

Radiation Education: Carpe Diem

Dr. Wagner exhorts us to “. . . help make the public’s understanding of radiation more rational, pointing out warranted fears and reassuring them about its safety and beneficial uses.” We in the nuclear medicine community are in a unique position today to do so because of the current focus on potential terrorist uses of nuclear weapons and dirty bombs. We can use the heightened media attention as an opportunity to deliver 4 major messages:

- The routine uses of radioactivity and radiation today provide significant benefits to the population.
- Dirty bombs are not nuclear or atomic bombs.
- The main purpose of a dirty bomb is psychological terror, not physical terror; it is a weapon of mass disruption.
- Nuclear medicine professionals are the most qualified health care workers to deal with the effects of a dirty bomb and with contaminated victims.

In delivering these messages, we must be mindful of Dr. Wagner’s attention to perception of risk. In general, risk perception depends on 2 major characteristics: the level of “observability” and the level of “threat.” Risks are perceived as greater when the exposure cannot be sensed (by our 5 senses, as is the case with radiation), is involuntary, is of no direct benefit, or is potentially life threatening. Unfortunately, the public often perceives all radiation exposure as possessing these characteristics.

I encourage you to seek out opportunities to be interviewed by the media and to deliver these messages. You may want to consider some formal media training before tackling these interviews in earnest. I was lucky enough to go through such training at Hopkins, and it really helped.

In addition, I encourage you to actively work with your hospital’s emergency department and with local government, especially your health, fire, and police departments. In Baltimore City, I’ve had the opportunity to work with the local government in developing and implementing a radiation terror response plan. The following outline of the plan gives an idea of the issues that must be addressed, as well as examples of opportunities for education.

The first step in developing and implementing the plan was the identification of potential radiological terror events. We identified 4 broad categories: nuclear bomb, dirty bomb, attack on a fixed nuclear facility, and attack on radiological materials in transit. Early on, we eliminated preparation for a nuclear bomb attack, because we considered it unlikely and because we did not believe that significant city-level response could be marshaled. We also eliminated attack on a fixed nuclear facility (although

Maryland has an operating nuclear power plant), because we considered such an attack unlikely and difficult to counteract successfully. We also eliminated attack on radiological materials in transit (although such an attack is possible) because of the rapidly changing jurisdictions involved. Thus, we concentrated on preparedness for a dirty bomb event, which most experts consider to be the most likely radiological terror scenario.

The plan has four sequential steps: (1) determine that radioactivity is present; (2) determine the radionuclides and amounts; (3) estimate the dose distribution in space and time; and (4) implement a response (for example, evacuation). In Baltimore City, any explosion of unknown origin triggers a first response by the bomb squad, which is part of the police department, and the hazmat team, which is part of the fire department. In the usual situation, the bomb squad first clears the site for secondary devices, and the hazmat team then clears the site for hazardous materials. Both the bomb squad and hazmat team have had radiation detectors in the past, but these have not been routinely deployed. As a result of the plan, new detectors were obtained and deployed. Currently, the bomb squad and hazmat team first assess the site for the presence of radiation before the bomb squad goes in. The detectors are Canberra Dosicards, a credit-card sized unit based on a silicone diode detector, worn in a plastic ID badge holder clipped to the torso.

The detection of radiation will immediately trigger several actions: (1) implementation of a 12-block evacuation, starting from the center out (in order to easily stop if later determinations indicate the need for only a smaller evacuation); (2) mobilization of a radiation strike team; (3) alerts to all area hospitals; and (4) alerts to appropriate police, fire, emergency medical services, and public works personnel and actions.

The radiation team includes radiation experts from academia, the city’s Homeland Security Officer, and the hazmat leader for the Maryland Department of the Environment. The team is equipped with more advanced radiation detectors and will take environmental samples. These samples will be assayed either at the Department of the Environment’s analytical laboratory, which is located in downtown Baltimore, or, if the downtown area is too contaminated, at the Aberdeen Proving Grounds (a half-hour helicopter ride away). Once the radionuclide(s) is identified along with an estimate of total activity, we will use the public domain computer program HOTSPOT to model the dose distribution in space and time. Based on



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Radiopharmaceutical Science Council Announces Changes

The SNM Radiopharmaceutical Science Council (RPSC) represents a diverse group of scientists, physicians, pharmacists, and technologists who are interested in all aspects of development, formulation, dispensing, and administration of radiopharmaceuticals. As part of a revitalization of all councils within the Society, substantial changes are occurring within the RPSC. A subtle but significant change is renaming it the Radiopharmaceutical Sciences Council. This minor change was made to emphasize the multidisciplinary nature of council membership and to embrace the many fields involved in this subspecialty of nuclear medicine. A range of scientific disciplines, including radiochemistry, inorganic chemistry, organic chemistry, medicinal chemistry, analytical chemistry, radiopharmacy, radiobiology, molecular biology, medical/health physics, pharmacology, pharmaceutical sciences, engineering (automation), and medicine, are required to develop and bring radiopharmaceuticals to the point of patient care. A primary goal in the council revitalization process is to make sure that the activities of the RPSC are broad enough to ensure that these diverse disciplines are well represented. It is also our goal to work with the SNM Technologist Section to institute activities that would better serve the needs of technologists and attract more technologists to the RPSC.

The revitalization process is going on in all councils, and it is likely that significant changes will occur in most. One of the important changes that will likely occur is the institution of interim meetings for council boards of directors to address issues and plan for the future. To expedite planning for the RPSC, our board held an interim meeting in March and defined several short- and long-term goals for the revitalization process. Some goals

will improve communication with RPSC members and offer more benefits to the RPSC membership. Other goals are directed at providing more recognition for professionals in the radiopharmaceutical sciences. Still other goals are directed at exploring opportunities to expand and strengthen the RPSC educational offerings, such as student poster sessions with social mixers at the SNM annual meeting and conducting workshops within other society meetings. The latter activity will be part of an expanded outreach program to attract new members to SNM and the RPSC. It is apparent that significant resources will be required to realize these goals. As part of the council revitalization, the SNM governance is supportive of the programs being developed and has set in place a mechanism for requesting resources. That mechanism requires each council to provide a business plan outlining proposed activities and an estimate of required resources. Such a business plan is being developed by the RPSC and will be presented to the SNM Board of Directors for consideration in the 2005 budget.

The most important part of the revitalization process is to identify how best to serve the current membership of the RPSC and add new benefits so that other interested professionals will want to join. The only way this will work is to have input from both RPSC and SNM members. In the coming months we will be adding material to our page on the SNM Web site at www.snm.org. (Click on "About SNM" then "Councils" to find the RPSC page). Take a look at what we are doing, and join us in the revitalization of this important council.

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the output of HOTSPOT, Baltimore's mayor and health commissioner will make a determination—perhaps block-by-block—of the need to evacuate or shelter in place.

A key element of the city's preparedness activities is training professional staff in the health, fire, and police departments. As part of that training activity, which is supervised by the Health Department, I have given a 2-hour introductory radiation terror lecture to approximately 500 city employees, in groups of about 40. This lecture is supplemented with ongoing meetings with selected health department duty officers, fire department hazmat officers, and police department bomb squad of-

ficers. This formal educational activity has an efficient "multiplying effect," because these officers can then train their peers.

Public education prior to a terrorist attack is critical. If you are only beginning to explain radiation to the public during and after an attack, it's too late. As part of its up-front education effort, the Baltimore City Health Department has created a Web site to help in this preparatory effort: www.ci.baltimore.md.us/government/health/bio/index.html.

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