NeutroSpec Withdrawn from Market

The Food and Drug Administration (FDA) issued a Public Health Advisory on December 19 to alert health care providers that the agency had requested market withdrawal of the diagnostic imaging agent NeutroSpec (^{99m}Tc-fanolesomab) pending additional review of reported deaths and serious and life-threatening adverse events associated with use of the product. The manufacturer, Palatin Technologies, Inc. (Cranberry, NJ), and marketing partner, Tyco Healthcare Mallinckrodt, agreed to implement an immediate voluntary market suspension making the product unavailable for approved or investigational uses.

Postmarketing adverse events reported to the FDA from patients receiving NeutroSpec included shortness of breath and sudden drops in blood pressure that led to death from cardiopulmonary failure in 2 patients and required cardiopulmonary resuscitation, oxygen, and/or intravenous fluids in 15 other patients. The FDA noted that these events occurred within minutes after NeutroSpec administration. Most, but not all, of the patients who experienced these events had existing cardiac and/or pulmonary conditions that may have placed them at higher risk. A review of all post-marketing reports showed an additional 46 patients who experienced adverse events that were similar but less severe. All of the reactions also occurred immediately after NeutroSpec was administered.

According to the advisory, the decision to suspend marketing was based on the life-threatening nature of the associated adverse events, the unpredictability of the reaction, and availability of other means of diagnosing appendicitis that do not carry these risks. In a statement issued on the same day as the advisory, Palatin Technologies, Inc., confirmed immediate voluntary suspension of NeutroSpec sales and announced a recall of all existing customer inventories of the product. After initial reports of serious adverse events earlier in the fall, including the 2 deaths, which involved patients with severe underlying cardiopulmonary compromise who received NeutroSpec for off-label uses, Palatin had issued a provider letter about safe use on November 30.

NeutroSpec, the only diagnostic agent approved for imaging equivocal appendicitis, was approved for marketing by the FDA on July 6, 2004. In premarket studies submitted to the FDA as part of the drug's application for approval, NeutroSpec was administered to 523 patients. These studies revealed relatively few safety concerns. Most of the adverse events reported since marketing occurred in patients who were given the drug on an off-label basis. Off-label indications have included osteomyelitis and other infections. No evidence suggests that patients who received the drug face any long-term risks.

The FDA advisory suggested the use of alternative ways to diagnosis appendicitis, including helical CT and ultrasound. In early January, the agency was conducting additional investigations into the deaths and adverse events associated with NeutroSpec and was working closely with the manufacturers to evaluate the risks and benefits associated with its use. An FDA advisory committee meeting was to be scheduled for early 2006 to discuss existing data about the risks and benefits of NeutroSpec, what additional safety measures should be taken with its use, and what indications may exist where benefits of the product are outweighed by the known risks.

For more information, see the FDA advisory at www.fda.gov/cder/drug/advisory/technetium99.htm, and see the latest news on the sales withdrawal and recall at www.palatin.com. The FDA urges health care providers to report adverse event information associated with this or any medical product to the FDA via the MedWatch program by phone (800-FDA-1088), by fax (800-FDA-0178), or at www.fda.gov/medwatch/index.html.

U.S. Food and Drug Administration
Palatin Technologies, Inc.

NRC and States Issue Controls Requirements

The Nuclear Regulatory Commission (NRC) and state regulators announced on December 5 the issuance of legally binding requirements to licensees to implement increased controls over radioactive materials in certain "quantities of concern." The requirements are the first part of a cooperative effort, announced in September, between the NRC and the 33 Agreement States to enhance controls of radioactive materials that could potentially be of use to terrorists. The effort is consistent with the International Atomic Energy Agency's Code of Conduct for the Safety and Security of Radioactive Materials, which is the internationally recognized standard for categorizing and protecting radioactive materials. The NRC's order to its licensees was published December 1 in the *Federal Register.* As of December 2, approximately 2,200 licensees nationwide had received the requirements. "This effort demonstrates close cooperation between federal and state agencies toward the common goal of protecting public health and safety in the productive use of radioactive materials," said Jack Strosnider Jr., director of the NRC Office of Nuclear Materials Safety and Safeguards.

"The 33 Agreement States have done a tremendous job in rapidly issuing increased controls that were essentially identical to NRC's requirements," said Janet Schlueter, director of the NRC

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Office of State and Tribal Programs. Licensees must complete implementation of the required measures within 180 days of receiving them. Although the radionuclides of concern are not used in routine nuclear medicine practice, several have been used in connection with research and still others are used in radiation oncology and treatment devices. Among the radionuclides of concern are ^{241}Am, ^{252}Cf, ^{244}Cm, ^{60}Co, ^{137}Cs, ^{153}Gd, ^{192}Ir, ^{147}Pm, ^{238}Pu, ^{239}Pu, ^{75}Se, ^{90}Sr, ^{170}Tm, ^{169}Yb, combinations of these materials, and any of these materials in combinations of certain quantities with other radionuclides. Additional information about the increased controls, including guidance to licensees, is available from the NRC's electronic document database, ADAMS, by entering ML053130241 in the search box at www.nrc.gov/reading-rm/adams/web-based.html.

U.S. Department of Energy

DOE Off-Site Source Recovery Project

On December 12 the U.S. Department of Energy (DOE) issued a special announcement about its program to recover excess and unwanted radioactive sealed sources presenting disposal difficulties. The DOE conducts the program with reduced or no costs to licensees. When initiated in the 1970s, the program dealt largely with ^{241}Am and plutonium sources but more recently has moved aggressively to include other isotopes of concern. Medical licensees are encouraged to register other sealed sources for potential inclusion in this program. The DOE is currently emphasizing larger excess sources containing ^{60}Co and ^{137}Cs, such as medical irradiators. The DOE is also considering a campaign to manage large numbers of small obsolete sources, examples of which are ^{137}Cs brachytherapy sources and others. To be considered, institutions must register their material with Los Alamos National Laboratory. To learn more and register online, visit http://osrp.lanl.gov.

Department of Energy

Nuclear Medicine an Imaging Utilization Driver

In an article appearing in the January issue of the *American Journal of Roentgenology* (2006;186:7–11), Matin and colleagues from the Brigham and Women's Hospital of the Harvard Medical School (Boston, MA) assessed the use of imaging services at their institution from 1993 to 2002 to determine whether a downward trend in utilization observed in the previous decade had continued or whether expanding modalities and applications had resulted in increased use. The authors analyzed 10-year trends in diagnostic imaging services for inpatients, focusing on annual utilization rates of conventional studies, ultrasound, nuclear medicine, CT, and MR imaging. Trends in relative value units (RVUs) were used as one of several metrics of change in the study. Utilization of conventional studies was found to have decreased significantly over the study period. The rate of use of nuclear medicine studies increased incrementally in the first half of the study period but increased by 37% in the second half with the introduction of clinical PET. This represented a 2-fold increase in the number of nuclear medicine studies over the decade, from 2,400 in 1993 to approximately 5,000 in 2002. The increase was also marked in CT and MR imaging, which increased from 8,402 and 1,728 studies, respectively, in 1993 to 20,715 and 6,902, respectively, in 2002. These changes were accompanied by an increase of 49% in total professional RVUs, 78% in technical RVUs, and 72% in global RVUs, reflecting the growing complexity of the technology associated with the newer modalities. The authors concluded that "the rising complexity and severity of illness among patients, combined with the increasing clinical utility of newer imaging techniques, may explain the progressive substitution of these newer studies for conventional studies."

American Journal of Roentgenology

Fire Sale on NM Equipment?

A story in the December 9 issue of the *Nashville Business Journal* suggested that an "impending glut" in the PET imaging market will make used nuclear medicine equipment "a real bargain" during 2006. Attorney William Wright, Jr., wrote that the effects of the November 2 Centers for Medicare & Medicaid Services (CMS) final rule to include nuclear medicine as a designated health service under the Ethics in Patient Referrals Act will lead to a "fire sale on nuclear imaging equipment." Although CMS delayed implementation until January 1, 2007, Wright believes that rather than restructure current ownership of physician-invested imaging centers, many physicians will simply choose to sell.

The news story was framed not as a cautionary tale but as an opportunity for new investors. Wright noted that few physicians will choose to embrace the risks inherent in the 2 options that would allow them to maintain ownership or interest in imaging facilities. The first is to avoid referring any Medicare & Medicaid patients to their facilities—an impractical solution and one hedged by significant and punitive consequences should any lapses occur. The second is to restructure ownership of centers to conform to equipment-leasing arrangements as spelled out by CMS, a strategy that has already been criticized on ethical grounds by industry observers. Given these options, many nuclear medicine physicians may choose to simply sell their imaging centers to new investors.

Wright noted that one result may be a consolidation within the industry, with less profitable centers closing. He concluded, however, that nuclear imaging will remain a "highly profitable business," and that the coming year "will provide a window of opportunity for new investors to redefine the nuclear imaging industry and possibly snap up some bargains in the process."

Nashville Business Journal

NIH Launches Cancer Genomics Project

The National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI) announced on December 13 the launch of a comprehensive effort to accelerate understanding of the molecular basis of cancer through the application of genome analysis technologies, especially large-scale genome sequencing. The Cancer Genome Atlas (TCGA) will begin with a pilot project to determine the feasibility of a full-scale effort to systematically explore the universe of genomic changes involved in all types of human cancer. "Thanks to the tools and technologies developed by the Human Genome Project and recent advances in using genetic information to improve cancer diagnosis and treatment, it is now possible to envision a systematic effort to map the changes in the human genetic blueprint associated with all known forms of cancer," said National Institutes of Health (NIH) Director Elias A. Zerhouni, MD. "This atlas of genomic changes will provide new insights into the biological basis of cancer, which in turn will lead to new tests to detect cancer in its early, most treatable stages; new therapies to target cancer at its most vulnerable points; and, ultimately, new strategies to prevent cancer."

NCI and NHGRI have each committed $50 million over 3 years to the TCGA Pilot Project. The project will develop and test the science and technology framework needed to systematically identify and characterize the genetic mutations and other genomic changes associated with cancer. The pilot will involve a few types of cancer that will be chosen for their value in helping to determine the feasibility of a possible larger scale project. The process for determining the types of cancers to be studied is currently underway. Data collected by designated TCGA Centers will be deposited in public databases supported by NCI's cancer Biomedical Informatics Grid (caBIG) and the National Library of Medicine's National Center for Biotechnology Information. As in the Human Genome Project, TCGA data will be made available to the worldwide research community. For more information on the project, see www.nih.gov/news/pr/dec2005/nci-13a.htm.

National Cancer Institute

NIBIB Workshop on Point-of-Care Tech

The National Institute of Biomedical Imaging and Bioengineering (NIBIB), in partnership with the National Science Foundation (NSF), has announced a workshop to address the topic of "Improving Health Care Accessibility through Point-of-Care Technologies." The meeting, which will be held April 11 and 12 in Washington, DC, will bring together a diverse group of technology developers, clinicians, and clinical researchers to assess the technological developments required for advances in point-of-care testing and to identify high-priority clinical applications that can benefit from a point-of-care approach. Specifically, advances in several technology areas will be considered, including sensors and lab-on-a-chip devices, noninvasive patient monitoring, low-cost imaging, health informatics, and telehealth. Clinical needs will be addressed in the areas of primary care, emergency medical services, home and community-based health care, and health care in developing countries. In addition, representatives from the in vitro diagnostics, patient monitoring, imaging, and telehealth industries will provide their perspectives on commercializing technologies for point-of-care use. The impact of regulatory and reimbursement issues will be addressed, as will various topics relevant to the manufacturing of low-cost devices. The meeting will highlight successful collaborations and provide opportunities to network with clinicians and technology developers to begin building interdisciplinary teams and will present an opportunity to inform representatives from NIBIB, NSF, and the National Institutes of Health about the role these agencies can play in bridging the technology/clinical gap in the development of point-of-care technologies. To learn more about the meeting, visit www.capconcorp.com/nibib-pointofcare.

National Institute of Biomedical Imaging and Bioengineering

U.S. Progress Slow in Improving Patient Safety

A study published in the December 14 issue of the *Journal of the American Medical Association* (2005;294:2858-2865) and authored by Longo et al. from the University of Missouri–Columbia reported slow progress in improving patient safety in U.S. hospitals. In response to concerns originally raised by the Institute of Medicine in 1996 about medical errors and quality of care, new patient safety systems have been created in many institutions. The authors conducted a survey to assess the status of hospital patient safety systems at 2 points in time, 2002 and 2004, and to identify changes over time in hospitals in 2 states. The survey instrument was a 91-item questionnaire that included information on 7 main variables identified as important for patient safety: computerized physician order entry (CPOE) systems, computerized test results, and assessments of adverse events; specific patient safety policies; use of data in patient safety programs; drug storage, administration, and safety procedures; manner of handling adverse event/error reporting; prevention policies; and root cause analyses. The results indicated that "development and implementation of patient safety systems is at best modest" and that "self-reported regression in patient safety systems was also found." Among the surprises noted was that although a substantial percentage of hospitals have medication safety systems, only 3% reported full implementation of CPOE systems, a step considered essential to improving safety measures.

Journal of the American Medical Association