Interventional Neurology Program Requirements

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29 **Table of Contents**
30

31

Interventional Neurology Program Requirements

The common program requirements are standards required of accredited programs in all UCNS subspecialties. They are shown in **bold** typeface below. Requirements in regular typeface are defined by each subspecialty.

I. Introduction

A. The subspecialty of Interventional Neurology is primarily concerned with the application of minimally invasive, catheter-based techniques for the treatment of patients with vascular disorders involving the brain, spinal cord, head and neck. Just like any other specialist in similar areas, the interventional neurologist assumes the primary care role for the patients that he/she evaluates and treats with such procedures. Therefore, the *Interventional Neurology Core Curriculum* provides the opportunity to acquire specialized knowledge in the fundamental concepts of the illnesses that require this type of treatment, in close concert with the technical aspects of the procedures required for the execution of such treatment. This subspecialty represents the natural expansion of expertise in the field of cerebrovascular disorders, and, as such, it demands as a prerequisite the completion of specialized postgraduate education in vascular neurology and/or neurocritical care.

The interventional neurologist must evaluate patients both in emergent and non-emergent settings, carefully weighing the benefit/risk ratio of applying neurointerventional procedures intended for the treatment or prevention of cerebrovascular catastrophes. Such responsibility requires in-depth knowledge of the disease processes themselves, the technical aspects of the planned procedures, and a keen understanding of how to match the two. Moreover, the interventional neurologist must be conversant with therapeutic strategies designed to support his/her patients, before, during, and after the completion of any neurointerventional procedure. In an eminently multidisciplinary context, he/she would be required to interact closely with other specialists, including emergency physicians, neurosurgeons, vascular surgeons, cardiologists, neuroradiologists, anesthesiologists, as well as with nurses and technologists directly involved in the care of these patients. The ultimate goal of treatment is the reversal of potentially catastrophic cerebrovascular emergencies (e.g., recanalization of acute large arterial cerebral occlusions with progressing ischemia), the containment of ongoing processes destined to induce increasing degrees of neurologic injury (e.g., endovascular treatment of ruptured aneurysms), or the prevention of future potentially disabling events (e.g., stenting of severely stenotic lesions).

Educational programs in Interventional Neurology must exist in the context of comprehensive cerebrovascular centers, conducive to the progressive exposure to complex techniques, under the supervision and mentoring of specialists with ample experience in the completion of relevant neurointerventional procedures. The availability of related educational environments, specifically catheterization and angiography suites and intensive care units, is an intrinsic physical prerequisite to promote a learning environment that would lend itself ideal for the development of the desired skills.

B. **Purpose of the Training Program**

1. **The purpose of the training program is to prepare the physician for independent practice in** Interventional Neurology. **This training must be based on supervised clinical work with increasing patient care responsibilities and transition to independent practice over the course of the training program.** Their foundation must harness organized instruction,

exposure to relevant clinical material, and integration with applicable aspects of other disciplines.

2. **The program must require its fellows to obtain competencies in the six core competency areas defined by the Accreditation Council for Graduate Medical Education (ACGME). It is the responsibility of the program to provide precise definitions of specific knowledge, skills, and behaviors, as well as educational opportunities in which the fellow must demonstrate competence in those areas. The program's curricular goals and objectives must correlate to the appropriate ACGME Core Competencies and global learning objectives.**

II. Institutional Support

There are three types of institutions that may comprise a program: 1) the sponsoring institution, which assumes ultimate responsibility for the program and is required of all programs, 2) the primary institution, which is the primary clinical training site and may or may not be the sponsoring institution, and 3) the participating institution, which provides required experience that cannot be obtained at the primary or sponsoring institutions.

A. Sponsoring Institution

1. **The sponsoring institution must be accredited by the ACGME or the Canadian Excellence in Residency Accreditation (CanERA), formerly the Royal College of Physicians and Surgeons of Canada (RCPSC), and meet the current ACGME Institutional Requirements or CanERA General Standards of Accreditation for Institutions with Residency Programs. This responsibility extends to fellow assignments at all primary and participating institutions. The sponsoring institution must be appropriately organized for the conduct of graduate medical education (GME) in a scholarly environment and must be committed to excellence in both medical education and patient care.**
2. **A letter demonstrating the sponsoring institution's responsibility for the program must be submitted. The letter must:**
   a. **confirm sponsorship and oversight of the training program's GME activities,**
   b. **state the sponsoring institution's commitment to training and education, which includes the resources provided by the sponsoring institution, the primary institution, and/or the departments that support the program director's fulfillment of his or her duties as described in these program requirements, and**
   c. **be signed by the designated institution official of the institution as defined by ACGME or postgraduate dean as defined by CanERA.**
3. **Institutional support and oversight are further demonstrated by the required designated institution official/postgraduate dean signature on all program accreditation and reaccreditation applications and annual report submissions.**

B. Primary Institution

1. **Assignments at the primary institution must be of sufficient duration to ensure a quality educational experience and must provide sufficient opportunity for continuity of care. The primary institution must demonstrate the ability to promote the overall program goals and support educational and peer activities.**
2. **A letter from the appropriate department chair(s) at the primary institution must be submitted. The letter must:**
   a. **confirm the relationship of the primary institution to the program,**
   b. **state the primary institution's commitment to training and education, and**
   c. **list specific activities that will be undertaken, supported, and supervised at the primary institution.**

C. Participating Institutions

1. **Assignments to participating institutions must be based on a clear educational rationale, must have clearly stated learning objectives and activities, and should provide resources not otherwise available to the program. When multiple participating institutions are used, there should be assurance of the continuity of the educational experience.**
2. **Assignments at participating institutions must be of sufficient duration to ensure a quality educational experience and should provide sufficient opportunity for continuity of care. All participating institutions must demonstrate the ability to promote the overall program goals and support educational and peer activities.**
3. **If a participating institution is used, a participating institution letter must be submitted. The letter must:**
   a. **confirm the relationship of the participating institution to the program,**
   b. **state the participating institution's commitment to training and education,**
   c. **list specific activities that will be undertaken, supported, and supervised at the participating institution, and**
   d. **be signed by the appropriate official, e.g., department chair or medical director, of the participating institution.**

III. Facilities and Resources

A. Each program must demonstrate that it possesses the facilities and resources necessary to support a quality educational experience.

1. **Additional professional, technical, and administrative personnel must be provided to adequately support the fellowship training program in attaining its educational and administrative goals.**
2. **In programs not situated in a department of neurology, evidence must be provided that demonstrates fellows have access to neurological services** including general, vascular, and critical care neurology as well as neurosurgical and neuroimaging support**.**
3. There must be an adequate number and variety of patients with pathologic conditions amenable to treatment via neurointerventional procedures. Fellows must gain direct exposure to the most common conditions listed in Sections I and II of the *Interventional Neurology Core Curriculum.*
4. There must be adequate space and equipment for the educational program, including meeting rooms, classrooms with audiovisual and other educational aids, office space for staff and fellows, and access to reference materials. The catheterization and angiography environment must contain the necessary radiographic equipment to perform complex neurointerventional procedures, as well as an optimal inventory of devices necessary for the completion of procedures listed in the core competencies.
5. A dedicated neurointensive care environment that is sufficient to accommodate patients who require perioperative management, such as dedicated neurointensive care unit.

IV. Faculty

The faculty of accredited programs consists of: 1) the program director, 2) core faculty, and 3) other faculty. Core faculty are physicians who oversee clinical training in the subspecialty. The program director is considered a core faculty member when determining the fellow complement. Other faculty are physicians and other professionals determined by the Subspecialty to be necessary to deliver the program curriculum. The program director and faculty are responsible for the general administration of the program and for the establishment and maintenance of a stable educational environment. Adequate durations of appointments for the program director and core

faculty members are essential for maintaining such an environment. The duration of appointment for the program director must provide for continuity of leadership.

A. Program Director Qualifications

1. There must be a single program director responsible for the program. The person designated with this authority is accountable for the operation of the program and he or she should be a member of the faculty or medical staff of the primary institution.

2. The program director must:

a. possess requisite specialty expertise as well as documented educational and administrative abilities and experience in his or her field,

b. be certified by the American Board of Medical Specialties (ABMS), RCPSC, American Osteopathic Association (AOA), **or College of Family Physicians of Canada (CFPC) in** neurology, neurosurgery, or neuroradiology with fellowship training in neuroendovascular medicine,

c. possess a current, valid, unrestricted, and unqualified license to practice medicine in the state or province of the program,

d. if UCNS certification is offered in the subspecialty, be certified, and maintain certification, in Interventional Neurology **by the UCNS,**

i. New programs without a certified program director may apply for accreditation, as long as the application contains an attestation that the program director will become certified at the next available opportunity, which includes certification through the UCNS faculty diplomate pathway. The attestation must contain a statement that the program understands that should the program director fail to achieve certification, the program must immediately submit a program change request appointing an appropriately qualified program director.

e. submit evidence of a minimum of 50% of clinical time in the practice of Interventional Neurology,

f. have the interest, authority, and time required to fulfill the teaching and administrative responsibilities to develop, implement, and achieve the educational goals of the training program, and

i. Examples should be submitted documenting the program director's prior experience teaching, lecturing, or writing on topics related to Interventional Neurology, as well as activities related to the organization and management of an educational program in Interventional Neurology.

g. maintain continuing education in vascular and Interventional Neurology,

h. demonstrate a commitment to the principles and practices of educational theory and methodologies.

B. Program Director Responsibilities

1. The program director must:

a. oversee and organize the activities of the educational program in all institutions participating in the program including selecting and supervising the faculty and other program personnel at each institution, and monitoring appropriate fellow supervision and evaluation at all institutions used by the program,

b. prepare accurate statistical and narrative descriptions of the program as requested by the UCNS, as well as update the program and fellow records annually,

c. ensure the implementation of fair policies and procedures, as established by the sponsoring institution, to address fellow grievances and due process in compliance with the ACGME's or CanERA's institutional requirements,

d. monitor fellow stress, including mental or emotional conditions inhibiting performance or learning, and drug- or alcohol-related dysfunction, and

e. obtain prior approval of the UCNS for changes in the program that may significantly alter the educational experience of the fellows. Upon review of a proposal for a program change, the UCNS may determine that additional oversight or a site visit is necessary. Examples of changes that must be reported include:

1) change in the program director,

2) the addition or deletion of sponsoring, primary, or participating institution(s),

3) change in the number of approved fellows, and

4) change in the format of the educational program.

2. The program director is also responsible for selecting fellows in accordance with institutional and departmental policies and procedures.
3. The program director must function as one of the primary practitioners of Interventional Neurology within the institution.

C. Core Faculty Qualifications

1. Each core faculty member must:

a. possess requisite specialty expertise as well as documented educational and administrative abilities and experience in his or her field,

b. be currently certified by the ABMS, RCPSC, AOA, **or CFPC in** neurology, neurosurgery, or neuroradiology with fellowship training in neuroendovascular medicine,

c. possess a current, valid, unrestricted, and unqualified license to practice medicine in the state or province of the program,

d. be appointed in good standing to the faculty of an institution participating in the program, and

e. possess UCNS certification, be eligible for certification, or possess equivalent qualifications in Interventional Neurology.

2. The core faculty must include at least one neurologist. The neurologist may also be the program director.

D. Core Faculty Responsibilities

1. There must be a sufficient number of core faculty members with documented qualifications at each institution participating in the program to instruct and adequately supervise all fellows in the program.

2. Core faculty members must:

a. devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities,

b. evaluate the fellows they supervise in a timely manner, and

c. demonstrate a strong interest in the education of fellows, demonstrate competence in both clinical care and teaching abilities, support the goals and objectives of the educational program, and demonstrate commitment to their own continuing medical education by participating in scholarly activities.

3. The faculty must function as a team of physicians providing full-time around-the-clock coverage for neurointerventional procedures to this specific population of cerebrovascular patients. As such, a minimum of two core faculty members will be required for every educational and training program.
4. At each institution, there must be a sufficient number of faculty with documented qualifications to adequately instruct and supervise all fellows in the program.

E. Other Faculty

Educational and training programs in Interventional Neurology should take advantage of the institution's specialists in other relevant disciplines. As such, fellows should constantly interact with colleagues in neurosurgery, critical care, emergency medicine, cardiology, anesthesiology, vascular surgery, hematology, among others. Such interactions are desirable in order to round up the education of the fellow, while providing perspective on conditions and techniques that are relevant for the practice of Interventional Neurology.

V. Fellow Appointment

A. Duration of Training

1. **Fellowship programs must be no less than** 24 months dedicated to Interventional Neurology. **At least 80% of the fellow's time must be spent in supervised training activities in the practice of** Interventional Neurology**, including didactic and clinical education specific to the subspecialty, electives, and scholarly activities. Flexible Fellowships**
    a. **Programs may offer flexible fellowships for a variety of reasons, including, but not limited to: combined clinical/research fellowships or to allow fellows opportunities for work/life balance. Programs that combine clinical and research training (clinician-scientist fellowship program) may be up to 36 months in duration for a one-year program and 48 months for a two-year program. At least** 24 **full months of this extended-program period must be spent in patient-oriented** Interventional Neurology **clinical, educational, and scholarly activity, the distribution of which across this extended period is at the program's discretion.**

B. Fellow Eligibility

1. **The fellow must possess a current valid and unrestricted license to practice medicine in the United States or its territories or Canada.**
2. **The fellow must be a graduate of a residency program in neurology** who completed a one-year vascular neurology program or a two-year Neurocritical Care fellowship**,** neurosurgery, or radiology who have completed a one-year neuroradiology fellowship **accredited by the ACGME,** UCNS, **RCPSC, or CanERA.**
3. **The fellow must be board certified or eligible for certification by the ABMS, RCPSC,** AOA, **or CFPC in** neurology, neurosurgery, or neuroradiology**.**

C. Fellow Complement

The fellow complement is the number of fellows allowed to be enrolled in the program at any given time, e.g., across all training years.

1. **There must be at least 1** UCNS-certified **core faculty member(s) for every 1** active **fellow(s),** and no less than two faculty members as defined under IV.D.3.

D. Appointment of Fellows and Other Students

1. **The appointment of fellows who do not meet the eligibility criteria above must not dilute or detract from the educational opportunities of regularly appointed** Interventional Neurology **fellows. Programs must include these fellows in all reports submitted to UCNS to demonstrate compliance with the approved fellow complement. Fellows who are enrolled without meeting the eligibility criteria must be notified that they may not apply for UCNS certification examinations as graduates of an accredited program.**

VI. Educational Program

A. Role of the Program Director and Faculty

1. **The program director, with assistance of the faculty, is responsible for developing and implementing the academic and clinical program of fellow education by:**
    a. **preparing a written statement to be distributed to fellows and faculty and reviewed with fellows prior to assignment, which outlines the educational goals and objectives of the program with respect to the knowledge, skills, and other attributes to be demonstrated by fellows for the entire fellowship and on each major assignment and each level of the program,**
    b. **preparing and implementing a comprehensive, well-organized, and effective curriculum, both academic and clinical, which includes the presentation of core specialty knowledge supplemented by the addition of current information, and**
    c. **providing fellows with direct experience in progressive responsibility for patient management.**
        1. Criteria must be established to evaluate and document procedural competencies. This should include, but not limited to, how the training is conducted, the minimum number of directly observed procedures, and those conducted under supervision, prior to the mentor approving independent practice.

B. Competencies

1. **A fellowship program must require that its fellows obtain competence in the AGCME Core Competencies to the level expected of a new practitioner in the subspecialty. Programs must define the specific and unique learning objectives in the area including the knowledge, skills, and behaviors required and provide educational experiences as needed in order for their fellows to demonstrate the core competencies.**
2. **The program must use the ACGME Core Competencies to develop competency-based goals and objectives for all educational experiences during the period of fellowship training in** Interventional Neurology**.**

C. Didactic Components

1. **The program must include structured, fellow-specific educational experiences such as rounds, conferences, case presentations, lectures, and seminars that complement the clinical and self-directed educational opportunities. Together, various educational experiences must facilitate the fellow's mastery of the core content areas and foster the competencies as described above.**
2. Fellows must regularly attend seminars and conferences in neurology, neurosurgery, and radiology, with emphasis on neuroradiology, specifically those with an emphasis in cerebrovascular pathology and neurointerventional procedures. Additional didactic exposure may be desirable in vascular neuropathology, neuroradiology, Neuroimaging, and neuroepidemiology. Regularly scheduled lectures in research methodology and analysis are very desirable. It is imperative that the fellows also learn about major developments in the basic and clinical sciences relevant to neurointerventional procedures, as well as that they attend national and international meetings where research is present. Overall, all the elements of the *Interventional Neurology Core Curriculum* must be covered in one form or another.

D. Clinical Components

1. **The fellow's clinical experience must be spent in supervised activities related to the care of patients with** cerebrovascular disorders for whom neurointerventional procedures are either an option or the sole form of treatment**. Clinical experiences may include all training relevant to** Interventional Neurology, **including lectures and individual didactic experiences and journal clubs emphasizing clinical matters.**

2. For each 24 months of education and training, fellows must complete at least 9 of those months while "on service" providing direct care relevant to neuro-interventional procedures in each year. The latter includes preprocedural evaluation and patient selection, procedural technical participation, and post-procedural management.
3. During the educational and training program, fellows are expected to complete, under supervision, a minimum of 200 diagnostic angiographic procedures (including both cerebral and spinal), and a minimum of 200 therapeutic procedures (including both cerebral and spinal.
    a. 50 acute ischemic stroke treatments
    b. 50 intracranial embolizations including aneurysm, arteriovenous malformation, arteriovenous fistula, tumor, subdural hematoma treatments with at least 10 ruptured aneurysm treatments.
    c. 25 intracranial or extracranial stent placements (at least 5 in each category and may include stents or flow diverters for aneurysms)
    d. 10 extracranial embolizations including trauma, epistaxis, etc.
    e. 3 spinal angiograms and/or embolizations
4. In addition to procedural responsibilities, outpatient consultation of patients referred for possible neurointerventional procedures, as well as outpatient follow-up of those previously treated should also be part of the program.

E. Scholarly Activities

1. **The responsibility for establishing and maintaining an environment of inquiry and scholarship rests with the faculty. Both faculty and fellows must participate actively in some form of scholarly activity. Scholarship is defined as activities unrelated to the specific care of patients, which includes scholarship pertaining to research, writing review papers, giving research-based lectures and participating in research-oriented journal clubs.**
2. **There must be adequate resources for scholarly activities for faculty and fellows.** The program must include sufficient space, equipment, and computer resources to support scholarly activities. Access to statistical support and data analysis infrastructure must also be available.

F. Fellow Supervision, Clinical Experience and Education, and Well-Being

Providing fellows with a sound academic and clinical education must be carefully planned and balanced with concerns for patient safety and fellow well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on fellows to fulfill service obligations. Didactic and clinical education defined by the program requirements must have priority in the allotment of a fellow's time and energy.

1. **Fellow Supervision**
    a. **All patient care required by the program requirements must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of fellows at all times. Fellows must be provided with rapid, reliable systems for communicating with supervising faculty.**
    b. **Faculty schedules must be structured to provide fellows with continuous supervision and consultation.**
    c. **Faculty and fellows must be educated about and meet ACGME or CanERA requirements concerning faculty and fellow well-being and fatigue mitigation.**
2. **Clinical Experience and Education and Well-Being**
    a. **Clinical assignments must recognize that the faculty and fellows collectively have responsibility for the safety and welfare of patients. Fellow clinical experience and**

education supervision, and accountability, and clinical work hours, including time spent on-call, must comply with the current ACGME or CanERA institutional program requirements.

VII. Evaluation

A. Fellow Evaluation

1. Fellow evaluation by faculty must:
   a. take place at least semi-annually to identify areas of weakness and strength, which must be communicated to the fellow,
   b. use the subspecialty milestones to document fellow experience and performance, and
   c. include the use of assessment results to achieve progressive improvements in the fellow's competence and performance in the ACGME Core Competencies and the subspecialty's core knowledge areas. Appropriate sources of evaluation include faculty, patients, peers, self, and other professional staff.
2. The program must include a mechanism for providing regular and timely performance feedback to fellows. Issues of unacceptable performance must be addressed in a timely fashion and in accordance with the policies and procedures of the sponsoring institution.
3. Summary and final evaluation of the fellow must:
   a. be prepared by the program director and should reflect the input of faculty,
   b. include a formative evaluation of the fellow's demonstration of learning objectives and mastery of the ACGME Core Competencies using the subspecialty's milestones,
   c. include a final, summative evaluation by the program director using the subspecialty's milestones to document the fellow's demonstration of sufficient competence and professional ability to practice the subspecialty competently and independently, and
   d. include a statement specifically regarding the fellow's ability to practice the subspecialty independently upon completion of the program.

B. Faculty Evaluation

1. The performance of faculty must be evaluated by the program director on an annual basis.
2. The evaluations must include a review of their teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities.
3. These evaluations must include confidential annual written evaluations by fellows.

C. Program Evaluation and Outcomes

1. The effectiveness of a program must be evaluated in a systematic manner. In particular, the quality of the curriculum and the extent to which the educational goals have been met must be assessed.
2. Confidential written evaluations by fellows must be utilized in this process.
3. The program will use fellow performance and outcome assessment in its evaluation of the educational effectiveness of the fellowship program. At a minimum, the fellow performance on the UCNS certification examination should be used as a measure of the effectiveness of the education provided by the training program. The development and use of clinical performance measures appropriate to the structure and content of each program is encouraged.
4. The program must have a process in place for using fellow performance and assessment results together with other program evaluation results to improve the fellowship program.