Guidelines for Brain Amyloid Imaging Published

On January 28, SNMMI and the Alzheimer's Association published online guidance for appropriate use of PET in brain amyloid imaging in suspected Alzheimer disease (AD). These guidelines, which include the first consensus criteria for PET in AD, appear in the current issue of *The Journal of Nuclear Medicine* (2013;54: 476–490) and in the February issue of *Alzheimer's & Dementia* in an article authored by members of the joint SNMMI/Alzheimer's Association Amyloid Imaging Taskforce (AIT). The AIT included experts on dementia and brain imaging who reviewed the scientific literature and developed recommendations for clinical use of PET in AD.

"As amyloid imaging becomes more prevalent in clinical settings, medical professionals must understand how to appropriately utilize the test," said Frederic H. Fahey, DSc, SNMMI president. "Neurology and dementia experts should order the test only when appropriately indicated, and nuclear medicine and molecular imaging professionals must ensure they have been adequately trained to interpret the results of the scan. Working together, we hope that the information garnered from amyloid PET imaging will aid in diagnosis and play a pivotal role in the development of new treatments for Alzheimer's."

After review and discussion, the AIT concluded that amyloid imaging could be helpful in diagnosis of individuals with cognitive impairment when considered along with other clinical information and when performed according to standardized protocols by trained staff. In addition, they emphasized that the decision to order amyloid imaging should be made only after a comprehensive evaluation by a physician experienced in assessment and diagnosis of cognitive impairment and dementia and only if the presence or absence of amyloid would increase certainty in diagnosis and/or alter treatment plans.

The guidelines suggest that appropriate candidates for amyloid PET imaging include: those who complain of persistent or progressive unexplained memory problems or confusion and who demonstrate impairments in standard tests of cognition and memory; individuals meeting tests for possible AD but who have unusual clinical presentations; and individuals with progressive dementia and atypically early onset (younger than 65 years old). The AIT concluded that inappropriate candidates for amyloid PET imaging include: individuals who are 65 years old or older who meet the standard definitions and tests for AD (because a positive PET result would provide little added value) and asymptomatic individuals or those with a cognitive complaint but no clinical confirmation of impairment. The group added that amyloid PET imaging is also inappropriate: as a means of determining the severity of dementia; when requested solely because of family history of dementia or presence of other risk factors for AD (such as the ApoE-ε4 gene); as a substitute for genetic testing for mutations that cause AD; and for nonmedical reasons, such as insurance, legal, or employment decisions.

"Our primary goal is to provide health care practitioners with the information and options available to provide patients with the best possible diagnosis and care, while also taking into account the cost-effective use of limited health care resources," said Maria Carrillo, PhD, Alzheimer's Association vice president of medical and scientific relations and one of the authors of the guidelines.

The AIT emphasized that the health care provider must make definitive judgments about the care of each patient. To assist in this process, the taskforce identified the following general sequence of events consistent with the new criteria for appropriate use of amyloid PET imaging: (1) evaluation by a dementia expert to assess the need for diagnostic testing, possibly to include amyloid PET if the recommended criteria are met. (2) Referral to a qualified provider of amyloid PET services. (3) Performance, interpretation, and reporting of amyloid PET imaging according to established standards. (4) Incorporation of PET results into the clinical assessment process. (5) Disclosure of PET results by the clinician to the patient and caregivers, along with discussion of results and management consequences.

Despite the potential benefits of amyloid PET imaging, the AIT concluded that PET results should not constitute and are not equivalent to a clinical diagnosis of AD. The group noted that imaging is one of many tools that clinicians should use judiciously to manage patients and that amyloid PET imaging cannot substitute for careful history taking and clinical examination.

"Because both dementia care and amyloid PET technology are in active development, these new appropriate use criteria will require periodic reassessment and updating," Carrillo said. One clear area for future updating will be in expanding areas of dementia assessment, particularly if reimbursement is implemented for PET in these indications. The AIT concluded that the proven sensitivity and specificity of new radiopharmaceuticals for brain amyloid and the known association between brain β-amyloid deposition and AD suggest these new radiopharmaceuticals could prove to be helpful in the workup and diagnosis of patients with cognitive impairment.

SNMMI