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Interventional Standards

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determining if an imaging study is warranted, especially when multiple, serial CT or flouroscopic studies may be required during a single admission. In a published case report of radiation overexposure resulting in epilation, for example, the patient had actually received four 120 kV PCT studies with CT-angiograms (CTAs), and 2 conventional digital subtraction angiograms, all within a 2-week period.[6] The need to keep serial studies involving ionizing radiation to a minimum is increasingly being underscored at many centers, most notably for critically ill patients in neurologic intensive care units who may receive multiple unenhanced CT, CTA, PCT, and fluoroscopic examinations.[7,8]

PCT studies should be performed at 80 kVp[9] and no more than 200 mAs. When using such parameters, the effective radiation dose associated with a single slab PCT study is approximately equal to that of an unenhanced head CT, roughly 2–3 mSv.[10,11] A comprehensive stroke CT protocol that includes an unenhanced and postcontrast head CT, PCT, and CTA of the cervical and intracranial arteries may deliver a mean effective dose up to 6 times that of a standard, unenhanced head CT.[12] Not every scan sequence, however, need be performed for every patient. Dedicated stroke protocols should be tailored to specific clinical indications, and radiation reduction strategies such as adaptive dose modulation, not to mention MR imaging scanning when feasible, should be implemented as appropriate.

Finally, as noted in the FDA alert that prompted this editorial, it is important to bear in mind that "while unnecessary radiation exposure should be avoided, a medically needed CT scan obtained with appropriate acquisition parameter has benefits that outweigh the radiation risks." Increasingly, indications for performing PCT include evaluation of patients with signs and symptoms of acute stroke, vasospasm following aneurysmal subarachnoid hemorrhage, and chronic vascular occlusive disease (cerebrovascular reserve assessment with acetazolamide challenge). In stroke patients, especially those for whom MR imaging cannot be obtained, PCT permits more accurate assessment of infarct core (irreversibly ischemic tissue) than does unenhanced CT.[13,14] A recent publication by Lin and colleagues, for example, has shown that PCT is significantly more sensitive (64.6% versus 26.2%, $P < .0001$) and accurate (76.0% versus 52%, $P < .0001$), and has a better negative predictive value (59.6% versus 42.2%, $P = .032$) than does unenhanced CT in the detection of acute brain ischemia within 3 hours of symptom onset.[15] In another study, PCT detected abnormalities consistent with stroke/transient ischemic attack in many patients (32%) for whom no occlusion was identified on CTA; negative PCT/CTA predicted good outcome in most patients.[16] PCT findings may not only help select patients for thrombolytic therapy beyond the currently standard 3–4.5 hour time window for IV treatment, but might also prove to be of value in patient management within the first 3 hours of stroke onset. Since 2000, the American Heart Association has twice issued guidelines and recommendations for acute stroke imaging that have included extensive discussion of the role of PCT.[17,18]

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EDITORIAL

Interventional Standards

The American Society of Interventional and Therapeutic Neuroradiology (ASITN) recently changed its name to the Society of NeuroInterventional Surgery (SNIS). This name

change is meant to reflect the evolution of the neurointerventional field to include specialists who are not radiologists (ie, neurosurgeons and neurologists). The *American Journal of Neuroradiology* (*AJNR*) was formerly the official journal of the ASITN. With this change of name, the SNIS launched the *Journal of Neurointerventional Surgery*. Because most practicing neurointerventionalists are radiologists, *AJNR* will continue to have an important role in publishing neurointerventional articles. Moreover, *AJNR* will cooperate with the SNIS in jointly publishing important documents, as exemplified by "Reporting Standards for Endovascular Repair of Saccular Intracranial Cerebral Aneurysms" and "Performance and Training Standards for Endovascular Ischemic Stroke Treatment," so as to maximize the dissemination of information that has an impact on how interventional neuroradiology is practiced. Publication of these articles will occur only in an electronic form, and they may be accessed at www.ajnr.org.

These documents are the efforts of multisociety collaborations that intend to establish basic standards for practice. They strive to bring together the multiple specialties involved in endovascular neurointerventions to create reference standards that relate to fundamental issues such as training, procedure performance, and reporting. The "Reporting Standards for Endovascular Repair of Saccular Intracranial Cerebral Aneurysms" was written under the auspices of the SNIS, the Society of Interventional Radiology, the Joint Section on Cerebrovascular Neurosurgery of the American Association of Neurologic Surgeons and Congress of Neurologic Surgeons, and the Section of Stroke and Interventional Neurology of the American Academy of Neurology. The "Performance and Training Standards for Endovascular Ischemic Stroke Treatment" was produced by the Neurovascular Coalition, which consists of the SNIS, the American Academy of Neurology, the American Association of Neurologic Surgeons/Congress of Neurologic Surgeons Cerebrovascular Section, and the Society of Vascular and Interventional Neurology.

The "Reporting Standards for Endovascular Repair of Saccular Intracranial Cerebral Aneurysms" is important because it addresses significant inconsistencies in nomenclature and definition for research and reporting purposes. This article will provide for consistency of reporting on imaging in clinical trials and observational studies involving cerebral aneurysms, thereby helping different researchers publish results that are directly comparable.

The "Performance and Training Standards for Endovascular Ischemic Stroke Treatment" defines what constitutes adequate training to perform neurointerventional procedures in patients with acute ischemic stroke and what performance standards should be adopted to assess outcomes. This is an especially important and timely accomplishment because numerous physicians now wish to become involved in endovascular stroke therapy. Such a document establishes basic guidelines to promote a higher quality of patient care as the number of providers increases.

Despite the recent changes adopted by the SNIS, *AJNR* will continue its role in promoting better science and better patient care by participating in the dissemination of important articles.

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