Goals and Objectives
ESN Fellows (PGY8+)

Duration: 12 months
Supervising Faculty: Teaching faculty as assigned by the Fellowship Director

Summary of Rotation Goals:

By the end of the ESN Fellowship training (PGY8+), the fellow will be able to:

Patient Care

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

Fellows:

(1) Will serve as consultants under the supervision of staff endovascular surgical neuroradiology practitioners. Appropriate standards of care and concern for patient welfare must be strictly maintained. Communication, consultation, and coordination of care with the referring clinical staff and clinical services must be maintained and documented with appropriate notes in the medical record;

(2) Will participate in and personally perform and analyze a broad spectrum of endovascular procedures. The patient population will provide a diversity of illnesses from which broad experience in endovascular surgical neuroradiology therapy can be obtained. The case material shall encompass a range of diseases, including:

(a) Aneurysms
(b) Arteriovenous malformation
(c) Atherosclerotic disease of the cervical vessels
(d) Occlusive vascular disease and acute infarction
(e) Intracranial neoplasms
(f) Vascular anomalies of the Head and Neck
(g) Neoplasms of the head and neck
(h) Vascular anomalies of the spine
(i) Neoplasms of the spine
(j) Traumatic vascular lesions of the CNS, head, neck and spine

(3) Will perform a minimum of 100 therapeutic endovascular procedures;

(4) Will have adequate training and experience in invasive functional testing;

(5) Will attend and participate in clinical conferences, participate in the clinical teaching of neurological surgery, and/or radiology fellows and/or medical students;

(6) Will have experience in didactic and clinical experiences that encompass the full clinical spectrum of endovascular surgical neuroradiology therapy. The program in endovascular surgical neuroradiology will not have an adverse impact on the educational experience of diagnostic radiology, neuroradiology, neurological surgery, or neurology fellows in the same institution; and,

(7) Will make rounds with the endovascular surgical neuroradiology faculty members during which patient management decisions are discussed and made.

Medical Knowledge

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care.

Fellows:

(1) Will undergo clinical training consisting of a period of 12 continuous months in endovascular surgical neuroradiology during which the fellow has the opportunity to carry out all of the following under close supervision:

   (a) Perform clinical preprocedure evaluations of patients, and their preliminary diagnostic studies, and consult with clinicians on other services;
   (b) Perform diagnostic and therapeutic endovascular surgical neuroradiology procedures;
   (c) Generate procedural reports; and,
   (d) Participate in short term and long term post procedure follow up care, including neurointensive care. The continuity of care must be of sufficient
duration to ensure that the fellow is familiar with the outcome of all endovascular surgical neuroradiology procedures.

(2) Will complete the following didactic component areas:

(a) Anatomical and physiologic basic knowledge:
   (i) Arterial and venous angiographic anatomy of the brain, spine, spinal cord, and head and neck, including:
      (a) Collateral circulation
      (b) Dangerous anastomosis
      (c) Cerebral blood flow
      (d) Autoregulation
      (e) Variants of anatomy
      (f) Vascular distributions and supply/drainage
   (ii) Related bony and soft tissue anatomy and physiology;
      (a) Vertebral, face, and skull bony anatomy
      (b) Brain, neck, face, and spine soft tissue anatomy and physiology

(b) Pharmacology of the CNS and vasculature and relevant brain physiology:
   (i) Vasodialators and constrictors
   (ii) Agents used in provocative testing
   (iii) Contrast agents
   (iv) Coagulation cascade
      (a) Anticoagulants
      (b) Antiaggregants
      (c) Thombolytics
   (c) Embolic, sclerosing, ablative and bone stabilization agents
      (i) Blood pressure control
      (ii) Heart rate control
      (iii) Allergic reaction control
      (iv) Infection
      (v) Stroke risk reduction

(d) Technical aspects of endovascular surgical neuroradiology, including:
   (i) Catheter and delivery systems
   (ii) Embolic, sclerosing and stabilizing agents in cerebral, spinal and head and neck embolization
   (iii) Stents, balloons, and revascularization devices
   (iv) Flow controlled navigations and embolization
   (v) Complications of angiography and embolization
   (vi) Collateral network manipulations, flow diversion
(vii) Electrophysiology
(viii) Provocative testing
(ix) Imaging of the vascular system
(x) Direct access/therapeutic injection techniques, including biopsy and aspiration.

(3) Provide the following knowledge base information for all the disease states listed in below:
(a) Classification
(b) Clinical presentation
(c) Imaging appearance
(d) Natural history
(e) Epidemiology
(f) Hemodynamic and physiologic basis for disease and treatment
(g) Indications and techniques for treatment
(h) Contraindications for treatment
(i) Treatment alternatives
(j) Combined therapies
(k) Risks of treatment
(l) Complication management

(i) Disease states
   (a) Arteriovenous malformations and fistulae
   (b) Vascular trauma
   (c) Hemorrhage and epistaxis
   (d) Stroke and cerebral ischemia
   (e) Arteriopathies
   (f) Vertebral fracture and degeneration
   (g) Tumors
   (h) Other vascular malformations and lesions

Practice-based Learning and Improvement

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Fellows are expected to develop skills and habits to be able to meet the following goals:
(1) Identify strengths, deficiencies, and limits in one's knowledge and expertise;
(2) Set learning and improvement goals;
(3) Identify and perform appropriate learning activities;
(4) Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
(5) Incorporate formative evaluation feedback into daily practice;
(6) Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;
(7) Use information technology to optimize learning; and,
(8) Participate in the education of patients, families, students, fellows and other health professionals.

Interpersonal and Communication Skills

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Fellows are expected to:

(1) Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
(2) Communicate effectively with physicians, other health professionals, and health related agencies;
(3) Work effectively as a member or leader of a health care team or other professional group;
(4) Act in a consultative role to other physicians and health professionals; and,
(5) Maintain comprehensive, timely, and legible medical records, if applicable.

Professionalism

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Fellows are expected to demonstrate:

(1) Compassion, integrity, and respect for others;
(2) Responsiveness to patient needs that supersedes self-interest;
(3) Respect for patient privacy and autonomy;
(4) Accountability to patients, society and the profession; and,
(5) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Systems-based Practice

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Fellows are expected to:

(1) Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
(2) Coordinate patient care within the health care system relevant to their clinical specialty;
(3) Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
(4) Advocate for quality patient care and optimal patient care systems;
(5) Work in interprofessional teams to enhance patient safety and improve patient care quality; and,
(6) Participate in identifying system errors and implementing potential systems solutions.