Congressional Bill and Coalition White Paper on Radionuclide Shortage

On July 28, SNM and a coalition of 8 other organizations issued the final version of a joint white paper urging the U.S. Congress to take steps to maintain adequate supplies of $^{99}$Mo. The coalition jointly issued the paper to ensure that patient care is not compromised by the current worldwide shortage of $^{99}$Mo or to curtail the use of highly-enriched uranium (HEU) in radionuclide production as a nonproliferation strategy. In response, U.S. Representative Edward Markey (D-MA) introduced legislation (HR 3276) reflecting many of the coalition’s concerns. The coalition has endorsed the legislation. In addition to SNM, the coalition includes the American Association of Physicists in Medicine, American College of Radiology, American Nuclear Society, American Society of Nuclear Cardiology, American Society for Radiation Oncology, Council on Radionuclides and Radiopharmaceuticals, Health Physics Society, and Nuclear Energy Institute.

“Recent closures of nuclear facilities abroad are putting a severe strain on our ability to meet demand for this critical medical isotope,” said Michael Graham, MD, PhD, president of SNM. “Congress should take steps to boost production domestically and to ensure that the transition away from using highly enriched uranium in medical isotope production does not further strain supplies. We applaud Congress for taking up this issue and urge the government to act without delay.”

To address concerns about radioisotope shortages and about the transition away from HEU, the Coalition’s white paper recommended that the government explore a public-private partnership to identify domestic sources to speed the availability of $^{99}$Mo and ensure continued diagnostic imaging for patients.

The paper identified 2 potential domestic sources of $^{99}$Mo as the most viable: the University of Missouri Research Reactor Center (MURR; Columbia, MO) and the collaborative effort between the Babcock & Wilcox (B&W) and Coviden companies to build a reactor running strictly on low-enriched uranium (LEU). MURR could meet approximately 50% of the U.S. demand for $^{99}$Mo with a minimal amount of structural and equipment change, the paper noted. The reactor could also help fill gaps in supplies during planned shutdowns of other reactors. B&W and Coviden estimated that their new reactor technology could be operational in about 5 y and supply half of the U.S. demand for $^{99}$mTc. The coalition urged the government to speed approvals for these facilities and support the Markey bill, which designates federal funding for the projects.

The organizations stressed that any requirement to transition from HEU to LEU in the production of medical isotopes must ensure that supplies of $^{99}$Mo are sufficient and that patient needs are not compromised. Adequate time must be available for research and development to guarantee that the technology and equipment are robust and reliable. The white paper is available for download at www.snm.org/index.cfm?PageID=1110&RPID=8905&FileID=149216.

CMS Announces 2010 OPPS Changes

On July 9, the Centers for Medicare & Medicaid Services (CMS) posted an advanced copy of the proposed rule for Medicare payment for hospital outpatient and ambulatory surgical center (ASC) services in calendar year 2010. The proposed rules affect hospital outpatient and ASC payments for services paid under the outpatient prospective system (OPPS) and ASC payment system. The notice of proposed rulemaking was published on July 20 in the Federal Register. The proposed rule includes a 2.1% annual inflation update, along with other factors, to yield an overall 1.9% increase to Medicare payment rates for most services that would be paid under the OPPS. Certain hospitals that did not meet the quality reporting requirements would be reduced by 2% to yield an overall negative 0.1% update.

Important nuclear medicine, nuclear cardiology, echocardiography, cardiology CT angiography, and brachytherapy policies proposed include:

- CMS continues packaging payments for ALL diagnostic radiopharmaceuticals and contrast agents in with the Ambulatory Payment Classification (APC) category (major service procedure). CMS will continue to use hospital claims data median costs, as derived from hospital charges reduced by department-specific cost-to-charge ratios (CCRs) for rate setting in 2010.
- For CMS-approved 2010 transitional pass-through drugs, radiopharmaceuticals, contrast agents, and biologics, CMS proposes to pay separately using the following rule: If average sales price (ASP) data are available, payment would be at ASP + 6%, whereas agents without ASP information would be paid at wholesale acquisition cost (WAC) + 6%. If WAC data are not available, these would be paid based on 95% of the product’s most recently published average wholesale price. For diagnostic radiopharmaceuticals and contrast agents with pass-through status, CMS proposes to continue their 2009 policy to pay separately and to use the device methodology to estimate offset costs that could reasonably be attributed to the products packaged into APC groups, in an effort to avoid duplicate
payments. The offset file is posted on the CMS Web site. CMS proposes to begin the 2–3-y pass-through payment eligibility period for new drugs and other agents on the date of the first sale of the drug following approval by the U.S. Food and Drug Administration. This is proposed to apply to those products that qualify for pass-through beginning on or after January 1, 2010.

- Separately payable therapeutic radiopharmaceuticals are proposed to be paid by CMS, setting a prospective payment rate utilizing voluntary manufacturer-submitted ASP information through the existing ASP process at ASP + 4%. If ASP information is not available, CMS is proposing that payment would be based upon mean costs from hospital claims data at charges adjusted using department-specific CCRs. CMS is proposing to allow but NOT require manufacturers (not including nuclear pharmacies) to submit ASP information for any separately payable therapeutic radiopharmaceutical. CMS is specifically requesting public comment on the development of a therapeutic radiopharmaceutical crosswalk, similar to the National Drug Code/Healthcare Common Procedure Coding System crosswalk for separately payable drugs.

- Separately payable drugs and biologicals are proposed to be paid at 104% of the ASP rather than the current rate of 106% of ASP paid in the office and independent diagnostic testing facility settings. For 2010, CMS has arrived at this proposed payment using a different methodology from 2009. CMS proposes to reduce the payment of packaged drugs and biologicals that is included in the procedure payment and adjusting (for charge compression) the payment for separately payable drugs and biologicals. Had CMS used the 2009 methodology, payment would have been ASP minus 2%.

- CMS proposes to pay separately for drugs, biologicals, and therapeutic radiopharmaceuticals costing $65 or more per day, consistent with the previous $60 threshold updated for inflation for 2010. Payments for other drugs will continue to be bundled into payments for their associated procedures with an adjustment as noted above.

- CMS continues packaging many add-on “image processing services” with the costs of the major Current Procedural Terminology (CPT) codes. Examples of bundled CPTs include 76376, 76377, 78020, 78478, 78480, 78496, and 93325.

SNM prepares charts and spreadsheets that evaluate the impact of the Final OPPS rule for nuclear medicine procedures and products. The materials are available online in the SNM Coding Corner at http://interactive.snm.org/index.cfm?PageID=1981.

Centers for Medicare & Medicaid Services
SNM

NRC Authorized User Clarification

The U.S. Nuclear Regulatory Commission (NRC) announced in the July 14 issue of the Federal Register (2009;74:33901) that it is amending its regulations to clarify that individuals who do not need to comply with the training and experience requirements as described in the applicable regulations for the medical use of byproduct material (i.e., are “grandfathered” in) may serve as preceptors/work experience supervisors for individuals seeking recognition on NRC licenses for the same medical uses of byproduct material. The regulations that govern the medical use of byproduct material were amended in their entirety in 2002 and again in 2005. Individuals who were identified on an NRC or Agreement State license or permit before the regulations were amended do not currently need to requalify by meeting the training and experience requirements of the applicable regulations. When the regulations were revised, the NRC intended that those authorized individuals would also be able to serve as preceptors and work experience supervisors. However, the regulations as they are currently written do not specifically state that grandfathered individuals can fill these roles. This direct final rule amends the regulations to clarify that all individuals grandfathered under the applicable regulations may serve as preceptors/work experience supervisors for individuals seeking recognition on an NRC license for the same uses. In addition, several minor administrative changes were included in this rule-making, which will be effective on September 28. The final rule is available at: http://edocket.access.gpo.gov/2009/pdf/E9-16658.pdf

U.S. Nuclear Regulatory Commission

MDS Nordion Proposes MAPLE Reactors Solution

On July 30, MDS Nordion (Ottawa, Canada) announced the submission of a proposal to the government of Canada Expert Review Panel on Medical Isotope and 99mTc Generator Production. In the submission, MDS Nordion outlined its position that the answer to the current shortage of medical radioisotopes is “the completion and bringing into service of the MAPLE project” and described the technical and regulatory requirements needed for the provision of a secure supply of medical isotopes for the health care system in Canada and around the world. At the same time, MDS Nordion proposed building Canada’s first 99mTc generator manufacturing facility.

MDS Nordion has opposed the 2008 decision by Atomic Energy of Canada, Ltd. (AECL) to halt the troubled MAPLE reactor project at Chalk River (Ontario). The twin MAPLE reactors were originally intended to replace the aging National Research Universal, (NRU) reactor but were never put into commercial operation. On May 14, the NRU was shut down because of a leak of heavy water from the reactor vessel and is not expected to be restarted until at least the end of 2009, a target that many
observers believe to be optimistic. The result has been a well-publicized shortage of \(^{99}\text{Mo}\) and worldwide discussion of strategies for production of adequate and reliable supplies of radionuclides for medical and research applications.

MDS Nordion representatives estimated that with expertise and guidance from the South African Nuclear Energy Corporation (Necsa), owner and operator of the SAFARI-1 reactor (Pelindaba, South Africa), and working with AECL, a solution to put the MAPLE reactors into service could be achieved in 24 mo. “We look forward to working with Necsa on the next stages of this proposal,” said Steve West, president of MDS Nordion. “We believe this approach provides a good path forward to bring the MAPLEs into service and provide a long-term supply of medical isotopes for Canadians. This goal is of utmost importance and we are also supportive of other proposals which may provide this critical supply.”

In the proposal, MDS Nordion urged the AECL to honor its previous long-standing commitment to bring the MAPLE facilities into service and to do so by collaborating with Necsa on adaptation of the OSCAR computer codes, which are successfully used by the world’s leading isotope producing reactors. The computer codes are specifically designed to model research reactor performance and operation and are currently in use by the High Flux Reactor (Petten, The Netherlands) and SAFARI-1. Adopting the OSCAR computer codes could be essential to resolving the existing discrepancy between the predicted and measured value of the power coefficient of reactivity of the MAPLE reactors, allowing them to be licensed by the Canadian Nuclear Safety Commission for safe operation.

MDS Nordion is also proposing the construction of a fully licensed production facility to manufacture \(^{99m}\text{Tc}\) generators for distribution to Canadian hospitals and elsewhere. MDS Nordion would build, operate, and maintain the generator production line and perform all necessary activities, including provision of licensed packaging, consumable supplies, and transport logistics to all Canadian health care centers.

MDS Nordion

**NIH Launches Human Connectome Project**

Representatives of the National Institutes of Health (NIH) Blueprint for Neuroscience Research announced on July 15 the launch of a $30 million project that will use cutting-edge brain imaging technologies to map the circuitry of the healthy adult human brain. By systematically collecting brain imaging data from hundreds of subjects, the Human Connectome Project (HCP) will yield insight into the ways in which brain connections underlie brain function and will open new lines of inquiry for human neuroscience. Investigators have been invited to submit detailed proposals to carry out the HCP, which will be funded at up to $6 million/y for 5 y. The Blueprint Grand Challenges are large-scale projects intended to promote major leaps in the understanding of brain function and in approaches to treating brain disorders. The HCP is the first of 3 Blueprint Grand Challenges to be launched in 2009 and 2010. The others will focus on targeted drug development for neurologic diseases and on the neural basis of chronic pain disorders.

“The HCP is truly a grand and critical challenge: to map the wiring diagram of the entire, living human brain. Mapping the circuits and linking these circuits to the full spectrum of brain function in health and disease is an old challenge but one that can finally be addressed rigorously by combining powerful, emerging technologies,” said Thomas Insel, MD, director of the National Institute of Mental Health (NIMH), which is part of the NIH Blueprint.

In addition to brain imaging, the HCP will involve collection of DNA samples, demographic information, and behavioral data from subjects. The aggregate data will serve as a baseline for future studies and will be freely available to the research community. Researchers will optimize and combine state-of-the-art brain imaging technologies. The funding announcement suggested 3 technologies for carrying out the HCP but stressed that other technologies would be considered. These technologies included: high angular resolution diffusion imaging with MR, resting-state functional MRI (fMRI), and electrophysiology and magnetoencephalography combined with fMRI.

The HCP will support development of new data models, informatics, and analytic tools to help researchers make the most of the data. Funds will be provided for building an online platform to disseminate HCP data and tools and for engaging and educating the research community about ways to use these data and tools. “Human connectomics has been gaining momentum in the research community for a few years,” says Michael Huerta, PhD, associate director of NIMH and the lead NIH contact for the HCP. “The data, the imaging tools, and the analytical tools produced through the HCP will play a major role in launching connectomics as a field.”

The NIH Blueprint for Neuroscience Research is a cooperative effort among the NIH Office of the Director and the 15 NIH institutes and centers that support research on the nervous system. Complete information, including current funding opportunities for this initiative, is available at www.neuroscienceblueprint.nih.gov.

**States Vary in Quality of Health Care**

On June 26 the Agency for Healthcare Research and Quality (AHRQ) released its 2008 State Snapshots report on the quality of health care in the United States. The report provides state-specific health care quality information, including strengths, weaknesses, and opportunities for improvement. The information used to create the report was drawn from the 2008 National Healthcare Quality Report, released in May by the U.S. Department of Health and Human Services (HHS). As in previous years, the report indicates
that no state performs uniformly well or poorly on all quality measures.

The 2008 State Snapshots report summarizes health care quality from 3 perspectives: type of care (preventive, acute, and chronic care), setting of care (hospitals, ambulatory, nursing homes, and home health care), and by clinical areas (cancer, diabetes, heart disease, maternal and child health, and respiratory disease). The report was designed to allow users to explore whether a state has improved compared with other states in several areas of health care delivery. New features in this year’s report provide more ways to analyze the quality of health care for each state compared with all states or with states in the same region. Other features include special sections on asthma care and on disparities analyses. The report also includes enhanced dashboards for each state that display all summary measures on health care quality and allow a clear view of the range of that state’s performance.

AHRQ’s annual state snapshots are based on data drawn from more than 30 sources, including government surveys, health care facilities, and health care organizations. To access this year’s report, see http://statesnapshotsahrq.gov/snaps08/index.jsp. HHS is also releasing state-by-state reports on the health care status quo, and these are available at www.HealthReform.gov.

Agency for Healthcare Research and Quality

An Aging World

The U.S. Census Bureau (Washington, DC) released on July 20 a report commissioned by the National Institute on Aging (NIA; Bethesda, MD) that indicated that the average age of the world’s population is increasing at an unprecedented rate. Data in An Aging World: 2008 estimated the number of people worldwide aged 65 y and older at 506 million as of midyear 2008; by 2040, that number will be more than 1.3 billion. In little more than 3 decades, the proportion of older people will double, from 7% to 14% of the world’s population. The report examined the demographic and socioeconomic trends accompanying this phenomenon.

The report looked at 9 international population trends identified in 2007 by the NIA and the U.S. Department of State, including detailed information on life expectancy, health, disability, gender balance, marital status, living arrangements, education and literacy, labor force participation and retirement, and pensions among older people around the world. “Aging is affecting every country in every part of the world,” said Richard Suzman, PhD, director of NIA’s Division of Behavioral and Social Research. “While there are important differences between developed and developing countries, global aging is changing the social and economic nature of the planet and presenting difficult challenges. The fact that, within 10 years, for the first time in human history there will be more people aged 65 and older than children under 5 in the world underlines the extent of this change.”

Highlights of the report include:

- The most rapid increases in the older population are in the developing world, where the current rate of growth of the older population is more than double that in developed countries. In 2008, 62% (313 million) of the world’s people aged 65 and older lived in developing countries. By 2040, today’s developing countries are likely to have more than 1 billion people aged 65 and over, 76% of the projected world total.

- The “oldest old,” people aged 80 y and older, are the fastest growing portion of the total population in many countries. This group is projected to increase 233% between 2008 and 2040, compared with 160% percent for the population aged 65 and over and 33% for the total world population of all ages.

- In China and India, the 65-and-older population numbered 166 million in 2008, nearly a third of the world’s total. These numbers will climb to 329 million in China and 222 million in India in 2040.

- Childlessness among European and U.S. women aged 65 in 2005 ranged from less than 8% in the Czech Republic to 15% in Austria and Italy. Twenty percent of women aged 40–44 y in the United States in 2006 had no biological children. The NIA noted that these and other data “raise questions about the provision of care when this cohort reaches advanced ages.”

The complete report is available at www.census.gov/prod/2009pubs/p95-09-1.pdf.

National Institute on Aging

DOE Wins 46 R&D 2009 Awards

On July 24 U.S. Secretary of Energy Steven Chu, PhD, announced that Department of Energy (DOE)—funded researchers had won 46 of the 100 annual awards given by R&D Magazine for the most outstanding technology developments with promising commercial potential. The awards are presented in recognition of exceptional new products, processes, materials, or software developed throughout the world and introduced into the market the previous year. “The DOE’s national laboratories are incubators of innovation, and I’m proud they are being recognized once again for their remarkable work,” said Chu. These awards highlight some of the successes made by the DOE national laboratories in technology transfer, moving forward basic research results into commercial products. This year, scientists and engineers from 12 of the 17 DOE National Laboratories as well as the Nevada Test Site received awards. Since 1962, when the R&D 100 competition began, DOE has received more than 800 of the awards. R&D 100 awards are selected by an independent panel of judges based on the technical significance, uniqueness, and usefulness of projects and technologies from across industry, government, and academia.

Among the DOE winners are a number of technologies with both immediate and long-range applications in medicine and specifically in nuclear medicine. Many of these projects were (Continued on page 46N)
Pediatric ¹¹C-MET PET

In an article e-published on July 4 ahead of print in the Journal of Neurooncology, Galldiks et al. from the University of Cologne (Germany) reported on the utility of ¹¹C-methionine PET studies in the differentiation between tumorous and nontumorous lesions in children and young adults with brain tumors. The study included 48 PET scans from 39 patients (ages, 2–21 y) with brain neoplasms. The authors found that differentiation between tumorous (n = 39) and nontumorous brain lesions (n = 9) was possible at a threshold of 1.48 of relative tracer uptake, with sensitivity of 83% and specificity of 92%. Differentiation between high-grade malignant lesions and low-grade tumors was not possible; however, a significant difference in tracer uptake was noted between the histologically homogeneous subgroups of astrocytoma WHO grade II and anaplastic astrocytoma WHO grade III. The authors noted that the radiation exposure and long scan times associated with ¹¹C-methionine PET restrict its use in pediatric patients. They concluded that ¹¹C-methionine PET “might be a useful tool to differentiate tumorous from nontumorous lesions in children and young adults when a decision for further therapy is difficult or impossible from routine structural imaging procedures alone.”

Journal of Neurooncology

PET in TBI

de la Cueva-Barrao et al. from the Hospital 9 de Octubre (Valencia, Spain) reported in the July 16 issue of the Revista de Neurologia (2009;49:58–63) on a study designed to evaluate the accuracy of ¹⁸F-FDG PET as a predictor of long-term disability after severe traumatic brain injury (TBI). The study included 56 patients who had severe TBIs in a long-term rehabilitation program. All patients were assessed with cognitive and functional examinations and underwent PET imaging at the beginning of the study. A physician unaware of the clinical and cognitive assessments performed semi-quantitative analyses of PET results. The total number of lesions on PET was correlated with the intensity of the TBI and with clinical data at admission and at 6-mo follow-up. PET showed changes in cerebral metabolism in all patients studied, with the thalamus most often affected. The extent of cerebral hypometabolism on PET was significantly correlated with TBI severity, functional disability, global outcome, and memory and intelligence impairment both at baseline and at follow-up. Despite these correlations and the promising aspects of PET as a “useful tool when studying brain dysfunction after severe TBI,” the authors concluded that “clinical variables related to the severity of the TBI still are the best predictors of functional outcome after TBI.”

Revista de Neurologia

(Continued from page 41N)

carried out under collaborative agreements with academic sites and/or private industry. Project titles and originating laboratories include the Hard X-Ray Nanoprobe from Argonne National Laboratory (IL), a technology that will significantly improve the ability of medical scientists and nanoscientists to study the use of nanocomposites in tissues, cells, and subcellular organelles in new medical imaging techniques and therapies; Compact Gamma Camera from Brookhaven National Laboratory (Upton, NY), a high-resolution nuclear medical probe that can pinpoint the location of cancer tissue in the prostate gland in detail at an early stage; Precision Nanoparticles from Idaho National Laboratory (Idaho Falls), a technology that efficiently produces nanoparticles in uniform and prescribed sizes (1–100 nanometers) using super-critical fluids; the TEAM Electron Microscope Stage from the Lawrence Berkeley National Laboratory (CA), an improvement on 1 of the world’s most powerful electron microscopes, enabling atomic-scale imaging in 3D; the GeMini from the Lawrence Livermore National Laboratory (CA), a palm-sized γ-ray spectrometer based on germanium technology; the Artificial Retina from the Lawrence Livermore National Laboratory, 4 other national labs, and 4 academic sites, a device with bioelectronic integrated circuits that transform digital images from a camera mounted on a pair of glasses into electric signals in the eye that the brain uses to create a visual image; the Mass-Independent Kinetic-Energy-Reducing Inlet System for Mass Spectrometers from the Oak Ridge National Laboratory (TN), a system that permits high-resolution mass analysis of large, intact biological molecules without having to break them apart; Ultrasensitive ESI-MS Source & Interface from the Pacific Northwest National Laboratory (Richland, WA), a system that integrates 4 technologies to provide greater sensitivity and precise measurements from mass spectrometry instrumentation while requiring smaller samples; and the Hyperspectral Confocal Fluorescence Microscope System from Sandia National Laboratories (Albuquerque, NM), a system that rapidly finds all emitting fluorescence species of an image, determining their relative concentrations without any a priori information.

The 47th Annual R&D 100 Awards will be formally presented at an awards banquet in Orlando, FL, on November 12. A complete list of awardees and their projects is available at: www.rdmag.com/RD100Home.html.

U.S. Department of Energy