

RSNA Statement on Imaging in the Evaluation of Dementia **Updated: 5/25/22**

The Radiological Society of North America (RSNA) is committed to excellence in patient care through education and research.

- Dementia encompasses a group of disorders that result in cognitive deficits in domains such as memory, language, visuospatial perception, attention, and behavior. Most are caused by progressive neurodegenerative disease and result in significant disability. Dementia is operationally defined by deficits in multiple cognitive domains of sufficient severity to interfere with functional activities of daily living. Because of their insidious onset, the similarity of different dementia syndromes at early stages and the difficulty in distinguishing early dementia from the changes of normal aging on imaging and clinical evaluation, the diagnosis of dementia is often challenging.
- The most common neurodegenerative disorders are Alzheimer’s disease, Lewy body dementia, and frontotemporal lobar degeneration. Cerebrovascular disease, although not a common lone cause of dementia, is the second most common comorbid pathology underlying dementia after Alzheimer’s disease. The prevalence of Alzheimer’s disease, the most common neurodegenerative disorder, is rapidly increasing worldwide as the population ages. Most elderly individuals with diagnosis of dementia are found to have a mixed dementia patterns with multiple contributing pathologies at autopsy, most commonly combinations of Alzheimer’s disease with cerebrovascular disease and/or Lewy body disease.
- An accurate diagnosis can be used to tailor appropriate care, including supportive care, and to help in life planning for patients, families, and caregivers. It is also useful to assess blood relatives of the affected patient, as heredity may play a role in the development of some neurodegenerative diseases, such as Alzheimer’s disease.
- Because structural brain imaging with magnetic resonance imaging (MRI) can identify some uncommon but potentially treatable conditions that may also cause cognitive decline, most practice guidelines include imaging in the workup of patients undergoing evaluation for cognitive complaints. Quantitative, volumetric analysis of high-resolution structural MRI may have utility for diagnosis and staging the severity of Alzheimer’s disease and other neurodegenerative diseases.
- Brain FDG-PET and amyloid PET imaging may be helpful for selected patients with dementia. Imaging including amyloid PET and MRI also plays an important role when patients are being considered for treatment and therapy planning with new or investigational drugs. As recommended by the Society of Nuclear Medicine and Molecular Imaging and the Alzheimer’s Association, brain PET should not be used as a screening examination.
- Computed tomography (CT) may be considered as an alternative if MRI is contraindicated, but does not have the same diagnostic utility for the evaluation of dementia, especially rapidly progressive dementia.
- To improve patient health and safety, appropriate precautions should always be taken to minimize radiation exposure through the use of the “As Low As Reasonably Achievable (ALARA)” principle.

This statement was prepared in collaboration with the American Society of Neuroradiology.

RSNA is a strong advocate for quality, safety, equity and strict adherence to appropriateness criteria in medical imaging and radiation oncology. Through its peer-reviewed journals, education programs and annual scientific assembly, RSNA continually informs radiologists, medical physicists, radiation oncologists and other radiology professionals of the latest technologies and research developments designed to optimize dose and improve patient safety.