



# HOSPITAL INFECTION CONTROL & PREVENTION

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**AHC Media**

## Addicted Patients Inject, Infect Their Own IV Lines

*At risk of bloodstream infections, overdose*

By Gary Evans, Senior Staff Writer

**T**he national opioid epidemic is causing daily overdoses in the community, diversion drug thefts by healthcare workers, and now a dangerous new aspect at the bedside: Hospitalized patients are injecting illicit drugs and hoarded medications directly into their placed IV lines.

In the process, they may give themselves bloodstream infections — a serious complication in its own right — but in this scenario the risk is compounded by possible overdose. There are some reports of patients overdosing in hospitals, joining the estimated 29,000 people who OD annually on opioids in the U.S.

“I have definitely seen this,” says **Kimberly New, RN, JD**, founder of Diversion Specialists in Knoxville, TN. “In fact, I am aware of more than one case in which a patient did this and overdosed and died while in a hospital or other healthcare facility.”

Infection preventionists were already involved in the issue because drug-diverting healthcare workers have caused a tragic succession of hepatitis outbreaks among patients in recent

years. Infections caused by traveling surgical techs have happened so frequently that Colorado recently enacted a tough new law requiring registration, fingerprints, and a background check for these workers.

**“THERE ARE SOME REPORTS OF PATIENTS OVERDOSING IN HOSPITALS, JOINING THE ESTIMATED 29,000 PEOPLE WHO OD ANNUALLY ON OPIOIDS IN THE U.S.”**

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*(See related story in this issue.)*

This latest disturbing nuance to the problem is addicted patients infecting themselves by tampering with their IV lines while hospitalized for some other condition. In manipulating and accessing their lines, patients may contaminate the insertion site and seed their own bloodstream infections. They may also develop BSIs caused by whatever illicit drugs and solutions they managed to surreptitiously inject in their system while hospitalized. An unexpected outbreak of this variety happened at Baptist Medical Center in Jacksonville, FL, last year, and given the nature of addiction and the scale of the opioid epidemic, hospitals all over the country could be facing similar cases.

Two colleagues at the hospital shared their experience with this complex problem recently in Charlotte at the annual conference of the Association for Professionals in Infection Control and Epidemiology (APIC).

"From October 2014 to September 2015, we reported 16 bloodstream infections — a combination of CLABSIs and non-CLABSIs in one particular service," says **Robyn Kay**, MPH, CIC, clinical epidemiologist at Baptist Medical. "When we dove down into each of these infections, [we realized] we had a problem. Our clinicians were writing in the patient record that they were concerned about line manipulation and accession, so we needed to take action pretty quickly."

The hospital has a full regalia of infection prevention protocols and bundles in place, but it was something of a shock to find that eight of the 16 BSIs were due to patient line manipulation and access to inject drugs.

"We didn't plan for patients who self-inject and manipulate their lines," says **Blanca McKean**, MSN, RN, NE-BC, nursing director of the Adult Tower at Baptist Medical. "You don't know you have an issue until it's an issue. We didn't find any literature specifically on how to manage this patient population that self-injects while in hospitals, but we did find that it is not an isolated issue."

Indeed, infection preventionists should be aware of this new risk as various aspects of the opioid epidemic continue to roil through the healthcare system, says **Susan Dolan**, RN, MS, CIC, president of APIC.

"IPs need to have this on their radar, and really [be aware] whenever they see unusual organisms at unusual sites or notice an unusual event," she says. "Another important piece as part of this whole drug diversion situation is to connect with their pharmacy folks, be sure that they are aware of what the policies are, and know what mechanisms are in place to prevent diversion."

On top of the problem of patients and healthcare workers stealing and injecting drugs, there are continuing infections caused by poorly trained providers blatantly reusing needles, syringes, or single-dose vials on more than one patient.

"These startling and continuing outbreaks are probably somewhat the tip of the iceberg," Dolan says. "We certainly don't know about all of them because detection requires putting the pieces of the puzzle together. It takes the right people at the right place and right time. It takes someone who has an inquisitive mind, who says, 'Something isn't right. Why would a patient like this with

no risk factors have hepatitis?”

## Red Flags

Showing a slide of various plastic syringes, straws, and other drug paraphernalia taken from patients, McKean says the experience with addicted patients underscores how serious the opioid epidemic has become.

“We have a problem nationwide with opioid overuse,” she says. “Since 2000, we have had an increase of 137% in opioid-related deaths. Let that sink in for a second: a 137% increase.”

Deconstructing events from the identified cases, Kay and McKean did a retrospective chart review for some of the patients with bloodstream infections.

“Some of the patients we noted had behavioral changes, increased anxiety, depression, and aggression, as well as an increase in pain medication requests,” McKean says.

The patients required frequent placement and adjustment of their peripheral lines, and “with some of these patients we changed lines up to four times in one day,” she adds. “These patients also complained of difficulty swallowing unrelated to any medical issues — which required the need for IV pain medication administration.”

Other red flags included patients appearing over-sedated beyond what would be expected for the medication they were taking. Patients would often insist on closed doors and privacy and took frequent and prolonged bathroom visits.

“They wanted privacy, especially after [pain] meds were administered,” McKean says. “They were also very protective

of their belongings. They didn’t want to allow a change of linens or have any help with hygiene. They demanded to do it themselves. We found when taking care of these patients that the reason was that they were hiding all of their paraphernalia in their beds.”

## The Intervention

A multidisciplinary team was formed to address the issue, with representation from physicians, nurses, infection control, pharmacy, risk management, and behavioral health. A series of interventions was devised based on incremental steps that begin with the admission process.

“The best time to try and identify these patients is during admission,” McKean says. “We have an opportunity to identify them through the physician [workup] or the nursing admission assessment. We try to identify if there is any history of drug abuse.”

If so, the patients are told that because of their drug history, behavioral health will be consulted to minimize any potential withdrawal effects or relapses during the hospitalization. Pharmacy is brought in to validate their current medications and recommend any necessary changes.

“This is just fostering open, honest communication, and again, it is aimed at preventing withdrawal,” McKean says. “We collaborate with our patient relations and risk management. We want to avoid line placement if possible. And if we do need to place a line, we don’t want to place it in an area that is too accessible to the patient.”

For example, a line placed in the neck area can be eas-

ily accessed with both hands and thus should be avoided,

“We also want to [place the line] in their dominant arm because then it will be harder for them to access it,” McKean says. “We don’t want to leave any nursing supplies in the room. We found a couple of times in delivering nursing care and bringing in our supplies to either flush a line or medicate a patient — you turn around to do something in the chart and your supplies have disappeared. You think you are losing your mind, but it is actually the patient taking them.”

## Some Elude Detection

Addicted patients not identified during the initial admission may be subsequently identified, warranting placement in a room that allows video monitoring.

“We have had this occur several times where we find these patients in the bathroom injecting in their lines,” she says. “They are in a bathroom a prolonged time and you go in there and they are injecting some foreign substance.”

At this point, the patient is transferred to a “care view” room if possible, which has a video monitor that allows oversight without actually recording the patient.

“Hopefully that will help deter them from injecting because they know we are watching them,” McKean says. “We remove the sharps container and the trash can from the room.”

Medication is either administered intramuscularly or in a solution.

“A lot of times when you give these patients their pain meds they ‘cheek’ them and then take them out later, crush them, and inject them into their lines,” she says.

The nursing team tries to ensure patient room doors and bathroom doors remain open and either ban visitors or require them to check in first with security.

“We have found that a lot of times visitors will bring in these substances for the patient,” she says. “If [warranted], coordinate with security to conduct a room search. We have had to do that a couple of times and it is not pleasant. We don’t want to make the patients feel

awkward or incriminated, but we want to make sure they’re safe. The last thing we want to do is find a patient overdosed in the bathroom.”

The program is a work in progress, with the next phase to include a scripted educational video to model drug addiction conversations with patients.

“We realize that this approach may not be feasible for every hospital system, but the process has been helpful to identify at-risk patients

and prevent healthcare-associated infections,” Kay says. “Some of the challenges are that a patient may decide to leave against medical advice, and of course we worry about that. Another [challenge] is identifying these patients [early]. Sometimes we do miss them. We want to minimize the inpatient admissions and hopefully screen them out if they don’t need [hospitalized] medical care while they are in the emergency department.” ■

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## Drug Diversion: A New Sheriff in Town

*Tough new state law targets traveling surgical techs*

**A**fter a series of highly publicized drug diversion incidents by healthcare workers and patient outbreaks in Colorado in recent years, the state has passed a law that requires surgical technologists to register and submit to background checks.

Effective Aug. 10, 2016, Colorado law (House Bill 16-1160) requires that surgical techs pass a criminal history check and submit fingerprints to the state Bureau of Investigation. The law also stipulates that employers requiring surgical techs to take a drug test must forward any positive results for a non-prescribed controlled substance to state officials.

In the latest of a succession of incidents in Colorado, last year the state charged an HIV-positive surgical technician with stealing opioid drugs, leading to a recommendation that some 3,000 patients at Swedish Medical Center in Englewood be tested for bloodborne viruses.

Colorado may now have the strongest law in the land to address what is clearly a national problem. Addicted healthcare workers are

another spectrum in a tsunami of national opioid addiction. Surgical techs that are “travelers” or agency workers have been able to go from hospital to hospital, even in cases where they have been discovered diverting drugs and fired. Hospitals fear liability and bad publicity in drug diversion incidents and may fire workers without pursuing public prosecution. In the most recent incident in Colorado, the surgical tech allegedly falsified his job history and resume to leave no trail back to past incidents.

“When hospitals detect this, they find that these surgical techs have been at numerous other facilities, not just in our state but throughout the country,” says **Susan Dolan**, RN, MS, CIC, president of APIC and epidemiologist at Children’s Hospital Colorado in Aurora. “Colorado has passed this legislation now requiring background checks and fingerprinting, and this is something we need to do nationally. These folks only stay until they get caught and then there is no way to track them.”

In the most egregious case to

date, an HCV-infected traveling radiology technician was linked to a cluster of HCV patient infections at a New Hampshire hospital in 2012. The subsequent investigation uncovered a large HCV outbreak spanning several years, involving more than a dozen hospitals and affecting thousands of patients in eight states. The technician was stealing syringes filled with narcotics, self-injecting, refilling them with saline, and placing them back into the procedure area, officials reported. He was sentenced to 39 years in prison.

According to the CDC — in what is certainly an undercount of actual infections — there have been an estimated 100 patient infections and 30,000 potentially exposed patients via drug diversion reported in U.S. healthcare facilities over the last decade.<sup>1</sup>

With a history of drug use, the diverter is often infected with HCV or other bloodborne pathogens. They then contaminate syringes and solutions in diverting drugs, setting off outbreaks among patients that are often the

event the leads to their arrest. In the absence of an outbreak, ongoing sporadic infections and other patient harms are largely going undetected because bloodborne infections may not be discovered for some time, perhaps not until a patient later gets a blood test for something else. If the patient has no risk factors for HIV or hepatitis, they are understandably mystified and alarmed that they have acquired a serious infection.

In a position paper issued earlier this year, APIC recommended that healthcare settings “institute drug diversion monitoring systems and security measures to assist in averting and/or identifying diversion activity. CDC defines an appropriate response to a drug diversion event as including [an] ‘assessment of harm to patients, consultation with public health officials when tampering with injectable medications is suspected, and prompt reporting to enforcement agencies.’”<sup>2</sup>

There are commercially available programs that keep track of drug inventories, document access, and reconcile unused drugs and “waste,” Dolan says. “Periodically, some pharmacies test the leftover drugs so you can be sure that someone is not sending back saline as the leftover,” she says. “The other thing is to be astute on the front lines, be aware of patients that do not seem to be under good pain control.”

APIC also cites a common risk factor for diversion in some facilities that prefill syringes and IV solutions in advance to be ready for a scheduled procedure. Of course, therein lies the temptation to the drug diverter, who has been described as the type of worker who may come in early and work late. Therefore, APIC warned against these prefilling practices, recom-

mending that injectable meds be prepared as close as possible to their time of clinical use.

“We tried to put our position

**“SHE TOOK THE SYRINGE, PUT A CLEAN NEEDLE ON AND PUT IT IN THE BIN AS THE SECOND DOSE, FIGURING SINCE I CHANGED THE NEEDLE IT’S SAFE FOR THE NEXT PATIENT...”**

paper in a practical format for frontline use,” says Dolan. “[We are addressing] how things really happen on the frontline. There are people you wouldn’t suspect who are diverting. The people who come in early and stay late. The people who sign up for a lot of overtime. That’s one extreme, and on the other there are people who aren’t performing well and always seem lethargic. But some of these people are high performers. You wouldn’t suspect them, and they build trust to gain access.”

## **Injection Safety 101**

Beyond the diversion issue, the APIC paper addresses a vexing and frustrating problem that continues to occur with shocking regularity. Clinicians who should know basic injection safety and proper infection control measures time and again ignore some essential step and expose patients to each other’s blood via reused

needles or contaminated vials.

“We’re still continuing to see these issues, but I think what we are finding is the majority of these are happening in facilities outside of hospitals — in the community in small practices, in long-term care facilities and nursing homes,” she says.

Dolan shares a cautionary tale of a healthcare worker in Colorado who was administering influenza vaccine that was to be given in two doses to young pediatric patients. “The medical assistant was delegated to give the shots and knew how to do the technique, but didn’t understand the ramifications of how she was doing the procedure and handling the medication,” she notes.

Seizing on the idea that two doses were needed, the healthcare worker gave each child a partial dose and then saved the remainder in syringes labeled “second dose” in a bin in the clinic refrigerator. No child’s name or identifier was on any of them.

“She took the syringe, put a clean needle on and put it in the bin as the second dose, figuring since I changed the needle it’s safe for the next patient, whoever needs their second dose,” Dolan says.

As infection preventionists are well aware, changing the needle does not solve the problem as minute levels of blood aspirated into the syringe solution could transmit hepatitis C and other infections between patients. The APIC paper recommends the following steps as a kind of injection safety 101:

- Never use a syringe for more than one patient, even if the needle has been changed between patients.
- Use a new sterile syringe and a new sterile needle for each entry into a vial or IV bag.

- Use sharps safety devices to give injections whenever possible.
- Discard syringes, needles, and cannulas in a sharps container immediately at the point of use.
- Discourage transporting medication-filled syringes in pockets or clothing.
- Label all syringes containing medication if not immediately administered. Include patient identification information, names and amounts of all ingredients, and the name or initials of the preparer.

## Vial Issues

Another problem is reuse of vials labeled single-use, as some may be large enough to contain more of the medicine. Citing multiple outbreaks, the FDA is proposing label changes and creating a new category of vial called “single-patient-use.”<sup>3</sup>

“In the past, the term ‘single-use’ container has been used by FDA to describe a package type that contained multiple doses but was intended to be used in a single patient,” the agency states in the proposed rule. “Unfortunately, the term ‘single-use’ was also inappropriately used as if it were interchangeable with the term ‘single-dose’ which was not the agency’s original intent. To address this confusion regarding the terminology, the [FDA] is retiring the term “single-use” and a new package type term ‘single-patient-use’ container, is being created to address the need for describing a package that contains multiple doses of an injectable medical product that is intended to be used in a single patient.”

While there has certainly been confusion about medication vials, there has also been a certain level of greed as facilities adopted dan-

gerous practices to scavenge meds. The most infamous example was the 2008 hepatitis outbreak at a Las Vegas endoscopy clinic, where workers were using single-dose vials of propofol on more than one patient. The practice had been going on for years, and tens of thousands of patients were advised to seek testing for HIV and hepatitis.

**“MEDICATIONS COST A LOT OF MONEY AND THEY ARE NOT [BEING MANUFACTURED] IN WAYS THAT YOU ARE ABLE TO JUST GIVE A SINGLE DOSE AND THEN THROW IT AWAY.”**

“I do think some of it is to save money — there is still that incentive,” Dolan says. “Medications cost a lot of money and they are not [being manufactured] in ways that you are able to just give a single dose and then throw it away.”

The problem has also been exacerbated by drug shortages in some cases. The FDA has not issued a final rule on its proposed changes, but APIC submitted comments to the agency urging them go further and require design changes in certain vials to block unsafe reentry. “FDA [should] consider providing additional requirements in the near future for industry on Single-Dose containers such that re-entry or reuse of such containers is prohibited by product design features. ... [T] here are instances where a single-

dose container may contain more drug than is required by a single dose, but is not intended for use following removal of a single dose.”<sup>4</sup>

In the interim, IPs should continue to be vigilant for unsafe injection practices and drug diversion incidents during rounds in their facilities, Dolan says.

CMS includes basic injection safety aspects in hospital inspections using its infection control worksheets. That will certainly add pressure for compliance with aseptic technique, she adds.

“All of these [CMS] infection control worksheets that we are starting to see put into place actually have very specific components [on injection safety] for their inspectors,” Dolan says. “It is a red flag and it escalates the issue within the state for [facility] certifications. I think putting teeth into this is really helpful.” ■

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# Zika Mosquito Spread Begins In Miami

*Aedes mosquitoes proving difficult to eradicate*

As this issue went to press, public health officials in Miami confirmed the first local cases of Zika transmission in the United States via mosquitoes.

On July 29, 2016, the state health department confirmed the first four people infected by local mosquitoes in Miami-Dade and Broward counties. As of Aug. 5, Miami had 16 cases of local transmission by mosquitoes in the same square-mile area. Statewide, Florida was also reporting a total of 351 travel-related cases and 55 infections of pregnant women. Zika virus infection has been linked to congenital microcephaly and other serious birth defects.

As public health officials continued to test people who live or work near the index cases, they found some were asymptomatic — not surprisingly, since only about 20% of those infected with Zika have the typical symptoms of fever, rash, joint pain, and red eyes. *Aedes aegypti* mosquitoes were found in the area, which is north of Miami in a neighborhood called Wynwood.

The popularity of the area may not bode well for Zika control, as shops and restaurants were still drawing large crowds even as the first cases were confirmed.

“It’s very popular with young people,” says **Barbara Russell**, RN, MPH, CIC, director of infection control at Baptist Hospital of Miami. “There are a lot of nice restaurants and people live there and, of course, work there. That’s where the concentration is right now. Our health department is telling anyone who is pregnant who lives there, works there or has been there recently to see their obstetri-

cian or doctor and get tested.”

Incoming patients at Baptist Hospital are being asked if they have been to the local area or any of the international destinations where Zika is spreading, she tells *Hospital Infection Control & Prevention*. Standard precautions are sufficient to prevent transmission to other patients, but the primary message in addition to cautioning pregnant women is safe sex and avoiding attempts at conception until tested for Zika.

“ONCE WE WENT THROUGH HIV I DIDN'T REALIZE I WAS GOING TO BE TALKING ABOUT SAFE SEX AGAIN.”

“Once we went through HIV, I didn’t realize I was going to be talking about safe sex again,” Russell says. “But we counsel the man and woman to wait until the test results come back — it takes a few days. Until we call you, have no sexual intercourse or use condoms.”

Healthcare workers have been briefed and educated about Zika for some time now, so there is a general sense of readiness in the hospital.

“We put out newsletters, and the chief officer of the whole system periodically sends out an email to give an update,” she says. “We have information on our website and we hold classes and do one-on-ones. We take phone calls from the community as well as the staff.”

Again, the hospital is fol-

lowing standard precautions, reinforcing basic barrier protection from blood exposures.

“[We are telling healthcare workers] that’s why we have needle safety devices, why you wear gloves and wear goggles if you are doing anything that could create a splatter,” Russell says. “It’s the same thing we do for hepatitis C. Also, some patients are just coming in for testing; they are not sick enough to be admitted. We are really urging pregnant women to get tested so they can have peace of mind. That’s what 90% of this is about.”

Another component of IP involvement is in Zika testing, serving as a kind of liaison between the hospital and state health department.

“The way it works here in Miami-Dade County is that if somebody needs to be tested — if a doctor thinks they need to be tested or they have symptoms or whatever — we go through the health department and they have to approve the testing,” she says. “So infection control has gotten very involved in that as kind of the conduit between the doctors and the health department.”

The blood supply was affected for a couple of days, but now donations are being tested and the supply has been restored.

“They were not taking the blood for a day or two but now they have started testing the blood,” Russell says. “For several weeks, if you went to donate blood they have asked you where you traveled, and if you have just traveled to [a Zika area] they will not take your blood. Now they are starting to test the blood like they do for HIV.”

## CDC Response and Recommendations

Finding persistence populations of mosquitoes in the Wynwood neighborhood, the CDC issued a travel warning for the area of transmission and dispatched an emergency response team to Miami.

“We advise pregnant women to avoid travel to this area, and pregnant women who live or work in this area and their partners to make every effort to avoid mosquito bites and prevent sexual transmission of Zika,” said CDC Director **Tom Frieden**, MD, at a recent CDC

press conference. “This advice applies to anyone who lives in or has traveled to this area any time after June 15. That is the earliest known date that one of the cases could have been infected with Zika.”

There is concern that the *Aedes aegypti* mosquitoes that commonly spread Zika are resisting eradication despite heavy spraying, he notes.

“It’s possible that the mosquitoes there are resistant to the insecticides that have been used,” Frieden said. “Second, it’s possible that there are what we call ‘cryptic’ breeding places or small amounts of standing water where mosquitoes continue to hatch.”

To that latter point, the *Aedes* mosquitoes need only a small

amount of water to lay their eggs, meaning common flowering plants in the area like bromeliad can serve as a nest of sorts.

“Despite the daily use of spraying, the vector control experts [in Florida] were still seeing new larval mosquitoes and moderately high *Aedes aegypti* counts,” Frieden said. “Just to be clear, this is a really tough mosquito to control. When Key West had an outbreak of dengue a few years back, despite extensive mosquito control efforts, that outbreak continued for more than a year. It’s a demonstration of how intensive the efforts need to be to control this infection.” ■

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## Strange Cases of Zika Transmission

*‘In our line of work, nothing is truly off the table.’*

**Z**ika virus is proving nothing if not unpredictable as we now also have a strange case of apparent transmission to a caregiver from a dying patient as well as the first documented case of apparent female-to-male sexual transmission.

Beginning with the case that has epidemiologists really puzzled, a dying patient in Utah with a staggering level of circulating Zika virus apparently infected a family caregiver in what may be the first case of non-sexual person-to-person transmission of the emerging virus.

The family member who cared for the patient completely recovered from the Zika infection, but the unusual Utah case opens up a whole new area of concern for a virus that is proving highly unpredictable. In addition, as this issue went to press, the first 16 cases of mosquito transmission were reported in Florida. That was a feared but expected milestone, but the Utah case is yet another departure from

the projected Zika characteristics.

The case began with the first reported Zika-related death of a person in the continental U.S., which occurred in late June near Salt Lake City.

“The deceased patient had traveled to an area with Zika and lab tests showed he had uniquely high amounts of virus — more than 100,000 times higher than seen in other samples of infected people — in his blood,” the CDC reported.<sup>1</sup>

That certainly suggests how the patient was able to transmit the virus to a family contact who provided care, as any exposure to blood or body fluid could have contained high levels of virus. Zika virus has been recovered in a variety of bodily fluids in past research, including semen, vaginal fluid, urine, blood, and saliva. Transmission by one of these fluids is merely supposition at this point, but public health investigators are not ruling anything out. Asked about airborne transmission, a CDC epidemiologist

said at a recent press conference that was “extremely unlikely,” particularly in the absence of a medical procedure that could generate aerosols.

“In our line of work, nothing is truly off the table,” said **Michael Bell**, MD, Deputy Director of CDC’s Division of Healthcare Quality Promotion. “The table is vast. We never want to underestimate possibilities, however, it would be extremely unlikely for something like that to occur.”

Here’s what is known: The caregiver had not traveled to a Zika transmission area, had no sexual risk factors, and the *Aedes* mosquitoes that transmit the virus have not been seen in Utah. *Culex* mosquitoes that typically feed on birds in the state are being periodically tested for Zika virus, and thus far all are negative. The CDC and state health officials are testing other family members of the index case and healthcare workers who may have provided care.

Again, the secondary case recovered and did not have the high viral

titers of Zika like the index case.

The question of why the first patient had such an off-the-charts viral load raises the issue of whether Zika proliferated due to the patient's reported underlying medical condition.

"From the infection control perspective, I think it is too early to make a clear statement about what we think could have happened," Bell said at the press conference. "Certainly a high viral load is something we take very seriously, as it is not something about which we have a very long experience [with Zika]. So you are asking sort of a chicken or the egg question. Someone who is extremely ill and debilitated from another disease process could have a diminished immune system that does not fight the virus as well, and that might allow more virus to proliferate in the bloodstream. On the other hand, someone with a high viral load could be sick with the viral infection. I personally cannot tell you which way that went."

Given the lack of information, the CDC is not changing any guidelines for PPE use by healthcare workers treating Zika patients.

"Make sure that healthcare personnel don't have any direct contact with blood or bodily fluid, through broken skin, needlesticks or splashes to the mucous membranes," Bell said. "I think this highlights the fact that with an infection like Zika virus, a good percentage of patients don't have

symptoms. It means that it is as important as ever to stick with good precautions. Just like we assume anybody might carry hepatitis or HIV; we don't wait for a positive diagnosis in order to prevent blood or bodily fluid exposure. The same thing is true with Zika virus, and this is a great example of why we should never take chances but always adhere to standard precautions."

## Sexual Transmission from Female

Another surprising manifestation of the emerging virus was the recent case of female to male sexual transmission. Erring on the side of caution now means taking precautions if either partner has been in a Zika transmission area. This follows a surprising number of male-to-female cases of sexual transmission and the first documented report of Zika infection via needlestick. The CDC reported that a woman in New York City transmitted Zika virus to a male sex partner the day she returned from a region with widespread transmission of the virus.<sup>2</sup> No condom was used and the man began exhibiting Zika symptoms several days later. An astute clinician who had treated the woman made the connection, documenting the first case of female-to-male transmission of Zika virus.

In light of the case and other transmission events, the CDC recently

broadened its recommendations to prevent sexual transmission of Zika. The recommendations are for men and women — who have traveled to or reside in an area where Zika is being transmitted — and their sex partners. Of note, the CDC now recommends Zika awareness and appropriate precautions for all pregnant couples, including female partners of pregnant women.

The CDC is now defining potential sexual exposure to Zika virus as "having had sex with a person who has traveled to or lives in an area with active Zika virus transmission when the sexual contact did not include a barrier to protect against infection. Such barriers include male or female condoms for vaginal or anal sex and other barriers for oral sex. Sexual exposure includes vaginal sex, anal sex, oral sex, or other activities that might expose a sex partner to genital secretions."<sup>3</sup> ■

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# Antibiotic Use Reductions May Decrease *Clostridium difficile*

*FDA warning on fluoroquinolones, IDSA says limit therapy for VAP*

Two recent developments limiting antibiotic use could have a secondary benefit of reducing *Clostridium difficile* infections, which have been the bane of infection preven-

tionists since emerging in a highly virulent strain some 15 years ago.

The first is the FDA's recent safety warning<sup>1</sup> that clinicians should only use fluoroquinolones on the

following three conditions if no other antibiotic alternative exists:

- acute bacterial sinusitis,
- acute bacterial exacerbation of chronic bronchitis, and

- uncomplicated UTIs.

The FDA cited serious, “potentially permanent” side effects of the muscles, joints and nervous system associated with the following fluoroquinolones:

- moxifloxacin,
- ciprofloxacin and cipro extended release,
- gemifloxacin,
- levofloxacin, and
- generic ofloxacin.

“These medicines are associated with disabling and potentially permanent side effects of the tendons, muscles, joints, nerves, and central nervous system that can occur together in the same patient,” the FDA stated in the drug communication.

In addition, the FDA revised its strongest warning — the “boxed warning” — and updated other parts of the labels for the aforementioned drugs.

“For some serious bacterial infections the benefits of fluoroquinolones outweigh the risks, and it is appropriate for them to remain available as a therapeutic option,” the FDA stated.

Though not mentioned by the FDA, the action could reduce *Clostridium difficile* infections, which can establish in the gut after administration of fluoroquinolones and other antibiotics. Some studies<sup>2</sup> have found fluoroquinolones may increase onset of *C. diff*, so reductions in administration of this drug class could have a side benefit of reducing gut onset of the enteric pathogen.

## Cut Back Duration

In another development that could favorably affect *C. diff* rates, the Infectious Diseases Society of America (IDSA) is advising limited duration of antibiotic courses to treat hospital-associated pneumonia (HAP) and ventilator-associated pneumonia (VAP). These infections affect hundreds of thousands of patients a year

and generate high volumes of antibiotic use. In conducting a review of the literature and considering other factors, IDSA is recommending that antibiotic treatment should not go beyond a week. Of course there will be individual circumstances and exceptions, but in general, antimicrobials administered beyond seven days for these patients have little additional therapeutic benefit and can select out resistant bacteria and trigger *C. diff* infections by wiping out commensal bacteria in the gut.

*Hospital Infection Control & Prevention* talked to lead author **Andre C. Kalil**, MD, an infectious disease physician at the University of Nebraska Medical Center in Omaha, about the guidelines.

“Pneumonias are the top cause of use of antibiotics in ICUs in the United States,” he says. “It is logical to think it must be one of the top causes of *C. diff* just because of this high frequency of use. *C. diff* is definitely something that we are very concerned about. This is not a preventive guideline, but we believe that more judicious use of antibiotics could curtail *C. diff* as well.”

The IDSA and the American Thoracic Society guidelines call for antibiotic administration for “seven or fewer days” for HAP and VAP.

“We did an extensive review of the literature to make sure that this is the most effective [time period],” Kalil says. “Sure, there will be exceptions as we note in the guidelines, but this should be highly effective [to treat infections], and on top of that we gain several other benefits of having shorter courses: less side effects, less *C. diff*, less drug resistance, and lower costs.”

A key aspect of the guidelines calls for all hospital clinicians to create antibiograms to clearly show the range of susceptibility and resistance in the particular pathogens causing infections in their hospital. This knowledge will inform therapy and

allow allow maximum benefit in the shortest duration, the guidelines state.

“We believe this is really important for the accuracy of treatment of VAP and HAP because you really have to know your hospital flora, your ICU flora — what normally infects the patients in your hospital?” Kalil says. “Then you are able to have much more individualized and precise care with your antibiotics. This type of approach will not only benefit the patient by delivering the right drug but also avoid the mistakes of giving unneeded drugs and exposing the bugs [enough] to develop resistance. We think this is something that will benefit both individual patients and society.”

Though antibiotic stewardship goes beyond the scope of the guidelines, it goes without saying that creating antibiograms could inform judicious use of drugs as a part of such programs.

The new guideline updates the 2005 IDSA recommendations, which recommended different treatment durations for the various bacteria that cause HAP and VAP. ■

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# Will a Mysterious Outbreak of *Elizabethkingia* End Unsolved?

Survivors asked to meet and try to jog memories

Unable to determine the source of an inexplicable outbreak of *Elizabethkingia anopheles* in Wisconsin and two other states, investigators are inviting the survivors of the infection to participate in focus groups and see if they can find a common link that preceded their illness.

“We want to get those that are still living face-to-face in groups and see if they can help each other bring some information to the surface,” says **Gwen Borlaug**, MPH, CIC, coordinator of the HAI Prevention Program in Wisconsin.

Updating the exhaustive but fruitless investigation recently at the APIC conference in Charlotte, Borlaug said the investigation continues though the number of cases appears to have peaked.

“At this point in the investigation, I think it is apparent that clues to the source of these infections are not found in the epidemiologic, clinical, environmental, or laboratory data that we have collected to date,” says. “We therefore need to expand our investigation methods.”

Active surveillance will continue, as *E. anopheles* is now a reportable condition in the state. That in itself is unusual, as the relatively obscure bacteria usually causes about five to 10 infections per state annually in the U.S.

“Whole genome sequencing is ongoing and that is going to help focus the epi-analysis toward patients with very closely related isolates,” she says.

As of June 16, 2016, the CDC confirmed 65 cases in three states with 20 deaths. With one case in

Illinois and one in Michigan, the remaining 63 are in Wisconsin, which reported the first six cases between Dec. 29, 2015, and Jan. 4 of this year. The temporal and geographic pattern of the infections suggest west-to-east movement across southeast Wisconsin and the bordering areas of Michigan and Illinois. Though the common source of the outbreak remains unknown, two of the infections in Wisconsin were acquired in healthcare settings, Borlaug says.

“In terms of place of residence, 75% of the cases were living at home, 20% resided in nursing homes, and four patients were hospitalized at the time of their first positive culture,” she says. “Two of those cases had no signs or symptoms of infections and likely represent colonization. Those were incidentally identified in their hospital stay but two others represent healthcare associated infections.”

The cases don't explain the outbreak, however, as no common source has been found despite an exhaustive investigation. The CDC has been assisting in an ongoing outbreak investigation that has included testing of water, soil, plants, food, and personal products in the search for a source of the genetically distinct strain of *E. anopheles*.

Thirty-four isolates collected from other areas of the country do not match the infecting strain.

In addition, investigators have looked for common healthcare contacts in dialysis, dental settings, long-term care, and hospitals. With the exception of the two aforementioned nosocomial cases, there is no discernable pattern in healthcare contacts that would explain the majority of cases. The infections have primarily been in people with immune deficiencies and underlying health problems over the age of 65. The majority of the infections identified to date have been bloodstream infections, but some patients have had the bacteria isolated from other sites, including the respiratory tract and joints.

How exhaustive has the search been? Among the environmental sources tested have been neti pots, bird baths, marijuana, vacuum cleaner bags, leaf cuttings, and soil, Borlaug says. Among the food sources have been fish, as fish-fries are a common social event in Wisconsin, she adds. That led to questions about fish varieties and health — leads that had to be followed like everything else in the case.

“I didn't know we had a state Fish Health Veterinarian,” she said. ■

## COMING IN FUTURE MONTHS

- HCV in dialysis settings: Tip of the iceberg?
- IPs are the Hawthorne Effect personified
- The IP role in detecting, preventing sepsis
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## CME/CE QUESTIONS

**1. Which of the following were "red flags" for patients who may inject drugs into their IV lines?**

- a. Complained of difficulty swallowing.
- b. Frequent and prolonged bathroom visits.
- c. Resisted a change of linens.
- d. All of the above.

**2. A new drug diversion prevention law in Colorado requires registration and background checks for which type of healthcare worker?**

- a. Anesthesiologists
- b. Pain management nurses
- c. Surgical techs
- d. All of the above

**3. The FDA is proposing vial label changes and creating a new category of vial called:**

- a. Single-patient-use
- b. Single-day-dose
- c. Safe re-entry-multidose
- d. Multipatient-use

**4. Which level of infection control precautions were being used at Baptist Hospital of Miami to protect healthcare workers from Zika virus?**

- a. Standard
- b. Droplet
- c. Airborne
- d. All of the above

## CME/CE OBJECTIVES

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

1. Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
2. Describe the effect of infection control and prevention issues on nurses, hospitals, or the healthcare industry in general;
3. 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.