

## MED-WASTE REGULATIONS POSE BACKDOOR THREAT TO NUCLEAR MEDICINE

Somewhere between "fight and flight," somewhere between ignoring the issue and the smothering overregulation developed by EPA, is a middle ground that will answer society's needs without dreadfully perturbing the delivery of health care.

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**D**uring the summers of 1987 and 1988, several beaches around New York City were closed because of the washup of trash then identified as originating from hospitals. Occurring as it did against the backdrop of increasing societal concern for all kinds of wastes, these relatively minor occurrences created splashy headlines and sensationalized news coverage and provoked a public outrage that was disproportionate to the actual events.

Despite the overreaction, some legitimate concerns were raised. Medical related wastes do pose some hazards to society. Some are generic to all waste streams and include the esthetic damage done to the environment, the deleterious effect on commercial and recreational use, and subtle effects on various ecosystems that are often apparent only when one looks at the overall pattern of waste disposal. Other issues are more specific to "med-wastes." While the potential for transmission of the

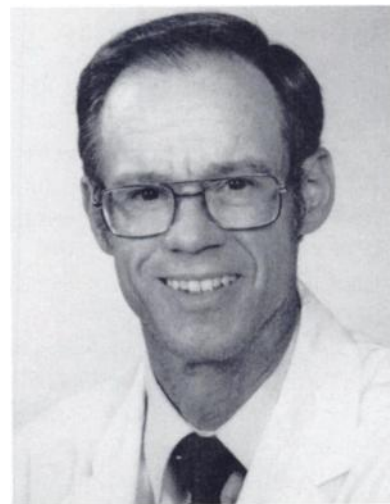
AIDS virus received the most attention, it is probably among the least significant problems relating to spread of infection. Many other microbes are far harder outside the body, and their dispersal by direct inoculation or entry into the biosphere cannot be taken lightly.

"Sharps," composed of needles, broken glass, scalpel blades, and the like, pose a direct threat of physical injury. Some are contaminated by infectious agents, and some, mostly needles and syringes, fall into a class of "abusables."

Finally, med-wastes may contain small amounts of pharmaceuticals and other substances that are bioactive. Large concentrations or amounts are regulated under the Resource Conservation and Recovery Act (RCRA) or by the Occupational Health and Safety Authority (OSHA) "Right to Know" Act. Total amounts of med-waste cannot exceed regulatory limits, but local concentrations are sometimes higher than this and could be a problem under certain circumstances.

### Medical Waste Tracking Act

In light of the publicity generated and the fact that it happened during two consecutive summers, it was inevitable that the Environmental Protection Agency (EPA) would become involved. On March 24, 1989, EPA published its proposed response in the *Federal Register* (1). The regulations,



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known as the Medical Waste Tracking Act (MWTa), cover 70 pages and took effect June 22, 1989. The comment period ended May 23, 1989, but comments will not be considered for two years. Salient features of the MWTa are summarized below.

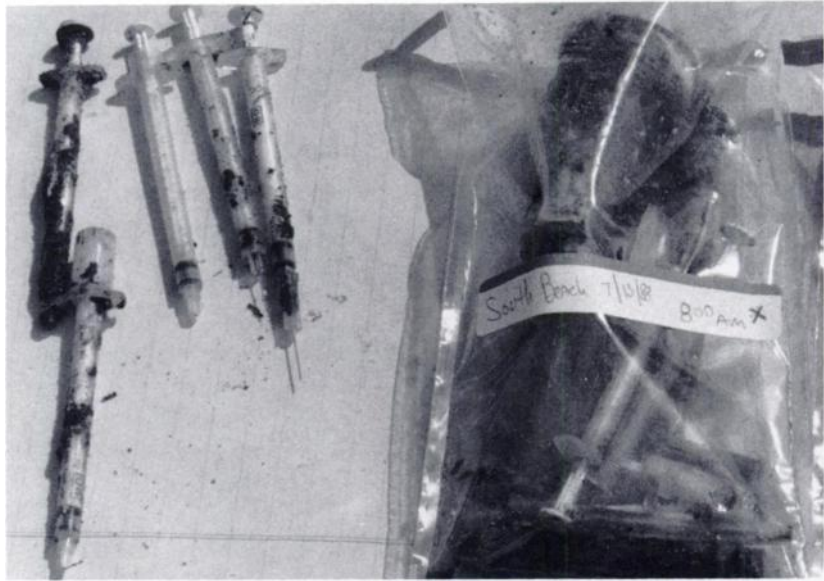
EPA's major concern is to define the extent of the med-waste problem. Admitting that it has virtually no hard data on volume, handling, hazard, or origin of such materials, it proposes a two-year pilot program to gather facts. This effort originally included New York, New Jersey, Connecticut, and the states bordering the Great Lakes. Other states or entities could opt in (Louisiana, Rhode Island, the District of Columbia, and Puerto Rico did), and the Great Lake states could opt out (all of them did). Loui-

siana and DC have since asked to be withdrawn.

The Agency defines 10 categories of med-wastes, which can be lumped together as infectious waste, human remains, and hazardous waste, but it ignores the issue of abusables. Anyone shipping less than 50 pounds of waste per month and per shipment is exempt from the manifesting clause. Fifty pounds is a rather small amount, so few generators would qualify. Generators include not only hospitals but also private offices of health care providers, funeral parlors, hospices, universities, businesses engaged in medical-related research, nursing homes, and other establishments generating such trash. Specifically excluded are private homes and businesses that provide rest room facilities to the public. Nonpatient-related trash also is not considered med-waste.

EPA's strategy is to forbid disposal of med-waste with other streams of trash, to require segregation of different classes of med-waste, to restrict amount and length of storage, to restrict access, to define conditions of storage, and to require disposal through licensed haulers and brokers. For each shipment of waste, a detailed manifest must be filled out by the generator, who retains a copy. The hauler must fill out more information and retain his copy, as must the final broker. The generator then receives a final copy of the manifest that he must match with his original and keep on file for three years. If any med-waste gets into the environment, the paper trail will allow EPA to point the finger at the guilty party. Although the regulations exempt small generators from minor clauses, the burden is the same for all, no matter how small or large.

For now, the effect will be felt most keenly in the participating states, DC, and Puerto Rico, but EPA intends to develop regulations based upon this experience that will apply nationally.



*Medical waste found on a Staten Island, NY beach during the summer of 1988. (Courtesy UPI/Bettmann Newsphotos)*

Problems associated with this system should be obvious to even the most casual reader. Unfortunately, as one studies the strategy and logistics, many additional and far more serious difficulties become apparent. In the first place, EPA points out quite specifically that the beach wash-ups were greatly exaggerated. Med-waste is a tiny fraction of municipal waste. Even the most draconian measures against med-waste would have little impact upon the volume of solid waste. Moreover, a number of "laboratory animals" identified by officials were in fact *Rattus Norvegicus*, common sewer rats that had been washed out to sea and drowned. Many of the syringes and needles came from household waste of outpatient diabetics and others. *These wastes are not regulated.* The contents of many waste packages washed ashore are typical, not of hospitals or medical offices but of private homes.

While some hospitals were clearly identified by their waste, the fault does not necessarily lie with them. Although there are strong economic disincentives for complying with regulations, hospitals typically recog-

nize their responsibility to society and take all reasonable means to prevent uncontrolled dispersal of medically hazardous materials. Far less attention is paid to haulers and brokers, who stand to gain economically from these regulations. It is not fair to tar an entire industry with the behavior of a few individuals, but the record of the trash disposal industry is far from spotless (2,3).

The paperwork requirements are substantial. For private offices, one must at least fill out, file, collate, and store manifests for each shipment. Detail is not minute, but it is not inconsiderable either. For larger generators, problems increase apace. Hospitals that incinerate their own med-waste must not only manifest their waste but must fill out an additional form saying what was incinerated. Both must be kept for three years.

Almost no consideration seems to have been given to the logistics of handling waste on site. Each type of hazard has different properties and must be handled differently. Sharps must be segregated and contained in

*(continued on page 1433)*

(continued from page 1432)

such a fashion as to prevent injury. Liquids must be placed in leakproof containers. Infectious wastes must be isolated and contained separately. So it is with body parts, dry waste, etc. All wastes must be stored in a restricted access area. The economic, physical, and logistic requirements are better imagined than described.

Of more than slight interest to nuclear physicians are wastes containing radionuclides. These are to be dually regulated under Nuclear Regulatory Commission (NRC) and MWTA authority. The regulations do not address the potential issue of waste containing regulable quantities of radionuclides, chemical hazards (covered by RCRA), and med-wastes. It is conceivable that these could be *triple* regulated.

The implications for all of medicine are far-reaching and obvious. Those in the private practice of nuclear medicine are not exempt, nor are hospitals, research facilities, and radiopharmacies (consider the labeling of white blood cells). It is very easy to view the regulations as yet another impediment to the delivery of health care by narrow-minded, insensitive bureaucrats who are utterly ignorant of the logistics of health care and who, lacking the authority to really control the problem, choose to take out their frustrations on those whom they can regulate. While there is probably some truth in that view, there is another side to the story.

#### Throw-Away Culture

We in North America have evolved into a throw-away culture. We have become accustomed to the convenience, economy, and safety of many disposable items. The medical profession is as enamored of this practice as is the rest of the society. Like the rest of society, we frequently fail to recognize the obvious—*wastes do not simply cease to exist once they are discarded*. The physical life of many

of our “disposables” is very long. Our recent experience with med-wastes is likely only the leading edge of a much bigger problem .

Not only are some of our wastes quite long-lived, many have a genuine hazardous potential. Broken glass and used scalpel blades can still cut, bacteria and viruses can still infect, and syringes and needles can still be abused, even though they are finished with their intended lives. Moreover, the infectious component cannot be identified “in the field.” What differentiates a tongue depressor used

by an AIDS patient from an unused one? This necessitates much stricter handling of wastes so that anything that was, or might have been, used in patient care must be considered the same. Society’s concern about med-wastes has a legitimate basis, and we must never lose sight of that.

Somewhere between “fight and flight,” somewhere between ignoring the issue and the smothering over-regulation developed by EPA, is a middle ground that will answer society’s needs without dreadfully perturbing the delivery of health care.



*New York Health Department inspector with a discarded syringe found on a Staten Island beach during the summer of 1988. (Courtesy UPI/Bettman Newsphotos).*

When similar regulations were imposed upon Pennsylvania's physicians, the Commission on Public Health and Toxic Substances of the Pennsylvania Medical Society developed a strategy to help the state's doctors comply (4). That plan was based almost totally on the decades of experience of the nuclear medicine community in dealing with the NRC's radwaste regulations.

### The Key is Minimization of Volume

As with NRC waste, the key is minimization of volume. Just as nuclear physicians have thought through all of their procedures with an eye to reducing the amount of radwaste generated, one can go through an identical exercise to restrict the volume of materials contaminated, or potentially contaminated, by patients. Just as we carefully segregate radwaste from routine trash, so can anyone limit his med-waste to only that which is truly regulated. Just as we segregate by half-life, others can separate by hazard.

Some dissimilarities exist, of course. Most nuclear physicians eliminate the radioactive component of their wastes by on-site decay. This is not possible for med-waste, so disposal will obviously be necessary. Waste partnerships with others in a building or in close proximity may create an economy of scale. Recycling is obviously inappropriate for some wastes but perhaps not for all. At some point, it may be more economical to employ reusables rather than disposables.

Unlike the MWTA, Pennsylvania law prohibits any processing of med-wastes. Healthcare providers elsewhere may destroy the infectious component of waste by autoclaving, may render abusables useless by simple and safe destructive means, and compact bulky dry wastes in a trash masher. An option being explored by the Keystone state is for

small generators to contract with local hospitals possessing licensed incinerators. Because med-waste can only be transported in permitted, placarded vehicles, several hospitals are looking at sending special vans around their community to make pickups, and then incinerating the slightly larger volumes for a price. The hospitals can make some money, and local doctors can pay less if local laws permit this practice.

Incineration has a down side, of course. Not every incinerator is capable of destroying all chemical hazards, and the gaseous effluent, bottom ash, and fly ash may have environmentally objectionable components. Still, incineration is an important part of the solution. Each generator has a plurality of options and each must tailor his own strategy depending on his needs and his environment.

In summary, the MWTA presents a drastic partial solution to a problem that has been misperceived and overstated. However, physicians must realize that its intent is constructive in that the issues are real. While the

effect for most states is two years away, it will likely be felt to some degree by all. Nuclear physicians, who have lived for decades with waste management, have the knowledge and experience to deal with those issues and can play an active and constructive role in educating our clinical colleagues in how to deal with the med-waste problem.

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### References

1. Environmental Protection Agency Standards for Tracking and Management of Medical Waste. *Federal Register* 1989; 54(56):12326-95.
2. U.S. Ecology Appalachia, Incorporated: Proposal for development and operation of the Appalachian states low level radioactive waste compact and regional disposal facility. 1(4) (Compliance History), Newport Beach, California, October 1988.
3. Chem Nuclear Systems, Incorporated: Proposal to the Commonwealth of Pennsylvania, Department of Environmental Resources, for the Appalachian states low level radioactive waste compact regional disposal facility. 1(4) (Compliance History), Columbia, South Carolina, October 1988.
4. Brill DR, Donovan JW, Hawk DL, et al: Disposal of office hazardous wastes. *Pa Med* 1989; 92:35-37.

## SNM Awards Young Cardiovascular Investigators

The Society of Nuclear Medicine's Cardiovascular Council has given the first annual young cardiovascular investigator awards to six promising young researchers working in cardiovascular nuclear medicine. The awards were given during the first scientific session of the SNM Annual Meeting in June.

Marc F. Shelton, MD, Washington University School of Medicine, "Enhanced Extraction of [F-18] Fluoromisonidazole by Jeopardized Myocardium Assessed with PET."

Robert C. Hendel, MD, University of Massachusetts Medical Center, "Diagnostic Utility of a New Tc-99m Myocardial Imaging Agent (SQ30217) Utilizing a Rapid Imaging Protocol."

Naresh C. Gupta, MD, Creighton University Medical Center, "Comparative Efficacy of Adenosine Infusion and Dipyridamole-Tl-201 Perfusion Imaging."

Todd S. Kotler, MD, Cedars-Sinai Medical Center, "Assessment of

Myocardial Viability With Rest-Redistribution Thallium Scintigraphy Early Post-Thrombolysis: Correlation with Positron Emission Tomography (PET)."

Pierre Chouraqui, MD, Cedars-Sinai Medical Center, "Clinical Comparison of I-123 Fatty Acid and Thallium-201 for Assessment of Exercise Induced Myocardial Ischemia."

Florence M. Prigent, MD, Cedars-Sinai Medical Center, "Reproducibility of Quantitative Indices on Follow-Up SPECT Stress-Redistribution Tl-201 Studies Performed Within One Year in Stable Diagnostic Patients."