FDA Unveils Radiation Initiative

The U.S. Food and Drug Administration (FDA) announced on February 9 a major initiative to reduce unnecessary radiation exposure from CT, nuclear medicine studies, and fluoroscopy. In a press release outlining the initiative, the FDA noted that although these imaging techniques "have led to early diagnosis of disease, improved treatment planning, and image-guided therapies that help save lives every day," the risks for both excessive exposure and long-term consequences should be addressed. "The amount of radiation Americans are exposed to from medical imaging has dramatically increased over the past 20 years," said Jeffrey Shuren, MD, JD, director of the FDA Center for Devices and Radiological Health. The FDA is advocating the adoption of 2 principles of radiation protection: appropriate justification of the radiation procedure and optimization of radiation dose used during each procedure.

The 3-pronged initiative announced by the agency will "promote the safe use of medical imaging devices, support informed clinical decision-making, and increase patient awareness of their own exposure." The FDA intends to issue targeted requirements for manufacturers of CT and fluoroscopic devices to incorporate safeguards into the design of their machines, develop safer technologies, and provide appropriate training to support safe use by practitioners. The agency scheduled a public meeting for March 30 and 31 to solicit input on these requirements.

Examples of types of new requirements detailed in the FDA announcement included potential stipulations that CT, fluoroscopic, and nuclear medicine devices display, record, and report equipment settings and radiation doses; that these devices provide an alert for users when doses exceed a diagnostic reference level; that special and new types of training for users be provided; that training for users be offered; and/or that devices be able to capture and transmit radiation dose information to a patient's permanent electronic medical record and to national dose registries. In addition, the FDA and the Centers for Medicare & Medicaid Services are collaborating to incorporate quality assurance practices into mandatory accreditation and conditions of participation survey processes for imaging facilities and hospitals.

The press release stated that "FDA recommends that health care professional organizations continue to develop, in collaboration with the agency, diagnostic radiation reference levels for medical imaging procedures, and increase efforts to develop one or more national registries for radiation doses." A dose registry would pool data from many imaging facilities nationwide, capturing dose information from a variety of imaging studies. Results from this registry would be used to define diagnostic reference levels where they do not yet exist, validate levels that do exist, and provide benchmarks for health care facilities to use in individual imaging studies.

In addition, the FDA is collaborating with other organizations to develop and disseminate a patient medical imaging history card. This tool, which would be available on the FDA's Web site, will allow each patient to track his or her own medical imaging history and share it with physicians.

Imaging specialists and representatives from professional societies had mixed reactions to talk of additional regulatory oversight. Radiologists and radiation specialists testifying at a special U.S. House of Representatives hearing on February 26 called for "a more standardized, comprehensive method of overseeing medical radiation, both diagnostic and therapeutic." Privately, many imaging providers have voiced concerns about a focus on radiation safety that often erroneously conflates and confuses injuries resulting from medical mistakes, overexposure and economic problems associated with too frequent or unnecessarily repeated imaging, and long-range risk projections for routine imaging.

Additional information on the FDA initiative is available at: www.fda.gov/Radiation-EmittingProducts/RadiationSafety/RadiationDoseReduction/UCM199904.htm.

U.S. Food and Drug Administration

International Focus on Isotope Shortage

Covidien (Loughlinstown, Ireland) announced on February 17 that a deal had been reached with the Institute of Atomic Energy in Poland (IAE POLATOM) to use its Maria reactor (Swierk) to supply ^{99}Mo. "This is an historic agreement. It is the first time in decades that a new reactor has been brought into the global supply chain for medical isotopes," Timothy R. Wright, president of Covidien's pharmaceutical division, said in a statement. The announcement came only 2 d before the High Flux Reactor (HFR) in Petten (The Netherlands) was shut down for at least 6 mo of repair and refurbishment. The Petten shutdown was expected to add to North American radioisotope supply challenges, which began in 2009 with the long-term shut-down of Canada's National Research Universal reactor at Chalk River. Combined, the Petten and Canadian reactors supplied the United States with more than 80% of its ^{99}Mo supply.

The new Covidien supplies may help to lessen the growing ^{99}Mo shortages in the United States. "We have applications in with the FDA and Health Canada to supply the U.S. and Canada," said Bruce Farmer, a spokesman for Covidien. "We're optimistic that would be in the next month or 2, but obviously that's out of our control." However, the Maria reactor is smaller

than the HFR and more expensive to operate. It will provide less than half the radioisotope supply that Covidien previously obtained from Petten.

"We are pleased by the level of international cooperation and coordination that is taking place to help resolve some of the continuing challenges that we face due to the ongoing medical isotope shortage," said Michael M. Graham, PhD, MD, president of SNM. "This will help. However, we need to establish a stable source closer to home. We need a stable ^{99m}Tc supply to diagnose patients in the U.S. Any and all viable efforts are welcome. Most critically, we must ensure that we have a stable and reliable supply to be able to image patients in the U.S."

Covidien
SNM

Zanzonico Named to ACMUI

The U.S. Nuclear Regulatory Commission (NRC) announced on February 17 the selection of Pat B. Zanzonico, PhD, as the nuclear medicine medical physicist representative on the Advisory Committee on the Medical Uses of Isotopes (ACMUI). The ACMUI was established in 1958 and advises the NRC on policy and technical issues related to the regulation of medical use of radioactive material.

Zanzonico currently serves as a member and attending physicist at Gerstner Sloan–Kettering Graduate School at the Memorial Sloan–Kettering Cancer Center (New York, NY), where he also serves as cohead of the center's nuclear medicine research and small animal imaging laboratories and chair of the committee on radiation. He serves on the special contributing faculty and on the radioactive drug research committees at both the center and the New York Presbyterian Hospital/Weill–Cornell Medical College. He is actively involved in biomedical research on radionuclide-based methods for detecting and localizing tumor hypoxia, immune effector–cell trafficking, patient-specific dosimetry for radionuclide therapies, and small animal and molecular imaging.

Zanzonico is a member of the editorial board and past associate editor of *The Journal of Nuclear Medicine*, a member of the National Council on Radiation Protection and Measurement and of the Medical Internal Radionuclide Dosimetry Committee, and an expert consultant to the International Atomic Energy Agency. In addition, he has authored more than 80 peer-reviewed publications and more than 65 invited presentations.

Nuclear Regulatory Commission

SNM/ACNM Respond to NCR Changes

The SNM and the American College of Nuclear Medicine (ACNM) on February 24 sent a letter to Dale Klein, PhD, Commissioner of the Nuclear Regulatory Commission (NRC), to voice their opposition to the commission's proposal to limit radiation worker annual doses to 20 mSv (2 rem). The letter was sent as a response to the NRC solicitation for public comment on the proposed changes (*Fed Reg.* 2009; 74[128]:32198). Leaders from the 2 professional societies wrote that they were "generally opposed to the proposal because there is no clear scientific basis for a reduction in permissible worker radiation absorbed doses."

The letter, which was supplemented by extensive appendices, presented evidence to counter the NRC claims that this change would result in clear benefits to workers. In part, the letter stated: "While it appears that a change from a 50 mSv (5 rem) to a 20 mSv (2 rem) dose limitation system would affect only a relatively small portion of the medical radiation worker population, there is nevertheless a real possibility that this change will cause increased costs to patients and third-party payers and, potentially, a decrease in the quality and availability of medical care. . . . Reducing dose limits in a way that may increase costs and possibly decrease medical quality, without any demonstrable benefit to workers, is not reasonable at this time." The public comment period on the proposed change ended on March 31. A Web site on potential changes to the NRC's radiation protection regulations is available at www.nrc.gov/about-nrc/regulatory/rulemaking/opt-revise.html.

SNM
American College of Nuclear Medicine

CMS and ^{18}F-NaF PET to Identify Bone Mets

On February 26, the Centers for Medicare & Medicaid Services (CMS) posted a final decision memorandum allowing coverage for ^{18}F-NaF PET and PET/CT imaging to identify bone metastasis of cancer either to inform the initial antitumor treatment strategy or to guide subsequent antitumor treatment strategy after completion of initial treatment under a Coverage with Evidence Development (CED) framework. Any new registry would need to be developed following the CMS guidelines and would have to be approved by CMS and/or the Agency for Healthcare Quality and Research before claims could be billed, a process that will likely take several months to complete. Updates will be posted on the SNM Web site (www.snm.org) as CED programs evolve. The complete decision memorandum can be viewed at: www.cms.hhs.gov/mcd/viewdecisionmemo.asp?from2=viewdecisionmemo.asp&id=233&.

Centers for Medicare & Medicaid Services

New NIH Common Fund Programs

The National Institutes of Health (NIH) announced on February 25 7 scientific initiatives to be supported through the NIH Common Fund, which encourages work across the NIH institutes and centers to accomplish projects that could not be assayed by a single institute. "These strategic investments will yield critical new resources, scientific knowledge, and strategic partnerships across a broad landscape of basic biology, behavioral science, global health, and clinical medicine," said NIH director Francis S. Collins, MD, PhD.

The research programs will distribute $17.8 million in NIH Common Fund support in fiscal year 2010 and additional funds in future years. The projects capitalize on emerging scientific opportunities and technology advances to fuel biomedical discovery, strengthen the biomedical community nationally and globally, and hasten the translation of science discoveries into new and better treatments. Included in the 7 programs are initiatives with direct relevance to molecular imaging and therapy research. Among the new initiatives are: (1) the Library of Integrated Network-Based Cellular Signatures Program, which will build a community resource of scientific information to drive understanding of the ways in which components of biological systems, such as genes and proteins, function normally to maintain health or become disrupted by genetic and environmental stressors to cause disease; (2) the Protein Capture Reagents Program, which will create a suite of high-quality, affordable, and reliable new research tools to isolate proteins to study their function under normal conditions and when the cell is stressed or diseased; (3) the Knockout Mouse Phenotyping Program, which will be an international partnership to decipher the ways in which specific genes control certain characteristics or phenotypes in mice; (4) the Science of Behavior Change Program, which will examine ways in which human biology, culture, and society together influence ability to adopt and maintain healthy behaviors; (5) the NIH Induced Pluripotent Stem Cell Center, which will be a national center to drive the translation of scientific knowledge about stem cell biology into new cell-based treatments; (6) the Global Health Program, which will explore ways to increase capacity for global health research by enhancing education, training, and research opportunities in developing countries; and (7) the Regulatory Science Program, a collaboration between NIH and the Food and Drug Administration, which will encourage rapid and efficient use of new knowledge, technologies, and innovations in the development, investigation, and regulatory review of medical products.

Additional information about the NIH Common Fund can be found at http://commonfund.nih.gov.

National Institutes of Health

FROM THE LITERATURE

Each month the editor of Newsline selects articles on diagnostic, therapeutic, research, and practice issues from a range of international publications. Most selections come from outside the standard canon of nuclear medicine and radiology journals. These briefs are offered as a monthly window on the broad arena of medical and scientific endeavor in which nuclear medicine now plays an essential role. We have added a special section on molecular imaging, including both radionuclide-based and other molecular imaging efforts, in recognition of the extraordinary activity and promise of diagnostic and therapeutic progress in this area. The lines between diagnosis and therapy are sometimes blurred, as radiolabels are increasingly used as adjuncts to therapy and/or as active agents in therapeutic regimens, and these shifting lines are reflected in the briefs presented here. We have also added a small section on noteworthy reviews of the literature.

MOLECULAR IMAGING

Imaging VEGF Receptor Response

In the February issue of *Translational Oncology* (2010;3:56–64), Blankenberg et al. from Stanford University (CA) reported on the development of a molecular imaging tracer for imaging vascular endothelial growth factor receptor (VEGFR) response to antiangiogenic therapy. The tracer, ^{99m}Tc-scVEGF, is an engineered single-chain form of radiolabeled VEGF. When injected intravenously in mice, the tracer preferentially binds to and is internalized by VEGFRs expressed in tumor vasculature. The article details the ability of VEGFR imaging to monitor the effects of pazopanib, a small-molecule tyrosine kinase inhibitor under clinical development. Pazopanib selectively targets VEGFR, platelet-derived growth factor receptor, and c-Kit receptors in mice with HT29 human colon tumor xenografts. The ability of the VEGFR imaging to accurately assess pazopanib-induced decreases in numbers of VEGFR-2$^+$/CD31$^+$ endothelial cells in the tumor vasculature was confirmed at histologic analysis. The authors concluded by suggesting that "VEGFR imaging can be used for the identification of patients that are responding to VEGFR-targeted therapies and for guidance in rational design, dosing, and schedules for combination regimens of antiangiogenic treatment."

Translational Oncology

Intraoperative NIRF Cholangiography

In an article in the February issue of the *World Journal of Surgery* (2010; 34:336–343), Figueiredo et al. from the Massachusetts General Hospital and Harvard Medical School (Charlestown, MA) reported on a new near-infrared fluorescent (NIRF) agent that