The amines, N-isopropyl p-iodoamphetamine (IMP) and HIPDM have been labeled with I-123. These radiotracers distribute proportional to cerebral blood flow and are retained in the brain for a sufficiently long time so that imaging can be performed with standard, readily available equipment. Transaxial tomography with amines is useful in acute cerebral infarction where the X-ray CT scan can be normal for several days after onset of symptoms, while the uptake of radiolabeled amines will be altered at or before the onset of the stroke. Emission computed tomography with I-123 IMP is as accurate as X-ray CT for the diagnosis of acute cerebral infarction. Furthermore, I-123 IMP defines the extent of both reversible and irreversibly ischemic cerebral tissue. Imaging with radiolabeled amines can also detect perfusion abnormalities in asymptomatic patients with normal CT studies but with significant stenoses of the carotid or proximal cerebral arteries. I-123 amine imaging appears particularly promising for following patients before and after surgical therapy. I-123 amine imaging may play its most important role in the assessment of patients with dementia, differentiating patients with Alzheimer's disease from multi-infarct dementia and the dementias of normal pressure hydrocephalus, multiple sclerosis and other etiologies. Perfusion imaging with I-123 IMP coupled with receptor-specific imaging with I-123 IQNB, a radiotracer that specifically labels muscarinic acetylcholine receptors, may, in addition, help us elucidate the pathophysiology and mechanisms behind Alzheimer's disease. Both perfusion and receptor-specific imaging with SPECT tracers will play an increasingly important role in the management and diagnosis of patients with neurologic diseases.