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## Planning for the Ultimate Risk

### *Emergency Preparedness for a Nuclear Disaster*

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*Hospitals should be ready for radiation disasters of all types.*

In 1979 the United States became seriously aware of the dangers of nuclear energy when the Three Mile Island Nuclear Generating Station in Pennsylvania experienced a core meltdown that released radioactive gases into the air. Awareness was further heightened in 1986, after the debacle at the Chernobyl Nuclear Power Plant in Ukraine, when the testing of a potential safety feature resulted in explosions in one of the cores and the release of radioactive material. And now this year at the Fukushima I Nuclear Power Plant in Japan, a magnitude 9.0 earthquake created a tsunami that led to flooding and loss of electrical power, which resulted in partial core meltdowns

and hydrogen explosions, releasing radiological material into the environment. These catastrophes highlight one of humanity's greatest fears: a nuclear disaster that maims, kills, and poisons the air, water, and land for decades to come—threatening the well-being of the region and even the world.

“Although events such as these arrest everyone's attention, there's a whole spectrum of radiological events,” says John Hick, M.D., medical director for emergency preparedness, Hennepin County Medical Center, Minnesota. “Hospitals should understand that their radiation disaster planning must account for all

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## Planning for the Ultimate Risk

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scenarios that might affect their area and for a range of casualty numbers,” continues Hick, who is also assistant medical director for emergency medical services. “They need to coordinate their planning with local, state, and federal governments.”

Hick describes three possible events along the nuclear disaster continuum:

- A radiation emergency at a nuclear power plant, including problems with the reactor core or stored materials, with release of radiologic isotopes into the ground, air, and/or water
- Detonation of a nuclear dispersion device, such as a “dirty bomb” set off by terrorists. A dirty bomb involves conventional explosives laced with nuclear material, and explosion of such a device results in low levels of radiation release.
- Detonation of an improvised nuclear device, which is a weapon that generates a nuclear explosion and potentially devastating consequences with very high radiation levels

Any radiation emergency would likely occur without warning, signaled after the incident by announcements on radio, television, the Web, and other media. The area’s medical centers would need to activate their emergency plans immediately because a surge of patients would probably rush to the hospital within minutes to hours for treatment and/or screening. Significant confusion about the presence, type, and effects of radioisotopes is probable during the hours after an incident.

## Responding to a Nuclear Event

How should a health care organization plan to respond to a nuclear incident? Regardless of the type of incident, an organization would need to take the following steps in response:

## Exposure vs. Contamination

Humans in the developed world are routinely exposed to small amounts of radiation from the atmosphere and during medical or dental procedures, such as diagnostic X-rays.

*Exposure*, where no radioactive material remains on or inside the body, isn’t the same as *contamination*. Radioactive contamination refers to the presence of radioactive material on or in a person’s body, which may be hazardous to the person, depending on the amount and kind of radiation involved.

1. Perform triage
2. Treat the seriously injured while containing contamination and isolating some patients
3. Decontaminate patients
4. Assess radiation exposure/effects, including directed therapies, as needed

One Chicago-area medical center recently practiced these steps in an emergency preparedness exercise. “We had a drill several years ago based on the scenario of a dirty bomb detonated by a terrorist,” says Robert Wagner, M.D., F.A.C.N.M., F.A.C.R., professor of radiology and medical director of nuclear medicine, Loyola University Medical Center, Maywood, Illinois. Loyola planned the exercise with the idea that most of the people creating a surge would be “what we call the worried well.” Wagner explains that these are people who fear they’ve been contaminated by the radiation released in the incident (see “Exposure vs. Contamination,” above). However, they might not be contaminated—and moreover, they might not have any physical injuries. “It’s important to separate those who have no physical injuries from those who do,” says Wagner. “You certainly don’t want the worried well to overwhelm

## External Expertise

Oak Ridge Institute for Science and Education (ORISE) in Oak Ridge, Tennessee, is sponsored by the U.S. Department of Energy and offers training, preparedness, and emergency assistance; it's also called REACTS (Radiation Emergency Assistance Center/Training Site). For information, go to <http://orise.orau.gov/health-communication-technical-training/default.aspx>.

The following sites also provide information and planning help:

- The U.S. Department of Health and Human Services Radiation Emergency Medical Management Web page for health care providers offers information about patient assessment, decontamination, and incident response: <http://www.remm.nlm.gov>
- The Armed Forces Radiobiology Research Institute Web page provides a wealth of information on planning and management: <http://www.usuhs.mil/afri>
- The Centers for Disease Control and Prevention Radiation Emergencies Web page has useful reference and training information for hospitals and health care providers: <http://emergency.cdc.gov/radiation>

your ability to treat people with critical injuries from a blast, such as puncture wounds, lacerations, burns, or other trauma from an explosive device, complicated by presence of radiation.”

Wagner recommends setting up a triage station at the hospital or at the site of the incident. In the Loyola drill, triage was conducted in a tent designed to be raised in just 15 minutes. Patients with serious injuries were sent to a designated isolation section of the emergency department (ED), while patients without physical injuries were assessed—and, if necessary, decontaminated—in the tent.

If an organization doesn't have a tent for the worried well, it should designate “a place such as a gym, a large meeting room, or another shelter that will hold between 10 and 100 people,” says Wagner. While these people are waiting to be assessed for contamination, Wagner advises that they not be allowed to eat, drink, or smoke. “If people are contaminated, these activities would convert external contamination to internal contamination. External contamination can generally be washed off, but internal contamination can do serious harm to bodily systems,” he explains.

The worried well can be assessed for contamination using a survey meter—a handheld radiation detector, or Geiger counter—unless there are too many of them. “In mass casualty situations, you can't use a survey meter to examine patients one at a time,” says Lawrence H. Flesh, M.D., F.A.C.P.E., F.A.C.H.E., chief medical officer, VA Healthcare Network, Upstate New York. “What you need is a portal monitor. Just as its name implies, it's a doorway with a monitor. As patients walk through this doorway at the decontamination center, the monitor tells who is and isn't contaminated,”

**Life-threatening injuries must be treated before the radiation contamination is dealt with.**

—Lawrence H. Flesh, M.D.,  
F.A.C.P.E., F.A.C.H.E.,  
VA Healthcare Network  
Upstate New York

says Flesh, who lectures around the country on acute radiation syndrome.

Wagner suggests that organizations consider using medical students to help with the worried well. “Medical students are valuable members of the medical team,” he says. “They're familiar with the basics of medicine, and they know how to gather information and take samples.” Once it's determined that a patient does not have large amounts of contamination, medical students can be instructed in how to take patient names and contact information, and obtain samples. “The medical students can have patients wipe their hands with alcohol swabs, take oral and nasal samples, and put those samples into red-top tubes labeled with the patients' information,” says Wagner. These samples can later be assessed for the presence of radioactivity.

Staff protection is essential. Staff members who routinely work with nuclear medicine and may be called on to treat patients who might be contaminated usually rely on a film badge dosimeter, which measures how much radiation the employee has been exposed to over time. However, for emergency situations, hospitals may wish to have on hand a limited number of real-time dosimeters, such as pen or digital display dosimeters, which provide better information about the actual exposure rate.

## Decontamination

When patients are contaminated with radiological material, they must be decontaminated. “The hospital should have a designated decontamination facility equipped with warm showers,” says Wagner. “When people who are contaminated remove their clothing, you often get rid of 95 percent of the contamination.”

If there is local contamination on the hands, face, or feet, only those areas need to be cleaned. “If large areas of contamination

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# CASE STUDY

## For Infant Ears Only

### *Tri-City Medical Center Diminishes Decibels in the NICU*

**N**oise. The word evokes images of construction sites, jets take-offs, traffic jams, and rock concerts. But what about actions like closing doors, setting down baby bottles, and conversing with a colleague? Can the sounds created by these actions also be considered noise? Absolutely. To a newborn in a neonatal intensive care unit (NICU), whose bed is a hard plastic isolette, sounds such as these can reverberate and create a loud and uncomfortable environment. Noise levels can have a negative impact on an infant patient's comfort level and influence his or her safety and outcomes, in addition to affecting the satisfaction of the infant's family, staff, and others.<sup>1</sup> Because of this, Joint Commission–accredited organizations are required to meet the needs of their patient population and make sure



*The Sound Ear is a visual reminder to staff and patients' families to keep noise levels to a minimum.*

**Source:** Tri-City Medical Center. Used with permission.

#### About Tri-City Medical Center and Its NICU

Located in Oceanside, California, Tri-City Medical Center is a 397-bed, full-service health care facility serving the San Diego area. Originally built in the early 1960s, Tri-City Medical Center was expanded in the 1970s; the neonatal intensive care unit (NICU) opened in 1986.

that interior spaces are safe and suitable to the care, treatment, and services provided (Standard EC.02.06.01, Element of Performance 1).<sup>1</sup>

The NICU at Tri-City Medical Center, Oceanside, California, is made up of four pods, each holding up to as many as five isolettes at a time. In 2010, the NICU was functioning at an average daily sound level of 62 dB, according to Susan M. Bowles, M.S.N., RNC-NIC, CNS, clinical nurse specialist for the NICU at Tri-City Medical Center. However, current guidelines recommend an average hourly level less than 45 dB,<sup>2,3</sup> where 10% should be at a level of 50 dB or less, and transient noise levels should not exceed 65 dB.<sup>2</sup> Noise created by conversing practitioners, staff, parents, and visitors, and noise created by closing portholes, placing bottles on isolettes, closing cabinet doors, and beeping alarms and monitors contributed to a noisy environment. In order to promote a healthier environment of care for neonate patients in the NICU, the organization needed to find simple solutions to reduce NICU noise while “working with the constraints of an older building and limited budget,” says Bowles.

#### Guidelines for Minimizing Noise in the NICU

Although Tri-City Medical Center had policies to minimize noise throughout the hospital, it needed to find ways to meet the unique situation of the NICU environment. Since the budget did not allow for either new equipment or a new building, the organization had to modify the existing guidelines. After reviewing evidence-based literature and learning what other organizations had done to reduce noise, Bowles began adapting existing models to suit the Tri-City Medical Center NICU. She developed a set of noise-reduction guidelines for both staff and visitors to the NICU. By following these simple guidelines, the noise level in the NICU was reduced from 62 dB to 54 dB between October 2010 and February 2011. Although the noise level is still above the recommended 45 dB, the 8 dB reduction is a significant improvement for the unit.

In order to provide protected sleep for babies, the first implemented guideline was “Quiet Time.” During this time, staff and visitors are asked to speak softly, limit actions when near an isolette, reduce foot traffic, and refrain from performing elective procedures. Quiet Time is in effect

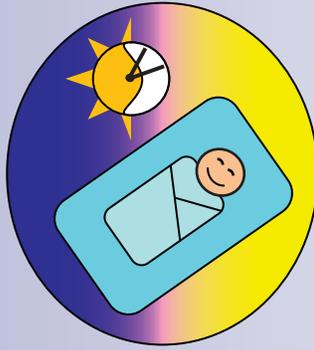
two times per day (from 1 to 2 in the morning and afternoon) and is signaled by turning down the lights. Other guidelines that were implemented include the following: using a “library” voice at all times, taking care of a crying baby or monitor bell within 30 seconds, and asking visitors (excluding parents) to visit at other times so babies are able to sleep.

## Educating and Monitoring Staff

Staff education is a vital part of the noises reduction effort and takes place in many arenas, including during rounds, in staff meetings, and in individual education. Staff members are asked what they’d want for their babies if they were in the NICU and are educated on the benefits of a quiet environment for patients, their families, and staff. Staff are also educated on the sources and impact of noise in the NICU and methods for reducing or avoiding noise. They’re informed of facts like these: Actions in, on, or near an isolette—such as closing metal doors, closing a solid plastic porthole, or dropping in a

mattress—can be as loud as 90, 100, and 120 dB, respectively.<sup>3</sup> These levels are comparable to the noises of a pneumatic drill, a lawn mower, and a boom box in a car.<sup>3</sup> Even holding a conversation at the bedside can be as high as 60 dB, and tapping fingers on an isolette can be up to 90 dB.<sup>3</sup> Being aware of these actions and making sure to avoid or limit them is very important to the NICU’s environment of care.

Bowles educates staff on the floor on a one-on-one basis. She recommends noise-reducing alternatives such as the following: temporarily suspending alarms on equipment that might sound when providing interventions, conducting conversations away from the bedside, minimizing the number of times an isolette door is opened and closed, and pressing the latch on a porthole before opening it. During



**Turn down the lights.**  
**It's Quiet Time**  
**1-2 A.M. & 1-2 P.M.**

- Speak softly
- Limit actions when near an isolette
- Reduce foot traffic
- Refrain from performing elective procedures

*Tri-City Medical Center instituted quiet time in the NICU to help babies sleep.*

these one-on-one training sessions, staff also view a presentation featuring the guidelines and how following them benefits the babies. Figure 1, left, shows a slide from this presentation.

Bowles also created a continuing education (CE) package that staff can complete to earn CE credits toward their professional licenses. The CE package is a series of evidence-based articles that support the newly implemented guidelines and illustrate how the guidelines can benefit the babies in the NICU. “The more avenues you give to staff to understand why you are implementing change, the more buy-in you get,” says Bowles.

The NICU displays posters and signs throughout the unit as additional visual reminders for families and staff to keep their voices down. Some isolettes even have signs posted directly on them to protect the sickest babies.

## Monitoring Noise Levels

To help ensure that noise levels are kept to a minimum, Tri-City Medical Center uses the “Sound Ear” to alert staff and families when noise levels are inappropriate. The Sound Ear is a lighted device in the shape of an ear that monitors decibel levels on the unit. It is green when the noise level is acceptable, yellow when noise is getting too loud, and red when noise is too loud. (A photo of the Sound Ear is

**Figure 1. Educational Slide Presentation**

### Why is it important to maintain quiet?

- A rise of 10 dB corresponds to a doubling of subjective loudness
  - Sound of 80 dB is twice as loud as 70 dB which is twice as loud as 60 dB
  - 80 dB is 4x the loudness of 60 dB



This slide is part of an educational presentation given to staff to help them understand why maintaining a quiet environment is so important.

Source: Tri-City Medical Center. Used with permission.

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# What's the Score?

## *Weiss Memorial Hospital Creates a Tool to Quantify Performance During Emergency Management Drills*

Every emergency your organization experiences is a learning opportunity. Whether it's an actual event or a preparedness drill, you can observe the response effort and evaluate how your organization handles the six critical functions of emergency management—communications, resources and assets, security, staff, utilities, and patient support. Your organization can highlight successes and investigate shortcomings and use the lessons learned to make improvements.

But how can your organization effectively evaluate the six critical areas during a drill?

Weiss Memorial Hospital, a 236-bed acute care facility affiliated with the University of Chicago Medical Center, created a scorecard that helps the organization quantify its response to an event, including efforts associated with the six critical functions (see "Emergency Drill Scorecard" on page 7). The organization uses the scorecard to complement its after-action reports and drive performance improvement efforts.

### **Why the Hospital Created the Form**

"We have always critiqued our emergency management drills," says Chris Pettineo, M.S., director of emergency preparedness, Weiss Memorial Hospital. However, those critiques have been more qualitative than quantitative. "We wanted to develop a measureable way to gauge our performance, including efforts associ-

ated with the six different functions." The organization felt this would not only help it meet Joint Commission standards but allow a thorough analysis of response efforts. "The six critical functions are more than spokes in the greater emergency management wheel," says Pettineo. "They are, in fact, the hub of an all-hazards approach to emergency mitigation, preparedness, response, and recovery."

### **How the Hospital Created the Form**

The hospital spent five months creating and finalizing the form, and the emergency management (EM) committee was in charge of the process. "We discussed it at every monthly meeting, breaking each of the 6 critical functions into different scorable items," says Pettineo. "With each function having 4 facets, the tool offers 24 elements to score."

During one round of revisions, the committee added a section for comments so that users could do more than just check boxes on a list. "We wanted users to be able to discuss what they were seeing during a drill and provide suggestions for improvement," says Pettineo. "We felt that adding a comments section would allow for a qualitative review in addition to a quantitative one."

### **How the Hospital Uses the Form**

For every EM drill, the hospital assigns at least one observer to assess per-

formance. "This is usually a member of the EM committee who is familiar with our incident command process and the Emergency Operation Plan," says Pettineo. The observer uses the form to score various aspects of the response, categorized into the six critical functions. For each item on the scorecard, the observer checks whether, during the drill, the area being evaluated "always complies," "sometimes complies," or "rarely complies" with the activity; each option corresponds to a set number of points. A sum of the different scores yields a total, which shows how well the staff navigated the emergency response. The score matches to a percentage, which indicates next steps, including developing an action plan or launching a performance improvement project.

"In some cases, a drill may have multiple observers looking at different areas, such as the intensive care unit and emergency department," says Pettineo. "After every observer completes the form, we can easily tabulate the different scores and determine a final total and corresponding percentage for our overall response." When the form is complete, the hospital distributes the tool electronically to all the departments involved in the response effort. This not only improves communication but limits the need for excess paper.

In addition to drills, Weiss Memorial uses its form to measure response to actual emergencies. "Although we don't assign observers during an actual emergency, we

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## Emergency Drill Scorecard

 <p><b>WEISS</b> MEMORIAL HOSPITAL</p>	Site: _____	Column 1 (3 points / checkmark) Always Complies	Column 2 (2 points / checkmark) Sometimes Complies	Column 3 (1 point / checkmark) Rarely Complies	
	Date: _____				
	Leader: _____				
	Observer: _____				
<b>Communication</b>	Effectiveness of initial alarm—heard and correctly identified at all points on the site				
	All staff given effective briefing of the objectives and kept well informed				
	Effective use of PA, radios, verbal briefings, back-up communications				
	Plans to communicate with community, RHCC, external authorities				
<b>Resources and Assets</b>	Obtains supplies needed at onset of emergency response				
	Replenishes supplies used during response				
	Management of support activities				
	Knowing when to evacuate (96 hours)				
<b>Safety and Security</b>	Organization establishes internal safety and security operations				
	Establishes process for access control and lock-down				
	Identifies roles for community security support (police, sheriff, etc.)				
	The plan identifies means for isolation/decontamination				
<b>Staff Responsibilities</b>	Staff roles and responsibilities are defined in the EOP				
	Staff are trained for their assigned roles during emergencies				
	The organization communicates to licensed independent practitioners their roles				
	There is a process for identifying care providers				
<b>Utilities Management</b>	Electrical backup? Fuel?				
	Water contingency plan?				
	Other essential utilities identified?				
	Clinical interventions...backup equipment available?				
<b>Patient Clinical and Support Activities</b>	Manage clinical activities such as triage, assessment, treatment, admission, discharge, and evacuation				
	Establish strategies for vulnerable populations				
	Establish hygiene and sanitation needs of the patient				
	Mortuary services considered?				
<b>Total</b>					

Total Score	Percentage	Evaluation Results	Improvement Plan
72 – 66	≥ 91%	Best practice	None needed
65 – 58	90% – 81%	Good working habits	Action plan
57 – 24	≤ 80%	Needs some improvement	Performance improvement project

Source: Weiss Memorial Hospital, Chicago. Used with permission.

# This Patient Room Looks Clean, But Is It?

## Options for Evaluating Environmental Cleaning

A patient checks into her room in preparation for a procedure the next day and runs her finger over the bedside tray table. If the room looks clean, she may feel safe from methicillin-resistant *Staphylococcus aureus* (MRSA) or any of the other bacteria that cause the health care–associated infections (HAIs) she’s been warned about. But a surface that appears to be clean may in fact harbor microbial contaminants.

The Centers for Disease Control and Prevention (CDC) has released a document that describes how to optimize the thoroughness of cleaning high-touch surfaces—such as tray tables, light switches, and toilet seats—in patient rooms. The CDC guidance document recommends a two-level cleaning and monitoring program administered by infection preventionists (IPs) and coordinated and maintained through environmental services (ES) professionals.

### Options for Evaluating Cleaning

The CDC document “Options for Evaluating Environmental Cleaning” was prepared by Alice Guh, M.D., M.P.H., of the Division of Healthcare Quality Promotion in the National Center for Emerging and Zoonotic Infectious Diseases at the CDC, and Philip Carling, M.D., of Carney Hospital and Boston University School of Medicine in Boston. “The evidence shows clearly that the

transmission of many health care–associated pathogens is related to contamination of surfaces and equipment that are near the patient,” says Guh. “We encourage all hospitals to develop programs to optimize the thoroughness of high-touch surface cleaning as part of the terminal room cleaning performed at the time patients are transferred or discharged.”

### A Two-Tiered Approach to Environmental Cleaning

In the CDC document, which is available at <http://www.cdc.gov/HAI/toolkits/Evaluating-Environmental-Cleaning.html>, the CDC has divided the cleaning and

“**Studies show that many surfaces are not being cleaned thoroughly.**”  
—Alice Guh, M.D., M.P.H.,  
Centers for Disease Control and Prevention

monitoring program into two levels: Level I is a **basic** infection prevention and control (IC) program coordinated through the joint participation of the IP staff and ES management to promote compliance with CDC guidelines.<sup>1,2</sup> The Level I program includes a checklist of high-touch surfaces to be used when cleaning patient rooms (see “CDC Checklist for

Environmental Cleaning,” page 9).

Various measures for evaluating environmental cleaning can be used in a Level I program to encourage and engage ES staff, including self-reporting by ES staff or a competency evaluation of ES staff by ES management and/or IP staff.

Level II of the CDC cleaning and monitoring program is an **advanced** program that incorporates the basic elements and infrastructure of Level I; in fact, the cleaning methods used in this level are the same as those in Level I. However, in the Level II program, objective monitoring methods—direct observation, swab cultures, fluorescent gel, ATP system, and agar slide cultures—are used by an ES or IP evaluator or a joint IP/ES team to assess the thoroughness of environmental cleaning.

The programs also encourage hospitals to educate ES staff about what is expected of them in their cleaning work. The results of the evaluation of environmental cleaning should be reported to the hospital’s infection prevention and control committee and, if the hospital is participating in a state-based prevention collaborative, could be shared with the state health department.

“Some hospitals should consider implementing the advanced program right from the start,” says Guh, “particularly those with increased rates of infection caused by health care–associated pathogens, such as *Clostridium difficile*.

And all hospitals that have successfully achieved the goals of a Level I program should advance to Level II.” Moreover, Carling urges hospitals that have achieved a high compliance rate at Level II to go beyond that to optimize their environmental hygienic practices in other areas of the hospital.

## Studies Show Risks

In case hospitals need any encouragement to advance their cleaning practices, Carling cites an article he co-authored in the June 2010 issue of the *American Journal of Infection Control*. That article points out eight recent studies confirming that patients occupying rooms that previously hosted patients with vancomycin-resistant enterococci (VRE), MRSA, *Clostridium difficile*, and *Acinetobacter baumannii* infection or colonization have on average a 73% increased risk of acquiring the same pathogen compared to patients not occupying such rooms.<sup>3</sup> “These studies show that many surfaces are not being cleaned thoroughly,” says Guh. Carling adds, “There’s almost no way that subsequent room occupants can pick up those bacteria unless it’s through environmental contamination.” Guh also notes that many other pathogens, such as norovirus, are also being transmitted through the environment. “Furthermore,” she says, “the environment in hospitals has been found to harbor many bacteria that are becoming increasingly resistant to antibiotics.”

“The intention of the CDC document is to determine objectively whether environmental cleaning has been performed,” continues Guh. “We encourage health care facilities to take a programmatic approach to improving their environmental cleaning, to educate their ES personnel about what’s expected of them, and to foster close cooperation between ES staff and the IP team.”

Carling says, “The acceptance of these Level II programs by ES workers has

### CDC Checklists for Environmental Cleaning

The following are checklists for cleaning and monitoring.\*

**High-Touch Room Surfaces**  
The following are high-touch room surfaces that should be cleaned by ES workers. These are some of the sites most frequently contaminated and touched by patients and health care workers.

<input type="checkbox"/> Bed rails/controls	<input type="checkbox"/> Room sink
<input type="checkbox"/> Tray table	<input type="checkbox"/> Room light switch
<input type="checkbox"/> IV pole (grab area)	<input type="checkbox"/> Bathroom handrails by toilet
<input type="checkbox"/> Call box/button	<input type="checkbox"/> Bathroom sink
<input type="checkbox"/> Telephone	<input type="checkbox"/> Toilet seat
<input type="checkbox"/> Bedside table handle	<input type="checkbox"/> Toilet flush handle
<input type="checkbox"/> Chair	<input type="checkbox"/> Toilet bedpan cleaner

**Equipment Present in the Room**  
In addition to the high-touch room surfaces, the following high-touch equipment should be considered when cleaning is performed:

<input type="checkbox"/> IV pump control	<input type="checkbox"/> Multi-module monitor cables
<input type="checkbox"/> Multi-module monitor controls	<input type="checkbox"/> Ventilator control panel
<input type="checkbox"/> Multi-module touch screen	

**Monitoring Methods**  
The following is a list of monitoring methods to be used when evaluating cleaning:

<input type="checkbox"/> Direct observation	<input type="checkbox"/> Adenosine triphosphate (ATP) bioluminescence system
<input type="checkbox"/> Swab cultures	<input type="checkbox"/> Agar slide cultures
<input type="checkbox"/> Fluorescent gel	

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\* Selection of detergents and disinfectants should be according to institutional policies and procedures.

been amazing. The model for the last 50 years has been to look for visual evidence of imperfect cleaning. Now ES workers can be shown how thoroughly they are cleaning critical surfaces through the use of Level II type programs.”

## AHE Speaks

The viewpoint of the ES workers who do the actual work of cleaning patient rooms is articulated by the Association for the Healthcare Environment (AHE; formerly known as ASHES), part of the American Hospital Association (AHA). AHE represents the health care environmental services profession, from workers

to housekeepers to ES management.

“The important thing is to agree as a team on what those high-touch surfaces are and what’s the cycle for cleaning,” says Patti Costello, executive director of AHE. Costello describes ES as a labor-intensive department. “You need adequate staff and enough time to do a good job,” she says. “ES managers should sit down with hospital administration and IPs and establish specific cleaning standards, starting with clinical spaces such as patient rooms and procedure rooms, and then move to common areas such as hallways, floors, and so on.”

*Continued on page 11*

## Planning for the Ultimate Risk

(continued from page 3)

tion remain on the body, taking a shower may be useful,” says Wagner. “After the shower, survey the patient again.”

Patients who have been moved to the ED may also be contaminated. “Many hospital EDs do not have experience with radiation incidents,” says Flesh. “If an individual experiences a sudden onset of nausea and vomiting and their leucocytes are quite low, it could signal radiation sickness.”

Hospitals can call on the expertise of the professional staff in their own organization, advises Flesh, such as the nuclear physicians and the professionals in radiology or radiation therapy. “They are trained and experienced in exposure and contamination and can be recruited to train the ED staff on how to handle a patient who may be contaminated,” says Wagner. Loyola sends all its nuclear medicine residents to a facility in Oak Ridge, Tennessee, called the Radiation Emergency Assistance Center Training Site (REACTS) (see “External Expertise,”

page 3) for training in how to handle radiation incidents.

## Isolation in the ED

Loyola University Medical Center’s director of disaster medicine is Katherine A. Martens, M.D., F.A.C.E.P., associate professor, Division of Emergency Medicine, Department of Surgery. “In a radiation event, it’s definitely important to treat the patient first,” says Martens. “But contamination can be tracked all over the hospital by workers or patients, thereby contaminating the whole facility. Our plan for treating contaminated patients calls for us to confine them to a room with physical barriers and removable floor coverings to facilitate containment and cleanup.”

Under this plan, staff members wearing personal protective equipment (PPE) handle any potentially contaminated clothing and other material from patients and turn it over to someone outside the isolation area for disposal. “So everything that’s contaminated is physically confined and then cleaned up,” says Martens. “Even though that part of the hospital is contaminated, the idea is to limit it to a

confined space and not contaminate the rest of the facility or compromise the safety of other patients or staff.”

In the ED, Loyola’s Wagner recommends that hospital personnel be double-gowned and wear double gloves and double booties. “A lead apron is too heavy and really provides no protection,” says Wagner. “But a cap and a mask are useful to protect wearers from accidentally touching their hair or face while caring for patients.”

## Advice from Experts

Wagner urges facilities to conduct periodic nuclear disaster preparedness exercises. “Radiation has a lot of mystery and fear associated with it. This may cause providers to delay treatment,” he says. “That’s why providers in the ED should understand the intricacies of radiation exposure and contamination and how to protect themselves and their patients.” And the VA’s Flesh says, “If the patient is hurt as well as contaminated, they may die if not treated. Life-threatening injuries must be treated before the radiation contamination is dealt with.” 

## For Infant Ears Only

(continued from page 5)

included on page 4.) According to Bowles, “The Sound Ear is a visual reminder that boosts awareness. Staff and parents look to the Sound Ear to make sure noise levels are appropriate for the NICU.”

## Keys to the Program’s Success

The NICU’s program to reduce noise was successful for many reasons. A key reason for the program’s success is that the guidelines were simple and evidence based. Also, staff buy-in was strong, especially after staff witnessed the benefits for babies. In addition, “Staff hold each other accountable,” says Bowles. “I am satisfied

that the staff got it, understands it, and sees the benefit of it.” Staff also reported feeling better and less stressed when off duty. Because of the benefits the program has produced, says Bowles, “Some of the naysayers are now the biggest supporters of the project. I have the privilege of working with a group of people [physicians and staff] who are highly motivated and extremely professional. They strive to do the best they can every day and are willing to provide the kind of care that will result in optimum outcomes.”

## Continuing to Make Improvements

Tri-City Medical Center’s noise mitigation initiative was a big step in the right

direction, but there is still room for improvement, according to Bowles. The NICU will continue exploring ways to reduce noise. Ideas for making future improvements include replacing old ceiling tiles with acoustic tile, reconfiguring pods, and replacing the automatic doors with quieter equipment. 

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## What's the Score?

(continued from page 6)

do use the form to review the overall response effort at the next EM committee meeting," says Pettineo. "During the meeting, we use the form as a basis of discussion, polling the group about the various activities and gathering feedback and opinions on how to score ourselves."

## The Benefits of the Form

Through its scorecard, Weiss Memorial now has a method for quanti-

tatively critiquing its EM drills.

According to Pettineo, the form is a "data-rich tool that allows us to simply, quickly, and consistently collect information about a drill and evaluate performance." The biggest benefit of the form is that it allows the hospital to identify and frame improvement efforts in order to yield a more thorough and effective response in the future.

A recent improvement was in the very first item on the scorecard, involving communication—that the initial

alarm is heard and correctly identified at all points on the site. "Through the [process of collecting] feedback from the scorecard, we realized there were dead zones—places where people did not hear the emergency code announcement on the overhead pager," says Pettineo. The solution? Redundant communication. "We now follow the overhead pager announcement with an alpha page," says Pettineo. "Without the drill scorecard, we might not have caught this communication gap." 

## This Patient Room Looks Clean, But Is It?

(continued from page 9)

### A Hospital's Point of View

Carol Sulis, M.D., is associate professor of medicine at Boston University School of Medicine and a hospital epidemiologist at Boston Medical Center. "In the old days, if it looked clean, people assumed the room was clean," says Sulis. "But as more multi-drug-resistant organisms came along, Boston Medical Center became interested in looking at the environment itself. We wanted to see whether the patient rooms were being cleaned effectively, so we agreed to be a beta test site for the type of program the CDC is advocating to objectively evaluate environmental cleaning."

Was there a problem with justifying the costs of this evaluation program? "Boston Medical Center is a private, not a public, hospital, and of course every expense must be weighed," says Sulis. She explains that the cost of one incident of an HAI caused by a contaminated surface is "really huge" and therefore is worth the cost of the evaluation program. She particularly appreciates the way the CDC program removes subjectivity and replaces it with objective measures in evaluating cleaning procedures. "The cleaning measurement

scores are either on target or they're not," says Sulis.

In addition, since the process of evaluating environmental cleaning went into effect, Boston Medical Center has noted a marked improvement in patient satisfaction surveys. "The room cleanliness scores on the patient satisfaction surveys improved more than any other measures," Sulis reports. "What's more, our ES workers feel like they're appreciated."

Sulis would like to see this type of program extended beyond patient rooms to operating rooms (both in- and outpatient), intensive care units, clinics, dental schools, and emergency medical services vehicles such as ambulances and helicopters.

## Advice from the Professionals

"Certain areas have to be cleaned every day, no matter who has used them and no matter whether they look soiled or not," says Sulis. "Yes, it takes time to clean those areas adequately. But when ES workers do a good job and are praised for it, everyone benefits—especially the patients who aren't becoming infected."

The CDC's Guh advocates a collaborative and thoughtful effort. "The concept presented in the CDC document is easy to understand and implement, and

it isn't resource intensive," she says.

"This type of program should be viewed as a joint effort by IPs, the quality assurance department, and ES management as a vital part of overall infection prevention. Many senior ES leaders in hospitals around the country support this form of programmatic approach because they realize the impact it's already having on patient safety." 

*Please note that the suggestions made in this article do not constitute current requirements of The Joint Commission. Standard IC.01.05.01, EP 1, states, "When developing infection prevention and control activities, the hospital uses evidence-based national guidelines or, in the absence of such guidelines, expert consensus." Health care organizations accredited by The Joint Commission are encouraged to consider the content of this article but would not be required to comply with such content because it is not currently part of an evidence-based national guideline.*

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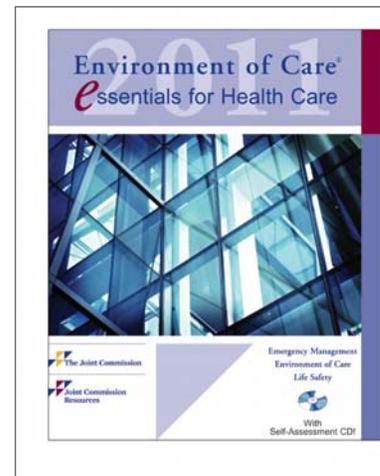
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