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Infection preventionists on alert for MERS, as U.S. becomes 12th nation to report emerging coronavirus

“In our globally connected world, it will not be the last.”

By **Gary Evans**, Executive Editor



Infection preventionists remain on heightened alert nationwide after the first case of Middle East Respiratory Syndrome (MERS) coronavirus in the United States was recently hospitalized at Community Hospital in Munster, IN.

“It was inevitable — we knew it would end up coming to our shores,” says **Ann Marie Pettis**, RN, BSN, CIC, a member of the Association for Professionals in Infection Control and Epidemiology (APIC). “All of us in infection prevention knew it was coming, but this bumps it up even higher on our priority list.”

As this issue went to press, no secondary cases had been reported

among contacts to the index case, a male American health care worker who had been working in a hospital in Riyadh, Saudi Arabia. He told investigators there were some MERS patients in the hospital, but recalled no direct contact with any of them, according to published reports. The U.S. MERS patient steadily improved from stable to good condition and was discharged May 9.

The highly publicized case morphed into a teachable moment, with the Centers for Disease Control and Prevention advising clinicians to increase their index of suspicion for MERS infection in travelers from the Middle East. Healthcare providers should suspect MERS infection in patients with severe lower respiratory illness that have traveled to the region within the last 14 days.

In This Issue

- ❑ **Vigilance:** The CDC has received some 160 notifications of possible MERS cases and specimens have been sent in for confirmation cover
- ❑ **WHO:** Infection control breaks linked to surge in Saudi MERS cases 52
- ❑ **Compendium updated:** A new section on hand hygiene will be added, as other major HAIs are updated from 2008 recommendations 53
- ❑ **CAUTI revised:** CAUTI guidelines focus on behavioral changes 54
- ❑ **What not to do:** CAUTI prevention practices shown to be ineffective. 55
- ❑ **Got HBV immunity?** A surprising number of health care workers don't 56
- ❑ **Pertussis upsurge:** Puts susceptible health care workers at risk 58



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"It's definitely our job to put this on everybody's radar and remind them to ask for a travel history," says Pettis, an infection preventionist at the University of Rochester (NY) Medical Center. "This has really become the new normal. It's been 11 years since SARS, and that was kind of a watershed event for all of us. It's sort of like the way AIDS changed the way we look at blood and body fluids — SARS changed the way we look at respiratory infection prevention."

CDC alerted to 160 possible cases

Though there are some distinctions, MERS is something of a pathogenic cousin to the Severe Acute Respiratory Syndrome (SARS) coronavirus that emerged dramatically in 2002-2003. An outbreak that began in China spread globally, eventually causing more than 8,000 infections and some 775 deaths. MERS has caused fatal infections primarily in patients with underlying medical conditions (e.g., chronic renal insufficiency, diabetes mellitus). The coronavirus has shown the ability to spread to both patients and health care workers in hospital outbreaks in the Middle East.

Wary of imported cases, the CDC sounded the alarm prior to the recent flu season, reminding clinicians that severe respiratory infections may be MERS. (See "Have virus will travel" spe-

cial report, September 2013 *Hospital Infection Control & Prevention*.) As a result, the agency has been fielding reports of possible MERS cases for some time now, with the Indiana case the first confirmation.

"The CDC has received something like 160 notifications of possible MERS cases and specimens have been sent in," says **William Schaffner**, MD, chairman of the department of preventive medicine at Vanderbilt University School of Medicine in Nashville. "That means folks are indeed on the alert around the country. Obviously, this case reminds us that everybody that comes in with a pneumonic illness should be asked if they traveled to the Middle East. It's something we need to be doing comprehensively because it's a small world out there."

The U.S. case flew from Riyadh, Saudi Arabia, to Chicago, IL, via a connecting flight from London on April 24, 2014. He then boarded a bus for a trip of some 30 miles to Munster, IN. The infection was apparently in the incubation phase at this juncture, as it would not be until three days later, on April 27, that symptoms of fever, cough, and breathlessness were severe enough to prompt the emergency room visit.

"I actually think the risk of transmission to others is very low, although one could argue that being in the confined space of an aircraft or a bus

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for several hours may be akin to a family circumstance,” Schaffner says. “There has been transmission [within] families in addition to the health care environment.”

MERS was suspected and the patient was put in isolation and specimens were sent to the state public health officials and the CDC. The CDC confirmed the diagnosis on May 2 and began a follow-up investigation of people who were possibly exposed to the MERS patient in the Munster hospital and during air and bus travel.

“The [U.S. patient] was providing care in Saudi Arabia and [then] developed symptoms in the United States,” **Anne**



Schuchat, MD, director of CDC's National Center for Immunization and Respiratory Diseases, said at a recent press conference. “The assumption is the person acquired the illness in Saudi Arabia. We can't confirm that it is from the hospital — that would be part of [our] active investigation.

We know there is quite a bit of disease in Saudi Arabia right now.”

Indeed, a team of experts from the World Health Organization recently concluded that that surge of MERS cases in the Kingdom was due in part “to breaches in WHO's recommended infection prevention and control measures.” The WHO reported another disturbing finding: one-fourth of all MERS cases have been infections in health care workers. (See related story, p. 52)

In order to detect possible secondary cases, family members and health care workers with significant contact with the patient underwent daily monitoring for two weeks, which should cover the incubation period of the infection.

“It is very concerning that the virus has spread in hospitals and we should not be surprised if additional cases are identified among the health care providers who had close contact with this patient before the patient was isolated and special precautions were implemented,” Schuchat said.

Interestingly, Community Hospital used video

surveillance and other technology to identify staff who may have had prolonged or unprotected exposures to the patient. Hospital employees have an ID tracer tag that emits a radio frequency, making it possible to determine when and for how long care givers were in the patient's isolation room.

Full gamut of precautions

Given the uncertain routes of transmission of MERS, the CDC has essentially pulled out all stops in recommending a combination of standard, contact, and airborne precautions for patients hospitalized with known or suspected MERS. Hospitals should use airborne infection isolation rooms with health care workers donning gloves, gowns, eye protection and N95 respirators, the CDC recommends. Compliance with infection control measures is critical because no vaccine or effective antiviral treatment is currently available for MERS. Transmission to health care workers taking such precautions has not been reported, reminding, as SARS veteran **Allison McGeer**, MD, observed: “We know what rules this virus lives by.”

Still, as MERS cases have recently increased in the Middle East concerns have mounted that the coronavirus has mutated much as its SARS predecessor did.¹

“The fact that 200 new cases were reported by



Saudi Arabia and the United Arab Emirates in the single month of April 2014 has raised concerns that viral mutations have led to enhanced adaptation to human hosts,” says **Stan Deresinski**, MD, FACP, FIDSA, an infectious disease physician and professor of medicine

at Stanford University. “The available evidence, however, has not, to date, confirmed this fear. Rather, it has been suggested that at least part of the reason has been increased recognition of the disease.”

An isolate of the virus that was collected recently from a patient in Saudi Arabia was sequenced in search of mutations, but none were found.

“Based on the sequencing of one viral isolate,

we haven't seen changes," Schuchat said. "We will continue to monitor the situation. With the SARS virus, we do believe there was a change in the virus that led to more explosive transmission."

Another suspected factor in the upsurge of cases is the mass birthing of dromedary camels (the one-humped type) that occurs every winter in breeding facilities, Deresinski says. The virus, like the SARS coronavirus, has been found in

bats. Their role is less certain, but dromedary camels are clearly an important reservoir of the MERS virus. For example, a country-wide survey in Oman led to MERS detection in camel conjunctival and nasal secretions. The camel viruses were closely related to MERS of human origin detected in the same geographic area.²

"In a few cases, closely related MERS-CoV has been identified in humans and camels with which they have had contact," Deresinski says.

WHO: Infection control breaks linked to surge in Saudi cases

One quarter of MERS cases are health care workers

Breaks in infection control protocols while treating MERS patients has led to infected health care workers and given hospitals an "amplifying" effect as the epidemic continues in Saudi Arabia, the World Health Organization reports.

A team of experts from the World Health Organization (WHO) recently completed a 5-day mission to Saudi Arabia to investigate an increase in MERS infections in Jeddah. Among their findings was that one quarter of all MERS cases have been health care workers.

"The upsurge in cases can be explained by an increase, possibly seasonal, in the number of primary cases amplified by several outbreaks in hospitals due to breaches in WHO's recommended infection prevention and control measures," the team reported.¹ "There is a clear need to improve health care workers' knowledge and attitudes about the disease and systematically apply WHO's recommended infection prevention and control measures in health care facilities."

As of May 3, 2014, 489 cases, including 126 deaths, were reported to WHO globally. Of those 406 cases and 101 deaths were in Saudi Arabia, the epicenter of the outbreak since the novel coronavirus was first recognized 2012. The numbers can change from one day to the next according to when Member States inform WHO.

The team looked into the epidemiological, disease prevention, organizational and communication aspects of the Jeddah outbreak to understand the public health risk and transmission chain and to propose next steps and actions. After meeting health officials in the capital, WHO experts visited two main hospitals in Jeddah to analysis transmission patterns and review infection control measures.

Key findings of the Jeddah outbreak include the following.

- Current evidence does not suggest that a recent increase in numbers reflects a significant change in the transmissibility of the virus. There is no evidence of sustained human-to-human transmission in the community and the transmission pattern overall remained unchanged.
- The reasons for the increase in the number of primary community cases, as well as the infection route, remain unknown. Three quarters of all primary community cases have been male, the majority of whom have been over 50 years old. Secondary transmission in the community and households is much lower than in health care settings.
- Some confirmed cases presented with mild or no symptoms.
- Based on the current situation and available information, WHO encourages all Member States to continue their surveillance for severe acute respiratory infections and to carefully review unusual patterns.

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Thus, some human infections may result from contact with the animals, eating camel meat, and the common practice of consuming unpasteurized camel milk, he notes.

While the bulk of MERS cases have occurred in Saudi Arabia, regional infections have also occurred in six nearby countries: Oman, Kuwait, United Arab Emirates, Qatar, and Jordan.

"The U.S. is the 12th country to which the virus has been exported and, in our globally connected world, it will not be the last," Deresinski says.

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Infection control compendium updated

New section on hand hygiene added

The leading infection control and infectious disease organizations are issuing updated recommendations in new compendium guidelines that will be published in sections over the next few months.

The first published update focuses on preventing catheter-associated urinary tract infections [CAUTIs] (*See related story, p. 54.*) Revised guidance on several other health care associated infections (HAIs) are slated to follow in the coming months.

First published in 2008, the compendium guidelines are designed to provide the best practical guidance on infection prevention in the absence of randomized clinical trials, which have not been conducted on many infection prevention practices.

"The compendium was always meant to be a practical guide to preventing HAIs in acute care hospitals," says **Edward Septimus**, MD, a lead author in the project and Medical Director of the Infection Prevention and Epidemiology Clinical Services Group for the HCA Healthcare System.¹ "You have to weigh the evidence, but I don't think you can say there's not a randomized controlled trail for that so you don't have to implement it. [There may be] strong observational studies that

suggest what in fact may be a practical, reasonable things to do. It's the old Voltaire comment, you don't want perfect to be the enemy of the good."

In contrast, the Centers for Disease Control and Prevention's Healthcare Infection Control Practices Advisory Committee (HICPAC) faces such a high bar for proof of practices it is often forced to issue "no recommendations" on "unresolved issues." For example, recently updated HICPAC guidelines for preventing surgical site infections focused on some difficult issues in an exhaustive and largely futile attempt to find conclusive data.

In comments submitted to the CDC, the Association for Professionals in Infection Control and Epidemiology (APIC) expressed "concern that the application of these guidelines by healthcare professionals has the potential to lead to great confusion on topics for which there are limited or absent recommendations. ... We fear that many professionals will misunderstand the statement 'No recommendations' and revert back to traditional or unstudied practices."

Another concern is the body of evidence that was excluded from the document due to an exclusive reliance on systematic reviews and randomized controlled trials, APIC noted.

Grading the evidence

"A lot depends upon how you grade evidence and HICPAC uses a very high bar," Septimus says. "We all want to look at evidence for interventions, but everything can't be based on a randomized control trial. Some of us look at this in a more practical way. If you have a number of observational trials that show significant reduction of infections, we sort of [push] that up a bit in terms of whether it should be a strong recommendation."

In addition to APIC, other groups collaborating on the compendium update include the Society for Healthcare Epidemiology of America, the Infectious Disease Society of America, The Joint Commission, and the American Hospital Association. CDC input also informed the process as the compendium was updated. The CAUTI update was recently published in the SHEA journal — *Infection Control and Hospital Epidemiology* — where the remaining recommendations will also be published over the next few months.²

"We felt that there is a lot of interest and usefulness in providing these documents as soon as possible," says **Deborah Yokoe**, MD, MPH, one

of the project leaders and a hospital epidemiologist at Brigham and Women's Hospital in Boston.³ "We didn't want to hold up publication of any of the specific documents while awaiting completion of the other documents. In particular, we have one new compendium section on hand hygiene and we knew that would take more work to complete than the other sections, which are basically updates."

In addition the compendium synthesizes best evidence for the prevention of surgical site infections, central line-associated bloodstream infections, ventilator-associated pneumonia, *Clostridium difficile*, and MRSA. As for hand hygiene, it remains both the cardinal principle and enduring compliance problem for many infection control programs.

"It really is such an important, fundamental practice for infection prevention," Yokoe says. "There continues to be a lot of interest in improving hand hygiene in health care facilities so the decision was made to add that as a new section."

The 2014 updated compendium guidelines include basic HAI prevention strategies augmented by advanced approaches for outbreak management and other special circumstances. The new guidelines include performance and accountability measures to apply to individuals and groups implementing infection prevention practices.

"A lot of the updates and recommendations are very similar to the 2008 versions, but some of the special approaches — which hospitals can consider if they had the basic practices in place but they still think there is room for improvement — have been updated based on more recent studies," she says.

In this latest iteration of the compendium, a new segment has been added to each article that briefly describes examples of published implementation strategies and provides references that hospitals can access for more detailed information. Each section contains a "statement of concern," a brief summary of previously described detection and prevention approaches, recommended infection prevention strategies, proposed performance measures, and examples of implementation strategies for consideration. Each hospital must apply the recommendations to their setting and distinct safety culture, Septimus emphasizes.

"The bottom line is you want to have this adaptive culture of safety occur within frontline health care workers," he says. "We may understand

the science, but on a local basis, what adaptive, behavioral changes need to take place? In my facility — not some generic facility — based on our culture and my leadership? It has to be owned at the local level. Safety ought to be part of the basic DNA of all organizations and health care workers."

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Revised CAUTI guidelines include behavioral changes

Michigan leads the way on CAUTI prevention

Revised compendium guidelines to prevent catheter-associated urinary tract infections (CAUTIs) include some new socio-adaptive and technical strategies for infection preventionists to consider.¹

"Much of the socio-adaptive recommendations came from the work performed by Michigan-based CAUTI researchers during the past decade," says **Sanjay Saint**, MD, MPH, George Dock professor of medicine at the University of Michigan Medical School and epidemiologist at the VA Ann Arbor (MI) Healthcare System.

"We have made more than 40 site visits and [done interviews] over the phone to hospitals from Maine to California," he says. "We've had interviews with chief executive officers, mid-level managers, infection preventionists, and front-line nurses and physicians."

Site visitors focused on CAUTI and learned how successful hospitals have implemented programs. And they assessed what wasn't working in struggling hospitals. Practical issues involving implementation came from the Michigan program's

“four E’s” of engagement, education, execution, and evaluation, notes **Lindsay Nicolle**, MD, professor of internal medicine and medical microbiology at the University of Manitoba in Winnipeg, Canada.

“Dr. Saint has made valuable tools and examples from his program available and is willing to share them,” she says.

In a recent publication in *JAMA Internal Medicine*, Saint and colleagues showed that hospitals in Michigan had a 25% reduction in CAUTIs while non-Michigan hospitals had only a 6% reduction.²

The CAUTI guidance paper contains key findings regarding socio-adaptive research, which is especially relevant when organizations are implementing programs, Saint notes.

For example, here are a few of the barriers and possible solutions cited by the CAUTI compendium team:

Lack of physician buy-in to CAUTI prevention practices: The possible solutions including finding a physician champion and providing physicians with feedback and data about urinary catheter use and monthly indwelling urinary catheter prevalence and CAUTI rates;

Difficult to do education for nurses because of their inflexible schedules regarding overtime and non-patient care time: Bring education to the bedside through unit competencies and talking with nurses one-to-one during the point prevalence assessments;

Physicians are resistant to having an automatic stop order for nurses to discontinue urinary catheter use: One solution could be to have nurses prompt physicians for DC order as an initial strategy to build rapport and to identify a physician champion who can serve as an advocate.

Immediate impact: Limit catheter use

Hospitals could make the biggest impact with an immediate change to limit catheter use, Nicolle says.

“Don’t use a catheter unless there is a clear indication for it, and make sure catheter use is based on clear, existing guidelines,” she adds. “Once a catheter is in place, make sure it’s removed as soon as possible.”

The key technical aspect of the revised guidance is that there is more evidence now to support early removal of the catheter, Saint says.

“This would include daily assessment of the

CAUTIs: Unproven practices not advised

The recently published compendium guidelines on preventing catheter-associated urinary tract infections include approaches that should not be considered a routine part of CAUTI prevention:

1. Do not routinely use antimicrobial/antiseptic-impregnated catheters (quality of evidence: I).
2. Do not screen for asymptomatic bacteriuria in catheterized patients (quality of evidence: II).
3. Do not treat asymptomatic bacteriuria in catheterized patients except before invasive urologic procedures (quality of evidence: I).
4. Avoid catheter irrigation (quality of evidence: II).
 - a. Do not perform continuous irrigation of the bladder with antimicrobials as a routine infection prevention measure.
 - b. If continuous irrigation is being used to prevent obstruction, maintain a closed system.
5. Do not use systemic antimicrobials routinely as prophylaxis (quality of evidence: III).
6. Do not change catheters routinely (quality of evidence: III)

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catheter by the bedside nurse or computerized reminders that the patient has a urinary catheter,” he says. “There have been approximately 30 studies that show catheter reminders, stop-orders, and nurse-initiated removal protocols working quite well,” he explains.³

“There is now new research focusing on the emergency department, showing how that would be a good venue in which to intervene to reduce the use of urinary catheters,” Saint adds. “In most hospitals, the number one place of insertion is in the ER.”

Health systems can use stop orders, reminders, and nurse protocols with indications showing why the patient needs to have the catheter removed, he says.

"Some hospitals use a default method where the catheter is removed unless an order for continuation is given; others have it set up where after 48 hours, the nurse contacts the physician to ensure the catheter is removed – it depends on the culture of the hospital," Saint explains. "The most important aspect is to ensure that daily assessment is occurring, and in these guidelines we have additional research to support that approach."

Another new part of the guidelines involves catheter use for women having C-sections and thoracic surgery patients, Nicolle says.

"Systematic review suggests that evidence does not support indwelling catheter use for C-section patients and thoracic surgery patients," she adds.

The revised guidance also reflects new research about the previously unresolved area of antimicrobial catheters. Based on a 2012 *Lancet* study, there is good evidence that antimicrobial catheters should not be used routinely, Saint says.⁴

"They found no benefit for using antimicrobial catheters," he says. "This means we cannot rely on a technological fix like antimicrobial coating; we have to rely primarily on behavior change."

Fortunately, it's easier to encourage behavior change with automated cues and reminders as health systems increasingly move to electronic health records, he notes.

When a nurse inputs data about a patient's use of a Foley catheter, the pull-down screen will show indications, and if there are no indications then the nurse will be instructed to call the physician or get an order for catheter removal, Saint says.

"Or, if the medical executive committee has approved nurse-initiated discontinuation then the nurse is empowered to remove the catheter," he adds.

The revised guidance continues to reinforce CAUTI prevention education and proper technique for catheter insertion.

Health systems could assess staff annually on their insertion technique.

Hospitals increasingly are requiring surveillance on units to collect data on the percentage of patients who have a catheter and CAUTI rates, Saint says.

"They want actionable information so that a quality improvement change can happen in real time," he says.

Early removal of urinary catheters also will address the important area of preventing non-infectious harms of the catheter, a topic that has recently been the focus on increased attention.⁵

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CDC: Test workers for HBV immunity

As many as 10% may be non-responders

A growing number of health care workers are coming into their profession with childhood vaccination against hepatitis B virus (HBV). Yet 5% to 10% of them may unknowingly be non-responders to the vaccine, leaving them at risk if they have a bloodborne pathogen exposure, according to the Centers for Disease Control and Prevention.

The most protective strategy would involve serologic testing of these previously vaccinated employees at hire, the CDC says in newly released guidance.¹ If they do not have antibody levels of at least 10 mIU/ml, they should receive a booster dose of the vaccine and retesting, CDC says. They may receive up to three new doses of HBV vaccine, the agency says.

Yet CDC also says employers may adopt a

post-exposure approach, based on risk and cost factors. "The risk in certain occupations is an important consideration, as well as whether the person is a trainee or a non-trainee," says **Trudy Murphy**, MD, a medical epidemiologist and unit leader for CDC's vaccine unit and a co-author of the guidance.

For example, some communities or hospital units may have a low prevalence of hepatitis B, and employees who are not involved in direct patient care would have a lower risk, she notes. Conversely, trainees have a higher rate of blood-borne pathogen exposures and therefore would be at higher risk, she says.

In a post-exposure program, health care workers would receive HBV serologic testing at the time of an exposure and would be revaccinated if they have antibody levels below 10 mIU/ml. If the source patient is hepatitis B surface antigen-positive or the HBsAg status is unknown, those exposed health care workers also would receive one dose of hepatitis B immune globulin.

A post-exposure approach hinges on prompt reporting and follow-up. Yet only about half (54%) of percutaneous and 17% of mucocutaneous exposures are reported, CDC notes.

"The only way to ensure protection is to take a pre-exposure approach or to have exposures reported and managed at the time of the exposure," says Murphy. "The goal here is to make sure that all health care workers or personnel are protected against hepatitis B."

Not related to OSHA regs

The CDC guidance does not affect the U.S. Occupational Safety and Health Administration requirement for employers to offer the hepatitis B vaccine to all employees who have a risk of exposure. Employees who decline the vaccine must sign a declination statement.

Only about 64% of health care workers reported having been vaccinated against hepatitis B in a 2011 survey.² Vaccination rates are somewhat higher among health care workers in direct patient care, but they're still well below the HealthyPeople 2020 goal of 90%.³

Some other issues to consider related to HBV vaccination of health care workers:

- CDC recommends pre-vaccination serologic testing of health care workers who may have a higher risk of being infected with hepatitis B, including HCWs born in geographic regions

where HBV is endemic (eastern Europe, Asia, Africa, the Middle East and Pacific Islands) or people who were not vaccinated as infants and whose parents were born in those regions; HCWs who received the HBV vaccine as adults or adolescents, after they began engaging in high-risk behaviors; people who are HIV-positive or who receive hemodialysis. They should be tested for HBV surface antigens as well as HBV antibodies, CDC says.

- Health care workers who have written documentation of a completed three-dose vaccination series and subsequent serologic testing that showed an immune response do not need further testing — even years later. "We think the vaccine protection is holding up very well after 20 years," Murphy says.

- HCWs with documented immunity to HBV do not need post-exposure management, even if the source patient is HBV-positive.

- Hospitals should consider using an electronic system for maintaining HCW immunization records. That makes it easier for hospitals to access the records if there is an exposure and to provide the records for HCWs who move to a new facility, says Murphy.

- About 800,000 to 1.4 million Americans have chronic HBV, so the risk of exposure remains significant, she says. "They're asymptomatic for the most part, so the health care personnel would not automatically recognize they have hepatitis B," she says.

CDC received reports of 203 cases of acute HBV among health care workers from 2005 to 2010. Although information about occupational exposures was limited, 28, or 17% of cases with available information, had sustained a sharps injury. In about half the cases, HCWs had other risk factors for HBV.

"People who are at risk do get infected and they can become chronically infected," says Murphy.

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HCW pertussis vaccination lags

Outbreaks continue throughout U.S.

For the past 10 years, the United States has been wrestling with a resurgence of pertussis as outbreaks strike in different states. In 2013, cases subsided in most of Minnesota, but spiked in Texas and North Carolina, for example. California reported 2,372 cases, 132 hospitalizations and one death — of a two-month-old.

But one thing has changed little in the last few years: Pertussis vaccination of health care workers. By 2012, only about 31% of health care workers had received the recommended one-time booster Tdap, which protects against pertussis as well as tetanus and diphtheria.¹ That was just a slight increase from a rate of 27% in 2011, as reported by the Centers for Disease Control and Prevention.²

“Every institution ought to think about this very seriously and ought to have a [pertussis vaccination] program,” says **William Schaffner**, MD, professor of preventive medicine at Vanderbilt University in Nashville, TN, and past president of the National Foundation for Infectious Diseases. “At the least, emergency, pediatrics and obstetrics [personnel] ought to be thoroughly covered.”

Schaffner notes that infants and children, who are the most vulnerable, may be seen in other units as well, such as orthopedics.

More than 24,000 pertussis cases were reported to CDC last year. But the American College of Occupational and Environmental Medicine (ACOEM) notes that those reports are “only the tip of the iceberg” and the actual number of annual cases is likely to be a million or more. In a position statement, ACOEM advised occupational health providers “to assign high priority to vaccinating health care workers as soon as feasible.”

Should vaccination be mandatory?

Late last year, some leading infectious disease organizations raised the ante by stating that all recommended vaccines should be mandatory for health care workers if voluntary programs fail to achieve 90% vaccination coverage.

Citing the premise of “Do no harm,” the orga-

nizations said that “Mandatory immunization programs are necessary where voluntary programs fail to maintain adequate HCP vaccination rates.” The joint position statement was issued by the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS). (See HEH, *January 2014*, p.1)

At about \$40 a dose, a sudden move to mandatory vaccination of all employees could be quite expensive, particularly at a time of diminished resources. But some hospitals have begun to promote Tdap, with a special focus on units that treat pregnant women and children.

Tampa (FL) General Hospital offers Tdap to all newly hired employees and at each annual visit to employee health. Clinical employees who choose not to receive the vaccine must sign a declination. Last year alone, the hospital gave almost 1,000 Tdap vaccines.

JoAnn Shea, MSN, ARNP, director of employee health and wellness, promotes the vaccine in units that treat women and children, including labor & delivery, neonatal intensive care, and pediatrics. In those units, more than 70% of employees have had a Tdap booster.

“We tell employees that pertussis in children is normally acquired from an adult. They may be asymptomatic and not know they have pertussis,” Shea says.

In Wisconsin, which had a major pertussis outbreak in 2012, the Marshfield Clinic made all recommended vaccines mandatory, with exceptions for medical contraindications and strongly held religious beliefs. The state reported almost 6,500 confirmed and probable cases of pertussis in 2012, including three infant deaths.

“We have all these facilities that are mandating flu [shots] but they’re not mandating pertussis,” says **Bruce Cunha**, RN, MS, COHN-S, manager of Employee Health and Safety. “Why would you do one and not the other?”

Barriers to vaccination

Why don’t health care workers get the Tdap vaccine? The reasons may be similar to those who decline the influenza vaccine — fear of needles, concern about side effects, distrust of vaccines.³

A study of 2011 National Health Interview Survey data found that physicians were somewhat more likely than nurses to receive the

pertussis vaccine (41.5% versus 36.5%). Vaccination rates varied from 30% to barely 12% for other health care workers.⁴

Educating employees and encouraging vaccination can be effective, says **William Buchta**, MD, MPH, medical director of the Employee Occupational Health Service at the Mayo Clinic in Rochester, MN, where about 80% of employees have received the pertussis vaccine.

He notes that pertussis is highly contagious — but not easily identified in adults. “It tends to look like any other respiratory illness during the time you’re infectious,” he says. “For most adults, it’s a bad cold and a long cough.”

The Tdap vaccine has a couple of caveats. Health care workers who have a known exposure to pertussis and contact with patients who are at risk of severe illness (such as pregnant women and infants) should receive post-exposure prophylaxis with antibiotics — even if they were vaccinated, CDC says. Other health care workers — vaccinated or not — should either receive post-exposure antibiotics or be monitored for symptoms and be treated, if necessary, for 21 days after exposure.

Meanwhile, CDC has been studying the Tdap effectiveness over time, in the wake of reports of waning immunity. Health care workers will likely need an additional Tdap booster at some interval, possibly every 10 years, the ACOEM statement says.

“Although we recognize that the vaccine has limitations, it remains the best way to prevent pertussis,” Schaffner says.

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CNE/CME Instructions

To earn credit for this activity, please follow these instructions.

1. Read and study the activity, using the provided references for further research.
2. Scan the QR code below or log on to www.cmecity.com to take a post-test; tests can be taken after each issue or collectively at the end of the semester. First-time users will have to register on the site using the 8-digit subscriber number printed on their mailing label, invoice or renewal notice.
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CNE/CME Objectives

Upon completion of this educational activity, participants should be able to:

- Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
- Describe the effect of infection control and prevention issues on nurses, hospitals, or the health care industry in general;
- Cite solutions to the problems encountered by infection preventionists based on guidelines from the relevant regulatory authorities, and/or independent recommendations from clinicians at individual institutions. ■

COMING IN FUTURE MONTHS

■ APIC in Anaheim: Look for news alerts, tweets from the 2014 APIC conference

■ Elementary Watson: Genome sequencing is changing medial microbiology

■ Antibiotic stewardship—why now and how

■ National HAI reduction plan: Are we there yet?

■ CMS value based purchasing targets for full reimbursement

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CNE/CME Questions

1. The Centers for Disease Control and Prevention advised clinicians to suspect MERS if patients present with which factors:
 - A. High fever and travel to the Middle East within the last five days
 - B. Acute respiratory symptoms and exposure to camels or bats
 - C. Lower respiratory illness and travel to the Middle East within the last 14 days
 - D. Travel on an overseas flight with a symptomatic passenger nearby
2. MERS has caused fatal infections primarily in patients with underlying medical conditions (e.g., chronic renal insufficiency, diabetes mellitus).
 - A. True
 - B. False
3. A team of experts from the World Health Organization completed a 5-day mission to Saudi Arabia and reported that:
 - A. MERS has mutated and become more transmissible
 - B. One quarter of MERS cases are health care workers
 - C. MERS transmission is occurring despite very high compliance with infection control measures
 - D. Culling dromedary camel herds may eliminate the reservoir of the virus
4. According to **Sanjay Saint**, MD, MPH, which of the following was found to be ineffective in a 2012 study in *Lancet*:
 - A. Protocols for nurse removal of catheters
 - B. Standing orders to remove catheters after 48 hours
 - C. Routine use of antimicrobial catheters
 - D. Chlorhexidine bathing prior to catheter insertion



The Joint Commission Update for Infection Control

News you can use to stay in compliance

Joint Commission seeks 'high reliability' patient safety in collaboration with South Carolina hospitals

'We asked ourselves what is the next generation of this work?'

In an ambitious attempt to see if patient safety successes can go beyond individual units and even entire facilities, the Joint Commission Center for Transforming Healthcare is partnering with 20 hospitals in South Carolina.

"When we look at health care organizations around the country there is a lot of work being done to improve quality — a lot of places have established a particular [high quality] unit, a particular service," says **Mark R. Chassin, MD, FACP, MPP, MPH**, president of The Joint Commission (TJC). "What we don't see is entire hospitals, hospital systems, regions, functioning at very high levels of safety that is maintained over long periods of time. We don't see in health care the level of excellence and safety of commercial air travel — or even amusement parks."

The project with the South Carolina Hospital Association (SCHA) — the first of its kind for the TJC Center — includes 20 hospitals from seven health systems located throughout the state. CEOs and other executives from participating SCHA hospitals will meet regularly to collaborate on performance improvement projects and discuss strategies to move toward high reliability care. The specific interventions have not been announced yet, but medical errors and preventable infections are expected to be prime targets for reduction and even eradication.

"We will learn together how to move from a project-to-project approach to improvement to a transformative process that moves an entire organization from pockets of excellence — with

a lot of variation in quality — to one where it is equally maintained in every service for every patient every time," Chassin says. "That's the ultimate goal — a health care system where patients do not get harmed."

In the Joint Commission collaboration, improvements will be measured through safety culture survey assessments, evidence that activities have produced significant reductions in patient harm, and associated cost savings. In addition, the South Carolina hospitals will use a Web-based electronic tool designed by the TJC Center to identify critical high-reliability practices in health care and help hospitals assess their performance in these areas.

This "Targeted Solutions Tool" provides a step-by-step process to assist health care organizations in measuring performance, identifying barriers, and implementing the center's solutions. The TJC Center has developed targeted solutions for improving hand hygiene compliance, reducing the risk of wrong site surgery, and improving hand-off communications. Targeted solutions for surgical site infections, heart failure hospitalizations, safety culture, and patient falls will be added as these projects come on line. (See <http://www.centerfortransforminghealthcare.org/>)

Mistakes were made

"The primary job is always to deliver the right care for each patient every time," says **Thorn-ton Kirby, FACHE**, president and CEO of the SCHA. "Unfortunately the fact that medical care

is increasingly complex yields the fact that we still make mistakes. We don't like that mistakes are made, but they are still made. But South Carolina hospitals have been working really hard to improve the quality and safety of patient care over the last several years with really great results."

Indeed, South Carolina has not exactly been a laggard in quality improvement, as hospitals statewide are adopting a surgical safety checklist designed by author and surgeon **Atul Gawande**, MD, MPH, and colleagues at the Harvard University School of Public Health. (*See related story, this page*)

"The hospitals have been doing great work," Kirby says. "We asked ourselves what is the next generation of this work? Our conclusion is it's time to change the culture of hospitals so that we do not make mistakes. That is a tall order but that is why we are focused on this work."

Though zero infection goals have become commonplace in hospitals, some question whether health care delivery can ever achieve the efficiency of business and industry models. In an article lamenting the toxic safety cultures in too many hospitals, Chassin turned an old analogy on its head in conceding that sustaining high reliability in health care is harder than "rocket science."¹ Still, collaborations like the one in South Carolina signal the Joint Commission is in it for the long run.

"We know it's going to take a long time but we designed this so that each organization can take a hard look at itself – where it's strengths and weaknesses are — and learn from each other," Chassin says. "We fully expect that some places will be strong in one area and some in others."

Beyond the hospitals initially participating in the South Carolina project, the collaboration between the Center and SCHA is designed to improve safety and quality in health care organizations across the state. The lessons learned about identifying the underlying causes of specific breakdowns in care and creating targeted solutions will eventually be applied to other health care facilities nationally, according to the Joint Commission.

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South Carolina ORs adopt surgery checklist

Harvard comes to the Palmetto state

South Carolina hospitals are moving to the leading edge of the patient safety movement, collaborating with The Joint Commission on multiple projects and adopting a highly touted surgical safety checklist in every operating room in the state.

The 2015 Surgical Safety project is the brain child of author and surgeon, **Atul Gawande**, MD, who developed the checklist along with colleagues at the Harvard University School of Public Health. All 61 acute care hospitals in South Carolina have pledged to implement the checklist as a routine component of surgical care, according to the South Carolina Hospital Association. (*See checklist, p 3.*)

Project leaders estimate that even if the effort is only minimally successful, at least 500 lives will be saved annually along with \$28 million in health care costs.

Gawande led the World Health Organization's Safe Surgery Saves Lives Initiative, which resulted in development of a surgical checklist that has reduced surgery-related complications by more than one-third. Gawande documented his experience creating and testing the WHO Surgical Safety Checklist in his book "The Checklist Manifesto."

Key checkpoints on the surgical list include reviewing patient information and verifying the surgical site before the induction of anesthesia. The anesthesiologist shares patient-specific information with the rest of the surgical team, which goes down a checklist of patient risks and underscores that any team member can call for a "time out" if a break in protocol is observed.

The surgeon reiterates this safety factor, asking, "Does anybody have any concerns? If you see something that concerns you during this case, please speak up." In a debriefing following the procedure the surgical team discusses key concerns for patient recovery and management, with discussions centering on the question: "What could have been done to make this case safer or more efficient?"

Editor's note: for more on the South Carolina surgical checklist program go to <http://www.safesurgery2015.org/> ■

Safe Surgery 2015: South Carolina Checklist Template

Before Induction of Anesthesia

Nurse and Anesthesia Provider Verify:

- Patient identification (name and DOB)
- Surgical site
- Surgical Procedure to be performed matches the consent
- Site marked
- Known allergies
- Patient Positioning
- The anesthesia safety check has been completed

Anesthesia Provider Shares Patient Specific Information with the Team:

- Anticipated airway or aspiration risk
- Risk of significant blood loss
 - Two IVs/central access and fluids planned
 - Type and crossmatch/screen
 - Blood availability
- Risk of hypothermia - operation >1h
 - Warmer in place
- Risk of venous thromboembolism
 - Boots and/or anticoagulants in place

Before Skin Incision

Entire Surgical Team:

- Is everyone ready to perform the time out?
 - Please state your name and role
-
- Patient's name
 - Surgical procedure to be performed
 - Surgical site
 - Essential imaging available
-
- Has antibiotic prophylaxis been given within the last 60 minutes?
 - Plan for redosing discussed

Briefing

Surgeon Shares:

- Operative Plan
- Possible difficulties
- Expected duration
- Anticipated blood loss
- Implants or special equipment needed

Anesthesia Provider Shares:

- Anesthetic plan
- Airway concerns
- Other concerns

Circulating Nurse and Scrub Tech Share:

- Sterility, including indicator results
- Equipment issues
- Other concerns

Surgeon says:

"Does anybody have any concerns? If you see something that concerns you during this case, please speak up."

Before Patient Leaves Room

Nurse reviews with Team:

- Instrument, sponge and needle counts are correct
- Name of the procedure performed
- Specimen labeling
 - Read back specimen labeling including patient's name

Debriefing

Entire Surgical Team Discusses:

- Equipment problems that need to be addressed.
- Key concerns for patient recovery and management
- What could have been done to make this case safer or more efficient



Version - 4-24-12

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged. Based on the WHO Surgical Safety Checklist, URL <http://www.who.int/patientsafety/safesurgery/en>. © World Health Organization 2008 All rights reserved.

TJC looking closely at endoscopy reprocessing

Joint Commission, other expert groups weighing in

With infections related to contaminated endoscopes a recurrent problem in health care, the Joint Commission and several other groups and associations are reiterating the importance of reprocessing procedures.

An emerging theme is safe practices in all settings and a desire for standardization of the guidelines issued by the different associations and expert groups. For example, the American Society for Gastrointestinal Endoscopy (ASGE) recently issued updated guidelines in part because the CMS and Joint Commission are taking a hard look at reprocessing practices.

"Over the past two years, surveyors have

called into question accepted practices at many accredited endoscopy units seeking reaccreditation," the ASGE states.¹ "Many of these issues relate to the Ambulatory Surgical Center Conditions for Coverage set forth by CMS and the lack of distinction between the sterile operating room and the endoscopy setting."

The Centers for Medicare and Medicaid Services Conditions has eliminated the distinction between a sterile operating room and a non-sterile procedure room, meaning GI endoscopy units are now held to the same standards as sterile operating rooms.

"We are doing flexible endoscope [procedures] in many different practice settings now, and in my opinion that is what the CMS and the Joint Commission surveyors are looking for — that you have standardization no matter where it is," says Rose Seavey MBA, BS, RN, CNOR, CRCST, CSPDT, president and CEO of Seavey Healthcare Consulting in Denver, CO.

Toward that end, the Association for the Advancement of Medical Instrumentation (AAMI) is working on a comprehensive guide to flexible endoscopes in health care facilities that may emerge as the gold standard for practice.

“So many guidelines are not that comprehensive, but this will be talking about the whole gamut of reprocessing,” Seavey says.

For its part, the Joint Commission recently issued some basic guidance on endoscope reprocessing that emphasized vigilance, warning that “the long term effects of poor processes and an unsafe environment are severe. Working in partnership with infection control and clinical staff, environment of care professionals should ensure that these critical tools remain safe, clean, and ready for use every time.”²

Recommending periodic environmental tours of reprocessing areas, the Joint Commission created a checklist that includes the following points:

- Is the reprocessing area sized appropriately in relation to the volume of equipment processed?
- Do staff put on personal protective equipment (PPE) before entering the area?
 - Are staff wearing suitable PPE?
 - Is there sufficient work space?
 - Are cleaning supplies, storage areas, and other critical items clearly labeled?
- Is there an appropriate hand washing station?
 - Is there an appropriate eyewash station?
 - Are “dirty” areas physically separated from “clean” ones?
 - Are there suitable storage areas for cleaned endoscopes? On visual inspection, do these areas look clean, free of debris and dry? If a cabinet serves as storage, does the cabinet have doors?
 - Are endoscope storage containers dry and located off the ground”?
 - What is the route from the processor to the cabinet? (The route should not cross through the soiled processing area.)

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TJC patient safety guide for CEOs, docs

Seeking to ‘motivate and energize’ leaders

Joint Commission Resources (JCR) has released a new, free guide to help hospital executives and physician leaders implement and sustain safe practices. Produced by the JCR Hospital Engagement Network (HEN), the guide is part of the federal Partnership for Patients initiative to improve the quality, safety and affordability of healthcare.

“Patient Safety Initiative: Hospital Executive and Physician Leadership Strategies,” is intended to help motivate and energize healthcare leaders to assess gaps in their organizational safety culture, engage key influencers for change, set goals for targeted improvement, implement proven safe practices, and reinforce key behaviors to ensure high-reliability performance improvement.

The document includes two sections:

Part I focuses on hospital executive leadership strategies and includes an Activation Toolkit with seven components: board engagement on patient safety; safety culture debriefing; safety leadership rounds; teamwork training and skill building; daily safety briefing; senior executive adopt a work unit; and known best practices of execution.

Part II focuses on physician leadership and includes an Activation Toolkit with seven components: physician communication at the bedside; physician involvement in unit-based huddles; physician leadership of unit-based patient safety meetings; harm-reduction rounding checklists and evidence-based guidelines; multidisciplinary teamwork training; physician leadership of post-adverse event debriefs; and managing challenging behavior.

Editor’s note: The patient safety guide is available for download at: <http://bit.ly/1rFPysn>

For more information on the JCR HEN, go to www.jcrinc.com/CMS-Hospital-Engagement-Network ■