NM Providers "Consolidating" as SPECT Procedures Decline

IMV, a market research and online publishing company based in Des Plaines, IL, released a report on December 19 indicating that providers of nuclear medicine services using fixed cameras, particularly those for cardiac assessments, are consolidating because of procedure volume declines over the period from 2008 to 2012. The proprietary report, released through the IMV Medical Information Division, found that an estimated 14.5 million nuclear medicine patient studies were performed on 14,825 SPECT or SPECT/CT cameras in the United States in 2012. This represents a 9% decrease from the 16.0 million studies performed in 2008 and an average annual decline of 2.5% over the period covered by the report. "We attribute this decline in nuclear medicine patient studies to several factors, including the impact of precertification requirements from health insurance companies, reduced reimbursement, and studies shifting to competing technologies, such as bone studies shifting to PET," said Lorna Young, senior director of market research at IMV.

The IMV *2013 Nuclear Medicine Market Outlook Report* is based on responses to an IMV-hosted online survey of 410 nuclear medicine department/facility managers nationwide. Their responses were mapped to the total of 6,985 short-term general hospitals, imaging centers, and physician practices in the United States with fixed nuclear medicine cameras.

Study data suggest that physician practice locations (primarily cardiology practices) are under financial pressure as a result of reduced reimbursement from Medicare and third-party payers. The number of physician practices performing nuclear medicine studies has declined 6% over the past 2 y, a decline the report cited as likely to continue. Respondents from physician office locations were asked in the study survey whether they plan to pursue strategic actions over the next few years, including changing practice ownership to include joint ventures with hospitals. Almost one-third of respondents were either considering or planning such changes.

IMV data indicate that this is affecting plans for purchase of new technology. Although 29% of nuclear imaging sites in the survey were independent physician office locations, fewer than 10% of respondents planning camera purchases through 2015 were physician offices. The study also identified a "relatively large installed base" of aging equipment. In the sites planning to purchase nuclear medicine cameras, almost 90% of planned purchases will be for replacement units. One driver for replacement activity is SPECT/CT cameras, which are projected to account for at least 40% of planned purchases for nuclear medicine cameras.

Among other findings highlighted in the report is that 80% of nuclear medicine imaging conducted in nonhospital locations is accounted for by cardiovascular studies, which account for only 46% of studies in hospitals. Overall, an estimated 8.0 million myocardial ischemia perfusion studies were performed in 2012, of which 58% used pharmacologic stress agents, either alone or with exercise. Slightly more than one-fourth of responding sites indicated that they currently provide neurologic examinations. IMV projects that this figure will grow to more than one-third by 2016.

For more information about IMV's report, see the Web site at www.imvinfo.com.

IMV

New BRAIN Initiative Funding Opportunities

The National Institutes of Health (NIH) announced on December 17 the release of 6 funding opportunities for 2014 "to build a new arsenal of tools and technologies for unlocking the mysteries of the brain." The NIH action is in support of President Obama's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. The new funding initiative was developed in response to high-priority areas identified in September 2013 by the NIH Advisory Committee to the Director's BRAIN Working Group. The due date for submission of applications for these awards is March 13. Awards are expected to be announced in September 2014 and will constitute NIH's initial investment of $40 million in the initiative.

The BRAIN initiative is a large-scale interagency federal effort described by Obama as "giving scientists the tools they need to get a dynamic picture of the brain in action and better understand how we think, how we learn, and how we remember." NIH, the National Science Foundation, and the Defense Advanced Research Projects Agency expect to contribute a total of $110 million to the initiative in the 2014 fiscal year. The NIH $40 million contribution in fiscal 2014 is in addition to the ~$5.5 billion slated in the NIH fiscal 2014 budget for neuroscience research. Private organizations have also committed to assist in this interdisciplinary effort.

The first wave of NIH investments in the BRAIN initiative will focus on technology development to advance basic science. Two of the funding announcements call for developing methods for classifying and assessing the cells and circuits of the brain; 3 focus on developing and optimizing technologies for recording and modulating collections of cells that function as circuits; and a final funding announcement, titled "Planning for Next Generation Human Brain Imaging" (R24) (RFA-MH-14-217), calls for projects that create teams of imaging scientists and other experts from a range of disciplines (such as engineering, material sciences, nanotechnology,

or computer science) to plan for a "new generation of noninvasive imaging techniques" that would be used to understand human brain function. Incremental improvements to existing technologies will not be funded under the last announcement.

"Scientists need new tools to be able to dissect the roles of particular neurons in the circuits underlying how we think and behave, and to learn which brain cells are disrupted by neurological disorders. These initiatives should provide them," said Story Landis, PhD, director of the NIH National Institute of Neurological Disorders and Stroke. For more information about the NIH BRAIN Initiative and these funding opportunities, see www.nih.gov/science/brain.

National Institutes of Health

NeuroBioBank Opens Access to Postmortem Tissue

The National Institutes of Health (NIH) announced on December 2 that it is shifting from a limited funding role to coordination of a Web-based resource for sharing postmortem brain tissue. Under its NeuroBioBank initiative, NIH will fund 5 brain banks to begin collaborating in a tissue sharing network for the neuroscience community. "Instead of having to seek out brain tissue needed for a study from scattered repositories, researchers will have 1-stop access to the specimens they need," explained Thomas Insel, MD, director of the National Institute of Mental Health, 1 of 3 NIH institutes underwriting the project. "Such efficiency has become even more important with recent breakthrough technologies." The other participating institutes are the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) and the National Institute of Neurological Disorders and Stroke.

NIH institutes previously awarded investigator-initiated grants to support disease-specific brain bank activities. The NeuroBioBank uses a contracting mechanism, which, according to an NIH press release, "affords the agency a more interactive role." Contracts totaling about $4.7 million for the 2013 fiscal year were awarded to brain banks at the Mount Sinai School of Medicine (New York, NY), Harvard University (Cambridge, MA), the University of Miami (FL), Sepulveda Research Corporation (Los Angeles, CA), and the University of Pittsburgh (PA). These brain and tissue repositories solicit brain donations, store these donations, and distribute them to qualified researchers.

In addition to serving the research community, the NeuroBioBank Web site (https://neurobiobank.nih.gov/) provides members of the public with information about the donation process and about the ways in which postmortem tissue research advances knowledge about neurologic and other disorders. The project seeks brain tissue from individuals with brain disorders as well as from nonaffected individuals. Individuals who are at least 18 y old may register as potential donors, and next of kin can also give permission for donation of tissue from children and those who have not registered. The preferences and privacy of donors or their next of kin are respected in the process of sample collection. "The NIH NeuroBioBank will offer economies of scale, increase availability of biospecimens, establish a standardized system, and raise public awareness of the importance of human brain research," said NICHD director Alan Guttmacher, MD. NIH is also encouraging other brain banks to partner with the NeuroBioBank by making their inventories available via the centralized Web site.

National Institutes of Health

Pericyte Loss and Alzheimer Disease

In a study published in the December issue of *Nature Communications* (2013;13:2932) Sagare et al. from the University of Southern California (Los Angeles) and the University of Rochester Medical Center (NY) reported on a study designed to determine whether pericyte degeneration influences Alzheimer disease (AD)–associated neurodegeneration. Pericytes are contractile cells that wrap around endothelial cells in vessels throughout the body. In the brain, they help to sustain the integrity of the blood–brain barrier (BBB), and a deficiency of pericytes is associated with BBB breakdown. The authors showed that in mice that overexpressed amyloid-β precursor protein, pericyte loss elevated brain amyloid-β 40 and amyloid-β 42 levels and accelerated amyloid angiopathy and cerebral β-amyloidosis by slowing clearance of soluble amyloid from brain interstitial fluid. Pericyte deficiency was also associated with development of τ pathology, early neuronal loss, and cognitive decline. These data led the authors to conclude that pericytes "control multiple steps of AD-like neurodegeneration pathogenic cascade in amyloid-β precursor protein–overexpressing mice" and that pericytes may represent a therapeutic target for modifying disease progression in AD.

In a December 13 press release from the National Institute on Aging and the National Institute of Neurological Disorders and Stroke, parts of the National Institutes of Health and cofunders of the study, senior author Berislav V. Zlokovic, MD, PhD, director of the Zilkha Neurogenetic Institute at the Keck School of Medicine of the University of Southern California, Los Angeles, said "This study helps show how the brain's vascular system may contribute to the development of AD. . . . Pericytes act like the gatekeepers of the BBB." He added that "our results suggest that damage to the vascular system may be a critical step in the development of full-blown AD pathology."

The researchers concluded that their findings point to a "2-hit vascular hypothesis" of AD development, in which the toxic effects of increased amyloid-β deposition on pericytes in aged blood vessels leads to a breakdown of the BBB and a reduced ability to clear amyloid from the brain. Next, the progressive accumulation of amyloid-β in the brain and pericyte death may launch a damaging feedback loop that causes dementia.

National Institutes of Health