

# The State of Nuclear Medicine, 2008

## From the Newsline Editor

### A Matter of Perspective

Two themes emerged in reviewing the year's scientific and medical news in preparation for our annual retrospective issue of Newsline. Both themes ultimately have to do with scope or (because it is a term so much nearer to our daily experience) what we might call "field of view."

### From Global to Molecular

The first thoughts about perspective came in reviewing the top science news for the year. Many editors in the popular press and scientific publications cited 2 stories as most significant for 2007: global warming and the announcement that researchers had successfully converted human skin cells into embryonic stem cells. One story has the entire Earth as its focus; the other hones in on the therapeutic possibilities of microscopic cells. These vastly different perspectives reflect the extraordinary range of contemporary science. Moreover, the fact that each of these areas of research has been marked by social and political debate is also a reminder that even the most value-neutral scientific endeavors may have larger repercussions.

The year brought news that at times shocked, confused, and encouraged the nuclear medicine community—and included widely varying fields of view. On the global level, constraints on the international flow of radionuclides were tightened, giving rise to fears about the ongoing reliability of supplies for medical applications at a time when procedures such as SPECT and PET are making inroads in developing countries. In the United States, the Nuclear Regulatory Commission (NRC) expanded controls on transportation, licensing, and byproduct materials, a process that raised concerns about the potential for shortages of research and other radionuclides. These concerns were already high after dramatic budget cuts in U.S. Department of Energy (DOE) Office of Science support for basic nuclear medicine research. Throughout 2006 and 2007, SNM and other organizations lobbied Congress to restore these funds and take a broader perspective on the benefits of both an expanded supply of radionuclides and enhanced support for cutting-edge research.

As the year drew to a close, an event galvanized international attention and emphasized the importance of the "big view" for the nuclear medicine community. In a story carried in the pages of Newsline and in international media outlets, the Canadian reactor supplying the largest percentage of the world's medical radioisotopes was shut down for routine repairs and then failed to reopen because of

regulatory noncompliance. The resulting shortage of radioisotopes, most notably those from  $^{99m}\text{Tc}$  generators, was felt almost immediately in North and South America and Asia. The shutdown caused a political scandal in Canada, along with appointment cancellations in many institutions. Radioisotope production was resumed in late December only by special dispensation of the Canadian government, and, as of Newsline press time, some institutions are still dealing with imaging backlogs.

Perhaps the most newsworthy aspect of this series of events was the fact that legislators, clinicians, and the public on both sides of the border were stunned to realize the extent to which a number of routine and essential medical diagnostic procedures were entirely dependent on a single source for radioisotopes. The case for redundant supplies and for freedom from total reliance on imports could not have been made clearer to the U.S. Congress, which during these same weeks was also considering the question of restoring funding to the DOE Office of Science. Although events in Canada were not cited as a direct cause, it is certain that Congress was influenced by news about shortages when it ended the year by sending a bill containing an increase of \$17.5 million for basic nuclear medicine research, to be awarded through competitive grant solicitations.

While the global supply of radionuclides and large-scale support for research were focuses for 2007, a much smaller field of view—molecular imaging and therapy—continued to dominate the nuclear medicine science scene. We are no closer to a specific definition of "molecular medicine" than we were at this time last year. In fact, a quick review of the literature in this and other fields indicates that the label is being put on efforts as diverse as organ imaging and particle physics. What is certain is that molecular medicine is widely hailed as the science of the future, a certainty underlined by numerous new National Institutes of Health (NIH) funding initiatives soliciting submissions on molecular imaging and therapy (a tremendous boon to our field at a time of otherwise flat NIH budgets). Molecular medicine also promises to change the focus of therapy from broadly applied methods to therapeutic and pharmaceutical regimens tailored to the specific genomic and biologic needs of the individual—again, a landmark change



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in perspectives. The promise of molecular imaging and therapy is also helping to keep the nuclear medicine technology markets strong and fuel the development of increasingly sophisticated small animal and hybrid imaging devices.

SNM has been active as a leader in molecular medicine. The Molecular Imaging Center of Excellence (MICoE), now in its second year, has enjoyed great success in creating new avenues for communication and in drawing in participants from fields outside traditional nuclear medicine practice. Under the forward-looking leadership of editor-in-chief Heinrich Schelbert, MD, PhD, the focus of *The Journal of Nuclear Medicine (JNM)* has been expanded to include new areas of molecular imaging that span basic science, diagnosis, and therapy. As editor of Newsline, I have been pleased to reflect this enhanced focus by supplementing our popular From the Literature section with additional molecular imaging briefs and by carrying regular reports on the activities of the SNM MICoE.

### The Field of View Expands

The second theme that emerged in reviewing the year's stories in Newsline, *JNM*, and other sources was the sheer diversity that now characterizes our field. As recently as 20 years ago, a nuclear medicine practitioner could reasonably be assumed to have familiarity with the entire field. The numbers of procedures, modalities, and radionuclides (and their various combinations) were limited, and, with daily experience, the average nuclear medicine physician could be expected to have at least some degree of expertise across the entire spectrum. Today, a quick review of the pages of *JNM* shows the dizzying range of basic, pharmacologic, dosimetric, small animal, and clinical research and practice in our field. Not only is our armamentarium of equipment and radiopharmaceuticals expanding at exponential rates, but the field now includes areas such as CT, optical, and ultrasound

techniques that were once outside the purview of nuclear medicine training.

This is only 1 of the reasons behind the stepped-up requirements for lifelong learning and maintenance of certification, as supported by numerous SNM programs and reported on regularly here in Newsline. As physicians, physicists, and technologists, we are all challenged by the broad range of endeavors that our field now encompasses. Comprehensive expertise is virtually impossible, and keeping up with even a broad understanding of innovations is difficult. Even staying current in terminology, from microbubbles to nanocarbon tubules, can be daunting. Along with many others in the field, I suspect that we are at a turning point past which greater and greater specialization will be required within our field.

The rewards, of course, will be even more new discoveries that benefit both today's and tomorrow's patients. The danger lies in the loss of the ability to take a comprehensive, large-field-of-view look at nuclear medicine as a whole and in the possibility of subdisciplinary fragmentation and encroachment (rather than partnership) with other disciplines. This may simply be a marker of scientific progress. In fact, within our lifetimes nuclear medicine may come to be viewed as the progenitor of numerous fields, no longer a discipline itself but the forerunner and pioneer of distinct areas of research and practice. Only time—and perspective—will tell.

I hope that 2008 brings productivity and prosperity to all Newsline readers, whatever their fields of endeavor, and that the year will see both resolutions to old challenges and beneficial results from the novel synergies we are seeing at every level of research and practice.

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## Continuing and Accumulating Successes

**S**NM has accomplished a great deal this past year—for our patients, for the public, and for the profession. These successes have occurred in the halls of Congress, with regulatory agencies, and with our professional colleagues. We have voiced concerns in the national media about critical radioisotope shortages. We have received support from the National Academy of Sciences (NAS) for future investments in nuclear medicine and molecular imaging research. We have continued to monitor and press on vital practice issues. These successes speak well for continued growth and national prominence that SNM has gained in the public eye.

As 2007 ended, SNM achieved a major legislative victory as approximately \$17.5 million for basic nuclear

medicine research was included in a federal appropriations package for the Department of Energy (DOE) Office of Science for 2008. We have fought hard for 3 years to achieve this victory, restoring funding cut from the DOE budget in the 2006 budget year. Congress first began funding nuclear medicine research with the passage of the Atomic Energy Act of 1954, and that funding was continued for a half century—until it was drastically cut. Although this \$17.5 million may be budget noise to legislators, it is critical to continue the development of new treatments and



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