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Stealth *C. diff*: Asymptomatic carriers add another threat to emerging pathogen

CDC: 'We are not at the point of saying go after asymptomatic carriers.'

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Investigators have found that asymptomatic carriers of *Clostridium difficile* "have the potential to contribute significantly to disease transmission," including causing infections with the highly toxigenic strain that has plagued hospitals with severe outbreaks.¹ Stealth *C. diff* transmission is the last thing infection control professionals want to think about, especially when it is hard enough to contain the emerging pathogen by focusing on active cases with typical symptoms such as diarrhea.

Despite the findings, a leading *C. diff* researcher at the Centers for Disease Control and Prevention told *Hospital Infection Control* that ICPs still should focus their primary prevention efforts on long-term care residents and hospital patients with active, symptomatic infection. "At least in outbreaks, controlling *C. diff* transmission at the point of containing the patient with active disease appears to be able to control [spread]," says L. Clifford McDonald, MD, acting chief of the prevention and response branch at the CDC division of healthcare quality promotion. "We are not at the point of saying, 'Go after asymptomatic carriers.'"

Though the study focused on long-term care, the same problem may be fueling transmission in hospitals as residents are admitted as patients, says Curtis Donskey, MD, co-author of the study and director of infection control at the Cleveland VA Medical Center. "The [findings] are applicable to hospitals because 33% of the patients who were asymptomatic carriers were sent to our acute care hospital during the six months after the study was completed," he says. "These patients are often coming from the nursing home and they are carrying *C. difficile* on their skin."

Clinical factors, such as previous *C. diff*-associated disease and recent antibiotic use, may be predictive of asymptomatic carriage, the study found. Conceding that some attempt at active surveillance cultures is not practical for *C. diff* patients, Donskey suggested using a predictive model to trigger precautionary isolation during an outbreak. "If you just looked at patients that had a previous history of *C. diff* or had been on antibiotics

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in the past three months, that would predict about two-thirds of patients who had asymptomatic carriage," he says. "So hospitals that don't have the ability to do an anaerobic culture easily can identify a lot of the patients who are asymptomatic carriers."

However, there remain a portion of such asymptomatic patients who slip through the predictive model. "Patients will acquire the organism and become an asymptomatic carrier, but never get any kind of disease," Donskey says. "The patients develop an immune response and carry it asymptotically."

In that regard, the research raises questions about

how many asymptomatic carriers of *C. diff* with no history of long-term care residency may be reservoirs for transmission in hospitals. "There is no question that our data pertain mostly to long-term care, but we are currently doing some more studies to try and extend this to our acute care facilities to see how common it is," Donskey says. "It is probably less common overall in the acute care hospital, but we suspect it is still going to be significant."

Virulent strain detected

The findings also are troubling because the researchers discovered asymptomatic carriers had skin contamination with *C. diff* strains that included the toxigenic strain (ribotype 027) that has caused severe hospital outbreaks with heightened mortality. "About 37% of the asymptomatic carriers had the epidemic strain," reports **Michelle Riggs, BS**, lead author of the study and lab manager at the medical center. "It produces a higher amount of toxins in the body. Some of the literature says that the epidemic strain actually produces more spores. It is possible that because it produces more spores and it is resistant to more drugs, that it could be a lot harder."

Adds Donskey, "We were a little bit surprised. The question we had going in to the study was since this strain is more virulent and toxic, are we going to see it being carried asymptotically like other strains? We expected to see some, but people may be a little surprised that a strain we think of as so virulent can be carried by people without any symptoms."

However, some level of asymptomatic carriage of the epidemic strain is not surprising, McDonald says. The strain has been detected in retail meats and in community-acquired cases of *C. diff*. (See related story, p. 125.)

"After someone has had *C. diff* many will continue to carry it," McDonald says. "Other asymptomatic people that have not had actual *C. diff* disease get it by nosocomial transmission in health care and long-term care settings. Did they get it from an asymptomatic person or an active person? We think it is primarily the symptomatic [patients], but there probably is some transmission from the [asymptomatic patients]."

Despite conceding that some low level of transmission may be occurring via asymptomatic *C. diff* carriers, McDonald emphasized that the focus should remain on *C. diff* patients with common symptoms such as diarrhea because they are the

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Editorial Questions

For questions or comments, call **Gary Evans** at (706) 310-1727.

Adjunct IC measures to use in *C. diff* outbreak

Consider if asymptomatic carriers suspected

Infection control professionals at the Cleveland VA Medical Center took several additional prevention measures because they suspected asymptomatic *Clostridium difficile* carriers were fueling an outbreak in their long-term care facility.¹ The authors' interventions — which, we remind, were taken during an outbreak — are summarized as follows:

- **Sporicidal disinfectant:** Because environmental surfaces in asymptomatic carriers' rooms may frequently be contaminated with spores, use of sporicidal disinfectants may be indicated in outbreak settings. Given the high rate of asymptomatic carriage in the long-term care facility, they used a 10% bleach solution for terminal cleaning of all rooms after patients were discharged or transferred from the ward.

- **Emphasis on glove use:** Because alcohol-based hand hygiene products do not kill spores, use of gloves may be indicated when caring for patients at high risk for asymptomatic carriage in the context of an outbreak of *C. difficile* infection.

- **Extending isolation:** Current guidelines recommend discontinuation of contact precautions for patients with *C. diff*-associated disease (CDAD) after diarrhea resolves, but it may be reasonable to extend the duration of contact precautions until the time when the patient is discharged from the hospital. In the study, nearly one-fourth of asymptomatic carriers had had a previous episode of CDAD. A previous study found that as many as one-half of patients with CDAD continued to excrete spores in stool after resolution of diarrhea.²

- **Clinical prediction rule:** Because active surveillance for asymptomatic carriage of *C. difficile* may not be feasible in many health care facilities, a sensitive clinical prediction rule could be useful to allow identification of patients at high risk for carriage. The researchers found that a prediction rule based on history of previous CDAD and antibiotic use in the previous three months had 77% sensitivity to detect asymptomatic carriage.

Addition of fecal incontinence as a third variable in the prediction rule increased sensitivity to 83%, with only a modest reduction in specificity.

- **A question of personal hygiene:** Another infection control measure was suggested in an accompanying editorial commentary by **Carlene Muto**, MD, director of infection control at the University of Pittsburgh Medical Center.³ Noting the authors' emphasis on recovery of *C. diff* from the skin of residents in the study, she questioned whether an upgrade in personal hygiene might be part of the solution. "Before routine cleaning procedures are expanded to include a bleaching step, perhaps a more rigorous personal hygiene initiative could be developed," she wrote.

Asked to respond by *Hospital Infection Control*, **Curtis Donskey**, MD co-author of the study and director of infection control at the Cleveland VA Medical Center, e-mailed the following response:

"We didn't look at the personal hygiene of our patients, but we agree with Dr. Muto's point and are currently looking into how well standard hospital bathing practices remove *C. difficile* from skin. Several researchers have recently reported that daily bathing with chlorhexidine may be a useful infection control strategy for hospital pathogens such as *Staphylococcus aureus* and vancomycin-resistant enterococcus. Chlorhexidine kills many pathogens but not *C. difficile* spores, so more work is needed to determine the best approach to remove *C. difficile*. Because we found *C. difficile* spores on skin and in the environment, we think that the optimal infection control approach will have to address both skin and environmental contamination."

References

1. Riggs MM, Sethi AK, Zabarsky TF. Asymptomatic carriers are a potential source for transmission of epidemic and nonepidemic *Clostridium difficile* strains among long-term care facility residents. *Clin Infect Dis* 2007; 45: (Oct. 15, 2007 issue) published electronically at <http://www.journals.uchicago.edu/CID/>.
2. McFarland LV, Elmer GW, Surawicz CM. Breaking the cycle: Treatment strategies for 163 cases of recurrent *Clostridium difficile* disease. *Am J Gastroenterol* 2002; 97:1,769-1,775.
3. Muto CA. Asymptomatic *Clostridium difficile* colonization: Is this the tip of another iceberg? Editorial commentary. *Clin Infect Dis* 2007; 45:999-1,000. ■

most likely source of transmission. "Someone with diarrhea is much more of a contagion risk," he says. "The question right now is do we have enough data to say that the contagion risk from asymptomatics is great enough that we should be isolating all these people using some kind of active surveillance mechanism? First of all, we are going to need some tests that would make it easier to do that, and I suspect that they will be available soon. But then we are going to have to see some evidence that it really contributes to containment [of infection transmission]."

Even if asymptomatic *C. diff* carriers could be easily identified, it still would raise several other thorny issues, including placing ever more patients in isolation and the lack of an effective decolonization protocol, he adds. "It won't work with metronidazole," he says. "And with vancomycin, all you will do is get the bug back when they stop the vanc and then they will carry it even longer. We have [insufficient] data right now to say that we should be trying to detect these asymptomatics and put them in isolation."

Skin carriage common

Overall, the Cleveland VA study found that 35 (51%) of 68 asymptomatic patients were carriers of *C. diff*, and 13 (37%) of the patients carried epidemic strains. Compared with noncarriers, asymptomatic carriers had higher percentages of skin (61% vs. 19%) and environmental contamination (59% vs. 24%). Eighty-seven percent of isolates found in skin samples and 58% of isolates found in environmental samples were identical to concurrent isolates found in stool samples. "Some observations from our study were unexpected," the authors noted. "First, approximately one-fifth of patients with negative stool culture results had skin and environmental culture results positive for *C. difficile*. We hypothesize that the presence of *C. difficile* on skin may have been attributable to prior stool carriage or to levels of stool colonization that were below the limit of detection." Although numerous studies have evaluated environmental *C. difficile* contamination, a new finding was the frequency of skin contamination among patients with active disease and asymptomatic carriers. Most concerning, "Spores on the skin of asymptomatic patients were easily transferred to investigators' hands," the authors concluded.

Though the findings strongly suggest that asymptomatic carriers may contribute to transmission of *C. difficile* infection, the authors con-

cede that molecular typing of strains acquired by patients will be necessary to confirm that the exact strains from asymptomatic carriers are being transmitted. They did find that three subtypes carried by asymptomatic carriers were identical to isolates in infected patients. Although some epidemiological studies have suggested that asymptomatic carriers play a relatively minor role in disease transmission, the researchers also cited another paper that reported nosocomial acquisition of *C. diff*-associated disease (CDAD) in a hospital ward was epidemiologically linked to transmission from new, asymptomatic patients admitted to the ward.²

"It's been known over the years that there are a fair number of patients who carry *C. difficile* asymptotically," Donskey says. "The presumption has been if you don't have diarrhea you are probably less likely to be a source for transmission. But [there is some research] that suggests that these patients could be important. People have kind of downplayed this data in the past, but it is a question that has come up with these current outbreaks that are going on. Maybe we should revisit this whole question of how important they are in transmission."

Control measures typically used for patients with suspected or documented CDAD include contact precautions until diarrhea has resolved, with patient rooms cleaned with a 10% bleach solution upon discharge. The problem is that asymptomatic carriers might not even be put in isolation. "We found we could get *C. diff* on our hands after touching these asymptomatic patients," he says. "Not with the frequency of those patients who have active diarrhea, but for patients who are asymptomatic carriers most health care workers are not wearing gloves and are using an alcohol hand hygiene product that may not remove the spores if you get them on your hands."

Gloves, bleach cleaning emphasized

The medical center took several additional infection control measures to minimize the impact of asymptomatic carriers and halt the outbreak. Those included terminal cleaning of *all* patient rooms with a bleach solution, extending duration of contact precautions and a heavy emphasis on glove use. (**See article, p. 123.**) Glove use was emphasized more than switching completely to plain soap washes, which are considered more effective against *C. diff* than the alcohol hand rubs that are now ubiquitous in hospitals.

"We are trying to encourage using gloves more frequently in the hospital," Donskey says. "We

are trying to keep patients who had a history of *C. diff* in isolation longer and encouraging glove use for those patients."

Indeed, another thing to consider in an outbreak situation is keeping patients with *C. diff* in isolation even after symptoms resolve due to the possibility they have become asymptomatic carriers, he adds.

"I think 25% of the patients who were asymptomatic carriers had a previous history of *C. diff*," Donskey says. "They were treated, their symptoms resolved, but they were still shedding and they still had it on their skin. So, it makes sense that we might [extend precautions]. There is actually a lot of debate among infection control people about how long we should keep patients in isolation now. Our tendency is to lean toward being more conservative and keep these patients in isolation longer."

Adoption of a bleach cleaning regimen for all patient rooms appears to be the most effective intervention, he adds. "We used to use a regular hospital disinfectant, but those do not kill the *C. diff* spores. We made a switch so that all of our cleaning is done with bleach now. In the nursing home and even in the general hospital, we have gone toward using bleach for terminal cleaning of rooms. We have seen a significant decrease in our rates over the past year since we began using bleach throughout the institution."

Bleach cleaning is in line with CDC recommendations, but the focus should be terminal cleaning of rooms occupied by patients with active CDAD, particularly the bathroom, McDonald says.

"Frankly, if bleach cleaning had no downside to it you could say the more the better and just do the whole hospital," he adds. "But it does have downsides. It's caustic, corrosive, and there are ventilation issues. So until we have a sporicidal-like bleach that doesn't have those problems it makes sense to first focus on where the money is and that is in the known CDAD patient rooms. That is where our guidance leads people."

Still, ICPs facing an ongoing outbreak of *C. diff* in long-term care or hospital settings may want to consider some of the measures used at the Cleveland VA in case asymptomatic carriers are contributing to transmission, Donskey advises. "These patients could potentially play an important role in transmission," he says. "In the setting of outbreaks, if you are not getting a good response with the other measures, it would be reasonable to consider expanding terminal cleaning with bleach to rooms of patients that are not having diarrhea and potentially increasing the use of gloves in the hospital as well because the

spores may be getting on health care workers' hands and being transmitted to other patients. That is pretty much what we have done here in our hospital in response to this data."

Don't expect any national *C. diff* recommendations to change based on the study, including those being jointly created by the Society for Healthcare Epidemiology of America and the Infectious Disease Society of America, says McDonald, a consultant on those joint guidelines. "[They] are not going to say anything different than what we are saying right now in terms of going after asymptomatic patients," he says. "In terms of bleach cleaning, you certainly can go beyond the circle of known *C. diff* patient rooms, but what we are saying is to begin there and work your way out."

References

1. Riggs MM, Sethi AK, Zabarsky TF. Asymptomatic Carriers Are a Potential Source for Transmission of Epidemic and Nonepidemic *Clostridium difficile* Strains among Long-Term Care Facility Residents. *Clin Infect Dis* 2007; 45: (Oct. 15, 2007 issue) published electronically at <http://www.journals.uchicago.edu/CID/>
2. Clabots CR, Johnson S, Olson MM, et al. Acquisition of *Clostridium difficile* by hospitalized patients: Evidence for colonized new admissions as a source of infection. *J Infect Dis* 1992; 166:561-567. ■

Suspicion lingers *C. diff* transmitted by meat

No clusters, but could sporadic transmission occur?

Investigators are trying to verify or refute the lingering suspicion that an undefined level of *Clostridium difficile* is being transmitted to humans through meat in the food supply. The link has not been sufficiently established to unequivocally say *C. diff* is a foodborne pathogen, but a leading researcher says nearly 20% of cases may not be accounted for by traditional risk factors.

Concern is being fueled by cases of community-acquired *C. diff* and the fact that researchers have found that some retail meat samples tested positive for *C. diff* strains. (See *Hospital Infection Control*, February 2007, p. 13.) Research and analysis are continuing, but the most disconcerting finding is that *C. diff* strains detected include the highly toxigenic strain that has caused hospital outbreaks and infections in the community. A

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Halting LTC norovirus outbreak in eight days

ICP proves it can be done via aggressive measures

A norovirus outbreak can be notoriously difficult to control in a long-term care setting before it exacts a huge toll on residents and staff. However, rapid adoption of strict measures successfully kept the pathogen at bay while it was running rampant in a community outbreak, says **Mary Webb**, RN, BSN, MA, CIC, infection control and wound care professional at San Mateo (CA) Medical Center.

"[Our reaction] was immediate," she says. "The minute we had the second diarrhea we jumped on this without knowing [the etiologic agent]. I wanted to stop the spread of whatever was going on. I didn't know if it was somebody that had bad food or what. But when you work in long-term care, some things can spread very rapidly."

The emergence of two new strains of norovirus has resulted in increased reports of hospital and long-term care outbreaks, some of which appear to involve the first fatal infections with the virus reported in the United States, the Centers for Disease Control and Prevention reports.¹

Beginning in October 2006, emergency department visits for acute gastroenteritis (AGE) nationally started increasing. For example, in New York state alone, 333 AGE outbreaks were reported from Oct. 1, 2006, through Jan. 31, 2007. That is more than four times the number reported during the same period in 2005-2006 (76 outbreaks), the CDC found. Of those outbreaks, 272 (82%) occurred in long-term care facilities and 26 (8%) in hospitals. Of 216 health care facility outbreaks (both hospitals and long-term care) with available data, a total of 7,907 patients and 4,317 staff members were affected. Of these, 207 (2.6%) patients and 20 (0.5%) staff

members were hospitalized, and 16 deaths among patients with AGE were reported. In addition, two deaths in a Wisconsin nursing home were associated with AGE outbreaks in health care facilities. Illness compatible with norovirus infection also was the primary cause of death recorded for a resident of a long-term care facility in North Carolina.

In the San Mateo outbreak, it appears ongoing community transmission worked its way into the facility via visitors and staff members, Webb surmises.

"Two of our residents had visitors on a Sunday that came from an outside residential senior community that appeared to be having [an outbreak]," she says. "We implemented precautions right away, not knowing anything about [norovirus] and notified public health. We put our infection control guidelines out there very proactively and immediately."

Staff members who had been attending a family event may have brought it into the facility as well, she said, noting the outbreak peaked at 12 resident cases and 11 employee cases. "They hadn't been working when our patients were ill or even incubating, and some had been to a family event," she says.

Regardless, as aggressive control measures came into play, the outbreak was halted and the public health department lifted restrictions in eight days. The case numbers are small compared to many outbreaks, which can go for prolonged time periods. "It was in the one unit and it didn't cross over to the unit across the hall," Webb says. "It didn't go anywhere else because we just simply stopped it. If you worked in that unit you didn't move from that unit. The other [staff] were not allowed to come in. You've got to break the chain of transmission very early."

Steps to break the chain

Webb emphasizes that taking specific steps to prevent the virus from being transmitted from person to person can control outbreaks. Those include:

- **Limiting transmission when initial cases are suspected.**
 1. Close doors to long-term care nursing unit.
 2. Notify medical director.
 3. Place the isolation station over the entrance

door to the long-term care nursing unit (e.g., masks, gowns, gloves, hand hygiene supplies).

4. Place "Do not Enter" signs on door to the long-term care nursing unit.

5. Place isolation stations over door of each symptomatic resident room.

6. Discontinue staff "floating."

7. Ask family of symptomatic residents to avoid visitation.

8. Notify public health, communicable disease, licensing and certification authorities.

9. Begin line listing of residents who are symptomatic.

• **Instituting infection control measures without waiting for diagnostic confirmation.**

1. Do not admit to the unit.

2. Do not discharge from the unit.

3. Dedicate patient care equipment to a single resident or among symptomatic residents, adequate clean and disinfect before use for another resident.

4. Exclude nonessential personnel from the affected unit.

5. Clean hands before and after glove use.

6. Wear gowns and change between each resident contact.

7. Cancel or postpone group activities.

8. Increase frequency of routine ward bathroom and toilet cleaning.

9. Use EPA-approved disinfectant to disinfect surfaces.

10. Consider antiemetics for patients with vomiting.

11. Clean carpets and soft furnishing if contaminated.

Reference

1. Centers for Disease Control and Prevention. Norovirus Activity — United States, 2006-2007. *MMWR* 2007; 56(33):842-846. ■

IDSA strongly endorses federal antibiotic effort

Bill to create 'Office of Antimicrobial Resistance'

Clinicians have been traditionally skittish about the long arm of the law reaching into the realm of medicine, but no one is curbing

their enthusiasm about the potential benefits of a proposed federal law targeting the serious problem of antibiotic resistance.

STAAR Act 'snapshot'

Introduced by Reps. Jim Matheson (D-UT) and Michael Ferguson (R-NJ) H.R. 3697 — the Strategies To Address Antimicrobial Resistance (STAAR) Act — would improve the nation's capacity to control antibiotic resistance by establishing a network of experts across the country to conduct regional monitoring of resistant organisms as they occur — a kind of "snapshot" to pick up on problems early. The network would collaborate with the Centers for Disease Control and Prevention on disease surveillance. In a second major activity of the network, researchers also would work with CDC and the National Institutes of Health to find ways to slow the development of resistance.

"We need to determine the best ways to keep approved antibiotics working longer," says **Louis Rice**, MD, chair of Infectious Disease Society of America's research on resistance workgroup. "Currently, very little research is focusing on this. The STAAR Act network provides the range of experts we need to study the complex field of drug resistance."

The STAAR Act also creates a board of infectious diseases, public health and veterinary experts to advise the federal government on reducing resistance, and an Office of Antimicrobial Resistance in the Department of Health and Human Services to coordinate, help plan, and guide the government's response to resistance.

There are very few new drugs in the pipeline to replace the failing ones, because the pharmaceutical industry now finds developing new antibiotics less appealing than developing drugs for chronic conditions such as heart disease. "We are in danger of slipping backward to the era before antibiotics," adds **Martin J. Blaser**, MD, past president of IDSA. "The STAAR Act gets us back in the fight."

(Editor's note: Find a summary of the STAAR Act and other related information at www.idsociety.org/STAARAct.htm.) ■

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troubling footnote is that cooking may not kill the resilient spore-forming pathogen.

"We know it is in retail meats," says **L. Clifford McDonald**, MD, acting chief of the prevention and response branch at the CDC division of healthcare quality promotion. "But we do believe from the epidemiology that we can sort out that about 80% of all *C. diff* in humans appears to be health care-associated."

Most of the cases are probably acquired the old-fashioned way, through nosocomial transmission after admission to a health care facility.

"Some of the other [cases] that seem to be transmitted in the community setting may actually have a doctor's office involved [or other ambulatory settings]," he says. "What could the percent be that is transmitted directly through the meats? We don't know. We think it's less than 20% and it may be as low as 5% if there is any [transmission] at all. No one has proven it."

Foodborne pathogens such as *Salmonella* usually aren't carried by humans so they are easier to detect in clusters and outbreaks. Not so with *C. diff*, which can remain dormant until triggered by a course of antibiotics.

"It won't [show] clusters very well because you could probably eat *C. diff* in most instances and not get disease until you take antibiotics or until you are sick from something else," McDonald says. "So that makes it hard to detect a cluster. It's probably going to be sporadic disease and that is going to make it hard to prove that the food supply is playing a role. It doesn't mean that it can't be [ascertained], but it is going to take some more artful things."

The CDC first reported the phenomenon of community-associated *C. diff* in 2005, citing reports in four states of infections in patients previously thought to be at low risk for *C. diff*. Considered in the context of high-morbidity, hospital-associated outbreaks in North America, Great Britain, and the Netherlands, the cases of severe *C. diff* appear to reflect a "changing epidemiology," the CDC reported.¹ More evidence is being accumulated in the form of continuing cases in otherwise healthy people in the community, many of whom have no history of recent hospitalization or prolonged antibiotic use that typically precedes *C. diff* infection.

The CDC recently conducted a study at 10 of its FoodNet surveillance sites, looking for community-acquired *C. diff*-associated disease (CA-CDAD) and

performing stool cultures for *C. diff* over a three-month period. Presumed CA-CDAD was defined in an ambulatory patient with a *C. difficile* toxin-positive stool who, based upon available medical record review, had no overnight stay in a health care facility in the preceding three months. A total of 175 presumed CA-CDAD cases were identified. *C. diff* was isolated from the stool specimens of 92 (57%) of 162 patient specimens cultured. The isolates from presumed CA-CDAD cases were genetically diverse, indicating that CA-CDAD is not caused by a single strain, the CDC found. Again, the epidemic strain (ribotype 027) that has caused severe hospital outbreaks was among the *C. diff* detected in the community cases.

"These [community strains] look more diverse, which suggests that wherever they are coming from there is a more diverse pool out there," McDonald says. "Whether they are from the food supply or just person-to-person in the community, they are more diverse. There is some of the epidemic strain [in the community] — the one that is causing all the problems in the hospitals. There are also strains that have been a problem in food-producing animals, too."

Strains of *C. diff* seen in pigs also were identified in humans, though it's unclear if the animals were the original source or people have also carried such strains. "We don't know if it was there before in the community in humans [because] nobody was looking 10 years ago," he says. "These are not the 'purest' community cases. Going forward, we would like to get cases that have been fully studied from an epidemiology standpoint to make sure that they weren't recently in a health care facility or a doctor's office. Then we can start asking about food consumption."

Reference

1. Centers for Disease Control and Prevention. Severe *Clostridium difficile*-associated disease in populations previously at low risk — Four states, 2005. *MMWR* 2005; 54(47): 1,201-1,205. ■

ICPs use seasonal flu shots as pandemic drill

Drills reveal problems, up vaccination rates

Infection control professionals are killing two birds with one shot, administering annual flu

vaccine in rapid-fire fashion to simulate immunizing health care workers against an emerging influenza pandemic.

If avian influenza A (H5N1) mutates into a pandemic flu strain, it will be critical to immunize as many health care workers as quickly as possible with whatever vaccine is available. Similarly, a bioterrorism attack or emerging infection may require rapid administration of some vaccine, treatment or prophylaxis. How to prepare for such eventualities? Why not take health care workers' historic apathy about getting the annual flu shot and energize it with a time-crunched rapid immunization drill? Such planning may be critical if for no other reason than if a pandemic flu strain emerges health care workers that wouldn't be caught dead getting an annual flu shot may now look at immunization as a matter of literal survival.

"In a true pandemic, if something were available, they will take it," says **Joyce Lawhorne**, RN, CIC, an ICP at Oconee Memorial Hospital in Seneca, SC.

Having never tested the ability to provide mass prophylaxis or vaccination to all workers in a short period of time at her hospital, Lawhorne and colleagues proposed a drill last year using the seasonal flu vaccine.¹ Originally, the plan was to make the seasonal flu vaccine program mandatory by either taking the vaccine or signing a declination form. "Unfortunately, everybody still has a right to decline [vaccination]," she tells *Hospital Infection Control*. "But it's really amazing to see the ones that would not take a seasonal flu vaccine, but [said] that during a pandemic, they will take it. The trend seemed to be that even those that had never taken a seasonal flu vaccine would take it."

Get all players to the table

At any rate, mandatory attendance at the drill was considered too costly, but planners moved ahead to see how many staff they could reach in a tight time frame. The infection control, employee health and the education departments collaborated to develop a medication dispensing vaccine clinic model that could be used in any mass casualty event. "Get all of the players at the table at one time," Lawhorne advises. "Make sure that everybody understands what's going on and the importance of it." They structured the plan into the hospital emergency incident command system model, developing job action sheets for all clinic positions. Vaccinators completed mandatory competencies for injection technique. Planners worked with public health for an evaluation and

after-action report of the drill. "We realized we will also serve as a resource for our public health people," she says. "They are not going to be able to vaccinate everybody either, so we will probably be called on to vaccinate first responders and volunteers."

Educational sessions on pandemic and seasonal influenza were conducted, emphasizing attendance at the drill. Fliers were posted and verbal reminders given frequently. Letters were sent to each employee explaining the drill and asking for participation. Door prizes were given. "Educate your staff prior to implementing the drill," says Lawhorne. "That helped us a great deal. We had multiple educational opportunities on pandemic preparedness leading up to the drill, then that's when we actually told them the purpose of it was to solicit their help in testing our system."

The drill was conducted for two days, 13 hours each day, with times overlapping into all shifts. Mobile vaccine clinics also were deployed. "We started with a dispensing station, but then went ahead and deployed mobile vaccination stations to outlying facilities. We know in a real event, they are not going to be able to leave their stations. We sent security guards with [vaccinators] just like in a real event," she notes.

During the two days, 1,084 vaccinations were administered and a total of 1,322 people were processed. That resulted in a 23% increase in vaccination rates of staff from 42% to 65%. Of those, 10% were first-time recipients. Still, many of the 32% of people declining did so due to never having had flu, and feeling vaccination was not necessary. Planners also used this opportunity to collect information for ordering purposes next season and to determine the number of health care workers' household members who would need prophylaxis if indicated and available. The drill established a sense of teamwork and allowed the largest bulk of vaccines to be given in a two-day period as opposed to workers reporting to employee health randomly to get vaccine. The hospital now has an up-to-date manual and online copy, with job action sheets, medication protocols, clinic supply list, emergency orders, clinic designs, and a pool of staff that have completed competencies for vaccine administration.

"I think we are much better prepared," says Lawhorne. "As a matter of fact, we are getting ready to use that same process this season, except we're going to shrink it to one day and we're going to test a different communication system."

Lessons learned included finding out that there

was no method of rapid notification of staff. "We are working now with our public health and emergency preparedness in the county to see if we can tie into the reverse 911 system to put a bank of phone numbers of our health care workers in there and then send out a "canned" message that 'Vaccines will be given at this date, time and location,'" she says.

In addition, there was no centralized photo identification database for restricting access to a vaccine dispensing clinic. "The problem is not all of our volunteers in our long-term care facility had a picture ID, which we would require in a real event before we would give out medication," Lawhorne says. Plans call for the development of ID badges that can be scanned for demographic information. "Then we can go ahead and confirm they are still actively employed [and] this is where they work," she says. "Are they a direct care provider in case there is a vaccine shortage? Or is this somebody who could be triaged to get a vaccine at a later time?"

Whether it is pandemic flu vaccine or some medicine from the Strategic National Stockpile, federal emergency planners have developed the concept of the "push POD" — meaning rapid transport of a vital intervention to a given "point of distribution." Since hospitals may serve as some of these POD sites, St. Luke's/Roosevelt Hospitals in New York City used the annual flu vaccine to see how rapidly they could conduct mass vaccinations in 2006.²

"We told most people that it was coming up," **Rosalyn Rapoport**, RN, BSN, employee health nurse at the facility tells *HIC*. "We had a committee with representatives from many different areas in the hospital so everybody knew. But really the idea of push POD is to do it 'cold.'"

Still, the drill gave an indication of the kind of issues that would arise should a public health emergency require prophylactic treatment of staff. "I would really say this is something for hospitals to try," she adds. "You do get more flu vaccinations and you learn a lot about what your problems are if you had an actual disaster."

The influenza team worked in conjunction with the hospitals' emergency management team which was chaired by the same administrator. There were two major goals: 1) evaluate the hospital's ability to reach 80% of the employees during a distinctive time period; and 2) increase overall vaccination rates to 50%.

The team developed a comprehensive schedule for a 10-day period during October and November at each of the two major facilities. The schedule

included coverage on evenings, nights and weekends. There were more than 100 departments between the locations. All departments were contacted by a team member to alert them to the program and to schedule visits from a mobile vaccine team or to a centralized vaccine station. Employees

CNE/CME instructions

Physicians and nurses participate in this CNE/CME program by reading the issue, using the provided references for further research, and studying the questions. Participants should select what they believe to be the correct answers, then refer to answer key to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing the semester's activity, you must complete the evaluation form that will be provided and return it in the reply envelope to receive a credit letter. ■

CNE/CME questions

17. Despite the findings regarding asymptomatic carriers of *Clostridium difficile*, the CDC says ICPs still should focus their primary prevention efforts on long-term care residents and hospital patients with active, symptomatic infection.
 - A. True
 - B. False
18. A medical center took several additional infection control measures to minimize the impact of asymptomatic *C. diff* carriers and halt an outbreak. Those included:
 - A. terminal cleaning of all patient rooms with bleach.
 - B. extending duration of contact precautions.
 - C. an emphasis on glove use.
 - D. All of the above
19. Noting the emphasis on recovery of *C. diff* from the skin of asymptomatic residents in the study, an accompanying editorial commentary raised what other control measure to consider?
 - A. Gowning health care workers
 - B. More rigorous personal hygiene for residents
 - C. A decolonization protocol with vancomycin
 - D. All of the above
20. Aggressive infection control measures halted a norovirus outbreak in a long-term care facility in what period of time?
 - A. 72 hours
 - B. Five days
 - C. Eight days
 - D. 12 days

who declined the vaccine were asked to sign a declination form. On the ninth day of the POD drill, a special mock disaster code lasting two hours was called requiring all staff members on duty to report immediately to the central location.

Of the approximately 5,500 employees, 57% were reached during the 10-day POD exercise. One-third of the departments exceeded the goal of reaching 80% of the staff; an additional 34% of the departments reached 60% to 79% of the employees. Of the 3,157 employees who were reached, 66% were vaccinated. "That really went up for us because in previous years we had never gone over 50%," she says.

Although they did not reach 80% of the staff during the drill, several factors were identified to improve emergency preparedness, she says. That includes maintaining a more accurate telephone contact list," Rapoport says. "The first time we did the drill, we did it at Roosevelt," she explains. "We had people calling from a list of department heads. We found that the list was not up to date, and we did not have enough people making the calls. We did a better job of calling and reaching people when we did St. Luke's, [our second hospital]. We did better there because we had a more up-to-date list and more callers."

It was learned that there was a need for more coordination of the POD stations, and plans call for the development of a priority algorithm and assignment of predesignated POD team members.

"We did not expect as many people to come down and we not did have [enough] vaccinators," Rapoport says. "We did not have it as well organized as we should have. If we did it again, we have learned some things. We got a bigger response than we anticipated and we should have had more non-clinical people getting the consents and asking the questions, so the clinical people — the nurses — could just vaccinate. We got consent for every vaccination and we got declination statements. The primary reason was unfortunately, "it gives me the flu. That is a real hard one to deal with."

References

1. Lawhorne, JD. Utilization of seasonal influenza vaccine to test readiness to provide mass prophylaxis or vaccination in a bioterrorism or pandemic event. Abstract 3-39. Presented at

the Conference of the Association for Professionals in Infection Control and Epidemiology. San Jose, CA; June 24-28, 2007.

2. Smith BA, Rapoport R, Gabasan AC, et al. Push point of distribution (POD) drill increases compliance with influenza vaccinations and evaluates hospital's emergency preparedness. Abstract 3-32. Presented at the Conference of the Association for Professionals in Infection Control and Epidemiology. San Jose, CA; June 24-28, 2007. ■

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CNE/CME answers

17. A; 18. D; 19. B; 20. C.

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- identify the particular clinical, legal, or educational issue related to epidemiology;
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