

Report Shows Patient Visits Rising

IMV Medical Information Division (Des Plaines, IL), a marketing and research consulting firm, on November 6 released data on nuclear medicine patient visits in the United States in 2007. Among the encouraging factors reported was an upswing in the number of visits after a downturn in 2006. “Last year at this time, we observed a 12% downturn in patient visits from 17.2 million in 2005 to 15.2 million in 2006, which we attributed to several factors, including precertification requirements from health insurance companies as well as competing technologies, such as PET/CT oncology procedures,” said Lorna Young, senior director, market research, IMV Medical Information Division. “Now, we are seeing a slight resurgence to 15.7 million in 2007 and, based on year-to-date estimates, anticipate 2008 to close out at 16.0 million patient visits, still below 2005 levels.”

The report describes trends in nuclear medicine patient visits by procedure type, radiopharmaceutical and pharmacological stress agent utilization, camera and computer-installed base by manufacturer and year of installation, planned purchases, and networking and site operations characteristics. The report also covers adoption trends of new technologies, including SPECT/CT. Among the highlighted findings are:

- From 2006 to 2007, the total number of patients receiving myocardial ischemia/perfusion scans increased 5%, from 8.54 million to 8.93 million.
- Although dual-head SPECT cameras are the most preferred camera type, accounting for more than two-thirds of planned camera purchases, SPECT/CT is growing, accounting for more than 12% of purchase plans.
- Forty-five percent of nuclear imaging sites are not part of hospitals

(e.g., are in cardiology offices), and 55% are hospital based. Hospitals account for two-thirds of all nuclear imaging procedures.

- Hospital and nonhospital sites are equally likely (89%) to perform routine myocardial ischemia/perfusion studies. Hospitals are more likely to conduct other study types, including bone, liver/hepatobiliary, renal, respiratory, infection/abscess, and tumor localization studies.
- Patient waiting times for nuclear imaging procedures have decreased, with waiting time of 1+ d for scheduled outpatient procedures decreasing from 77% of the sites in 2003 to 52% of the sites in 2008.

These data are included in IMV’s *2008 Nuclear Medicine Market Summary Report*, a proprietary publication available by purchase or database licensing. Among other areas explored are trends in radiopharmaceutical budgets, numbers and types of cameras installed, methods of transmission, and staffing data. For more information, see www.imvinfo.com.

IMV Medical Information Division

WSJ Profiles “Radiology Police”

In an article appearing on November 6, the *Wall Street Journal* (WSJ) described the use of radiology business managers, dubbed “radiology police,” to serve as gatekeepers between medical imaging providers and insurers. According to the article’s author, Anna Wilde Mathews, increasing numbers of insurers, including Aetna, WellPoint, and Cigna, are engaging the services of radiology business managers and radiology business management companies to approve studies prescribed by physicians. Some imaging specialists argue that these reviews are in direct contradiction of their professional expertise, whereas insurers note the need

for constraining rapidly accelerating imaging costs. A few insurers, however, are more direct in citing physician expertise as an issue in the use of business management gatekeepers. “There’s a lot of new technology, and it’s emerging faster than physicians’ knowledge of how to use it,” John Jesser, a vice president for health care management at WellPoint, told *WSJ*. “An RBM can offer the most up-to-date, best-researched information on when to perform an imaging scan.”

The article cited the experiences of several patients and physicians when “stuck in the middle” in incidents of denial of coverage for recommended imaging procedures. Representatives from the 3 largest U.S. radiology business management groups—CareCore National; American Imaging Management, a WellPoint subsidiary; and National Imaging Associates, a unit of Magellan Health Services Inc.—were consulted for the article. Robert LaGalia, president of National Imaging Associates, reported that around 90 million consumers’ insured imaging procedures are now covered by radiology business managers, representing more than half of all Americans with private insurance. All 3 radiology business management companies reported that 70% or more of all physician requests for scans are approved after the provision of basic information and indications. More studies are approved after physicians speak directly to radiology business managers to clarify imaging requests.

The *WSJ* went on to cite a recent Government Accountability Office report indicating that Medicare spending on scans varies widely by geographic region, a finding interpreted as indicating that not all procedures are necessary or appropriate. The article also provided a series of suggestions for patients whose insurers deny coverage for recommended imaging procedures.

Wall Street Journal

Imaging Technology Use, Benefits Assessed

A team of analysts from Stanford University (CA) and the Harvard Medical School (Boston, MA) reported in the November–December edition of *Health Affairs* (2008;27:1467–1478) on the rapidly rising use of advanced imaging technologies and the challenges in understanding both short- and long-term value added by the incorporation of these techniques into routine health care. Baker and colleagues focused first on data relating to increasing use of CT and MR imaging. The authors analyzed Medicare claims reports and found that the number of MR procedures per 1,000 beneficiaries rose from 0.3 in 1985, to 50 in 1995, to 173 in 2003. The number of CT procedures increased from 235 per 1,000 beneficiaries in 1995 to 547 per 1,000 in 2005. As expected, increased availability of the new technologies drove these numbers. Each new CT scanner led to an additional 2,224 CT procedures/y, and each new MR unit led to an additional 733 MR procedures/y.

The authors explored what they termed “society’s value proposition” in new imaging technologies through the example of CT and CT angiography in abdominal aorta aneurysms. Although the technology clearly enhances outcomes for some patients, these individuals constitute only a small percentage of those imaged. The authors noted that newer imaging technologies may also convey less tangible benefits in a wider range of patients by providing more information about a disease or condition that can inform long-term preventative or prophylactic approaches. The authors concluded that new analyses are needed to identify and measure these intangible benefits. At the same time, the results of their own study point to “important questions about the extent to which the health care system should pay for benefits other than improvements in objective health measures.” The article appeared in a special issue of *Health Affairs* on the costs and benefits of increased use of new medical technologies.

Health Affairs

Photo-Fission Proposed to Resolve Isotope Shortage

On November 17, TRIUMF (Canada’s National Laboratory for Particle and Nuclear Physics), the University of British Columbia, and Advanced Applied Physics Solutions, Inc. (AAPS), all of Vancouver, released a report proposing a “uniquely Canadian method for producing select medical isotopes” that avoids using weapons-grade uranium and nuclear reactors. Global concern about the reliable supply of key medical isotopes has grown in the recent past and was heightened in 2007 when the Chalk River (Ontario) nuclear reactor encountered regulatory challenges and was shut down for an extended period. This was followed by unexpected shutdowns of European reactors.

“This report takes a close look at an alternative to using nuclear reactors to make these medical isotopes. The new technology is based on high-power accelerators, an area in which TRIUMF is a global leader,” said authoring committee cochair and TRIUMF director Nigel S. Lockyer, PhD. “As a public research institution, we felt it important to take a close look at Canadian solutions to this potential problem.”

The challenge was to identify novel approaches to fission production of ^{99}Mo , the essential isotope in the production of $^{99\text{m}}\text{Tc}$, which is used in more than 30 million nuclear medicine procedures worldwide each year. The TRIUMF-based Task Force on Alternatives for Medical Isotope Production, which included 30 expert participants from Canada and the United States, reviewed the advantages and disadvantages of 3 approaches, including the neutron-capture process, the photo-neutron process, and the photo-fission process. The group focused on the photo-fission process, in which an intense photon beam generated by an electron accelerator fissions natural uranium nuclei. Among the advantages of photo-fission, according to the task force, are: (1) lower cost, fewer criticality issues, and reduced waste storage security associated with natural uranium targets; (2) the ability to use

existing processing techniques and generator technologies; and (3) greater predictability of schedule, costs, and licensing procedures than for reactors.

The task force noted that the technology is already available to build a particle accelerator capable of driving enough photo-fission to supply much of Canada’s need for the ^{99}Mo isotope. A system of 6 machines would enhance reliability and ensure Canada’s competitiveness in the North American market. “This novel method is certainly of great interest to private enterprise,” said Phillip Gardner, president and CEO of AAPS. “With all the aging reactors around the world experiencing technical issues, it is critical that we explore a new approach with experts in the field and with commercial partners.”

Lockyer clarified the purpose of the task force and its findings: “This report doesn’t propose that TRIUMF become a medical isotope factory. Rather, it demonstrates that a new technology developed in basic physics research has real-world applications.” The photo-fission accelerator technology arises from a new project at TRIUMF in a collaboration led by the University of Victoria.

The Task Force on Alternatives for Medical Isotope Production was convened by TRIUMF, the University of British Columbia, and AAPS, with support from Natural Resources Canada.

In its conclusions, the task force recommended several steps to advance efforts at photo-fission for medical isotope production in Canada. The first involves the development of benchmarks and laboratory validation of the proposed method, including completion of technical and engineering design of a full-scale machine and proof-of-principle demonstration of the accelerator and target system for producing ^{99}Mo . This would be followed by a “strong and focused” research and development program to validate the use of a photo-fission accelerator for production of significant quantities of high-quality ^{99}Mo .

In summarizing its findings, the task force recommended that the Canadian government immediately form

a ^{99}Mo Photo-Fission Accelerator Steering Group of public-private partners. This steering group would select a project director, provide oversight, and bring together the skills, resources, and business sense required to develop the technology; oversee a proof-of-principle demonstration; and assess and/or pursue commercial viability. Additional information is available at: <http://admin.triumf.ca/facility/5yp/comm/isotope-task-force.php>.

TRIUMF

Society for Neuroscience 2008

Two recent National Institutes of Health-sponsored events held in conjunction with the annual meeting of the Society for Neuroscience (SfN), in Washington, DC, included discussions of current investigations in which imaging techniques play key roles. On November 14, the National Institute on Drug Abuse (NIDA) convened a 1-d miniconvention at which NIDA scientists presented recent findings and discussed future directions in neuroscience. Sessions included “Frontiers in Addiction Research”; “Epigenetics, Brain Function, and Addiction”; an “Early Career Investigators Poster Session”; “Multilevel Multimodal Imaging of Gene Expression, Cells, Neurons, and Circuitry”; “Cortical Development and Substance Abuse Induced Abnormality”; and “Willpower: What Really Governs Our Choices?” The miniconvention events also included the Jacob P. Waletzky Memorial Lecture, delivered by the 2008 Waletzky awardee, R. Christopher Pierce, PhD, of Boston University School of Medicine (MA).

On November 15, a stellar group of NIH directors and leading neuroscientists assembled at the SfN meeting to discuss new trends in neuroscience research and novel findings announced during the meeting sessions. The session was open to the press and public and included discussion of mental health, substance abuse, brain issues related to aging, eye health, new imaging capabilities, stroke, and neurologic disorders.

Also at the SfN meeting, the Ralph W. Gerard Prize in Neuroscience was presented to Marcus Raichle, MD, of Washington University (St. Louis, MO) and Mortimer Mishkin, PhD, of the National Institute of Mental Health (NIMH; Bethesda, MD). The \$25,000 prize will be shared between the awardees, each of whom uses advanced imaging techniques in cutting-edge neuroscience research.

Raichle, a professor of radiology, neurology, neurobiology, and biomedical engineering at Washington University, has made outstanding contributions to the study of human brain function through the development and use of PET and functional MR imaging. His group’s landmark study, published in *Nature* in 1988, described the first integrated strategy for the design, execution, and interpretation of functional brain images.

Mishkin, who has been at NIMH for more than 50 y, helped identify areas in the cerebral cortex that are essential for perception and memory. His work showed that knowing the presence and location of a stimulus depends on the activity of separate sensory “pathways” or “streams,” each made up of many cortical areas arranged in a hierarchy. He is a senior investigator at NIMH, where his laboratory continues to explore the neurobiologic mechanisms of perception and memory.

Society for Neuroscience

Final Rule for Patient Safety Organizations

The U.S. Department of Health and Human Services (HHS) issued on November 21 a final rule for patient safety organizations (PSOs). The rule becomes effective on January 19. It provides final requirements and procedures for PSOs, new entities with which clinicians and health care providers can work to collect, aggregate, and analyze data—within a legally secure environment of privilege and confidentiality protections—to identify and reduce patient care risks and hazards.

“I expect the final rule and the creation of Patient Safety Organiza-

tions to greatly improve the quality of health care for all Americans,” said HHS Secretary Mike Leavitt. “By making it easier for clinicians and health care organizations to report and learn from adverse events without fear of new legal liability, we will be able to improve our nation’s health care systems and minimize factors that can contribute to mistakes.”

Under interim guidance issued on October 8, the Agency for Healthcare Research and Quality (AHRQ) has already listed 15 PSOs, and others will be added. The listing of PSOs is authorized by the Patient Safety and Quality Improvement Act of 2005. The Patient Safety Act is intended to encourage voluntary, provider-driven initiatives to improve the safety of health care through the establishment of legal protections to ensure that providers who report patient safety information do not incur new legal liability; to promote rapid learning about the underlying causes of risks and harms in the delivery of health care; and to share those findings widely, thereby speeding the pace of improvement.

The final rule is consistent with many of the provisions of the proposed rule issued in early 2008. However, it also includes new requirements for PSOs, such as: (1) the requirement that a PSO notify providers if the patient safety work product it submits is inappropriately disclosed or its security is breached; and (2) additional flexibility in requirements for ways in which a component PSO maintains separation between itself and its parent organization(s).

The final rule also makes several important changes from those in the proposed rule regarding the listing and delisting of PSOs and the ways in which PSOs must comply with statutory requirements. AHRQ administers provisions dealing with PSO operations, and the HHS Office for Civil Rights (OCR) enforces confidentiality provisions. The final rule addresses concerns regarding how providers may efficiently collect and analyze patient safety event information with privilege and confidentiality protections while complying with existing reporting

requirements that seek similar information.

To read the final rule and access more information about PSOs, including background on the rulemaking process, visit AHRQ's PSO Web site at www.pso.ahrq.gov. Additional information about the confidentiality and disclosure of patient safety work product may be found at OCR's Web site at www.hhs.gov/ocr/psqia/.

*U.S. Department of Health
and Human Services*

DOE Supercomputer Fastest for Open Science

On November 10 the U.S. Department of Energy (DOE) announced that the latest upgrade to the Cray XT Jaguar supercomputer at its Oak Ridge National Laboratory (ORNL) had increased the system's computing power to a peak 1.64 "petaflops" (quadrillion mathematical calculations per second), making Jaguar the world's first petaflop system dedicated to open research. Scientists have already used the newly upgraded Jaguar to complete an unprecedented superconductivity calculation that achieved a sus-

tained performance of more than 1.3 petaflops.

"Jaguar is one of science's newest and most formidable tools for advancement in science and engineering," said Raymond L. Orbach, PhD, DOE Under Secretary for Science. "It will enable researchers to simulate physical processes on a scale never seen before and approach convergence for dynamical processes never thought possible. High-end computation will become the critical third pillar for scientific discovery, along with experiment and theory."

The upgrade at DOE's Oak Ridge National Leadership Computing Facility represents a major milestone in a 4-y project begun in 2004 when the DOE Office of Science launched a sustained effort to upgrade supercomputing capabilities for unclassified research at DOE national laboratories. The project to build a petaflops machine included partnerships with industry to develop new hardware and computer architectures.

Within hours of access to the Oak Ridge supercomputer, an ORNL team became the first to achieve sustained petascale performance on a scientific

application. In 1998, another ORNL team was the first to achieve sustained terascale performance for science. Supercomputing holds significant promise for U.S. economic competitiveness, including the promise of enabling American industry to perform "virtual prototyping" of complex systems and products. Jaguar will enable companies to reduce development costs and shorten the time required to market new technologies. Jaguar is the result of a partnership among DOE, ORNL, and Cray that has pushed computing capability at a rapid pace. The current upgrade is the result of an addition of 200 cabinets of Cray XT5 to the existing 84 cabinets of the XT4 Jaguar system.

Eighty percent of the Leadership Computing Facility resources are allocated each year through DOE's Innovative and Novel Computational Impact on Theory and Experiment program, a competitively selected, peer-reviewed process open to researchers from universities, industry, government, and nonprofit organizations.

U.S. Department of Energy

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pharmaceutical development will benefit. With the approval of the first multicenter IND for ¹⁸F-fluorothymidine (FLT) in September of this year, the SNM Clinical Trials Network has achieved an important early success toward integrating imaging biomarkers into therapeutic clinical trials. More information about the CTN and the ways in which it will facilitate drug development will be presented at a workshop on February 8 and 9, immediately after SNM's Mid-Winter Educational Symposium in Clearwater, FL.

Education. In the coming year, members will focus on developing new molecular imaging fellowship and residency curricula, as well as creating new sessions and courses. In addition, SNM will launch a new series of basic science lectures to supplement existing courses offered in PET/CT, cardiac PET/CT, neurology PET/CT, and other areas. SNM is moving

forward with the curricula for its new 4-y baccalaureate degree and its advanced associate degree, for which the first class will be offered this year. Largely as a result of these advances in education, SNM has received approval from the American Registry of Radiologic Technologists as a Recognized Continuing Education Evaluation Mechanism (RCEEM+) provider—1 of only 3 organizations to achieve this ranking.

SNM's leaders, volunteers, and staff keep moving forward by undertaking and leading projects that are important to the profession—expanding services to members and improving the practice of nuclear medicine. If you have questions about any part of SNM, please contact headquarters staff at 800-487-5620.

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