Opinion:
Interventional vascular neurology
An ability acquired through training

Simultaneously published in the Journal of Stroke and Cerebrovascular Diseases and the Journal of Neurosurgery,1,2 “Performance and training standards for endovascular ischemic stroke treatment” by Meyers et al. proposes guidelines for training requirements to achieve cognitive and technical qualifications in interventional treatment of acute stroke patients, thus ensuring quality of care and safety.

Recommendations for cognitive training include at least 6 months of documented training in cerebrovascular disease within an ACGME approved residency program (neurology, radiology, or neurosurgery) and additional experience in a 1-year endovascular surgical neuroradiology fellowship. The cognitive part of the latter training was undefined and will likely vary among fellowships.

Technical requirements focus on the minimum quantity of cases. They were defined as documented training in 100 diagnostic cerebral arteriograms, training in intracranial microcatheter and microguidewire navigation (or 30 cases as primary operator with supervision by a neurointerventionalist), and 10 endovascular stroke procedures.

A grandfathering option was proposed for all endovascular specialists not specifically trained and not yet credentialed in the clinical neurosciences, and recommends 6 months of cognitive training and documentation of supervised cerebral angiography in the aforementioned amount. No recommendation was made as to how the cognitive training curriculum should be structured (i.e., full-time vascular neurology fellowship, part-time participant on stroke service, directed readings).

Because stroke care is tailored to the individual patient, it makes sense that skilled care be available from physicians trained in the clinical neurosciences. As interest in and utilization of endovascular techniques increases by clinicians from different specialties, such as interventional cardiologists, radiologists, and vascular surgeons, these training guidelines provide a useful document for understanding what is regarded as the minimum requirements by various neurologic experts analogous to the stringent training and credentialing guidelines for acute coronary interventions by interventional cardiologists.3 Credentialing committees have an obligation to maintain recognized accreditation standards and to be aware of recommendations endorsed by national organizations most directly involved in acute stroke care. How this will translate into practice remains to be determined.

As a stroke neurologist and current fellow in interventional neuroradiology (also called endovascular surgical neuroradiology), I believe that 6 months of cognitive training in cerebrovascular diseases is a bare minimum to acquire the skills needed to take care of an acute endovascular stroke patient. Stroke is a complex disease and decisions made in the angiography suite at the time of the event require an understanding of the pathology, likely outcome, possible complications, and safety of the applied drugs and devices used in the cerebral vasculature. A comprehensive stroke team approach—such as 24/7 access to noninterventional neurologists and neurosurgeons in a comprehensive stroke center—is helpful in the evaluation of acute ischemic stroke patients for selection for interventional treatment. Any neurointerventionalist can take advantage of and benefit from the expertise and knowledge of such a team, where it exists. Ultimately, however, the neurointerventionalist must be comfortable making these judgments independently. Cognitive training leads to superior performance; for example, cognitive training of inexperienced interventionalists has been shown to improve the quality of the endovascular outcome on virtual reality endovascular simulators.4

During the past 18 months of my neuroendovascular training, I have come to appreciate that acute stroke revascularization is one of the most challenging procedures of my training. The typical stroke patient is elderly and has a difficult vascular tree. This poses technical challenges and might test the neu-

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rointerventionalist’s knowledge and skill set. Decisions have to be made quickly and under pressure; for example, a seemingly straightforward basilar occlusion might become a real challenge in the presence of high-degree vertebral stenoses. Suddenly unanticipated questions arise, such as, “Is acute vertebral stenting indicated?” “Can the acutely ischemic patient tolerate aspirin and clopidogrel?” “At what dose?” “Which lesion should be treated first?” “Can the goals be achieved in a timely fashion?” The neurointerventionalist has to be prepared to answer those questions.

Overall, intraarterial therapy is applicable to a small subset of patients with ischemic stroke. It is estimated that tertiary centers in the United States each perform between 20 and 60 cases of acute intraarterial stroke therapy annually. Given those numbers, it may be a challenge for interventionalists solely focusing on endovascular ischemic stroke treatment to achieve and maintain appropriate skill sets, so as not to risk patient safety.

It has been over 10 years since the major intraarterial thrombolysis trial has been published, but intraarterial stroke therapies, including thrombolysis or mechanical thrombectomy, have not yet been shown to improve neurologic outcomes. The good news is that clinical trials comparing IV to IA therapy are currently underway. The demand for endovascular treatments is likely to increase in the face of an aging population since stroke is the third leading cause of death in the United States.

Technical proficiency is probably of paramount importance for endovascular trainees. The assessment of technical skills is currently subjective and unreliable. I am in my second year of interventional neuroradiology training, and I am well over the stated requirements in the recently published guidelines, but how proficient am I really?

Objective feedback of technical skills is crucial to the structured learning of endovascular procedures. Methods of assessment such as procedure log books and non-criteria-based direct observation of procedures lack validity and reliability. Virtual reality systems have the potential to be used in the future for assessment of skills, but are currently not widely available in the clinical neurosciences.

The guidelines recommended 15 hours every 2 years of stroke-specific continuing medical education, and procedural outcomes that conform to national standards and institutional requirements. This appears limited. The endovascular community could choose to follow the example of other high reliability organizations such as aviation, where continuous assessment is a part of their practice.

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REFERENCES
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