

# WASTE HANDLERS AND HOSPITALS AT ODDS OVER UNREGULATED NUCLEAR MEDICINE WASTE

A hodgepodge of more or less arbitrary requirements are at the root of problems hospitals are encountering.

**A**FTER SIFTING THROUGH mounds of garbage at a Detroit landfill in search of what turned out to be a slightly radioactive diaper, medical physicist Cheryl Culver knew that something was wrong with the system that waste handlers established to detect dangerous radioactivity.

The Michigan landfill operator had recently installed sensitive radiation monitoring equipment and several truckloads of regular hospital trash from William Beaumont Hospital triggered alarms. On each occasion the hospital sent Ms. Culver and other medical staff, who donned hip waders and portable scintillation detectors to find the offending items, including the diaper of a baby who had undergone a diagnostic iodine-131 study and disposable items used by an <sup>131</sup>I therapy patient. The items had measured at background levels in a survey of the patient's room.

The Detroit hospital's dilemma has become familiar coast-to-coast as landfill and incinerator operators install ultra-sensitive scintillation detectors to stop radioactive contaminants at the gates. Nuclear medicine physicians say the devices are often set at levels more restrictive than the law requires and detect minuscule levels of radioactivity that are safely—and legally—buried or burned with regular trash. Waste handlers say the terms of licensing agreements force them to monitor as strictly as possible.

In the pursuit of environmental safety, "hospitals and universities have been burdened with unnecessary costs, even though they are not in violation of any federal or state regulation and indeed are not despoiling the environment or endangering the public," contend Ms.

Culver, Howard J. Dworkin, MD and Ann Forsaith in a report that appears on page 349 of this journal. The authors describe how William Beaumont Hospital reached a compromise in 1990 with Detroit-area waste handlers establishing detection criteria they both could live with.

## Clashing Standards

In other regions, however, the conflict continues. A hodgepodge of more or less arbitrary standards are at the root of problems hospitals are encountering. Federal and state health regulations for handling radioisotopes say one thing, solid waste authorities, state legislators, and private waste brokers say another. Medical professionals and waste handling companies seem to agree on the need for uniform national standards. But the U.S. Nuclear Regulatory Commission is hamstrung by a Congressional act that gives states the authority to supersede NRC authority if the federal regulators try to assign "below regulatory concern" levels to radioactive wastes.

"We're well aware of the problem," says John Austin, PhD, chief of the NRC's decommissioning and regulatory issues branch. He says the commission is trying to prepare a pamphlet for landfill operators with advice about materials that could be buried safely in landfills, appropriate detector sensitivities, and other recommendations, but nothing with the force of law. "The Energy Policy Act makes it clear that the states have the authority to regulate materials that NRC exempts after the date of the act," Dr. Austin says.

Responding to alarms "is becoming a pervasive problem," says Rita Aldrich,

principle radiophysicist in the radiation health unit of the New York Department of Labor. New York radiological health officials notified hospitals in a September letter that radiation detectors recently installed at waste transfer, treatment, and other facilities were sounding alarms on refuse containing "trace quantities" of diagnostic radiopharmaceuticals or <sup>131</sup>I-contaminated waste from outpatients.

Due to the short half-lives and slight concentrations of most radionuclides used in nuclear medicine, waste from the rooms of diagnostic patients and outpatients is exempt from regulation by the NRC. Authorities consider diapers, catheters, and other items from such nuclear medicine patients no different than other biohazard waste. Only the waste from therapy patients is judged hazardous enough to require special radioactive waste disposal precautions, such as monitoring and storage in special areas until it decays to safer levels.

## Hospital Responsibility

With the stepped up detection at landfills, however, state officials are adopting the view that waste generators are responsible to stop waste that might trigger alarms, no matter how sensitive the detectors. New York officials are advising that hospitals review procedures for handling diagnostic patient waste and to consider monitoring some or all patient waste streams for radioactivity. New York waste facilities have adopted criteria that allow radioactivity levels in trash equivalent to less than 10 microcuries of gallium-67 per cubic meter.

Fully aware of the costs to hospitals of paying medical professionals to sort trash to meet such criteria, Ms. Aldrich

points out that when a load of trash is rejected, the cost to the government and the hospital may run to thousands of dollars. In most cases merely allowing the packaged waste to sit for a few days enables the radioactivity to decay to levels below even the most sensitive counters. But if trash is rejected, waste handlers charge for trucking it back to the hospital or time lost storing or sifting through it for radioactive items. Consequently, many hospitals are opting to monitor all exiting trash.

"Hospitals operating with budget problems, they can't afford to spend the time looking for piddling amounts of radioactive waste," says health physicist Tom Hensch of the Minneapolis Veterans Administration Medical Center. But several medical centers in Minnesota and elsewhere have had waste rejected by incinerator facilities or processing centers that autoclave medical waste, shred it, and then truck it to landfills.

Anxiety levels about disposal of radioactive hospital waste are so severe among the medical community in Minnesota that one nuclear medicine physician declined to speak on the record.

"I'd just as soon our state weren't mentioned," he told *Newsline*. "This has the potential to shut us down as a clinical operation."

### **Hair Trigger Alarms**

To meet the requirements of landfill licensing agreements mandated by communities expressing increasing intolerance of anything radioactive, waste handlers set up radiation monitors with hair triggers. In Minnesota, for example, state law bans from landfills any detectable level of radioactivity above background.

"We're really coming to loggerheads now because of the sensitivity of these detectors," says Kevin Nelson, PhD, a senior health physicist with the 3M Company in St. Paul. In 1990, when Dr. Nelson worked at the University of

Minnesota, he and several colleagues spent days rooting through tons of garbage at a regional incinerator in futile search of 500 microcuries of sulfur-35 and phosphorus-32 that a university employee had inadvertently thrown out with the regular trash. State officials finally agreed to let the load of waste presumably containing the isotopes to

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## **"THE LAST THING WE WANT TO DO IS BURN A SIGNIFICANT (RADIOACTIVE) SOURCE IN A MEDICAL WASTE INCINERATOR," SAYS ONE WASTE MANAGEMENT EXECUTIVE.**

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be buried in a landfill, but not until the University racked up about \$242,500 in expenses and Dr. Nelson's wallow in the trash caused him to develop a rash over most of his body—which underscores the fact that infectious biological wastes generally pose much greater health risks than radioactive hospital trash.

Radiation experts, including Dr. Nelson, believe that scintillation detectors are a reasonable precaution. A recent episode involving the loss of highly radioactive cancer therapy source left in a hospital outpatient is a case in point. A 3.7 curie iridium-92 source was discovered on November 27, when it set off an alarm on a radiation monitor at a disposal facility in Warren, Ohio. The cancer patient, an 82-year-old woman, had undergone treatment with a remote "afterloader" in which the source is attached to a wire and inserted through a catheter.

The source broke off and remained undetected in the rectum of the patient until she returned to a nursing home and the catheter was removed and dropped in a container of regular infectious waste. The woman died within days of

the radiation overdose, but detection of the source allowed NRC officials to swiftly locate and assess the exposures of 39 other people who came in contact with the source.

Such incidents have been rare, however, and Ms. Aldrich, the New York official, says that regulators "are going to have to allow some reasonable level of cross contamination if nuclear medicine is going to continue." After installation of detectors in New York, two of the most frequent causes of alarms were radium dials from airplane instruments and hospital waste. In most cases, the items from hospitals were unregulated diagnostic patient waste, according to Ms. Aldrich.

"It was not the result of people being sloppy," she says.

The waste handlers say they have tried to please both the generators of waste and the people that write the permits for landfills and incinerators. "We're trying to work with people, but we need to protect ourselves" from being stripped of operating permits, says Bruce Gantner, a divisional vice-president with Browning Ferris Industries. BFI is a giant in the waste disposal business with operations in 40 states, some of which began installing radiation detectors in 1986. Mr. Gantner says that the rate of shipments setting off alarms this year is "getting down to 1 in 10,000" at BFI facilities.

### **Screening Criteria**

BFI recommends that scintillation detectors at landfills be set at about twice background levels, or about 400 counts per minute above background. The company positions dual detectors at the gates so that entering trucks pass between. The company screens all infectious medical waste using hand held scintillation detectors. Although the NRC de minimis requirements specify allowable levels for incineration, BFI has a policy of not allowing anything above background to be on the safe side,

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## NEWS BRIEFS

Angeles, California, has awarded about 80 certificates a year for the past ten years. About 75% of candidates pass the examination. ■

### VA Hospital Says Nuclear Medicine Halt is Hearsay

The Veteran's Administration Medical Center in Ann Arbor, Michigan is displeased with all the attention it's getting from reports that waste disposal problems have halted nuclear medicine at the institution.

"We're not curtailing anything," says Milton Gross, MD, chief of nuclear medicine at the Ann Arbor VA. "If anything, our service continues to expand."

But various accounts that have cropped up even in national newspapers say the hospital is turning away nuclear medicine patients. A recent front-page story in *the New York Times* about radioactive waste disposal claims that after Michigan was expelled from the Midwest Low-Level Radioactive Waste Compact, the Ann Arbor VA hospital, "among others, sends patients out of state if they need radioactive materials for diagnosis or treatment."

Officials at the Ann Arbor VA dismiss the story as a rumor that defies common sense, and say that none of the papers that made the claim bothered to check its accuracy with the VA. The short-lived isotopes used in clinical nuclear medicine can be decayed safely on hospital premises and then sent out with other medical trash for burial or incineration, so clinical departments typically have minor waste disposal problems compared to biomedical research laboratories.

The industry newsletter *Straight Talk* is probably the first to print the claim about the Ann Arbor VA and is the apparent source of subsequent printed accounts. The newsletter contends in its November issue that the VA hospital is "no longer accepting patients requiring diagnoses and treatments that utilize

radioactive materials," that such patients "are being referred to other hospitals outside the state," and that research programs "have been put on hold." The newsletter is produced by Cal Rad Forum, a California-based association for industries that produce radioactive waste.

The VA's Dr. Gross says the nuclear medicine department at the Ann Arbor facility treats 4,000 patients a year, and the hospital employs about 40 researchers with an annual budget over \$3.5 million. The only "hold" placed on researchers, according to Dr. Gross, is the request that they shift to shorter-lived isotopes when possible. The radiation safety officer at the Ann Arbor VA, Joe Wissing, says he had to designate additional storage space in a basement for holding drums of low-level waste for decay or eventual burial when a disposal site opens. He estimates the VA has enough space to last at least 5 and perhaps 10 years before research is seriously threatened. The failure, however, to build disposal sites in the U.S. is creating a looming crisis. Eventually, Mr. Wissing says, "the waste is going to have to go somewhere."

The author of the newsletter story, Nicki Hobson of Cal Rad, told *Newsline* that she stands by her claim that the VA is halting nuclear medicine services. Ms. Hobson declined to identify who gave her the story and acknowledges that she didn't call the VA to verify it, but says she checked back with the source when people started questioning the report. As to Dr. Gross's assertions that her story is "totally false," she responds that "If a hospital can't provide full services, I can see why he would try to put the best face on the situation."

The VA's Dr. Gross claims it's a case of not letting the facts get in the way of a good story. "This is just the kind of sensational information that a compact would want," he says, as evidence to support the nuclear industry's need for low-level waste repositories. To those who've claimed the VA is halting nuclear medicine services he says, "come and audit our books." ■

### Hospital Waste

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according to Mr. Gantner. "The last thing we want to do," he says, "is burn a significant source in a medical waste incinerator."

Some state radiation control programs encourage waste handlers to set detectors as sensitive as possible. "Otherwise stuff that's shielded can get through, then you might miss something that's been shipped illegally," says Richard Ratliff, director of compliance and inspection at the Texas Bureau of Radiation Control.

Regulatory vigilance, however, is not overburdening hospitals in Texas. The Texas Department of Health adopted a BRC-type rule in 1987 that allows industries to route to ordinary landfills limited concentrations of radionuclides if the half-life is less than 300 days. Licensees must demonstrate the ability to separate the waste, account for concentrations of radioactivity, and properly package it to gain a permit for BRC disposal.

The policy lets hospitals promptly move radioactive medical waste out of hospital storage closets and into a landfill, "where it's safer," says Mr. Ratliff.

One Texas university saved about \$15,000 on waste disposal during the first year of the policy, according to state officials. Another licensee calculated that radioactive material that cost about \$1800 to bury at a municipal landfill would have cost over \$38,000 to ship to one of the low-level radioactive waste repositories in 1991.

Nuclear medicine physicians point to the Texas policy as evidence of the need for national standards. Many are coming to the conclusion that they will have to negotiate with landfill operators and local communities to establish allowable levels of radiation that all can accept.

"If and when the NRC comes out with a BRC rule, we can set our systems to a higher threshold," says BFI's Mr. Gantner. "Until the NRC comes out with a BRC rule, this is what we have to live with."

J. Rojas-Burke