

The American Board of Psychiatry and Neurology
Vascular Neurology Core Competencies Outline
(Coordinated with the ABPN Core Competencies Outline, Version 4.1)

I. Vascular Neurology Patient Care Core Competencies

- A. Vascular neurologists shall demonstrate the following abilities:
1. To perform and document a relevant history and examination on culturally diverse patients¹ to include as appropriate:
 - a. Chief complaint
 - b. History of present illness
 - c. Past medical history
 - d. A comprehensive review of systems
 - e. A biological family history
 - f. A sociocultural history²
 - g. A developmental history (especially for children)
 - h. A situationally germane general and neurological examination
 2. To delineate appropriate differential diagnoses
 3. To evaluate, assess and recommend effective management of patients
- B. Based on a comprehensive neurological assessment, vascular neurologists shall demonstrate the following abilities:
1. To determine:
 - a. If a patient's symptoms are the result of a vascular disease affecting the central/vascular nervous system or are of another origin (e.g., of a systemic, psychiatric, or psychogenic illness)
 - b. A formulation, differential diagnosis, laboratory investigation, and management plan
 2. To develop and maintain the technical skills to:
 - a. Perform lumbar puncture
 - b. Identify and describe abnormalities seen in common vascular disorders on radiographic testing, including plain films, arteriography, CT, MRI, and TCD or carotid duplex studies
 - c. Evaluate the application and relevance of investigative procedures and interpretation in the diagnosis of neurological disease, including the following:
 - 1) Electroencephalogram and evoked potentials
 - 2) Perimetry
 - 3) Psychometry
 - 4) CSF analysis
 - 5) Vascular imaging (Duplex, transcranial Doppler)
 - 6) Radiographic studies as outlined above
 - d. Identify and describe gross and microscope specimens taken from the normal nervous system and from patients with vascular neurological disorders

3. To recognize and treat vascular neurological disorders in both adults and children

II. Vascular Neurology Medical Knowledge Core Competencies

- A. Vascular neurologists shall demonstrate the following:
 1. Knowledge of major vascular diseases, including considerations relating to age, gender, race, and ethnicity, based on the literature and standards of practice. This knowledge shall include:
 - 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
 2. Knowledge of healthcare delivery systems, including patient and family counseling
 3. Knowledge of the application of ethical principles in delivering medical care
 4. Ability to reference and utilize electronic systems to access medical, scientific, and patient information

- B. Vascular neurologists shall demonstrate knowledge of the following:
 1. Basic science aspects of vascular neurology
 - a. Vascular neuroanatomy
 - b. Stroke pathophysiology
 - 1) Cerebral blood flow
 - 2) Blood-brain barrier in stroke
 - 3) Coagulation cascade
 - 4) Metabolic and cellular consequences of ischemia
 - 5) Inflammation and stroke
 - 6) Brain edema and increased intracranial pressure
 - 7) Restoration and recovery following stroke
 - 8) Secondary consequences from intracranial bleeding
 - c. Neuropathology of stroke
 - 1) Pathological-imaging-clinical correlations
 - d. Pharmacology
 - 1) Antiplatelet agents – prevention, acute treatment
 - 2) Anticoagulants – prevention, acute treatment
 - 3) Thrombolytic agents
 - 4) Neuroprotective agents and other acute treatments

- 5) Cardioactive agents
 - 6) Medications to prevent stroke by treating risk factors
 - 7) Medications to treat auto-immune diseases and vasculitis
 - 8) Medications to treat complications of stroke
 - 9) Medications to improve or restore neurologic function or to augment rehabilitation
 - 10) Medications to prevent rebleeding or vasospasm following hemorrhage
 - 11) Anti-migraine medications
 - 12) Vitamins
 - 13) Interactions between medications
 - 14) Drugs that cause stroke, including drugs of abuse
2. Patient evaluation and treatment selection, including:
 - a. The nature of patients' history and physical findings and the ability to correlate the findings with a likely localization for neurological dysfunction
 - b. Likely diagnoses and differential diagnoses
 - 1) In adults
 - 2) In children
 - c. Planning for evaluation and management
 - d. Potential risks and benefits of potential therapies, including surgical procedures
 3. Employment of principles of quality improvement in practice
- C. Prevention, risk factors and epidemiology
1. Populations at risk for stroke
 2. Modifiable risk factors for stroke
 3. Infections predisposing to stroke
 4. Genetic factors predicting stroke
 5. Stroke as a complication of other medical illnesses
 6. Special populations at risk for stroke
 7. Stroke education programs and regional health services
 8. Concepts of clinical research
 9. Outcomes
 - a. Prognosis
 - b. Mortality and morbidity of subtypes of stroke
- D. Clinical features of cerebrovascular diseases
1. Neuro-otologic signs and symptoms
 2. Neuro-ophthalmologic signs and symptoms
 3. Transient ischemic attack

4. Ischemic stroke syndromes – cerebral hemispheres
5. Ischemic stroke syndromes – brain stem and cerebellum
6. Ischemic stroke syndromes of the spinal cord
7. Vascular dementia and vascular cognitive syndromes
8. Features differentiating hemorrhagic or ischemic stroke
9. Intracerebral hemorrhage
10. Subarachnoid hemorrhage/saccular aneurysms
11. Vascular malformations
12. Primary intraventricular hemorrhage
13. Subdural or epidural hematoma
14. Spinal cord hemorrhage or infarction
15. Carotid cavernous or dural fistulas
16. Pituitary apoplexy
17. Hypertensive encephalopathy and eclampsia
18. Clinical presentations of primary and multisystem vasculitides
19. Hypoxia – ischemia
20. Brain death
21. MELAS and metabolic disorders causing neurologic symptoms
22. Non-stroke presentations of vascular disease
23. Cardiovascular diseases
24. Vascular presentations of other diseases of central nervous systems
25. Infectious diseases and stroke
26. Migraine

E. Evaluation of the patient with cerebrovascular disease

1. Evaluation of the brain and spinal cord
 - a. Computed tomography of brain
 - b. Computed tomography of spine and spinal cord
 - c. Magnetic resonance imaging of brain
 - d. PET and SPECT
 - e. Electroencephalography and evoked potentials
 - f. Examination of the CSF
 - g. ICP monitoring
2. Evaluation of the vasculature – occlusive or non-occlusive
 - a. Arteriography and venography
 - b. Extracranial ultrasonography
 - c. Intracranial ultrasonography
 - d. CT angiography
 - e. MR angiography
3. Evaluation of the heart and great vessels
 - a. Electrocardiography
 - b. Transthoracic echocardiography and transesophageal echocardiography
 - c. Other chest imaging studies
4. Other diagnostic studies
 - a. Hematologic studies

- b. Immunological studies
 - c. Biochemical studies
 - d. Urine tests
 - e. Biopsies
 - f. Evaluation of the complications of stroke
 - g. Evaluation of the consequences of stroke
 - h. Genetic testing
- F. Causes of stroke
1. Atherosclerosis – ischemic stroke
 2. Non-atherosclerotic vasculopathies – ischemic stroke
 - a. Non-inflammatory
 - b. Infectious
 - c. Inflammatory, non-infectious
 3. Migraine
 4. Other causes of ischemic stroke
 5. Genetic and metabolic causes of stroke
 6. Drug abuse and toxicities
 7. Cerebral amyloid angiopathy – infarction or hemorrhage
 8. Cardioembolic causes of stroke
 9. Pro-thrombotic causes of stroke
 - a. Inherited
 - b. Acquired
 - c. Autoimmune causes of thrombosis
 - d. Iatrogenic/drugs, toxins
 10. Bleeding diatheses
 - a. Inherited
 - b. Acquired
 - c. Systemic diseases
 - d. Iatrogenic/drugs/toxins
 11. Aneurysms
 12. Vascular malformations
 13. Trauma and intracranial bleeding
 14. Moyamoya disease and syndrome
 15. Hypertensive hemorrhage
 16. Other causes of hemorrhage
 17. Genetic diseases causing hemorrhagic stroke
 18. Complications of stroke
 - a. Early neurologic complications
 - b. Early medical complications
 - c. Chronic neurologic sequelae
 - d. Chronic medical sequelae
- G. Treatment of patients with stroke
1. Outpatient management
 2. Medical therapies to prevent stroke
 3. Hyperacute treatment of ischemic stroke
 - a. Emergency department

- b. Hospitalization
 - c. ICU
 - d. Neurosurgical management
 - 4. Chronic care
 - 5. Prevention of recurrent stroke
 - 6. Treatment of venous thrombosis
 - 7. Treatment of spinal cord vascular disease
 - 8. Treatment of pituitary apoplexy
 - 9. Professionalism, ethics, systems based practice
 - a. Palliative care
 - b. End-of-life decisions
 - c. Advanced directives, informed consent, regulations
 - d. Other
- H. Recovery, regenerative approaches and rehabilitation

III. Vascular Neurology Interpersonal and Communications Skills Core Competencies

- A. Vascular neurologists shall demonstrate the following abilities:
 - 1. To listen to and understand patients and to attend to nonverbal communication
 - 2. To communicate effectively with patients using verbal, nonverbal, and written skills as appropriate
 - 3. To develop and maintain a therapeutic alliance with patients by instilling feelings of trust, honesty, openness, rapport, and comfort in the relationship with physicians
 - 4. To partner with patients to develop an agreed upon healthcare management plan
 - 5. To transmit information to patients in a clear and meaningful fashion
 - 6. To understand the impact of physicians' own feelings and behavior so that it does not interfere with appropriate treatment
 - 7. To communicate effectively and work collaboratively with allied healthcare professionals and with other professionals involved in the lives of patients and families
 - 8. To educate patients, their families, and professionals about medical, psychosocial, and behavioral issues
- B. Vascular neurologists shall demonstrate the ability to obtain, interpret, and evaluate consultations from other medical specialties. This shall include:
 - 1. Knowing when to solicit consultation and having sensitivity to assess the need for consultation
 - 2. Formulating and clearly communicating the consultation question
 - 3. Discussing the consultation findings with the consultant
 - 4. Discussing the consultation findings with patient and family

- C. Vascular neurologists shall serve as an effective consultant to other medical specialists, mental health professionals, and community agencies by demonstrating the abilities to:
 - 1. Communicate effectively with the requesting party to refine the consultation question
 - 2. Maintain the role of consultant
 - 3. Communicate clear and specific recommendations
 - 4. Respect the knowledge and expertise of the requesting professionals

- D. Vascular neurologists shall demonstrate the ability to communicate effectively with patients and their families by:
 - 1. Gearing all communication to the educational and intellectual levels of patients and their families
 - 2. Demonstrating sociocultural sensitivity to patients and their families
 - 3. 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
 - 4. Providing preventive education that is understandable and practical
 - 5. Respecting the patients' cultural, ethnic, religious, and economic backgrounds
 - 6. Developing and enhancing rapport and a working alliance with patients and their families
 - 7. Ensuring that the patient and/or family have understood the communication

- E. Vascular neurologists shall 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 health professionals outside psychiatry and neurology.

- F. Vascular neurologists shall demonstrate the ability to effectively lead a multidisciplinary treatment team, including being able to:
 - 1. Listen effectively
 - 2. Elicit needed information from team members
 - 3. Integrate information from different disciplines
 - 4. Manage conflict
 - 5. Clearly communicate an integrated treatment plan

- G. Vascular neurologists shall demonstrate the ability to communicate effectively with patients and their families while respecting confidentiality. Such communication may include:
 - 1. The results of the assessment
 - 2. Use of informed consent when considering investigative procedures
 - 3. Genetic counseling and palliative care when appropriate
 - 4. Consideration and compassion for the patient in providing accurate medical information and prognosis

5. The risks and benefits of the proposed treatment plan, including possible side-effects of medications and/or complications of nonpharmacologic treatments
6. Alternative (if any) to the proposed treatment plan
7. Appropriate education concerning the disorder, its prognosis, and prevention strategies

IV. Vascular Neurology Practice-Based Learning and Improvement Core Competencies

- A. Vascular neurologists shall recognize limitations in their own knowledge base and clinical skills, and understand and address the need for lifelong learning.
- B. Vascular neurologists shall 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. This shall include, but not be limited to:
 1. Use of medical libraries
 2. Use of information technology, including Internet-based searches and literature databases (e.g., Medline)
 3. Use of drug information databases
 4. Active participation, as appropriate, in educational courses, conferences, and other organized educational activities both at the local and national levels.
- C. Vascular neurologists shall evaluate caseload and practice experience in a systematic manner. This may include:
 1. Case-based learning
 2. Use of best practices through practice guidelines or clinical pathways
 3. The review of patient records
 4. Obtaining evaluations from patients (e.g., outcomes and patient satisfaction)
 5. Employment of principles of quality improvement in practice
 6. Obtaining appropriate supervision and consultation
 7. Maintaining a system for examining errors in practice and initiating improvements to eliminate or reduce errors
- D. Vascular neurologists shall demonstrate an ability to critically evaluate relevant medical literature. This ability may include:
 1. Using knowledge of common methodologies employed in psychiatric and neurological research
 2. Researching and summarizing a particular problem that derives from their own caseloads
- E. Vascular neurologists shall demonstrate the ability:
 1. To review and critically assess scientific literature to determine how quality of care can be improved in relation to one's practice (e.g., reliable

and valid assessment techniques, treatment approaches with established effectiveness, practice parameter adherence). Within this aim, vascular neurologists shall be able to assess the generalizability or applicability of research finding to one's patients in relation to their sociodemographic and clinical characteristics

2. To develop and pursue effective remediation strategies that are based on critical review of the scientific literature

V. Vascular Neurology Professionalism Core Competencies

- A. Vascular neurologists shall demonstrate responsibility for their patients' care, including:
 1. Responding to communication from patients and health professionals in a timely manner
 2. Establishing and communicating back-up arrangements, including how to seek emergent and urgent care when necessary
 3. Using medical records for appropriate documentation of the course of illness and its treatment
 4. Providing coverage if unavailable, (for example, when out of town or on vacation)
 5. Coordinating care with other members of the medical and/or multidisciplinary team
 6. Providing for continuity of care, including appropriate consultation, transfer, or referral if necessary
- B. Vascular neurologists shall demonstrate ethical behavior, integrity, honesty, compassion, and confidentiality in the delivery of care, including matters of informed consent/assent, professional conduct, and conflict on interest.
- C. Vascular neurologists shall 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. Vascular neurologists shall demonstrate understanding of and sensitivity to end of life care and issues regarding provision of care.
- E. Vascular neurologists shall review their professional conduct and remediate when appropriate.
- F. Vascular neurologists shall participate in the review of the professional conduct of their colleagues.
- G. Vascular neurologists shall be aware of safety issues, including acknowledging and remediating medical errors, should they occur.

VI. Vascular Neurology Systems-Based Practice Core Competencies

- A. Vascular neurologists shall have 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 the:
1. Use of practice guidelines
 2. Ability to access community, national, and allied health professional resources that may enhance the quality of life of patients with chronic psychiatric and neurological illnesses
 3. Demonstration of the ability to lead and delegate authority to healthcare teams needed to provide comprehensive care for patients with psychiatric and neurological disease
 4. Demonstration of skills of the practice of ambulatory medicine, including time management, clinical scheduling, and efficient communication with referring physicians
 5. Use of appropriate consultation and referral mechanisms for the optimal clinical management of patients with complicated medical illness
 6. Demonstration of awareness of the importance of adequate cross-coverage
 7. Use of accurate medical data in the communication with and effective management of patients
- B. In the community system, vascular neurologists shall:
1. Recognize the limitation of healthcare resources and demonstrate the ability to act as an advocate for patients within their sociocultural and financial constraints
 2. Demonstrate knowledge of the legal aspects of vascular neurological diseases as they impact patients and their families
 3. Demonstrate an understanding of risk management
- C. Vascular neurologists shall demonstrate knowledge of and interact with managed health systems, including:
1. Participating in utilization review communications and, when appropriate, advocating for quality patient care
 2. Educating patients concerning such systems of care
- D. Vascular neurologists shall demonstrate knowledge of community systems of care and assist patients to access appropriate care and other support services. This requires knowledge of treatment settings in the community, which include ambulatory, consulting, acute care, partial hospital, skilled care, rehabilitation, and substance abuse facilities; halfway houses; nursing homes and home care; and hospice organizations. Vascular neurologists shall demonstrate knowledge of the organization of care in each relevant delivery setting and the ability to integrate the care of patients across such settings.

¹Cultural diversity includes issues of race, gender, language, age, country of origin, sexual orientation, religious/spiritual beliefs, sociocultural class, educational/intellectual levels, and physical disability.

Working with a culturally diverse population requires knowledge about cultural factors in the delivery of healthcare. For the purposes of this document, all patient and peer populations are to be considered culturally diverse.

²Regarding sociocultural issues, for the purposes of this document, “family” is defined as those having a biological or other wise meaningful relationship with the patient. Such “significant others” are to be defined from the patient’s point of view.

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