



الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

NEUROLOGY



سُبْحَانَكَ اللَّهُمَّ عَمَّا يُشْرِكُونَ

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INTRODUCTION AND OVERVIEW

Neurological diseases are increasingly recognized as a major public health problem, particularly in the developing world.^[1] The WHO has reported that hundreds of millions of people worldwide are affected by neurological disorders. They state, “Approximately 6.2 million people die because of stroke each year; over 80% of deaths take place in developing countries, and more than 50 million people have epilepsy worldwide. It is estimated that there are globally 35.6 million people with dementia with 7.7 million new cases every year - Alzheimer’s disease is the most common cause of dementia and may contribute to 60–70% of cases”.^[2]

Over the past 35 years, the Kingdom of Saudi Arabia has made considerable advances, surpassing many of its contemporaries, particularly in health care services. Neurology related treatment and services is one such area that has seen significant growth and development. As Saudi Arabia’s population steadily increases, due to extended life expectancy (as a result of better health care and preventive services), and the population ages, there is likely to be an increase in the prevalence of many chronic and progressive neurological disorders. In 1995, the Saudi Board of Neurology was established to ensure the continued development of adequate health care services in this specialty. Shortly after, the Saudi Commission for Health Specialties (SCFHS) commenced a four-year Neurology Residency-Training Program, and the first students graduated from its accredited training program in 1999. The SCFHS approved a fifth year of residency starting in 2016, and the neurology residency will now take five years to complete. The SCFHS’s five-year Neurology Residency-Training Program provides trainees with a comprehensive clinical education that emphasizes the acquisition of excellent clinical skills and knowledge.

The Neurology Residency-Training Program seeks to develop residents holistically on their journey to becoming excellent clinical neurologists. Core aspects of the training include, but are not limited to, the following:

- Interpersonal and communication skills, in order to maintain professional relationships with patients, families, and colleagues on the health care team
- Adequate professional judgment and attitudes required to practice and participate in the progress of the neurology field, through research and publication
- Principles of ethical behavior – familiarize residents with ethical issues of particular relevance to the field of neurology
- Integration of evidence-based medicine and research methods to improve patient care practices
- Awareness of quality assurance issues specifically related to the specialty

Under the supervision of experienced neurologists, trainees are guided in applying their clinical knowledge to provide supportive medical care, develop empathy, and learn how to incorporate preventative medicine and advocacy of patient welfare into their practice. Another objective of the program is to cultivate the norm of critical evaluation of the clinical methods, diagnostic techniques, and procedures employed in the process of patient care. Residents are equipped with tools for life-long learning and an understanding of the importance of attention to personal well-being as vital to the practice of medicine.

Since the initiation of the Neurology Residency Program 28 years ago, there have been many advances in technology and a better understanding of diseases and disorders related to the nervous system and its subdivisions (e.g., the autonomic and somatic nervous system).

INTRODUCTION AND OVERVIEW

In recognition of the importance of improving and enhancing the current curriculum to meet changes in the field, and to incorporate extensive and diversified clinical experiences, exposure to new knowledge, practical training in basic science and clinical research, evidence-based practice, and communication and leadership training, the Saudi Commission for Health Specialties has adopted the CanMEDS Physician Competency Framework. This Framework outlines the knowledge, skills, and abilities that physicians need for better patient outcomes. It is based on the seven roles that all physicians need to play in order to be better doctors: Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar, and Professional.^[3]

This handbook serves as an introduction to the Neurology Residency Program. It contains contact information for the Residency Program Committee, a detailed description of the Program goals and objectives, the educational curriculum, an outline of clinical rotations from R1 to R4, and other important guidelines. We hope you will find this handbook useful and informative.

MOST PREVALENT NEUROLOGICAL CONDITIONS

There are more than 600 diseases and disorders of the nervous system. Listed in the table below are a few of the most common (Order does not necessarily reflect prevalence):

Cerebrovascular diseases
Epilepsy
Headaches
Memory disorders
Neuroinfectious diseases
Peripheral neuropathy
Multiple sclerosis
Parkinson's disease and other movement disorders
Brain tumors
Neuropsychological disorders

REFERENCES

- 1) Bergen DC, Silberberg D. Nervous system disorders: a global epidemic. Arch Neurol 2002; 59:1194–6.
- 2) World Health Organization. <http://www.who.int/features>
- 3) Royal College of Physicians and Surgeons of Canada. <http://www.royalcollege.ca/portal/page/portal/rc/canmeds/framework>

STRUCTURE OF NEUROLOGY TRAINING PROGRAM

The Saudi board program in “Neurology” consists of four years of full-time supervised residency

Block	R1	R2	R3	R4	R5
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training in adult neurology preceded by a full year of internal medicine training, a total of five years. The training institution must be accredited by SCFHS for a Saudi Specialty Certification in Neurology. The Saudi Board in Neurology Residency Training Program is divided into two levels of two years each: Junior and senior levels.

The roadmap for the rotations, which is presented below, must be followed strictly. However, the sequence of rotations within each level can be changed according to the individual’s needs.

INTRODUCTION AND OVERVIEW

1	General medicine	Neurology (inpatient)	Paediatric neurology	Research 2	Neurology (Specialty clinic** & inpatient)
2	General medicine	Neurology (inpatient)	Paediatric neurology	EMG	Neurology (Specialty clinic** & inpatient)
3	Neurosurgery	Neurology (inpatient)	EEG	EEG	Neurology Specialty clinic** & inpatient)
4	Endocrinology	Neurology (inpatient)	EEG	Neurology (clinics/Specialty clinic**)	Neurology (Specialty clinic** & inpatient)
5	Rheumatology	Neurology (inpatient)	EMG	Neurology (consult)	Neurology Specialty clinic** & inpatient)
6	Critical care (or neuroICU)	Neurology (consult)	EMG	Neurology (consult)	Neurology (inpatient)
7	Critical care (or neuroICU)	Neurology (consult)	Neurology (inpatient)	Neurology (consult)	Neurology (inpatient)
8	Emergency Medicine	Neurology (consult)	Neurology (inpatient)	Neurology (consult)	Neurology (consult)
9	Cardiology	Neurology (clinics)	Neurology (consult)	Neurology (inpatient)	Neurology (consult)
10	Psychiatry	Neurology (clinics)	Neurology (consult)	Neurology (inpatient)	Neurology (consult)
11	Psychiatry	Neurology (clinics)	Neurology (clinics)	Neurology (inpatient)	Elective ***
12	Infectious disease	Neuroradiology*	Research 1	Neuroradiology	Elective ***
13	Leave	Leave	Leave	Leave	Leave

STRUCTURE OF NEUROLOGY TRAINING PROGRAM

The residency training year starts on October 1st annually and ends on September 30th.

Each block is four weeks.

* The neuroradiology rotation must be taken during the last six blocks of R2.

**Specialty clinics: Multiple sclerosis, Movement disorders, Epilepsy, Stroke prevention, Headache, etc.

***Elective blocks can be used for Neuro-ophthalmology and Neuropathology if available.

- **R1 Rotations:**

R1 internal medicine residents who applied and accepted in the neurology program; program directors need to take in consideration to fulfil the R1 neurology rotations before the end of academic year namely arrange for psychiatry and neurosurgery blocks.

- **Neurology clinic rotations (R2-R4)**

Residents are required to attend minimum of 3 half day clinics per week. The clinic rotation is supervised by neurology consultant or specialist.

Clinics can be general neurology or specialized clinics.

- **Neurology speciality clinic (R5)**

Residents will cover speciality clinics and inpatients service.

Resident should manage his/her time in order to cover both services efficiently.

The aim is to prepare the residents for future career as a general neurologist.

- **EEG and EMG:**

Residents need to fulfil the requirements of these rotations including DOPS and log book

COMPETENCIES OF NEUROLOGY RESIDENCY PROGRAM

Competencies for Rotation on the Neurology Inpatients Service: Senior Resident (R4, R5)

Medical Expert

By the end of the senior rotation, the resident will:

- 1) Obtain complete histories from patients seen in the emergency department and on the inpatient ward, obtaining a collateral history where necessary
- 2) Perform appropriate and efficient general and neurological physical examinations
- 3) Determine whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 4) Provide accurate anatomical localization for the disease process in question
- 5) Formulate appropriate differential and provisional diagnoses
- 6) Develop appropriate investigative and therapeutic treatment and general management plans for patients under their care
- 7) Develop appropriate clinical judgment in formulating an investigative and therapeutic plan that takes into account matters such as the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 8) Demonstrate the ability to independently manage neurological emergencies, including the following:
 - a) Acute bacterial meningitis
 - b) Acute encephalitis
 - c) Coma
 - d) Recurrent seizures and status epilepticus
 - e) Acute intracranial hemorrhage
 - f) Acute stroke
 - g) Recurrent transient ischemic events and threatened stroke
 - h) Incipient transtentorial herniation
 - i) Acute paralytic illness
 - j) Impending spinal cord compression
- 9) Perform technical procedures, including lumbar puncture, Tensilon® Test, and Dix-Hallpike Test
- 10) Demonstrate the ability to diagnose and manage neurological inpatients at the level of a junior consultant

Communicator

By the end of the senior rotation, the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Demonstrate effective communication with patients, family, and the health care team in the setting of a family conference
- 3) Anticipate problems of interpretation or expression by patients and their families
- 4) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 5) Explain the reason for consultations by other physicians or members of the health care team
- 6) Address the issue of prognosis honestly and sensitively where possible

COMPETENCIES OF THE PROGRAM

- 7) Maintain accurate and up-to-date clinical notes and records for each patient, including admission history and physical notes, daily progress notes, and discharge summaries
- 8) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 9) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 10) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 11) Ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

By the end of the senior rotation, the resident will:

- 1) Consult appropriately and in a timely fashion with other physicians and health care professionals
- 2) Interact in a collaborative fashion with other members of the health care team to maximize the appropriate use of everyone's skills in caring for the patient
- 3) Contribute effectively to interdisciplinary team activities, including attending multidisciplinary team meetings for hospital inpatients and leading such meetings when appropriate
- 4) Work effectively with resident or medical student colleagues assigned to the Neurology Clinical Teaching Unit to form a collegial and efficient team
- 5) Recognize that the optimal treatment of many patients with neurological disorders requires a team approach, and understand the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, and social workers) in managing patients with neurological illnesses
- 6) Collaborate appropriately with patients and families on management decisions

Manager

By the end of the senior rotation, the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Supervise more junior medical trainees and students in a manner that ensures the efficient and effective delivery of health care to patients
- 3) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 4) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 5) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 6) Formulate evidence-based (whenever possible) management plans that take into consideration the seriousness of the illness and the costs and benefits of various diagnostic and therapeutic interventions
- 7) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

By the end of the senior rotation, the resident will:

COMPETENCIES OF THE PROGRAM

- 1) Counsel patients and others on aspects of prevention of neurological disorders, including risk factors, and genetic and environmental concerns
- 2) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases, and make appropriate referrals to such organizations and services
- 3) Identify opportunities to contribute, as a neurologist, to improving the health of patients and communities
- 4) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem

Scholar

By the end of the senior rotation, the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and residents), other health care personnel, and patients
- 2) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 3) Demonstrate proficiency in critical appraisal of the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 4) Participate, when feasible, in clinical or basic-science studies as a member of a research team
- 5) Present clinical cases and pertinent reviews of the literature at CNS Grand Rounds

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Show appropriate consideration for the opinions of other members of the health care team, including fellow Trainees, in the management of patient problems and be able to provide means to discuss and resolve differences of opinion
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Demonstrate professional behaviors, including punctuality and reliability
- 6) Describe how ethical principles guide the practice of medicine

Neurology Inpatient Service

Junior Resident

Medical Expert

By the end of the second year rotation, the resident will:

- 1) Independently obtain complete histories from patients seen in the emergency department and on the inpatient ward, obtaining a collateral history where necessary
- 2) Independently perform an appropriate general physical examination and a basic neurological examination
- 3) Accurately assess the seriousness of a patient's presenting illness
- 4) Be able to evaluate whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 5) Be able to provide the anatomical localization for the disease process in question
- 6) Working with support from the senior resident and/or consultant, formulate appropriate differential diagnoses
- 7) Working with the senior resident and/or consultant, develop appropriate investigative, therapeutic, treatment, and general management plans for patients under their care
- 8) Working with the senior resident and/or consultant, develop appropriate clinical judgment in formulating an investigative and therapeutic plan that takes into account matters such as the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 9) Recognize and provide initial emergency management for the following acute neurological problems:
 - a) Acute bacterial meningitis
 - b) Acute encephalitis
 - c) Coma
 - d) Recurrent seizures and status epilepticus
 - e) Acute intracranial hemorrhage
 - f) Acute stroke
 - g) Recurrent transient ischemic events and threatened stroke
 - h) Incipient transtentorial herniation
 - i) Acute paralytic illness
 - j) Impending spinal cord compression

Communicator

By the end of the second year rotation the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) With support from the senior resident and/or consultant, clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) With support from the senior resident and/or consultant, explain the reason for consultations with other physicians or members of the health care team
- 5) With support from the senior resident and/or consultant, address the issue of prognosis honestly and sensitively where possible

COMPETENCIES OF THE PROGRAM

- 6) Independently maintain accurate and up-to-date clinical notes and records for each patient, including admission history and physical notes, daily progress notes, and discharge summaries
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) With support from the senior resident and/or consultant, ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

By the end of the second year, the resident will:

- 1) Recognize his/her limitations and consult with the senior resident and/or Neurology consultant appropriately
- 2) Interact in a collaborative fashion with other members of the health care team to maximize the appropriate use of everyone's skills in caring for the patient
- 3) Demonstrate an understanding of the reasons to consult with other physicians and health care professionals
- 4) Work effectively with resident or medical student colleagues assigned to the Neurology Clinical Teaching Unit to form a collegial and efficient team
- 5) Recognize that the optimal treatment of many patients with neurological disorders requires a team approach, and understand the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, social workers) in managing patients with neurological illness
- 6) Collaborate appropriately with patient and families on management decisions

Manager

By the end of the second year the resident will:

- 1) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 2) Formulate evidence-based (whenever possible) management plans that take into consideration the seriousness of the illness and the costs and benefits of various diagnostic and therapeutic interventions
- 3) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

By the end of the second year the resident will:

- 1) Recognize and respect the diverse cultural, social, biological, economic, and religious factors that may influence patient health and affect patient interaction with the health care system
- 2) Demonstrate knowledge and skills in areas of Preventive Medicine and Community Health and the ability to apply these to the problems of individual patients or groups of patients
- 3) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases

COMPETENCIES OF THE PROGRAM

Scholar

By the end of the second year the resident will:

- 1) Formulate a personal plan of study to acquire the necessary knowledge, skills, and attitudes to successfully achieve the competencies of the Neurology training program.
- 2) Demonstrate the ability to critically appraise the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 3) With support from the senior resident and consultant, present a clinical case and review of the literature at CNS Grand Rounds

Professional

By the end of the second year the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behavior, including punctuality and reliability
- 3) Describe how ethical principles guide the practice of medicine
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations
- 5) Show appropriate consideration for the opinions of other members of the health care team, including fellow Trainees, in the management of patient problems and be able to provide means to discuss and resolve differences of opinion

Senior Resident

By the end of the outpatient clinic experience provided during senior years of residency training in neurology, the resident will:

Demonstrate proficiency at the level of an independent neurologist in evaluating and managing outpatients from all major subspecialty areas of neurology, including patients with multiple sclerosis, epilepsy, neuromuscular disease, headache, pain, neuro-oncology, cognitive neurology, movement disorders, and neurodegenerative disease

Medical Expert

By the end of this rotation the resident will:

- 1) Obtain complete histories from patients seen in the outpatient clinic setting, obtaining a collateral history where necessary
- 2) Perform appropriate and efficient neurological and general examinations
- 3) Determine whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 4) Provide accurate anatomical localization for the disease process in question
- 5) Independently formulate appropriate differential and provisional diagnoses
- 6) Independently develop appropriate investigative and therapeutic treatment and general management plans for patients under their care
- 7) Independently develop appropriate clinical judgment in formulating an investigative and therapeutic plan that takes into account matters such as the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 8) Perform procedures, including lumbar puncture, Tensilon® Test, and Dix-Hallpike Test with proficiency

COMPETENCIES OF THE PROGRAM

Communicator

By the end of this rotation the resident will:

- 1) When dealing with patients and their families in the clinical setting, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively
- 6) Communicate effectively with medical colleagues, including referring physicians, in person, by telephone, and through dictated consultation and follow-up letters
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that clinical notes are up to date, and that the risks and benefits of proposed investigations or treatments have been explained to the patient and noted in the record
- 11) Ensure that informed consent has been obtained and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

During this rotation the resident will:

- 1) Consult appropriately with other physicians and health care professionals
- 2) Contribute effectively to interdisciplinary team activities
- 3) Recognize that the optimal treatment of many patients with neurological disorders requires a team approach, and understand the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, social workers) in managing patients with neurological illness
- 4) Collaborate appropriately with patients and families on management decisions

Manager

By the end of this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Develop an approach to the scheduling of clinical patients in a way that suits his or her style of practice and minimizes patient waiting time
- 3) Identify basic principles of physician billing for medical services
- 4) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 5) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 6) Use information technology to provide optimal patient care and life-long learning opportunities

COMPETENCIES OF THE PROGRAM

Health Advocate

During this rotation the resident will:

- 1) Counsel patients and others on aspects of prevention of neurological disorders, including risk factors, and genetic and environmental concerns
- 2) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases, and make appropriate referrals to such organizations and services
- 3) Identify opportunities to contribute, as a neurologist, to improving the health of patients and communities
- 4) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem
- 5) Access financial supports for patients when appropriate, including advocating for funding sources to offset medication costs for the patient and advocating for disability income support where needed

Scholar

By the end of this rotation the resident will:

- 1) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 2) Critically assess the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 3) Identify gaps in knowledge, and educational methods by which these gaps may be filled
- 4) Develop the ability to pose good learning questions relevant to patient care

Professional

By the end of this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Recognize the ethical principles that guide the practice of neurology
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Demonstrate professional behaviors, including punctuality and reliability

Neurology Outpatient Clinics

Junior Resident

At the end of the outpatient clinic experience provided during the junior years of residency training in neurology, the resident will gain experience in evaluating and managing outpatients from all major subspecialty areas of neurology, including patients with multiple sclerosis, epilepsy, neuromuscular disease, headache, pain, neuro-oncology, cognitive neurology, movement disorders, and neurodegenerative disease

Medical Expert

By the end of this rotation the resident will:

- 1) Obtain complete histories from patients seen in the outpatient clinic setting, obtaining a collateral history where necessary
- 2) Perform appropriate general and neurological physical examinations

COMPETENCIES OF THE PROGRAM

- 3) Determine whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 4) Provide accurate anatomical localization for the disease process in question
- 5) In conjunction with the consultant, formulate appropriate differential and provisional diagnoses
- 6) In conjunction with the consultant, develop appropriate investigative and therapeutic treatment and general management plans for patients under their care
- 7) In conjunction with the consultant, develop appropriate clinical judgment in formulating an investigative and therapeutic plan that takes into consideration matters such as the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 8) Where appropriate, perform procedures, including lumbar puncture, Tensilon® Test, and Dix-Hallpike Test

Communicator

By the end of this rotation the resident will:

- 1) In conjunction with the consultant, communicate effectively with clinic patients and their families, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the layperson
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) In conjunction with the consultant, clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) In conjunction with the consultant, address the issue of prognosis honestly and sensitively where possible
- 6) Working with the consultant, communicate effectively with medical colleagues, including referring physicians, in person, by telephone, and through dictated consultation and follow-up letters
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that clinical notes are up to date, and that the risks and benefits of proposed investigations or treatments have been explained to the patient and noted in the record
- 11) Ensure that informed consent has been obtained and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

COMPETENCIES OF THE PROGRAM

Collaborator

By the end of this rotation the resident will:

- 1) Work with the consultant; consult appropriately with other physicians and health care professionals
- 2) Contribute effectively to interdisciplinary team activities
- 3) Recognize that the optimal treatment of many patients with neurological disorders requires a team approach, and understand the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, social workers) in managing patients with neurological illness
- 4) Collaborate appropriately with patients and families on management decisions

Manager

By the end of this rotation the resident will:

- 1) Demonstrate the importance of initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Begin to demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 4) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

By the end of this rotation the resident will:

- 1) Demonstrate knowledge of aspects of prevention of neurological disorders, including risk factors, and genetic and environmental concerns
- 2) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases, and make appropriate referrals to such organizations and services
- 3) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Critically assess the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 2) Identify gaps in knowledge, and educational methods by which these gaps may be filled
- 3) Develop the ability to pose good learning questions relevant to patient care

Professional

By the end of this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures

COMPETENCIES OF THE PROGRAM

- 3) Recognize the ethical principles that guide the practice of neurology
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Demonstrate professional behaviors, including punctuality and reliability

Neurology Consult Service

Medical Expert

By the end of the senior years, the resident will:

- 1) Independently obtain complete histories from patients seen in consultation on inpatient wards, obtaining a collateral history where necessary
- 2) Independently perform appropriate general physical examinations and basic neurological examinations
- 3) Accurately assess the seriousness of a patient's presenting illness
- 4) Determine whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 5) Be able to provide the anatomical localization for the disease process in question
- 6) Independently formulate appropriate differential diagnoses
- 7) Independently develop appropriate investigative, therapeutic, treatment management plans for patients seen in consults
- 8) Demonstrate appropriate clinical judgment to formulate an investigative and therapeutic plan that takes into account matters such as: the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 9) Demonstrate the ability to diagnose and manage neurological inpatient consultations at the level of an independent neurologist
- 10) Demonstrate the ability to independently manage neurological emergencies, including the following:
 - a) Acute bacterial meningitis
 - b) Acute encephalitis
 - c) Coma
 - d) Recurrent seizures and status epilepticus
 - e) Acute intracranial hemorrhage
 - f) Acute stroke
 - g) Recurrent transient ischemic events and threatened stroke
 - h) Incipient transtentorial herniation
 - i) Acute paralytic illness
 - j) Impending spinal cord compression

Communicator

By the end of the fifth year, the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results

COMPETENCIES OF THE PROGRAM

- 4) Demonstrate effective communication with patients, family, and the health care team in the setting of a family conference
- 5) Clearly explain the reason for consultations with other physicians or members of the health care team
- 6) Address the issue of prognosis honestly and sensitively where possible
- 7) Independently complete an initial consultation note and relevant progress notes, including diagnosis, treatment plan, and outcome of investigations
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

By the end of the fifth year, the resident will:

- 1) Interact in a collaborative fashion with other members of the health care team to maximize the appropriate use of everyone's skills in caring for the patient
- 2) Consult appropriately and in a timely fashion with other physicians and health care professionals
- 3) Work effectively with the consulting medical or surgical service to form a collegial and efficient approach to patient care
- 4) Recognize that the optimal treatment for many patients with neurological disorders requires a team approach, and support the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, social workers) in managing patients with neurological illness. This may involve teaching the consulting medical or surgical services about the role and importance of other health care professionals
- 5) Collaborate appropriately with patients and families on management decisions

Manager

By the end of the fifth year, the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Supervise more junior medical trainees and students in a manner that ensures the efficient and effective delivery of health care for patients
- 3) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 4) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 5) Formulate evidence-based (whenever possible) management plans that take into consideration the seriousness of the illness and the costs and benefits of various diagnostic and therapeutic interventions
- 6) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 7) Use information technology to provide optimal patient care and life-long learning opportunities

COMPETENCIES OF THE PROGRAM

Health Advocate

By the end of the fifth year, the resident will:

- 1) Recognize and respect the diverse cultural, social, biological, economic, and religious factors that may influence patient health and affect patient interaction with the health care system
- 2) Counsel patients and others on aspects of prevention of neurological disorders, including risk factors, and genetic and environmental concerns
- 3) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases, and make appropriate referrals to such organizations and services
- 4) Identify opportunities to contribute, as a neurologist, to improving the health of patients and communities
- 5) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem

Scholar

By the end of the fifth year, the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and residents), other health care personnel, and patients
- 2) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 3) Demonstrate proficiency in critical appraisal of the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 4) Participate, when feasible, in clinical or basic-science studies as a member of a research team

Professional

By the end of the fifth year, the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Show appropriate consideration for the opinions of other members of the health care team, including the referring medical or surgical service in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Demonstrate professional behaviors, including punctuality and reliability
- 6) Show appropriate consideration for the opinions of other members of the health care team, including the consulting service team in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved

Junior Resident

Medical Expert

By the end of the second year, the resident will:

- 1) Independently obtain complete histories from patients seen in consultation on inpatient wards, obtaining a collateral history where necessary
- 2) Independently perform appropriate general physical examinations and basic neurological examinations
- 3) Accurately assess the seriousness of a patient's presenting illness

COMPETENCIES OF THE PROGRAM

- 4) Be able to evaluate whether a patient's symptoms and signs are the result of an organic or psychological disorder
- 5) Be able to provide the anatomical localization for the disease process in question
- 6) Working with support from the consultant, formulate appropriate differential diagnoses
- 7) Working with support from the consultant, develop appropriate investigative and therapeutic treatment management plans for patients seen in consult
- 8) Working with the consultant, develop appropriate clinical judgment in formulating an investigative and therapeutic plan that takes into consideration matters such as: the patient's age, general health, risks and costs of investigative procedures, risks and costs of therapeutic interventions, and epidemiology of the disease
- 9) Recognize and provide initial emergency management for the following acute neurological problems:
 - a) Acute bacterial meningitis
 - b) Acute encephalitis
 - c) Coma
 - d) Recurrent seizures and status epilepticus
 - e) Acute intracranial hemorrhage
 - f) Acute stroke
 - g) Recurrent transient ischemic events and threatened stroke
 - h) Incipient transtentorial herniation
 - i) Acute paralytic illness
 - j) Impending spinal cord compression

Communicator

By the end of the second year the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) With support from the consultant, clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) With support from the consultant, explain the reason for consultations by other physicians or members of the health care team
- 5) With support from the consultant, address the issue of prognosis honestly and sensitively where possible
- 6) Independently, complete an initial consultation note and relevant progress notes, including diagnosis, treatment plan, and outcome of investigations
- 7) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 8) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 9) With support from the consultant, ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

COMPETENCIES OF THE PROGRAM

Collaborator

By the end of the second year, the resident will:

- 1) Recognize his/her limitations and consult appropriately with the Neurology consultant.
- 2) Interact in a collaborative fashion with other members of the health care team to maximize the appropriate use of everyone's skills in delivering excellent care for the patient.
- 3) Demonstrate an understanding of the rationale for consultation with other physicians and health care professionals
- 4) Work effectively with the consulting medical or surgical service to form a collegial and efficient approach to patient care
- 5) Recognize that the optimal treatment of many patients with neurological disorders requires a team approach, and support the role of other health care professionals (occupational therapists, physiotherapists, speech-language pathologists, social workers) in managing patients with neurological illness. This may involve teaching the consulting medical or surgical services about the role and importance of other health care professionals.
- 6) Collaborate appropriately with patients and families on management decisions

Manager

By the end of the second year the resident will:

- 1) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 2) Formulate evidence-based (whenever possible) management plans that take into consideration the seriousness of the illness and the costs and benefits of various diagnostic and therapeutic interventions
- 3) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

By the end of the second year rotation the resident will:

- 1) Recognize and respect the diverse cultural, social, biological, economic, and religious factors that may influence patient health and affect patient interaction with the health care system
- 2) Demonstrate knowledge and skills in areas of Preventive Medicine and Community Health and the ability to apply these to the problems of individual patients or groups of patients.
- 3) Recognize the role of lay organizations and community services in providing support for individuals with neurological diseases

Scholar

By the end of the second year the resident will:

- 1) Formulate a personal plan of study to acquire the necessary knowledge, skills, and attitudes to successfully achieve the competencies of the Neurology training program.
- 2) Demonstrate the ability to critically appraise the neurological literature as it relates to patient diagnosis, investigation, and treatment

Professional

By the end of the second year the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the practice of medicine

COMPETENCIES OF THE PROGRAM

- 4) Demonstrate self-awareness, including an awareness of his or her own limitations
- 5) Show appropriate consideration for the opinions of other members of the health care team, including the consulting service team in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved

EMG/ Neuromuscular Service

Medical Expert

By the end of this rotation the resident will:

- 1) Describe the clinical features of major neuromuscular disorders
- 2) Obtain appropriate and complete histories from patients with neuromuscular complaints seen in the outpatient neuromuscular clinic and EMG laboratory
- 3) Perform appropriate and efficient physical examinations, with particular emphasis on examinations of the peripheral nervous system
- 4) Provide accurate anatomical localization for the neuromuscular disease process in question, specifically being able to localize problems to muscle, neuromuscular junction, nerve, plexus, root, anterior horn cell, or spinal cord pathology
- 5) Formulate appropriate differential diagnoses, and select appropriate investigations to evaluate the differential diagnoses
- 6) Construct, based upon clinical assessment, an appropriate electrodiagnostic approach specific to the clinical presentation
- 7) Describe the basic principles and techniques of nerve conduction studies and needle electromyography
- 8) Describe the basic principles and techniques of other specialized studies, including repetitive nerve stimulation, single fiber EMG, blink responses, somatosensory evoked potentials and visual evoked potentials
- 9) Explain the physiology of normal nerve conduction in myelinated and unmyelinated fibers, neuromuscular transmission, and excitation-contraction coupling, and identify disease processes where this normal physiology is disturbed
- 10) Recognize the characteristic physical examination findings and electrophysiological findings observed in myelopathies, motor neuron disease, radiculopathies, plexopathies, focal and generalized neuropathies, disorders of neuromuscular transmission, and myopathies
- 11) Recognize when electrophysiological results do not fit the clinical picture and may represent technical errors, normal variations, or incidental findings
- 12) Formulate appropriate management plans for common neuromuscular diseases.

Communicator

By the end of this rotation the resident will:

- 1) Communicate effectively with patients and their families in the neuromuscular clinic and EMG laboratory, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation by patients and their families
- 3) Clearly explain the performance of electrophysiological studies, the reasons for their performance, and their risks, complications, and potential benefits
- 4) Communicate effectively with medical colleagues, including referring physicians, in person, by telephone, and through dictated consultation letters and EMG reports

COMPETENCIES OF THE PROGRAM

- 5) Request appropriate electrodiagnostic studies by providing sufficient information on an EMG requisition to permit selection of studies
- 6) Communicate courteously, clearly, effectively, and appropriately with EMG technicians and other members of the health care team

Collaborator

During this rotation the resident will:

- 1) Recognize and respect the roles of other health care professionals involved in the care of patients with neuromuscular disease, including EMG technicians, nurse clinicians, physiotherapists, occupational therapists, speech-language pathologists, social workers, nutritionists, and clinical and laboratory support staff
- 2) Recognize the importance of close collaboration with EMG technicians when designing studies specific to an individual patient

Manager

By the end of this rotation the resident will:

- 1) Identify principles of quality assurance important in the management of an EMG laboratory
- 2) Identify the measures required to ensure patient safety in the EMG laboratory setting
- 3) Identify basic principles of physician billing for medical services, including billing for the technical and professional components of electrodiagnostic services
- 4) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 5) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 6) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

During this rotation the resident will:

- 1) Recognize the role of community services and lay organizations in providing support for individuals with neuromuscular diseases, and make appropriate referrals to such organizations and services
- 2) Advocate effectively for timely access to specific electrodiagnostic, imaging, and muscle biopsy studies based upon the urgency of the presenting problem
- 3) Recommend studies beyond those requested by the referring physicians when appropriate, to provide optimal care

Scholar

During this rotation the resident will:

- 1) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 2) Critically assess the neurological literature as it relates to patient diagnosis, investigation, and treatment
- 3) Identify gaps in knowledge, and educational methods by which these gaps may be filled, including reviewing key readings relevant to an understanding of the basic principles of neurophysiology and electrophysiology
- 4) Develop the ability to pose good learning questions relevant to patient care
- 5) Attend and participate in formal and informal team learning sessions, including EMG lab educational sessions, daily reviews of EMG studies, and neuromuscular rounds

COMPETENCIES OF THE PROGRAM

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Recognize the ethical principles that guide the practice of neurology, including principles of informed consent for electrodiagnostic tests and specific treatments (such as IVIG and medications)
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Demonstrate professional behaviors, including punctuality and reliability

Epilepsy and Electroencephalography (EEG)

Medical Expert

By the end of this rotation the resident will:

- 1) Describe the basic principles of EEG recording, and discuss the indications for and limitations of EEG as a diagnostic tool
- 2) Obtain complete histories from patients with epilepsy, recognizing the importance of collateral history
- 3) Perform appropriate and efficient physical examinations on patients presenting with seizures
- 4) Correlate clinical features with EEG findings in patients with epilepsy
- 5) Recognize the EEG features that are characteristic of common epilepsy syndromes
- 6) Recognize the EEG features that are characteristic of certain non-epileptic disorders, including herpes simplex encephalitis, hepatic encephalopathy, and Creutzfeldt-Jakob disease
- 7) Demonstrate proficiency in the medical management of epilepsy, including:
 - a) Principles of anticonvulsant use
 - b) Choice of drug
 - c) Recognition of drug pharmacology and side effects
 - d) Principles of monitoring anticonvulsant treatment
 - e) Identify indications for surgical management of epilepsy, and describe an approach to the workup of potential surgical candidates

Communicator

By the end of this rotation the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to a layperson
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Clearly explain the performance of all diagnostic and therapeutic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively where possible
- 6) Maintain accurate and up-to-date clinical notes and records for each patient
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen

COMPETENCIES OF THE PROGRAM

- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that informed consent has been obtained for procedures or treatments and that requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

During this rotation the resident will:

- 1) Contribute effectively to interdisciplinary team activities on the epilepsy service
- 2) Work effectively with resident or fellow colleagues assigned to the epilepsy service
- 3) Recognize and respect the roles of other health care providers involved in the care of patients with epilepsy, including EEG technicians, neurosurgeons, psychologists, research nurses, and clinic support staff

Manager

By the end of this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 4) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with epilepsy
- 5) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

During this rotation the resident will:

- 1) Recognize the role of lay organizations and community services in providing support for individuals with epilepsy, and make appropriate referrals to such organizations and services
- 2) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem
- 3) Identify important biological, psychological, social, cultural, and economic influences on the presentation and management of epilepsy

Scholar

During this rotation the resident will:

- 1) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 2) Critically assess the neurological literature as it relates to the diagnosis, investigation, and treatment of epilepsy
- 3) Participate, when feasible, in clinical or basic-science studies as a member of a research team
- 4) Participate in Epilepsy Rounds, including presenting and discussing interesting cases
- 5) Attend EEG reading sessions to improve familiarity with normal and abnormal EEG patterns

COMPETENCIES OF THE PROGRAM

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Recognize the ethical principles that guide the practice of neurology
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Be punctual and reliable in all professional activities

Neurocritical Care Rotation

Medical Expert

By the completion of this rotation, the resident will:

- 1) Demonstrate proficiency in the recognition, assessment, investigation, and management of patients with life-threatening disorders of the nervous system, including the following:
 - a) Comatose states
 - b) Raised intracranial pressure
 - c) Status epilepticus
 - d) Acute myelopathy
 - e) Neurogenic respiratory failure
 - f) Acute peripheral nerve disease, including Guillain Barre syndrome
 - g) Failure to wean from the ventilator
 - h) Severe head injury
 - i) Intracranial hemorrhage
 - j) CNS infections
 - k) Neurological consequences of systemic illness, including transplant-related neurological syndromes
- 2) Demonstrate the steps and procedures involved in the determination of brain death
- 3) Develop a strategy to offer prognostic advice and treatment recommendations for critically ill patients where decisions regarding withdrawal of life support arise
- 4) Recognize common abnormalities in cranial CT and MRI scans
- 5) Correctly interpret CSF findings in critically ill patients
- 6) Recognize the indications for and limitations of diagnostic tests used in neurocritical care, including:
 - a) EEG
 - b) Continuous EEG monitoring
 - c) Evoked responses
 - d) CSF analysis
 - e) Neuro-imaging

COMPETENCIES OF THE PROGRAM

Communicator

During this rotation the resident will:

- 1) Demonstrate empathy and effective listening skills in interactions with patients and their families
- 2) Deliver information to patients and their families about suspected or confirmed diagnoses, investigation results, management plans, treatment risks, and prognosis, in a humane and understandable manner
- 3) Communicate effectively with colleagues and other health care professionals
- 4) Produce and maintain clear and accurate written records of clinical encounters
- 5) Participate in and/or lead discussions with the families of critically ill patients when life- and-death decision-making is required

Collaborator

During this rotation the resident will:

- 1) Demonstrate understanding of the roles of the different health care professionals involved in the care of critically ill patients
- 2) Demonstrate respectful interactions with other members of the health care team
- 3) Appropriately consult with other health care professionals to optimize care for critically ill patients
- 4) Recognize the role of the neurologist within the larger context of a multidisciplinary care team for an individual with a critical illness

Manager

By the completion of this rotation the resident will:

- 1) Recognize and analyze the costs and benefits of available diagnostic procedures and therapeutic interventions to facilitate allocation of finite resources to patients with critical illnesses
- 2) Manage time effectively, including providing consultation on patients with life-threatening neurological illnesses in a timely manner, and prioritize patient assessments based on the acuity of the presenting problem

Health Advocate

By the completion of this rotation the resident will:

- 1) Recognize and respect the diverse cultural, social, and religious factors that may influence patient health and affect patient interaction with the health care system
- 2) Recognize important risk factors for serious neurological diseases and counsel patients and their families accordingly to reduce recurrence risks where possible
- 3) Demonstrate awareness of the medical and societal issue of brain death and organ donation, and develop a strategy to introduce this issue in family discussion when necessary

Scholar

During this rotation, the resident will:

- 1) Participate actively in organized educational activities, including rounds and team meetings
- 2) Critically assess the neurological literature and apply evidence-based principles to the investigation and management of patients with critical illness
- 3) Identify gaps in his or her knowledge and develop appropriate learning questions and strategies to fill these gaps

COMPETENCIES OF THE PROGRAM

Professional

During this rotation the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the approach to managing patients with life-threatening neurological diseases, including principles related to surrogate decision-making for critically ill patients unable to speak for themselves
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations

Stroke

Medical Expert

- 1) By the end of this rotation the resident will:
- 2) Obtain complete histories from patients presenting with stroke-related symptoms in the emergency department and in stroke or TIA clinics, obtaining a collateral history where necessary
- 3) Perform appropriate and efficient physical examinations on patients presenting with stroke-related symptoms
- 4) Identify and provide anatomic localization for the common symptoms and syndromes of stroke and transient ischemic attack
- 5) Distinguish the different pathological subtypes of stroke based upon clinical and radiological features
- 6) Describe the vascular supply to the central nervous system, and relate clinical stroke symptoms and syndromes to disruptions to this vascular supply
- 7) Discuss the principles of thrombolysis for acute stroke, including its indications and contraindications, and develop a protocol for screening patients for thrombolysis and for delivering tPA to appropriate candidates and providing appropriate monitoring and follow-up
- 8) Discuss the role of the following interventions for acute stroke:
 - a) Endovascular treatment
 - b) Surgical treatment for intracerebral hemorrhage
 - c) Surgical and medical management of subarachnoid hemorrhage

Communicator

By the end of this rotation the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Clearly explain the performance of all diagnostic therapeutic procedures (including thrombolysis), the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively where possible
- 6) Maintain accurate and up-to-date clinical notes and records for each patient, including admission history and physical notes, daily progress notes, and discharge summaries
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen

COMPETENCIES OF THE PROGRAM

- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health-care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

During this rotation the resident will:

- 1) Contribute effectively to interdisciplinary stroke team activities
- 2) Work effectively with residents or fellow colleagues assigned to the stroke team
- 3) Recognize and respect the roles of other health care providers involved in the care of patients with stroke, including physiatrists, physiotherapists, occupational therapists, speech-language pathologists, social workers, research nurses, and clinic support staff

Manager

By the end of this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 4) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurological diseases
- 5) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

During this rotation the resident will:

- 1) Demonstrate understanding of the principles of secondary stroke prevention, including the role of anti-thrombotic agents, vascular risk factor management, and lifestyle modification
- 2) Counsel patients and their families on aspects of stroke prevention
- 3) Recognize the role of lay organizations and community services in providing support for individuals with stroke, and make appropriate referrals to such organizations and services
- 4) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients, based upon the urgency of the presenting problem
- 5) Recognize the role of the neurologist in advocating for timely access to acute stroke care, and describe opportunities for reducing barriers to such access, including education at the community level

Scholar

During this rotation the resident will:

- 1) Develop a strategy to maintain professional competence through various methods of continuing medical education

COMPETENCIES OF THE PROGRAM

- 2) Critically assess the neurological literature as it relates to the diagnosis, investigation, and treatment of cerebrovascular disease
- 3) Participate, when feasible, in clinical or basic-science studies as a member of a research team

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Recognize the ethical principles that guide the practice of neurology, including demonstrating detailed understanding of the informed consent process as it applies to acute stroke care
- 4) Demonstrate self-awareness, including recognition of his or her own limitations
- 5) Be punctual and reliable in all professional activities

Pediatric Neurology Service

Medical Expert

By the end of this rotation the resident will;

- 1) Obtain a relevant history from a child and/or the child's parent or caregiver when presented with a child with neurological symptoms
- 2) Perform an appropriate neurological examination on a child, taking into consideration the effect of the changing normal neurodevelopmental baseline
- 3) Perform a developmental assessment on a child presenting with neurological symptoms
- 4) Develop evidence-based approaches to the investigation and management of children presenting with:
 - a) Headache
 - b) Altered level of consciousness
 - c) Paroxysmal disorders, including seizures and their mimics
 - d) Developmental delay and regression
 - e) Hypotonia in infancy
 - f) Ataxia
 - g) Hemiplegia, monoplegia, paraplegia, and quadriplegia
 - h) Movement disorders
 - i) Disorders of vision and ocular motility
 - j) Sensory and autonomic disturbances
 - k) Lower brainstem and cranial nerve dysfunction
- 5) Develop evidence-based diagnostic and management strategies for common diseases in pediatric neurology, including:
 - a) Epilepsy
 - b) Stroke in childhood
 - c) Hydrocephalus
 - d) Metabolic disorders
 - e) Neuromuscular diseases such as Duchenne and other muscular dystrophies
 - f) Pediatric migraine
 - g) Tourette's syndrome and other childhood movement disorders
 - h) Neurocutaneous syndromes, including neurofibromatosis I and II, Sturge-Weber syndrome, and tuberous sclerosis

COMPETENCIES OF THE PROGRAM

- i) Meningitis, encephalitis, and other CNS infections
- j) Inherited neuropathies, including Charcot-Marie-Tooth
- 6) Describe the principles of rehabilitation involved in the management of the brain-injured child
- 7) Identify important differences in the pharmacotherapy of children versus that of adults presenting with neurological diseases

Communicator

By the end of this rotation the resident will:

- 1) When dealing with children and their families, in the clinic or inpatient setting, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively where possible
- 6) Communicate effectively with all medical colleagues, including referring physicians in all settings, in person, by telephone, and through clinic or inpatient records, letters, and discharge summaries
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen

Collaborator

During this rotation the resident will:

- 1) Recognize and respect the roles of the multidisciplinary team members involved in providing care for children with neurological illnesses, including physicians, nursing staff, clinical nurse specialists, physiotherapists, occupational therapists, social workers, psychologists, music and art therapists, pharmacists, and clerical and support staff
- 2) Consult appropriately with other physicians and health care professionals
- 3) Contribute effectively to interdisciplinary team activities, providing leadership where appropriate

Manager

During this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 4) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for children with neurological diseases
- 5) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

By the end of this rotation the resident will:

- 1) Counsel patients and families on aspects of prevention of neurological disorders, including risk factors modification
- 2) Provide genetic counseling regarding inherited neurological diseases

COMPETENCIES OF THE PROGRAM

- 3) Recognize the role of lay organizations and community services in providing support for children with neurological diseases, and make appropriate referrals to such organizations and services
- 4) Identify opportunities to contribute, as a neurologist, to improving the health of patients and communities
- 5) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients, based upon the urgency of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 2) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 3) Critically assess the neurological literature as it relates to patient diagnosis, investigation, and treatment

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Show appropriate consideration for the opinions of other members of the health care team, including fellow trainees, in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved
- 4) Recognize the ethical principles that are especially relevant when providing care to children, including principles of consent to treatment in the pediatric population
- 5) Demonstrate self-awareness, including recognition of his or her own limitations

Neuropathology

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate knowledge of the microscopic anatomy of the brain, including the identification of neurons, oligodendrocytes, astrocytes, microglia, ependymal cells, anterior pituitary cells, and choroid plexus based upon microscopic appearance
- 2) Identify various tissues based on microscopic appearance, including:
 - a) Cerebellar cortex
 - b) 6-layer cerebral cortex
 - c) Hippocampal formation
 - d) Substantia nigra
 - e) Occipital cortex
 - f) Retina
 - g) Anterior horn cells, dorsal root ganglion, spinal cord
 - h) Anterior and posterior pituitary
 - i) Skeletal muscle
 - j) Peripheral nerve

COMPETENCIES OF THE PROGRAM

- 3) Describe the utility of the following techniques for examining the central and peripheral nervous system and muscle:
 - a) Hematoxylin and eosin
 - b) Nissl stain
 - c) Golgi methods
 - d) Myelin stains
 - e) Silver stains
 - f) Congo red
 - g) Histochemical staining of muscle
 - h) Immunohistochemistry
 - i) Teased fiber preparations of peripheral nerve
 - j) In-situ hybridization techniques
 - k) Electron microscopy
- 4) Demonstrate understanding of the developmental anatomy of the brain and spinal cord, and its application to congenital malformations
- 5) Recognize the histological appearance and features of the following:
 - a) Open and closed head trauma
 - b) Cerebral herniations
 - c) Spinal cord trauma
 - d) Cerebral edema
 - e) Cerebral infarction
 - f) Atheromatous lesions of carotid and intracranial vessels
 - g) Subarachnoid hemorrhage and various types of cerebral aneurysm
 - h) Vasculitis and arteritis
 - i) Intracerebral hemorrhage
 - j) HIV and AIDS and their effects on the central nervous system
 - k) Meningitis, bacterial and otherwise
 - l) Viral and other encephalitides
 - m) Brain and spinal abscess and subdural empyema
 - n) Wernicke's encephalopathy
 - o) Subacute combined degeneration of the spinal cord
 - p) Multiple sclerosis
 - q) Primary and secondary tumors of the brain, spinal cord, meninges, pituitary, and cranial and peripheral nerves
 - r) Anoxic cerebral injury
 - s) Epilepsy, including mesial temporal sclerosis
 - t) Degenerative diseases of the nervous system, including Alzheimer's disease, Parkinson's disease, motor neuron disease, and multiple systems atrophy
 - u) Primary muscle and nerve diseases
 - v) Common congenital malformations of the brain and spinal cord

Communicator

By the end of this rotation the resident will:

- 1) Prepare written reports of neuropathological examinations that offer concise descriptions of relevant pathological changes and clear neuropathological diagnoses
- 2) Provide accurate verbal reports of neuropathological examinations to referring physicians when necessary

COMPETENCIES OF THE PROGRAM

Collaborator

During this rotation the resident will:

- 1) Demonstrate understanding of the roles of the different members of the neuropathology team, including physicians, laboratory technicians, and clerical and support staff
- 2) Demonstrate respectful interactions with other members of the neuropathology team
- 3) Work appropriately with other physicians (including neurologists and neurosurgeons) to ensure the best care for patients requiring neuropathology service

Manager

During this rotation the resident will:

- 1) Recognize and analyze the costs and benefits of available diagnostic procedures in neuropathology to facilitate optimal allocation of finite resources to patients with neurological illnesses
- 2) Manage time effectively, including prioritizing interpretation of neuropathology studies based on the acuity of the presenting problem

Health Advocate

By the end of this rotation the resident will:

- 1) Recognize opportunities for health advocacy within the field of neuropathology, including advocating for adequate resources to meet the needs of patients and referring physicians
- 2) Appreciate the role of the neuropathologist in advocating for the best approach to diagnosis for patients, including discussing cases with referring physicians or advocating for additional studies based upon results of initial studies

Scholar

By the end of this rotation the resident will:

- 1) Participate actively in organized educational activities and teaching rounds
- 2) Critically assess the literature and apply evidence-based principles to the use of neuropathological techniques in the diagnosis of neurological illness
- 3) Identify gaps in his or her knowledge and develop appropriate learning questions and strategies to fill these gaps

Professional

During this rotation the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the approach to neuropathology, including an understanding of consent for autopsy and/or use of tissue samples
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations

Neurology Longitudinal Clinic

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate ability to obtain accurate medical histories from patients presenting for neurological consultation
- 2) Perform an efficient, detailed, and accurate neurological examination on patients presenting for neurological consultation
- 3) Provide anatomic localization of the presenting symptoms and signs
- 4) Formulate an appropriate differential diagnosis based upon the clinical presentation
- 5) Outline a plan for investigation and management of a patient presenting with neurological symptoms and/or signs
- 6) Demonstrate an organized and effective approach to the long-term follow-up of patients with neurological diseases, including:
 - a) Anticipating and managing side effects of treatment
 - b) Identifying alternative treatment approaches when initial lines of treatment are ineffective or poorly tolerated
 - c) Monitoring patients with serial directed clinical examination, supplemented as necessary with imaging or laboratory tests
 - d) Recognizing new symptoms or signs that may require a revision of the original diagnostic impression

Communicator

By the end of this rotation the resident will:

- 1) Demonstrate effective and accurate information gathering skills through history taking
- 2) Demonstrate empathy and effective listening skills in interactions with patients and their families
- 3) Deliver information to patients and their families about suspected or confirmed diagnoses, investigation results, management plans, risks of treatment, and prognosis in a humane and understandable manner
- 4) Communicate effectively with colleagues and other health care professionals
- 5) Produce and maintain clear and accurate written records of clinical encounters, including the dictation of consultation and follow-up notes to send to referring physicians

Collaborator

During this rotation the resident will:

- 1) Demonstrate effective consultation and collaboration with other health care professionals
- 2) Work effectively within an interprofessional team of health care professionals to provide care for patients with chronic neurological illnesses
- 3) Recognize when referral to other health care professionals, including other physicians, physiotherapists, occupational therapists, speech-language pathologists, social workers, psychologists, and others is appropriate for patients with chronic neurological illnesses
- 4) Recognize when referral for subspecialty neurology consultation is appropriate

Manager

During this rotation the resident will:

- 1) Recognize and analyze costs and benefits of available diagnostic procedures and therapeutic interventions to facilitate allocation of finite resources

COMPETENCIES OF THE PROGRAM

- 2) Develop a practice management plan that includes scheduling of office patients, maintenance of patient records, and billing for services
- 3) Manage time effectively to balance career demands and personal responsibilities and needs
- 4) Identify appropriate situations where patients can or should be discharged from the practice

Health Advocate

By the end of this rotation the resident will:

- 1) Mobilize community resources as appropriate to meet the health needs of individual patients
- 2) Counsel patients appropriately regarding modification of risk factors for neurological disease
- 3) Recognize and respect the diverse cultural, social, biological, economic, and religious factors that may influence patient health and affect patient interaction with the health care system

Scholar

By the end of this rotation the resident will:

- 1) Recognize the need to engage in lifelong learning in neurological practice, and begin to develop a plan to maintain professional competence
- 2) Critically assess the neurological literature and apply evidence-based medicine principles to practice
- 3) Identify gaps in his or her knowledge and develop appropriate learning questions and strategies to fill these gaps

Professional

During this rotation the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the approach to managing patients with neurological diseases
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations
- 5) Describe methods of ensuring patient privacy and confidentiality in an office setting and in a hospital setting

Neuroradiology

Medical Expert

By the end of this rotation, the resident will:

- 1) Identify the detailed normal anatomy of the brain, skull, and spine, as seen on plain X-ray, computerized axial tomogram, and magnetic resonance images, and extracranial and intracranial arterial and venous systems, as seen on angiography
- 2) Interpret changes in the plain X-ray, MRIs, and CT imaging of the neuraxis by stating a most probable and differential diagnosis of the common neurological conditions that produce such changes
- 3) Discuss the techniques and limitations of the various common protocols for neuroimaging, including plain X-rays, MRIs, and CT imaging of neuraxis and its appendages
- 4) Discuss the techniques, risks, and interpretation of cerebral and spinal angiography
- 5) Recognize and treat reactions to radiographic contrast material

COMPETENCIES OF THE PROGRAM

Communicator

By the end of this rotation the resident will:

- 1) Provide clinical summaries for appropriate neuroimaging protocol planning and interpretation
- 2) Produce, with the assistance of a neuroradiologist, concise written reports of the results of neuroradiological procedures
- 3) Provide accurate verbal reports of neuroradiological procedures to referring physicians in emergency situations

Collaborator

By the completion of this rotation the resident will:

- 1) Demonstrate understanding of the roles of the different members of the neuroradiology team
- 2) Demonstrate respectful interactions with other members of the neuroradiology team
- 3) Work appropriately with other physicians (including neurologists and neurosurgeons) to ensure the best care for patients requiring neuroimaging

Manager

By the completion of this rotation the resident will:

- 1) Recognize and analyze the costs and benefits of available diagnostic procedures in neuroradiology to facilitate optimal allocation of finite resources to patients with neurological illnesses
- 2) Manage time effectively, including prioritizing imaging procedures for patients with neurological symptoms based on the acuity of the presenting problem

Health Advocate

By the completion of this rotation, the resident will:

- 1) Recognize opportunities for health advocacy within the field of neuroradiology, including advocating for adequate resources to meet the imaging needs of patients with neurological symptoms
- 2) Appreciate the role of the neuroradiologist in advocating for the best imaging for patients, including discussing cases with referring physicians or advocating for additional imaging based upon results of initial studies

Scholar

During this rotation, the resident will:

- 1) Participate actively in organized educational activities and teaching rounds
- 2) Critically assess the neuroradiological literature and apply evidence-based principles to the imaging of patients with neurological symptoms and signs
- 3) Identify gaps in his or her knowledge and develop appropriate learning questions and strategies to fill these gaps

Professional

During this rotation the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the approach to imaging patients with neurological signs and symptoms, including the process of obtaining informed consent for procedures and tests
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations

Research

Communicator

Present a completed research project, including design, results, and conclusions, in at least one scientific presentation (e.g., Resident Research Day)

Collaborator

- 1) Interact in a collaborative fashion with the research supervisor to develop a research design and carry out the research project
- 2) Contribute effectively to the presentation materials for the research project (this may include an oral presentation, poster, or manuscript)

Manager

- 1) Take responsibility for initiating and sequencing activities of the research plan and project implementation in a timely fashion
- 2) Utilize personal time and energy effectively to balance other residency responsibilities and the research project
- 3) Set priorities for the timing of the implementation of the research project

Scholar

- 1) Participate in clinical or basic-science studies as a member of a research team
- 2) Develop a research question, in conjunction with the research supervisor
- 3) Review the literature using critical appraisal skills to support your research hypothesis
- 4) Write a research proposal that may be used to apply for ethics submissions and/or grant funding (grant funding is not a requirement of the research objects)
- 5) Implement a research project, with support from the research supervisor
- 6) Analyze the study results with support from the research supervisor
- 7) Interpret the findings of the study
- 8) Present the research in a scholarly forum

Professional

- 1) Demonstrate professional attitudes, including integrity and honesty, as they relate to medical research
- 2) Describe how ethical principles guide the research process

Neurosurgery Service

Medical Expert

By the end of this rotation the resident will:

- 1) Describe the indications for, and provide a basic description of the performance of the following neurosurgical procedures:
 - a) Craniotomy for tumor
 - b) Brain biopsy (open and stereotactic)
 - c) Craniotomy for aneurysm
 - d) Epilepsy surgery, including awake craniotomy
 - e) Ventriculoperitoneal shunt
 - f) Lumbar and cervical discectomy

COMPETENCIES OF THE PROGRAM

- g) Carotid endarterectomy
 - h) Carpal tunnel release
 - i) Nerve and muscle biopsy
 - j) Craniotomy or burr hole procedures for trauma
- 2) Identify important complications of common neurosurgical procedures
- 3) Outline the principles of management for the following neurosurgical emergencies:
- a) Intracerebral hemorrhage
 - b) Subarachnoid hemorrhage
 - c) Acute hydrocephalus
 - d) Acute cerebellar infarction
 - e) Acute spinal cord compression
 - f) Acute cauda equina compression
 - g) Craniocerebral trauma
 - h) Spinal cord and spinal column trauma
- 4) Discuss the pathophysiology of increased intracranial pressure, recognize its clinical presentation, develop an adequate differential diagnosis for a patient presenting with increased intracranial pressure, and demonstrate proficiency in its management
- 5) Develop a clinical approach to the following scenarios, including the development of a differential diagnosis and an evidence-based plan for investigation and management:
- a) Bilateral weakness, including that due to spinal cord injury, spinal tumors, cervical spondylolytic myelopathy, cervical disc herniation, epidural abscess, and spinal AVM
 - b) Unilateral or focal weakness, including that due to carpal tunnel syndrome, other peripheral nerve lesions, radiculopathy, brain tumors, intracerebral hemorrhage, and acute stroke
 - c) Bilateral numbness, including that due to spinal cord tumor or syringomyelia
 - d) Focal or unilateral numbness, including that due to carpal tunnel syndrome, transient ischemic attacks, and partial seizures
 - e) Anosmia, including that due to craniocerebral trauma and olfactory groove meningioma
 - f) Visual loss, including that due to optic sheath meningioma, optic nerve or chiasmal glioma, and carotid ophthalmic aneurysm
 - g) Diplopia, including that due to posterior communicating artery aneurysm
 - h) Altered hearing and vertigo, including that due to acoustic neuroma, other cerebellopontine angle tumors, and glomus tumors
 - i) Ataxia and gait disturbance, including that due to cerebellar infarction, hemorrhage, neoplasm, or hydrocephalus
 - j) Dementia with a surgically treatable etiology, including normal pressure hydrocephalus and chronic subdural hematoma
 - k) Coma, including that due to intracerebral or subarachnoid hemorrhage or craniocerebral trauma
- 6) Identify indications for surgical management in neurological diseases, including Parkinson's disease, epilepsy, and chronic pain syndromes

Communicator

By the end of this rotation the resident will:

- 1) When dealing with patients and their families, communicate effectively and regularly, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families

COMPETENCIES OF THE PROGRAM

- 3) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively where possible
- 6) Maintain accurate and up-to-date clinical notes and records for each patient, including admission histories and physical notes, daily progress notes, and discharge summaries
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team
- 9) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 10) Ensure that informed consent has been obtained for procedures or treatments and that the requisitions for investigations or consultations have been filled out clearly, concisely, legibly, and factually

Collaborator

During this rotation the resident will:

- 1) Consult appropriately with other physicians and health care professionals
- 2) Contribute effectively to interdisciplinary team activities, including attending multidisciplinary team meetings for hospital inpatients and leading such meetings when appropriate
- 3) Work effectively with resident or medical student colleagues assigned to the Neurosurgical Service to form a collegial and efficient team
- 4) Recognize and respect the role of other health care professionals (neurosurgeons, neuroradiologists, neuropathologists, psychiatrists, clinical nurse specialists, ward nurses, OR nurses, occupational therapists, physiotherapists, speech-language pathologists, pharmacists, social workers, and clerical staff) in managing patients requiring neurosurgical treatment

Manager

By the end of this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem
- 4) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with neurosurgical diseases
- 5) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

During this rotation the resident will:

- 1) Counsel patients and others on aspects of prevention of neurosurgical disorders, including risk factors, and genetic and environmental concerns
- 2) Recognize the role of lay organizations and community services in providing support for individuals with neurosurgical diseases, and make appropriate referrals to such organizations and services

COMPETENCIES OF THE PROGRAM

- 3) Advocate effectively for timely access to investigations, consultations, and treatment interventions for patients based upon the urgency of the presenting problem
- 4) Counsel patients regarding a return-to-work plan following neurosurgical procedures

Scholar

During this rotation the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 2) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 3) Critically assess the neurosurgical literature as it relates to patient diagnosis, investigation, and treatment

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Show appropriate consideration for the opinions of other members of the health care team, including fellow trainees, in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved
- 4) Recognize the ethical and medico-legal principles that guide the practice of neurosurgery, including principles of informed consent for procedures, emergency consent, and surrogate decision-making
- 5) Demonstrate self-awareness, including recognition of his or her own limitations
- 6) Be punctual and reliable in all professional activities

General Internal Medicine Service

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate proficiency in assessment of patients presenting with undifferentiated medical complaints and problems, including:
 - a) Eliciting a relevant history
 - b) Performing an appropriate physical examination
 - c) Employing diagnostic tests appropriately
- 2) Develop evidence-based management approaches to common medical illnesses, as well as less common but remediable conditions
- 3) Demonstrate effective, integrated management of multiple medical problems in patients with complex illnesses

COMPETENCIES OF THE PROGRAM

- 4) Perform common procedures used in the diagnosis and management of medical patients, including:
 - a) ECG interpretation
 - b) Central line insertion
 - c) Bone marrow aspiration/biopsy
 - d) Thoracentesis
 - e) Lumbar puncture
 - f) Paracentesis
 - g) Joint aspiration

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with medical illnesses
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigations, and proposed management in a clear, understandable manner
- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing medical illness-related topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of medical patients
- 2) Recognize and respect the roles of the various team members, including other physicians, nursing staff, respiratory therapists, social workers, occupational therapists, physiotherapists, pharmacists, nutritionists, and support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible
- 5) Demonstrate effective time management to achieve balance between career and personal responsibilities

Health Advocate

By the end of this rotation the resident will:

- 1) Identify important determinants of health, including psychosocial, economic, and biological determinants
- 2) Adapt patient assessment and management based on health determinants

COMPETENCIES OF THE PROGRAM

- 3) Recognize the importance of preventative strategies in patients with medical illness or risk factors for medical illness
- 4) Demonstrate appropriate attention to prevention counseling in patient encounters
- 5) Advocate where appropriate for timely patient access to tests or consultations, based upon the acuity of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 2) Demonstrate the ability to generate clinical questions related to patient care and utilize and analyze available resources to develop and implement evidence-based solutions to such questions
- 3) Demonstrate adequate knowledge of the basic sciences relevant to patient care, including physiology, pathophysiology, biochemistry, and pharmacology
- 4) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 5) Critically assess the medical literature as it relates to the diagnosis, investigation, and treatment of cardiovascular diseases

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of medical and research practice, including the ethics surrounding consent to treatment and end-of-life care
- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors, including punctuality and reliability

Cardiology Service

Medical Expert

By the end of this rotation the resident will:

- 1) Develop evidence-based approaches to the investigation and management of patients presenting with:
 - a) Chest pain
 - b) Heart failure/dyspnea
 - c) Disturbances of cardiac rhythm
 - d) Hypotension/shock/cardiac arrest
 - e) Hypertensive crisis
- 2) Develop evidence-based management strategies for the following diseases:
 - a) Acute myocardial infarction
 - b) Unstable angina
 - c) Acute pulmonary edema and chronic heart failure

COMPETENCIES OF THE PROGRAM

- d) Cardiac arrest/life-threatening arrhythmias
 - e) Disorders of cardiac rhythm and conduction
 - f) Shock/hypotension
 - g) Hypertensive urgency/emergency
 - h) Common forms of valvular heart disease
 - i) Endocarditis
 - j) Pericardial diseases
 - k) Atherosclerosis
- 3) Demonstrate proficiency in the following procedures:
- a) Clinical examination of the cardiovascular system
 - b) ECG interpretation
 - c) Chest X-ray interpretation as it pertains to cardiovascular disease
 - d) Resuscitative skills according to ACLS guidelines
 - e) Arterial and venous catheterization
- 4) Identify the indications for, limitations of, and risks associated with the following:
- a) Holter monitor/loop recorder
 - b) Exercise ECG – stress test
 - c) Echocardiography
 - d) Myocardial perfusion imaging and radionuclide angiography
 - e) Cardiac catheterization and angiography
 - f) Revascularization strategies
- 5) Recognize the neurological complications of cardiovascular diseases and cardiac procedures

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with cardiovascular disease
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigation, and proposed management in a clear, understandable manner
- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing cardiac topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of cardiovascular patients
- 2) Recognize and respect the roles of the various team members, including invasive and noninvasive cardiologists, cardiac surgeons, nursing staff, technicians in various cardiologic services, respiratory therapists, social workers, occupational therapists, physiotherapists, pharmacists, nutritionists, and clinic support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services

COMPETENCIES OF THE PROGRAM

- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible

Health Advocate

By the end of this rotation the resident will:

- 1) Identify social, genetic, and economic factors that predispose to or exacerbate cardiovascular disease
- 2) Recognize the importance of preventative strategies in cardiovascular disease, particularly as they relate to:
 - a) Modification of risk factors for atherosclerosis, including smoking, hypertension, diabetes, and hyperlipidemia
 - b) Prevention of cardiac thromboembolism
 - c) Recognition of the importance of identifying and treating hypertension to prevent complications, including MI, stroke, renal dysfunction, and heart failure
 - d) Antibiotic prophylaxis to prevent endocarditis
 - e) Secondary prevention of asymptomatic LV dysfunction and congestive heart failure
- 3) Demonstrate appropriate attention to prevention counseling in patient encounters
- 4) Advocate where appropriate for timely patient access to tests or consultations, based upon the acuity of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Demonstrate understanding of key basic science principles relevant to the function of the cardiovascular system, including:
 - a) Physiology of the cardiac cycle
 - b) Normal cardiac rhythm/conduction
 - c) Determinants of myocardial oxygen demand
 - d) Pharmacology of cardioactive drugs
 - e) Pathophysiology of common cardiovascular diseases, including atherosclerosis
- 2) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 3) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 4) Critically assess the medical literature as it relates to the diagnosis, investigation, and treatment of cardiovascular diseases

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society, including requirements to inform various licensing authorities regarding patients where the severity of their cardiac disease imposes physical limitations that impact occupational or driving safety
- 3) Demonstrate understanding of the ethical underpinnings of providing care for patients with cardiovascular diseases, including the ethics surrounding consent to treatment

COMPETENCIES OF THE PROGRAM

- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors including punctuality and reliability

Emergency medicine

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate proficiency in assessment of patients presenting with undifferentiated complaints and problems, including:
 - a) Eliciting a relevant history
 - b) Performing an appropriate physical examination
 - c) Employing diagnostic tests appropriately
- 2) Develop an approach to the assessment, investigation, and emergency management of patients presenting with:
 - a) Fever
 - b) Dizziness and vertigo
 - c) Weakness
 - d) Confusion
 - e) Decreased level of consciousness
 - f) Seizures
 - g) Headache
 - h) Dyspnea
 - i) Chest pain
 - j) Syncope
 - k) Nausea and vomiting
 - l) Abdominal pain
 - m) Gastrointestinal bleeding
 - n) Diarrhea or constipation
 - o) Jaundice
 - p) Vaginal bleeding and acute pelvic pain
 - q) Back pain
 - r) Orthopedic trauma
 - s) Wound management issues
 - t) Intoxication
 - u) Acute psychiatric symptoms
- 3) Develop familiarity with common emergency procedures, demonstrating proficiency if possible in the following:
 - a) Suturing
 - b) Casting
 - c) Foreign body removal
 - d) Venous access
 - e) Chest tube placement
 - f) Intubation

COMPETENCIES OF THE PROGRAM

- 4) Distinguish problems requiring urgent care from those requiring emergent care, and develop speed and efficiency in assessments of those patients with particularly acute problems
- 5) Recognize the typical presentations of patients with neurological illnesses requiring emergent care, including status epilepticus, acute stroke syndromes, infectious diseases of the CNS, and acute neuromuscular syndromes

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories in an efficient manner from patients presenting to the emergency department
- 2) Anticipate problems of interpretation or expression by patients and their families
- 3) Demonstrate effective presentation of clinically relevant information at the bedside
- 4) Convey information to patients and families about diagnosis, proposed investigation, and proposed management in a clear, understandable manner
- 5) Explain the reason for consultations with other physicians or members of the health care team
- 6) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 7) When requesting investigative procedures, ensure that adequate information is provided about the patient and the reasons for the investigation to the person who will be performing or reporting the study
- 8) Maintain clear and concise written records that accurately reflect the clinical encounter

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of patients in the emergency department
- 2) Recognize and respect the roles of the various team members, including other physicians, nursing staff, respiratory therapists, social workers, and support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible
- 5) Demonstrate effective time management to achieve balance between career and personal responsibilities
- 6) Assign priority to patient care tasks taking into account the acuity of the presenting problem

COMPETENCIES OF THE PROGRAM

Health Advocate

By the end of this rotation the resident will:

- 1) Identify important determinants of health, including psychosocial, economic, and biological determinants
- 2) Adapt patient assessment and management based on health determinants
- 3) Recognize the importance of preventative strategies, and demonstrate appropriate attention to prevention counseling in patient encounters
- 4) Advocate where appropriate for timely patient access to tests or consultations, based upon the acuity of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 2) Demonstrate the ability to generate clinical questions related to patient care and utilize and analyze available resources to develop and implement evidence-based solutions to such questions
- 3) Demonstrate adequate knowledge of the basic sciences relevant to patient care, including physiology, pathophysiology, biochemistry, and pharmacology
- 4) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 5) Critically assess the medical literature as it relates to emergency medicine
- 6) Participate actively in Emergency Medicine Grand Rounds and journal clubs

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of medical practice, including the ethics surrounding consent to treatment in the emergency setting
- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors, including punctuality and reliability

Hematology

Medical Expert

By the end of this rotation the resident will:

- 1) Develop evidence-based approaches to the investigation and management of patients presenting with:
 - a) Anemia
 - b) Polycythemia
 - c) Thrombocytopenia
 - d) Thrombocytosis
 - e) Leukocytosis
 - f) Neutropenia

COMPETENCIES OF THE PROGRAM

- g) Pancytopenia
 - h) Lymphadenopathy/splenomegaly
 - i) Suspected venous thromboembolism
 - j) Suspected bleeding disorder
- 2) Develop evidence-based management strategies for the following diseases:
- a) Iron-deficiency anemia
 - b) Megaloblastic anemia
 - c) Anemia of chronic disease
 - d) Thalassemia
 - e) Sickling disorders
 - f) Autoimmune hemolytic anemia
 - g) Microangiopathic hemolytic anemia
 - h) Immune thrombocytopenia
 - i) Chronic and acute leukemias
 - j) Polycythemia vera and primary thrombocytosis
 - k) Myelodysplastic syndromes
 - l) Aplastic anemia
 - m) Lymphomas and myeloma
 - n) Deep vein thrombosis and pulmonary embolism
 - o) Bleeding disorders
- 3) Recognize common neurological complications of hematological disorders, including thrombosis or hemorrhage affecting the nervous system
- 4) Demonstrate proficiency in the following procedures:
- a. Clinical examination of superficial lymph nodes
 - b. Clinical examination of the spleen
 - c. Bone marrow aspiration and biopsy
 - d. Interpretation of the complete blood count and blood smear
- 5) Demonstrate appropriate use of hypercoagulability screening, particularly as it applies to patients presenting with stroke
- 6) Identify appropriate use of blood transfusion products and appreciate potential complications of transfusion

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with hematological diseases
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigation, and proposed management in a clear, understandable manner
- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing hematological topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of hematological patients

COMPETENCIES OF THE PROGRAM

- 2) Recognize and respect the roles of the various team members, including nurse clinicians, pharmacists, palliative care team members, and clinic support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible

Health Advocate

By the end of this rotation the resident will:

- 1) Identify social, genetic, and economic factors that predispose to or exacerbate hematological disease
- 2) Recognize the importance of preventative strategies in hematological disease
- 3) Demonstrate appropriate attention to prevention counseling in patient encounters

Scholar

By the end of this rotation the resident will:

- 1) Demonstrate understanding of key basic science principles from biochemistry and physiology that underlie the normal functioning of the blood system
- 2) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 3) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 4) Critically assess the hematological literature as it relates to patient diagnosis, investigation, and treatment

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of providing care for patients with hematological disease, including the ethics surrounding consent to transfusion of blood products and the ethical principles underlying decision-making for end-of-life care in patients with hematological disease
- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors, including punctuality and reliability

Infectious Diseases

Medical Expert

By the end of this rotation the resident will:

- 1) Develop evidence-based approaches to the investigation and management of patients presenting with:
 - a) Fever
 - b) Leukocytosis
 - c) Septic shock
 - d) Stiff neck and headache
 - e) Heart murmurs
 - f) Lymphadenitis/lymphadenopathy
 - g) Soft tissue inflammation
 - h) Inflamed joints
 - i) Cough and sputum production
 - j) Embolic lesions
 - k) Painful throat, ears, or sinuses
- 2) Develop evidence-based management strategies for the following diseases:
 - a) Fever of unknown origin
 - b) Septicemia
 - c) Meningitis
 - d) Encephalitis
 - e) Pneumonia, bronchitis
 - f) Mediastinitis
 - g) Endo- or pericarditis
 - h) Intraabdominal sepsis
 - i) Hepatitis
 - j) Osteomyelitis and septic arthritis
 - k) HIV infection and AIDS
 - l) Viral syndromes
 - m) Infections in immunosuppressed patients
 - n) Pharyngitis, sinusitis, otitis
 - o) Soft tissue infections
 - p) Sexually transmitted diseases
- 3) Recognize the neurological complications of infectious diseases, including HIV, Lyme disease, West Nile virus, and syphilis
- 4) Demonstrate proficiency in the following procedures:
 - a) Interpretation of microbiology laboratory investigations, including stains, cultures, and serology
 - b) TB skin test
 - c) Monitoring HIV infection with laboratory tests

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with infectious diseases
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigations, and proposed management in a clear, understandable manner

COMPETENCIES OF THE PROGRAM

- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing infectious disease topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of infectious disease patients
- 2) Recognize and respect the roles of the various team members, including infection control nurses, pharmacists, clinical microbiology laboratory staff, and clinic support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, including the costs of antibiotics and infection control procedures

Health Advocate

By the end of this rotation the resident will:

- 1) Identify social, genetic, and economic factors that predispose to or exacerbate infectious disease
- 2) Recognize the importance of preventative strategies in infectious disease, including the prophylaxis of certain communicable diseases
- 3) Demonstrate appropriate attention to prevention counseling in patient encounters
- 4) Recognize the advocacy role of the infectious disease physician in controlling infectious diseases in hospitals, communities, and populations through methods such as advocating vaccinations, contact tracing in certain illnesses, use of prophylactic antibiotics for contacts of infected individuals where appropriate, and counseling to communities regarding methods of reducing the risk of transmission of infection

Scholar

By the end of this rotation the resident will:

- 1) Demonstrate understanding of key basic science principles, including microbial virulence factors and host defense mechanisms
- 2) Demonstrate understanding of the pharmacology of selected antimicrobial agents
- 3) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 4) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 5) Critically assess the medical literature as it relates to patient diagnosis, investigation, and treatment in infectious diseases

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of providing care for patients with infectious diseases, including the ethics surrounding consent to investigation and treatment as well as ethical issues related to managing patients with HIV infection
- 4) Identify diseases that are reportable to the Ministry of Health, and recognize the societal responsibility involved in such reporting
- 5) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 6) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 7) Demonstrate self-awareness, including recognition of his or her own limitations
- 8) Demonstrate professional behaviors, including punctuality and reliability

Rheumatology

Medical Expert

By the end of this rotation the resident will:

- 1) Perform an organized, comprehensive MSK screening examination
- 2) Demonstrate those components of the MSK appropriate for the identification of:
 - a) Ankylosing spondylitis
 - b) Lumbar disc disease with radiculopathy
 - c) Fibromyalgia
 - d) IP and MCP capsular distension, median nerve compression, de Quervain's tenosynovitis, flexor tendon nodules
 - e) Medial and lateral elbow epicondylitis, elbow joint capsular distension, olecranon bursitis, rheumatoid nodules
 - f) Frozen shoulder, supraspinatus tendonitis, subacromial bursitis, rotator cuff tear
 - g) Hip joint disease, trochanteric bursitis, meralgia paresthetica
 - h) Knee joint effusions, patellofemoral dysfunction, ligamentous disease of the knee, bursitis at the knee
 - i) Achilles tendonitis, plantar fasciitis, posterior tibial tenosynovitis, MTP inflammation
- 3) Recognize the neurological complications of common rheumatological illnesses, including rheumatoid arthritis, systemic lupus erythematosus, Sjogren's syndrome, scleroderma, and osteoarthritis
- 4) Describe the settings in which the following investigations are appropriate:
 - a) Synovial fluid analysis
 - b) RF, ANA, anti-DNA, anti-ENA, uric acid
 - c) Plain X-rays
 - d) Bone scan
 - e) MSK CT scan
 - f) MSK MRI scan
- 5) Detect and describe characteristic X-ray findings in patients with:
 - a) Rheumatoid arthritis
 - b) Osteoarthritis

COMPETENCIES OF THE PROGRAM

- c) CPPD
 - d) Gout
 - e) Psoriatic arthritis
 - f) Ankylosing spondylitis
- 6) Identify the features on history, examination, and laboratory investigation that permit diagnosis of:
- a) Osteoarthritis
 - b) Rheumatoid arthritis
 - c) SLE
 - d) Psoriatic arthritis
 - e) Fibromyalgia
 - f) Gout
 - g) Pseudo gout
 - h) Palindromic rheumatism
 - i) Septic arthritis
 - j) Polymyalgia rheumatica
- 7) Outline a treatment approach for patients with:
- a) New onset rheumatoid arthritis
 - b) Recurrent gouty arthritis
 - c) Fibromyalgia
 - d) Osteoarthritis of the knee
 - e) Acute low back pain

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with rheumatological disease
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigation, and proposed management in a clear, understandable manner
- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing rheumatological topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of rheumatological patients
- 2) Recognize and respect the roles of the various team members, including occupational therapists, physiotherapists, pharmacists, and clinic support staff
- 3) Consult appropriately with other physicians and health care professionals

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation

COMPETENCIES OF THE PROGRAM

- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible

Health Advocate

By the end of this rotation the resident will:

- 1) Identify social, genetic, and economic factors that predispose to or exacerbate rheumatological disease
- 2) Recognize the importance of preventative strategies in rheumatological disease
- 3) Demonstrate appropriate attention to prevention counseling in patient encounters
- 4) Advocate where appropriate for timely patient access to tests or consultations, based upon the acuity of the presenting problem

Scholar

By the end of this rotation the resident will:

- 1) Demonstrate understanding of key basic science principles from biochemistry and physiology that underlie the normal functioning of the musculoskeletal system
- 2) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 3) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 4) Critically assess the medical literature as it relates to the diagnosis, investigation, and treatment of rheumatological diseases

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of providing care for patients with rheumatological diseases, including the ethics surrounding consent to treatment
- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors, including punctuality and reliability

Critical Care Medicine

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate applied knowledge of the following:
 - a) Respiratory dysfunction
 - i) Determine the presence of respiratory failure, provide for its emergency support, and develop a plan of action for its investigation and management
 - b) Cardiovascular dysfunction

COMPETENCIES OF THE PROGRAM

- i. Recognize the nature of the problem, provide emergency life support including ACLS, and develop a plan for its investigation and management
- c) Neurological dysfunction
 - i. Develop an approach to the patient with an altered level of consciousness, including instituting immediate life-sustaining measures, carrying out an appropriate neurological examination, deriving an anatomic localization and differential diagnosis, and making a plan for investigation and management
 - ii. Recognize acute and chronic neuromuscular disorders requiring life sustaining treatment, and develop a plan for diagnosis, support, and specific therapy
- d) Renal dysfunction
 - i. Recognize the problem of a patient with oliguria or advancing or established renal failure
 - ii. Institute measures to preserve remaining renal function in such patients, while developing a plan for precise diagnosis, adequate supportive measures, and appropriate definitive therapy
- e) Gastrointestinal dysfunction
 - i. Evaluate the nature of the illness in patients presenting with gastrointestinal crisis, including the provision of immediate life-sustaining support and the development of a diagnostic and therapeutic plan
- f) Hepatic dysfunction
 - i. Recognize the problem of jaundice and/or hepatic failure, and provide for immediate life-sustaining support while developing a plan for diagnosis and definitive therapy
- g) Hematological and oncological disorders
 - i. Recognize the problem of a patient with malignancy, thrombotic, or thrombolytic disorder, bleeding, neutropenia, or anemia, and provide life sustaining support while devising a plan for investigation, support, and therapy
- h) Metabolic and endocrine disorders
 - i. Recognize the nature and severity of common metabolic, endocrine, or fluid and electrolyte abnormalities, and develop a plan for precise diagnosis, emergency and long-term treatment, and appropriate monitoring
- i. Septic illness
 - i. Identify the features of catastrophic septic illness, and provide for immediate life-sustaining treatment while devising a plan for definitive diagnosis, continued life support, and appropriate definitive therapy
- j) Intoxication
 - ii. Formulate a differential diagnosis for patients potentially suffering from toxic syndromes
 - iii. Devise a plan to support organ function, prevent further absorption, alter distribution, and enhance elimination of common toxins
- k) Nutritional support
 - i. Evaluate the nutritional status of a critically ill patient
 - ii. Devise a management strategy for providing enteral and/or parenteral nutrition for critically ill patients
- l) Pharmacotherapy
 - i. Demonstrate knowledge of the indications, risks, and side effects of drugs commonly used in the critical care environment, including pressor agents, analgesics, sedatives, and antimicrobials
- m) End-of-life issues

COMPETENCIES OF THE PROGRAM

- i. Where death is inevitable, facilitate a dignified process of withdrawal of life-sustaining support, without withdrawal of care
- 2) Demonstrate practical knowledge of the following technical skills:
 - a) Airway assessment and maintenance
 - b) Care of patients requiring conventional and non-invasive ventilation
 - c) Central venous cannulation
 - d) Resuscitation of patients in undefined shock and with cardiac rhythm disturbance
 - e) Arterial cannulation
 - f) Thoracentesis and chest tube insertion
 - g) Application and maintenance of a pulmonary artery catheter
 - h) Portable chest X-ray interpretation
 - i) Lumbar puncture
 - j) Brain death determination
 - k) Peritoneal tap

(Not all residents will have hands-on exposure to all these experiences during their limited time in the ICU, but residents should strive to become familiar with the indications for and general principles surrounding these interventions.)

Communicator

During this rotation the resident will:

- 1) Obtain thorough and relevant histories
- 2) Present a concise synopsis of a patient's clinical problem to the team during rounds
- 3) Discuss diagnosis, investigations, management, and prognosis with patients and their families in terms that are understandable
- 4) Obtain and document informed consent for tests and procedures
- 5) Maintain clear and accurate clinical notes and records

Collaborator

During this rotation the resident will:

- 1) Recognize and respect the roles of other physicians, nursing staff, respiratory therapists, physiotherapists, occupational therapists, nutritionists, pharmacists, social workers, secretarial staff, and support staff in the provision of optimal patient care in an ICU setting
- 2) Recognize that effective teamwork is critical in the ICU setting, and demonstrate proficiency in working effectively within the ICU health care team
- 3) Consult specialist physicians appropriately to optimize patient care

Manager

During this rotation the resident will:

- 1) Utilize health care resources in a scientifically, ethically, and economically defensible manner
- 2) Be aware of and utilize clinical practice guidelines where appropriate
- 3) Demonstrate effective time management to achieve a balance between professional and personal responsibilities

COMPETENCIES OF THE PROGRAM

Health Advocate

During this rotation the resident will:

- 1) Recognize and respect the diverse cultural, social, and religious factors that may influence patient health and affect patient interaction with the health care system
- 2) Recognize important risk factors for critical illness and counsel patients and their families accordingly to reduce recurrence risks where possible
- 3) Demonstrate awareness of the medical and societal issue of brain death and organ donation, and develop a strategy to introduce this issue in family discussion when necessary

Scholar

During this rotation the resident will:

- 1) Develop an effective personal learning strategy
- 2) Generate clinical questions related to patient care and utilize and analyze available resources to develop and implement evidence-based solutions to such questions
- 3) Demonstrate effective teaching skills in dealings with more junior trainees, patients, families, and other health care personnel
- 4) Participate actively in organized educational activities, including rounds and team meetings

Professional

During this rotation the resident will:

- 1) Demonstrate professional attitudes and qualities, including honesty, integrity, compassion, and respect for patient dignity and confidentiality
- 2) Demonstrate professional behaviors, including punctuality and reliability
- 3) Describe how ethical principles guide the approach to managing patients with critical illness, including principles related to surrogate decision-making for critically ill patients unable to speak for themselves
- 4) Demonstrate self-awareness, including an awareness of his or her own limitations

Psychiatry service

Medical Expert

By the end of this rotation the resident will:

- 1) Demonstrate proficiency in obtaining a psychiatric history, supplementing with collateral history where necessary
- 2) Demonstrate proficiency in the assessment of mental status
- 3) Recognize and classify important psychiatric symptoms and develop a differential diagnosis based upon interpretation of these symptoms
- 4) Develop an evidence-based approach to the evaluation and management of patients presenting with:
 - a) Mood disorders, including depression and bipolar mood disorder
 - b) Anxiety disorders
 - c) Psychotic disorders, including schizophrenia and other delusional disorders
 - d) Suicidal ideation or attempt
 - e) Somatoform disorders
 - f) Personality disorders
 - g) Dementia

COMPETENCIES OF THE PROGRAM

- 5) Identify circumstances where psychiatric symptoms may be due to neurological or systemic disease, and outline a plan for appropriate investigation of such patients
- 6) Recognize the potential neurological complications of treatment for psychiatric illness, including drug-induced movement disorders, and describe a plan for managing such complications
- 7) Describe the mechanisms of action of and indications for medications that have roles in the management of both psychiatric and neurological illnesses, including anticonvulsants, antidepressants, and typical and atypical antipsychotic agents

Communicator

By the end of this rotation the resident will:

- 1) Communicate effectively and regularly with patients and their families, responding to questions in a considerate, sympathetic, and factual manner, appropriate to the clinical situation, in terms that are understandable to the lay person
- 2) Anticipate problems of interpretation or expression by patients and their families, including the potential effects of mental illness on the ability of patients to communicate accurately
- 3) Clearly explain the performance of all diagnostic procedures, the reasons for their performance, their risks, complications, and potential benefits, and the likely outcome of the anticipated results
- 4) Explain the reason for consultations with other physicians or members of the health care team
- 5) Address the issue of prognosis honestly and sensitively where possible
- 6) Maintain accurate and up-to-date clinical notes and records for each patient, including admission history and physical notes, daily progress notes, and discharge summaries
- 7) Ensure that consultation requests provide sufficient information for the physician to understand why the patient is being seen
- 8) Communicate courteously, clearly, effectively, and appropriately with nurses and other members of the health care team

Collaborator

During this rotation the resident will:

- 1) Consult appropriately with other physicians and health care professionals
- 2) Contribute effectively to interdisciplinary team activities, including attending multidisciplinary team meetings for hospital inpatients and leading such meetings when appropriate
- 3) Work effectively with resident or medical student colleagues assigned to the Psychiatry Service to form a collegial and efficient team
- 4) Recognize that the optimal treatment of many patients with mental illness requires a team approach, and understand the role of other health care professionals (nurses, psychologists, occupational therapists, social workers) in managing patients with psychiatric illness
- 5) Identify community agencies that may play a key role in the management of patients with mental illness

Manager

By the end of this rotation the resident will:

- 1) Take responsibility for initiating and sequencing care activities for each patient, interpreting the outcomes, and clearly outlining the medical care plan to all members of the health care team.
- 2) Utilize personal time and energy effectively to balance patient care responsibilities, learning needs, and personal needs
- 3) Set priorities for the timing of assessment of requested consultations based upon the acuity of the presenting problem

COMPETENCIES OF THE PROGRAM

- 4) Demonstrate an appreciation of the cost-benefit of various interventions, and develop strategies for wise use of finite health care resources for patients with mental illness
- 5) Identify indications for inpatient care for patients with mental illness, and demonstrate awareness of the costs and benefits of institutional versus community care
- 6) Use information technology to provide optimal patient care and life-long learning opportunities

Health Advocate

During this rotation the resident will:

- 1) Demonstrate understanding of biological, social, cultural, and economic determinants of mental health
- 2) Counsel patients appropriately regarding prevention strategies for exacerbations of psychiatric illness
- 3) Recognize the role of lay organizations and community services in providing support for individuals with psychiatric diseases, and make appropriate referrals to such organizations and services
- 4) Mobilize resources to assist patients with the personal financial costs of psychiatric illness and its treatment, including advocating for funding support for medications and for income support via disability programs as appropriate

Scholar

During this rotation the resident will:

- 1) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 2) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 3) Critically assess the psychiatric literature as it relates to patient diagnosis, investigation, and treatment
- 4) Develop the ability to ask and answer learning questions that address gaps in knowledge and enhance patient care

Professional

During this rotation the resident will:

- 1) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 2) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 3) Show appropriate consideration for the opinions of other members of the health care team, including fellow trainees, in the management of patient problems and be able to provide means whereby differences of opinion can be discussed and resolved
- 4) Recognize the ethical and medico legal principles that guide the practice of psychiatry, including guidelines for involuntary hospitalization, consent to treatment in the mentally ill, and patient privacy and confidentiality
- 5) Demonstrate self-awareness, including recognition of his or her own limitations
- 6) Be punctual and reliable in all professional activities

Endocrinology

Medical Expert

By the end of this rotation the resident will:

- 1) Develop evidence-based approaches to the investigation and management of patients presenting with:
 - a) Polyuria and polydipsia
 - b) Weight loss and gain
 - c) Palpitations, shakiness, and/or sweating
 - d) Fatigue
 - e) Visual field loss or blurred vision
 - f) Delayed or premature sexual development
 - g) Sexual dysfunction
- 2) Develop evidence-based management strategies for the following diseases:
 - a) Diabetes (Types 1 and 2) and its complications
 - b) Hyper- and hypothyroidism
 - c) Clinically significant and incidentally found nodules of endocrine glands
 - d) Pituitary dysfunction
 - e) Dysfunction of the adrenal cortex and medulla
 - f) Hyper- and hypocalcemia
 - g) Hypogonadism
 - h) Hyperandrogenism
 - i) Hypoglycemia
 - j) Hypertension
- 3) Recognize the neurological complications that may occur in endocrine diseases, including diabetes, thyroid disease, parathyroid disease, and adrenal disease
- 4) Demonstrate proficiency in the following procedures:
 - a) Clinical examination of the thyroid
 - b) Clinical examination to detect complications of diabetes
 - c) Visual field testing and extra ocular muscle testing

Communicator

By the end of this rotation the resident will:

- 1) Obtain thorough and relevant histories from patients with endocrinological diseases
- 2) Demonstrate effective presentation of clinically relevant information at the bedside
- 3) Convey information to patients and families about diagnosis, proposed investigation, and proposed management in a clear, understandable manner
- 4) Produce clear and concise consultation notes that communicate effectively with referring physicians and colleagues
- 5) Develop skills in presenting and discussing endocrinological topics at teaching and patient care rounds

Collaborator

During this rotation the resident will:

- 1) Participate effectively in the multidisciplinary management of endocrine patients
- 2) Recognize and respect the roles of the various team members, including nurse educators, nutritionists, pharmacists, and clinic support staff
- 3) Consult appropriately with other physicians and health care professionals

COMPETENCIES OF THE PROGRAM

Manager

During this rotation the resident will:

- 1) Participate in the functioning of the health care team, assuming leadership responsibilities where appropriate
- 2) Demonstrate appropriate use of available resources, including diagnostic tests, inpatient services, and consultative services
- 3) Recognize the economic implications of clinical decisions regarding resource allocation
- 4) Develop an understanding of the costs of treatment for individual patients, and an awareness of the resources available to assist in paying for those aspects of care for which patients are financially responsible

Health Advocate

By the end of this rotation the resident will:

- 1) Identify social, genetic, and economic factors that predispose to or exacerbate endocrine disease
- 2) Recognize the importance of preventative strategies in endocrine disease
- 3) Demonstrate appropriate attention to prevention counseling in patient encounters

Scholar

By the end of this rotation the resident will...

- 1) Demonstrate understanding of key basic science principles from biochemistry and physiology that underlie the normal functioning of the endocrine system
- 2) Develop effective teaching skills through teaching other physicians (including medical students and house officers), other health care personnel, and patients
- 3) Develop a strategy to maintain professional competence through various methods of continuing medical education
- 4) Critically assess the endocrinological literature as it relates to patient diagnosis, investigation, and treatment

Professional

During this rotation the resident will:

- 1) Recognize his or her professional obligations to patients and colleagues
- 2) Demonstrate awareness of the responsibility of the medical profession to society
- 3) Demonstrate understanding of the ethical underpinnings of providing care for patients with endocrine disease, including the ethics surrounding consent to investigation and treatment
- 4) Demonstrate personal and professional attitudes, including integrity, honesty, and compassion, consistent with developing into the consulting physician role
- 5) Include the patient in discussions and decisions concerning appropriate diagnostic and management procedures
- 6) Demonstrate self-awareness, including recognition of his or her own limitations
- 7) Demonstrate professional behaviors, including punctuality and reliability

TEACHING AND LEARNING OPPORTUNITIES

There are two major components to this chapter: Didactic centralized components of curriculum and Rotation-based components of curriculum.

Didactic centralized components of curriculum

Morning Meetings 2-3 times per week: The competencies from the morning meetings are to:

- a) Educate all attending residents, monitor patient care, and review management decisions and their outcomes
- b) Develop competence in short presentations of all admitted patients in a scientific and informative fashion
- c) Learn and gain confidence in presenting long cases in a systematic fashion
- d) Develop appropriate differential diagnoses and proper management plans
- e) Present 5-minute-topic presentations on the disease of interest

Morbidity and Mortality Rounds

Mortality and morbidity rounds are conducted at least once every 4-8 weeks. The program director and department chairman will assign the task to a group of trainees who will prepare and present the cases for all department members. The proceedings are generally kept confidential by law. The competencies of the mortality and morbidity conference are to:

- a) Focus on the goal of improving patient care and identify areas of improvement for clinicians involved in case management
- b) Prevent errors that lead to complications
- c) Modify behavior and judgment based on previous experience
- d) Identify systems issues that may affect patient care, such as outdated policies and changes in patient identification procedures

Grand Rounds/Guest Speaker Lectures

Experienced senior staff members from different neuroscientific disciplines will present these rounds on a weekly basis. The topics will be selected from the core knowledge of the curriculum.

The competencies of the grand rounds are to:

- a) Increase neurology residents' knowledge and skills, and ultimately, improve patient care
- b) Understand and apply current practice guidelines in the field of neurology and its branches
- c) Describe the latest advances in the field of neurology and research
- d) Identify and explain areas of controversy in the field of neurology

Case Presentations

Assigned residents, under the supervision of specialized seniors, conduct case presentations weekly. The presented cases are those that have interesting findings, unusual presentations, or difficult diagnoses or management. The competencies of case presentations are to:

- 1) Present a comprehensive history and physical examination with details pertinent to the patient's problem
- 2) Formulate a list of all problems identified in the history and physical examination
- 3) Develop a proper differential diagnosis for each problem
- 4) Formulate a diagnosis/treatment plan for each problem

- 5) Present a follow-up patient's case, in a focused, problem-based manner that includes pertinent new findings and diagnostic and treatment plans
- 6) Demonstrate a commitment to improving case presentation skills by regularly seeking feedback on presentations
- 7) Accurately and objectively record and present data

Journal Clubs, Critical Appraisal, and Evidence-based Medicine

Journal club meeting is conducted at least once every 4 weeks. The chief resident or program director will choose a new article from a reputable journal and forward it to one of the senior residents at least two weeks before the scheduled meeting.

The competencies of journal club are to:

- 1) Promote continuing professional development
- 2) Keep up-to-date with the literature
- 3) Disseminate information on and build up debate concerning good practice
- 4) Ensure that professional practice is evidence-based
- 5) Learn and practice critical appraisal skills
- 6) Provide an enjoyable educational and social occasion

Joint Specialty Meetings (Neuroradiology, Neuropathology, Neurosurgery) Weekly, biweekly, or monthly

The competencies of the joint specialty meeting are to:

- a) Provide the knowledge, technical skills, and experience necessary to interpret and correlate clinical findings, and laboratory dates, such as radiological imaging, with the pathological changes
- b) Promote effective communication and sharing of expertise with peers and colleagues
- c) Promote the development of investigative skills to better understand pathological processes as they apply to both individual patients and the general patient population
- d) Promote the acquisition of knowledge; provide experience in laboratory direction and management; encourage residents to assume a leadership role in the education of other physicians and allied health professionals

Academic Half Day (AHD)

The half-day curriculum will be organized around themes. As much as possible, sessions related to the same theme will be delivered over consecutive weeks to ensure continuity of learning.

The curriculum will consist of 45 half-day teaching sessions per year (90 teaching hours). The entire curriculum will be presented twice during a resident's training (i.e., a 225-hour curriculum, repeated every 30 months).

Theme 1: Neuro-Ophthalmology/Otology

Core Topics

- Optic nerve disorders (1h)
- Approach to diplopia (1h)
- Nystagmus and other disorders of gaze (1h)
- Transient monocular/binocular vision loss (1h)
- Optic neuropathy/neuritis (1h)
- Interpretation of visual fields (1h)
- Ischemic ocular motor cranial neuropathy (1h)
- Pupil abnormality (1h)
- Approach to dizziness and vertigo (1h)

Special Topics

- Basic neuroscience (2h)
 - Visual pathways
 - Control of eye movements
 - Vestibular system
 - CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 10 hours

Theme 2: Neuro-Oncology

Core Topics

- Primary brain and spinal cord tumors (2 hours)
- Metastatic involvement of the nervous system (1 hour)
- Paraneoplastic syndromes (1 hour)
- Neuroradiology of brain tumors (1-2 hrs.)

Special Topics

- CanMEDS Communicator: "Breaking Bad News" (1-2 hrs.)
- Neuropathology: Primary brain tumors (1-2 hrs.)
- Basic neuroscience: Molecular biology of brain tumor development (1h)
- CanMEDS Scholar (Evidence-based Neurology)

Total: 8-10 hours

Theme 3: Pain And Headache

Core Topics

- Primary headache syndromes - migraine, cluster headache, tension (2 h)
- Less common headache syndromes – IIH, intracranial hypotension, post-concussive, SUNCT, etc. (1h)
- Neuropathic pain and its treatment (1h)
- Cancer pain syndromes (1h)
- CanMEDS Collaborator: Multidisciplinary approach to management of back pain

Special Topics

- Basic neuroscience (2h)
 - Pain pathways
 - Migraine pathophysiology
 - Pathophysiology of neuropathic pain
 - CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 8 hours

Theme 4: Infectious Diseases In Neurology

Core Topics

- Bacterial/fungal meningitis (1h)
- Viral and aseptic meningitis (1h)
- Viral encephalitis (1h)
- Neurological complications of HIV infection (1h)
- Prion diseases, including Creutzfeldt-Jakob disease (1h)
- West-Nile, leprosy, brain abscess, syphilis, and other rarely seen but important infectious diseases (1h)
- Medical microbiology

Special Topics

- Neuropathology: Infectious diseases of the nervous system (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)
- CanMEDS Health Advocate: Community health issues related to infectious diseases (e.g., West Nile, meningitis) (1h)

Total: 10 hours

Theme 5: Demyelinating Disease

Core Topics

- ☑ Diagnosis and differential diagnosis of multiple sclerosis (1h)
- ☑ Management of MS (1h)
- ☑ Other demyelinating diseases (1h)

Special Topics

- Basic neuroscience: Current concepts of MS pathogenesis (1h)
- Basic neuroscience: Imaging in demyelinating diseases (1h)
- CanMEDS Scholar (Evidence-based Neurology)
- Neuropathology: MS and other demyelinating diseases (1h)

Total: 7 hours

Theme 6: Neurological Complications Of Systemic Disease

Core Topics

- Neurological complications of cardiac disease and cardiac procedures (1h)
- Neurological complications of connective tissue disease (1h)
- Neurological complications of diabetes (1h)
- Neurological complications of pituitary and other endocrine diseases (1h)
- Neurological complications of pregnancy (1h)
- Neurotoxicology, including alcohol (1h)
- Nutritional deficiencies (1h)
- Liver disturbance and hepatic encephalopathy (1h)

Special Topics

- CanMEDS Communicator: The family meeting – techniques for discussing life-and-death decision-making with families of critically ill patients (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 8 hours

Theme 7: Pediatric Neurology

Core Topics

- Approach to the floppy infant (1h)
- Approach to the child with developmental delay or regression (1h)
- Chromosomal abnormalities and inborn errors of metabolism (1h)
- Neurocutaneous syndromes (1h)

Special Topics

- NSR: Developmental milestones, primitive reflexes, and their significance (1 h)
- NSR: Neuroembryology – structures, primary neurulation, neuronal migration, stages of CNS development, cortical architecture layers, Brodmann's areas (1-2h)
- Neuropathology: Congenital anomalies of the brain and spinal cord (1h)
- CanMEDS Communicator: Dealing with "difficult" patients and families (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 7-8 hours

Theme 8: Neurogenetics

Core Topics

- Genetic principles and mechanisms of human disease (2h)
 - Types of inheritance
 - Mitochondrial genetics
 - Genetic heterogeneity
 - Penetrance, other important concepts
- Trinucleotide repeat disorders in neurology (1h)
- CanMEDS Communicator/Professional: Genetic counseling: techniques, bioethics, consent (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 5 hours

Theme 9: Cerebrovascular Disease

Core Topics

- Clinical presentation/localization of stroke syndromes (1h)
- Management of stroke
 - Acute management, including tPA (1h)
 - Secondary prevention (1h)
- Cardiogenic stroke (1h)
- Less common etiologies (i.e., MELAS/vasculitis/venous thrombosis) (1h)
- Intracerebral hemorrhage (1h)

Special Topics

- Stroke in the young/children (1h)
- Basic neuroscience: Vascular anatomy of the nervous system (1h)
- Basic neuroscience: Consequences of cerebral ischemia (1h)
- CanMEDS Health Advocate: Effective counseling of patients regarding risk factor modification (1h)
- CanMEDS Scholar (Evidence-based Neurology)
- CanMEDS Communicator/Ethics: Management of post stroke neurological patient
- Neuropathology: Cerebrovascular disease (1h)

Total: 10 hours

Theme 10: Neuromuscular Disease

Core Topics

- Approach to peripheral neuropathy (1-2h)
- AIDP and CIDP (1h)
- Approach to myopathy (1-2h)
- Diseases of the neuromuscular junction and their treatment (1h)
- The myotonias (1h)
- IVIg
- Neuromuscular pearls
- Clinical examination and investigation for autonomic dysfunction (1h)
- Disorders of the autonomic nervous system (1h)
- Management of respiratory failure in neuromuscular disease
- Physiological basis of normal EMG/NCS and common EMG/NCS abnormalities (1 h)

Special Topics

- Basic neuroscience (2h)
 - Genetics of inherited neuropathies/myopathies
 - Immunopathogenesis of immune-mediated neuropathies
 - Autonomic nervous system
- Neuropathology: Muscle and nerve pathology (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)
- CanMEDS Collaborator: Neuromuscular disease & the multidisciplinary team (1h)

Total: 10-12 hours

Theme 11: Movement Disorders

Core Topics

- Approach to and differential diagnosis of Parkinsonism (1h)
- Therapy of Parkinson's Disease (1h)
- Hyperkinetic movement disorders
 - Tics, myoclonus, and tremor (1h)
 - Chorea and Huntington's disease (1h)
 - The dystonias (1h)
- Acquired and inherited ataxias (1h)

Special Topics

- Basic neuroscience: Basal ganglia anatomy and physiology (1h)
- Basic neuroscience: Spinocerebellar pathways and disorders (1h)
- Neuropathology of key movement disorders (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 9 hours

Theme 12: Epilepsy

Core Topics

- Childhood epilepsies (1h)
- Approach to new-onset seizures in an adult (1h)
- Medical treatment of epilepsy (1h)
 - Rational pharmacotherapy
 - AED pharmacology
- Surgical treatment of epilepsy (1h)
- Status epilepticus (1h)

Special Topics

- EEG: Basic concepts (1h)
- Basic mechanisms underlying epilepsy and treatment, including the action potential, ion channels, neurotransmitters, and epileptogenesis (1-2h)
- Epilepsy and driving, flying, swimming, diving (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)

Total: 8 hours

Theme 13: Cognitive Neurology

Core Topics

- Clinical approach to suspected dementia (1h)
- Clinical approach to aphasia (1h)
- Behavioral neurology examination: Apraxia, agnosia, etc. (1h)
- Alzheimer's disease (1h)
- Vascular dementia (1h)
- Other dementias – FTD, CBD, DLB (1h)

Special Topics

- Neuropathology: The dementias (1h)
- Pathophysiology of the dementias (1h)
- CanMEDS Scholar (Evidence-based Neurology) (1h)
- CanMEDS: Communicator, Health Advocate, Collaborator: Care planning for individuals with dementia (1h)
- CanMEDS Professional: Bioethics around life-sustaining treatment and the demented (1h)

Total: 11 hours

Theme 14: Sleep Neurology

Core Topics

- Approach to sleep studies (1h)
- Sleep disorders, i.e., parasomnias, narcolepsy, sleep disordered breathing (1h)
- Restless leg syndrome (1h)

Total: 3 hours

Theme 15: Trauma Of The Central Nervous System

Core Topics

- Acquired Brain Injury (1 h)
- Approach to mild and severe brain injury
- Pathophysiology and management, including seizures
- CanMEDS: Health Advocate: Returning to sports after mild head injury (1 h)
- Spinal cord injury: Management and pathophysiology (1 h)
- CanMEDS: Collaborator: Rehabilitation of head injury and spinal cord injury (1 h)

Total: 4 hours

Theme 16: Neuro-Intensive Care

Core Topics

- Diagnosis of brain death (1 h)
- Coma (1 h)
 - Post-hypoxic coma: Acute management, prognostic investigations
 - Metabolic encephalopathy
- Critical illness polyneuropathy (1 h)

Special topics

- CanMEDS professional/communicator: End-of-life and the dying patient discussion with families (1h)
- Discussing Do-Not-Resuscitate Orders (1 h)
- Medical error disclosure (1 h)

Total: 5 hours

Theme 17: “Orphan” Topics

Core Topics

- Disorders of smell and taste: Clinical aspects (1h)
- Approach to disorders of bowel, bladder, and sexual function (1h)
- Clinical disorders of CSF circulation, including hydrocephalus (1h)

Special Topics

- Basic neuroscience: Anatomy/physiology of smell and taste (1h)
- Basic neuroscience: Autonomic nervous system (1h)
- Basic neuroscience: CSF pathways (1h)
- Basic neuroscience: Neurotransmitters (Glutamate, GABA, Dopamine, Serotonin, Ach, Opiate)

Total: 10 hours

Neurological emergencies that must be immediately recognized and promptly managed include the following:

- Acute bacterial meningitis
- Acute encephalitis
- Coma
- Recurrent seizures and status epilepticus
- Acute intracranial hemorrhage
- Acute stroke
- Recurrent transient ischemic events and threatened stroke
- Incipient transtentorial herniation
- Acute paralytic illness
- Impending spinal cord compression

Procedures to be mastered by neurology residents while rotating in internal medicine year:

- ECG interpretation
- Central line insertion
- Bone marrow aspiration/biopsy
- Thoracentesis
- Lumbar puncture
- Paracentesis
- Joint aspiration

TEACHING AND LEARNING OPPORTUNITIES

Residents must have clinical and basic sciences knowledge to practice neurology, which includes, but is not limited to*:

Core topic	Detailed components:
Vascular diseases of the central nervous system	<ul style="list-style-type: none"> • Anatomy of cerebral and spinal vascular systems • Physiology of cerebral and spinal blood flow • Risk factors, prevention, etiology, pathophysiology, clinical features, investigation and management of cerebral ischemia, infarction, and related disorders, including: <ul style="list-style-type: none"> ○ Atherothrombotic infarction and carotid stenosis ○ Embolic infarction and cardio-embolic disorders ○ Lacunar infarction ○ Arterial dissection ○ Prothrombotic conditions ○ Vasculitis ○ Thrombosis of cerebral veins and venous sinuses ○ Strokes in adolescents, children, and neonates ○ Management of acute ischemia • Risk factors, prevention, etiology, pathophysiology, clinical features, investigation, and management of hemorrhagic cerebrovascular disorders and vascular malformations, including but not limited to: <ul style="list-style-type: none"> ○ Intracerebral hematomas ○ Subarachnoid hemorrhage and cerebral aneurysms ○ Vascular malformations, including arteriovenous fistulas • Risk factors, prevention, etiology, pathophysiology, clinical features, investigation, and management of vascular diseases of the spinal cord
Neuro-oncology	<ul style="list-style-type: none"> • Epidemiology, etiology, pathogenesis, pathology, clinical features (including localization), investigation, management, and prognosis of neoplasms of the nervous system in adults and children, including but not limited to: <ul style="list-style-type: none"> ○ Primary neoplasms of brain and spinal cord ○ Meningiomas ○ Metastatic neoplasms of brain, spinal cord, and meninges, including spinal cord compression ○ Neoplasms of the skull base and anterior visual pathways, including pituitary adenoma and craniopharyngioma ○ Neoplasms of cranial nerves, peripheral nerves, and nerve roots • Pathogenesis, pathology, clinical features, investigation, management, and prognosis of paraneoplastic neurological syndromes • Pathogenesis, clinical features, and management of intracranial hypertension due to central nervous system (CNS) tumors • Neurological complications of cancer treatment, including chemotherapy and radiation therapy
Disorders of cerebrospinal fluid (CSF) flow and intracranial pressure	<ul style="list-style-type: none"> • Physiology and anatomy of CSF production, flow, and reabsorption, and the blood-brain barrier • Etiology, pathophysiology, clinical manifestations, investigation, and management of disorders of CSF flow and intracranial pressure, including: <ul style="list-style-type: none"> ○ Obstructive hydrocephalus ○ Non-obstructive hydrocephalus, including normal pressure hydrocephalus ○ Idiopathic intracranial hypertension (pseudotumor cerebri) ○ Intracranial hypotension ○ Cerebral edema

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Infectious and transmissible diseases affecting the CNS	<ul style="list-style-type: none"> • Analysis of the CSF and interpretation of the results in CNS infections • Etiology, pathogenesis, pathology, epidemiology, clinical manifestations, investigation, and management of infectious diseases of the CNS, including: <ul style="list-style-type: none"> ○ Meningitis, meningoencephalitis, and encephalitis due to bacterial or viral pathogens ○ Cerebral abscess ○ Epidural abscess, subdural empyema, and intracranial thrombophlebitis ○ CNS tuberculosis ○ Neurosyphilis ○ Lyme disease ○ Fungal infections of the nervous system ○ CNS infections caused by protozoa, Rickettsia species, and parasites ○ Neurological complications of human immunodeficiency virus ○ Opportunistic CNS infections in the immunocompromised patient ○ Prion diseases
Demyelinating and inflammatory diseases of the CNS	<ul style="list-style-type: none"> • Pathogenesis, genetics, pathology, epidemiology, clinical manifestations, investigation, diagnostic criteria, management, and prognosis of multiple sclerosis (MS) • Etiology, pathogenesis, pathology, epidemiology, clinical manifestations, investigation, management, and prognosis of demyelinating and inflammatory CNS diseases other than MS, including: <ul style="list-style-type: none"> ○ Acute disseminated encephalomyelitis and its variants ○ Cerebellitis ○ Brainstem encephalitis ○ Transverse myelitis ○ Optic neuritis ○ Neuromyelitis optica ○ Neurosarcoidosis • Etiology, pathogenesis, pathology, epidemiology, clinical manifestations, investigation, management, and prognosis of diseases that can mimic MS
Epilepsy	<ul style="list-style-type: none"> • Basic mechanisms underlying epilepsy and its treatment, including the action potential, ion channels, neurotransmitters, and epileptogenesis • Classification of epileptic seizures and syndromes • Epidemiology, genetics, clinical manifestations, treatment, and prognosis of epileptic seizures and syndromes in adults and children • Pharmacological principles, complications, and teratogenic effects of anti-epileptic drug administration • Non-pharmacological treatment of epilepsy, including ketogenic diet, surgery, and vagal nerve stimulation • Effects of pregnancy on epilepsy and its management • Diagnosis and management of status epilepticus • Diagnosis and differential diagnosis of non-epileptic seizures
Headache and craniofacial pain	<ul style="list-style-type: none"> • Anatomy and physiology of craniofacial pain pathways • Classification of headache • Pathophysiology, clinical features, and management of headache and craniofacial pain disorders, including but not limited to: <ul style="list-style-type: none"> ○ Primary headaches, including: <ul style="list-style-type: none"> – Migraine and its variants – Tension-type headaches – Trigeminal autonomic cephalgias – Other primary headaches ○ Secondary headaches ○ Thunderclap headache, including reversible cerebral vasoconstriction syndrome ○ Cranial neuralgias and primary facial pain

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Dementia and amnesia	<ul style="list-style-type: none"> • Anatomy and physiology of memory and the limbic system • Classification, diagnostic criteria, pathogenesis, pathology, clinical features, and management of dementia and memory disorders, including: <ul style="list-style-type: none"> ○ Mild cognitive impairment ○ Alzheimer's disease ○ Frontotemporal degeneration and dementia ○ Dementia with Lewy bodies ○ Vascular dementia ○ Other secondary dementias, including Korsakoff syndrome ○ Pseudodementia ○ Transient global amnesia and epileptic amnesia ○ Amnesic states
Delirium and other acute confusional states	<ul style="list-style-type: none"> • Etiology, pathophysiology, clinical features, diagnosis, and management of delirium and other acute confusional states
Syndromes caused by focal CNS lesions	<ul style="list-style-type: none"> • Anatomy and physiology of cerebral cortical function Pathophysiology and clinical features of syndromes caused by focal cerebral lesions, including: <ul style="list-style-type: none"> ○ Lesions of frontal, temporal, parietal, or occipital lobe ○ Brainstem lesions ○ Cerebellar lesions ○ Lesions of white matter tracts, including disconnection syndromes
Movement disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the extrapyramidal motor pathways • Etiology, genetics, pathophysiology, pathology, and clinical features of movement disorders, including but not limited to: <ul style="list-style-type: none"> ○ Primary Parkinsonian disorders, including Parkinson's disease and atypical Parkinsonian disorders ○ Secondary Parkinsonian disorders ○ Chorea/ballismus ○ Dystonia and related disorders ○ Tremor ○ Tics and Tourette's syndrome ○ Paroxysmal dyskinesias ○ Drug-induced movement disorders ○ Myoclonus • Management of movement disorders and treatment complications
Cerebellar and spinocerebellar disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the cerebellum and its pathways • Etiology, genetics, pathophysiology, pathology, clinical features, and management of cerebellar and spinocerebellar disorders, including but not limited to: <ul style="list-style-type: none"> ○ Cerebellar malformations ○ Inherited ataxias and spinocerebellar ataxias ○ Infectious and post-infectious ataxias ○ Cerebellar disorders caused by metabolic dysfunction and inborn errors of metabolism ○ Cerebellar disorders caused by toxins ○ Episodic ataxias ○ Motor neuron disorders

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Motor neuron disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the pyramidal pathways and reflex arc • Mechanisms and management of spasticity • Etiology, pathophysiology, clinical features, and management of motor neuron disorders: <ul style="list-style-type: none"> ○ Disorders primarily affecting upper motor neurons (UMN), including: <ul style="list-style-type: none"> – Cerebral palsy – Primary lateral sclerosis – Hereditary spastic paraplegias – Human T-lymphotrophic virus (HTLV) infections – UMN disorders caused by toxins ○ Disorders primarily affecting lower motor neurons (LMN), including: <ul style="list-style-type: none"> – Pediatric and adult-onset spinal muscular atrophies – Benign focal amyotrophy – Infectious causes of lower motor neuron disorders – Post-polio syndrome – Genetic causes of LMN disorders – LMN disorders caused by inborn errors of metabolism – LMN disorders caused by toxins, radiation, and neoplasms ○ Disorders affecting both upper and lower motor neurons, including: <ul style="list-style-type: none"> – Amyotrophic lateral sclerosis (ALS), including sporadic and familial ALS – ALS syndromes with dementia or parkinsonism – Disorders caused by inborn errors of metabolism
Peripheral neuropathies	<ul style="list-style-type: none"> • Histology and macroscopic anatomy of peripheral nerves, including muscle innervation and sensory dermatomes • Physiology of axons and peripheral nerves and their reactions to injury • Etiology, genetics, pathophysiology, pathology, clinical features, investigation, and management of peripheral nerve disorders, including: <ul style="list-style-type: none"> ○ Hereditary neuropathies ○ Traumatic, entrapment, and idiopathic mononeuropathies ○ Inflammatory and demyelinating polyradiculoneuropathies, including acute and chronic demyelinating polyneuropathies and multifocal motor neuropathy with conduction block ○ Neuropathies caused by metabolic, toxic, and nutritional disorders, including critical illness polyneuropathy ○ Neuropathies caused by systemic inflammatory and vasculitic disorders ○ Neuropathies caused by paraproteinemias, monoclonal gammopathies, and neoplasms, including paraneoplastic disorders ○ Infectious neuropathies
Nerve root and plexus disorders	<ul style="list-style-type: none"> • Anatomy of nerve roots and brachial and lumbosacral plexi, including muscle innervation and sensory dermatomes • Etiology, pathophysiology, pathology, clinical features, investigation, and management of nerve root and plexus disorders, including: <ul style="list-style-type: none"> ○ Traumatic and congenital radiculopathy and plexopathy ○ Disc herniation ○ Diabetic polyradiculopathy, amyotrophy, and other ischemic plexopathies ○ Neoplastic and radiation-induced polyradiculopathy and plexopathy ○ Idiopathic brachial plexopathy and neuralgic amyotrophy ○ Dorsal root ganglion disease
Neuromuscular junction disorders	<ul style="list-style-type: none"> • Etiology, pathophysiology, pathology, clinical features, investigation, and management of diseases affecting the neuromuscular junction, including: <ul style="list-style-type: none"> ○ Myasthenia gravis ○ Congenital myasthenic syndromes ○ Lambert-Eaton syndrome ○ Botulism ○ Disorders caused by drugs and toxins

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Muscular disorders and myopathies	<ul style="list-style-type: none"> • Histology and physiology of normal muscle • Etiology, genetics, pathophysiology, pathology, clinical features, investigation, and management of diseases affecting muscle, including: <ul style="list-style-type: none"> ○ Muscular dystrophies ○ Congenital myopathies ○ Muscle disorders caused by channelopathies ○ Metabolic and mitochondrial myopathies ○ Inflammatory myopathies ○ Myopathies caused by endocrinological and electrolyte disorders ○ Myopathies caused by drugs and toxins ○ Critical illness myopathy
Neurological complications of acquired systemic and metabolic disorders	<ul style="list-style-type: none"> • Etiology, pathophysiology, pathology, clinical manifestations, investigation, management, and prognosis of neurological disorders caused by acquired systemic and metabolic disorders, including: <ul style="list-style-type: none"> ○ Hypo- and hyperglycemia ○ Disorders of electrolytes and water balance ○ Vitamin deficiencies ○ Cardiovascular disorders, including syncope and ischemic-hypoxic encephalopathy ○ Respiratory disorders ○ Hematological disorders ○ Hepatic and gastrointestinal disorders ○ Renal disorders and dialysis ○ Rheumatological disorders and vasculitis ○ Endocrinological disorders, including diseases of the thyroid, parathyroid, adrenal and pituitary glands ○ Complications of organ transplantation and immune suppression
Neurological complications of pregnancy and delivery	
Neurological disorders caused by drugs and toxins	<ul style="list-style-type: none"> • Pathophysiology, pathology, clinical manifestations, investigation, management, and prognosis of neurological disorders caused by drugs and toxins, including: <ul style="list-style-type: none"> ○ Ethanol and other alcohols, including fetal alcohol syndrome ○ Psychoactive drugs, including opioids, stimulants, and hallucinogens ○ Dopamine and dopaminergic agents ○ Anticonvulsants, including fetal teratogenesis ○ Antineoplastic and immunosuppressive agents ○ Cardioactive drugs ○ Bacterial toxins, including botulism, tetanus, and diphtheria ○ Environmental and occupational toxins, including metals, organic chemicals, and carbon monoxide
Traumatic injury of the nervous system and coma	<ul style="list-style-type: none"> • Anatomy and physiology of consciousness • Clinical features, classification, and management of mild brain injury, including criteria for return to playing sports • Clinical features, pathophysiology, pathology, and management of moderate-severe traumatic brain injury and brain herniation • Prognosis for neurological recovery and seizures after traumatic brain injury • Diagnosis of brain death, minimally conscious state, and persistent vegetative state • Clinical features and management of traumatic spinal cord injury

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Inborn errors of metabolism affecting the nervous system	<ul style="list-style-type: none"> • Pathophysiology, genetics, clinical manifestations, investigation, management, and prognosis of neurological disorders caused by inborn errors of metabolism, including: <ul style="list-style-type: none"> ○ Amino acid disorders ○ Organic acidemias ○ Galactosemia ○ Disorders associated with hyperammonemia ○ Pyrimidine disorders ○ Disorders of copper and iron metabolism ○ Lipoprotein deficiencies ○ Mitochondrial and oxidative metabolism disorders ○ Peroxisomal and lysosomal disorders
Developmental abnormalities of the nervous system	<ul style="list-style-type: none"> • Embryology and clinical, radiological, and pathological features of the major developmental abnormalities of the nervous system, including: <ul style="list-style-type: none"> ○ Neural tube defects ○ Disorders of segmentation and cleavage, including holoprosencephaly, septo-optic dysplasia, and dysgenesis of corpus callosum ○ Disorders of proliferation ○ Disorders of migration ○ Disorders of organization ○ Disorders of myelination ○ Posterior fossa malformations • Normal developmental milestones and primitive reflexes • Clinical features, differential diagnosis, and management of delayed development, developmental regression, and behavioral disorders, including: <ul style="list-style-type: none"> ○ Global developmental delay ○ Intellectual impairment ○ Developmental regression/neurodegenerative disorders ○ Motor development disorders ○ Language development disorders ○ Behavioral and attention disorders ○ Autism and pervasive development disorders
Neurogenetic disorders	<ul style="list-style-type: none"> • Basic knowledge of genetics as applied to neurological diseases • Ethical considerations in neurogenetics • Genetics, clinical presentation, management, and testing of the major neurogenetic syndromes, including: <ul style="list-style-type: none"> ○ Neurocutaneous syndromes ○ Trisomy 21 ○ Fragile X syndrome ○ Turner syndrome ○ Noonan syndrome ○ Aicardi syndrome ○ Angelman and Prader-Willi syndromes ○ Cockayne syndrome ○ Rett syndrome

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Sleep disorders	<ul style="list-style-type: none"> • Anatomy and physiology of sleep and wakefulness • Etiology, pathophysiology, classification, clinical features, and management of sleep disorders, including: <ul style="list-style-type: none"> ○ Intrinsic sleep disorders, including: <ul style="list-style-type: none"> – Insomnia – Narcolepsy – Hypersomnia – Central sleep apnea – Restless legs syndrome ○ Extrinsic sleep disorders ○ Parasomnias ○ Sleep disorders associated with neurological disorders
Somatoform (functional) disorders with neurological manifestations	<ul style="list-style-type: none"> • Clinical manifestations, investigation, and management of somatoform disorders with neurological manifestations, including: <ul style="list-style-type: none"> ○ Conversion disorder, including non-epileptic seizures ○ Somatization disorder
Neurointensive care	<ul style="list-style-type: none"> • Recognize and manage neurological conditions requiring an intensive care unit
Neuro-ophthalmological disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the afferent visual pathways, ocular motor system, pupillary pathways, and accommodation • Etiology, genetics, pathophysiology, clinical features (including visual field findings), investigation, and management of neuro-ophthalmological disorders, including: <ul style="list-style-type: none"> ○ Disorders of optic nerve, optic chiasm, retrochiasm pathways, calcarine cortex, and extrastriate visual cortex ○ Neurologically relevant retinal disorders, including retinal ischemia and infarction Papilledema ○ Central and peripheral disorders of eye movement, including those causing strabismus, nystagmus, and saccadic oscillations ○ Pupillary disorders ○ Ptosis ○ Orbital disorders and proptosis
Neuro-otological disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the auditory, vestibular, and vestibulo-ocular systems • Etiology, pathophysiology, clinical features, investigation, and management of neuro-otological disorders, including: <ul style="list-style-type: none"> ○ Sensorineural hearing loss and tinnitus ○ Vertigo and unilateral loss of vestibular function ○ Bilateral loss of vestibular function
Disorders of other cranial nerves and related disorders	<ul style="list-style-type: none"> • Disorders of smell and taste <ul style="list-style-type: none"> ○ Anatomy and physiology of olfaction and taste sensation ○ Etiology, pathogenesis, clinical features, investigation, and management of disorders of smell and taste • Anatomy and physiology of cranial nerves V, VII, and IX – XII and related brainstem and cerebral pathways • Etiology, pathogenesis, clinical features, investigation, and management of disorders of other cranial nerves and related disorders, including: <ul style="list-style-type: none"> ○ Disorders of trigeminal nerve and corneal and facial sensation ○ Disorders of facial nerve and facial movement ○ Glossopharyngeal neuralgia ○ Disorders of the vagus nerve and dysphagia ○ Disorders of the spinal accessory nerve ○ Disorders of the hypoglossal nerve ○ Bulbar and pseudobulbar palsy ○ Multiple cranial nerve palsies

TEACHING AND LEARNING OPPORTUNITIES

Core topic	Detailed components:
Autonomic nervous system disorders	<ul style="list-style-type: none"> • Anatomy and physiology of the autonomic nervous system • Etiology, pathophysiology, clinical features, investigation, and management of disorders of the autonomic nervous system, including: <ul style="list-style-type: none"> ○ Acute autonomic paralysis (pure pandysautonomia) ○ Primary autonomic failure ○ Dysautonomia and orthostatic hypotension caused by peripheral neuropathy ○ Autonomic dysfunction in neurodegenerative disorders ○ Autonomic dysreflexia after spinal cord lesions ○ Neurological disorders of bladder function
Pain disorders	<ul style="list-style-type: none"> • Anatomy and physiology of nociception and pain pathways • Etiology, pathogenesis, clinical features, investigation, and management of pain disorders, including: <ul style="list-style-type: none"> ○ Central and peripheral neuropathic pain disorders ○ Complex regional pain syndrome ○ Post-herpetic neuralgia ○ Back pain
Electroencephalography (EEG)	<ul style="list-style-type: none"> • Physiological basis of normal EEG and common EEG abnormalities • Recognition of normal physiological rhythms in wakefulness, drowsiness, and sleep • Principal characteristics of neurophysiological maturation in children • EEG indications and limitations, including sleep-deprived, video, intensive care monitoring, and ambulatory EEG • Recognition of common EEG abnormalities and their significance
Electromyography and nerve conduction studies (EMG/NCS)	<ul style="list-style-type: none"> • Physiological basis of normal EMG/NCS and common EMG/NCS abnormalities • Indications for and limitations of EMG/NCS in neurological disorders • Recognition of common EMG/NCS abnormalities and their significance
Neuroimaging	<ul style="list-style-type: none"> • Neuroradiological anatomy and pathophysiology • Normal and abnormal neuroimaging findings • Indications, contraindications, and limitations for neuroimaging, including the selection of appropriate magnetic resonance studies and indications for functional neuroimaging • Differential diagnosis of common neuroimaging abnormalities
Other laboratory investigations	<ul style="list-style-type: none"> • Anatomic and physiological basis, indications, contraindications, and interpretation of results, of: <ul style="list-style-type: none"> ○ Lumbar puncture ○ Visual field testing, including Goldmann and automated perimetry ○ Visual evoked responses ○ Auditory brainstem evoked responses ○ Somatosensory evoked responses ○ Vestibular and caloric testing ○ Apnea testing for brain death ○ Edrophonium (Tensilon) test or equivalent test

Core topic	Detailed components:
Classification of, and clinical approach to, manifestations of neurological diseases, including:	<ul style="list-style-type: none"> ○ Muscle weakness, paralysis, and cramps ○ Sensory disturbances ○ Autonomic disturbances ○ Regional pain ○ Seizures and syncope ○ Headache and facial pain ○ Movement disorders ○ Ataxia, incoordination, and disturbances of gait ○ Disturbances of vision, eye movement, and pupillary and eyelid function ○ Dizziness and vertigo ○ Altered hearing ○ Dysphagia ○ Disturbances of speech and language ○ Impaired consciousness and acute confusion ○ Sleep disturbances ○ Disturbances of memory, cognitive function, and behavior ○ Disturbances of smell and taste ○ Developmental delay and regression ○ Dysmorphic features

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Rotational (Practice Based) components of curriculum

Daily Round Based Learning

Daily round is a good opportunity to conduct bedside teaching for small groups of residents, usually those who are involved in patient care. The competencies are as follows:

- Document history and physical examination according to accepted formats, including a complete written data base, problem list, and a focused S.O.A.P. note
- Generate differential diagnoses appropriate to the level of training
- Review admission notes, discharge summaries, and medical reports
- Develop evidence-based management plan
- Interpret lab investigation results (imaging, EEG, EMG, CSF/blood tests, etc.)
- Consult with specialties of other disciplines
- Communicate with patients and families, including risk factors and prevention
- Create discharge and follow-up plans

On-Call Duty Based Learning (OBL)

All residents must do a minimum of 8-10 on-calls per month.

R 2-3

- Elicit a comprehensive history and perform a complete physical examination on admission; write clearly the patient's assessment and differential diagnosis of medical problems; initiate the management plan.
- Discuss the management plan, including investigations and treatment plan, with seniors.
- Communicate the plan to the nurse assigned to patient care.
- Perform the basic procedures necessary for diagnosis and management.

R 4-5

- Supervise the junior residents' admission notes and orders, discuss the proposed management plan, and supervise its implementation.
- Supervise the junior residents' skills in history taking and physical examination.
- Help the junior residents to interpret laboratory investigations and perform bedside diagnostic and therapeutic procedures.
- Attend consultations within and outside the department, including emergency consultations, and participate in outpatient clinics once or twice weekly.

Clinic Based learning (CBL)

R 2-3: (1-2 clinics per week)

- It is strictly prohibited to cover the outpatient clinics without a consultant's supervision.
- Elicit a focused history and physical examination under the supervision of the consultant.
- Briefly present the clinical findings to the attending consultant.
- Discuss the differential diagnosis and management plan with the attending consultant.
- Write the patient's assessment and differential diagnosis, and the management plan.
- Develop communication skills from the attending consultant.

R 4-5: (1-2 clinics per week, including longitudinal clinic)

- It is strictly prohibited to cover the outpatient clinics without a consultant's supervision.
- Senior residents will follow up the patient for a prolonged duration, under the supervision of the attending consultant.
- Supervise notes, orders, and management of the attending junior resident.
- Write concise notes during the on-call and at least three times per week for inpatients.
- Discuss the management plan, including investigations, treatment, and referral to other disciplines with consultant.
- Discuss with consultant the need for specialized procedures.
- Elicit clinical signs from junior residents.
- Interpret and discuss the laboratory results with junior residents.
- Assess the performance of junior resident in terms of focused history taking, focused physical examination, and communication skills.

Self-Directed Learning (SDL)

- Achieving personal learning goals beyond the essential, core curriculum
- Maintenance of personal portfolio (self-assessment, reflective learning, personal development plan)
- Auditing and research projects
- Reading journals
- Attendance at training program organized on a regional basis (Symposia, Conferences, Board review, etc.). E-learning universal topics (see next topic)

E-Learning

The Saudi Commission for Health Specialties intends to develop an e-learning platform for high value, interdisciplinary topics of 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 and will be delivered in a modular fashion. FD At the end of each learning unit, there will be an on-line formative assessment. After completion of all topics, there will be a combined summative assessment in the form of a context-rich MCQ. All trainees must attain minimum competency in the summative assessment.

The following are mandatory modules to be completed at each resident's level:

- R1-2: modules 1 & 4
- R3: modules 3 & 5
- R4: modules 2 & 6
- R5: module 7

Module 1: Introduction

- 1) Safe drug prescribing
- 2) Hospital acquired infections
- 3) Sepsis; SIRS; DIC
- 4) Antibiotic stewardship
- 5) Blood transfusion

Safe drug prescribing:

At the end of the Learning Unit, you should be able to:

- 1) Recognize the importance of safe drug prescribing in healthcare
- 2) Describe the various Adverse Drug Reactions with examples of commonly prescribed drugs that can cause such reactions
- 3) Apply the principles of drug-drug interactions, drug-disease interactions, and drug-food interactions to common situations
- 4) Apply the principles of prescribing drugs in special situations, such as renal failure and liver failure
- 5) Apply the principles of prescribing drugs in elderly and pediatrics age group patients, and during pregnancy and lactation
- 6) Promote evidence-based cost effective prescribing
- 7) Discuss ethical and legal framework governing safe-drug prescribing in Saudi Arabia

Hospital Acquired Infections (HAI)

At the end of the Learning Unit, you should be able to:

- 1) Discuss the epidemiology of HAI with special reference to HAI in Saudi Arabia
- 2) Recognize HAI as one of the major emerging threats in healthcare
- 3) Identify the common sources and set-ups of HAI
- 4) Describe the risk factors of common HAIs, such as ventilator associated pneumonia, MRSA, Central line-associated blood stream infection (CLABSI), Vancomycin Resistant Enterococcus (VRE)

- 5) Identify the role of healthcare workers in the prevention of HAI
- 6) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAI
- 7) Propose a plan to prevent HAI in the workplace

Sepsis, SIRS, DIC

At the end of this learning unit, you should be able to:

- 1) Explain the pathogenesis of sepsis, SIRS, and DIC
- 2) Identify patient-related and non-patient related predisposing factors for sepsis, SIRS, and DIC
- 3) Recognize a patient at risk of developing sepsis, SIRS, and DIC
- 4) Describe the complications of sepsis, SIRS, and DIC
- 5) Apply the principles of management of patients with sepsis, SIRS, and DIC
- 6) Describe the prognosis of sepsis, SIRS, and DIC

Antibiotic Stewardship

At the end of the learning unit, you should be able to:

- 1) Recognize antibiotic resistance as one of the most pressing public health threats globally
- 2) Describe the mechanism of antibiotic resistance
- 3) Determine the appropriate and inappropriate use of antibiotics
- 4) Develop a plan for safe and proper antibiotic usage, including right indications, duration, types of antibiotic, and discontinuation
- 5) Appraise local guidelines on the prevention of antibiotic resistance

Blood Transfusion

At the end of the learning unit, you should be able to:

- 1) Review the different components of blood products available for transfusion
- 2) Recognize the indications and contraindications of blood product transfusion
- 3) Discuss the benefits, risks, and alternatives to transfusion
- 4) Undertake consent for specific blood product transfusion
- 5) Perform the steps necessary for safe transfusion
- 6) Develop understanding of special precautions and procedures necessary during massive transfusions
- 7) Recognize transfusion associated reactions and provide immediate management

Module 2: Cancer

- 1) Principles of cancer management
- 2) Side effects of chemotherapy and radiation therapy
- 3) Oncological emergencies
- 4) Cancer prevention
- 5) Surveillance follow-up of cancer patients

Principles of Cancer Management

At the end of the Learning Unit, you should be able to:

- 1) Discuss the basic principles of staging and grading of cancers
- 2) Enumerate the basic principles (e.g., indications, mechanisms, types) of:
 - a) Cancer surgery
 - b) Chemotherapy
 - c) Radiotherapy
 - d) Immunotherapy
 - e) Hormone therapy

Side Effects of Chemotherapy and Radiation Therapy

At the end of the Learning Unit, you should be able to:

- 1) Describe important side effects (e.g., frequent or life or organ threatening) of common chemotherapy drugs
- 2) Explain the principles of monitoring side-effects in a patient undergoing chemotherapy
- 3) Describe the measures (pharmacological and non-pharmacological) available to ameliorate the side-effects of commonly prescribed chemotherapy drugs
- 4) Describe important (e.g., common and life-threatening) side effects of radiation therapy
- 5) Describe the measures (pharmacological and non-pharmacological) available to ameliorate the side-effects of radiotherapy

Oncological Emergencies

At the end of the Learning Unit, you should be able to:

- 1) Enumerate important oncological emergencies encountered both in hospital and ambulatory settings
- 2) Discuss the pathogenesis of important oncological emergencies
- 3) Recognize oncological emergencies
- 4) Institute immediate measures when treating a patient with oncological emergencies
- 5) Counsel patients in an anticipatory manner to recognize and prevent oncological emergencies

Cancer Prevention

At the end of Learning Unit, you should be able to:

- 1) Conclude that many major cancers are preventable
- 2) Identify smoking prevention and life-style modifications as major preventable measures
- 3) Recognize cancers that are preventable
- 4) Discuss major cancer prevention strategies at the individual as well as national level
- 5) Counsel patients and families in a proactive manner regarding cancer prevention, including screening

Surveillance and Follow-Up of Cancer Patients

At the end of the Learning Unit, you should be able to:

- 1) Describe the principles of surveillance and follow-up of cancer patients
- 2) Enumerate the surveillance and follow-up plan for common forms of cancer
- 3) Describe the role of primary care physicians, family physicians, and similar others in the surveillance and follow-up of cancer patients
- 4) Liaise with oncologists to provide surveillance and follow-up for cancer patients

Module 3: Diabetes and Metabolic Disorders

- 1) Recognition and management of diabetic emergencies
- 2) Management of diabetic complications
- 3) Comorbidities of obesity
- 4) Abnormal ECG

Recognition and Management of Diabetic Emergencies

At the end of the Learning Unit, you should be able to:

- 1) Describe the pathogenesis of common diabetic emergencies, including their complications
- 2) Identify risk factors and groups of patients vulnerable to such emergencies
- 3) Recognize a patient presenting with diabetic emergencies
- 4) Institute immediate management
- 5) Refer the patient to the appropriate next level of care
- 6) Counsel patients and families to prevent such emergencies

Management of Diabetic Complications

At the end of the Learning Unit, you should be able to:

- 1) Describe the pathogenesis of important complications of Type 2 diabetes mellitus
- 2) Screen patients for such complications
- 3) Provide preventive measures for such complications
- 4) Treat such complications
- 5) Counsel patients and families with special emphasis on prevention

Comorbidities of Obesity

At the end of the Learning Unit, you should be able to:

- 1) Screen patients for presence of common and important comorbidities of obesity
- 2) Manage obesity related comorbidities
- 3) Provide dietary and lifestyle advice for prevention and management of obesity

Abnormal ECG

At the end of the Learning Unit, you should be able to:

- 1) Recognize common and important ECG abnormalities
- 2) Institute immediate management, if necessary

Module 4: Medical and Surgical Emergencies

- 1) Management of acute chest pain
- 2) Management of acute breathlessness
- 3) Management of altered sensorium
- 4) Management of hypotension and hypertension
- 5) Management of upper GI bleeding
- 6) Management of lower GI bleeding

At the end of this learning module, you should be able to:

- 1) Triage and categorize patients
- 2) Identify patients who need prompt medical and surgical attention
- 3) Generate preliminary diagnoses based on history and physical examination
- 4) Order and interpret urgent investigations
- 5) Provide appropriate immediate management to patients
- 6) Refer patients to next level of care, if needed

Module 5: Acute Care

- 1) Pre-operative assessment
- 2) Post-operative care
- 3) Acute pain management
- 4) Chronic pain management
- 5) Management of fluid in the hospitalized patient
- 6) Management of electrolyte imbalances

Pre-Operative Assessment

At the end of the Learning Unit, you should be able to:

- 1) Describe the basic principles of pre-operative assessment
- 2) Perform pre-operative assessment in uncomplicated patients with special emphasis on:
 - a) General health assessment
 - b) Cardiorespiratory assessment
 - c) Medications and medical device assessment
 - d) Drug allergy
 - e) Pain relief needs
- 3) Categorize patients according to risks

Post-Operative Care

At the end of the Learning Unit, you should be able to:

- 1) Devise a post-operative care plan, including monitoring of vitals, pain management, fluid management, medications, and laboratory investigations
- 2) Hand over the patients properly to the appropriate facilities
- 3) Describe the process of post-operative recovery in a patient
- 4) Identify common post-operative complications
- 5) Monitor patients for possible post-operative complications
- 6) Institute immediate management for post-operative complications

Acute Pain Management

At the end of the learning unit, you should be able to:

- 1) Review the physiological basis of pain perception
- 2) Proactively identify patients who might be in acute pain
- 3) Assess a patient with acute pain
- 4) Apply various pharmacological and non-pharmacological modalities available for acute pain management
- 5) Provide adequate pain relief for uncomplicated patients with acute pain
- 6) Identify and refer patients with acute pain who can benefit from specialized pain services

Chronic Pain Management

At the end of the learning unit, you should be able to:

- 1) Review the bio-psychosocial and physiological basis of chronic pain perception
- 2) Discuss various pharmacological and non-pharmacological options available for chronic pain management
- 3) Provide adequate pain relief for uncomplicated patients with chronic pain
- 4) Identify and refer patients with chronic pain who can benefit from specialized pain services

Management of Fluid in Hospitalized Patients

At the end of the Learning Unit, you should be able to:

- 1) Review the physiological basis of water balance in the body
- 2) Assess a patient for his/her hydration status
- 3) Recognize a patient with over and under hydration
- 4) Order fluid therapy (oral, as well as intravenous) for a hospitalized patient
- 5) Monitor fluid status and response to therapy through history, physical examination, and selected laboratory investigations

Management of Acid/Base Electrolyte Imbalances

At the end of the Learning Unit, you should be able to:

- 1) Review the physiological basis of electrolyte and acid/base balance in the body
- 2) Identify diseases and conditions that are likely to cause or are associated with acid/base and electrolyte imbalances
- 3) Correct electrolyte and acid/base imbalances
- 4) Perform careful calculations, checks, and other safety measures while correcting acid/base and electrolyte imbalances
- 5) Monitor response to therapy through history, physical examination, and selected laboratory investigations

Module 6: Frail Elderly

- 1) Assessment of frail elderly
- 2) Mini-mental state examination
- 3) Prescribing drugs in the elderly
- 4) Care of the elderly

Assessment of Frail Elderly

At the end of the Learning Unit, you should be able to:

- 1) Enumerate the differences and similarities between comprehensive assessment of the elderly and assessment of other patients
- 2) Perform comprehensive assessment, in conjunction with other members of the health care team, of a frail elderly person with special emphasis on social factors, functional status, quality of life, diet and nutrition, and medication history
- 3) Develop a problem list based on assessment of the elderly person

Mini-Mental State Examination

At the end of the learning unit, you should be able to:

- 1) Review the appropriate usages, advantages, and potential pitfalls of Mini-MSE
- 2) Identify patients suitable for mini-MSE
- 3) Screen patients for cognitive impairment through mini-MSE

Prescribing Drugs in the Elderly

At the end of the Learning Unit, you should be able to:

- 1) Discuss the principles of prescribing drugs in the elderly
- 2) Recognize poly-pharmacy, prescribing cascade, inappropriate dosages, inappropriate drugs, and deliberate drug exclusion as major causes of morbidity in the elderly
- 3) Describe the physiological and functional declines in the elderly that contribute to increased drug-related adverse events
- 4) Discuss drug-drug interactions and drug-disease interactions among the elderly
- 5) Be familiar with Beers criteria
- 6) Develop a rational prescribing habit for the elderly
- 7) Counsel elderly patients and families on safe medication usage

Care of the Elderly

At the end of the Learning Unit, you should be able to:

- 1) Describe the factors that need to be considered while planning care for the elderly
- 2) Recognize the needs and well-being of care-givers
- 3) Identify the local and community resources available in the care of the elderly
- 4) Develop, with inputs from other health care professionals, an individualized care plan for an elderly patient

Module 7: Ethics and Healthcare

- 1) Occupational hazards of HCW
- 2) Evidence-based approach to smoking cessation
- 3) Patient advocacy
- 4) Ethical issues: Transplantation/organ harvesting, withdrawal of care
- 5) Ethical issues: Treatment refusal, patient autonomy
- 6) Role of doctors in death and dying

Occupational Hazards of Health Care Workers (HCW)

At the end of the Learning Unit, you should be able to:

- 1) Recognize common sources and risk factors of occupational hazards among the HCW
- 2) Describe common occupational hazards in the workplace
- 3) Develop familiarity with legal and regulatory frameworks governing occupational hazards among the HCW
- 4) Develop a proactive attitude to promote workplace safety
- 5) Protect yourself and colleagues against potential occupational hazards in the workplace

Evidence-based Approach to Smoking Cessation

At the end of the learning unit, you should be able to:

- 1) Describe the epidemiology of smoking and tobacco usage in Saudi Arabia
- 2) Review the effects of smoking on the smoker and family members
- 3) Effectively use pharmacological and non-pharmacological measures to treat tobacco usage and dependence
- 4) Effectively use pharmacological and non-pharmacological measures to treat tobacco usage and dependence among special population groups such as pregnant ladies, adolescents, and patients with psychiatric disorders

Patient Advocacy

At the end of the Learning Unit, you should be able to:

- 1) Define patient advocacy
- 2) Recognize patient advocacy as a core value governing medical practice
- 3) Describe the role of patient advocates in patient care
- 4) Develop a positive attitude towards patient advocacy
- 5) Be a patient advocate in conflicting situations
- 6) Be familiar with local and national patient advocacy groups

Ethical issues: Transplantation/organ harvesting, withdrawal of care

At the end of the learning unit, you should be able to:

- 1) Apply key ethical and religious principles governing organ transplantation and withdrawal of care
- 2) Be familiar with the legal and regulatory guidelines regarding organ transplantation and withdrawal of care
- 3) Counsel patients and families in light of applicable ethical and religious principles
- 4) Guide patients and families to make informed decisions

Ethical issues: Treatment refusal, patient autonomy

At the end of the learning unit, you should be able to:

- 1) Predict situations where a patient or family is likely to decline prescribed treatment
- 2) Describe the concept of “rational adult” in the context of patient autonomy and treatment refusal
- 3) Analyze key ethical, moral, and regulatory dilemmas in treatment refusal
- 4) Recognize the importance of patient autonomy in the decision making process
- 5) Counsel patients and families declining medical treatment in light of the best interest of patients

Role of Doctors in Death and Dying

At the end of the Learning Unit, you should be able to:

- 1) Recognize the important role a doctor can play during the dying process

- 2) Provide emotional as well as physical care to a dying patient and family
- 3) Provide appropriate pain management to a dying patient
- 4) Identify suitable patients for referral to palliative care services

Neurology Recommended Readings

- 1) Bradley's Neurology in Clinical Practice
 - a) Two volumes with an online video library and e-book
 - b) A must read for senior residents
- 2) Textbook of Neurology. Rowland, L. Merritt's.
 - a) An excellent basic clinical text
 - b) Recommended for junior residents
- 3) Principles of Neurology. Adams, R., Victor, M., Ropper, A.
 - a) You can choose either Adams' or Bradley's for the senior level
- 4) Techniques of the Neurologic Examination. DeMyer.
- 5) Aids to the Examination of the Peripheral Nervous System. Saunder, W.B.
- 6) Localization in Clinical Neurology. Brazis, P.W., Masdeu, J.C., Biller, J.
- 7) Electromyography and Neuromuscular Disorders. Preston, D.C., Shapiro, B.E.
- 8) Continuum: Lifelong Learning in Neurology, AAN

Leaves

Residents in training are eligible to:

- Thirty vacation leave days per year, which may be divided into two or three segments, depending on the trainee and departments' policies.
- One of the two Eid holidays (Ramadan or Hajj holiday) not to exceed 10 days.
- The Program Director may grant the resident study leave to attend a meeting, courses, conference, or seminar related to the specialty, for a maximum of one week per academic year.

Leave without pay and carry-over of leave days to the subsequent year are not allowed.

Sick leave, exceptional emergency leave, and maternity leave for a period not exceeding 90 days shall be compensated with an equivalent number of days during annual leave, or at the end of the training.

A certificate of training completion will only be issued upon the resident's compensation of any training interruptions.

ASSESSMENT

Evaluations and assessments throughout the program are conducted in accordance with the Commission's training and examination rules and regulations. The process includes the following steps.

Annual Assessment

Continuous Appraisal

This assessment is conducted toward the end of each training rotation throughout the academic year and at the end of each academic year as a continuous assessment in the form of a formative and summative evaluation.

Formative Continuous Evaluation

To fulfill the CanMEDS competencies based on the end-of-rotation evaluation, the resident's performance will be jointly evaluated by relevant staff for the following competencies:

1. Performance of the trainee during daily work.
 2. Performance and participation in academic activities.
 3. Performance in a 10- to 20-min direct observational assessment of trainee–patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee–patient encounter.
 4. Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory.
 5. The CanMEDS-based competencies end-of-rotation evaluation form must be completed within 2 weeks after the end of each rotation (preferably in electronic format) and signed by at least two consultants. The program director will discuss the evaluation with the resident, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within 4 weeks after the end of the rotation.
 6. The assessment tools used, can be in the form of an educational portfolio (i.e., monthly evaluation, rotational Mini-CEX*, long case assessment CBDs,** DOPS,*** and MSF****).
 7. Academic and clinical assignments should be documented on an annual basis using the electronic logbook (when applicable). Evaluations will be based on accomplishment of the minimum requirements for the procedures and clinical skills, as determined by the program.
- *Clinical evaluation exercises
 - **Case-based discussions
 - ***Direct observation of practical skills
 - ****Multisource feedback

Summative Continuous Evaluation

This is a summative continuous evaluation report (Annual Report) prepared for each resident at the end of each academic year. The report may also involve the result of clinical examination, oral examination, objective structured practical examination (OSPE), objective structured clinical examination (OSCE), and international in training evaluation exam

End-of-Year Examination

The end-of-year examination will be limited to R1, R2, R3 and R4 . The number of exam items, eligibility, and passing score will be in accordance with the Commission’s training and examination rules and regulations. Examination details and blueprints are posted on the commission website: www.scfhs.org.sa

Principles of Neurology Examination (Saudi Board Examination: Part I)

This written examination, which is conducted in multiple choice question formats, is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission’s training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Final In-training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

In addition to approval of the completion of clinical requirements (resident’s logbook) by the local supervising committee, FITER is also prepared by program directors for each resident at the end of his or her final year in residency (R4). This report may also involve clinical examinations, oral examinations, or other academic assignments.

Final Neurology 1Board Examination (Saudi Board Examination: Part II)

The final Saudi Board Examination comprises of two parts, a written examination and a clinical examination.

Written Examination

This examination assesses the trainee’s theoretical knowledge base (including recent advances) and problem-solving capabilities with regard to the specialty of Neurology. It is delivered in multiple choice question formats and held at least once a year. The number of exam items, exam format, eligibility, and passing score will be in accordance with the Commission’s training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Clinical Examination

This examination assesses a broad range of high-level clinical skills, including data collection, patient management, communication, and counseling skills. The examination is held at least once a year, preferably in an OSCE format in the form of patient management problems (PMPs). The exam eligibility, format, and passing score will be in accordance with the Commission’s training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Certification

Certificates of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Board in Neurology" certificate.

APPENDICES

Mentor Guidelines

A mentor is an assigned faculty supervisor responsible for the professional development of residents under his/her responsibility. Mentoring is the process whereby a mentor provides support to a resident. A mentee is the resident under the supervision of the mentor.

The needs: Post-graduate residency training is a formal academic program for residents to develop their full potential as future specialists. This is potentially the final substantial training program before they become independent specialists. However, unlike the undergraduate program with its well-defined structure, residency training is inherently less organized. Residents are expected to deliver patient care in clinical settings. They are rotated through multiple sites and sub-specialties.

This structure of the residency program, while necessary for good clinical exposure, also lacks the opportunity for a long-term professional relationship with a faculty member. Residents may feel lost without proper guidance. Moreover, without a long-term relationship, it is extremely difficult to identify a struggling resident. Residents may also struggle to develop their professional identities in the home program, particularly when they are rotating away in other disciplines for a long duration.

Finally, the new curriculum has a more substantial work-based continuous assessment of clinical skills and professional attributes. Residents are expected to maintain log-books, complete mini-CEXs and DOPS, and meticulously chart their clinical experience. This requires a robust and structured monitoring system with clear accountability and defined responsibility.

Nature of Relationship: Mentorship is a *formal yet friendly* relationship. This is a *partnership* between mentor and resident (i.e., the mentee). Residents are expected to take the mentoring opportunity seriously and help the mentor to achieve the outcomes. The mentor should receive a copy of any adversarial report by other faculty members about the resident.

Goals:

- Guide residents towards personal and professional development through continuous monitoring of progress
- Early identification of struggling residents as well as high achievers
- Early detection of residents who are at risk of emotional and psychological disturbances
- Provide career guidance

Roles of the Mentor

The primary role of the mentor is to nurture a long-term professional relationship with the assigned resident. The mentor is expected to provide an “academic home” for residents so that they can feel comfortable sharing their experiences, expressing their concerns, and clarifying issues in a non-threatening environment. The mentor is expected to keep sensitive information about the residents confidential.

The mentor is also expected to make appropriate and early referral to the Program Director or Head of Department if s/he determines a problem that would require expertise or resources that are beyond his/her capacity. Examples of such referral might include:

- Serious academic problems
- Progressive deterioration of academic performance
- Potential mental or psychological issues
- Personal problems interfering with academic duties
- Professional misconduct, etc.

However, the following are NOT expected roles of a mentor:

- Providing extra tutorials, lectures, or clinical sessions
- Providing counseling for serious mental and psychological problems
- Involvement in residents' personal matters
- Providing financial or other material supports

Roles of the Resident

- Submits resume at the start of the relationship
- Provides mentor with medium (1-3 years) and longer term (3-7 years) goals
- Takes primary responsibility for maintaining the relationship
- Schedules monthly meetings with mentor in a timely manner; does not request ad hoc meetings, except in an emergency
- Recognizes self-learning as an essential element of residency training
- Reports any major events to the mentor in a timely manner

Who can be a mentor?

Any faculty member of consultant grade and above within the residency program can be a mentor. There is no special training required.

Number of residents per mentor

As a guideline, each mentor should not have more than 4-6 residents. As much as possible, the residents should come from all years of training. This will create an opportunity for the senior residents to guide the junior residents.

Frequency and duration of engagement

The recommended minimum frequency is once every 4 weeks. Each meeting might take 30 minutes to 1 hour. It is also expected that once assigned, the mentor should continue with the same resident, preferably for the entire duration of the training program, or at least two years.

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Performance in Emergencies <input type="checkbox"/>	Unable to assess emergencies independently. Often displays poor judgment.	Usually makes appropriate emergency assessments and decisions.	Makes appropriate, reliable, and independent assessments and decisions in emergencies.
Diagnostic Planning and Assessment <input type="checkbox"/>	Orders inappropriate lab or imaging tests. Does not recognize significance of results. Cannot identify structures or common abnormalities on scans.	Usually orders appropriate tests and recognizes the significance of results. Identifies most normal structures and common abnormalities on scans.	Orders appropriate tests and recognizes the significance of results. Identifies all normal structures and common abnormalities on scans.
Therapeutic Planning <input type="checkbox"/>	Cannot describe appropriate management of common neurological disorders.	Appropriately manages and orders treatment for common neurological disorders.	Plans and implements complete, rational, and efficient therapeutic strategy for common neurological disorders.
Basic Science <input type="checkbox"/>	Lacks basic science knowledge and does not apply it to patient care.	Adequate fund of basic science knowledge and applies it appropriately to patient care.	Exceptional fund of basic science knowledge and applies it consistently to patient care.
Neuroimaging <input type="checkbox"/>	Does not recognize indications or contraindications. Does not pick up abnormalities.	Usually understands indications. Picks up most abnormalities.	Orders appropriate neuroimaging studies. Very competent at interpretation.
Electrophysiology <input type="checkbox"/>	Does not recognize indications or contraindications. Does not pick up abnormalities.	Usually understands indications. Picks up most abnormalities.	Orders appropriate studies. Very competent at interpretation.
Lumbar Puncture <input type="checkbox"/>	Does not recognize indications or contraindications. Uses improper technique. Omits or orders inappropriate CSF studies.	Usually understands indications and contraindications. Uses reasonable technique. Orders appropriate studies.	Appropriately justifies LP. Superb technique. Competent in difficult situations. Orders appropriate studies.
Communicator/ Collaborator Competencies			
Rating: 1 _____ 3 _____ 5			
Patient/Family Relationships <input type="checkbox"/>	Avoids talking to patients and families. Shows little or no respect or empathy. Does not explain diagnosis, treatment, or prognosis.	Listens to patients and family. Shows appropriate respect and empathy. Usually explains diagnosis, treatment, and prognosis.	Excellent listening skills. Establishes exceptional rapport with patients/family. Provides patient and family-centered explanations of diagnosis, prognosis, etc.
Records and Reports <input type="checkbox"/>	Reports/records are incomplete and inaccurate and lack vital data.	Reports/records are usually complete, orderly, and systematic.	Reports/records are consistently accurate, organized, and comprehensive.

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Teaching <input type="checkbox"/>	Does not teach. Neglects students and contributes little to their education. Ignores students' needs.	Makes an effort to teach students and to respond to students' needs. Adapts teaching according to students' needs.	Always available/approachable. Involves students and stimulates them to learn. Skillful learner-centered teaching.
Team Relationships <input type="checkbox"/>	Antagonizes co-workers and colleagues. Poor at resolving conflicts. Does not share information with others.	Reliable team member. Works well with others. Keeps co-workers well-informed.	Active team member. Resolves conflict in difficult situations. Proactively shares information with co-workers.
Team Leadership Skills <input type="checkbox"/>	Shows no leadership skills.	Takes some responsibility for running the service but not yet a well-organized team leader.	Takes full responsibility for running the pediatric neurology service, seeking advice appropriately.
Manager Competencies			
Rating: 1 _____ 3 _____ 5			
Manager <input type="checkbox"/>	Often late. Wastes time on trivial tasks. Often fails to plan ahead or complete work. Triage patients poorly. Squanders resources.	Usually punctual and uses time well. Prioritizes tasks. Completes work. Triage patients and allocates resources appropriately.	Always on-time and plans ahead. Prioritizes and completes tasks efficiently. Triage patients and allocates resources wisely.
Health Advocate Competencies			
Rating: 1 _____ 3 _____ 5			
Health Advocate <input type="checkbox"/>	Fails to counsel patients & families re. their conditions or risk factors. Ignores patients' needs for community resources.	Usually educates patients & families re. their conditions & risk factors. Advises on community resources and often helps recruit them when needed.	Routinely educates patients & families and assists with managing risk factors. Proactively facilitates access to community resources when needed.
Scholar Competencies			
Rating: 1 _____ 3 _____ 5			
Continuing Education and Critical Appraisal <input type="checkbox"/>	Shows little intellectual curiosity. Does not read articles or monographs around patient problems. Little understanding of levels of evidence.	Often reads articles or monographs around patient problems. Critically assesses the information and applies it appropriately at bedside.	Consistently researches the literature around patient problems. Superb critical thinker. Generates hypotheses and seeks evidence.

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Professional Competencies			
Rating: 1 _____ 3 _____ 5			
Responsibility <input style="width: 20px; height: 15px;" type="checkbox"/>	Avoids responsibility. Needs repeated reminders. Fails to complete tasks.	Shares workload. Reliably completes tasks and follows up on unresolved issues.	Eager to give extra effort when needed. Always completes tasks.
Self-Assessment Ability <input style="width: 20px; height: 15px;" type="checkbox"/>	Unaware of own limitations. Fails to request required assistance. Does not seek feedback. Unable to take advice. Has difficulty admitting errors.	Aware of own limitations. Seeks appropriate assistance and feedback. Accepts advice graciously. Admits errors.	Consistently recognizes own limitations and displays satisfactory behavior. Regularly seeks and incorporates feedback to excel.
Values & Ethics <input style="width: 20px; height: 15px;" type="checkbox"/>	Fails to respect personal, cultural, or gender issues. Fails to deal appropriately with ethical issues.	Respects personal, cultural, and gender issues. Deals appropriately with ethical issues.	Integrates personal, cultural, and gender considerations. Keenly recognizes and skillfully manages ethical issues.
Overall performance			
Rating: 1 _____ 3 _____ 5			
Overall Performance <input style="width: 20px; height: 15px;" type="checkbox"/>	Unsatisfactory performance for level of training. Fails or is borderline in meeting several competencies or commits egregious errors.	Appropriate performance for level of training. Meets most competencies. Progressing at expected rate.	Excellent performance. Performing at least one year above PGY level in all competencies.
1) Describe OUTSTANDING performances, FAILURES, or difficulties:			
Comments:			
Evaluator(s) Name: _____ Signature: _____ Date: _____ Resident: Has this evaluation been discussed with you? Yes <input type="checkbox"/> No <input type="checkbox"/> I agree with this performance evaluation. Yes <input type="checkbox"/> No <input type="checkbox"/>			

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Resident's Signature: _____	Date: _____
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Neurology In-training Competencies/Evaluation - Junior Resident

Saudi Commission for Health Specialties Neurology In-training Competencies Evaluation Junior Resident				
Name of Resident:		PG Year:		
Service:		Period of Evaluation: to		
Ratings: 1) Fails to meet competencies for PGY level 2) Partly meets competencies for PGY level 3) Meets competencies for PGY level 4) Exceeds competencies for PGY level 5) Exceeds competencies and performs at a level at least two years above current PGY level NA = Not Assessed				
Rating: <div style="display: flex; justify-content: space-around; width: 100%;"> 1 3 5 </div>				
MEDICAL EXPERT	Data Gathering (also Communicator) <input type="checkbox"/>	Poor interviewing skills. Obtains incomplete, disorganized, or inaccurate histories. Omits important information.	Good interviewing skills. Usually obtains complete and accurate histories.	Skillfully interviews difficult patients. Obtains complete, systematic, accurate, and concise histories.
	Physical Examination <input type="checkbox"/>	Conducts incomplete or technically deficient exam. Often misses significant findings.	Conducts complete and systematic exam. Recognizes most significant findings.	Conducts thorough, technically sound exam. Recognizes all normal and abnormal findings.
	Clinical Knowledge <input type="checkbox"/>	Unable to localize symptoms and signs. Cannot formulate a differential diagnosis of common neurological problems.	Usually localizes symptoms and signs correctly. Formulates reasonable differential diagnoses of common neurological problems.	Displays very good ability to localize neurological symptoms and signs and derives appropriate differential diagnoses.
	Judgment and Decision Making <input type="checkbox"/>	Does not derive decisions logically from data. Often delays decisions inappropriately.	Usually shows good judgment resulting from logical reasoning. Makes decisions with little delay.	Makes correct and timely decisions (even on complex matters) from efficient analysis of information.

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	<p style="text-align: center;">Team Relationships</p> <div style="text-align: center;"><input type="checkbox"/></div>	Antagonizes co-workers and colleagues. Poor at resolving conflict. Does not share information with others.	Reliable team member. Works well with others but no well-developed leadership skills. Keeps co-workers well-informed.	Active team member, recognized for leadership skills. Resolves conflict in difficult situations. Proactively shares information with co-workers.
MANAGER	<p style="text-align: center;">Manager</p> <div style="text-align: center;"><input type="checkbox"/></div>	Often late. Wastes time on trivial tasks. Often fails to plan ahead or complete work. Triage patients poorly. Squanders resources.	Usually punctual and uses time well. Prioritizes tasks. Completes work. Triage patients and allocates resources appropriately.	Always on-time and plans ahead. Prioritizes and completes tasks efficiently. Triage patients and allocates resources wisely.
HEALTH ADVOCATE	<p style="text-align: center;">Health Advocate</p> <div style="text-align: center;"><input type="checkbox"/></div>	Fails to counsel patients re. their conditions or risk factors. Ignores patients' needs for community resources.	Usually educates patients re. their conditions and risk factors. Advises on community resources and often helps recruit them when needed.	Routinely educates patients and assists with managing risk factors. Proactively facilitates access to community resources when needed.
SCHOLAR	<p style="text-align: center;">Continuing Education and Critical Appraisal</p> <div style="text-align: center;"><input type="checkbox"/></div>	Shows little intellectual curiosity. Does not read articles or monographs around patient problems. Little understanding of levels of evidence.	Often reads articles or monographs around patient problems. Critically assesses the information and applies it appropriately at the bedside.	Consistently researches the literature around patient problems. Superb critical thinker. Generates hypotheses and seeks evidence.
PROFESSIONAL	<p style="text-align: center;">Responsibility</p> <div style="text-align: center;"><input type="checkbox"/></div>	Avoids responsibility. Needs repeated reminders. Fails to complete tasks.	Shares workload. Generally, completes tasks and follows up on unresolved issues.	Eager to make extra effort when needed. Always completes tasks and is up-to-date on patient issues.
	<p style="text-align: center;">Self-Assessment Ability</p> <div style="text-align: center;"><input type="checkbox"/></div>	Unaware of own limitations. Fails to request required assistance. Does not seek feedback. Unable to take advice. Has difficulty admitting errors.	Aware of own limitations. Seeks appropriate assistance and feedback. Accepts advice and admits errors.	Consistently recognizes own limitations and displays satisfactory behavior. Regularly seeks and incorporates feedback to excel.
	<p style="text-align: center;">Values & Ethics</p> <div style="text-align: center;"><input type="checkbox"/></div>	Fails to respect personal, cultural, or gender issues. Fails to deal appropriately with ethical issues.	Respects personal, cultural, and gender issues. Deals appropriately with ethical issues.	Integrates personal, cultural, and gender considerations. Keenly recognizes and skillfully manages ethical issues.

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	<p>Medical Knowledge</p> <p style="text-align: center;"><input type="checkbox"/></p>	Shows a limited fund of basic and clinical knowledge. Cannot explain mechanisms of neurological diseases.	Shows good basic and clinical knowledge and is able to explain mechanisms of most neurological diseases.	Shows an exceptional fund of basic and clinical knowledge. Consistently able to explain mechanisms of neurological diseases.
	<p>Performance in Emergencies</p> <p style="text-align: center;"><input type="checkbox"/></p>	Unable to assess emergencies independently. Often displays poor judgment.	Makes appropriate emergency assessments and decisions.	Makes appropriate, reliable, and independent assessments and decisions in emergencies.
	<p>Diagnostic Planning and Assessment</p> <p style="text-align: center;"><input type="checkbox"/></p>	Fails to order appropriate lab or imaging tests. Does not recognize significance of results. Cannot identify normal structures or abnormalities on scans.	Orders appropriate tests and recognizes the significance of results. Identifies normal structures and most abnormalities on scans.	Orders appropriate tests and recognizes the significance of results. Identifies all normal structures and abnormalities on scans.
	<p>Therapeutic Planning</p> <p style="text-align: center;"><input type="checkbox"/></p>	Cannot describe appropriate management of common neurological disorders.	Appropriately manages and orders treatment for common neurological disorders.	Plans and implements complete, rational, and efficient therapeutic strategy.
Rating: 1 _____ 3 _____ 5				
COMMUNICATOR / COLLABORATOR	<p>Patient Family Relationships</p> <p style="text-align: center;"><input type="checkbox"/></p>	Avoids talking to patients and families. Poor listening skills. Shows little or no respect or empathy. Does not explain diagnosis, treatment, or prognosis.	Good listening skills. Shows appropriate respect and empathy. Provides patient-centered explanations of diagnosis, prognosis, etc.	Excellent listening skills. Establishes exceptional rapport with patients and families.
	<p>Records and Reports</p> <p style="text-align: center;"><input type="checkbox"/></p>	Reports/records are incomplete and inaccurate and lack vital data.	Reports/records are usually complete, accurate, and systematic.	Reports/records are consistently accurate, organized, and comprehensive.
	<p>Teaching</p> <p style="text-align: center;"><input type="checkbox"/></p>	Does not teach. Neglects students and contributes little to their education. Ignores students' needs.	Teaches students and residents effectively. Adapts teaching according to student level.	Always available/approachable. Involves students and stimulates them to learn. Skillful learner-centered teaching.

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	<p style="text-align: center;">Team Relationships</p> <p style="text-align: center;"><input type="checkbox"/></p>	Does not share information with others. Poor at resolving conflict. No leadership skills.	Reliable team member. Works well with others and has some leadership skills. Keeps co-workers well-informed.	Active team member, recognized for leadership skills. Resolves conflict in difficult situations. Proactively shares information with co-workers.
MANAGER	<p style="text-align: center;">Manager</p> <p style="text-align: center;"><input type="checkbox"/></p>	Poor time management skills. Unable to co-ordinate the work of the health care team or supervise junior trainees. No interest in improving systems of care.	Good time management skills. Often co-ordinates the work of the health care team and supervises junior trainees. Shows interest in improving systems of care.	Superb time management. Effectively supervises the work of the health care team. Actively promotes quality improvement of systems of care.
HEALTH ADVOCATE	<p style="text-align: center;">Health Advocate</p> <p style="text-align: center;"><input type="checkbox"/></p>	Fails to counsel patients re. their conditions or risk factors. Ignores patients' needs for community resources.	Educates patients re. their conditions and risk factors. Aware of community resources and helps recruit them when needed.	Routinely educates patients and assists with managing risk factors. Proactively facilitates access to community resources when needed.
SCHOLAR	<p style="text-align: center;">Continuing Education and Critical Appraisal</p> <p style="text-align: center;"><input type="checkbox"/></p>	Shows little intellectual curiosity. Does not read articles or monographs around patient problems. Little understanding of levels of evidence.	Reads articles or monographs around patient problems. Critically assesses the information and applies appropriately at the bedside.	Consistently searches the literature around patient problems. Superb critical thinker. Generates hypotheses and seeks evidence.
PROFESSIONAL	<p style="text-align: center;">Responsibility</p> <p style="text-align: center;"><input type="checkbox"/></p>	Avoids responsibility. Needs repeated reminders. Fails to complete tasks.	Takes appropriate share of responsibility. Completes tasks and follows up on unresolved issues.	Eager to make extra effort when needed. Always completes tasks and is current on patient issues.
	<p style="text-align: center;">Self-Assessment Ability</p> <p style="text-align: center;"><input type="checkbox"/></p>	Unaware of own limitations. Fails to request required assistance. Does not seek feedback. Unable to take advice. Has difficulty admitting errors.	Aware of own limitations. Seeks appropriate assistance and feedback. Accepts advice and admits errors.	Consistently recognizes own limitations and displays satisfactory behavior. Regularly seeks and incorporates feedback to excel.
	<p style="text-align: center;">Values & Ethics</p> <p style="text-align: center;"><input type="checkbox"/></p>	Fails to respect personal, cultural, or gender issues. Fails to deal appropriately with ethical issues.	Respects personal, cultural, and gender issues. Deals appropriately with ethical issues.	Integrates personal, cultural, and gender considerations. Keenly recognizes and skillfully manages ethical issues.
Overall performance				
<p style="text-align: center;">Rating: 1 _____ 3 _____ 5</p>				

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Overall Performance: <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>	Unsatisfactory performance for level of training. Fails or is borderline in meeting several competencies or commits egregious error(s).	Appropriate performance for level of training. Meets all or almost all competencies. Progressing at expected rate.	Excellent performance. Performing well above PGY level in most competencies.
Describe OUTSTANDING performances, FAILURES, or difficulties:			
Comments:			
Evaluator(s) Name: _____ Signature: _____ Date: _____ Resident: Has this evaluation been discussed with you? Yes No I agree with this performance evaluation. Yes No Resident's Signature: _____ Date: _____ Resident's comments on evaluation:			

Neuromuscular and EMG Rotation Competencies/Evaluation

<p align="center">Saudi Commission for Health Specialties Neurology In-training Competencies/Evaluation Neuromuscular/EMG ROTATION</p>				
Name of Resident:			PG Year:	
Service:			Period of Evaluation: to	
<p>Ratings:</p> <p>1) Fails to meet competencies for PGY level</p> <p>2) Partly meets competencies</p> <p>3) Meets competencies</p> <p>4) Exceeds competencies</p> <p>5) Exceeds competencies and performing well above PGY level</p> <p>NA = Not Assessed</p>				
<p>Rating: 1 3 5</p>				
MEDICAL EXPERT	Data Gathering (Communicator)	Poor interviewing skills. Obtains incomplete, disorganized, or inaccurate histories. Omits important information.	Good interviewing skills. Usually obtains complete, systematic, and accurate histories.	Skillfully interviews difficult patients. Obtains complete, systematic, accurate, and concise histories.
	Physical Examination	Conducts incomplete or technically deficient exams. Often misses significant findings.	Conducts complete and systematic exams. Recognizes most significant findings.	Conducts thorough, technically sound exams. Recognizes all normal and abnormal findings.
	Clinical Knowledge	Unable to localize symptoms and signs. Cannot formulate a differential diagnosis of common neurological problems.	Usually localizes symptoms and signs correctly. Formulates reasonable differential diagnoses of common neurological problems.	Displays very good ability to localize neurological symptoms and signs and derive appropriate differential diagnoses.
	Peripheral Anatomy	Difficulties understanding peripheral nerve and muscle anatomy sufficient to impair ability to conduct EMG and nerve conduction tests.	Adequate PNS anatomy to clinically evaluate radiculopathies and mononeuropathies. Able to conduct EMG on common limb muscles without reference to texts.	Able to trace the root plexus, and nerve innervation of most muscles and dermatomes. Able to perform needle EMGs on commonly and uncommonly needed muscles without reference to texts.
	Pathophysiology	Unable to describe how pathophysiology is reflected in EMG/NCV tests.	Describes how pathophysiology is reflected in NCV and EMG tests.	Able to discuss at a high level potential mechanisms for abnormal findings on EMG/NCV tests.

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	<p>Presentations</p> <input type="checkbox"/>	Neglects neuromuscular rounds and contributes little to their presentation	Presents appropriately at neuromuscular rounds.	Enthusiastically prepares neuromuscular rounds of excellent quality for all levels of interest.
	<p>Team Relationships</p> <input type="checkbox"/>	Antagonizes co-workers and colleagues. Poor at resolving conflict. Does not share information with others.	Reliable team member. Works well with others but no well-developed leadership skills. Keeps co-workers well-informed.	Active team member, recognized for leadership skills. Resolves conflict in difficult situations. Proactively shares information with co-workers.
MANAGER	<p>Manager</p> <input type="checkbox"/>	Often late. Wastes time on trivial tasks. Often fails to plan ahead or complete work. Triage patients poorly. Squanders resources.	Usually punctual and uses time well. Prioritizes tasks. Completes work. Triage patients and allocates resources appropriately.	Always on-time and plans ahead. Prioritizes and completes tasks efficiently. Triage patients and allocates resources wisely.
HEALTH ADVOCATE	<p>Infection Control and Safety</p> <input type="checkbox"/>	Fails to recognize unsafe working conditions. Performs EMG studies that put patient at risk of harm from electrical, physical, or infectious process.	Recognizes unsafe working conditions. Performs safe EMG studies, minimizing risk of harm from electrical, physical, or infectious processes.	Fully recognizes and minimizes all risks associated with EMG/NCV. Understands lab safety regulations in Saudi Arabia. Advocates for safe practices.
	<p>Health Advocate</p> <input type="checkbox"/>	Fails to counsel patients re. their conditions or risk factors. Ignores patients' needs for community resources.	Usually educates patients re. their conditions and risk factors. Advises on community resources and often helps recruit them when needed.	Routinely educates patients and assists with managing risk factors. Proactively facilitates access to community resources when needed.
	<p>Ethics related to Genetic Testing</p> <input type="checkbox"/>	Fails to understand role of genetic counseling in neuromuscular diseases.	Usually understands role of genetic risks, and provides appropriate counseling prior to testing.	Routinely educates patients and assists understanding implications of genetic testing on patient and family.
SCHOLAR	<p>Continuing Education and Critical Appraisal</p> <input type="checkbox"/>	Shows little intellectual curiosity. Does not read articles or monographs around patient problems. Little understanding of levels of evidence.	Often reads articles or monographs around patient problems. Critically assesses the information and applies it appropriately at the bedside.	Consistently searches the literature around patient problems. Superb critical thinker. Generates hypotheses and seeks evidence.
<p>Competencies Rating:</p> <p style="text-align: center;">1 3 5</p>				

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PROFESSIONAL	Responsibility <input type="checkbox"/>	Avoids responsibility. Needs repeated reminders. Fails to complete tasks.	Shares workload. Reliably completes tasks and follows up on unresolved issues.	Eager to make extra effort when needed. Always completes tasks.
	Self-Assessment Ability <input type="checkbox"/>	Unaware of own limitations. Fails to request required assistance. Does not seek feedback. Unable to take advice. Has difficulty admitting errors.	Aware of own limitations. Seeks appropriate assistance and feedback. Accepts advice graciously. Admits errors.	Consistently recognizes own limitations and displays satisfactory behavior. Regularly seeks and incorporates feedback to excel.
	Values & Ethics <input type="checkbox"/>	Fails to respect personal, cultural, or gender issues. Fails to deal appropriately with ethical issues.	Respects personal, cultural, and gender issues. Deals appropriately with ethical issues.	Integrates personal, cultural, and gender considerations. Keenly recognizes and skillfully manages ethical issues.

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Overall performance			
Rating: 1 _____ 3 _____ 5			
Overall Performance: <div style="text-align: center; margin-top: 10px;"> <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/> </div>	Unsatisfactory performance for level of training. Fails or is borderline in meeting several competencies or commits egregious error(s).	Appropriate performance for level of training. Meets all or almost all competencies. Progressing at expected rate.	Excellent performance. Performing well above PGY level in most competencies.
Describe OUTSTANDING performances, FAILURES, or difficulties:			
Comments:			
Evaluator(s) Name: _____			
Signature: _____ Date: _____			
Resident: Has this evaluation been discussed with you? Yes No			
I agree with this performance evaluation. Yes No			
Resident's Signature: _____ Date: _____			

Neuroradiology Competencies/Evaluation

Saudi Commission for Health Specialties Neurology In-training Competencies/Evaluation Neuroradiology			
Name of Resident:		PG Year:	
Service:		Period of Evaluation: to	
Ratings: 1) Fails to meet competencies for PGY level 2) Partly meets competencies 3) Meets competencies 4) Exceeds competencies 5) Exceeds competencies and functions at the level of a PGY-4 resident NA = Not Assessed			
Medical Expert			
Rating: 1 _____ 3 _____ 5			
Observational Skill <input style="width: 30px; height: 20px;" type="checkbox"/>	Unable to detect abnormalities on neuroimaging studies.	Usually detects abnormalities on neuroimaging studies.	Skillfully detects abnormalities on neuroimaging studies.
Anatomical/clinical knowledge <input style="width: 30px; height: 20px;" type="checkbox"/>	Unable to identify neuro-anatomical structures. Poor grasp of pathophysiology.	Reasonable grasp of neuro-anatomy and the pathophysiology involved.	Clearly identifies neuro-anatomical structures. Excellent understanding of pathophysiological processes.
Diagnostic formulation <input style="width: 30px; height: 20px;" type="checkbox"/>	Unable to generate an appropriate differential diagnosis based on clinical history and neuro-radiological studies.	Generates reasonable differential diagnoses.	Formulates a complete differential diagnosis and can identify most likely scenario.
Investigative Planning <input style="width: 30px; height: 20px;" type="checkbox"/>	Shows poor knowledge of role of neuro-imaging in common neurological problems. Unaware of contra-indications and complications. Unable to suggest appropriate next step.	Usually able to indicate the role of neuro-imaging in common neurological problems and aware of contraindications and complications. Usually able to suggest appropriate next step.	Shows superb knowledge of role of neuro-imaging in most neurological problems and contra-indications and complications. Skillfully suggests plans for further investigations.
Basic Science <input style="width: 30px; height: 20px;" type="checkbox"/>	Poor grasp of basic science pertaining to neuro-imaging.	Some understanding of basic science pertaining to neuro-imaging.	Clear grasp of physics and basic science in neuro-imaging.

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Communicator/ Collaborator			
Rating:			
1 _____ 3 _____ 5			
Patient/Family Relationships <input type="checkbox"/>	Avoids talking to patients and families. Shows little or no respect or empathy. Does not explain imaging procedure.	Listens to patients and families. Shows appropriate respect and empathy. Usually explains imaging procedures when required.	Excellent listening skills. Establishes exceptional rapport with patients/families. Provides patient-centered explanations of procedures when required.
Records and Reports <input type="checkbox"/>	Reports/records are incomplete and inaccurate and lack vital data.	Reports/records are usually complete, orderly, and systematic.	Reports/records are consistently accurate, orderly, and comprehensive.
Teaching <input type="checkbox"/>	Does not teach. Neglects students and contributes little to their education. Ignores students' needs.	Makes an effort to teach students and to respond to their needs. Adapts teaching according to students' needs.	Always available/approachable. Involves students and stimulates them to learn. Skillful learner-centered teaching.
Team Relationships <input type="checkbox"/>	Antagonizes co-workers and colleagues. Poor at resolving conflict. Does not share information with others.	Communicates well with technical staff. Shows respect for referring physicians, neuroradiology staff, and other trainees.	Communicates superbly with technical staff, referring physicians, staff, and other trainees. Resolves conflict in difficult situations.
Manager			
Rating:			
1 _____ 3 _____ 5			
Manager <input type="checkbox"/>	Often late. Wastes time on trivial tasks. Often fails to plan ahead or complete work. Triage patients poorly. Squanders resources.	Usually punctual and uses time well. Prioritizes tasks. Completes work. Triage patients and allocates resources appropriately.	Always on-time and plans ahead. Prioritizes and completes tasks efficiently. Triage patients and allocates resources wisely. ▼
Health Advocate			
Rating:			
1 _____ 3 _____ 5			
Health Advocate <input type="checkbox"/>	Ignores patients' needs for further imaging.	Advises on need for further imaging and often helps recruit neuro-imaging resources for patients when needed.	Proactively facilitates patient access to imaging resources when needed.

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Scholar			
Rating: 1 _____ 3 _____ 5			
Continuing Education and Critical Appraisal	Shows little intellectual curiosity. Does not read articles or monographs around patient problems. Little understanding of levels of evidence.	Often reads articles or monographs around patient problems. Critically assesses the information and applies it appropriately.	Consistently searches the literature around patient problems. Superb critical thinker. Generates hypotheses and seeks evidence.
Professional			
Rating: 1 _____ 3 _____ 5			
Responsibility <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/>	Avoids responsibility. Needs repeated reminders. Fails to complete tasks.	Shares workload. Reliably completes tasks and follows up on unresolved issues.	Eager to make extra effort when needed. Always completes tasks.
Self-Assessment Ability <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/>	Unaware of own limitations. Fails to request required assistance. Does not seek feedback. Unable to take advice. Has difficulty admitting errors.	Aware of own limitations. Seeks appropriate assistance and feedback. Accepts advice graciously. Admits errors.	Consistently recognizes own limitations and displays satisfactory behavior. Regularly seeks and incorporates feedback to excel.
Values & Ethics <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/>	Fails to respect personal, cultural, or gender issues. Fails to deal appropriately with ethical issues.	Respects personal, cultural, and gender issues. Deals appropriately with ethical issues.	Integrates personal, cultural, and gender considerations. Keenly recognizes and skillfully manages ethical issues.
Overall Performance			
Rating: 1 _____ 3 _____ 5			
Overall Performance: <input style="width: 30px; height: 20px; border: 1px solid black;" type="checkbox"/>	Unsatisfactory performance for level of training. Fails or is borderline in meeting several competencies or commits egregious errors.	Appropriate performance for level of training. Meets most competencies. Progressing at expected rate.	Excellent performance. Performing at least one year above PGY level in all competencies.
Describe OUTSTANDING performances, FAILURES, or difficulties:			

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Comments:	
Evaluator(s) Name: _____	
Signature: _____	Date: _____
Resident: Has this evaluation been discussed with you?	Yes <input type="checkbox"/> No <input type="checkbox"/>
I agree with this performance evaluation.	Yes <input type="checkbox"/> No <input type="checkbox"/>
Resident's Signature: _____	Date: _____

