ACGME Educational Goals By Rotation

For Vascular Neurology Fellows on the <u>inpatient Stroke Service</u> and the <u>Neurocritical Care Service</u> rotations, the following core competencies are expected to be mastered and evaluations will be focus on these areas:

Patient Care:

A. Perform and document a relevant history on culturally diverse patients including the following components:
    a. Chief complaint
    b. History of present illness
    c. Past medical history
    d. Comprehensive review of systems
    e. Family history
    f. Social history including employment, living situation, tobacco, alcohol, and ilicit drug use and history
B. Perform and document a relevant examination on culturally diverse patients including the following components:
    a. A complete and thorough general examination
        i. Skin
        ii. HEENT
        iii. Neck
        iv. Cardiovascular
        v. Pulmonary
        vi. Abdominal
        vii. Extremities including pulses
    b. A complete and thorough neurologic examination
        i. Mental status
        ii. Cranial nerves
        iii. Strength
        iv. Sensation
        v. Cerebellar testing
        vi. Reflexes
        vii. Gait
C. Perform and document an expedited history and physical on a patient presenting to the emergency department
    a. Including a complete and accurate National Institutes of Health Stroke Scale
        i. NIHSS Certification is required
D. Generate appropriate differential diagnoses
E. Review all available data including labs, vascular studies, and imaging
F. Evaluate, assess and recommend effective management of patients
    a. Plan for further evaluation including labs, vascular studies, and imaging, as needed

b. Determine if the patient's symptoms are the result of cerebrovascular disease or are of another origin (e.g., of a systemic, psychiatric, or psychogenic illness)
c. Identify and describe abnormalities seen in common vascular disorders on radiographic testing, including plain films, anteriography, CT, MRI, and TCD or carotid duplex studies
d. Recommend therapeutic and preventative interventions to achieve optimal recovery from the acute event and prevent further brain injury

Medical Knowledge:

A. Demonstrate knowledge of major vascular and neurocritical care diseases, including considerations relating to age, gender, race, and ethnicity, based on the literature and standards of practice. This knowledge includes but is not limited to:
    a. The epidemiology of the disorder
    b. The etiology of the disorder, including medical, genetic, and sociocultural factors
    c. The phenomenology of the disorder
    d. An understanding of the impact of physical illness on the patient's functioning
    e. The experience, meaning, and explanation of the illness for the patient and family, including the influence of cultural factors and culture-bound syndromes
    f. Effective treatment strategies
    g. Course and prognosis
    h. Knowledge of healthcare delivery systems, including patient and family counseling
    i. Knowledge of the application of ethical principles in delivering medical care
    j. Ability to reference and utilize electronic systems to access medical, scientific, and patient information
B. Demonstrate knowledge of basic science aspects of vascular and critical care neurology
    a. Vascular neuroanatomy
    b. Stroke pathophysiology
    c. Cerebral blood flow
    d. Blood-brain barrier in stroke
    e. Coagulation cascade
    f. Metabolic and cellular consequences of ischemia
    g. Inflammation and stroke
    h. Brain edema and increased intracranial pressure
    i. Restoration and recovery following stroke
    j. Inflammation and edema following ntracranial bleeding

    k. Ventilatory management
C. Pharmacology
    a. Antiplatelet agents for both prevention and acute treatment
    b. Anticoagulants for both prevention and acute treatment
    c. Thrombolytic agents intravenous and intra-arterial dosing
    d. Antihypertensive agents for acute or long term blood pressure reduction including PO and IV medication
    e. Cardioactive medications
        i. Pressors, rate controlling agents, anti-arrythmic agents
    f. Hypercholesterolemic agents
    g. Medications to treat auto-immune diseases and vasculitis
    h. Medications to prevent and treat complications of stroke
        i. Deep vein thrombosis, infections
    i. Medications to improve or restore neurologic function or to augment rehabilitation
    j. Medications to prevent vasospasm following subarachnoid hemorrhage
    k. Interactions between medications
    l. Drugs that cause stroke, including drugs of abuse
D. Therapy
    a. Potential risks and benefits of therapies, including surgical procedures
        i. Intravenous thrombolysis
        ii. Intra-arterial thrombolysis and thrombectomy
        iii. Intravenous heparinization
        iv. Hemicraniectomy
        v. Clot evacuation
        vi. Novel, investigative interventions and therapies including neuroprotectants, thrombolytics, thrombectomy devices, PFO closure devices.
E. Prevention, risk factors and epidemiology
    a. Populations at risk for stroke
    b. Modifiable risk factors for stroke
    c. Infections predisposing to stroke
    d. Genetic factors predicting stoke
    e. Stroke as a complication of other medical illnesses
    f. Special populations at risk for stroke
    g. Stroke educations programs and regional health services
F. Concepts of clinical research
G. Outcomes
H. Prognosis
I. Mortality and morbidity of subtypes of stroke
J. Pathophysiology, prognosis, and treatment of specific clinical syndromes including:
    a. Ischemic stroke syndromes – cerebral hemispheres
    b. Ischemic stroke syndromes – brain stem and cerebellum

c. Ischemic stroke syndromes of the spinal cord
d. Vascular dementia and vascular cognitive syndromes
e. Features differentiating hemorrhagic or ischemic stroke
f. Intracerebral hemorrhage
g. Aneurismal subarachnoid hemorrhage
h. Vascular malformations
i. Primary intraventricular hemorrhage
j. Subdural or epidural hematoma
k. Spinal cord hemorrhage or infarction
l. Carotid cavernous or dural fistulas
m. Pituitary apoplexy
n. Hypertensive encephalopathy and eclampsia
o. Primary and multisystem vasculitides
p. Hypoxia – ischemia
q. Brain death
r. MELAS and metabolic disorders causing neurologic symptoms
s. CADASIL, Fabry's, and other genetic causes of stroke
t. Non-stroke presentations of vascular disease
u. Cardiovascular diseases
v. Vascular presentations of other diseases of central nervous systems
w. Infectious diseases and stroke
x. Migraine and its relation to stroke

K. Evaluation of the patient with cerebrovascular and neurocritical care disease including:
    a. Evaluation of the brain and spinal cord
        i. Computed tomography of brain
        ii. Computed tomography of spine and spinal cord
        iii. Magnetic resonance imaging of brain
        iv. PET and SPECT
        v. Electroencephalography and evoked potentials
        vi. Examination of the CSF
        vii. ICP monitoring
    b. Evaluation of the vasculature
        i. Conventional arteriography and venography
        ii. Extracranial (carotid Doppler) ultrasonography
        iii. Intracranial (transcranial Doppler) ultrasonography
        iv. CT angiography
        v. MR angiography
    c. Evaluation of the heart and great vessels
    d. Electrocardiography
    e. Transthoracic echocardiography and transesophageal echocardiography
        i. Evaluation for right-to-left shunting
        ii. Aortic atheromatous disease
    f. Other chest imaging studies

    g. Hematologic studies
        i. Hypercoagulable studies, when appropriate
        ii. Blood smear, when appropriate
        iii. Hemoglobin electropheresis, when appropriate
    h. Immunological studies
    i. Biochemical studies
    j. Urine tests
    k. Biopsies
L. Evaluation of the complications of stroke
M. Evaluation of the consequences of stroke
N. Genetic testing
O. Causes of stroke
    a. Atherosclerosis – ischemic stroke
    b. Non-atherosclerotic vasculopathies – ischemic stroke
    c. Non-inflammatory
    d. Infectious
    e. Inflammatory, non-infectious
    f. Migraine
    g. Other causes of ischemic stroke
    h. Genetic and metabolic causes of stroke
    i. Drug abuse and toxicities
    j. Cerebral amyloid angiopathy – infarction or hemorrhage
    k. Cardioembolic causes of stroke
    l. Pro-thrombotic causes of stroke
    m. Autoimmune causes of thrombosis
    n. Iatrogenic drugs, toxins
    o. Bleeding diatheses
        i. Inherited
        ii. Acquired
    p. Systemic diseases
    q. Aneurysms and subarachnoid hemorrhage
    r. Vascular malformations
    s. Trauma and intracranial bleeding
    t. Moyamoya disease and syndrome
    u. Hypertensive hemorrhage
    v. Other causes of hemorrhage
    w. Genetic diseases causing hemorrhagic stroke
P. Complications of stroke
    a. Early neurologic complications
    b. Early medical complications
    c. Chronic neurologic sequelae
    d. Chronic medical sequelae
Q. Treatment of patients with stroke
    a. Outpatient management

i. Medical therapies to prevent stroke
b. Hyperacute treatment of ischemic stroke
i. Emergency department
ii. Hospitalization
iii. ICU
iv. Neurosurgical management
c. Chronic care
i. Prevention of recurrent stroke
ii. Treatment of venous thrombosis
d. Treatment of spinal cord vascular disease

R. Palliative care
a. End-of-life decisions
b. Advanced directives, informed consent, regulations

Interpersonal and Communications Skills:

A. Demonstrate the following abilities:
a. Listen to and understand patients and to attend to nonverbal communication
b. Communicate effectively with patients using verbal, nonverbal, and written skills as appropriate
c. Develop and maintain a therapeutic alliance with patients by instilling feelings of trust, honesty, openness, rapport, and comfort in the relationship with physicians
d. Partner with patients to develop an agreed upon healthcare management plan
e. Transmit information to patients in a clear and meaningful fashion
f. Understand the impact of physicians' own feelings and behavior so that it does not interfere with appropriate treatment
g. Communicate effectively and work collaboratively with allied healthcare professionals and with other professionals involved in the lives of patients and families
h. Educate patients, their families, and professionals about medical, psychosocial, and behavioral issues

B. Obtain, interpret, and evaluate consultations from other medical specialties. This shall include:
a. Knowing when to solicit consultations
b. Formulating and clearly communicating the consultation question
c. Discussing the findings with the consultant
d. Discussing the consultation recommendations with patient and family

C. Serve as an effective consultant to other medical specialists, mental health professionals, and community agencies by demonstrating the abilities to:
a. Communicate effectively with the requesting party to refine the consultation question
b. Maintain the role of consultant

    c. Communicate clear and specific recommendations
    d. Respect the knowledge and expertise of the requesting professionals
D. Demonstrate the ability to communicate effectively with patients and their families by:
    a. Gearing all communication to the educational and intellectual levels of patients and their families including
    b. Demonstrating sociocultural sensitivity to patients and their families
    c. Providing explanations of psychiatric and neurological disorders and treatment that are jargon-free and geared to the educational/intellectual levels of patients and their families
    d. Providing preventive education that is understandable and practical
    e. Respecting the patients' and their families cultural, ethnic, religious, and economic backgrounds
    f. Developing and enhancing rapport and a working alliance with patients and their families
    g. Ensuring that the patient and/or family have understood the communication
E. Maintain up-to-date medical records and write legible prescriptions. These records must capture essential information while simultaneously respecting patient privacy, and they must be useful to other health professionals
F. Vascular neurologists shall demonstrate the ability to effectively lead a multidisciplinary treatment team, including being able to:
    a. Listen effectively
    b. Manage time spent caring for each patient
    c. Elicit needed information from team members
    d. Integrate information from different disciplines
    e. Manage conflict
    f. Clearly communicate an integrated treatment plan
G. Demonstrate the ability to communicate effectively with patients and their families while respecting confidentiality. Such communication may include:
    a. The results of the assessment
    b. Use of informed consent when considering investigative procedures
    c. Genetic counseling and palliative care when appropriate
    d. Consideration and compassion for the patient in providing accurate medical information and prognosis
    e. The risks and benefits of the proposed treatment plan, including possible side-effects of medications and/or complications of nonpharmacologic treatments
    f. Alternative (if any) to the proposed treatment plan
    g. Appropriate education concerning the disorder, its prognosis, and prevention strategies

Practice-Based Learning and Improvement:

A. Recognize limitations in their own knowledge base and clinical skills, and understand and address the need for lifelong learning
B. Demonstrate appropriate skills for obtaining and evaluating up-to-date information from scientific and practice literature and other sources to assist in the quality care of patients. Proficiencies should include, but not be limited to:
    a. Use of medical libraries
    b. Use of information technology, including Internet-based searches and literature databases (e.g., Pubmed, Ovid)
    c. Use of drug information databases
    d. Active participation, as appropriate, in educational courses, conferences, and other organized educational activities both at the local and national levels.
C. Employ multiple and varied approaches to education and development including:
    a. Case-based learning
    b. Didactic lectures
    c. Reading journals, reviews, and textbooks
    d. Use of best practices through practice guidelines or clinical pathways
    e. The review of patient records
    f. Obtaining evaluations from patients (e.g., outcomes and patient satisfaction)
    g. Employment of principles of quality improvement in practice
    h. Obtaining appropriate supervision and consultation
D. Demonstrate an ability to critically evaluate relevant medical literature and apply it to challenging, common, and unusual clinical situations. This ability may include:
    a. Using knowledge of common methodologies employed in neurological research
    b. Researching and summarizing a particular problem that derives from their own caseloads
    c. Searching online databases (Pubmed, Ovid, etc.) to optimally answer clinical questions

Professionalism:

A. Demonstrate responsibility for their patients' care including:
    a. Responding to communication from patients and health professionals in a timely manner
    b. Establishing and communicating how to seek emergent and urgent care when necessary
    c. Using medical records for appropriate documentation of the course of illness and its treatment
    d. Providing coverage if unavailable, (for example, when out of town or on vacation)

    e. Coordinating care with other members of the medical and/or multidisciplinary team
    f. Providing for continuity of care, including appropriate consultation, transfer, or referral if necessary
B. Demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest
C. Demonstrate respect for patients and their families, and their colleagues as persons, including their ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political leanings, and sexual orientations
D. Demonstrate understanding of and sensitivity to end of life care and issues regarding provision of care
E. Review their own professional conduct and remediate when appropriate.
F. Review the professional conduct of their colleagues, residents, medical students, and attendings
G. Always be aware of safety issues, including acknowledging, reporting, and remediating medical errors, should they occur.

Systems-Based Practice:

A. Develop a working knowledge of the diverse systems involved in treating patients of all ages, and understand how to use the systems as part of a comprehensive system of care in general and as part of a comprehensive, individualized treatment plan. This will include:
    a. The use of practice guidelines
    b. The ability to access community, national, and allied health professional resources (AHA, NSA, NINDS, etc.) that may enhance the quality of life of patients with vascular neurologic disorders
    c. The ability to lead and delegate authority to the housestaff
    d. The efficient and effective practice of ambulatory medicine, including time management, clinical scheduling, and rapid communication with referring physicians
    e. The use of appropriate consultation and referral mechanisms for the optimal clinical management of patients on the Vascular Neurology and Neurocritical care service
B. In the community system, vascular neurologists shall:
    a. Recognize the limitations of healthcare resources and demonstrate the ability to act as an advocate for patients within their sociocultural and financial constraints
    b. Demonstrate knowledge of the legal aspects of vascular and critical care neurological diseases as they impact patients and their families
    c. Demonstrate an understanding of risk management
C. Demonstrate knowledge of and interact with managed health systems, including:

a. Participating in utilization review communications and, when appropriate, advocating for quality patient care
b. Educating patients concerning such systems of care
c. Vascular neurologists shall demonstrate knowledge of community systems of care and assist patients to access appropriate care and other support services.

For Vascular Neurology Fellows on the <u>Neurosonology</u> rotation, the following core competencies are expected to be mastered and evaluations will be focus on these areas:

Patient Care:

A. Demonstrate a satisfactory level of diagnostic competence in acquisition and interpretation of extracranial carotid Doppler ultrasound and transcranial Doppler ultrasound technology
B. Demonstrate an understanding of the utility of ultrasound studies for various neurologic disorders and clinical situations including
    a. Intracranial and extracranial arterial stenosis
    b. Vasospasm
    c. Dissection
    d. Right-to-left shunting
    e. Microembolic signal detection .

Medical Knowledge:

A. Demonstrate knowledge of neurosonology including clinical applications, diagnostic sensitivity and specificity for each indication, and limitations

Interpersonal and Communications Skills:

A. Demonstrate interpersonal and communication skills that result in effective information exchange and learning with other health care providers resulting in:
    a. Collegial and clear communications with Neurosonology staff and technologists
    b. Rapid and accurate communication of neurosonology results

Practice-Based Learning and Improvement:

A. Demonstrate the ability to evaluate their own technical and diagnostic skills with neurosonology studies , appraise and assimilate scientific evidence and improve their patient care practices.
    a. Identify and knowledge gaps in personal knowledge and skills.
    b. Develop and implement strategies for filling gaps in knowledge and skills.
    c. Commit to professional scholarship through critical perusal and use of relevant print and electronic literature, and practice of evidence-based medicine.
    d. Facilitate education of residents, students and other health professionals.
    e. Accept and respond positively to feedback.

Professionalism:

A. Demonstrate a commitment to fulfilling professional responsibilities and ethical principles and exhibit sensitivity to a diverse patient population.

B. Demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest
C. Demonstrate respect for patients and their families, and their colleagues as persons, including their ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political leanings, and sexual orientations

Systems-Based Practice:

A. Demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide optimal physical medicine & rehab services
B. Demonstrate an understanding of diagnostic studies, health care delivery and resources in the University of Pennsylvania Health System
C. Apply evidence-based, cost-conscious strategies to optimize care delivery.

For Vascular Neurology Fellows on the <u>Neurorehabiliation rotation</u>, the following core competencies are expected to be mastered and evaluations will focus on these areas:

Patient Care:

A. Demonstrate a satisfactory level of diagnostic competence, provide appropriate and effective consultation, evaluation, and treatment decisions in the context of Physical Medicine & Rehab services
    a. Learns to take complete medical histories and perform careful and accurate physical/functional examinations.
    b. Learns to prescribe exercise, physical modalities, medications and medical equipment
    c. Integrate medical knowledge with clinical data and judicious use of diagnostic and therapeutic procedures
    d. Define and prioritize patients' rehabilitation goals and medical issues
    e. Provide therapeutic care plans
    f. Promote health and function and prevention of disease and injury
    g. Recognize and respond appropriately to psychosocial aspects of illness and functional limitations
    h. Recognize the role of patient advocacy and serve as a patient advocate.

Medical Knowledge:

A. Demonstrate knowledge of PM&R including clinical manifestations, diagnosis, and management of disabilities and medical problems encountered on a general rehabilitation inpatient ward, consultation service, and outpatient service, focusing on patients with cerebrovascular disease but including a variety of orthopedic and neurologic diagnoses.
B. Demonstrate knowledge of the role of physical therapy, occupational therapy, speech and swallow therapy in treatment of patients

Interpersonal and Communications Skills:

A. Demonstrate interpersonal and communication skills that result in effective information exchange and learning with other health care providers, patients, and patients' families.

Practice-Based Learning and Improvement:

A. Demonstrate the ability to evaluate their own diagnostic and consultative practices, appraise and assimilate scientific evidence and improve their patient care practices.
    a. Identify and knowledge gaps in personal knowledge and skills.
    b. Develop and implement strategies for filling gaps in knowledge and skills.
    c. Commit to professional scholarship through critical perusal and use of relevant print and electronic literature, and practice of evidence-based medicine.
    d. Facilitate education of residents, students and other health professionals.

e. Accept and respond positively to feedback.

Professionalism:

A. Demonstrate a commitment to fulfilling professional responsibilities and ethical principles and exhibit sensitivity to a diverse patient population.
B. Demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest
C. Demonstrate respect for patients and their families, and their colleagues as persons, including their ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political leanings, and sexual orientations

Systems-Based Practice:

A. Demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide optimal Neurosonology services
B. Demonstrate an understanding of medical and rehabilitation practices, health care delivery and resources in the University of Pennsylvania Health System
C. Apply evidence-based, cost-conscious strategies to optimize care delivery.

For Vascular Neurology Fellows on the <u>Diagnostic Neuroradiology rotation</u>, the following core competencies are expected to be mastered and evaluations will be focus on these areas:

Patient Care:

A. Demonstrate a satisfactory level of competence in interpretation of Neuroradiology studies including
    a. Computed tomography of brain
    b. Computed tomography of spine and spinal cord
    c. Magnetic resonance imaging of brain
    d. Magnetic resonance imagin of the spinal and spinal cord
    e. PET and SPECT
    f. Conventional arteriography and venography
    g. CT angiography of intracranial and extranial vessels
    h. MR angiography of intracranial and extranial vessels
B. Demonstrate an understanding of the utility and limitations of MRI, CT, PET, SPECT, and fluoroscopy for various neurologic disorders and clinical situations
    i. Understand when one study may be preferable to another for a particular clinical question or patient condition

Medical Knowledge:

A. Demonstrate knowledge of Neuroradiology studies including:
    a. Clinical applications
    b. Diagnostic sensitivity and specificity of each study for a particular indication or clinical question
    c. Limitations of each study

Interpersonal and Communications Skills:

A. Demonstrate interpersonal and communication skills that result in effective information exchange and learning with other health care providers resulting in:
    a. Collegial and clear communications with Neuroradiology staff and technologists
    b. Rapid and accurate communication of Neuroradiology results to the requesting service

Practice-Based Learning and Improvement:

A. Demonstrate the ability to evaluate their own technical and diagnostic skills with neuroradiology studies , appraise and assimilate scientific evidence and improve their patient care practices.
    a. Identify and knowledge gaps in personal knowledge and skills.
    b. Develop and implement strategies for filling gaps in knowledge and skills.
    c. Commit to professional scholarship through critical perusal and use of relevant print and electronic literature, and practice of evidence-based medicine.

d. Facilitate education of residents, students and other health professionals.
e. Accept and respond positively to feedback.

Professionalism:

A. Demonstrate a commitment to fulfilling professional responsibilities and ethical principles and exhibit sensitivity to a diverse patient population.
B. Demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest
C. Demonstrate respect for patients and their families, and their colleagues as persons, including their ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political leanings, and sexual orientations

Systems-Based Practice:

A. Learn the cost of each of the diagnostic studies
B. Demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide optimal physical medicine & rehab services
C. Demonstrate an understanding of diagnostic studies, health care delivery and resources in the University of Pennsylvania Health System
D. Apply evidence-based, cost-conscious strategies to optimize care delivery.

For Vascular Neurology Fellows on the <u>Interventional Neuroradiology rotation</u>, the following core competencies are expected to be mastered and evaluations will focus on these areas:

Patient Care:

A. Demonstrate a satisfactory level of competence in assisting in the acquisition of conventional angiography
B. Demonstrate an understanding of the types of interventions that may be done during conventional angiography
    a. Arterial thrombolysis and thrombectomy
    b. Venous thrombolysis and thrombectomy
    c. Aneurysm coiling
    d. Arteriovenous malformation embolization
    e. Arteriovenous fistula embolization
    f. Arterial angioplasty and stenting
C. Demonstrate a satisfactory level of competence in the interpretation of conventional angiography
    a. Evaluate intracranial and extracranial vessels to diagnose:
        i. Atherosclerotic stenosis or occlusion
        ii. Dissection
        iii. Vasospasm
        iv. Vasculopathy
        v. Venous thrombosis
        vi. Arteriovenous malformation
        vii. Arteriovenous fistula
        viii. Aneurysm

Medical Knowledge:

A. Demonstrate knowledge of conventional angiography studies including:
    a. Clinical applications
    b. Diagnostic sensitivity and specificity for a particular indication or clinical question
    c. Risks and benefits of a potential intervention
    d. Limitations

Interpersonal and Communications Skills:

A. Demonstrate interpersonal and communication skills that result in effective information exchange and learning with other health care providers resulting in:
    a. Collegial and clear communications with Neuroradiology staff and technologists
    b. Rapid and accurate communication of Neuroradiology results to the requesting service

Practice-Based Learning and Improvement:

A. Demonstrate the ability to evaluate their own technical and diagnostic skills with conventional angiography, appraise and assimilate scientific evidence and improve their patient care practices.
    a. Identify and knowledge gaps in personal knowledge and skills.
    b. Develop and implement strategies for filling gaps in knowledge and skills.
    c. Commit to professional scholarship through critical perusal and use of relevant print and electronic literature, and practice of evidence-based medicine.
    d. Facilitate education of residents, students and other health professionals.
    e. Accept and respond positively to feedback.

Professionalism:

A. Demonstrate a commitment to fulfilling professional responsibilities and ethical principles and exhibit sensitivity to a diverse patient population.
B. Demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict of interest
C. Demonstrate respect for patients and their families, and their colleagues as persons, including their ages, cultures, disabilities, ethnicities, genders, socioeconomic backgrounds, religious beliefs, political leanings, and sexual orientations

Systems-Based Practice:

A. Learn the cost of conventional angiography and each associated intervention
B. Demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide optimal physical medicine & rehab services
C. Demonstrate an understanding of diagnostic studies, health care delivery and resources in the University of Pennsylvania Health System
D. Apply evidence-based, cost-conscious strategies to optimize care delivery.