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APIC 2014: Saudi IPs say MERS is 'our challenge,' but tide is turning with aggressive new measures

'We have to be ready around the clock'

By Gary Evans, Executive Editor

The wider availability of PCR tests to rapidly detect MERS coronavirus is enabling hospitals in Saudi Arabia to better identify cases and prevent transmission to patients and health care workers, infection preventionists from the Kingdom tell *Hospital Infection Control & Prevention.*

Rather than crestfallen at the global attention on the emergence of the novel coronavirus, the Saudi clinicians expressed confidence and a surprising level of pride that it is their fate to be at the epicenter of a possible pandemic.


Mercy Joseph, BSN, CIC

"It is our challenge — we in infection control and prevention," says **Mercy Joseph**, BSN, CIC, an infection preventionist at King Fahad Medical City in Riyadh. "Now we have to be ready around the clock. It is a good challenge for us and we enjoy our work a lot. We know we are doing something for the public."

In an exclusive interview in Anaheim at the annual conference of the Association for Professionals in Infection Control and Epidemiology (APIC), the Saudi clinicians say they are close to turning the tide of MERS and have recently stopped transmission in their hospitals.

"We have gone three weeks with zero cases," Joseph says.

Concurring was **Dr. Areej Taher Ben Sadek**, an infection preventionist at King Fahad Hospital in Jeddah. "For the last six weeks — and among health care workers for the last two months — we have zero reported cases," she says.

While both Saudi IPs confirmed that they have had MERS trans-

In This Issue

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mission in the past to patients and health care workers, one of the key differences now is wider availability of PCR tests that can confirm or rule out MERS in no more than six hours.

"That is really helping us manage the cases," Joseph says. "The lab is one of the main center points of our care. Even at night, we have good communication and they will call us without fail."

Delays in getting confirmed test results have likely led to unprotected exposures to patients and health care workers, says **Fiaz Ahamed**, MD, MBBS, infection preventionist at Al Rass General Hospital.

"Before there was only one center in one city where they were testing," he says. "Now there are many [testing] centers and they are implementing efficient specimen test protocols to guarantee the validity of tests."

Asked about reported[1] breakdowns in infection control in Saudi hospitals, Ahamed says failure to follow all precautions for unconfirmed cases has been part of the problem.

"Sometimes there are breaches in infection control strategies — they may have not been wearing masks or something," he tells *HIC*. "Actually, the infection control programs are very strong in Saudi Arabia. Once the patient is confirmed there is 100% infection control."

But exposures may occur from suspect patients because until recently, test results may not have been available for 2 to 3 days at many hospitals. "Confirmed cases are placed under isolation that includes negative pressure air ventilation," Ahamed says. "But only the confirmed cases are there, and the suspect cases during this time period could be a source of infection."

The threat to health care workers

Certified in infection control since 2006, Joseph says anyone who comes to her hospital with flu-like symptoms is immediately separated into another area and tested for MERS. "There is no mixing and mingling — we have a really good triage system," she says.

The hospital has seen transmission to health care workers from unsuspected cases, particularly one who did not show any obvious signs of MERs.

"He was not even suspected [as having MERS] and that was the reason he exposed a lot of health care workers," Joseph says. "Only after admission was it suspected, and by that time some employees were exposed."

Another health care worker infected a colleague because the two shared a small apartment, she says. It is estimated that a quarter of MERS cases have been in health care workers, but the vast majority of fatal infections have occurred in patients with chronic underlying conditions.

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Rapid follow-up, no MERS spread in two U.S. cases

CDC: 'We will continue to err on the side of caution'

None of the health care workers or other people exposed to the first two MERS cases in the United States were infected, as contacts were subject to rapid follow up and home quarantine policies following the exposures.

For example, in the hours before MERS was suspected in the second U.S. case in Orlando, several employees in the emergency department at Dr. P. Phillips Hospital had unprotected exposures.

With the help of nurse managers, the hospital quickly identified those exposed employees, says **Ken Michaels**, MD, MPH, medical director of occupational health at Orlando Health, the parent health system. Two physicians and 14 employees at Dr. P. Phillips Hospital were placed on home isolation for 14 days. Another six employees and one physician at Orlando Regional Medical Center were furloughed after it was discovered they were exposed when the patient accompanied a friend to the radiology department there.

Daily phone calls to exposed employees helped assuage fears, and use of a mobile occupational health clinic at the hospital made testing quick and convenient, Michaels says.

"We wanted to make sure they had an avenue to ask questions, to be heard," says Michaels, who personally called each furloughed employee every day to ask about any symptoms and to respond to any concerns. "I really think that made a tremendous difference. It was very reassuring for them."

The Florida MERS case was confirmed on May 11, 2014, about a week after the first U.S. imported case of MERS was confirmed in Illinois. Both men had recently worked in hospitals in Saudi Arabia. The CDC initially reported the Illinois man transmitted MERS to a business associate from Indiana, but reversed the call after more definitive testing.

"While we never want to cause undue concern among those who have had contact with a MERS patient, it's our job to move quickly when there's a potential public health threat," says **David Swerdlow**, MD, the CDC's incident manager for MERS response. "Understand that the situation is very fluid and our information may change. Because there is still much we don't know about this virus, we will continue to err on the side of caution." ■

"We had a few cases of health care workers becoming infected, but they are all fine now," Joseph says.

The first two MERS cases in the U.S. were health care workers who traveled from Saudi Arabia, drawing attention to the large number of workers from other nations who provide medical care in the Kingdom. (*See related story, above.*) 63.) Health care workers who travel from Saudi Arabia to other nations should be aware of any signs and symptoms of MERS, which has an incubation period for as long as two weeks, Joseph says.

"We know the main important factor is to give them more education," she says. "We tell them if you are leaving this country you have to self-observe for yourself. Even us coming here, we are also exposed to the patients, so we have to do the proper precautions and self-observe."

Some Saudi hospitals are giving incentives like salary supplements to health care workers willing to work with MERS patients, Ahamed says. "But if I am a physician or health care worker and I follow the complete measures of prevention I will be happy to work there. If you follow these measures there is no harm in working."

Al Rass is some 400 miles away from where most cases have been occurring, and thus far Ahamed has primarily dealt with suspect cases. "In my hospital we have had 15 suspect cases, but none of them became positive," he says. "But I do visit hospitals where there are some [MERS] patients. I do rounds and I have been with them and their infection control practitioners."

Though Ahamed did not want to get into health policy matters, many of the initiatives and changes described by the Saudi IPs have come recently under the new leadership of health min-

ister Adel bin Mohammad Faqih. The change has resulted in more transparency and the case count and mortality figures were revised upward after a review of all cases since the outbreak began in 2012. As of June 4, 2014 there were 695 MERS cases and 283 deaths in Saudi Arabia. Other new initiatives under Faqih include an electronic case reporting system, guidelines for the proper labeling and storage of samples in hospitals and labs, protocols to ensure the integrity of samples during transport, and a courier transportation system for rapid transfer of specimens.

"Our country has a lot of resources and all the control measures are being provided," Ahamed says.

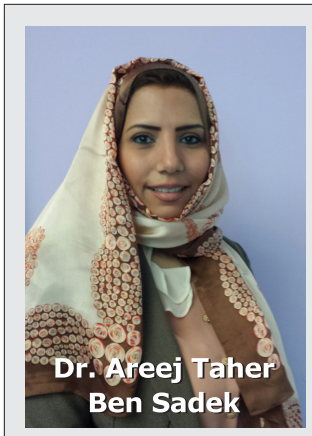
Mutable MERS lacks pandemic punch

While a deadly threat to immune compromised patients in hospitals, MERS has not been able to sustain transmission in the community beyond a few reports of families and other close contacts. Many uncounted mild or asymptomatic cases may have occurred, but transmission seems to rapidly dissipate in the community. In the absence of a mutation making it more transmissible — which is certainly a realistic concern given the known mutability of coronaviruses — MERS currently lacks the staying power needed for true pandemic potential.

Last year, for example, researchers compared MERS to SARS using the classic epidemiological measure of reproductive ratio, the expected number of secondary infections from a single case. The reproductive ratio reaches a tipping point for further transmission at 1 or above, indicating secondary infections can sustain an outbreak. Researchers looked at 55 laboratory-confirmed cases of MERS, finding that even in their most "pessimistic scenario," that MERS had a reproductive ratio of .69. They noted that pre-pandemic SARS was in the .80 range, but that coronavirus did apparently mutate and become more transmissible at some point in the outbreak.[2] That possibility remains with MERS, which has apparently established a reservoir in camels in the region after likely emerging as a bat-borne virus.

Some Saudi Clinicians are trying to treat MERS cases with an experimental combination of ribavirin and interferon, Ahamed notes. The drug combination had some success against SARS, but the results with MERS have been inconclusive.

"[Overall,] the case fatality rate is about 40% for the confirmed cases," Ahamed says.



The emergence of MERS has led to a dramatic culture change in Saudi Arabia, as the IPs say that people are washing their hands much more frequently in public settings.

"In the schools, the malls, in the Mosques, everywhere now we have [hand hygiene]," says Ben Sadek. "I went to my daughter's school and they are asked, 'Please you are a doctor can you give us some education?' I told them it is not just MERS. It could be meningitis, the flu, we just need to apply hygiene and standard precautions to everything in our lives. Even at home — hand hygiene."

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A bug in Brazil: Is VRSA back with a vengeance?

'To dismiss this as an anomaly would be unwise'

Though the health care continuum is currently under siege by a host of emerging gram negatives like CRE, at one time a much-feared single pathogen was thought to herald the arrival of the post-antibiotic era: Vancomycin-resistant *Staphylococcus* aureus (VRSA).

Sporadic cases of VRSA eventually occurred in the U.S., as MRSA infections appeared that were impervious to vancomycin — the mainstay drug against resistant staph strains for decades. But the vaunted superbug was not able to sustain itself and establish an endemic presence in hospitals or communities. Some theorized that the price of greater drug resistance in the microorganism was the loss of vigor and transmissibility, and the VRSA threat was largely forgotten.

Now we have this — an alarm blinking in Brazil, warning that VRSA is back and showing true threat potential. In answer to our first

skeptical question about the finding, lead researcher **Cesar Arias**, MD, PhD, says, "To dismiss this as an anomaly would be unwise."


Cesar Arias, MD, PhD

A professor of medicine and molecular genetics at the Houston-based University of Texas Health Science Center, Arias and colleagues conducted microbiological and genetic analyses of VRSA recovered from the blood of a 35-year-old Brazilian man. They identified a novel transferable plasmid that carries the genes necessary for vancomycin resistance. As noted in the case summary below, the VRSA isolate has genetic links to the widespread USA300 community strain and its vanA cluster plasmid could be easily transferred — and presumably confer resistance — to other staph strains.

"We report the case of a patient from Brazil with a bloodstream infection caused by a strain of methicillin-resistant *Staphylococcus aureus* (MRSA) that was susceptible to vancomycin … but that acquired the vanA gene cluster during antibiotic therapy and became resistant to vancomycin," the authors reported.[1] "Both strains are … phylogenetically related to MRSA lineage USA300. A conjugative plasmid …carrying the vanA cluster was identified and readily transferred to other staphylococci. … The presence and dissemination of community-associated MRSA containing vanA could become a serious public health concern."

Two points jump out immediately from this summation — the potential for VRSA in the widely dispersed MRSA USA300 community strain, and the fact that the patient had a bloodstream infection instead of the soft tissue infections typical for VRSA.

"This is the first-ever reported bloodstream infection caused by a highly vancomycin-resistant MRSA bacteria," Arias says. "The fact that this was acquired as a bloodstream infection raises the question, has this bug now adapted and is it more able to carry these genetic resistance traits? We don't know how widespread this plasmid is in Brazil."

The patient had a history of leg cellulitis and was admitted to a hospital in June 2012 with recurrent infections of the skin and soft tissues. Vancomycin and other antibiotics were used to treat recurrent symptoms while the patient remained in the hospital for treatment of skin cancer. On July 16 and 24, blood cultures yielded MRSA isolates that were susceptible to vancomycin, linezolid, and clindamycin. On August 15, however, fever recurred and blood cultures were positive for two MRSA isolates, one of which was resistant to vancomycin (minimal inhibitory concentration, > 32 µg per milliliter).

"This is a bloodstream infection coming straight from the soft tissue infection with the ability to cause severe infection in this case," Arias says. "So this is behaving as staph behaves, the acquisition of these [resistance components] did not appear to cause any problems in its pathogenic ability."

'This strain is different'

Much like many of the first cases of VRSA, vancomycin resistance may have been transferred by a co-infecting vancomycin resistant enterococci (VRE) strain.

"It is possible the transposon that carried the resistance gene came from enterococci because we compared the sequence of the transposon — t is identical to the VRE that we isolated from the patient," Arias says. "However, the plasmid — which is the one that is carrying this transposon — it is not an enterococcal plasmid. This plasmid seems to be able to go into any staph and that could cause problems."

Given the genetic lineage identified, that would apparently include the USA300 community strain, which arose dramatically in the 1990s and has now displaced less hardy MRSA varieties in both the community and hospitals. In short, the story of VRSA is far from over.

"I don't think so," Arias says. "Strains of VRSA have now popped up in the United states, in Europe, India, Iran and now in South America. Now it is true that there is no evidence that it has disseminated, but this strain is different from the others. The difference is that this strain is now in a genetic background that has previously been shown to be easily spread. This community-associated MRSA USA300 has become epidemic in the U.S. and also in South America. It has actually entered hospitals."

A USA300 strain of VRSA would certainly

threaten hospital patients, but given its community origins could also cause infections in healthy people.

"The worst resistance possible has now appeared in [a] community-associated MRSA clone," says **Barbara Murray**, MD, co-author of the paper and director of the Division of Infectious Diseases at the UTHealth Medical School. "There will have to be increased surveillance in South America and worldwide in the future."

There are a few other possible drug options (i.e.,linezolid) against VRSA.

"We have options, but the problem is the options are more expensive — we will be hard pressed to find [options] equivalent to vancomycin," says Arias, the founder and scientific director of the Molecular Genetics and Antimicrobial Resistance Unit at Universidad El Bosque in Bogota, Colombia.

The VRSA isolate in this case was also resistant to teicoplanin, erythromycin, clindamycin, ciprofloxacin, gentamicin, and trimethoprim–sulfamethoxazole. Beset with other infections, including carbapenem-resistant *Acinetobacter baumannii*, the Brazilian patient died in November 2012. The patient died while receiving meropenem, linezolid, polymyxin B sulfate, and amphotericin B.

Reference

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APIC 2014: Infection prevention in the ED

'Being fast will save someone's life.'

As the "front door of the hospital" to both patients and pathogens, the emergency department (ED) is a critical setting for infection prevention that has a unique and often poorly understood work culture. As a result, infection prevention projects can quickly run aground if undertaken with the typical approaches used for other patient settings, a leading emergency medicine researcher told a packed audience recently in Anaheim at the annual conference of the Association for Professionals in Infection Control and Epidemiology (APIC).

'I think it's important for everyone in this room to look at the work environment of the ED," says **Jeremiah Schuur**, MD, director of Quality, Patient Safety and Performance Improvement for Emergency Medicine at the Brigham and Women's Hospital in Boston. "You go into work and your job is to take care of everybody that shows up as quickly as possible and you don't get lot of [patient] information. There's a huge pressure on being fast, because being fast will save someone's life. It may not be everybody's life, but if you are not fast there is going to be someone in the waiting room who is there too long."

Schuur described a work force of committed professionals who nonetheless may cut corners on measures like personal protective equipment (PPE), an all too common problem that was cited by an infection preventionist in the audience.

"We deprioritize (PPE) and it's a challenge," Schuur said. "People do that because in order to do your job sometimes you can't take every step. You can't put on precautions for every patient who has influenza-like illness, because at certain times of the year that would be one in every four patients and that would take all of the time we have."

Instead of the typical inservice approach, emergency medicine workers respond better to stories and personal narratives that embody the importance of infection prevention in the chaotic setting, he added. These stories particularly resonate with ED workers if told by a member of their team or by someone who has worked in emergency medicine, he said.

"I really can't emphasize the importance of this enough," he said. "This has to be the emergency department's initiative to get their support. As much as anything else, if it is not something the ED is really championing themselves it is going to fail."

For example, hand hygiene compliance improved considerably at one ED when an emergency nurse returned to work after being treated for breast cancer. "She [repeatedly] told her story about having been neutropenic and having to fear every person who came into the room when she was getting chemotherapy," Schuur told APIC attendees.

By the same token, IPs should enlist an ED champion to support an intervention, making sure the data generated is actionable, relevant to the setting, and promptly reported back. "Are you asking people to do things that are going to take five extra steps, which is going to make it impos-

Key strategies to improve ED infection prevention

Researchers on improving infection prevention in the emergency department recently recommended the general strategies below in Anaheim at the annual conference of the Association for Professionals in Infection Control and Epidemiology. The comments are from interviews they conducted during their project.

Leadership Support: Hospital, ED, key consult services (e.g., trauma)

- Helps to set expectations
- Necessary to secure funds and resources for initiative.
- Gain the support of leadership

"He got onboard and once he got onboard he was just a train. He's a big train when it comes to infection [prevention], everything in the hospital when it comes to infections. He's very supportive in giving us what we need." RN educator

Data Collection and Feedback

- Post data on flyers in the staff lounge or include in the ED newsletter

Staff Engagement

- Include staff on multidisciplinary committees

Champions

- Develop program cheerleaders (self-identified or chosen by management or leadership)
- Have devoted interdisciplinary champions as noted by this ED Chairman:

"If you don't have a shepherd it doesn't happen. It doesn't have to be a physician, it really doesn't. It has to be an interested champion who is willing to take the message to the streets, recognize that there are many different streets. You've got the attendings, the nurses, whoever."

Build Environment Modifications

- Ask staff "What are the structural barriers to compliance?" Great way to encourage the participation of frontline workers

Staff Training

- Make training a part of annual education and competencies
- Train new hires

Workflow Modifications

- Make it easy for staff to comply with workflow modifications ■

sible for them to do their jobs efficiently? [That is] ultimately going to undermine compliance," he said.

Schuur is one of the principal investigators in an ongoing project to identify successful infection prevention interventions in hospital emergency departments. He has received funding from the Agency for Healthcare Research and Quality to identify infection control practices that have been successfully implemented by EDs.

A key portal for infection control

"I would make the case that the emergency department is a key portal for infection prevention," he told APIC attendees. "There are about 130 million [patient] visits every year. It [varies] hospital to hospital, but overall, nationwide half of the admissions [come through the ED]. Over 2 million ICU admissions, and we place lots of devices which are then at risk for infection — central lines, urinary catheters and intubation."

The patient population is widely diverse, suffering from various maladies in very close proximity.

"Sometimes they are separated by curtains, a hallway and sometimes nothing," he said. "So there is a real obvious chance for there to be transmission. We may have someone who is on chemotherapy, someone who is neutropenic, someone from a skilled care facility who has a multidrug resistant organism."

ED staff vary from doctors and nurses to security staff, translators, and technicians who may have little medical training. The overriding prime mission of emergency medicine — the life-saving emergencies where seconds and minutes matter — actually occurs only about 5% to 10% of the time one works in the ED, Schuur said.

"But working in that situation engenders a certain acceptability or normalization of deviance," he said. "[The thinking is] if it's OK to break rules in that situation, you might be able to do it in more situations. And so our culture prioritizes urgent intervention over refection — we value decisive action over circumspection."

Chronic crowding in many EDs certainly fuels that type of mindset, as workers often have insufficient space and manpower to provide the best care, he adds. ICU beds are rarely available within an hour and breakdowns in communication about "where the patient is from and where are they going" are far too common. "All of these will affect your ability to provide safe care and infection prevention," he said.

Another undermining factor is "goal conflicts" that ED workers use to rationalize non-compliance. "Why wash your hands if you don't clean the blood pressure cuff, the pulse oximeter, and the bedside table?" Schuur said. "Why should I wear precautions when nobody ever comes to clean the bedside curtains? This goes along with the normalization of deviance."

Thus the IP with an infection prevention idea for the emergency department should enter the ED with eyes wide open and the full support of department leaders and administration. Once staff fully buy-in, positive momentum can build rapidly, says Schuur, who thought little about infection prevention until his young son developed an MRSA abscess on his arm — twice. Concerned that he was the source, Schuur brought an infection control rigor home after work that eventually translated into a growing interest in infection prevention in the ED in general.

Editor's note: Part II of this story, focusing on the prevention of specific infections and improving hand hygiene in the emergency department, will be featured in our next issue. ■

A modest proposal: Ban handshakes in healthcare

C. diff may spread with friendly greeting

The ancient ritual of the handshake evolved in human dynamics in part as a way to instill trust by extending the weaponless hand. Ironically, this act of goodwill could put a frail patient's life at risk if pathogens on the hands are exchanged as well as greetings.

That has raised a question that seems intuitively valid but could be surprisingly difficult to accomplish: Is it time to ban handshakes in health care settings?

Absolutely, says one who has embarked on something of a quixotic quest to break the shake, **Mark Sklansky**, MD, a professor of pediatrics at UCLA Medical Center in Los Angeles.

"I really believe it is the right thing to do for our patients and there are ways of doing this that do not compromise the doctor-patient relationship," he says. "Critics of this are concerned that it is going to further alienate patients from their doctors. If it is not replaced with any warmth and compassion in other ways, then yes, I think there is a risk of that. But there are many other ways we can express the same kind of sentiment that we do currently with a handshake."

Sklansky concedes that a hand shake may have a calming effect on patients and family members, engendering trust and reassurance. Seen in that light, banning handshakes could raise a marginal patient safety issue in its own right, but the benefits of a ban far outweigh the risks, he notes. In any case, it makes little sense for health care workers who are constantly trying to decontaminate their hands to complicate the issue by shaking them with colleagues and visitors between patients.

"There are clear benefits to the handshake but we feel a health care setting that is a concentration of vulnerable patients and pathogenic organisms is not the right place to be continuing this gesture," he says. "We know that it is a gesture that transmits disease."

Transmission of C. diff by handshake

Several research examples were cited in a recent review paper[1] Sklansky and colleagues did on the issue: "The infectious risk of the handshake has been described in the medical literature since the early 20th century. Multiple studies have demonstrated that the handshake can and does transmit pathogens,[2-4] and widespread hand hygiene policies have been predicated on the well-established link between hand transmission of pathogens and disease. *Clostridium difficile* spores have been demonstrated to be transmitted via the handshake"

Indeed, *C. diff* may be the best single argument for a handshake ban. It has emerged to epidemic levels in a particularly virulent strain (NAP1) and its spores have been found clinging to hands even after infection preventionists have thrown everything at them but the patient sink. Most hospitals switch from alcohol hand foams to soap and water for known *C. diff* patients, but the problem is that even soap is surpris-

ingly ineffective at spore removal. In a 2013 study, the few solutions found even partially effective against *C. diff* (greater than one log spore reduction) included a heavy-duty Borax brand name product and an industrial solution designed to remove printer's ink.[5]

It is widely acknowledged that alcohol hand rubs provide little protection against *C. diff*. In the aforementioned handshake study[4] a variety of alcohol hand cleaning solutions were used by volunteers whose hands had been inoculated with *C. diff* spores. So many residual *C. diff* spores remained on the volunteers' hands that they could be easily transferred by a handshake with another person. A mean of 30% of the residual *C. diff* spores were transferred per handshake.

More research needed to drive change.

While the research certainly underscores the risk of handshakes contributing to health care associated infections, a handful of studies will not likely be sufficient to drive broad change. "In terms of large scale and institutions adopting this, people are going to want more data," Sklansky says.

In that regard, he plans to propose some type of handshake ban to his colleagues at UCLA, perhaps limited to an ICU setting. "In NICUs and other places doctors may have to do rounds on 10 to 20 patients in one day," he says. "You see the patients, the families at the bedside and it is just not practical to wash your hands before and after every handshake. If you wash your hands but then shake someone's hands [they may become] contaminated again."

If given the green light on the idea, Sklansky plans to research the attitudes of patients and caregivers about banning the practice and also look at the incidence of infections before and after a ban. In any case, a handshake ban would have to be accompanied by the appropriate signage and patient educational materials to make it clear it was being done in the name of infection prevention.

Even in the name of that higher calling, it's hard to overstate how entrenched handshaking is in human relations. As Sklansky has occasionally attempted to avoid handshakes in the hospital he has sometimes drawn some chilly reactions.

"I've tried this intermittently over the years and it's always been a challenge — the stigma puts me in a difficult position," Sklansky says. "I'm hoping that more attention to this will legitimize this issue and concern and people will recognize it is actually in the patient's best interest. We are doing it for their sake. Many patients understand when I wash my hands and don't shake their hands, but I have certainly found after we published this paper that there is actually a fair amount of concern from the lay public as well as people within the profession that this is not a good [idea], it's not going to work — the handshake is just too socially engrained."

Indeed, the practice is so widely accepted in our culture that Sklansky compared the challenge of banning it to fighting Big Tobacco. Since the first Surgeon General's report on smoking in 1964 — when some 40% of adults (and their doctors) smoked — smoking has plummeted to some 18% and bans are widespread. "Removing such a deeply embedded cultural custom from social situations has involved, beyond formal bans/regulations, widespread media and educational efforts, as well as the development and promotion of effective alternatives, such as nicotine gum," Sklansky notes in the paper.

Bow, nod and … fist bump?

So what would be the effective alternative to handshaking, something that would imbue the same warm feeling without risking downstream infections?

"Personally, I like putting your hand on your heart, and sort of nodding your head with respect to each person with a smile, he says. "I think once people start trying this stuff and actually banning the handshake, people are going to find that they can communicate warmth and compassion — and maybe actually improve the connection that we have now that is sometimes sort of perfunctory with a handshake."

Other alternatives from various cultures include a wave of the open hand, a slight bow of the head, and the yoga gesture of placing the hands, palms together, against the chest and tilting the head forward.

In a hip reference to rap and sports culture, one group advocates the "fist bump" as a good alternative to shaking hands. They actually tested their hypothesis, finding that the surface area of the palm was much bigger than the knuckles, the total skin contact time of the handshake was 2.7 times longer, and colonization of the shaken hand was four-fold greater

than the tapped knuckles.[6]

"Implementing the fist bump in the healthcare setting may further reduce bacterial transmission between healthcare providers by reducing contact time and total surface area exposed when compared with the standard handshake," the authors concluded.

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AHRQ kit to prevent dialysis infections

Infection prevention in end stage renal diseases

About one in six U.S. dialysis patients die annually from an infection and 12% of dialysis patients are hospitalized due to septicemia, according to the Agency for Healthcare Research and Quality (AHRQ).

While those estimates are based on 2007 data, the statistics served as a call to action for AHRQ, which is funding a major new infection prevention project for end-stage renal disease (ESRD) facilities. Called the National Opportunity To Improve Infection Control in ESRD (NOTICE), the project seeks to reduce vascular access infections, enhance infection control best practices, and improve the safety culture in dialysis facilities.

"We funded this project to develop practical, research-based tools that end-stage renal disease facilities can use to make care safer for patients who get dialysis," says **Darryl T. Gray**, MD, ScD, medical officer for the Center for Quality Improvement and Patient Safety at AHRQ.

The primary pathogens infecting dialysis patients include susceptible and drug resistant strains of *Staph aureus*, *E. coli*, Pseudomonas and Klebsiella.

"Dialysis patients are exposed to these pathogens more frequently than other patients because the hemodialysis process requires accessing a patient's bloodstream, and these patients are often hospitalized for various illnesses," he says. "These factors, along with the fact that dialysis patients' immune systems don't work as well as they should, make it easier for common pathogens to make dialysis patients sick."

There also have been outbreaks of hepatitis C virus in dialysis facilities, but HCV is not a major emphasis of the project.

"Screening patients for hepatitis C and tracking the transmission [of HCV] are not routinely done in dialysis facilities, and they are not part of the AHRQ-funded project," Gray says. "However, many of the infection prevention techniques used in the AHRQ project, such as proper disinfecting of equipment between patient treatments, will help prevent transmission of hepatitis C."

The project's recently completed first phase included baseline analysis and development of a 24-page toolkit, which includes infection control worksheets and checklist designed for dialysis facilities. (Available at: http://1.usa.gov/TmUt85) The second phase will includes testing the tools in end-stage renal disease facilities and performing additional analyses, Gray says.

"We expect the second phase to be complete by the end of this year," he adds.

Primary tool: Checklists

Each checklist or infection control worksheet describes methods to prevent infections associated with vascular access. They identify 73 distinct items of appropriate practice. For example, the 9-step checklist for access of AV fistula sites goes from hand hygiene (HH), supply assembly, all the way to inserting cannulation needles, removing gloves and HH again.

"The checklists cover steps to prevent infection during initiation of dialysis, medication preparation, and during the administration and termination of dialysis," Gray explains. "They

also cover disinfecting the treatment station and making sure that supplies are not contaminated."

AHRQ also offers a change package to help facilities implement and sustain these infection prevention methods.

The project's analysis is underway and near completion, Gray notes.

"The primary infection measure is vascular access-related infections (VAIs) per 100 hemodialysis patient months," he says.

The project includes collecting primary source data on local access site infections, bloodstream-associated infections, and positive blood cultures from the subset of study facilities that report infection data to the National Health Safety Network. Medicare claims also are included in the source data.

ESRD facilities are performing their own audits of adherence to the checklist items. They were evaluated during a post-orientation period from October 2011 to January 2012.

"Infection control evaluators monitored adherence to infection control procedures described in the checklists among staff from 34 ESRD facilities," Gray says.

Project participants are using a toolkit that contains educational materials, including modules on improving safety culture that adapt AHRQ's Comprehensive Unit-based Safety Program framework for use in ESRD facilities. They also are using a modified version of the AHRQ Hospital Survey on Patient Safety Culture to measure safety culture changes that are occurring due to the use of the toolkit, he adds.

The five-page survey asks about staff support and workload issues, patient safety, supervisors, communications, frequency of events, and the facility's work climate. It also asks for a letter grade for how well the work area is doing on patient safety.

Most materials are available online at the AHRQ website. The project is expected to end in the fall of 2014. ■

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.
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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

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■ More detailed coverage of the 2014 APIC conference

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CNE/CME Questions

1. Which of the following new initiatives in Saudi Arabia are being used to stop the spread of MERS?
   A. Rapid PCR testing
   B. electronic case reporting
   C. couriers for transfer of specimens
   D. all of the above

2. Instead of the typical infection control inservice approach, emergency medicine workers respond better to:
   A. role playing scenarios
   B. stories and personal narratives
   C. humorous animated reminders on computers
   D. all of the above

3. In a case of vancomycin resistant *Staphylococcus aureus* (VRSA) in Brazil, researchers cited which of the following concerns?
   A. it caused a bloodstream infection
   B. showed a genetic connection to USA300 community MRSA
   C. resistance was conferred on a transmissible plasmid
   D. all of the above

4. Researchers found that colonization of the shaken hand was how much greater than that of the tapped knuckles after a "fist bump"?
   A. two-fold
   B. four-fold
   C. six-fold
   D. eight-fold

HIC wins 1st as best healthcare newsletter

We are proud to announce that *Hospital Infection Control & Prevention* recently won First Place for Best Healthcare Newsletter at the annual awards of the Specialized Information Publishers Association (SIPA) in Washington, DC.

Written by long-time *HIC* editor **Gary Evans**, the 2013 coverage included "Have virus will travel," which anticipated the arrival of the first MERS cases in the U.S.

The trusted source for the infection preventionist for over four decades, *HIC* has won numerous editorial honors that include five prestigious awards from the National Press Club for analytical reporting. For breaking news, and posts both thought provoking and relatively mindless, check out Evans' HICprevent blog at http://hicprevent.blogs.ahcmedia.com/ Don't forget to follow @HICPrevention on Twitter for the continuing adventures of our stringer in the wasteland, complete with prototype PPE, the begoggled and beak-masked Plague Doctor.

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