-base balance, pulmonary system, gastrointestinal system, genitourinary system, and musculoskeletal systems

- Recognize and interpret clinical features of common medical conditions to arrive at a succinct list of differential diagnoses
- Formulate a relevant and organized medical problem list for a given individual medical patient
- Recognize when a patient is medically stable or unstable, and manage emergent conditions appropriately
- Select the appropriate investigations to assist with diagnosis and management of medical conditions
- Select and prescribe appropriate treatments for common acute and chronic medical conditions

By the end of Cardiology (selective) rotation, physiatrists will be able to:

Ischemic Heart Disease

- Demonstrate an understanding of the pathophysiology, and natural history of atherosclerotic coronary artery disease (CAD)
- Demonstrate expertise in the recognition and appropriate triage of CAD patients who present with an unstable acute coronary syndrome, which comprises non-ST-elevation, ST-elevation myocardial infarction, and unstable angina
- Elicit, present, and document a complete chest pain history to diagnose chest pain from an unstable cardiac condition and provide a rational and cogent differential
- Apply knowledge regarding the use of ancillary biochemical testing or other imaging techniques to appropriately triage such patients for appropriate medical therapy and/or revascularization techniques. This requires knowledge of the utility (including indications, contraindications, and limitations) of common cardiovascular tests, including static electrocardiography (ECG), exercise stress testing, nuclear imaging, echocardiography, computed tomography, right heart catheterization, intra-cardiac pressure measurement, and coronary angiography
- Demonstrate an understanding of the common ECG patterns of unstable cardiac disease, and the limitations of this technique in diagnosing patients with ischemic type chest pain
- Demonstrate an understanding of the indications and limitations of invasive and noninvasive tests for risk stratification prior to discharge following an initial presentation with a presumed or actual ACS
- Demonstrate knowledge related to rehabilitation of cardiac patients

Critical Care Cardiology

- Demonstrate expertise in the diagnosis and initial management of cardiogenic shock
- Demonstrate an understanding of normal and shock cardiovascular physiology, and ability to differentiate cardiogenic shock from shock states of other etiologies
- Demonstrate an understanding of the mechanical complications of myocardial infarction that can lead to the development of cardiogenic shock
- Demonstrate an understanding of the supportive technologies for the treatment of cardiogenic shock, including right heart catheterization, intra-cardiac pressure monitoring, intravenous inotropic and vasoactive medications, and intra-aortic balloon pumps
- Demonstrate the ability to recognize and understand the appropriateness of timely mechanical revascularization for cardiogenic shock

Valvular Heart Disease

- Apply knowledge and expertise in the accurate diagnosis of common valvular and peri-valvular heart lesions including mitral stenosis, mitral regurgitation, aortic stenosis, aortic regurgitation, mitral valve prolapse, and hypertrophic obstructive cardiomyopathy. The initial diagnosis of these conditions is usually made upon physical examination
- Demonstrate effective cardiac physical examination skills using palpation and static and dynamic auscultation to differentiate these and other valvular and sub-valvular lesions
- Demonstrate an understanding of the natural history of these conditions, their appropriate medical therapy, and the indication and timing of definitive mechanical intervention if appropriate

- Demonstrate an understanding of the indications of antibiotic prophylaxis of various valvular and peri-valvular lesions
- Demonstrate an understanding of secondary conditions that predispose individuals to develop various valvular heart conditions, including valvular lesions that complicate acute cardiac syndromes and inherited collagen vascular conditions

Arrhythmias

- Demonstrate the ability to recognize a normal ECG consistently and accurately
- Apply knowledge and expertise in the ECG interpretation of common atrial and ventricular arrhythmias including, but not limited to, atrial fibrillation, atrial flutter, atrio-ventricular (AV) reentrant tachycardia, AV nodal tachycardia, ventricular tachycardia, acquired AV block, bundle branch blocks, and hemi blocks
- Demonstrate an understanding of the pharmacological management of common tachy-arrhythmias and be familiar with the common indications for permanent and temporary cardiac pacing for brady-arrhythmias
- Demonstrate an understanding of the indications for, and the ability to apply the techniques of, emergent direct current cardio-version for hemo-dynamically significant tachyarrhythmia

Heart Failure

- Demonstrate expertise in the ability to define and diagnose the clinical features of diastolic and systolic heart failure
- Demonstrate an understanding of the underlying pathophysiology and etiologies that can result in systolic or diastolic dysfunction, and the ability to formulate a rational diagnostic approach to the heart failure patient
- Demonstrate the ability to diagnose and manage acute heart failure, including the use of pharmacotherapy of chronic heart failure properly and consistently
- Demonstrate an understanding of the emerging technologies for heart failure, including pacing, ventricular assist devices, implantable cardioverter defibrillators, and cardiac transplantation

By the end the Critical Care Medicine (selective) rotation, physiatrists will be able to:

- Demonstrate understanding of physiology and pathophysiology of organ systems involved in critical illness
- Describe the clinical features, complications, and approach to diagnosis of critical illness, including shock, respiratory failure, pulmonary edema, coma, renal failure, drug overdoses, seizures, acid-base disorders, and gastrointestinal hemorrhages.
- Discuss the assessment and management of fluid volume in the intensive care patient
- Describe the principles of ventilation and management of the acutely ventilated patient
- Select and interpret appropriate tests to assist with diagnosis and management of critical illnesses
- Describe the role of parenteral nutrition in the intensive care setting
- Describe the early rehabilitation needs of the critically ill patient

Skills

- Demonstrate reasonable competence in the physical examination of the medical patient, including examination of the skin, cardiovascular, pulmonary, and gastrointestinal systems
- Demonstrate ability to gain intravenous access (including drawing blood and placement of peripheral venous and arterial lines); perform a lumbar puncture, and drainage of fluids from various cavities, pleural, peritoneal, or joint
- Interpret with reasonable competence radiological imaging of the chest and abdomen, ECG, and laboratory results

Attitude

- Prioritize a procedure or therapy, taking into account clinical urgency and available resources
- Perform a procedure in a skillful and safe manner, adapting to unanticipated findings or changing clinical circumstances
- Establish plans for ongoing care and, when appropriate, timely consultation.
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Rheumatology

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Explain the anatomy, physiology, histology, and pathophysiology of connective tissue, bones, and joints
- Recognize the role of the immune system in the pathogenesis of rheumatic disease and recognize the clinical presentation of rheumatologic conditions including:
  - Rheumatoid arthritis
  - Seronegative arthropathies
  - Septic arthritis
  - Osteoarthritis
  - Systemic lupus erythematous
  - Crystal induced arthropathies
  - Tendinopathies
  - Polymyalgia rheumatica
  - Neuropathic arthropathy
  - Fibromyalgia
  - Metabolic bone diseases (rickets, osteomalacia, osteoporosis, Paget's disease, hyperparathyroidism)
  - Vasculitis
  - Osteonecrosis
  - Dermatomyositis/polymyositis

- Describe the classification and diagnosis of the above disorders
- Describe the principles of acute and long-term management of the above disorders
- Appraise use of medications in the treatment of the above disorders and select/prescribe appropriate drug therapy
- Select, justify, and interpret appropriate investigations, including lab tests, biopsies, radiological workup, and joint fluid analysis
- Describe the roles of other interdisciplinary team members in management of rheumatological patients

Skills

- Perform a complete and appropriate patient assessment
- Demonstrate proficiency in completing a relevant and organized history and functional history from a patient with joint disease
- Demonstrate proficiency in completing a physical and functional examination of the musculoskeletal system, with emphasis on structure and alignment, signs of inflammation, joint range of motion and stability, muscle strength, and extra-articular manifestations of rheumatic diseases

- Demonstrate an ability to select and interpret appropriate investigations, including laboratory tests and radiological workup
- Demonstrate the technique of diagnostic and therapeutic intra-articular and soft tissue injections and aspirations; examine and interpret synovial fluid analysis

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner, adapting to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Adult and Pediatric Neurology

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Describe the etiology, pathophysiology, clinical features, and classification of the following adult disorders:
  - Migraines/headaches/vertigo
  - Stroke
  - Seizure disorders
  - Peripheral neuropathies (acquired and congenital), radiculopathy, myelopathy
  - Brain and spinal cord tumors
  - Motor neuron disorders: Amyotrophic lateral sclerosis (ALS), Polio
  - Neuromuscular disorders: Myasthenia gravis
  - Multiple sclerosis
  - Movement disorders: Huntington's and Parkinson's disease
  - Disorders of gait and impaired coordination
  - Myopathies: Polymyositis
  - Dementia, delirium, and depression

- Describe the etiology, pathophysiology, clinical features, and classification of the following pediatric disorders:
  - Spinal muscular dystrophy
  - Hereditary polyneuropathies
  - Hereditary myopathies
  - Brachial plexus palsy in the neonate
  - Muscular dystrophies
  - Myelodysplasia
  - Cerebral palsy
  - Meningitis

- Describe the principles of management of the above disorders, both acutely and for long-term follow-up
- Appraise use of medications in the treatment of the above disorders and select/prescribe appropriate drug therapy
- Describe the indications for tissue plasminogen activator (tPA) therapy in ischemic stroke and its potential benefits and risks

- Select, justify, and interpret appropriate investigations, including lab tests, lumbar puncture, and radiological workup, electro diagnostic and psychometric tests
- Describe the roles of other interdisciplinary team members in management of neurological patients

Skills

- Focus on the neurological system when performing a competent physical and functional examination of a patient
- Order relevant tests and properly interpret results, including blood work, body fluid analysis, and imaging tests
- Perform diagnostic and therapeutic procedures as required, including lumbar puncture

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Adult & Pediatric Orthopedic and Spine Surgery

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Describe anatomy, neurophysiology, and histology of the spinal cord
- Describe the functional anatomy the vertebral column
- Describe pathophysiology of traumatic and non-traumatic spinal cord injury (SCI)
- Describe epidemiology of SCI and common mechanisms of injury
- Identify spinal cord syndromes and their clinical features
- Describe acute management of SCI, including diagnosis and injury classification
- List the various options for treatment of fractures and dislocations at all vertebral levels and types and uses of cervical and thoracolumbar bracing
- Demonstrate competency in management of acute SCI, including management of unstable fractures, respiratory compromise, wound infections, and neurogenic bowel and bladder dysfunction
- Select and justify appropriate diagnostic testing, including laboratory tests, CT scans, MRIs, angiograms, and myelograms
- Assess and select appropriate spinal orthoses
- Identify the roles of the interdisciplinary team members in the acute phase of SCI
- Describe the relevant anatomy, pathophysiology, classification, presentation, and management of the following common acquired disorders of the spine including:
  - Spondylosis and degenerative disc disease
  - Soft tissue injuries of the back
  - Spondylolysis and spondylolisthesis
  - Spinal stenosis
  - Sacroiliac joint dysfunction
  - Spine tumors (primary, metastatic) inflammatory, infectious causes
  - Flexion-extension injuries of the neck (whiplash)
  - Acute disc prolapse

- Define mechanical back pain
- Recognize the “red flags” in the diagnosis of low back pain
- “Describe Waddell’s signs: a group of five physical signs associated with the non-organic or psychological components of chronic low back pain.” Describe the etiology, pathophysiology, clinical features, classification, and management outlines of the following pediatric disorders:
  - Cerebral palsy (orthopedic complication and spasticity)
  - Scoliosis
  - Common fractures
  - Childhood hip disorders (transient synovitis, slipped capital femoral epiphysis, Legg-Calve-Perth’s disease, congenital dislocation, pyrogenic arthritis)

Skills

- Perform a competent neck and back examination with neurological examination
- Perform American spinal cord association classification (ASIA)
- Formulate a comprehensive clinical problem list and appropriate management plan for SCI and back pain
- Interpret relevant diagnostic tests, including laboratory tests, CT scans, MRIs, angiograms, and myelograms
- Demonstrate competence in management of spinal stabilization, including use of traction, Halo-vest, and other spinal orthoses

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Neurosurgery

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Describe the pathophysiology, clinical presentation, and principles of management of common neurosurgical conditions including acute brain injury, intracranial hemorrhage, brain tumors, acute spinal cord injury, and cervical myelopathy
- Demonstrate competency in management of the post-operative neurosurgical patient, seizures, electrolyte imbalance, and blood pressure
- Select and justify appropriate investigations, including laboratory tests, CT scans, MRIs, angiograms, lumbar punctures, electroencephalograms (EEG), and myelograms
- Identify the roles of the interdisciplinary team members in addressing the acute phase of brain injury

Skills

- Perform an appropriate neurological examination
- Formulate a comprehensive clinical problem list and appropriate management plan for the neurosurgical patient
- Interpret relevant investigations including laboratory tests, CT scans, MRIs, angiograms, lumbar punctures, EEGs, and myelograms

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Psychiatry

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Recognize the diagnosis and management of the most common problems encountered in neuropsychiatry and their relationship with other medical illnesses and disabilities
- Acquire knowledge and experience in the appropriate application of psychotherapy and psychopharmacology in the management of common neuropsychiatric disorders
- Become familiar with the diagnostic categories of Diagnostic and Statistical Manual of Mental Disorders (DSM) IV-R
- Demonstrate awareness of the medico-legal aspects of psychiatry relating to treatment and competence
- Have a broad knowledge of the psychological stages of coping with disability

Skills

- Conduct a thorough neuropsychiatric interview
- Perform a detailed mental status examination, including a cognitive status examination
- Perform a relevant physical examination
- Prescribe appropriate medications for common neuropsychiatric disorders

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Core Topics

Stroke Rehabilitation

The stroke rehabilitation rotation primarily includes inpatient care and consultations. When it is appropriate and available, outpatient clinical care may be included.

The trainee will develop the necessary clinical skills and knowledge required to manage a patient with stroke and be capable of managing the medical, psychosocial, and vocational aspects of that individual's ability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate thorough knowledge of the CNS neuroanatomical and neurophysiology, including the lobes of the brain, brainstem, cerebellum, and vascular supply to the brain
- Demonstrate knowledge of the pathophysiology of ischemic and hemorrhagic cerebral vascular accidents, including primary and secondary injury mechanisms
- Describe the acute management of patients with stroke, including the criteria, benefits and risks of early thrombolytic therapy
- Demonstrate knowledge of the various medications used in treatment of stroke, as well as their relative risks and benefits
- Describe the epidemiology and common etiologies, including risk factors, of ischemic and hemorrhagic strokes
- Describe the common stroke syndromes, including cerebral, subcortical, and brainstem stroke syndromes
- Describe the modifiable and non-modifiable risk factors for stroke
- Understand the relationship between stroke and other cardiovascular risk factors
- Demonstrate knowledge of primary and secondary stroke prevention, including the evidence and key clinical trials for secondary prevention and recommendations for:
  - Physical activity
  - Diet
  - Smoking
  - Alcohol
  - Hypertension
  - Hypercholesterolemia
  - Diabetes
  - Anticoagulation/antiplatelet treatment
  - Carotid stenosis

- Describe the recovery process following stroke including the following:
  - Predictors of recovery (for functional status, upper extremity function, ambulation, discharge home, return to work)
  - Mechanisms of recovery post-stroke, including neuroplasticity
  - Types and timeline for stroke recovery
  - Brunnstrom stages of motor recovery
  - Synergy patterns of the upper and lower extremities
  - Common tools for evaluating stroke recovery
  - Causes and risk factors for mortality post-stroke
  - Positive and negative prognostic factors post-stroke

- Demonstrate knowledge of the diagnosis and management of primary and secondary complications associated with stroke, including the following:
  - Spasticity: definition, pathophysiology, assessment, approach to management (physical, pharmacological, and surgical)
  - Thromboembolism
  - Post-stroke depression
  - Fatigue
  - Dysphagia and aspiration
  - Aphasia
  - Dysarthria
  - Apraxia
  - Neglect and perceptual impairments
  - Neurogenic bowel/bladder incontinence, constipation, urinary tract infections (UTIs)
  - Metabolic complications
  - Common pain presentations
  - Post-stroke shoulder pain
  - Complex regional pain syndrome
  - Central pain syndrome

- Demonstrate knowledge of the components of cognitive assessment and techniques of cognitive rehabilitation
- Understand the various therapeutic modalities and orthotic devices that may be applied to the stroke patient in the rehab setting; recognize the associated risks and benefits of such modalities and devices
- Demonstrate an approach to community integration, including home modifications, adaptive devices, and family adjustments
- Evaluate and manage sexual dysfunction in stroke patients
- Demonstrate knowledge of return to fitness activities
- Assess appropriateness to return to driving within the guidelines for driving ability

Skills

- Obtain a comprehensive history from the patient, family members, and/or other care providers
- Identify impairments resulting from the stroke
- Perform a competent physical examination relevant to the assessment of the patient with stroke, including adequate examination of the patient's cognitive, perceptual and communication abilities, musculoskeletal, general medical, and other examinations for relevant post-stroke sequelae. Consider:
  - Spasticity assessment
  - Gait
  - Orthotic/gait aid assessment

- Assess and interpret scales and parameters used to describe severity of stroke and functional outcomes:
  - Glasgow Coma Scale
  - Brunnstrom stages of motor recovery
  - FIM
  - Disability Rating Scale

- Demonstrate appropriate use and interpretation of common diagnostic studies, including cerebral angiography, radioisotope brain scan, brain CT, MRI, and somatosensory, brain stem auditory, and visual evoked potentials
- Be able to assess and treat common impairments after stroke, including the following:
  - Aphasia and language dysfunction
  - Motor, sensory, and coordination impairments
  - Cognitive and perceptual impairments, including neglect and vascular dementia

- Dysphagia and dysarthria
- Apraxia

- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy
- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources.
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents.
- Adopt strategies that promote patient safety and address human and systemic factors

Acquire Brain injury (ABI) Rehabilitation

This rotation includes primarily ABI inpatient experience and consultations. When available, outpatient clinic will be included in the rotation.

The trainee will develop the necessary clinical skills and knowledge required in acquired brain injury (ABI) rehabilitation for proficient management of patients with ABI.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications, and functional consequences of clinical presentations including, but not limited to:
- Demonstrate thorough knowledge of CNS neuroanatomy and neurophysiology, including the lobes of the brain, brainstem, cerebellum, and cerebrospinal fluid (CSF) dynamics.
- Demonstrate thorough knowledge of vascular supply to the brain.
- Correlate clinical findings to the location of the injury.
- Demonstrate knowledge of the pathophysiology of traumatic brain injury, including primary and secondary injury.
- Demonstrate awareness of neuroprotective agents that may affect traumatic brain injury.
- Demonstrate knowledge of the various medications used in treatment of acquired brain disorders, as well as their relative risks and benefits.

- Describe the epidemiology and management of acquired brain disorders, including the role of the emergency response team, acute hospital, and regional rehabilitation centers in patient management as well as prevention strategies (such as the role of alcohol).
- Understand the pathophysiology of anoxic brain injury and encephalitis, and the common locations with resulting deficits.
- Exhibit knowledge of the classification of brain tumors.
- Describe the long-term outcomes of various etiologies of ABI.
- Describe the recovery mechanisms after ABI.
- Describe the disorders of consciousness (i.e., coma, vegetative state, minimally conscious state).
- Demonstrate knowledge of the diagnosis and management of primary and secondary complications associated with acquired brain disorders, including the following:
  - Post-traumatic seizures
  - Post-traumatic hydrocephalus
  - Post-concussion syndrome
  - Visual impairment
  - Spasticity
  - Thromboembolism
  - Heterotopic ossification
  - Post-injury agitation
  - Dysphagia and aspiration
  - Aphasia
  - Neurogenic bowel/bladder
  - Sexual dysfunction
  - Autonomic instability/dysautonomia
  - Peripheral and central pain
  - Pressure ulcers
  - Metabolic and endocrine complications
  - Mental health issues post-ABI such as anxiety, depression, attention deficit, post-traumatic stress disorder, addictive behaviors, agitation, aggression, apathy, and abulia
  - Fatigue and sleep disorders
  - Endocrine dysfunction

- Demonstrate knowledge of the components of cognitive rehabilitation
- Understand the various therapeutic modalities and orthotic devices that may be applied to the brain disordered patient in the rehab setting and the associated risks and benefits of such modalities and devices
- Demonstrate an approach to community integration, including home modifications, adaptive devices, and family adjustment
- Evaluate variables that determine success of return to work and school
- Demonstrate knowledge of community reintegration, such as return to work/education, return to driving, return to leisure/social activities and sport, caregiver burden
- Demonstrate knowledge of and medico-legal issues in people with acquired brain disorders
- Demonstrate knowledge of mild traumatic brain injury/concussion
- Demonstrate an understanding of the patient's impairments, activity limitations, participation restrictions, and expected recovery
- Obtain a comprehensive history from the patient, family members, and/or other care providers
- Identify impairments resulting from the ABI

Skills

- Perform a competent physical examination relevant to the assessment of the patient with an acquired brain disorder (including adequate examination of the patient's cognitive, perceptual, and communication abilities)
- Assess and interpret scales and parameters used to describe severity of brain injury and functional outcomes:
  - Glasgow Coma Scale

- Galveston Orientation Amnesia Test
- Post-traumatic amnesia
- Ranchos Los Amigos Scale
- Functional Independence Measure (FIM)
- Disability Rating Scale

- Demonstrate appropriate use and interpretation of common diagnostic studies, including lumbar punctures, electroencephalography, and skull X-rays, cerebral angiographies, radioisotope brain scans, brain CTs, MRIs, and somatosensory, brain stem auditory, and visual evoked potentials
- Establish goals of care in collaboration with patients and their families, which may include slowing disease progression, treating symptoms, achieving cures, improving function, and palliation
- Formulate a comprehensive medical, physical, functional, and psychosocial problem list outlining an appropriate plan of management of:
  - Aphasia and language dysfunction
  - Motor, sensory, and coordination impairments
  - Cognitive and perceptual impairments
  - Dysarthria
  - Dysphagia
  - Apraxia
  - Behavioral disorders

- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Spinal Cord Injury (SCI) Rehabilitation

This rotation includes primarily SCI inpatient experience, consultations. When available, outpatient clinic will be included.

The trainee will understand the principles of rehabilitation management of the individual with a SCI and be capable of managing the medical, psychosocial, and vocational aspects of that individual's disability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)

- Describe anatomy, neurophysiology, and histology of the spinal cord
- Describe pathophysiology of traumatic and non-traumatic SCI
- Describe epidemiology of SCI and common mechanisms of injury
- Identify spinal cord syndromes and their clinical features
- Describe acute management of SCI, including diagnosis and injury classification
- Identify expected functional outcomes according to the level of SCI
- Appraise use of medications in the treatment of SCI patients and select/prescribe appropriate drug therapy
- Select, justify, and interpret appropriate investigations, including laboratory tests, radiological workup, urologic investigations, electro diagnostic, and psychometric tests
- Identify and explain the prevention, recognition, and management of common complications of SCI including:
  - Neurological:
    - Acute and chronic pain
    - Post-traumatic syringomyelia
    - Autonomic dysreflexia
    - Spasticity
    - Neurogenic bowel and bladder
    - Sexual dysfunction
    - Depression

  - Pulmonary/Cardiovascular:
    - Pneumonia
    - Thromboembolism
    - Pulmonary embolism
    - Respiratory impairment
    - Orthostatic hypotension
    - Edema

  - Endocrine/metabolic:
    - Temperature control
    - Hypercalcemia
    - Osteoporosis
    - Fertility

  - Pregnancy in SCI
  - Peripheral nerve and musculoskeletal disorders associated with SCI
    - Carpal tunnel syndrome (CTS)
    - Neck pain
    - Shoulder pain
    - Shoulder subluxation and dislocation
    - Overuse syndrome
    - Heterotopic ossification
    - Kyphosis
    - Scoliosis
    - Fractures

  - *Skin*:
    - Pressure ulcers
    - Ingrown toenails
    - Wound infections

  - *Genitourinary*:
    - Neurogenic bladder
    - UTI

  - Renal and bladder calculi
  - Pyelonephritis
  - Sexual dysfunction
  - Pyelonephritis
  - Orchitis, epididymitis
  - Chronic constipation
  - Hemorrhoids

- Gastrointestinal:
  - Ileus
  - Neurogenic bowel
  - Constipation
  - Diarrhea

- Comorbidities with SCI:
  - Traumatic brain injury
  - Substance abuse
  - Other medical comorbidities

- Demonstrate an understanding of the special needs and problems of children and adolescents with spinal cord injuries, including behavior, bladder, bowel, skin care, growth and development, mobility, nutrition, self-care, recreation, and schooling
- Identify the roles of rehab technologies and environmental modifications in SCI and assess the appropriate use of these technologies for an individual patient (e.g., assistive technology, functional electrical stimulation (FES) and be able to prescribe appropriate assistive devices, including ambulation aids, wheelchairs/seating, upper extremity and lower extremity orthoses, self-help aids, and environmental control units
- Identify the roles of physical modalities in SCI and assess the appropriate use of these modalities for an individual patient
- Identify, assess, and select appropriate use of orthoses and mobility aids in SCI
- Evaluate the need for surgical options that may improve function and QOL in SCI (e.g., tendon transfers, phrenic pacing, sphincterotomy, tendon lengthening, syringo-subarachnoid shunting, intrathecal baclofen pump implantation)
- Identify and manage medico-legal issues pertaining to SCI rehabilitation

Skills

- Complete a relevant and organized medical and functional history from a patient with spinal cord impairment
- Perform a physical examination and a comprehensive neurological examination with emphasis on the performance of an ASIA assessment to determine the neurological level of injury and the ASIA classification
- Perform a functional assessment based on neurological, musculoskeletal, cardiopulmonary, and psychosocial evaluation
- Perform a regional musculoskeletal examination with emphasis on structure and alignment, signs of inflammation, joint range of motion and stability
- Formulate a comprehensive medical, functional, and psychosocial problem list outlining short term and long-term rehabilitation goals and an appropriate plan of management
- Prepare and maintain complete and informative clinical records, including consultations, follow-up reports, and inpatient progress notes
- Select, justify, and interpret appropriate investigations, including laboratory tests, radiological workups, blood works, CT scans, MRIs, electro diagnostics—nerve conduction study (NCS) , EMG, somatosensory evoked potential (SEP), urodynamics, renal and abdominal ultrasounds, cystoscopies, duplex Doppler, lung scans, spiral chest CTs, dual energy x-ray absorptiometry (DEXA) bone density, and psychometric testing

- Formulate a comprehensive medical, physical, functional, and psychosocial problem list outlining an appropriate plan of management
- Assess and treat common impairments after SCI
- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
- Intra-articular injections
- Soft tissue injections
- Chemo denervation
- Catheterization of the urinary bladder
- Pressure ulcer dressing and debridement
- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Pediatric Rehabilitation

This rotation includes primarily pediatric outpatient clinic experience. When available, inpatient consultation or inpatient experience will be included.

The trainee will understand the principles of rehabilitation management of a child or young adult with physical impairments and be capable of managing the medical, psychosocial, and vocational aspects of that individual's disability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Describe the normal parameters of growth and development, and important development milestones
- Describe the neurodevelopmental models of development, the important childhood reflexes and their use in neurodevelopmental approaches to therapy in the child with neurological illnesses
- Describe the basic concepts of genetics and inheritance of genetically determined illness to provide genetic counseling, as it relates to developmental disabilities
- Describe the etiology, pathophysiology, clinical features, and classification of the following pediatric disorders:
  - Familial spinal muscular dystrophies
  - Hereditary polyneuropathies
  - Hereditary myopathies
  - Brachial plexus palsy in the neonate
  - Muscular dystrophies
  - Juvenile rheumatoid arthritis

- Myelodysplasia
- Cerebral palsy
- Scoliosis
- Congenital limb deficiencies
- Childhood hip disorders (transient synovitis, slipped capital femoral epiphysis, Legg-Calve-Perth's disease, congenital dislocation, pyrogenic arthritis)

- Identify prognostic functional outcomes of the above disorders and how the clinical picture changes with growth and development
- Identify and explain the prevention, recognition, and management of common complications associated with the above disorders
- Describe the non-pharmacological and surgical management of the above disorders
- Indicate how surgical techniques influence the outcome with pediatric neurological and musculoskeletal systems (e.g., shunts, tendon lengthening, strabismus correction, tethered cord resection)
- Respect the role of family and "alternate caregivers" in the treatment of children
- Appraise use of medications in the treatment of children and young adults with the above disorders and select/prescribe appropriate drug therapy
- Select, justify, and interpret appropriate investigations, including laboratory tests, radiological workups, electro diagnostic tests, tissue biopsies, urological studies, and developmental tests
- Identify the roles of rehab technologies and environmental modifications for children and young adults with disabilities
- Identify, assess, and select appropriate use of orthoses and mobility aids for children and young adults with disabilities
- Describe the common causes of childhood limp
- Demonstrate a knowledge of how appropriate professionals contribute to pediatric rehabilitation (e.g., nutrition specialist, orthopedic surgeon, urologist, neurosurgeon, rheumatologist, developmental pediatrician, neurologist)
- Understand the unique and blending roles of allied health professionals in treating a pediatric neurological and musculoskeletal disability:
  - Special education
  - Role of psychology, behavioral, and cognitive remediation
  - Speech therapy: aphasia/apraxia and dysarthria, augmentative communication
  - Occupational therapy: ADL, sensory integration, life skills
  - Physical therapy

Skills

- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Obtain a comprehensive history from the patient, family members, and/or other care providers
- Demonstrate a competent pediatric physical examination, including a comprehensive neurological examination
- Formulate appropriate rehabilitation plan based on realistic goals for children and young adults with disability
- Perform diagnostic and therapeutic procedures as required, including joint aspiration, joint injections, and botulinum toxin or phenol injections
- Spasticity assessment
- Gait
- Orthotic/gait aid assessment
- Demonstrate appropriate use and interpretation of common diagnostic studies, including CT scans, MRI scans, renal ultrasounds, urodynamics, cystoscopies, neuropsychology evaluations, electro diagnostic studies, blood works (e.g., creatine phosphokinase (CPK), dystrophin)
- Formulate a comprehensive medical, physical, functional, and psychosocial problem list outlining an appropriate plan of management

- Be able to assess and treat common impairments after neurological diseases including the following:
  - Aphasia and language dysfunction
  - Motor, sensory, and coordination impairments
  - Cognitive and perceptual impairments, including neglect and vascular dementia
  - Dysarthria
  - Dysphagia
  - Apraxia

- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation
  - Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

General Rehabilitation

This rotation includes primarily general inpatient experience and consultations. Outpatient clinical care will be included.

The trainee will develop the necessary clinical skills and knowledge required to manage a stroke patient and be capable of managing the medical, psychosocial, and vocational aspects of that individual's ability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications, and functional consequences of clinical presentations including, but not limited to:
  - Neurological disorders, including multiple sclerosis, Parkinson's, Guillain-Barre Syndrome, acute inflammatory demyelinating polyneuropathy (AIDP), chronic inflammatory demyelinating polyneuropathy (CIDP), peripheral neuropathies
  - Musculoskeletal disorders, including arthritides and multiple traumas
  - Generalized conditions, including deconditioning, burns, and cancers

- Describe the classification and diagnosis of the above disorders.

- Describe the principles of management of the above disorders, both pharmacologically and non-pharmacologically.
- Appraise use of medications in the treatment of the above disorders and select/prescribe the appropriate drug therapy.
- Select, justify, and interpret appropriate investigation, including lab tests, radiological workup, electro diagnostic and psychometric tests.
- Identify and prevent common complications, such as depression, infections, venous thrombosis, contractures, and chronic pain.
- Identify the roles of physical modalities and assess their appropriate application to the individual patient.
- Identify, assess, and select appropriate use of orthoses and mobility aids.
- Identify and manage relevant medico-legal issues.

Geriatric Medicine

- Demonstrate an understanding of the normal aging process, including the physiology, biology, and psychology of aging
- Demonstrate an understanding of frailty and its impact on medical and surgical recovery, as well as rehabilitation potential
- Appropriately perform a comprehensive geriatric assessment
- Demonstrate an organized approach to the assessment, investigation, and management of the geriatric patient with (but not limited to) cognitive impairment, delirium, responsive behaviors, frailty, functional decline, recurrent falls, polypharmacy, urinary incontinence, constipation, chronic pain, malnutrition, hip fracture, low bone density, and chronic kidney disease
- Demonstrate an approach to discharge planning of an older patient, including evaluation for rehabilitation, safety to return to community with or without supports, and/or long-term care
- Demonstrate an approach to capacity assessment of an older patient with cognitive impairment

Skills

- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Perform a competent physical and functional examination of the patient with particular emphasis on the neuromusculoskeletal systems and elderly complications
- Perform a Functional Independence Measure (FIM) assessment on the patient
- Order relevant investigations and interpret the results of tests, such as blood work, body fluid analysis, and imaging tests
- Formulate an appropriate rehabilitation plan based on realistic goals for the individual patient
- Perform diagnostic and therapeutic procedures as required, including joint aspiration, joint injection, motor point injections, and Botox injections
- Formulate a comprehensive medical, physical, functional, and psychosocial problem list outlining an appropriate plan of management
- Assess and treat common impairments after neuromuscular disorders
- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy
- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation

- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Musculoskeletal Rehabilitation

This rotation includes primarily outpatient experience, consultations and when available, inpatient care will be included.

The trainee will develop the necessary clinical skills and knowledge required to manage a patient with stroke and be capable of managing the medical, psychosocial, and vocational aspects of that individual's ability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications, and functional consequences of clinical presentations including, but not limited to:
  - Anatomy and physiology of bone, muscle, tendons, ligaments, and cartilage
  - Origins and insertions of all muscles in the human body
  - Anatomy of peripheral nerves and the brachial plexus

- Describe the relevant anatomy, pathophysiology, classification, presentation, and management of the following common acquired disorders of the sacroiliac joint and spine, including:
  - Spondylosis and degenerative disc disease
  - Soft tissue injuries of the back
  - Spondylolysis and spondylolisthesis
  - Spinal stenosis
  - Sacroiliac joint dysfunction
  - Flexion-extension injuries of the neck (whiplash)
  - Acute disc prolapse

- Describe the relevant anatomy, pathophysiology, classification, presentation, and management of the following common congenital and acquired disorders of the hip joint including:
  - Slipped capital femoral epiphysis
  - Legg-Calve-Perth's disease
  - Congenital and acquired hip dislocation
  - Hip osteoarthritis
  - Hip pointer syndrome
  - Snapping
  - Piriformis syndrome
  - Muscle strains
  - Bursitis
  - Avascular necrosis of the femoral head

- Describe the anatomy, pathophysiology, classification, presentation, and management of common acquired disorders of the knee, including:
  - Patellofemoral syndrome
  - Meniscus tears
  - Fractures
  - Ligamentous injuries
  - Instability
  - Bursitis

- Describe the anatomy, pathophysiology, classification, presentation, and management of common acquired disorders of the shoulders, including:
  - Impingement syndrome
  - Calcific tendinopathy
  - Adhesive capsulitis
  - Acromioclavicular joint dysfunction
  - Shoulder instability

- Describe the anatomy, pathophysiology, classification, presentation, and management of common acquired disorders of the elbow, wrist, and hand, including:
  - Medial and lateral epicondylitis
  - Olecranon bursitis
  - Contractures
  - Rheumatoid deformities
  - Dupuytren's contracture
  - De Quervain's disease

- Describe the anatomy, pathophysiology, classification, presentation, and management of common acquired disorders of the foot and ankle, including:
  - Pes planus and cavus
  - Hallux valgus and rigidus
  - Stress fractures
  - Interdigital neuritis
  - Plantar fasciitis
  - Tendonitis and Tendinopathies of the foot and ankle
  - Rheumatoid deformities
  - Inversion and eversion sprains of the ankle
  - Diabetic foot

- Demonstrate knowledge of rheumatologic disorders, including:
  - Osteoarthritis
  - Rheumatoid arthritis
  - Psoriatic arthritis
  - Seronegative spondyloarthropathies
  - Crystal induced arthropathy
  - Juvenile rheumatoid arthritis
  - Connective tissue disorders and systemic arthritic disorders
  - Vasculitis
  - Sjogren's syndrome

- Demonstrate knowledge of common bone disorders, including:
  - Heterotopic ossification
  - Primary and secondary bone tumors
  - Osteomyelitis
  - Metabolic bone disease (osteoporosis)
  - Fractures

- Describe the role of physical activity in the above disorders
- Describe congenital joint disorders (i.e., club foot, congenital hip problems)
- Describe the treatment approach for chronic pain and Myofascial pain
- Discuss the common surgical procedures used in the management of musculoskeletal (MSK) conditions (i.e., arthrotomy, osteotomy, arthroplasty arthrodesis)
- List early and late complication following joint arthroplasty
- Describe the principles of rehabilitation for patients with peripheral neuropathies and amputations
- Describe the pathophysiology and management (pharmacological and non-pharmacological) of spasticity in the outpatient setting
- Select, justify, and interpret appropriate investigations, including lab tests, electro diagnostics, and radiological workups
- Identify the roles of physical modalities and assess their appropriate application
- Identify, assess, and select appropriate use of orthoses and mobility aids
- Identify and develop an approach to relevant medico-legal issues

Skills

- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Obtain a focused musculoskeletal history
- Perform a focused musculoskeletal physical examination of the following areas:
  - Cervical spine
  - Shoulder
  - Elbow
  - Forearm, wrist, and hand
  - Thoracic spine
  - Lumbar spine
  - Pelvis/hip
  - Knee
  - Lower leg ankle and foot

- Be able to interpret laboratory investigations, imaging studies and other types of investigations commonly utilized in MSK medicine
- Demonstrate knowledge of normal and abnormal gait patterns
- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation

- Describe the use of interventional therapeutic procedures for pain, including:
  - Medial branch blocks
  - Epidural injections
  - Percutaneous high frequency neurotomy

- Demonstrate how to stretch important muscles and muscle groups
- Demonstrate the difference between open chain and closed chain exercise
- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation

- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factor

Orthotic/Prosthetic, Assistive devices, and Amputee rehabilitation

This rotation includes primarily outpatient experience and consultations. When available, inpatient care will be included.

The trainee will develop the necessary clinical skills and knowledge required to manage a patient with stroke and be capable of managing the medical, psychosocial, and vocational aspects of that individual's ability.

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications and functional consequences of clinical presentations including, but not limited to:
  - Prosthetics
  - Orthotics
  - Mobility aids

Prosthetics

- Describe the principles of anatomy, physiology, and kinesiology relevant to the amputee
- Describe principles of alignment and energy expenditure in prosthetic gait
- Describe the etiologies of amputations
- Describe the epidemiology of traumatic, vascular, and other non-traumatic amputations
- Describe the pathophysiology, clinical features, diagnosis, and medical management of the vascular amputees, with emphasis on diabetes mellitus, peripheral vascular disease, and atherosclerotic disease
- Describe the early and late complications of amputations, including edema, wound care, pain (phantom and neuropathic), psychological adjustment, skin (such as ulcers, verrucous hyperplasia, contact dermatitis, infection, epidermoid cyst), joint contractures, and bone health
- Describe the levels of amputation and advantages and disadvantages in both upper and lower extremities (Symes, below knee amputation (BKA), knee-disarticulation, above knee amputation (AKA), trans radial, elbow disarticulation, trans humeral, shoulder disarticulation, forequarter)
- List the criteria for fitting transtibial and transfemoral amputees
- Discuss the indications, contraindications, and potential complications of upper extremity prosthetics
- Discuss the indications, contraindications, and potential complications of lower extremity prosthetics, including suspension systems, liners, sockets, shin/shank, knee devices, and foot and ankle options
- Demonstrate knowledge of congenital amputations, classification, timelines for fitting upper and lower extremity prosthetic devices, and Van Ness rotationplasty procedure
- Identify the functional consequences of amputation, including the expected functional outcome for an individual amputee
- Select/prescribe the appropriate prosthesis for an individual amputee

- Identify the special needs of the growing child and elderly amputee
- Identify the role of pre-prosthetic and prosthetic therapy programs, including the prosthetic fitting process

Orthotics

- Discuss general principles of orthotics in terms of the biomechanics, purpose, and function of a given orthosis
- Describe various orthotic designs, components, and materials. Discuss their use in the clinical setting
- Identify physical impairments that might benefit from an orthotic device (including impairments of the spine and upper and lower extremities)
- Select/prescribe appropriate orthotic device(s) for an individual patient
- Describe the general process involved with construction of an orthosis
- Demonstrate knowledge of lower extremity orthotics, including:
  - Prefabricated versus custom-made orthosis
  - 3-point pressure system
  - Foot orthotic indications and features (such as, heel cup, arch supports, wedges, pads, cut-outs)
  - Supra-malleolar ankle foot orthosis (AFO)
  - AFO conventional versus thermoplastic customized (advantages and disadvantages)
  - AFO rigid vs. flexible, assist/resist/stop, ground reaction force, patellar tendon bearing, articulated
  - Knee ankle foot orthosis (KAFO) including knee locking devices and attachments to body
  - Hip knee ankle foot orthosis (HKAFO)
  - Cervico-thoraco-lumbo-sacral othosis (CTLSO)
  - Reciprocating gait orthosis

- Discuss the indications, contraindications, and potential complications of shoes, including components of shoes, common shoe modifications for therapeutic purposes, therapeutic shoes for arthritis, and neuropathy (Charcot joint)
- Discuss the indications, contraindications, and potential complications of upper extremity orthotics (types of orthotics for MSK fractures, tendonitis, osteoarthritis or RA, nerve dysfunction)
- Demonstrate knowledge of spinal and cervical orthoses, including:
  - Halo
  - Thoraco-lumbosacral orthosis(TLSO) prefabricated/custom
  - cruciform anterior spinal hyperextension (CASH)
  - Jewett
  - Lumbosacral corset
  - Lumbosacral orthosis (LSO)
  - Boston brace
  - Milwaukee

- Describe the various parts of common footwear and identify their functional significance
- Describe the principles of common shoe modifications for impairments in the foot and leg
- Discuss the indications, contraindications, and potential complications of pediatric lower limb orthotics including caster cart, standing frame, Para podium, reciprocating gait orthosis
- Select/prescribe appropriate shoe modifications for impairment in the foot and leg

Mobility Aids

- Describe various types and components of a wheelchair (manual and electric) and their functional purpose in the clinical setting
- Describe how the set-up of a wheelchair, such as dump, camber, and wheel alignment, may affect its performance

- Describe various seating systems and the principles of seating in both manual and electric wheelchairs
- Describe what is considered appropriate fit for a wheelchair
- Describe basic building standards for wheelchair access
- Describe the parts, benefits, and limitations of other mobility aids, such as walkers, canes, crutches, and scooters
- Types of gait reciprocating, none, 3-point gait, swing-to, swing-through, modified 3-point gait, and 4-point gait
- Demonstrate how a mobility aid should be fitted to the patient.
- Select/prescribe appropriate mobility aid(s) for an individual patient based on the history and physical examination
- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Obtain a relevant and organized physical and functional history and physical examination both pre and post operatively
- Formulate a comprehensive problem list, including medical, physical, functional, psychological, and socioeconomic issues
- Describe normal gait patterns, including definitions, determinants of gait, prerequisites for gait, gait cycle, muscles used at different points in the gait cycle, and common gait deviations including foot drop, foot slap, circumduction, and Trendelenberg
- Demonstrate knowledge of gait deviations with prosthesis: BKA and AKA, including prosthetic and non-prosthetic
- Prescribe appropriate medical, physical, occupational, and psychosocial therapy. List and explain their indications, precautions, and contraindications. For example:
  - MEDICAL:
    - Medications for peripheral vascular disease
    - Stump care and hygiene
    - Medications for stump and phantom pain

  - PHYSICAL:
    - Stump shaping/care (e.g., bandaging, shrinkers)
    - Therapeutic exercise
    - Pain control (e.g., Transcutaneous electrical nerve stimulation(TENS)
    - Pre-prosthetic training
    - Prosthetic training
    - Long-term management

  - OCCUPATIONAL:
    - ADL activities
    - Energy conservation
    - Vocational retraining
    - Return to driving
    - Psychological
    - Personal counseling
    - Family counseling

- Formulate a comprehensive medical, physical, functional, and psychosocial problem list outlining an appropriate plan of management

Skills

- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures
- Write an appropriate prosthetic prescription for upper and lower extremity amputees; demonstrate the ability to "check-out" the prosthesis

- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factor

EMG/NCS

This rotation includes primarily outpatient clinical care.

Demonstrate the diagnostic and therapeutic skills necessary in diagnosing and managing disorders of the peripheral nervous system and apply an ethical and holistic approach to the patient

Demonstrate basic technical proficiency in the EMG laboratory, especially in the generation and interpretation of nerve conduction studies

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications and functional consequences of clinical presentations.
- Demonstrate the diagnostic and therapeutic skills necessary to diagnose and manage disorders of the peripheral nervous system and apply an ethical and holistic approach to the patient
- Demonstrate basic technical proficiency in the EMG laboratory, especially in the generation and interpretation of nerve conduction studies

EMG:

- Know the innervation (root and peripheral nerve), method of activation, and electrode insertion site (using bony landmarks and a standard textbook) of the following muscles:

Upper limb muscles:	Lower limb muscles:
- Infraspinatus	- Iliopsoas
- Supraspinatus	- Vastus medialis
- Rhomboids	- Vastus lateralis
- Deltoid	- Adductor longus
- Biceps	- Tibialis posterior
	- Biceps femoris (short and long heads)
- Brachioradialis	
- Pronator teres	- Anterior tibialis
- Flexor carpi radialis	- Fibularis longus
- Extensor carpi radialis	- Medial gastrocnemius

- Flexor carpi ulnaris
- Extensor carpi ulnaris
- Triceps
- Extensor digitorum
- Extensor indicis proprius
- First dorsal interosseous
- Abductor digiti minimi
- Abductor pollicis brevis
- Cervical paraspinals
-

- Soleus
- Extensor digitorum brevis
- Tensor fascia lata
- Gluteus maximus
- Extensor hallucis longus
- Abductor hallucis
- Medial hamstrings
- Lateral hamstrings
- Gluteus medius
- Lumbosacral paraspinals

Nerve conduction studies:

- Know the anatomy, normal values, and sources of error for the following nerve conduction studies:
  - Median: motor, sensory, F waves, transcarpal (palmar stimulation)
  - Median-radial: sensory (thumb)
  - Ulnar: motor, including across elbow; sensory, F wave, and transcarpal
  - Median-ulnar: sensory (ring finger)
  - Radial: sensory
  - Tibial: motor, F wave
  - Fibular: motor, F wave
  - Sural: sensory
  - Superficial fibular: sensory
  - Medial and lateral plantar
  - Axillary
  - Motor
  - Facial
  - Spinal accessory
  - Medial and lateral ante-brachial
  - Dorsal ulnar cutaneous

- Describe the anatomical and physiological basis for electrophysiological studies, including the following:
  - The production of the resting potential; the concept of nerve excitability and production of the action potential
  - The physiology of muscle contraction and the concept of recruitment
  - The physiology of neuromuscular transmission at the motor end plate
  - The concept of the motor unit
  - The concept of volume conduction

- Describe the different types of electrodes used and the advantages and disadvantages of each.
- Describe common safety precautions, side effects, and contraindications to electrodiagnosis.
- Describe the technique of conventional nerve conduction and needle studies, including common motor and sensory conduction measurements.
- Describe the effects of age and temperature on nerve conduction measurements
- Describe the common sources of error, including cross-over anomalies and electrode placement problems
- Identify the configuration, amplitude, and duration of the normal needle EMG
- Identify the normal recruitment, recruitment frequency, and interference patterns
- Describe the role of special electro diagnostic studies such as:
  - H-reflex
  - F waves
  - SEPs

- Demonstrate knowledge of the pathophysiology of muscle and nerve damage and repair, including electrophysiological correlates on NCS/EMG, included the following:
  - Seddon and Sunderland classifications
  - The concept of segmental demyelination
  - Wallerian degeneration and “dying back” phenomena of nerves
  - Segmental necrosis of muscle

- Explain how electro diagnostic studies can differentiate between myopathies vs. neuropathies, acute vs. chronic neuropathies, and axonal vs. demyelinating neuropathies.
- Develop an approach to the investigation of a neuropathy.
- Describe and approach to the classification of neuropathies.
- Explain the process of nerve regeneration and factors important in prognosis following nerve injury
- Describe the etiology, clinical features, and use of electro diagnostic studies in common entrapment neuropathies, including:
  - Carpal tunnel syndrome
  - Pronator syndrome
  - Anterior interosseous syndrome
  - Saturday night palsy
  - Posterior interosseous syndrome
  - Thoracic outlet syndrome
  - Type I, II, and III ulnar entrapments
  - Cubital tunnel ulnar entrapment
  - Sciatic nerve entrapment
  - Peroneal nerve entrapment
  - Femoral nerve entrapment
  - Meralgia paresthetica
  - Tarsal tunnel syndrome
  - Bell’s palsy

- Describe the etiology, clinical features, and use of electro diagnostic studies in the following conditions:
  - Diabetic neuropathy
  - Hereditary sensory and motor neuropathies
  - Myopathies
  - Myotonic dystrophies
  - Neuropathies associated with systematic illness
  - Radiculopathies
  - Plexus injuries
  - Neuromuscular junction disorders
  - Motor neuron disorders
  - ALS

Skills

- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Perform a competent examination of the patient with particular emphasis on the peripheral neuromuscular system
- Perform a competent needle EMG study, including correct muscle localization and needle insertion techniques
- Select relevant conduction studies and interpret their results
- Formulate an appropriate differential diagnosis and management plan based on the electro diagnostic findings
- Perform diagnostic and therapeutic procedures as required, including Botox and phenol injections
- Carry out and interpret basic electro diagnostic tests, including standard nerve conduction studies, mixed nerve studies, late responses, repetitive nerve stimulation, and needle EMG

- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Pain

Be aware of the role of each of the inpatient and outpatient team members in treating acute and chronic non-surgical pain (clinical and administrative) and how each member functions on the rehabilitation team

Demonstrate diagnostic and therapeutic skills for ethical and effective patient care and demonstrate effective consultation skills with respect to patient care, education, and medico-legal opinions

Knowledge

By the end of this rotation, Physiatrists will be able to:

- Practice medicine within their defined scope of practice and expertise
- Demonstrate a commitment to high-quality care of rehabilitation patients
- Integrate the CanMED Intrinsic Roles into the physiatry practice
- Apply knowledge of the clinical and biomedical sciences relevant to physiatry (including, but not restricted to, anatomy, physiology, pathology, kinesiology, and ergonomics)
- Demonstrate knowledge of clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications and functional consequences of clinical presentations .
- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care
- Demonstrate compassionate and caring professional attitude in dealing with patients and family members of chronic pain, that is patient-centered, goal-focused, academically driven, and ethically appropriate
- Demonstrate knowledge of the nociceptive pain progression to chronic mechanical pain and neuropathic pain and the associated psychosocial burdens
- Discuss pain syndromes including Myofascial pain, fibromyalgia, and complex regional pain syndrome (CRPS)
- Demonstrate an awareness of cancer rehabilitation pain in comparison to chronic non-cancer pain
- Perform a focused musculoskeletal physical examination of the musculoskeletal and neurological systems with a focus on distinguishing between mechanical nociceptive pain versus neuropathic pain
- Review investigations and create treatment plans for complex chronic pain patients and determine contributing factors that are modifiable versus those that are fixed to enhance the treatment plan
- Describe the use of interventional therapeutic procedures for pain, including:
  - Trigger point injections
  - Soft tissue injections

- Demonstrate effective use of oral and topical chronic non-cancer pain medications, including opioids, analgesics, neuropathic medications, and antidepressants
- Demonstrate effective, appropriate, and timely consultation with other health professionals as needed for optimal patient care. Then, collaborate with these individuals to maximize recovery and

minimize risks
- Screen patient's risk factors for misuse/addiction risk factors with the use of tools, such as the Opioid Risk Tool (ORT)
- Describe the importance of psychological approaches to chronic pain management, including self-management, cognitive behavioral therapy, mindfulness, as well as acceptance commitment therapy (ACT)

Skills

- Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- Obtain a focused history
- Perform a focused physical examination
- Be able to interpret laboratory investigations, imaging studies, and other types of investigations commonly utilized in pain medicine
- Demonstrate effective, appropriate, and timely performance of the following diagnostic and therapeutic procedures:
  - Intra-articular injections
  - Soft tissue injections
  - Chemo denervation
  - Trigger point injection

- Describe the use of interventional therapeutic procedures for pain, including:
  - Medial branch blocks
  - Epidural injections
  - Percutaneous high frequency neurotomy

- Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy

Attitude

- Prioritize a procedure or therapy, considering clinical urgency and available resources
- Perform a procedure in a skillful and safe manner; adapt to unanticipated findings, or changing clinical circumstances
- Establish appropriate plans for ongoing care and timely consultation
- Implement a patient-centered care plan that supports ongoing care, follow-up investigations, response to treatment, and further consultation
- Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety
- Recognize and respond to harm from health care delivery, including patient safety incidents
- Adopt strategies that promote patient safety and address human and systemic factors

Educational Goals - PGY1 Trainee

Upon completion of the first postgraduate year, a PM&R trainee should:

- In various clinical settings, recognize and manage typical clinical problems among patients with PM&R problems. (Patient Care, Systems-Based Practice, Medical Knowledge)
- Discuss the management of typical clinical problems among patients with PM&R problems in various clinical settings. (Systems-Based Practice, Medical Knowledge, Practice-Based Learning)
- Demonstrate proper history and examination techniques. (Patient Care, Communication, Professionalism)
- Identify various diseases and conditions that are amenable to rehabilitation efforts. (Medical Knowledge)
- Describe allied health professionals involved in the rehabilitation team. (Systems-Based Practice, Practice-Based Learning)

Educational Goals - PGY2 Trainee

Upon completion of the second postgraduate year, a PM&R trainee should:

- Demonstrate proficiency in physiatric assessment, diagnosis, and prescription for functional impairments, arising from acute and chronic neurological, musculoskeletal, cardiovascular, and pulmonary conditions. (Patient Care, Medical Knowledge)
- Perform basic physiatric interventional procedures, like trigger point and intra-articular injections, nerve and phenol blocks, Botox injections, and diagnostic examination, including nerve conduction and electromyographic studies. (Patient Care, Medical Knowledge)
- Develop leadership skills to promote the team approach and responsible utilization of consulting services to maximize rehabilitation outcomes. (Systems-Based Practice, Interpersonal and Communication Skills, Professionalism)
- Demonstrate basic competence in performing the comprehensive and physiatric physical examination and in the analysis of data from pertinent diagnostic tests to achieve the appropriate diagnosis. (Patient Care, Medical Knowledge)
- Demonstrate a basic ability to formulate, implement, and monitor appropriate PM&R treatment plans to achieve maximum physical, psychological, social, vocational, avocational and educational outcomes for patients in the acute hospital setting, the acute rehabilitation unit or hospital, the sub-acute or long-term care environment, and the outpatient setting. (Patient Care, Medical Knowledge)
- Demonstrate a basic understanding of the roles of interdisciplinary rehabilitation team members and a basic ability to lead and coordinate their efforts. (Patient Care, Medical Knowledge, Systems-Based Practice)
- Demonstrate basic communication skills in communicating with patients, families, medical staff, team members, and other personnel. (Communication)
- Demonstrate basic competency in decision-making in the PM&R management of adults and children with most of the following conditions: traumatic brain injury, stroke, SCI, amputations, hereditary, developmental and acquired neuromuscular and musculoskeletal conditions, acute and chronic pain syndromes, cardiovascular and pulmonary disorders, and soft tissue disorders including burns and ulcers. (Patient Care, Medical Knowledge)
- Demonstrate basic familiarity with journals that constitute the medical literature relevant to PM&R and in the basic components of research papers. (Practice-Based Learning)
- Demonstrate basic familiarity with common cost containment issues in PM&R practice. (Systems-Based Practice)

Educational Goals - PGY3 Trainee

Upon completion of the third postgraduate year, a PM&R trainee should:

- Demonstrate an advanced level competence in performing the comprehensive and physiatric physical examination and in the analysis of data from pertinent diagnostic tests to achieve an appropriate diagnosis. (Patient Care, Medical Knowledge)
- Demonstrate an advanced ability to formulate, implement, and monitor appropriate PM&R treatment plans to achieve maximum physical, psychological, social, vocational, avocational, and educational outcomes for patients in the acute hospital setting, the acute rehabilitation unit or hospital, the sub-acute or long-term care environment, and the outpatient setting. (Patient Care, Medical Knowledge, Systems-Based Practice, Communication)
- Demonstrate advanced ability to lead and coordinate the efforts of an interdisciplinary rehabilitation team. (Systems-Based Practice, Professionalism, Communication)
- Demonstrate advanced communication skills to be an effective communicator with patients, families, medical staff, team members, and other personnel. (Interpersonal and Communication Skills)
- Demonstrate an advanced level of competency relative to decision-making in the PM&R management of adults and children with most of the following conditions: traumatic brain injury, stroke, SCI, amputations, hereditary, developmental and acquired neuromuscular and musculoskeletal conditions, acute and chronic pain syndromes, cardiovascular and pulmonary disorders, soft tissue disorders, including burns and ulcers. (Patient Care, Medical Knowledge)

- Demonstrate advanced technical skill in the performance of common PM&R procedures (and in the prevention and management of associated complications) including electrodiagnosis (electromyography and nerve conduction studies), joint and soft tissue injections. (Patient Care, Medical Knowledge)
- Demonstrate advanced knowledge of the biomedical research process and demonstrate advanced knowledge of the components of research papers and what journals constitute the medical literature relevant to PM&R. (Practice-Based Learning)
- Take an active role in common cost containment issues in PM&R practice when making choices in types of procedures and management. (Systems-Based Practice)

Educational Goals - PGY4 Trainee

Upon completion of the fourth postgraduate year, a PM&R trainee should:

- Recognize PM&R conditions, address the natural history, and anticipate nature of conditions when providing care. (Patient Care, Medical Knowledge)
- Demonstrate competence in performing comprehensive physical examination and analysis of pertinent data from diagnostic tests to achieve an appropriate diagnosis. (Patient Care, Medical Knowledge, Objective Structured Clinical Examination.
- Continue to formulate, implement, and monitor appropriate PM&R treatment plans to achieve maximum physical, psychological, social, vocational, avocational and educational outcomes for patients in the acute hospital setting, the acute rehabilitation unit or hospital, the sub-acute or long-term care environment, and the outpatient setting. (Patient Care, Medical Knowledge)
- Demonstrate ability to lead and coordinate the efforts of an interdisciplinary rehabilitation team with minimal supervision. (Systems-Based Practice, Communication)
- Demonstrate excellent communication skills to be an effective communicator with patients, families, medical staff, team members, and other personnel. (Communication)
- Continue to demonstrate a level of competency to be able to independently make decisions regarding appropriate PM&R management of adults and children with all of the following conditions: traumatic brain injury, stroke, SCI, amputations, hereditary, developmental and acquired neuromuscular and musculoskeletal conditions, acute and chronic pain syndromes, cardiovascular and pulmonary disorders, and soft tissue disorders, including burns and ulcers. (Patient Care, Medical Knowledge, Systems-Based Practice)
- Continue to demonstrate technical skill in the performance of common PM&R procedures and in the prevention and management of associated complications, including electrodiagnosis (electromyography and nerve conduction studies) and joint and soft tissue injections. (Patient Care, Medical Knowledge)
- Completion of research project. (Practice-Based Learning)
- Demonstrate the ability to supervise and guide junior trainees in PM&R activities. (Practice-Based Learning)

JUNIOR-LEVEL COMPETENCY-MATRIX: TO MAP COMPETENCY, LEARNING DOMAIN, AND MILESTONES

Training Year level	*Competency-Roles* (with annotation of learning domains involved: knowledge, Skills, Attitude)	Professional Activities Related to Specialty					
		Conducting full clinical and functional assessment	Setting a rehabilitation plan	Secondary prevention	Performing procedures	Managing emergencies	Compliance with documentation and proper reporting standards
R1	Professional Expert	Mastering history taking and physical examination	Effectively make consultations	Demonstrate patient-centered care	Relevant documentation of patient care	Recognize physiatry emergencies	Insight into their own limits of expertise
	Communicator	Effectively communicate with patients	Effectively communicate with caregivers and interdisciplinary team members	Effective communication with caregiver and interdisciplinary team members	Informed consent	Effectively communicate with patients, guardians, and team members	Writing, dictation, and presentation skills
	Collaborator		Interdisciplinary, teamwork	Interdisciplinary teamwork	Seek support from senior physicians when needed	Seek support from senior physicians when needed	Interprofessional communication
	Advocate	Holistic approach		Patient safety	Patient safety	Patient safety	Quality improvement
	Leader	Time management	Leading the team		Lead the situation for patient best interest	Lead the situation for patient best interest	Quality assurance
	Scholar			Evidence based practice	Evidence based practice	Evidence based practice	
	Professional		Confidentiality, interprofessional relationship			Interprofessional relationship	Interprofessional relationship
R2	*Competency-Roles* (with annotation of learning domains involved: knowledge, Skills, Attitude)	Professional Activities Related to Specialty					
		Conducting full clinical and functional assessment	Setting a rehabilitation plan	Secondary prevention	Performing procedures	Managing emergencies	Compliance with documentation and proper reporting standards
	Professional Expert	Mastering history taking and physical examination	Effectively make consultations	Demonstrate patient-centered care	Relevant documentation of daily patient care, prescriptions, discharge summaries	Recognize physiatry emergencies	Insight into their own limits of expertise
	Communicator	Effectively communicate with patients	Effectively communicate with caregivers and interdisciplinary	Effective communication with caregiver and interdisciplinary teams	Informed consent	Effectively communicate with patients, guardians, and team members	Writing, dictation, and presentation skills

	Collaborator		Interdisciplinary, teamwork	Interdisciplinary, teamwork	Seek support from senior physicians when needed	Seek support from senior physicians when needed	Interprofessional communication
	Advocate	Holistic approach		Patient safety	Patient safety	Patient safety	Quality improvement
	Leader	Time management	Leading the team		Lead the situation for patient best interest	Lead the situation for patient best interest	Quality assurance
	Scholar			Evidence based practice	Evidence based practice	Evidence based practice	
	Professional		Confidentiality, interprofessional relation			Interprofessional relationship	Interprofessional relationship

SENIOR-LEVEL COMPETENCY-MATRIX: TO MAP COMPETENCY, LEARNING DOMAIN, AND MILESTONES

Training Year level	***Competency-Roles* (with annotation of learning domains involved: knowledge, Skills, Attitude)**	**Professional Activities Related to Specialty**					
		Conducting full clinical and functional assessment	Setting a rehabilitation plan	Secondary prevention	Performing procedures	Managing emergencies	Compliance with documentation and proper reporting standards
R3	**Professional Expert**	Give expert opinion about patient rehab need/plan	Prioritize professional duties effectively	Patient-centered care	Appropriate investigations in a resource effective and ethical manner	Recognize and treat physiatry emergencies	Effective, appropriate, and timely performance of procedures
	Communicator	Effectively communicate with patients	Effectively communicate with caregivers & interdisciplinary	Effective communication with caregivers & interdisciplinary	Informed consent	Effectively communicate with patient, guardian, team member	Writing, dictation, and presentation skills
	Collaborator		Interdisciplinary, teamwork	Interdisciplinary, teamwork	Seek support from senior physicians when needed	Seek support from senior physicians when needed	Interprofessional communication
	Advocate	Holistic approach		Patient safety	Patient safety	Patient safety	Quality improvement
	Leader	Time management	Leading the team		Lead the situation for patient best interest	Lead the situation for patient best interest	Quality assurance
	Scholar			Evidence based practice	Evidence based practice	Evidence based practice	
	Professional		Confidentiality, interprofessional relationship			Interprofessional relationship	Interprofessional relationship
R4	***Competency-Roles (with annotation of learning domains involved: knowledge, Skills, Attitude)***	**Professional Activities Related to Specialty**					
		Conducting full clinical and functional assessment	Setting a rehabilitation plan	Secondary prevention	Performing procedures	Managing emergencies	Compliance with documentation and proper reporting standards
	Professional Expert	Expert opinion about patient rehab need and plan	Prioritize professional duties effectively	Patient-centered care	Appropriate investigations in a resource effective and ethical manner	Recognize/treat physiatry emergencies	Effective, appropriate, and timely performance of procedures
	Communicator	Effectively communicate with patients	Effectively communicate caregiver & interdisciplinary team members	Effective communication with caregiver & interdisciplinary team members	Informed consent	Effectively communicate with patient, guardian, team member	Writing, dictation, and presentation skills
	Collaborator		Interdisciplinary, teamwork	Interdisciplinary, teamwork	Seek support from senior	Seek support from senior	Interprofessional communication

					physicians when needed	physicians when needed	
	Advocate	Holistic approach		Patient safety	Patient safety	Patient safety	Quality improvement
	Leader	Time management	Leading the team		Lead the situation for patient best interest	Lead the situation for patient best interest	Quality assurance
	Scholar			Evidence based practice	Evidence based practice	Evidence based practice	
	Professional					Interprofessional relationship	Interprofessional relationship

TOP CONDITIONS AND PROCEDURES IN THE SPECIALTY

Top Conditions in the Specialty

- Stroke
- Multiple sclerosis
- Acquired brain injury
- MSK and chronic pain
- Cerebral palsy
- SCI
- Amputation
- Spina bifida
- Osteoarthritis
- Acute and chronic peripheral neuropathy

*In some specialties, the overall mortality pattern is important. For others, diseases are important. The numbers shown here are fictional.

Top Ten Causes of Outpatient Consultations Related to the Specialties in Saudi Arabia

- Nociceptive pain
- Neuropathic pain
- Weakness
- Spasticity
- Aphasia
- Dysphagia
- Cognitive impairment
- Bowel incontinence
- Bladder incontinence
- Infertility and sexual dysfunction

Top Causes of Inpatient Admissions Related to the Specialties in Saudi Arabia

- Deconditioning
- Stroke
- Cerebral palsy
- SCI
- Acquired brain injury
- Multiple sclerosis
- Acute inflammatory demyelinating disease

Top Procedures/Surgeries Performed by the Specialty

- Intra-articular injections
- Soft tissue injections
- Spinal injections
- Botulinum toxin injection for pain and spasticity
- NCS/EMG
- Urodynamics
- Fertility and sexuality procedures
- Intrathecal baclofen pump refill

Examples of Core Specialty Topics: Case Discussions; Interactive Lectures

- Approach to patient with neurogenic bladder
- Approach to patient with spasticity

CONTINUUM OF LEARNING

This includes learning that should take place at each key stage of progression within the specialty. Trainees are reminded of lifelong continuous professional development (CPD). Trainees should recognize CPD as a requirement for every healthcare professional. The following table states how the role is progressively expected to develop throughout junior, senior, and consultant levels of practice.

Undergraduate	R 1-2 (Junior Level)	R 3-4 (Senior Level)	Consultant
Non-practicing	Dependent/supervised practice	Dependent/supervised practice	Independent practice/provide supervision
Pre-Entrustable	Approaching Entrustable	Approaching Entrustable	Entrustable
Obtain basic health science and foundational level to core discipline knowledge	Obtain a fundamental knowledge related to core rehab issues	Apply knowledge to provide appropriate clinical care related to core rehab issues	Acquire advanced and up-to-date knowledge related to core clinical rehabilitation problems and management options
Internship to the practice of discipline	Apply clinical skills such as physical examination and practical procedures related to the core rehab problems and procedures	Analyze and interpret the findings from clinical skills to develop appropriate differential diagnoses and rehab plans	Compare and evaluate challenging, contradictory findings, and develop expanded differential diagnoses and management plan

ACADEMIC ACTIVITIES

- Academic activities will be in the form of a weekly educational half day (protected time off), in which the trainee will be free from regular work duties during the whole year (except for the summer months)
- The half day will be the same for all the programs. All trainees should attend and discuss the topics during those half days
- The half day format is divided into four parts:
  - Basic science
  - Clinical skills
  - (Two) Lectures about a core topic in Physical Medicine & Rehabilitation

- Attendance is mandatory and considered one of the promotion standards for all levels
- Trainees should meet 75% attendance in the academic activity
- Academic activity takes place every Tuesday from 13:00 till 17:00
- Attendee and facilitator will evaluate the presenters in an evaluation form created for this purpose
- All evaluation forms will be handed to the Supervisory Committee

General Principles

- Teaching should contain both:
  - Structured-programmatic component
  - practice-based component

- Efforts should be directed to empower trainees toward taking responsibility for self-directed learning
- Every week at least 2–4 hours of formal training time (commonly referred to as an *academic half day*) should be reserved. A formal teaching time is an activity that is planned in advance (with an assigned tutor, time slots, and venue)
- Formal teaching time excludes things such as bedside teaching and clinic postings
- Formal training time would include the following three formal teaching activities:
  - Universal topics: 20–30%
  - Core specialty topics: 40–50%
  - Trainee selected topics: 20–30%

- Formal training time should be supplemented by other practice-based learning, such as:
  - Morning report or case presentations
  - Morbidity and mortality reviews
  - Journal clubs
  - Grand rounds
  - Continuous professional activities relevant to specialty

- Every two weeks at least one hour should be assigned by trainees to meet with their mentors to review performance reports (e.g., ITER, e-portfolio, and mini-CEX)
- Through the residency training committee, program directors, and chief trainees (in coordination with academic and training affairs and regional supervisory committees) should work together to ensure the planning and implementation of academic activities as indicated in the curriculum. The aim is for the efficient use of available resources and the optimized exchange of expertise

Note: This is the half day schedule for 2018/2019. It is for demonstration purposes only and it will be updated annually.

2018/2019 academic half day schedule

- **Topics:**
  - SCI rehabilitation

- Kinesiology
- Musculoskeletal rehabilitation
- Sport medicine
- Pediatric rehabilitation
- Orthosis and prosthesis/amputee rehabilitation
- Neuromuscular disorders/EMG-NCS
- Cardiopulmonary rehabilitation

■ **Exams:**
- 2 OSCE exam + R4 written exam
- 2 Periodic Assessments

09/10/2018

Time	SCI REHABILITATION II	Supervisor/Presenter
12:00–12:40	Welcome Address by Chair of the Scientific committee of PM&R residency training program	
1:00–1:50	SCI-epidemiology and aetiology (traumatic and non-traumatic)	
2:00–2:50	SCI-Neuroanatomy I (functional organization of SC) + (blood supply of SCI & clinical correlations)	
3:00–3:40	SCI -Neuroanatomy II (neural pathways and Neuro transmitters) + (SCI syndromes)	
3:50–4:50	Traumatic SCI-pathophysiology + acute management and surgical intervention acute complications	

16/10/2018

Time	SCI REHABILITATION III	Supervisor/Presenter
1:00–1:50	SCI complications II (pressure ulcer management)	
2:00–2:50	SCI complications III (autonomic dysreflexia + orthostatic hypotension, immobilization Hypercalcemia)	
3:00–3:40	SCI complications IV (heterotopic ossification + pain following SCI)	
3:50–4:50	Canmed communication skills (breaking bad news)	

23/10/2018

Time	SCI REHABILITATION IV	Supervisor/Presenter
1:00–1:50	SCI Complications V (neurogenic bladder)	
2:00–2:50	SCI Complications VI (neurogenic bowel)	
3:00–3:40	(Sexuality & fertility) pregnancy in SCI	
3:50–4:50	Canmed: Communication skills (counselling)	

30/10/2018

Time	SCI REHABILITATION V	Supervisor/Presenter
1:00–1:40	SCI complications I (respiratory) and psychological implications of SCI	
1:45–2:30	Functional outcome following SCI	
2:45–3:50	Functional assessment and management of self-care and other ADL	
3:50–4:50	Canmed ASIA assessment	

06/11/2018

Time	SCI REHABILITATION VI	Supervisor/Presenter
1:00–1:40	Accessibility standard and disability services in KSA + driving	
1:45–2:30	Equipment prescription, assistive technology, and home modification and community integration	
2:45–3:50	Manual mobility system and powered mobility system	
3:50–4:50	Canmed full ASIA exam assessment	

13/11/2018

Time	GENERAL REHAB	Supervisor/Presenter
1:00–1:50	Muscle physiology	
2:00–2:50	Exercise physiology	
3:00–3:40	Therapeutic exercise and exercise prescription	
3:50–4:50	OSCE Injection basics (BOTOX)	

20/11/2018

Time	Kinesiology	Supervisor/Presenter
1:00–1:50	Introduction to kinesiology	
2:00–2:50	VR	
3:00–3:40	Biomechanical principles	
3:50–4:50	Canmed ethics	

27/11/2018

Time	MSK I	Supervisor/Presenter
1:00–1:50	Functional anatomy of thoracic and lumbosacral spine	
2:00–2:50	Thoracic, thoraco-lumbar spine clinical pathology I	
3:00–3:40	Lumbosacral spine clinical pathology II	
3:50–4:50	Lower back examination	

4/12/2018

Time	MSK II	Supervisor/Presenter
1:00–1:50	Functional anatomy of the hip and SIJ and kinesiology	
2:00–2:50	Hip clinical pathology	
3:00–3:40	SIJ clinical pathology	
3:50–4:50	Hip examination	

11/12/2018

Time	MSK III	Supervisor/Presenter
1:00–1:50	Functional anatomy of the knee and kinesiology	
2:00–2:50	Knee clinical pathology I	
3:00–3:40	Knee clinical pathology II	
3:50–4:50	Knee examination	

18/12/2018

Time	MSK IV	Supervisor/Presenter
1:00–1:50	Functional anatomy of the foot and ankle and kinesiology	
2:00–2:50	Foot and ankle clinical pathology I	
3:00–3:40	Foot and ankle clinical pathology II	
3:50–4:50	Foot and ankle examination	

25/12/2018

Time	SPORT MEDICINE I	Supervisor/Presenter
1:00–1:50	Sport medicine (general principles of rehabilitation) + conditioning (building aerobic power + building strength + flexibility)	
2:00–2:50	Performance enhancers + nutrition + athletic taping and bandaging	
3:00–3:40	Special group (young athlete-special concerns in female athlete-activity for older people and mature athletes	
3:50–4:50	Lower limbs examinations (OSCE)	

01/01/2019

Mid-year holiday

8/01/2019

Time	SPORT MEDICINE II	Supervisor/Presenter
1:00–1:50	Common sport related injuries (neurological)	
2:00–2:50	Common sport related injuries (upper limb)	
3:00–3:40	Common sport related injuries (lower limb)	
3:50–4:50	(OSCE) all special tests UL and LL	

15/1/2019

Time	ASSESSMENT I	Supervisor/Presenter
1:00–1:50	Comprehensive written exam of SCI, MSK, and sport medicine	
2:00–2:50		
3:00–3:40		
3:50–4:50	OSCE CANMED	

22/01/2019

Time	PEDIATRIC REHABILITATION I	Supervisor/Presenter
1:00–1:50	Growth and development	
2:00–2:50	Limping child I	
3:00–3:40	Limping child II	
3:50–4:50	Can MED (giving feedback)	

29/01/2019

Time	PEDIATRIC REHABILITATION II	Supervisor/Presenter
1:00–1:50	Classification of scoliosis and Idiopathic scoliosis	
2:00–2:50	Muscle dystrophies I	
3:00–3:40	Muscle dystrophies II	
3:50–4:50	Canmed Scoliosis examination	

05/02/2019

Time	ASSESSMENT II	Supervisor/Presenter
1:00–1:50	OSCE	
2:00–2:50	OSCE	
3:00–3:40	OSCE	
3:50–4:50	OSCE R4 written exam	

12/02/2019

Time	PEDIATRIC REHABILITATION III	Supervisor/Presenter
1:00–1:50	Paediatric rehabilitation—cerebral palsy	
2:00–2:50	Paediatric rehabilitation—cerebral palsy	
3:00–3:40	Paediatric rehabilitation—Down's syndrome	
3:50–4:50	Canmed communication skills (counselling)	

19/02/2019

Time	PEDIATRIC REHABILITATION IV	Supervisor/Presenter
1:00–1:50	CNS development + CSF dynamic and hydrocephalus	
2:00–2:50	Paediatric rehabilitation of spina bifida	
3:00–3:40	Paediatric rehabilitation of spina bifida	
3:50–4:50	Canmed communication skills in taking consent	

26/02/2019

Time	P&O and AMPUTEE REHABILITATION V	Supervisor/Presenter
1:00–1:50	Normal gait assessment	
2:00–2:50	Pathological gait assessment	
3:00–3:40	Pathological gait assessment	
3:40–4:50	Canmed patient education for diabetic foot	

05/03/2019

Time	P&O and AMPUTEE REHABILITATION I	Supervisor/Presenter
1:00–2:00	Peripheral vascular disease and diabetic foot assessment and management	
2:05–2:55	Amputee & prosthesis (upper limbs)	
3:00–3:50	Amputee & prosthesis (lower limbs)	
4:00–5:00	Canmed examination of peripheral vascular disease (PVD) foot	

12/03/2019

Time	P&O and AMPUTEE REHABILITATION II	Supervisor/Presenter
1:00–1:50	Paediatric amputee & prosthesis (congenital limb deficiency)	
2:00–2:50	Amputee & prosthetic gait assessment	
3:00–3:40	Amputee & prosthetic gait assessment	
3:50–4:50	Gait aids	

19/03/2019

Time	Neuromuscular disorders EMG/NCS	Supervisor/Presenters
1:00–1:50	Physiological basis of electrophysiological study	
2:00–2:50	Needle EMG	
3:00–3:40	Nerve conduction study	
3:50–4:50	General motor and sensory exam	

26/03/2019

Time	Neuromuscular disorders EMG/NCS	Supervisor/Presenters
1:00–1:50	Motor neuron diseases , amyotrophic lateral sclersosis (ALS)	
2:00–2:50	Polio and post-polio syndrome	
3:00–3:40	Neuromuscular junction disorders	
3:50–4:50	Canmed counselling (ALS)	

02/03/2019

Time	Neuromuscular disorders EMG/NCS	Supervisor/Presenters
1:00–1:50	Myopathy	
2:00–2:50	Polyneuropathy	
3:00–3:40	Polyneuropathy	
3:50–4:50	Canmed patient safety	

09/04/2019

Time	Neuromuscular disorders EMG/NCS	Supervisor/Presenters
1:00–1:50	Lumbosacral plexus and lumbosacral plexopathy	
2:00–2:50	Peripheral nerve injury and nerve entrapment syndromes (LL)	
3:00–3:40	Peripheral nerve injury and nerve entrapment syndromes (LL)	
3:50–4:50	Peripheral nerve examination (lower limb)	

16/04/2019

Time	Neuromuscular disorders EMG/NCS	Supervisor/Presenter
1:00–1:50	Brachial plexus and brachial plexopathy	
2:00–2:50	Peripheral nerve injury and nerve entrapment syndromes (UL)	
3:00–3:40	Peripheral nerve injury and nerve entrapment syndromes (UL)	
3:50–4:50	Peripheral nerve examination (upper limb)	

23/04/2019

Time	Cardiopulmonary Rehabilitation	Supervisor/Presenter
1:00–1:50	Pulmonary function test and exercise tolerance test	
2:00–2:50	Pulmonary rehabilitation	
3:00–3:40	Cardiac rehabilitation	
3:50–4:50	Principle of cancer rehabilitation and effect of radiation and chemotherapy	

27/04/2019

Time	ASSESSMENT IV	Supervisor/Presenter
1:00–1:50	OSCE	
2:00–2:50	OSCE	
3:00–3:40	OSCE	
3:50–4:50	OSCE R4 written exam	

30/04/2019

Time	Assessment III	Supervisor/Presenter
1:00–1:50	Comprehensive written exam of (neuromuscular disease (NMD), prosthesis & orthosis (P&O) ASSESSMENT IV (Paediatric rehabilitation mcqs & short answers)	
2:00–2:50	Trainees Questions and Answers	
3:00–3:40	Chief trainee election	
3:50–4:50	End of year farewell	

Universal Topics

- Universal topics are educational activities that are developed and applicable for all specialties
- Priority will be given to topics that:
  - Are of high value
  - Are interdisciplinary and integrated
  - Require expertise that might be beyond the availability of the local clinical training sites

- Universal topics will be developed centrally by SCFHS and will be available as e-learning. Each trainee will received personalized access to the online module
- Each universal topic will have a self-assessment at the end of the module
- As indicated in the “executive policies of continuous assessment and annual promotion,” universal topics will be a mandatory component of the criteria for the annual promotion of trainees from their current level of training to the subsequent level
- EMG/NCS Universal topics will be distributed over the whole period of training; please refer to Appendix C for universal topic modules assigned to every training year/program stage

Intent

- These are high value, interdisciplinary topics of the utmost importance to the trainee. The reason for delivering the topics centrally is to ensure that every trainee receives high-quality teaching and develops essential core knowledge. These topics are common to all specialties.
- Topics included here meet one or more of the following criteria:
  - Impactful: topics that are common or life-threatening
  - Interdisciplinary: topics that are difficult to teach using a single discipline
  - Orphan: topics that are poorly represented in the undergraduate curriculum
  - Practical: topics that trainees will encounter in hospital practice

- Topics are divided as per the requirement for each level of training

R1

Module 1: Introduction	Safe drug prescribing Hospital acquired infections
Module 2: Cancer	Principles of management of cancer
Module 3: Diabetes and Metabolic Disorders	Recognition and management of diabetic emergencies

Module 4: Medical and Surgical Emergencies	Management of acute chest pain Management of acute breathlessness
Module 5: Acute Care	Pre-operative assessment Post-operative care
Module 6: Frail Elderly	Assessment of frail elderly
Module 7: Ethics and Healthcare	Occupational hazards of health care workers

R2

Module 1: Introduction	Sepsis; systemic inflammatory response syndrome (SIRS); disseminated intravascular coagulation (DIC)
Module 2: Cancer	Oncologic emergencies
Module 3: Diabetes and Metabolic Disorders	Management of diabetic complications
Module 4: Medical and Surgical Emergencies	Management of upper Gastro Intestinal bleeding Management of lower Gastro Intestinal bleeding
Module 5: Acute Care	Management of fluid in the hospitalized patient
Module 6: Frail Elderly	Mini-mental state examination
Module 7: Ethics and Healthcare	Evidence based approach to smoking cessation

R3

Module 1: Introduction	Blood transfusion
Module 2: Cancer	Side effects of chemotherapy and radiation therapy
Module 3: Diabetes and Metabolic Disorders	Comorbidities of obesity
Module 4: Medical and Surgical Emergencies	Management of hypotension and hypertension
Module 5: Acute Care	Management of electrolyte imbalances
Module 6: Frail Elderly	Prescribing drugs in the elderly
Module 7: Ethics and Healthcare	Patient advocacy

R4

Module 1: Introduction	Antibiotic stewardship Blood transfusion
Module 2: Cancer	Surveillance follow-up of cancer patients
Module 3: Diabetes and Metabolic Disorders	Abnormal ECG
Module 4: Medical and Surgical Emergencies	Management of altered sensorium
Module 5: Acute Care	Acute pain management Chronic pain management
Module 6: Frail Elderly	Care of the elderly
Module 7: Ethics and Healthcare	Ethical issues: transplantation/organ harvesting; withdrawal of care Ethical issues: treatment refusal; patient autonomy Role of doctors in death and dying

Development and Delivery:

- Core topics of post graduate curriculum will be developed and delivered centrally by the Commission through e-learning platform. A set of preliminary learning outcomes for each topic will be developed. Content experts, in collaboration with the central team, may modify the learning outcomes
- These topics will be didactic in nature, with a focus on practical aspects of care. These topics will be more content-heavy, as compared to workshops and other face-to-face interactive sessions

The suggested duration of each topic is 90 minutes

Assessment

- The topics will be delivered in a modular fashion. At the end of each learning unit there will be an online formative assessment. After completion of all topics, there will be a combined summative assessment in the form of context-rich multiple-choice questions (MCQs). All trainees must attain minimum competency in the summative assessment. Alternatively, these topics can be assessed in a summative manner along with a specialty examination
- Assessment may include case studies, high-quality images, worked examples of prescribing drugs in disease states, and internet resources

ASSESSMENT OF LEARNING

Purpose of Assessment

Assessment plays a vital role in the success of postgraduate training. Assessment will guide trainees and trainers to achieve the targeted learning objectives. Additionally, a reliable and valid assessment will provide an excellent means for training advancement, as it will provide details relevant for curriculum development, teaching methods, and the quality of learning environment. Assessment can serve the following purposes:

A. **Assessment for learning**: Trainers will use information from trainees' performance to assess their improvement plans
B. **Assessment as learning**: Assessment criteria will drive trainees' learning
C. **Assessment of learning**: Assessment outcomes will represent a quality metric that can improve the learning experience

A. The assessment of learners is conducted in accordance with SCFHS training and examination rules and regulations.

The assessment is divided into two parts:

1. **Formative assessment** (i.e., a continuous assessment process during the training period)
2. **Summative assessment** (i.e., an assessment at the end of the program)

1. Formative Assessment

General Principles

Evaluation

End of Rotation Evaluation:

At the end of each training rotation, the supervising consultant/team shall provide the program director with the evaluation of the trainee's performance during that rotation, as per the approved evaluation form in the One45 system (within SCFHS website). Periodic reports will be submitted to the Regional Supervisory Committees of the Specialty to review and follow-up on trainee progress.

Trainees, as adult learners, should strive for feedback throughout their competency journey from "novice" to "mastery" levels. *Formative assessment* (also referred to as continuous assessment) is the component of assessment that is distributed throughout the academic year and provides trainees with effective feedback. Input for the overall formative assessment tools will be utilized at the end of the year to decide on promoting each individual trainee from the current-to-subsequent training level. Formative assessment will be defined based on the scientific (council/committee) recommendations (usually updated and announced for each individual program at the start of the academic year). According to the executive policy on continuous assessment (available online: www.scfhs.org), formative assessment will have the following features:

a) Multi-source: minimum four tools.
b) Comprehensive: covering all learning domains (knowledge, skills, and attitude).
c) Relevant: focusing on workplace-based observations.
d) Competency-milestone oriented: reflect on trainees' expected competencies that match the required developmental levels.

Trainees should play an active role in seeking feedback during their training. Additionally, trainers are expected to provide timely and informative assessments. SCFHS will provide an e-portfolio system to enhance communication and analysis of data arising from formative assessment.

Formative Assessment Tools*:* Logbook, academic activity, CBD

Logbook requirements - One45 Procedures

Rotation		R1	R2	R3	R4
		Junior		Senior	
Core rehab rotation Inpatient/Outpatient SCI Stroke TBI General (NMSK) Pediatric (The number of procedures that can be done in any one of these rotations)	1-Botulinum toxin injection for management of spasticity (anatomical, ultrasound or electrical stimulation guided)	6		20	
	2- Intrathecal baclofen programing and refill	0		6	
Internal Medicine Neurology Neurosurgery Intensive Care Orthopedics	1-Tracheostomy care (suctioning, change of tube, corking) with privileged staff (or observe)	4		0	
	2- Pressure sore care mechanical, surgical, lytic debridement, and applying VAC machine under supervision by privileged staff (or observe)	4		4	
Electrophysiology (EMG/NCS)	Electromyography and nerve conduction studies and interpretations	20			
Rheumatology MSK	Intra-articular injections Joint aspiration	4		6	
Urology/SCI	Supra-pubic catheter insertion with privileged staff or observe	4		2	
Orthopedic/Spine Surgery/Neurosurgery (Observe/Assist)	Attend OR for common surgical procedures according to the rotation	4 in each rotation			

List of Formative Assessment Tools

(According to the executive policy on continuous assessment, there is requirement of at least four tools, which should cover the three domains. A trainee should show competency in each assessment tool in order to be promoted to the subsequent training level. For further details, please refer to the policy on www.scfhs.org)

Learning Domain	Formative Assessment Tools
Knowledge	Structured Academic Activates Attendance and participation - weekly Structured Oral Exam (SOE) - once or twice per year Annual Written promotion Exam Case Based Discussion (CBD) - once per year The trainee should pass one out of three attempts

Skills	Logbook- each rotation OSCE - once or twice per year
Attitude	In-Training Evaluation Report (ITER) after each rotation

Promotion Standards for PM&R trainees

The aim of the formative assessment is to assess the trainee's knowledge, skills, and attitude.

For details, please see:

https://www.scfhs.org.sa/MESPS/TrainingProgs/RegulationBoard/Pages/default.aspx

The trainee promotion from one level to the next (including the promotion from R4 to Board Eligible), is based on:

1. The end of the year Promotion Examination (MCQs)
2. Obligatory OSCE and SOE that will be conducted once a year (R1 excluded)
3. Completing the Logbook
4. In-Training Evaluation Reports
5. CBD
6. Academic half days activity

Standard	Knowledge				Skills		Attitude
	Logbook	Promotion	SOE	CBD (long case)	Academic half day attendance & presentation skills evaluation	OSCE	ITERs
R1	√	√		√	√		√
R2/R3	√	√	√	√	√	√	√
R4	√		√	√	√	√	√

2.Summative Assessment

General Principles

The summative assessment is the component of the assessment that aims to make informed decisions regarding trainees' competency. In comparison to the formative one, summative assessment does not aim to provide constructive feedback. For further details on this section, please refer to the general bylaws and executive policy of assessment (available online: www.scfhs.org). To be eligible to sit the final exams, a trainee should be granted a "Certification of Training-Completion."

Part 1 Examination

- Trainees will be eligible to take the Part 1 exam at the end of the R1 academic year. The exam will be held once a year. It will be in the form of MCQs. Passing the Part 1 exam is obligatory for all junior level trainees to be promoted to the senior level. The SCFHS Rules and Regulations for exams will be applied. Trainees who do not pass their Part 1 exam cannot be promoted to the senior level.
- The Part 1 exam will test the candidates' knowledge of rehabilitation-related basic sciences, general rehab, and rehab related topics.
- For further details on this examination, please refer to the general bylaws and executive policy on assessment (available online: www.scfhs.org).

Example of Blueprint of the first part exam is shown in the following table:

N.B. The blueprint might be changed as needed or recommended by the exam committee

	Cognition			Domains			
Sections	Total Required Items	K1	K2	Management	Diagnosis	Imaging	Number of questions needed
Anatomy	6%	2	4	NA	4 (1)	2 (2)	3
Physiology & Histology	4%	2	2	NA	4 (6)	NA	6
Pharmacology	6%	2	4	4 (5)	2 (3)	NA	8
General Rehabilitation	20%	8	12	8	8	4	0
Medicine	12%	4	8	4	6 (6)	2 (2)	8
Rheumatology	10%	4	6	4 (4)	6 (2)	NA	4
Orthopedics	10%	4	6	3	7 (2)	NA	2
Neurosurgery	5%	2	3	1	4 (1)	NA	1
Pediatrics	7%	2	5	2 (2)	5	NA	2
Neurology	12%	3	9	4	8	NA	0
Research, Ethics& Professionalism and patient safety	8%	2	6	4	4	NA	1
Total	100	35	65				35

PM&R Final Blueprint part 2 - 2019		Cognition		Domain		
Sections	Total Required Items	K1	K2	Management	Diagnosis	Imaging
Stroke	12%	6	18	8	12	4
Head Injury	10%	6	14	10	6	4
Amputee/Prosthetics	12%	6	18	16	8	NA
Spinal Cord Injury	12%	6	18	12	8	4
Pediatric Rehab	10%	4	16	12	8	NA
MSK Pain & Sport	6%	2	10	6	4	2
Rheumatology	6%	2	10	4	8	NA
Orthopedics	6%	4	8	4	8	NA
Neurology	6%	2	10	4	6	2
Cardiac/Pulmonary Rehab	4%	2	6	4	4	NA
Burns & Cancer Rehab	4%	2	6	8	NA	NA
Pharmacology	4%	2	6	4	4	NA
Research,Ethics & Professionalism & patient safety	8%	4	12	8	8	NA
Total	200	48	152	100	84	16

Certification of Training-Completion

- The following are the prerequisites for admission of a trainee to the PM&R training program. The Saudi Commission for Health Specialties' rules and regulations apply.
- Trainees become eligible to take the specialty exam (Part II) after:

1) Passing the Part I exam
2) Successful completion of all their required rotations (44 Months of the Required Rotations)
3) Successful completion of the other promotion standards

- In order to be eligible to sit the final specialty examinations, each trainee is required to obtain a "*Certification of Training-Completion.*" Based on the training bylaws and executive policy (please refer to www.scfhs.org), trainees will be granted a "Certification of Training-Completion" once the following criteria are fulfilled:

1) Successful completion of all training rotations.
2) Completion of training requirements and promotion standards, as outlined by a scientific council/committee of the specialty (e.g., logbook, OSCE/SOE, CBD, and others).
3) Clearance from SCFHS training affairs, compliance with tuition payment, and completion of universal topics.
4) "Certification of Training-Completion" will be issued and approved by the local supervisory committee or its equivalent according to SCFHS policies.

FINAL SPECIALTY EXAMINATIONS

- It consists of two parts written and oral (clinical). It will be held according to the general examination rules and regulations for the Saudi Commission for Health Specialties.

a) **Written Component**
The written component consists of two papers:
Each paper consists of 100 (MCQs – one correct answer out of four possible answers).
Trainees will have two and half to three hours to complete each paper

b) **Oral and Clinical Component**
The oral and clinical component will be 12–15 stations of the Objective Structured Clinical Exam format (OSCE multiple stations). Some of the stations will consist of traditional clinical problems encountered in previous examinations (e.g., musculoskeletal and neurological examination and interpretation of x-rays). Standardized patients or simulators are often utilized when clinical skills are being evaluated. The following are examples of possible stations:

- Rehabilitation goal setting
- Joint examination
- Musculoskeletal examination
- Neurological examination
- Functional assessment
- Joint injection
- Chronic pain
- Dictation of discharge summary
- Anatomy specimen
- Counsel patient and family
- Gait deviation
- Structured oral (case review)
- Dictation of consultation note
- Prepare and present a seminar
- X-ray interpretation
- Slides interpretation
- Understanding services provided to people with disabilities
- Others

Candidates will be asked to demonstrate their competence in areas of clinical practice commonly encountered in Physical Medicine and Rehabilitation.

Standardized patients and others involved with the stations will provide an assessment of the candidate's attitude, approach, style and presentation. Assessments will be taken into consideration in the final pass/fail decision.

NB. SCFHS Rules and Regulations apply

- Adapted from the Royal College of Physicians, Canada, 2007 (documents on PM&R residency training)web site.
- Final specialty examination is the summative assessment component that grants trainees the specialty certification. It has two elements:

a) Final written exam: To be eligible for this exam, trainees are required to have a “Certification of Training-Completion.”
b) Final clinical/practical exam: Trainees will be required to pass the final written exam to be eligible to sit for the final clinical/practical exam.

■ A blueprint of the final written and clinical/practical exam is shown in the following table:

Example of Final Clinical Exam Blueprint

		DIMENSIONS OF CARE				
		Health Promotion & Illness Prevention 1±1 Station(s)	**Acute** 5±1 Station(s)	**Chronic** 3±1 Station(s)	**Psychological Aspects** 1±1 Station(s)	**# Station(s)**
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER	**Patient Care** 7±1 Station(s)	**1**	**4**	**2**		**7**
	Patient Safety & Procedural Skills 1±1 Station(s)		**1**			**1**
	Communication & Interpersonal Skills 2±1 Station(s)			**1**	**1**	**2**
	Professional Behaviors 0±1 Station(s)					**0**
	Total Stations	**1**	**5**	**3**	**1**	**10**

*Main blueprint framework adapted from Medical Council of Canada Blueprint Project

For further details on final exams, please refer to general bylaws and executive policy of assessment (available online: www.scfhs.org).

GLOSSARY

Glossary	
Blueprint	Description correlating educational objectives with assessment contents. For example, a test blueprint defines the proportion of test questions allocated to each learning domain and/or content.
Competency	Capability to function within a defined professional role that implies entrustment of a trainee (upon graduation of the program) with the required knowledge, skills, and attitude needed to practice unsupervised.
Specialty Core Content (skills, knowledge, and professional attitude)	A specific knowledge, skill, or professional attitude that is specific and integral to the given specialty.
Formative assessment	An assessment that is used to inform the trainer and learner of what has been taught and learned, respectively, for the purpose of improving learning. Typically, the results of formative assessment are communicated through feedback provided to the learner. Formative assessments are not intended to make judgments or decisions (though it can be used as such).
Mastery	Exceeding the minimum level of competency to the proficient level of performance indicating rich experience with possession of great knowledge, skills, and attitude.
Portfolio	A collection of evidence of progression towards competency. It may include both constructed components (defined by mandatory continuous assessment tools in the curriculum) and unconstructed components (selected by the learner).
Summative assessment	An assessment that describes the composite performance of the development of a learner at a particular point in time and is used to inform judgment and make decisions about the level of learning and certification.
Universal Topic	A knowledge, skill, or professional behavior that is not specific to the given specialty, but universal for the general practice of a given healthcare profession.

ABBREVIATIONS USED IN THIS DOCUMENT

Abbreviation	Description
ADL	Activity of Daily Living
AFO	Ankle – foot orthosis
AKA	Above knee Amputation
ALS	Amyotrophic lateral Sclero
BKA	Below knee Amputation
CBD	Case-Based Discussion Report
CBE	Competency-Based Education
COT	Consultation Observation Tool
CTLSO	Cervico-thoraco-lumbo-sacral orthosis
DOPS	Direct Observation of Procedural Skills Report
EMG	Electromyography
HKAFO	Hip - Knee - Ankle – foot orthosis
ICM	Intensive Care Medicine
IM	Internal Medicine
ITER	In-Training Evaluation Report
KAFO	Knee - Ankle – foot orthosis
MCQs	Multiple-choice Questions
Mini-CEX	Mini-Clinical Experience Report
NCS	Nerve Conduction study
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
PMR	Physical medicine and Rehabilitation
PT	Progress Test
R(1)	(First) Year of Residency
RTC	Residency Training Committee
SCFHS	Saudi Commission for Health Specialties
SCI	Spinal Cord Injury
SEPs	Somatosensory evoked Potentials
SOE	Structured Oral Exam
TENS	Trans-cutaneous electrical Nerve Stimulation
TLSO	thoraco-lumbo-sacral orthosis

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