



# McGill

**Neurology Residency  
Program**  
Department of Neurology &  
Neurosurgery

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## **Adult Neurology Residency Training Program McGill University**

### **Objectives of Training and Training Requirements In Neurology**

Dear Neurology Residents,

On behalf of the Department of Neurology and Neurosurgery and the Neurology Residency Training Committee, I would like to take this opportunity to welcome you to The Adult Neurology Training Program of McGill University. We wish you the best of success in your future studies.

In this package, please find enclosed our training program specific objectives of training and training requirements. These objectives and training requirements are to be considered as supplements to those provided by the Royal College of Physician and Surgeons of Canada Education Committee. The latter objectives and training requirements are also included in this package.

You will note that our program specific objectives and requirements are provided in the CanMEDS format. A brief description of the CanMEDS roles, as they relate to our training program, is provided. Furthermore, program specific objectives and requirements for each of the core rotations as well as elective rotations within our program will be provided at a later time. Training goals specific to the individual phases of our training program are provided.

These program specific objectives and requirements along with those provided by the Royal College of Physician and Surgeons of Canada Education Committee will form the basis on which you will be evaluated during your training. Please familiarize yourself with these objectives and training requirements contact me should any these be unclear.

Anne-Louise Lafontaine  
Adult Neurology Training Program Director

## **Adult Neurology Residency Training Program McGill University**

### Preamble

Neurology is the subspecialty of internal medicine dealing with the investigation, diagnosis and therapy of diseases specific to the peripheral and central nervous system as well as complications of systemic disorders affecting nervous function. Significant overlap occurs with psychiatric disorders. Thus trainees in neurology should acquire a firm grounding in internal medicine and some understanding of psychiatric disorders.

The aim of the program is to produce a physician-specialist with the competence to effectively diagnose and manage the care of patients with neurological diseases.

The objectives of our residency training program outlined below are provided in the CanMEDS format. The CanMEDS roles for physicians (and trainees) define a wide range knowledge, attitudes and skills required in order to be an effective, competent, knowledgeable and professional physician. The CanMEDS roles also provide the framework by which you will be evaluated during your residency training.

The following paragraphs outline the components of the CanMEDS roles, methods by which the objectives of such roles can be met and methods that will be used for evaluation. Detailed objectives are provided thereafter and you are asked to familiarize yourself with them as well.

Additional objectives forth by the Royal College and by a sub-committee of the Canadian Neurological Society Education and Manpower Committee will also be provided. These objectives are given to trainees entering the program and the trainee is referred to these documents for further information on expected competencies when presenting for certification examinations.

CanMEDS roles for neurology trainees:

### **1. Medical Expert/Clinical Decision Maker**

#### *A) Knowledge*

This area comprises the factual knowledge base that the consultant must have in order to properly evaluate and manage patients with neurological disease. In addition to knowledge relevant to medical disorders acquired during the PGY1 training, specific areas of knowledge needed include embryology, neuroanatomy, neurophysiology, histopathology, clinical and molecular genetics, pharmacology of neurology-specific

drugs and drugs that have neurological effects as well as knowledge of the plethora of clinical disorders affecting the nervous system (see attached for very detailed list).

Such knowledge can be acquired in several ways including ward teaching rounds, seminars, didactic teaching rounds, conferences, academic half-day as well as individual study. Residents are advised to purchase appropriate neurologic texts in consultation with staff and more senior residents and to make use of the excellent library facilities available throughout the McGill system.

Knowledge base will be assessed in three main ways:

- 1) Case review with attending staff gives the staff insight into the depth of knowledge acquired by the resident related to clinical cases as well as scientific knowledge when specifically tested.
- 2) Service rounds, at which oral discussions of cases occurs, provides a larger staff audience with evidence of knowledge base.
- 3) All residents write Royal College style, in-house short-answer examinations twice per year. These are marked by the Program Director and feedback is provided. PGY3-5 resident will also write the American Academy of Neurology resident in-training examination. PGY5 residents will undergo yearly or twice yearly practice OSCE's. Practice long-case type assessments will also be arranged.

### *B) Clinical Skills*

Clinical skills comprise the acts of obtaining a history, performing a comprehensive general and neurological examination, formulating a differential diagnosis, devising an investigation plan and planning therapy. These skills are best taught on the clinical services and in the outpatient clinic setting by the attending staff and more senior trainees. Likewise these skills are best assessed in these same settings as well as at service rounds and during the annual practise oral exam. A less formal clinical skills assessment, in which the resident is observed interviewing and examining a patient and is then given feedback, occurs periodically.

### *C) Technical Skills*

Technical skills in neurology consist of LPs, EMG and EEG techniques and interpretation. At McGill, EMG and EEG training are part of a mandatory rotation with both clinical and laboratory emphasis. Such specialized skills are best assessed in the laboratory setting. LPs are taught by senior trainees. At present no formal evaluation of this skill is in place.

## **2. Communicator**

Communication skills refer to the ability to communicate effectively with patients regarding their diagnosis, investigations needed, treatment plan, prevention and prognosis. Such discussions also include family members. Communication skills are also needed to effectively interact with other members of the health care team and to provide colleagues with the results of clinical assessments including recommendations. Communication skills are often already well established by the start of residency training. However, modifications of such skills can be brought about by observation of others and if serious problems exist, referral to individuals with expertise in correcting communications problems.

## **3. Collaborator**

Teaching skills are essential to a competent consultant who must be able to teach peers, residents and students of neurology and other disciplines and lay individuals. Teaching can be very broadly defined spanning formal lectures to informal one-on-one sessions. Teaching skills can be learned by observing others, presenting at seminars, teaching in McGill courses (i.e., CNS course, OT/PT courses) and by availing oneself of courses presented periodically at McGill or by the national societies. Such skills are assessed infrequently in our program and generally receive comment only when they are noted as extra strengths of the trainee.

Supervisory skills include supervision of students and more junior residents on the service, management of the ward service and interaction with other members of the health care team (nurses, therapists, pharmacists, social workers, dieticians etc.) both in the hospital and in the community.

## **4. Manager**

This role includes a variety of skills including record keeping. Proper record keeping requires recording of history and physical exam information, diagnostic and therapeutic formulation, progress notes, discharge notes, discharge summaries and clinic letters. Feedback by senior trainees and staff provides the best method of instruction. Evaluation is done by attending staff review of charts and letters as well as service rounds after discharge of the patient.

## **5. Health Advocate**

This role encompasses a variety of skills including the ability to identify the important determinants of health affecting patients. As well, one should be able to contribute effectively to improved health of patients and communities and recognize and respond to those issues where advocacy is appropriate.

## **6. Scholar**

The role encompasses a variety of academic skills. Academic skills include understanding the principles of clinical and basic research, the ability to properly read and evaluate literature, an understanding of and interest in the scientific basis for clinical practice. Residents are encouraged to utilize elective time to take the McGill summer courses in epidemiology that occur each May/June and which address a number of issues related to statistics, trial design, outcome analysis and epidemiology. Journal clubs help develop critical appraisal skills. Such skills are informally evaluated during clinical rotations and at conferences.

## **7. Professional**

Attitudes are difficult to teach and hard to evaluate given the subjective nature of some of these topics. Included in this category are items such as sense of responsibility to patients and colleagues, respect for the patient and self-assessment capabilities. Neurologists are frequently faced with the ethical issues related to life-support mechanisms, brain death, persistent vegetative state and refusal of treatment. The neurology resident acquires principles related to biomedical ethics from exposure to staff physicians as role models, ethics consultations by a biomedical ethics specialist, weekly multi-disciplinary service rounds (including social workers) and Neurology grand rounds. These attitudes are evaluated by staff during rounds and in clinic.

## **Evaluation**

The above CanMEDS roles and the objectives outlined briefly above and in more detail below form the basis of evaluation during the training program. Evaluation of each area can occur at differing sites and times and by different individuals during the program. Attitudes and skills are in general best evaluated using an ITER while knowledge is evaluated using an ITER as well as examining the results of the various formal exams (described above). Residents receive an evaluation by the staff involved for each rotation completed, the contents of which should be discussed with the resident. At the end of 6 months, a summative ITER is completed and reviewed with the resident by the program director. Areas of weakness should be discussed and plans made to address these weaknesses. Residents are encouraged to make themselves aware of the promotions policy of McGill.

## Objectives of Training and Training Requirements In Adult Neurology

Supplement to Royal College of Physician and Surgeons of Canada Education Committee  
Objectives of Training and Specialty Training Requirements in Neurology

### **GENERAL OBJECTIVES:**

Residents must demonstrate the knowledge, skills and attitudes relating to gender, culture and ethnicity pertinent to neurology. In addition, all residents must demonstrate an ability to incorporate gender, cultural and ethnic perspectives in research methodology, data presentation and analysis.

On completion of the educational program, the graduate physician will be competent to function as a consultant neurologist. This requires the physician to:

1. Provide scientifically based, comprehensive and effective diagnosis and management plan for patients with neurological disorders.
2. Communicate effectively with patients, their families and medical colleagues (particularly referring physicians), and other health care professionals.
3. Counsel patients and others on aspects of prevention of neurological disorders, including risk factors, and genetic and environmental concerns.
4. Maintain complete and accurate medical records.
5. Effectively coordinate the work of the health care team.
6. Be an effective teacher of other physicians (including medical students and house officers), other health care personnel and patients and their family.
7. Be proficient in professional and technical skills related to the specialty.
8. Demonstrate personal and professional attitudes consistent with a consultant physician role.
9. Be willing and able to appraise accurately his or her own professional performance.
10. Be willing and able to keep his or her practice current through reading and other modes of continuing medical education.
11. Be able to critically assess the neurological literature as it relates to patient diagnosis, investigation and management.
12. Be able to participate in clinical or basic science studies as a member of a research team.

## **SPECIFIC OBJECTIVES:**

At the completion of training, the resident will have acquire, along with those outlined by the Royal College of Physician and Surgeons of Canada Education Committee Objectives of Training and Specialty Training Requirements in Neurology, the following competencies and will function effectively in the following CanMEDS roles as:

1. **Medical Expert/Clinical Decision Maker**
2. **Communicator**
3. **Collaborator**
4. **Manager**
5. **Health Advocate**
6. **Scholar**
7. **Professional**

## **1. Medical Expert/Clinical Decision-Maker**

### ***General Requirements***

- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- Access and apply relevant information to clinical practice.
- Demonstrate effective consultation services with respect to patient care, education and legal opinions.

### ***Specific Requirements***

Provide scientifically based, comprehensive and effective diagnosis and management for patients with neurological disorders.

### **Clinical Skills**

For a patient with a neurological complaint or disorder, the physician will be able to:

- Obtain a complete neurological history from adults and children obtaining a collateral history where necessary.
- Perform an appropriate physical examination.
- Determine whether a patient's symptoms and signs are the result of an organic or psychological disorder. Where they are due to an organic disorder, the resident must determine whether they result from unifocal, multifocal or diffuse involvement of the nervous system and, where possible, appropriately localize the lesion(s).
- Formulate an appropriate differential and provisional diagnosis.
- Outline an appropriate plan of laboratory investigation.
- Outline an appropriate therapeutic plan.
- Exhibit appropriate clinical judgment in outlining a differential diagnosis and an investigative and therapeutic plan, taking into account matters such as the patient's age, general health, risk and cost of investigative procedures, risk and cost of therapeutic interventions, and epidemiology of the disease.

## Technical Skills

- Perform a lumbar puncture, vestibular testing (Dix-Halpike), caloric testing, apnea test, assess for diagnosis of brain death.
- Identify and describe abnormalities seen in common neurological disorders on plain x-rays, cerebral and spinal angiograms, computerized tomography (CT) of the brain and spinal column, magnetic resonance imaging (MRI) of the brain and spinal column.
- With regard to a specific patient or clinical history, evaluates the relevance of a specific report on the following investigative procedures: electroencephalogram; motor and sensory nerve conduction study; electromyography; evoked responses; electronystagmogram; audiogram; perimetry; psychometry; cerebrospinal fluid (CSF) analysis; plain x-ray; angiogram; ultrasound and CT, MRI scans of the neuraxis.
- Identify and describe gross and microscopic specimens taken from the normal nervous system and from the nervous system of patients affected by the major neurological disorders.

## Knowledge

- As a basis for clinical competence, the neurologist must be familiar with and able to describe or discuss:
- the clinical features, including presenting signs and symptoms, natural history, and prognosis, for the major neurological disorders including: neurological complications of systemic diseases, trauma to the nervous system, cerebrovascular disorders, nervous system tumors, infections of the nervous system, demyelinating disorders, anoxic/ischemic and toxic/metabolic encephalopathies, deficiency syndromes, neurocutaneous disorders, dementias, movement disorders, the epilepsy syndromes and clinical seizure types, headache disorders, sleep disorders, neurological disorders of pregnancy, disorders/diseases of the following anatomic structures; cerebellum, cranial nerves, special senses, roots, plexi, peripheral nerves, neuromuscular junctions, muscle
- the clinical features of the major psychiatric syndromes and their known or postulated neurochemical basis
- the embryological development of the nervous system and how congenital anomalies arise from disorders of this process
- the gross and microscopic anatomy of the nervous system, nerve roots, peripheral nerves, muscles and the vascular system of the nervous system; this includes the recognition of the structures in

both anatomical and neuro-imaging formats (when technically feasible)

- the anatomy, composition and physiology of myelin
- the mechanisms underlying the resting membrane potential, conduction of an action potential and synaptic transmission
- axonal transport
- the major neurotransmitters and neuromodulators including their clinical significance
- the role of trophic factors in the nervous system
- the formation and circulation of the cerebrospinal fluid (CSF)
- the biologic basis for the blood-brain, blood-cerebrospinal fluid and blood-nerve barriers, and their clinical importance in health and disease
- cerebral blood flow and cerebral metabolism
- function and dysfunction of the immune system with particular emphasis on the implications for nervous system disease
- the anatomical and physiological basis of consciousness, sleep and wakefulness
- the anatomical and physiological basis of speech, memory, learning and behaviour
- the anatomical and physiological basis of the following systems: special senses, sensory, motor, autonomic, limbic, and reticular activating system
- the physiology of the following major subdivisions of the central nervous system: major cortical regions, basal ganglia, thalamus, cerebellum, reticular activating system, respiratory centres and the limbic system
- the anatomic and physiologic basis of the normal neurological examination taking into account the effect of age
- the pathophysiology of neurologic symptoms and signs in the major, primary and secondary neurologic disorders; (examples of these include seizures, spasticity, tremor, aphasia, etc.)
- the basic principles underlying the interpretation of the major clinical tests such as nerve conduction studies, electromyography, electroencephalography, evoked potentials, perimetry, electronystagmography, audiometry, psychometry and CSF

analysis; the indications for, and potential value of and limitations and contraindications for, the tests in any clinical situation where their use is being contemplated

- the indications for, side effects and dosages of the major agents used in neurologic therapeutics
- the mechanism(s) of action of the major drugs used in neurological therapeutics
- the teratogenic effects of the major drugs used in neurological therapeutics
- the mechanism(s) of action of apheresis including the rationale for the therapeutic usefulness of the procedure in specific neurological diseases, and the indications and contraindications for its use
- the role of surgery in the therapy of neurological disorders including indications and contraindications for its use
- the role of rehabilitative medicine in the treatment of neurological disorders
- the basic histopathologic reactions which occur in nervous system disorders
- the pathologic changes (gross and microscopic) occurring in the major neurologic diseases
- infectious diseases of the nervous system
- the major bacteria causing nervous system infections including classification, staining characteristics, and antibiotic sensitivities
- the basic principles of clinical genetics
- the basic mechanisms of chromosomal division, and chromosomal abnormalities seen in the major neurological disorders that result from disturbances in these mechanisms
- the patterns of inheritance, where known, of neurological disorders
- the principles underlying and the diagnostic value of gene localization
- the biochemical basis for the major neurologic syndromes resulting from inborn errors of metabolism
- the basic procedures used in clinical epidemiology and the clinical epidemiology of nervous system disorders

- the major neurotoxicologic agents and their effects
- the therapeutic and toxic effects of irradiation on nervous tissue, its role in the treatment of, and its relationship to the production of nervous system disorders

## **2. Communicator**

### ***General Requirements***

- Establish therapeutic relationships with patients/families.
- Obtain and synthesize relevant history from patients/families/communities.
- Listen effectively.
- Discuss appropriate information with patients/families and the health care team.

### ***Specific Requirements***

Communicate effectively with patients, their families and medical colleagues (particularly referring physicians), and other health care professionals in both the inpatient and outpatient settings. The Neurologist will:

- Communicate effectively and regularly with patients and their families.
- Be considerate and compassionate in communicating with patients and families, willingly provide accurate information appropriate to the clinical situation, with a reasonable attempt at prognosis.
- Communicate effectively and appropriately with nurses and paramedical personnel.
- When ordering investigative procedures, ensure there has been adequate communication about the patient with the person who will actually be doing and/or reporting the diagnostic study.

Counsel patients and others about aspects of prevention of neurologic disorders, including risk factors, and genetic and environmental concerns. The neurologist will:

- Recognize that complete patient care requires that, in addition to the need for making a correct diagnosis, a search for risk factors for the disorder be undertaken.
- Recognize that treatment for a patient with a neurological disorder may require in addition to specific medical and surgical interventions, the elimination of risk factors and genetic counselling.

### **3. Collaborator**

#### ***General Requirements***

- Consult effectively with other physicians and health care professionals.
- Contribute effectively to other interdisciplinary team activities.

#### ***Specific Requirements***

Be an effective teacher of other physicians (including medical students and house officers), other health care personnel, and patients. The neurologists will:

- Provide instruction to medical students and more junior physicians at a level appropriate to their clinical education and professional competence.
- Willingly share knowledge with others with whom they are associated, thus ensuring the most effective delivery of health care to patients.
- Participate in multi-disciplinary ward rounds where and when appropriate.

### **4. Manager**

#### ***General Requirements***

- Utilize resources effectively to balance patient care, learning needs, and outside activities.
- Allocate finite health care resources wisely.
- Work effectively and efficiently in a health care organization.

- Utilize information technology to optimize patient care, life-long learning and other activities.

### ***Specific Requirements***

Be proficient in professional skills related to the specialty.

Demonstrate the following professional skills in time management:

- Recognize that effective use of time depends upon punctuality.
- Recognize that effective use of time requires planning.
- Develop speed as well as accuracy in clinical skills.
- Reserve time for reading and keeping current with the neurological literature.
- Establish routines for carrying out regular activities and adhere to them.

Maintain complete and accurate medical records:

- Record and maintain a complete and accurate medical record for every patient seen; this record will include the patient's history and the findings on physical examination (including the neurological examination), a differential diagnosis, a provisional diagnosis, a plan for management, appropriate progress notes, and a comprehensive discharge summary.

Effectively coordinate the work of the health care team:

- Organize and supervise the more junior physicians and medical students on a ward and/or consultation service in a manner that ensures the efficient and effective delivery of health care for the patients.
- Indicate, by the treatment plan, that for the optimal treatment of many patients with neurological disorder, a team approach is necessary -- members of the team may include nurses, rehabilitation personnel (physiotherapists, occupational therapists, speech therapists, etc.), psychologists, social workers, etc.
- Identify where an important role(s) can be played by disease focused lay groups with regard to helping the patient and/or family and to facilitate its happening.

## **5. Health Advocate**

### ***General Requirements***

Identify the important determinants of health affecting patients.

Contribute effectively to improved health of patients and communities.

Recognize and respond to those issues where advocacy is appropriate.

### ***Specific Requirements***

Learn about community resources and related patient support groups; provide assistance to access programs (e.g. home care, occupational and physiotherapy, drug plans, application for nursing homes etc) and participate in their activities.

Educate, be able to generate and access information (e.g. printed material, video tapes web sites) and be available as a resource person to counsel patients effectively on neurological disorders.

Counsel patients on the importance of taking responsibility for their own well-being and recognize the important determinants predisposing to neurological disorders (e.g. risk factors for transient ischemic attack (TIA) and stroke, teratogenic effects of anti-epileptic drugs).

Understand the role of national and international bodies(e.g. Alzheimer, Stroke, Multiple Sclerosis Societies) in the promotion of neurological health, and the prevention, detection, and treatment of neurological disorders.

## **6. Scholar**

### ***General Requirements***

Develop, implement and monitor a personal continuing education strategy.

Critically appraise sources of medical information.

Facilitate learning of patients, house staff/students and other health professionals.

Contribute to development of new knowledge.

### ***Specific Requirements***

Be able to critically assess the neurological literature as it relates to patient diagnosis, investigation and treatment:

- Develop criteria for evaluating neurological literature.
- Critically assess the neurological literature using these criteria.
- Be familiar with the design of experimental and observational studies, especially randomized controlled trials.

- Be able to calculate absolute risk reductions, relative risk reductions and numbers needed to treat or harm.

Be able to participate in clinical or basic science studies as a member of a research team:

- Be able to describe principles of good research.
- Use the above principles, and be able to judge whether a research project is properly designed.
- Complete a six month research elective in either clinical or basic science research during the PGY4.
- Be prepared to present research findings to peers at local, national or international conferences.

## **7. Professional**

### ***General Requirements***

Deliver highest quality care with integrity, honesty and compassion.

Exhibit appropriate personal and interpersonal professional behaviours with patients/families, peer residents. And other health care professionals.

Practice medicine ethically consistent with obligations of a physician.

### ***Specific Requirements***

Demonstrate personal and professional attitudes consistent with a consulting physician role:

- Periodically review his/her own personal and professional performance against national standards set for the specialty.
- Be willing to include the patient in discussions concerning appropriate diagnostic and management procedures.
- Show appropriate respect for the opinions of fellow consultants and referring physicians in the management of patient problems and be willing to provide means whereby differences of opinion can be discussed and resolved.

Be willing and able to appraise accurately his/her own professional performances and show that he/she recognizes his/her own limitations with regard to skill and knowledge by appropriately consulting other physicians and paramedical personnel when caring for the patient.

Be willing and able to keep his/her practice current through reading and other modes of continuing medical education and develop a habit of maintaining current his/her clinical skill and knowledge base through continuing medical education.

**Adult Neurology Residency Training Program  
McGill University**

**Goals of training during the training phases**

**1) PGY1**

This year is devoted to internal medicine. In order to maximize the amount of internal medicine training given to the neurology trainee, elective time is used for non-neurological specialties.

**2) Phase I (PGY 2-3)**

During this first 24 months of neurology training, the trainee should:

- Acquire the ability to do a detailed neurological history and physical exam, develop a basic differential diagnosis and investigation plan
- Achieve at least the minimum training standards in pediatric neurology for adult trainees
- Develop preliminary understanding of the usefulness, indications, contraindications, risks of diagnostic studies and the interpretation of test results including EEG, EMG and neuroimaging
- Be able to recognize and manage common neurological emergencies such as meningitis, subarachnoid bleed, herniation syndromes and cord compression
- Be able to recognize and manage common psychiatric disorders including acute agitation, schizophrenia, bipolar disorders, acute adjustment disorders and depression
- Be competent to work-up common neurological problems of in-patients and out-patients
- Develop clinical and laboratory skills in EEG and epilepsy
- Show developing consultation skills

**3) Phase II (PGY 4-5)**

During these 18 months of neurology training, the trainee will:

- Conduct a full-time 6-month basic or clinical research project to learn principles of research methodology

- Develop increased out-patient management skills
- Improve technique of neurological history and physical exam
- Demonstrate further sophistication in evaluation of diagnostic tests particularly in imaging and electrophysiology
- Develop clinical and laboratory skills in EMG, and neuromuscular diseases
- Develop good clinical consultation skills, particularly the recognition and treatment of neurological emergencies
- Develop competence in teaching skills
- Develop and consolidate knowledge related to subspecialty areas via elective rotations (psychiatry, neurosurgery, neuroradiology, neuro-ophthalmology, movement disorders etc.)
- Supervise and teach more junior trainees and effectively manage an inpatient ward service

### **5) Phase III (PGY 5)**

The final 6 months of training should allow the resident to refine skills attained in the previous years with emphasis on developing expertise and interest in out-patient and subspecialty areas of neurology. Specifically, the trainee will do 7 half-day out-patient clinics per week. The clinics should be a mixture of general and subspecialty clinics, and are to be tailored to meet the individual residents' needs and interests. During this phase of training, the resident will need:

- To rapidly and accurately evaluate neurological patients and provide appropriate recommendations on management
- To function effectively in an outpatient clinic setting
- To demonstrate an understanding of disease pathogenesis and epidemiology, and to critically analyse the neurological literature
- To communicate effectively and compassionately with patients and family members regarding diagnosis, investigation, treatment and prognosis
- To know when consultation with colleagues is appropriate
- To be aware of the ethical issues common to neurological cases and to be able to guide colleagues, students and families in decision making relevant to such issue