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Is it anthrax or the flu? Take steps to protect yourself and your patients

You must take a thorough history and look for suspicious signs

In mid-December, a woman comes to your ED complaining of headache and a sore throat with a temperature of 104°. The patient works at a news station and says she hasn't felt well for several days.

Until recently, you probably would assume this patient has the flu, but now you have to suspect a more frightening scenario: exposure to anthrax or another biological agent.

EDs have been inundated with a "huge influx" of people who believe that they have been exposed to anthrax, reports **Steve Weinman**, RN, BSN, CEN, director of the office of continuing medical education and the center for nursing education at Excerpta Medica in Hillsborough, NJ, and per diem instructor in emergency and trauma care at New York Presbyterian Hospital — Cornell Medical Center in New York City.

"This will only become worse as the flu season sets in," Weinman predicts. "This situation is not going to be an easy one to wade through, especially if public exposure continues to escalate."

Because anthrax starts out with flu-like symptoms, the flu season will definitely

EXECUTIVE SUMMARY

As patients come to EDs with possible anthrax exposure in increasing numbers, you must fine-tune your decontamination procedures and maintain a high index of suspicion.

- Even if a patient's rapid flu test is positive, anthrax cannot be ruled out.
- Use universal precautions to prevent contamination in the event anthrax spores are on a patient's clothes or skin.
- Give nurses a quick-reference tool with information on assessment and treatment of anthrax. (See **Anthrax tool for ED nurses, inserted in this issue.**)

4 steps to take if you suspect anthrax

Here are four steps to take if you suspect a patient has been exposed to anthrax, according to **Steve Weinman**, RN, BSN, CEN, director of the Hillsborough, NJ-based Office of Continuing Medical Education and the Center for Nursing Education at Excerpta Medica in Hillsborough, NJ, and per diem instructor in emergency and trauma care at New York Presbyterian Hospital — Cornell Medical Center in New York City:

1. Observe universal precautions.
2. Implement prompt triage and appropriate medical care.
3. Contact the appropriate public health authorities.
4. Provide appropriate antibiotics as indicated. ■

"cloud the issue," he says.

"It is better to be safe than sorry. So if you suspect anthrax, treat as anthrax," Weinman recommends. (See **list of steps to take if you suspect anthrax, above.**)

Don't make assumptions

Here are items to consider when treating a patient who may have been exposed to anthrax:

- **Take a thorough history.**

Although no anthrax patient so far has had nasal congestion, don't assume those symptoms mean it's "only the flu," cautions **Sharon S. Cohen**, RN, MSN, CEN, CCRN, trauma clinical nurse specialist at North Broward Hospital District in Fort Lauderdale, FL.

"A thorough history must be taken from the patient or whomever is available who can provide any history," Cohen advises. (See **list of questions to ask patients, p. 19.**)

You must determine if the patient has any flu-like symptoms and, if so, for how long, says Cohen. "Also find out if the patient came into contact with any unusual powder or suspicious mail," she adds. "Simple questions can help you determine what path to take and diagnosis to make."

Weinman notes that the reason no anthrax patient has presented with nasal congestion is because anthrax seeds in the lymphatic system of the lungs. "This would not be a reliable method to exclude anthrax if the patient has other symptoms," he says.

The rapid-flu test relies on the laboratory, and most hospitals don't provide this test on a 24-hour basis, says Weinman. "It is very expensive to use this test on everyone who you think may have the flu," he adds.

You also need to consider the possibility of concurrent infection with the flu and anthrax, warns Weinman. "The rapid-flu test will not rule out anthrax. Even if it is positive for flu, that does not mean that the patient does not also have anthrax," he says.

At North Broward Hospital District's EDs, patients with possible anthrax exposure is asked if they have aches and pains or a cough (productive or nonproductive) and vital signs are checked to see if they are febrile. "Next, we check out the patient's skin to see if there are any lesions and ask if they have had any nausea, vomiting, or diarrhea," says Cohen.

Those are typical symptoms of the cutaneous, gastrointestinal, and pulmonary versions of anthrax, says Cohen. "If the patient answers 'no' to all of those, then we send the patient home," she adds.

- **Identify possible risk factors for anthrax.**

Although you must consider any patient presenting with a complaint of new onset rash for the potential of cutaneous anthrax, a few high-risk groups have emerged, says Weinman.

As this issue went to press, these high-risk individuals are postal workers, members of the media, and staff of political figures, says Weinman. "However, as the true magnitude of this event unfolds, this high-risk group undoubtedly will grow and merge with the landscape of the general population," he cautions.

- **Try to streamline your decontamination process.**

According to Cohen, each potential anthrax patient is a significant drain on the ED's resources. (See **steps of the ED's decontamination procedure, p. 21.**)

"That includes donning protective equipment, putting the patient through fine decontamination, bringing the patient back to the ED, and educating the patient," she says.

It takes at least six ED staff members several hours to get each patient through the system, says Cohen. She reports that Broward General's ED has done more than a

COMING IN FUTURE MONTHS

■ What to do after a needlestick occurs

■ New guidelines for resuscitating infants

■ Effective ways to prepare children for painful procedures

■ Update on smallpox vaccinations

Ask patients these 6 questions

Ask potential anthrax patients the following questions, recommends **Steve Weinman**, RN, BSN, CEN, director of the Hillsborough, NJ-based office of continuing medical education and the center for nursing education at Excerpta Medica in Hillsborough, NJ, and per diem instructor in emergency and trauma care at New York Presbyterian Hospital — Cornell Medical Center in New York City:

- Are there any other similar cases in your workplace/household?
- What was the suspected source of exposure?
- Did you encounter any substance that leads you to believe you have been exposed to anthrax?
- When was the onset of symptoms?
- What are the symptoms?
- Are there any associated symptoms? ■

dozen decontaminations for suspected anthrax to date.

The ED's HazMat areas are left partially set up, because of the volume of patients being decontaminated. "The one positive thing that came out of this is that we've really fine-tuned our HazMat decontamination. We can get our people suited up in 15 minutes," says Cohen.

Normally, the area would take four or five people about an hour to set up properly, notes Cohen. "We have the proper water runoff and hot and warm water worked out, a curtain for privacy set up, and scrub brushes, disinfectants, and biohazardous bags for waste available," she explains.

- **Create a quick-reference tool.**

Darlene Bradley, RN, MSN, MAOM, CCRN, CEN, director of emergency and trauma services at University of California at Irvine Medical Center in Orange, created a tool for ED nurses to use when caring for patients with possible anthrax exposure. (See **Anthrax tool for ED nurses, inserted in this issue.**)

"Everything nurses need to know from the ED perspective is included on the form," she says. The form contains assessment and treatment information for each of the three possible modes of transmission.

"As the ED nurse is taking a history, she can review the incubation period to verify that it is within range," says Bradley.

The form lists associated risks and appropriate personal protective equipment. "The aftercare section includes what special instructions would be given to the patient or what education is required before he or

SOURCES

For more information on anthrax exposure, contact:

- **Darlene Bradley**, RN, MSN, MAOM, CCRN, CEN, Emergency/Trauma Services, University of California at Irvine Medical Center, 101 The City Drive, Route 128, Orange, CA 92868-3298. Telephone: (714) 456-5248. Fax: (714) 456-5390. E-mail: dbradley@uci.edu.
- **Sharon S. Cohen**, RN, MSN, CEN, CCRN, North Broward Hospital District, 1600 S. Andrews Ave., Fort Lauderdale, FL 33316. Telephone: (954) 355-4990. Fax: (954) 468-5270. E-mail: sscohen@nbhd.org.
- **Steve Weinman**, RN, BSN, CEN, Office of Continuing Medical Education and the Center for Nursing Education, Excerpta Medica, 105 Raider Blvd., Suite 101, Hillsborough, NJ 08844. Telephone: (908) 281-3651. Fax: (908) 874-5633. E-mail: RescSteve@aol.com.

she goes home," says Bradley.

- **Don't become complacent.**

It's easy to become frustrated to have numerous patients come in for a time-consuming decontamination process when you realize most have not been exposed, Cohen acknowledges. However, she warns that you must always take the appropriate precautions.

"If it comes in as a 'white, powdery substance unknown,' that could be anything," she says. "Your thought process may be, 'It's only anthrax,' but you can't think like that. You have to assume the worst — that it's an organophosphate [nerve agent]."

Cohen says that even if there is a "remote potential" for this, the patient is immediately walked outside, and HazMat is called to do gross decontamination.

For anthrax, as with any biological or unknown chemical, you must protect yourself, says Weinman. "Nurses have subscribed to the notion that the patient comes first, and delays in providing treatment — especially if it's believed to be lifesaving — should be avoided," he notes.

Times have changed, and you must protect yourself during this threat of biochemical terrorism, just as you would if caring for a trauma patient with massive external hemorrhage, says Weinman.

Universal precautions are a must, he stresses. "This is sufficient to prevent cutaneous cross-contamination, in the event that anthrax spores are present in sufficient quantity and quality on the patient's clothes or skin," he says. ■

- The American Hospital Association (AHA) in Chicago has issued an advisory to address the problem of large numbers of people seeking anthrax testing at EDs. The bulletin includes a document from the Department of Health and Human Services answering common questions about anthrax prevention and treatment. The bulletin is on the AHA web site (www.aha.org). Click on “Disaster Readiness,” and then click on “Advocacy” and scroll down to “Readiness Bulletin: What to tell your community about anthrax” that was issued Oct. 19, 2001.
- The Kaiser Mid-Atlantic Permanente Medical Group, based in Oakland, CA, is making anthrax screening and treatment guidelines available to other health care providers. Physicians in the Kaiser Permanente mid-Atlantic region have treated two confirmed pulmonary anthrax cases and say the group has learned about treatment with multiple antibiotics, the course of recovery over the first several days, more targeted screening of suspicious cases, and the best ways to handle the large numbers of people coming in to be tested. The guidelines are at www.kp.org/ and will be revised as the situation evolves. (Click on “Anthrax Clinical Guidelines for Physicians.”)
- The Centers for Disease Control and Prevention in Atlanta has several resources relating to anthrax on its web site (www.cdc.gov). Click on “Anthrax Information and Public Health Emergency Preparedness and Response.” Resources include an information sheet titled “Facts about Anthrax, Botulism, Pneumonic Plague, and Smallpox,” “Frequently Asked Questions about Anthrax,” and a link to video/satellite broadcasts including “Anthrax: What Every Clinician Should Know Part II, Nov. 1, 2001”; “Response to Bioterrorism: Overview and Clinical Aspects of Critical Biological Agents”; “Response to Bioterrorism: The Laboratory Response Network and Agents of Bioterrorism”; and “Anthrax: What Every Clinician Should Know, Oct. 18, 2001.”
- In April 1999, the Association for Professionals in Infection Control and Epidemiology and the Centers for Disease Control and Prevention prepared the report *Bioterrorism Readiness Plan: A Template for Health Care Facilities* to serve as a reference document and initial template for health care facilities’ bioterrorism readiness plans. The full text of the report, including specific responses to agents like anthrax, can be found at www.aha.org. Click on “Disaster Readiness.” Under “Readiness Resources,” click on “Hospital Readiness, Response, and Recovery,” then “Bioterrorism Readiness Plan: A Template for Health Care Facilities.” The report also is available at www.apic.org/bioterror. Scroll down to the “Readiness Planning” category, where you’ll see the report listed.

Watch for signs, symptoms of 3 forms of anthrax

Here are signs and symptoms to watch for in each mode of transmission of anthrax:

- **Cutaneous anthrax.**

This form often presents as a nondescript rash that forms papules and will evolve into a vesicle a few days after exposure, says **Steve Weinman, RN, BSN, CEN**, director of the Hillsborough, NJ-based Office of Continuing Medical Education and the Center for Nursing Education at Excerpta Medica in Hillsborough, NJ, and per diem instructor in emergency and trauma care at New York Presbyterian Hospital — Cornell Medical Center in New York City.

The surrounding skin appears inflamed, edematous, and necrotic, but without the purulence associated with

other infections, adds Weinman. “About one week post-infection, the pustule will break and the black eschar characteristic of anthrax forms,” he says.

The exposure may be similar to patients presenting with spider or other insect bites, says Weinman. “Mortality reported with this form of anthrax is reported as 1%,” he adds.

When spores are inhaled

- **Inhalational or pulmonary anthrax.**

This occurs when a sufficient quantity and quality of anthrax spores are inhaled, says Weinman. “Once inhaled, pulmonary macrophages envelop and transport the lymph system,” he explains. “The incubation with this type of exposure is one to six days.”

Once in the lymph system, the spores germinate, multiply, and produce toxins. These overwhelm the lymph node, resulting in bacteremia and death in an

Here's how one ED manages suspected anthrax patients

Here are the steps that take place in the ED at North Broward Hospital District in Fort Lauderdale, FL, when a patient calls 911 to report possible anthrax exposure:

- The ED is notified to expect a patient who reported being exposed to an unknown powdery substance. Staff are informed that gross decontamination has occurred at the scene. (If a patient comes directly to the ED saying he or she has been exposed to anthrax, HazMat is called because the ED doesn't have the required level of protective gear to do gross decontamination. HazMat then comes and sets up a gross decontamination area in the ED parking lot.)
- The ED sets up its decontamination area outside the department, to protect staff and patients from contamination.
- A minimum of two staff members get dressed in protective gear, including protective suits, masks, goggles, gloves, and boots, with two staff members assisting them in dressing.
- When the patient arrives, ED staff tell the emergency medical services (EMS) unit that the patient may be offloaded.
- If the patient is hemodynamically stable with vital signs within normal limits, then EMS personnel, in full protective gear, walk the patient into the decontamination area. (The area between the EMS

unit and the decontamination area is designated as the "red zone," where the highest level of contamination may occur, so only individuals who are in full protective gear can enter.)

- The patient goes through another fine decontamination washing series before being brought back to treatment areas. ED staff continue with scrubbing the patient, including underneath the fingernails.
- The patient's clothing and belongings are put into biohazard bags, and the patient is dressed in paper disposable scrubs.
- The patient is then moved from the "red zone" into the "yellow zone." (In the yellow zone, staff don't have to be dressed in full protective gear, but there is still the potential for contaminants).
- The patient is moved into the "green zone" which is low risk for contamination. A nurse walks the patient to a treatment room, usually an isolation room with reverse airflow.
- The patient is assessed by the physician.
- Unless the patient is symptomatic with joint pain, cough, or fever, he is discharged. If he is symptomatic, he is worked up as an infected patient, and steps are taken to determine what caused the infection.
- The patient is given a discharge information sheet with a hotline number for the state department of health. (**See *Children and Anthrax: A Fact Sheet for Parents and Frequently Asked Questions about Anthrax*, both enclosed in this issue.**) ■

overwhelming majority of cases, says Weinman.

He notes that the clinical presentation has two phases. "The first phase heralds the onset of myalgias, malaise, fatigue, nonproductive cough, and fever," says Weinman. "This presentation is obviously nonspecific, and is often confused with the flu."

Weinman adds that the patient may report improvement in symptoms several days after the onset. "The second phase lasts about 24 hours and results in rapid deterioration, resulting in death," he says.

According to the Atlanta-based Centers for Disease Control and Prevention, fatality rates for inhalational anthrax are extremely high, and the risk for death is high even if patients are provided with supportive care, including appropriate antimicrobial treatment.

The patient presents with acute respiratory distress, hypoxemia, and cyanosis, says Weinman. "A fever may be present, but the nurse also needs to be attuned to hypothermia indicating onset of shock," he adds.

Other signs will include stridor, as a result of tracheal

compression for an enlarged mediastinal lymph node, and diaphoresis, says Weinman. "Auscultation may reveal crackles," he says.

• Gastrointestinal (GI) anthrax.

This appears to be the rarest form of the infection, says Weinman. "To date, none of the reported anthrax cases have involved a GI component to the infection."

However, Weinman cautions that this statement is likely to change as the number of cases increase and if the type of anthrax used becomes more sophisticated.

Symptoms are very nonspecific and may include abdominal pain and fever followed by nausea, vomiting, and diarrhea, says Weinman. He notes that GI anthrax results from the oral ingestion of spores that are absorbed into the mesenteric lymph system and germinate similar to that of the inhalation form.

Later findings may include ascites due to lymph system congestion and, in some cases, GI hemorrhage from mucosal necrosis, says Weinman. "Mortality from this form of anthrax is reported to be 50%," he adds. ■

Improve care of patients with new cardiac drug

Do you want to be up to date on the latest cardiac treatments? If so, you should be familiar with ReoPro (abciximab), manufactured by Eli Lilly & Co. in Indianapolis.

"There is an emerging use of ReoPro and other IIb/IIIa inhibitors in the ED," reports **Janet Williams**, RN, MSN, CCRN, clinical trials nurse coordinator for the department of emergency medicine at the University of Cincinnati.

Cardiologists have routinely used IIb/IIIa inhibitors following angioplasty and stenting procedures in the cardiac catheterization laboratory, but these medications are now given in EDs, says Williams.

Here are things you should know about ReoPro:

- **Know dosages and procedures for withdrawing medication from vials.**

ReoPro dosing is weight-based and given as a bolus, followed by an infusion, explains Williams.

"When the medication is withdrawn from the vial, filtering is required," she says.

Infusions are run at the same drip rate per hour and the concentration of the infusion changes, based on the patient's weight, says Williams. "If the infusion is run at 21 cc/hour, as it is in my institution, a 250 cc bag will be infused in 12 hours," she explains.

Less wasting of medication occurs when the infusion is run at this rate, because the typical infusion time is 12 hours, adds Williams.

- **Understand the indications for the drug.**

Williams points to the following indications for the

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ReoPro (Eli Lilly & Co., Indianapolis) is commonly used by cardiologists after angioplasty and stenting, but the drug now is being used in the ED for the first time.

- Using ReoPro (abciximab) in the ED allows patients to be electively scheduled for coronary angiography, instead of emergently.
- You must document the start time of the infusion in the medical record to ensure that patients don't receive more than the maximum dosage.
- Observe patients for bleeding complications, and monitor platelet counts in the event thrombocytopenia occurs.

use of IIb/IIIa inhibitors:

- patients who present with recurrent myocardial ischemia who are not responding to conventional medical therapy (aspirin, heparin, and nitrates);

- patients for whom percutaneous intervention is planned within 24 hours.

Initiating the ReoPro infusion in the ED for these patients allows them to be electively scheduled for coronary angiography, instead of emergently when patients are unstable and there is a greater risk of complications, says Williams. (**See story on controversy over use of "combination therapy," p. 23.**)

Interface with cardiac cath lab

- **Document the start time of the infusion in the medical record.**

You may be in a key position to interface with the cardiac catheterization laboratory, says Williams.

"The ED nurse can help to determine if there will be a delay in transfer or may have the knowledge that the patient will require transfer to a definitive care facility," she says.

Typically, post-catheterization standing ReoPro orders will be written for the infusion to run for 12 hours, says Williams. "If the infusion is started in the ED, the 12 hours will need to be calculated from that time," she says.

Intensive care unit (ICU) nurses are familiar with this medication being started in the catheterization laboratory, says Williams. "So they often will determine the end point of 12 hours by using the catheterization time as the starting point, when it is not clearly documented or reported that the infusion was initiated in the ED," she explains.

She offers the following case scenario to illustrate this point: An ICU nurse receives the patient from the catheterization lab, and admission orders are written for the ReoPro to infuse for 12 hours. The nurse realizes the amount of solution remaining in the IV bag will not allow the drip to run for 12 hours.

The nurse calls pharmacy to obtain a replacement infusion bag to be hung when the current one is empty. The pharmacist explains to the nurse, if a second bag were sent to meet the 12-hour time frame order, the patient would receive more than the maximum dose allowed.

The pharmacist contacts the cardiologist to clarify the order. The cardiologist wanted the patient to receive the maximum dose, which was the entire content of the IV bag.

Collaboration by the pharmacist and the nurse prompts further review of the medical record to determine the infusion start time and clarification of orders

SOURCES

For more information about ReoPro, contact:

- **Rose Lengerich**, RN, BSN, Lindner Clinical Trial Center, 2123 Auburn Ave., Suite 424, Cincinnati, OH 45219. Telephone: (513) 585-1777. Fax: (513) 585-4858. E-mail: ROSEERRN@cs.com.
- **Janet Williams**, RN, MSN, CCRN, Department of Emergency Medicine, University of Cincinnati, 231 Albert Sabin Way, Cincinnati, OH 45267-0769. Telephone: (513) 558-8109. E-mail: willijm@ucmail.uc.edu.

with the cardiologist.

It is determined that the infusion was started in the ED and not in the catheterization laboratory, which is how the nurse was calculating the 12-time endpoint.

If this collaboration between the ED nurse, ICU nurse, pharmacist, and cardiologist had not taken place, the patient could have received an additional six hours of the infusion, which would have been over the maximum dose, says Williams.

- **Know safety considerations.**

There are two critical safety considerations when monitoring patients receiving ReoPro, according to **Rose Lengerich**, RN, BSN, a study coordinator for the Lindner Clinical Trial Center, based in Cincinnati.

"Nurses should astutely observe for bleeding complications, especially in patients who are in a very low weight class of less than 80 kg," she says.

Additionally, thrombocytopenia has been known to occur, so platelets counts should be monitored. "Six percent of the patients receiving a one-time dose of ReoPro and 19% of the patients receiving a subsequent dose of ReoPro will develop an antibody that could cause the patient to experience a hypersensitivity reaction or thrombocytopenia," says Lengerich. ■

Controversy: Using ReoPro with thrombolytics

When a 46-year-old man presents to the ED with chest pain, the initial electrocardiogram (ECG) shows a ST-segment elevation in the inferior leads. After the ED physician consults with the cardiologist, a decision is made to transfer the patient to another facility for definitive cardiac catheterization.

Because it's estimated that 90 minutes would pass

before the procedure is started, combination therapy (ReoPro and half-dose of Retavase) is given to the patient in the ED prior to transfer. By the time the patient arrives at the catheterization lab, the chest pain has decreased, ST-segment elevation has decreased, and the patient is hemodynamically stable.

The patient successfully underwent angioplasty and stenting of the right coronary artery, was transferred to the cardiac step-down unit, and was discharged home the following day without complications.

The above scenario illustrates recently changed practice, which includes the use of IIb/IIIa inhibitors in combination therapy with half-dose thrombolytics in the acute myocardial infarction (AMI) patient, says **Janet Williams**, RN, MSN, CCRN, clinical trials nurse coordinator for the department of emergency medicine at the University of Cincinnati.

ReoPro, which is manufactured by Eli Lilly & Co. in Indianapolis, is being used as part of the AMI protocol at four EDs affiliated with the Health Alliance of Greater Cincinnati: the University Hospital, the Christ Hospital, the Jewish Hospital, and Fort Hamilton Hospital. The study combines two blood-thinning drugs to provide the fastest treatment for heart attack victims. (See p. 24 to learn what the AMI protocol includes.)

An indication for combo therapy

Williams offers the following indication for combination therapy: The patient who presents to an ED with an AMI, and there is a delay in transferring this patient to the catheterization laboratory for primary angioplasty and stenting. Delay may be due to one of the following factors:

- definitive care transfer time from one facility to another;
- during the day when the catheterization team is busy finishing up other cases;
- on nights and weekends when the patient needs to remain in the ED until the on-call catheterization team arrives.

"This combination is controversial because of the view that primary angioplasty remains the gold standard for care of these patients," she explains.

Combination therapy may be warranted when there will be a time delay in transportation to the catheterization lab for primary angioplasty and stenting, says Williams.

This patient will benefit from receiving thrombolytics until transfer to the cardiac catheterization laboratory can occur, she says.

"The dosing of thrombolytics in 'combination therapy' is decreased in half," Williams explains. "This half dose benefits the patient because the decrease in

Here are steps of AMI protocol

- Here is what the acute myocardial infarction (AMI) protocol for use of ReoPro (Eli Lilly & Co., Indianapolis) at four EDs affiliated with the Health Alliance of Greater Cincinnati includes:
- A reduced dose of r-PA at 5 IU, two doses at 30-minute intervals is given.
 - ReoPro (abciximab) subsequently is started between doses of r-PA at 0.25mg/kg bolus given over two minutes with a continuous 12-hour infusion at 0.125mcg/kg/min.
 - Heparin also is administered at a reduced dose of 40 units/kg with a maximum dose of a 4,000-unit bolus.
 - Heparin drip is maintained at 7 units/kg/hour with a maximum dose of 800 units/hour.
 - Patient may proceed to the cath lab at the physician's discretion.

Source: Lindner Clinical Trial Center, Cincinnati.

EXECUTIVE SUMMARY

You will need a translator, preferably one with a medical background, when caring for non-English speaking patients.

- Subscribe to a telephone translation service.
- Develop a resource list of multilingual hospital staff who can serve as translators.
- Use translators to explain discharge instructions and consents to patients, not just during your assessment.

"We need to do the best we can for the patient to elicit all of the history so nothing is missed, using the best source possible at the time," says **Kathie Carlson**, RN, MSN, CEN, patient care manager at New York United Hospital Medical Center in Port Chester.

Here are ways to improve care of non-English-speaking patients by using translators as appropriate:

- Try to use a translator with a medical background.

You need to have ready access to a medical translator, argues Davidhizar. "Many hospitals have a telephone service that allows them to call in and get a translator on the phone," she suggests.

If you don't subscribe to a telephone service, Davidhizar recommends having a list of resources in your community who can translate.

"It is critical to have someone who can clearly explain what you need to communicate, if culturally competent care is to be delivered," she adds.

At New York United's ED, a roster of personnel and the languages they speak is kept in a central location. "We've been very lucky finding individuals who can translate using the same dialect, while making the person feel comforted," Carlson reports.

Obviously, the best interpreters are medical personnel, says Carlson. "Unfortunately, we don't have many who are bilingual. I do have some nurse technicians who are fluent in Spanish," she says.

However, she cautions that using clinicians for translation has pros and cons. "At times, a lot of translation is necessary, pulling that technician away from their duties," she explains. "These tasks aren't being done by anyone else, which causes animosity from other staff members."

- Use a translator who can relay nonverbal communication.

To ensure that no information is missed, a translator is needed who understands the verbal and nonverbal nuances of the language, Davidhizar explains.

dose decreases the potential side effects that could occur following thrombolytic infusion." ■

Patients who don't speak English pose challenges

When a non-English-speaking patient entered an ED clutching his abdomen, nurses quickly ushered him into an examining room and took vital signs, because they were anticipating the need for possible abdominal surgery.

While staff searched for a translator, the patient continued to point to his lower abdomen, recalls **Ruth Davidhizar**, RN, DNS, CS, FAAN, dean of nursing at Bethel College in Mishwaka, IN, and co-author of *Transcultural Nursing: Assessment and Intervention*. "No physical signs of distress appeared from the assessment," she adds.

When the translator finally arrived, he was rushed into the room to talk to the patient, says Davidhizar. "The translator turned and told the staff, 'This man came into the ED because he was looking for a bathroom. He only needs a bathroom.'"

While humorous, this incident illustrates the importance of accurate translation for non-English-speaking patients, says Davidhizar.

SOURCES AND RESOURCES

For more information about caring for non-English-speaking patients, contact:

- **Kathie Carlson**, RN, MSN, CEN, New York United Hospital Medical Center, 406 Boston Post Road, Port Chester, NY 10573. Telephone: (914) 934-3087. Fax: (914) 934-3586. E-mail: kkcarls@aol.com.
- **Ruth Davidhizar**, RN, DNS, CS, FAAN, Dean of Nursing, Bethel College, 1001 W. McKinley Ave., Mishwaka, IN 46545. Telephone: (219) 257-2594. E-mail: Rdaavidhiza@aol.com.

Here is a partial listing of companies that offer telephone translation services:

- **America Translating Services**, P.O. Box 800272, Santa Clarita, CA 91380. Telephone: (800) 535-0555. Fax: (800) 316-2230. E-mail: rj@am-translating.com. Web: www.am-translating.com.
- **Language Line Services**, One Lower Ragsdale Drive, Bldg 2, Monterey, CA 93940. Telephone: (800) 752-0093, ext. 196. E-mail: generalinfo@LanguageLine.com. Web: http://www.languageline.com.
- **New World Language Services**, 165 W. Hospitality Lane, Suite 10, San Bernardino, CA 92408. Telephone: (800) 873-9865 or (909) 388-1798. Fax: (909) 388-1796. E-mail: misc@newworldlanguages.com. Web: http://phonetranslators.com.

If patients cannot read, the challenges are greater, says Carlson. "Many years ago, I worked in an area that had an influx of Cambodians. I thought I was smart and developed index cards with pertinent questions and found someone to write it in the Cambodian language," she says. "I then discovered that most Cambodians at the time were unable to read their own language."

Use ongoing communication

- **Use translators throughout the ED visit.**

Davidhizar emphasizes that translators are needed throughout the patient's ED visit: when explaining procedures, when doing discharge planning, when consents are signed, when teaching is done, and to reassure patients regarding their concerns.

"Culturally appropriate care cannot be provided without ongoing communication," she says.

- **Use the most appropriate translator**

when possible.

When a non-English speaking patient arrives, the triage nurse needs to "feel out" the situation as best he or she can, says Carlson.

"If the patient has a problem of a personal nature, it's best to have a person of the same sex who is compassionate and caring doing the translation," she explains. "It could be awkward for the patient to share a personal problem with a security guard."

Carlson says she is "cautious" using family members for translation. "It may be embarrassing to the patient," she says. "Also, in some cultures, there is a dominance in the family, and you will only get the information the translator is willing to provide."

Still, Carlson acknowledges that there are times when you must "settle" for anyone who can do the translation. "That's unfortunate, but we are also dictated by time and volume constraints," she says. ■

Warning: You're at higher risk for exposure to flu

As an ED nurse, you're at high risk for being exposed to the flu "like no other group," warns **Janice C. Taylor**, RN, BSN, CEN, CFRN, an ED nurse at St. Joseph's Hospital in Bellingham, WA.

"All I know is, the year I did not get my flu shot, I got the flu. As usually happens, it started on my last day on, which means that for my five days off, I was as sick as a dog," she recalls.

Ever since, Taylor has gotten her flu shot every year. "Yes, my arm may be a little sore the next day, but it is worth it," she says.

"If there is anyone that is exposed to the flu, it is ED nurses," says Taylor. "During flu season, I get

EXECUTIVE SUMMARY

You are at higher risk than other health care providers for exposure to flu virus, so you should get the flu vaccine.

- Encourage patients in high-risk groups to get the vaccine and explain when to seek medical help.
- Fewer cases of flu will result in less confusion over anthrax exposure.
- Implement a program in which ED nurses administer the flu vaccine at your hospital to patients and staff.

coughed on, sneezed on, and vomited on by multiple patients a day, especially if I'm triaging," says Taylor.

College students, young adults, the elderly, and children all will wind up in your ED with the flu, says Taylor. "They may have a high fever, and most of the time they are dehydrated, needing IV fluid replacement," she says. "The doctor's offices are full, and they have to go somewhere."

Most of these patients will not be admitted, so nurses in inpatient areas will not be exposed, she explains.

Still, many ED nurses are reluctant to obtain the vaccine, notes Taylor. "Some people are worried that it won't work, some may think they don't need it, and others think it will give them the flu," she says. "The one bit of advice that I would give is for the ED nurse to get a flu shot. It's much better than getting the flu."

According to the Atlanta-based Centers for Disease Control and Prevention, the influenza vaccine is made of killed influenza viruses, which cannot cause infection, and almost all people who get the flu shot have no serious problems with it. However, some people, usually children who have not been exposed to influenza virus in the past, may have fever and body aches after vaccination. These symptoms, if they occur, usually start six to 12 hours after vaccination and can continue for one or two days.¹

Know types of flu strains

Here are things to know about the influenza vaccine:

• Increase your knowledge about the vaccine.

You must be familiar with the types of flu strains that immunization helps protect against, know the duration of the coverage, how soon to be vaccinated, and when the flu season is estimated to begin, says **Anna M. Smith, RN, MSN**, director of emergency services at University Of Louisville (KY) Hospital.

According to CDC recommendations, almost anyone would benefit from a flu shot, but it's especially important for the following groups:

- people 50 years old or older;
- residents of nursing homes or long-term care facilities;
- adults and children with chronic diseases of the heart, lung, or kidneys; diabetes; immunosuppression; or severe forms of anemia;
- children and teen-agers receiving long-term aspirin therapy;
- women who will be in the second or third trimester of pregnancy during the flu season;
- household contacts of those in high-risk groups;
- health care personnel;
- breast-feeding mothers;
- travelers.

SOURCES

For more information about the flu vaccination, contact:

- **Anna M. Smith, RN, MSN**, Emergency Services, University Of Louisville Hospital, 530 S. Jackson Hospital, Louisville, KY 40202. Telephone: (502) 562-3970. Fax: (502) 562-3444. E-mail: Annasm@ulh.org.
- **Janice C. Taylor, RN, BSN, CEN, CFRN**, Emergency Department, St. Joseph Hospital, 2901 Squakum Parkway, Bellingham, WA 98225. Telephone: (360) 734-5400. E-mail: JTaylor@peacehealth.org.

• Educate patients and colleagues.

Spreading the word about the flu vaccine is of particular importance this year, according to Smith.

"Encouraging the public to obtain the flu shot will help prevent confusion of symptoms with anthrax," she says. "We have had a number of people in the community present complaining of exposure."

Many of the biological agents, including anthrax, initially mimic flu symptoms, Smith notes. "We are encouraging vaccination to decrease the incidence of flu, thereby decreasing the numbers of people coming to the ED thinking they have been exposed to anthrax," she says. "The public has been very educated to the initial symptoms of anthrax."

As an ED nurse, you should educate patients, coworkers, and family members about the flu vaccine, Smith says. "Explain to the public how the vaccine works, what the vaccine consists of, that it does not cause you to be sick, and that it will not prevent every type of flu," she advises.

You also should educate patients about the difference between a cold and the flu, how to treat a cold, how to treat the flu, and when to seek medical help. (**See chart with cold and flu symptoms, inserted in this issue.**)

'Drive-through' flu shots

• Volunteer to give vaccines.

At University of Louisville Hospital, the public is encouraged to obtain the shot with a two-day "drive-through" program coordinated by the Employee Health and Infection Control department. From 7 a.m. until 2 p.m. on designated days, individuals can drive up to the hospital entrance, fill out a form, and receive an injection without ever getting out of the

car, says Smith.

"All nurses, including ED nurses, are encouraged to help participate in providing the injections," says Smith. "Last year, we gave over 5,000 injections, and we expect to give even more this year."

Reference

1. Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2001; 50: RR-4. ■



TIP OF THE MONTH

Give a PCA pump to patients in pain

Patients in severe pain should not have to wait for the best pain management available while waiting in your ED, argues **Kathryn Perlman, MS, RN**, clinical specialist for the ED at Presbyterian Hospital of Dallas. "Often, patients such as those with fractured hips or sickle cell crises must wait for inpatient beds," she explains.

While they wait, they usually get as-needed intravenous-push pain medications, says Perlman. "They must call for the nurse when they are in pain and then wait for the nurse to obtain, prepare, and administer the medication," she adds.

Don't let pain escalate

In a busy ED, this wait could turn into a lengthy delay that results in escalating pain, increased demands for medication, patient dissatisfaction, and a frustrated nurse, says Perlman.

Instead, ask the admitting physician to write orders for a patient-controlled analgesia (PCA) pump, she suggests. "Most hospitals have protocols and flow sheets already developed for PCA," she notes. (See **Patient Controlled Analgesia Order Form, Patient Controlled Analgesia procedure, and PCA Flow Sheet, inserted in this issue.**)

Perlman cautions that you will need to check the patient's allergies, make sure the patient is on a SaO₂

monitor, and follow the protocol for your hospital.

Most PCA pumps are not complicated, and many ED nurses already know how to set them up, notes Perlman. She suggests having clinical pharmacists and nurses on the surgical floors inservice ED staff and provide support the first few times that the pumps are used.

"Patients will be far more comfortable and satisfied, and the nurses [will be] better organized by using PCA pumps," she says. ■

[Editor's Note: For more information about using PCA pumps in the ED, contact: Kathryn Perlman, MS, RN, Emergency Department, Presbyterian Hospital of Dallas, 8200 Walnut Hill Lane, Dallas, TX 75231-4496. Telephone: (214) 345-6301. Fax: (214) 345-6486. E-mail: KathrynPerlman@texashealth.org.] ■

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Editorial Questions

For questions or comments, call
Joy Daughtery Dickinson
at (229) 377-8044.

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Editor: Staci Kusterbeck.
Vice President/Group Publisher: Brenda Mooney.
Senior Managing Editor: Joy Daughtery Dickinson,
(joy.dickinson@ahcpub.com).

Production Editor: Nancy McCreary.

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CEquestions

21. Which of the following is true regarding confusion between the flu and anthrax, according to Steve Weinman, RN, BSN, CEN, director of the Office of Continuing Medical Education and the Center for Nursing Education and per diem instructor in emergency and trauma care at New York Presbyterian Hospital — Cornell Medical Center?
 - A. The rapid-flu test can rule out anthrax if positive.
 - B. The rapid-flu test can only rule out anthrax if the patient does not have other symptoms.
 - C. Most EDs provide rapid-flu tests.
 - D. The rapid-flu test will not rule out anthrax even if positive.
22. Which of the following is true regarding the blood-thinning drug ReoPro, according to Janet Williams, RN, MSN, CCRN, clinical trials nurse coordinator for the department of emergency medicine at the University of Cincinnati?
 - A. Currently, there are no indications for the drug in the ED.
 - B. Administering ReoPro in the ED allows patients to be electively scheduled, instead of emergently scheduled, for coronary angiography.
 - C. Patients scheduled for coronary angiography should not be given ReoPro.
 - D. It is not necessary to monitor platelet counts for patients given ReoPro.
23. Which of the following is true regarding translators for a non-English-speaking ED patient, according to Ruth Davidhizar, RN, DNS, CS, FAAN, dean of nursing at Bethel College?
 - A. It is not preferable for translators to have a medical background.
 - B. Family members are the best choice for translators.
 - C. Translators are only needed during the patient assessment.
 - D. Translators are needed throughout the ED visit.
24. Which of the following is true regarding the influenza vaccine, according to recommendations of the Atlanta-based Centers for Disease Control and Prevention?
 - A. The influenza vaccine is made of live influenza viruses.
 - B. The influenza vaccine is contraindicated for immunosuppressed adults.
 - C. Pregnant women are at high risk for complications from the vaccine.
 - D. Breast-feeding mothers should be vaccinated.

CE objectives

[For more information on the CE program, contact American Health Consultants at (800) 688-2421.]

After reading this issue of *ED Nursing*, the CE participant should be able to:

1. Identify clinical, regulatory, or social issues relating to ED nursing. (See *Is it anthrax or the flu? Take steps to protect yourself and your patients; Improve care of patients with new cardiac drug; and Patients who don't speak English pose challenges* in this issue.)

2. Describe how those issues affect nursing service delivery.

3. Cite practical solutions to problems and integrate information into the ED nurse's daily practices, according to advice from nationally recognized experts. ■

Source: Darlene Bradley, RN, University of California Irvine Medical Center.

Children and Anthrax: A Fact Sheet for Parents

Recent news reports of anthrax cases in several U.S. cities may have created fear among both children and adults. The Centers of Disease Control and Prevention (CDC) has prepared this fact sheet to provide parents with information and resources to 1) help their children cope with their fears about anthrax and 2) make decisions related to anthrax and their children.

How To Reduce Children's Fears

■ Help your children feel safe.

Let them talk about their fears and worries. Stick to family routines that help children feel comfortable and secure. Reassure them that parents, teachers, doctors, and government officials are doing everything possible to keep them safe and healthy.

■ Limit children's viewing of television news.

Children may be frightened, overwhelmed, or traumatized by news reports about bioterrorism. Supervise what they watch on television, and when they do watch, be sure to allow for family-discussion time during and after viewing to let them air their fears and concerns.

■ Arm yourself with the facts.

Education is your best protection against unnecessary fear. Your children will be less fearful if they see that you are not afraid and if you spend time with them answering all of their questions.

What Every Parent Should Know



Anthrax is an illness caused by bacteria called *Bacillus anthracis*. These bacteria are found naturally in the soil. They can form a protective coat around themselves called spores, and they can release poisonous substances into the bodies of infected people.

You and your children cannot catch anthrax from each other or from any other person.

Even if you were to become sick with anthrax, you could **not** pass on the illness to your children. Also, even if someone were to put the bacteria that causes anthrax in your workplace on purpose, it is highly unlikely that you would carry the bacteria home to your children on your clothes or hair.

People come into contact with (are "exposed" to) bacteria or become infected with bacteria that cause anthrax in three ways. They can be exposed and infected by breathing in (inhaling) the bacteria, by coming into contact with the bacteria through cuts or abrasions in the skin, or by eating something that contains the bacteria (usually undercooked meat from an infected animal). The chance of coming into contact with the bacteria in any of these ways is very low. Also, our bodies have defenses against bacteria, so not everyone who comes into contact with the bacteria will become ill with anthrax.

There are three kinds of anthrax, all of which are treatable with antibiotics:

■ **Skin (cutaneous) anthrax** is the least serious form of anthrax. The first symptom is a small, painless sore that develops into a blister. One or two days later, the blister develops a black scab in the center.

■ **Gastrointestinal anthrax** is more serious than skin anthrax. The initial symptoms are nausea, loss of appetite, and fever, followed by severe abdominal pain. This is the least common form of anthrax.

■ **Inhalational anthrax** is the most serious form of anthrax. This illness begins with symptoms similar to those for a cold or the flu. If caught early, inhalation anthrax can be treated successfully with antibiotics. If it isn't caught early and more serious symptoms develop, inhalation anthrax usually results in death. Almost all cold and flu symptoms are **not** anthrax.

The signs and symptoms of anthrax infection in children older than 2 months of age are similar to those in adults. The illness affects children and adults in much the same way, though children may be more likely to suffer side effects from some of the antibiotics used to prevent or treat the disease.

Although you may be tempted to ask your doctor for a supply of antibiotics to keep on hand, neither the CDC nor the American Academy of Pediatrics recommends doing this. You should not obtain antibiotics for your children unless public health authorities have confirmed that it is likely that your children have come into contact with the bacteria that cause anthrax. Giving your children antibiotics when the antibiotics are not needed can do more harm than good. Many antibiotics have serious side effects in children, and using antibiotics when they are not needed can lead to the development of drug-resistant forms of bacteria in your children. If this happens, the antibiotics will not be able to kill the resistant bacteria the next time your child needs the same antibiotic to treat ear, sinus, or other infections that children frequently develop.

Currently, there is no anthrax vaccine for children. The anthrax vaccine used for adults has never been studied in children, and it is not recommended for people younger than 18 years old. It is currently available only for people in the military service, although public health officials are now considering its use for people in other high-risk professions.

The chances of your children coming into contact with bacteria that cause anthrax are extremely low. However, if public health officials confirm or suspect that you or your children have come into contact with the bacteria, your doctor or other health official will prescribe antibiotics to keep you and your children from developing anthrax. Early identification and treatment of anthrax in children is critical, so call your health care provider immediately with any questions or concerns. Remember: *Never give your child an antibiotic unless a doctor has examined your child and prescribed an antibiotic.* Also, be sure to use any antibiotic exactly as directed by the doctor or pharmacy.

Where to Get More Information

The American Academy of Pediatrics web site addresses numerous issues related to anthrax, bioterrorism, and children. You can access these topics at www.aap.org/advocacy/releases. Suggestions for helping children after a disaster are available at the web site of the American Academy of Child and Adolescent Psychiatry at www.aacap.org/publications/factsfam/disaster.htm. The CDC also offers information on a wide range of bioterrorism topics at www.bt.cdc.gov.

Source: Centers for Disease Control and Prevention, Atlanta.

Frequently Asked Questions About Anthrax

What are the signs and symptoms of anthrax?

Symptoms of disease vary depending on how the disease was contracted, but symptoms usually occur within seven days.

Cutaneous anthrax is the most common naturally occurring type of infection (>95%) and usually occurs after skin contact with contaminated meat, wool, hides, or leather from infected animals. The incubation period ranges from 1-12 days. The skin infection begins as a small papule, progresses to a vesicle in 1-2 days, followed by a necrotic ulcer. The lesion is usually painless, but patients also may have fever, malaise, headache, and regional lymphadenopathy. Most (about 95%) anthrax infections occur when the bacterium enters a cut of abrasion on the skin. Skin infection begins as a raised bump that resembles a spider bite, but (within 1-2 days) it develops into a vesicle and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are rare if patients are given appropriate antimicrobial therapy.

Inhalational anthrax is the most lethal form of anthrax. Anthrax spores must be aerosolized in order to cause inhalational anthrax. Studies show that 4,000–5,000 spores must be present to cause an infection. The incubation period of inhalational anthrax among humans is unclear, but it is reported to range from 1-7 days, possibly ranging up to 60 days. It resembles a viral respiratory illness and initial symptoms include sore throat, mild fever, muscle aches, and malaise. These symptoms may progress to respiratory failure and shock, with meningitis frequently developing.

Gastrointestinal anthrax usually follows the consumption of raw or undercooked contaminated meat and has an incubation period of 1-7 days. It is associated with severe abdominal distress followed by fever and signs of septicemia. The disease can take an oropharyngeal or abdominal form. Involvement of the pharynx is usually characterized by lesions at the base of the tongue, sore throat, dysphagia, fever, and regional lymphadenopathy. Lower bowel inflammation usually causes nausea, loss of appetite, vomiting and fever, followed by abdominal pain, vomiting blood, and bloody diarrhea.

What specific symptoms should I watch for?

Persons should watch for the following symptoms:

- fever (temperature greater than 100° F);
- flu-like symptoms (cough, fatigue, muscle aches), nausea, vomiting, or diarrhea;
- a sore, especially on your face, arms, or hands.

Is anthrax contagious?

No. Anthrax is not contagious; the illness cannot be transmitted from person to person.

What is the difference between exposure to anthrax and disease caused by anthrax?

A person can be exposed to anthrax when that person comes in contact with the anthrax bacteria and a culture taken from that person is positive for anthrax. A person can be exposed without having disease. A person who might have come in contact with anthrax, but without a positive culture might be potentially exposed. Disease caused by anthrax occurs when there is some sign of illness, such as the skin lesion that occurs with cutaneous anthrax.

A person who is exposed to anthrax but is given appropriate antibiotics can avoid developing disease.

Can I be exposed to anthrax via mail?

Letters containing *Bacillus anthracis* (anthrax) have been received by mail in several areas in the United States. In some instances, anthrax exposures have occurred, with several persons becoming infected. To prevent such exposures and subsequent infection, all persons should learn how to recognize a suspicious package or envelope and take appropriate steps to protect themselves and others.

What kind of mail should be considered suspicious?

Identifying Suspicious Packages and Envelopes

Some characteristics of suspicious packages and envelopes include the following:

- **Inappropriate or unusual labeling:**

- excessive postage;
- handwritten or poorly typed addresses;
- misspellings of common words;
- strange return address or no return address;
- incorrect titles or title without a name;
- not addressed to a specific person;
- marked with restrictions, such as "Personal," "Confidential," or "Do not X-ray";
- marked with any threatening language;
- postmarked from a city or state that does not match the return address.

- **Appearance:**

- powdery substance felt through or appearing on the package or envelope;
- oily stains, discolorations, or odor;
- lopsided or uneven envelope;
- excessive packaging material such as masking tape, string, etc.

- **Other suspicious signs:**

- excessive weight;
- ticking sound;
- protruding wires or aluminum foil.

If a package or envelope appears suspicious, DO NOT OPEN IT.

What should people do who get a letter or package with powder?

Tips for handling suspicious packages or envelopes:**

- Do not shake or empty the contents of any suspicious package or envelope.
- Do not carry the package or envelope, show it to others, or allow others to examine it.
- Put the package or envelope down on a stable surface; do not sniff, touch, taste, or look closely at it or at any contents that may have spilled.
- Alert others in the area about the suspicious package or envelope. Leave the area, close any doors, and take actions to prevent others from entering the area. If possible, shut off the ventilation system.
- WASH hands with soap and water to prevent spreading potentially infectious material to face or skin. Seek additional instructions for exposed or potentially exposed persons.
- If at work, notify a supervisor, a security officer, or a law enforcement official. If at home, contact the local law enforcement agency.
- If possible, create a list of persons who were in the room or area when this suspicious letter or package was recognized and a list of persons who also may have handled this package or letter. Give this list to both the public health authorities and law enforcement officials.

** These recommendations were published on Oct. 26, 2001 in: Update: Investigation of bioterrorism-related anthrax and interim guidelines for exposure management and antimicrobial therapy. MMWR 2001; 50:909-919.

Can anthrax spores be killed on letters in the mail by microwave, ultraviolet light, or ironing?

While some of these methods may kill some spores, it is not known what procedures to use (e.g., length of time, temperature, etc.). Furthermore, because of insufficient data on the efficacy of these methods in inactivating anthrax spores, the Centers for Disease Control and Prevention does not recommend these techniques for reliable decontamination.

Can I get screened or tested to find out whether I have been exposed to anthrax?

There is no screening test for anthrax; there is no test that a doctor can do for you that says you've been exposed to or carry it. The only way exposure can be determined is through a public health investigation. The tests that you hear or read about, such as nasal swabs and environmental tests, are not tests to determine whether an individual should be treated. These kinds of tests are used only to determine the extent of exposure in a given building or workplace.

Source: Centers for Disease Control and Prevention, Atlanta.

BIOTERRORISM WATCH



Preparing for and responding to biological, chemical and nuclear disasters

Flu or anthrax? First inhalational cases yield clues for clinicians to make the critical call

Use case history, blood work, X-rays, rapid tests

There is a postal worker in your emergency department (ED) with flulike symptoms.

That once insignificant observation about occupation and illness now triggers a detailed algorithm created by the Centers for Disease Control and Prevention (CDC) in Atlanta. (**See algorithm, p. 2.**) Is it flu or inhalational anthrax? Whether a realistic question or not, it is what many of your incoming patients may be asking — particularly if another wave of anthrax scares coincides with a nasty influenza season. Many of the initial symptoms are similar, but investigators dealing with the first inhalational anthrax cases have gleaned out key indicators that will help clinicians make the call.

"It is important to take a careful history from the [patients] when they present," says **Julie Gerberding, MD**, acting deputy director of CDC's National Center for Infectious Diseases. "If the [patients are] mail handlers in a professional environment — where they're dealing with large amounts of mail that is not their own — then the index of suspicion should be raised and more testing should be done to be sure there aren't additional clues to suggest that it is not a common viral infection."

Using the first 10 cases of inhalational anthrax as a baseline patient profile, the CDC reports that the median age of the patients was 56 years (range: 43-73 years), and seven were men.¹

The incubation period from the time of exposure to onset of symptoms when known (seven cases) was seven days (range: five to 11 days).

The initial illness in the patients included fever (nine) and/or sweats/chills (six). Severe fatigue or malaise was present in eight, and minimal or nonproductive cough in nine. One had blood-tinged sputum. Eight patients reported chest discomfort or pleuritic pain. Abdominal pain or nausea or vomiting occurred in five, and five reported chest heaviness. Other symptoms included shortness of breath (seven), headache (five), myalgias (four), and sore throat (two). The mortality rate was 40% for the 10 patients, much lower than historical data indicated. Indeed, one of the critical reasons to recognize inhalational anthrax early is that it is far more treatable than originally thought.

The CDC gathered comparative data on the symptoms and signs of anthrax and influenza, finding, for example, that only 20% of the anthrax patients reported sore throat.² Flu sufferers report a sore throat in 64% to 84% of cases. Likewise, 80% of the anthrax cases reported symptoms of nausea and vomiting. That symptom is reported in only 12% of flu cases. Shortness of breath appears to be another key distinguishing symptom, affecting 80% of the anthrax patients but seen in only 6% of flu patients.

"One of the other clues that we are noticing is that the patients with inhalation anthrax actually do not have nasal congestion or a runny nose,"

(Continued on page 3)

This supplement was prepared by Gary Evans, editor of *Hospital Infection Control*. Telephone: (706) 742-2515. E-mail: gary.evans@ahcpub.com.

Clinical Evaluation of People with Possible Inhalational Anthrax

Source: Centers for Disease Control and Prevention. Update: Investigation of bioterrorism-related anthrax and interim guidelines for clinical evaluation of persons with possible anthrax. *MMWR* 2001; 50:945.

Gerberding says. "They don't have the symptoms of an upper-respiratory tract infection. They have a more systemic chest presentation, and that may be another distinguishing characteristic."

Another finding on initial blood work is that none of the inhalational anthrax patients had a low white blood cell count (WBC) or lymphocytosis when initially evaluated. Given that, CDC officials note that future suspect cases with low WBC counts may have viral infections such as influenza. Chest X-rays were abnormal in all patients, but in two an initial reading was interpreted as within normal limits. Mediastinal changes including mediastinal widening were noted in all eight patients who had CT scans. Mediastinal widening may be subtle, and careful review of the chest radiograph by a radiologist may be necessary, the CDC advises.

Complementing the CDC's effort, are the observations of the few clinicians who have actually seen inhalational anthrax cases come into their hospital systems. Two inhalational anthrax cases, both of which survived, were admitted to the Inova Healthcare System in Fairfax, VA (near Washington, DC).

"Clinically, I think the history of the people who presented here is useful," says **Allan J. Morrison Jr.**, MD, MSc, FACP, health care epidemiologist for the Inova system. "They stutter-stepped toward their pulmonary symptoms. That had some mild symptoms and then they were sort of 'meta-stable.' They were not relentlessly progressing. Then they progressed with symptoms more aggressively. Whereas with influenza — in our experience — once you start to get sick, it just keeps on progressing with very high fevers, chills, muscle aches, and pains. As a consequence, we feel there should be a good way to differentiate the two."

Since anthrax is a realistic concern in the Washington, DC, area, what about the aforementioned scenario of symptomatic postal workers in the ED?

"We would take a very aggressive history, not only of occupation but physically where they have been," Morrison says. "If they are symptomatic and have been in or work around a 'hot zone' — a location from which anthrax has either been cultured environmentally or patients have come from there — we will err on the side of being very aggressive about working up anthrax. By that I mean chest X-rays, chemistry profile, [etc.]"

In addition, the hospital system pushed early flu vaccination programs for staff and the surrounding community. "We want to move toward

herd immunity," he says. "We are also working with our local hospitals to make sure that they have access to the rapid influenza tests. So for diagnosis — for obvious reasons — it is very helpful to make that distinction early."

One such rapid test is ZstatFlu (ZymeTX Inc., Oklahoma City), which the company claims can yield a diagnosis of influenza A or B some 20 minutes after a throat swab. The test detects neuraminidase, an influenza viral enzyme. However, Gerberding cautions clinicians not to rely solely on such tests. Rather, they should use the results of tests in combination with the patient history and clinical presentation, she says.

"So it is a constellation of history, clinical findings, and laboratory tests," she says. "Hopefully, when we get these all together, we'll be able to at least reduce the anxiety among some people and help clinicians diagnose those patients who really do require the antibiotic treatment. What we don't want to happen is for everybody coming in with the flu to get an antibiotic because that undermines a whole other set of public health issues relating to antimicrobial resistance and proper management of influenza."

Even the vaccinated can still have flu

Complicating the issue is the fact that the flu vaccine efficacy can vary annually, but is usually 70% to 90% protective, says **Keiji Fukuda**, MD, a medical epidemiologist in the CDC influenza branch. Thus, depending on how well the vaccine matches the circulating strain, a certain portion of flu patients will tell clinicians they have been immunized. But in addition to vaccine breakthrough infections, there is a plethora of other viral and respiratory pathogens that will be creating similar symptoms, he says. In a somewhat sobering reminder — given that at this writing, the total anthrax cases remained in the double digits — Fukuda notes that a typical flu season will send 114,000 people to the hospital and 20,000 to their graves.

"There has been an awful lot of attention on the [anthrax] cases, but the bottom line is that there have been few cases, and these cases generally have occurred in a limited number of communities within a limited number of groups," he says. "And so the epidemiologic message is that anthrax really has not been diagnosed in most parts of the country, whereas we expect to see millions and millions of flu cases all over the place."

If facilities are faced with an onslaught of patients with respiratory illness there are several measures they can take, he notes. Those include:

- Reduce or eliminate elective surgery.
- Relax staff-to-patient ratios within the limits of your licensing agency.
- Emphasize immunizing staff so more staff are available.
- Identify ways to bring in extra staff to help out with the patients.
- Set up walk-in flu clinics to triage the patients.

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CDC moving quickly on smallpox front

Immunizations, training, vaccine dilution studied

Though officially stating it has no knowledge of any impending use of smallpox as a bioweapon, the Centers for Disease Control and Prevention (CDC) is scrambling with conspicuous speed to be ready for just such an event.

CDC workers from a variety of specialties are not only receiving smallpox vaccinations, they are being trained to give them to others using the old bifurcated needle scarification technique. And, even as creation of a new vaccine is fast-tracked, researchers are trying to determine if the current stockpile of 15.4 million doses can be expanded fivefold by simply diluting the vaccine.

Based on such actions, it is fair to say the agency is at least highly suspicious that the known stocks of smallpox virus are not safely ensconced in their official repositories in Russia and the United States.

"CDC is putting together a number of teams, which will probably total [more than] 100 employees, that could be quickly dispatched in a moment's notice to assist state and local health departments and frontline clinicians investigate suspect cases of smallpox," **Tom Skinner**, a

spokesman for the CDC, tells *Bioterrorism Watch*.

"They are Epidemic Intelligence Service (EIS) officers, laboratorians, and others. Part of this includes vaccinating them against smallpox," he explains.

But while confirming that the CDC teams are being trained to administer the vaccine, Skinner would not specify who would be vaccinated following a smallpox bioterror event. "We have a smallpox readiness plan," he says. "Issues around vaccination are covered in that plan. That plan is being finalized. It is considered an operational plan. If we have a case tomorrow, it could be implemented. It covers who should be vaccinated and when."

The general consensus among bioterrorism experts is that those exposed would be vaccinated because the vaccine can prevent infection and possibly death even if given several days out. Likewise, health care workers and their family members would want vaccine if they were expected to care for the infected. Some aspect of quarantine would no doubt come into play because, unlike anthrax, it will be critical to separate the first smallpox cases and their contacts from the susceptible population.

Another aspect of CDC preparations includes the smallpox vaccine dilution study, which is being headed up by **Sharon E. Frey**, MD, associate professor of infectious diseases and immunology at Saint Louis University School of Medicine.

The vaccine, known as Dryvax, is no longer produced, but there are 15.4 million doses left. Frey and colleagues are looking at dilution studies that could maintain vaccine efficacy while increasing the available stock by millions of doses. In a study last year, Frey tried a one to 10 vaccine dilution, which would create a stockpile of more than 150 million doses. However, the resulting vaccine had only a 70% effective rate.

"The undiluted vaccine has about a 95% take rate," she tells *BW*. "It is not perfect, but we would like to be as close to that as we could be."

The new study will include a one to five dilution, which should show greater efficacy while increasing the stockpile to more than 75 million doses.

"We are looking at a 'take' rate for the vaccine, in other words how many people actually develop a typical lesion and whether they have a strong neutralizing antibody response to the vaccine," Frey says. "We know that the vaccine is still good. We actually titrated the vaccine and it is very similar to its original titer," she adds. ■

Cold or flu?

Question: How do I know if I have a cold or the flu?

Answer: Influenza (flu) and a cold are both respiratory (breathing) infections caused by viruses. Some of the symptoms are similar, and it can sometimes be difficult to tell if you have the flu or a very bad cold. The flu can cause more serious illness than a common cold. Your best protection against the flu is an annual flu shot. You can decrease your chances of getting a cold by frequently washing your hands and avoiding touching your nose, eyes, and mouth. The average adult gets 1-3 respiratory (breathing) illnesses each year, and children get even more. However, it would be unusual to get flu more than once a year.

Sometimes you can get a bacterial infection of the middle ear or sinuses at the same time or following a cold or the flu. These bacterial infections can be treated with antibiotics. The flu, however, can lead to more serious complications such as pneumonia and sometimes death. People who have the greatest risk of severe complications from flu are those 65 years old or older and those with certain medical conditions.



Colds usually begin slowly, two to three days after infection by the virus, and normally last only two to seven days. A bad cold can last up to two weeks, but this is unusual. You first will notice a scratchy, sore throat, followed by sneezing and a runny nose. You may get a mild cough several days later. Adults and older children usually don't have a fever, but if they do, it will be very mild. Infants and young children, however, sometimes run temperatures up to 102° F (39° C).

If you have the flu, you will have a sudden headache, dry cough, and you might have a runny nose and a sore throat. Your muscles will ache, you will be very tired, and you can have a fever up to 104° F (40° C). Most people feel better in a couple of days, but the tiredness and cough can last two weeks or longer.

The flu is a respiratory (breathing) illness. You cannot have a "stomach flu." Symptoms such as nausea, diarrhea, and vomiting are uncommon with the flu, except in very young children. Check with your health care provider if you have questions about the diagnosis and treatment of these illnesses. The following chart compares the symptoms of the flu and the common cold.

Symptoms	Cold	Flu
Fever	Rare in adults and older children, but can be as high as 102° F in infants and small children	Usually 102° F, but can go up to 104° F and usually lasts 3-4 days
Headache	Rare	Sudden onset and can be severe
Muscle aches	Mild	Usual, and often severe
Tiredness and Weakness	Mild	Can last two or more weeks
Extreme exhaustion	Never	Sudden onset and can be severe
Runny nose	Often	Sometimes
Sneezing	Often	Sometimes
Sore throat	Often	Sometimes
Cough	Mild hacking cough	Usual, and can become severe

Source: Centers for Disease Control and Prevention, Atlanta.

Source: Presbyterian Hospital of Dallas.

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ED Nursing

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When looking for information on a specific topic, back issues of ED Nursing newsletter, published by American Health Consultants, may be useful. To obtain 2001 back issues, go on-line to www.ahcpub.com. Click on the section titled "on the Web," and then "AHC Online." Or, contact our customer service department at P.O. Box 740060, Atlanta, GA 30374. Telephone: (800) 688-2421 or (404) 262-7436. Fax: (800) 284-3291 or (404) 262-7837. E-mail: customerservice@ahcpub.com. Senior Managing Editor: Joy Daugherty Dickinson.

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