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We Need to Stop Overreacting to COVID-19 Overreactions

President Franklin D. Roosevelt famously said that “the only thing we have to fear is fear itself—nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance.” Roosevelt had been bracing Americans to respond to the challenges of the Great Depression, but his sentiments about the paralyzing effects of fear can be applied today.

COVID-19 shouldn’t be ignored, but it shouldn’t be the national obsession that it’s become, either. As of this writing, it has caused 9 deaths in the United States. That’s not good, but in a country of 320 million people, neither is it cause for “nameless, unreasoning, unjustified terror.” To put things in context, between Oct. 1, 2019, and Feb. 22, 2020, between 18,000 and 46,000 people in the US died of flu, according to the US Centers for Disease Control and Prevention. Just like the flu, COVID-19 is a respiratory disease that’s life-threatening to vulnerable populations. Again, it bears watching, but it doesn’t merit panic.

On the other hand, the economic effects of fear of COVID-19 have been bruising. Some experts say that the outbreak could reduce global economic growth by $160 billion. That reduces what we’ll need to fight COVID-19 and other diseases: The funds that will fuel research that develops cures and vaccines.

COVID-19 shouldn’t be ignored, but it shouldn’t be the national obsession that it’s become, either. Fear of COVID-19 is causing more disruption than the disease itself.

Each month Infection Control Today® puts things in perspective. For instance, our cover story on page 28 by Linda Spaulding, RN, BC, CIC, CHEC, CHOP, reports—in a calm manner—just how outbreaks like COVID-19 should be handled. Spaulding is a member of our newly launched Editorial Advisory Board, which you see at right. It will be a working board, and Spaulding isn’t the only board member whose work appears in this issue.

On page 16, Saskia v. Popescu, PhD, MPH, MA, CIC, looks at the unique challenges in preventing infection for the extremely vulnerable in neonatal intensive care units. Rebecca Leach, RN, BSN, MPH, CIC, on page 32 examines how antimicrobial stewardship programs can function better when they tap into the perspective and skills that infection preventionists can offer.

Facts, not fear.

That’s what ICT® offers every issue and now, with our Editorial Advisory Board, we’ll be able to offer more. Please feel free to offer your real-world experience (or any comments or questions) by contacting Alexandra Ward, Editorial Director, at award@mjhlifesciences.com.

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hand hygiene

Pleased to Meet You, Hope You Guess My Name

I’m the new bug on the block, part of a zoonotic family of viruses that often infect bats, pangolins, cats, and camels. My strain is novel and I emerged just a few months ago. I trigger the same respiratory symptoms as a cold or influenza—fever, cough, runny nose, and sometimes shortness of breath. Infected individuals can display symptoms in as few as 2 days or as long as 14 days after exposure, public health officials believe.

I can be passed human-to-human, mainly via contaminated respiratory droplets from coughs and sneezes within a range of about 6 feet. I may be able to spread via contact with surfaces I have contaminated, but my exact avenues of transmission aren’t fully clear yet. They’ve also not yet fully identified my viral persistence in the environment. I’m mysterious that way.

Infection can lead to a type of pneumonia that can be deadly, and other members of my virus family have been known to cause complications such as acute respiratory distress syndrome, irregular heartbeat, cardiovascular shock, severe muscle pain, fatigue, and even heart damage or heart attack.

Older people and those with pre-existing medical conditions, such as diabetes or heart disease, may be more at risk of developing serious infection.

There is currently no vaccine to prevent my infection, and no specific treatment other than supportive care.

Precautionary measures recommended by the US Centers for Disease Control and Prevention to avoid infection include washing hands frequently for at least 20 seconds at a time with warm water and soap; avoiding touching the face, eyes, nose, or mouth with dirty hands; staying home when you are sick; and using disinfectants to clean objects you touch, such as phones, computers, utensils, dishware, and door handles.

Who am I? COVID-19
advanced technology

C. diff Contamination Not Affected by Ultraviolet Disinfection Devices

By Frank Diamond

Ultraviolet (UV) light can destroy pathogenic bacteria, including Clostridiodes difficile spores, but measuring the effectiveness of UV can be tricky, as investigators with Penn State Health, Milton S. Hershey Medical Center, found out. Their recent study in the American Journal of Infection Control describes the impact of portable pulsed-xenon UV disinfecting devices in 6 units of their hospital that had registered high C. diff infection (CDI) rates. The C. diff rates were measured over a 9-month period before and a 9-month period after the devices were installed, with no difference in C. diff contamination.

“Appropriate terminal cleaning evaluated by fluorescent marking environmental auditing did not significantly change over phase 1 and 2 study periods, with an average of 87% of 6510 tested high-touch surfaces demonstrating adequate removal of fluorescent marker,” the study states. “Use of UV devices during the 9-month phase 2 study period in 2017 averaged 93.6% of 8298 targeted terminal discharges without notable differences in use between units.”

The rate of healthcare-associated C. diff infection (HA-CDI) per 1000 patient-days for the units during phase 1 was 1.57 of 1000 patient-days compared with 1.61 of 1000 patient-days during the phase 2 study for the same hospital units.

Fibi Attia, MD, MPH, CIC, and the study’s corresponding author, tells Infection Control Today that although the findings didn’t necessarily surprise her, they did cause her to re-examine how best to use UV disinfection.

“Although we were optimistic that UV disinfecting devices would reduce the burden of pathogens in the environment, we always try to evaluate our techniques and processes,” Attia says. “When we didn’t see any impact on our infection data, we studied it in more depth. We also know that there are many factors that contribute to C. difficile infection rates. Even if microbe burden is decreased on surfaces that can be treated with UV, this in itself may not be sufficient to cut down C. difficile infection rates.”

Phase 1 of the study (when portable pulsed-xenon UV disinfecting devices were not used) occurred from January 2016 through September 2016. The devices were installed from October 2016 to December 2016, with full implementation by January 2017, which was when the 9-month phase 2 period of the study started. “Compliance reports for UV device utilization were generated automatically each time the device was used,” the study states.

Xenon lamps produce pulsed flashes of germicidal UV light at wavelengths from 200-315 nm, killing microbes on environmental surfaces.

Terminal cleaning focuses on infection spread and can vary from hospital to hospital, but often involves cleaning walls and floors, and removing all detachable objects and disinfecting them before they are returned to the room. It is usually conducted by environmental services (EVS).

The hospital rooms in the study were cleaned with a sporicidal disinfectant cleaning product: sodium hypochlorite in 2016, acid/hydrogen peroxide-based sporicidal in 2017. Randomly selected rooms were then subjected to fluorescent tagging to see how well they’d been cleaned.

The diagnosis of HA-CDI was based on molecular detection of toxin-producing C. difficile on a unformed stool specimen collected on or after the third calendar day of admission to a room.

“Directly following room cleaning, UV disinfection devices are placed in the room to deliver UV in 2 or 3 positions, with a 5-minute run time per position,” the study states. “A room with a bathroom has 3 UV device positions per room (on either side of the bed and in the bathroom). If the room does not have a bathroom, 2 positions are used (on either side of the bed).”

Attia says that “even if microbe burden is decreased on surfaces that can be treated with UV, this in itself may not be sufficient to cut down C. difficile infection rates. The control of HA-CDI likely requires a multifaceted approach which includes not only maximal decontamination of the environment, but optimization of diverse factors from disinfection of medical equipment to antimicrobial stewardship.”

The study also notes that it’s unclear how some of the mitigating circumstances for the pulsed-xenon UV disinfection in the final stage of terminal room cleaning may have affected HA-CDI rates. “The control of HA-CDI likely requires optimization of a multifaceted approach, including: excellent hand hygiene compliance, early identification of those with CDI and possibly also those with C. difficile colonization, optimal environmental cleaning, dedicated medical equipment, excellent antimicrobial stewardship, and other measures that may enhance maximal decontamination of the environment,” the study states. “It is possible that one or more of these factors, if suboptimal, negated any positive.”

Attia reiterates that “it is known that UV disinfection can destroy microbes, including C. difficile spores. However, we have alluded to the many other factors that increase risk of C. difficile. At this point it is difficult to ascertain how much each risk factor contributes to overall risk of C. difficile, including the benefit of UV disinfection after manual cleaning at the time patients are discharged.”

References available at InfectionControlToday.com.
vascular access

The Solution for Reducing Central Line-Associated Bloodstream Infections?

By Frank Diamond

Infection preventionists and other health-care providers seeking to reduce central line-associated bloodstream infections (CLABSI) might want to consider using alcohol plus chlorhexidine gluconate (CHG) prior to accessing central line hubs and vascular grafts. Doing so led to significantly lower CLABSI rates in an inpatient dialysis population, according to a study in the British Journal of Nursing.

Investigators with UNC Rex Hospital in Raleigh, North Carolina, removed 70% of alcohol swabs and alcohol hub disinfecting caps, replacing them with swabs containing 3.15% CHG/70% alcohol for central line hub disinfection and vascular graft access skin disinfection.

They examined 7568 central line days, 11 CLABSI events, and a 1.45 per 1000 device day rate during the 5-year preintervention period (2008–2012). The 6-month trial period involved 1559 central line days and no CLABSI events. The 5-year postimplementation period (2013–2017) involved 9787 central line days, 5 CLABSI events, and a 0.51 per 1000 device day rate.

Investigators used the statistical calculator from the US Centers for Disease Control and Prevention’s National Healthcare Safety Network. By performing a statistical test that calculated a P value, the program compared 2 incidence density rates. As the study noted, preventing CLABSI events involves often time-consuming precautions and processes that can increase costs and become a burdensome chore for staff, often interfering with other daily healthcare activities.

“Although this research primarily involves the hub contamination, other influencing factors can have a large role relating to infection, for example, the risks associated with access such as technique, maintenance, necessary time required to swab the hub, and dry time allotted,” the study states.

Although the 70% alcohol-only swabs most commonly used in healthcare (and in the preintervention period of this study) are easy to use and effective, killing many pathogens that can cause CLABSI, they’re far from perfect, say investigators. Opportunities for improvement involve using them more appropriately and persistently, and adjusting the size and chemical composition.

For instance, the typical 70% alcohol swab is just over an inch, making it difficult to wipe the surface of the central line hub properly. Specifically, it can hinder wiping the surface completely or long enough. In addition, often the finger can introduce contamination before, during, or after the wipe-down.

“Alcohol concentrations between 60% and 90% are extremely effective at killing microbes immediately, yet lack residual killing effect as with CHG, which provides high immediate, persistent, and residual microbial killing effect,” according to the study. “To provide better residual activity, concentrations of CHG can be added to alcohol-based preparations. The combination of alcohol and CHG provides powerful antibacterial activity effectively reducing bacterial counts, while providing substantial residual activity.”

A larger-sized swab—approximately 3.125 by 1.125 inches—was used during the postimplementation period. It covered more surface of the fingers allowing for less potential contamination during the disinfection process. Its greater surface drag could potentially remove more microbes. Using CHG 3.15%/70% alcohol on the larger-sized swabs helped prevent certain central line infections “due to the
initial and persistent microbial killing effect it has on the hub of the central line and the reduction of inadvertent contamination associated with a larger swab size,” the study states. “A larger-sized swab may also help reduce the risk of finger/hub exposure and the contamination that occurs with organisms located on the fingers.”

The study’s limitations include:
- Variations in scrub time and dry time during central venous catheter hub access. “While we were comparing 2 products, behavioral practices using these 2 products were possible influencers and represent a possible confounding variable,” the study states.
- To make a better comparison, investigators would have used swabs of equal size and solution density to compare against the alcohol/CHG swab.
- Internal disease processes could influence CLABSI surveillance. Infections that cannot be definitely proven could mask the true nature of a disease.

Investigators concluded that, “Special consideration should be given to strategies that improve care by focusing on line antisepsis, personal technique habits, better education methods, and adherence to appropriate line care. Early detection of all unnecessary lines with an emphasis on timely removal is also an important element identified with this research to help reduce the number of HAIs.”

Reference

Infection Control Today® reached out to the study’s corresponding author, R. Marty Cooney, an infection control officer with UNC REX Healthcare in Raleigh, North Carolina.

Infection Control Today®: What was the impetus for this study?
Cooney: My motivation to do this study was a drive I have to help others. By trying to reduce line infections as much as possible, I felt we could greatly reduce associated morbidity and mortality.

ICT®: Did the findings surprise you or did they reinforce what you already suspected?
Cooney: The findings did not surprise me as I suspected this intervention could greatly benefit many patients. By directly targeting the access point, I felt the CHG/alcohol combination would be a type of fail-safe. Alcohol and CHG combinations have greatly helped kill organisms with persistency in other types of applications (ie, surgical hand scrubs, IV line insertion skin preps, pre-operative skin surgical preps, etc.).

ICT®: Would it be difficult for hospitals to switch to swabs containing 3.15% CHG/70% alcohol for central line hub disinfection and vascular graft access skin disinfection?
Cooney: It was not difficult. It was a cost increase, but well worth it in the long term to significantly reduce infections.

ICT®: Does anyone manufacture such swabs, or would they have to be prepared by the healthcare worker at the site of use?
Cooney: We did not prepare our own product but chose to use a product on the market which had the right CHG/alcohol combination on a swab we were looking for.

ICT®: Was there a time differential?
Cooney: There was no difference for time. Healthcare workers are trained to scrub the hub and vascular graft access, then allow the product to dry prior to access. It was a product switch—from alcohol only swab product to the CHG/alcohol swab product.
As the US Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) scramble to contain COVID-19, personal protective equipment (PPE) shortages continue and infection preventionists (IPs) will likely need to give guidance on the extended use and re-use of N95 masks. These are important topics to consider, and now is the time for hospitals to engage in strategies or at least plan to potentially use/extend use of those N95s we’re struggling to acquire.

As our current guidance for screening is heavily reliant on travel to the affected area or exposure to a known/suspected case, widespread transmission beyond China will weaken such criteria.

There are 2 critical pieces of research recently released. The first was a study evaluating the persistence of coronaviruses on inanimate objects and inactivation processes. Although the authors evaluated research related to all coronaviruses that infect humans, they did find that across 22 studies, the virus can persist on inanimate objects (metal, glass, or plastic) for up to 9 days. Coronaviruses are enveloped viruses, meaning that they are easier to inactivate with disinfectants and that the use of EPA-registered hospital disinfectants is effective. The authors note that coronaviruses can be “efficiently inactivated by surface disinfection procedures with 62-71% ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite within 1 minute. Other biocidal agents such as 0.05-0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate are less effective.”

The second relevant piece of research that was recently published is a study in which the authors evaluated the clinical characteristics of 138 hospitalized patients with COVID-19 in Wuhan, China. Evaluation of these patients found 2 concerning pieces of information—26% required admission to an intensive care unit (ICU) and 41% of the 138 patients are believed to have acquired the disease through hospital transmission. These findings are concerning for a number of reasons. Firstly, patients in ICUs tend to require longer lengths of stay, which means more use of healthcare workers (infection preventionists among them) and other resources, and increases the patient’s risk for healthcare-associated infections (HAIs), but also the chance that COVID-19 could be transmitted. Secondly, the volume of HAIs is deeply worrisome as it shows, like SARS and MERS, hospitals easily act as amplifiers of these diseases during outbreaks.

This further reinforces the need to continuously work with staff to rapidly identify, isolate, and inform, when potential patients are triaged. More importantly though, it emphasizes the need to focus on infection prevention efforts and how we can better avoid such transmission.

Human coronaviruses can remain active on surfaces such as metal, glass, or plastic for up to 9 days after exposure. The best way to deal with that problem is by cleaning those surfaces with a solution that’s 62% to 72% ethanol, 5% hydrogen peroxide, or 0.1% sodium hypochlorite within 1 minute of contamination, according to investigators with University Medicine Greifswald and Ruhr University Bochum in Germany whose study ran as an article in press in the Journal of Hospital Infection (JHI).
“Currently, the emergence of a novel human coronavirus, temporary named 2019-nCoV, has become a global health concern causing severe respiratory tract infections in humans,” the authors write. “Human-to-human transmissions have been described with incubation times between 2-10 days, facilitating its spread via droplets, contaminated hands or surfaces. We therefore reviewed the literature on all available information about the persistence of human and veterinary coronaviruses on inanimate surfaces as well as inactivation strategies with biocidal agents used for chemical disinfection, e.g. in healthcare facilities.”

Investigators looked at 22 studies that dealt with disinfection techniques for human coronavirus such as severe acute respiratory syndrome (SARS) coronavirus, middle east respiratory syndrome (MERS) coronavirus, or endemic human coronaviruses (HCoV).

To reach their conclusions, investigators conducted a Medline search using the terms “coronavirus,” “TGEV [transmissible gastroenteritis virus],” “MHV [murine hepatitis virus],” and “CCV [candidate vaccine virus].” The research team also conducted analysis on search terms “survival surface,” “persistence surface,” “persistence hand,” “survival hand,” “survival skin,” “persistence skin,” “virucidal,” “chemical inactivation,” “survival study,” and “carrier test.” “Publications were included and results were extracted given they provided original data on coronaviruses on persistence (surfaces, materials) and inactivation by biocidal agents used for disinfection (suspension tests, carrier tests, fumigation studies),” the study states.

The viral load of coronaviruses on inanimate objects during an outbreak is unknown, but it is plausible that disinfection methods should help, especially when applied to frequently touched surfaces where you might expect the viral load to be most potent, according to the study.

**Surfaces should be cleaned with a solution that’s 62% to 72% ethanol, .5% hydrogen peroxide, or 0.1% sodium hypochlorite within 1 minute of contamination.**

The investigators cite the World Health Organization, which advises “that environmental cleaning and disinfection procedures are followed consistently and correctly. Thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital-level disinfectants (such as sodium hypochlorite) are effective and sufficient procedures.”

The investigators could not find data that describe how often and how much hands can be contaminated with coronaviruses after contacting an infected surface or patient. “In Taiwan, however, it was described that installing hand wash stations in the emergency department was the only infection control measure which was significantly associated with the protection of healthcare workers from acquiring the SARS-CoV, indicating that hand hygiene can have a protective effect,” the study states.

In addition, even though hand hygiene compliance appears to be significantly higher during an outbreak, there still seems to be a lack of total buy-in among physicians, the study states, adding that transmission can be successfully prevented when appropriate measures are consistently performed.

“Ethanol at concentrations between 62% and 71% reduced coronavirus infectivity within 1 min exposure time by 3.0–4.0 log_{10},” according to the study. “Concentrations of 0.1–0.5% sodium hypochlorite and 2% glutaraldehyde were also quite effective with > 3.0 log, reduction in viral titre. In contrast, 0.04% benzalkonium chloride, 0.06% sodium hypochlorite and 0.55% ortho-phenaldehyde were less effective.”

The endemic human coronavirus strain (HCoV-) 229E can remain infectious on certain surfaces for as little as 2 hours or up to 9 days. “A higher temperature such as 30°C or 40°C reduced the duration of persistence of highly pathogenic MERS-CoV, TGEV, and MHV,” the study states. “However, at 4°C persistence of TGEV and MHV can be increased to ≥ 28 days.” [4]

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**Aspergillus Said to Have Claimed Another Baby’s Life at Seattle Children’s Hospital**

**By Infection Control Today® Editorial Staff**

A 7th infant has died as a result of an Aspergillus mold infection after undergoing 3 heart surgeries at Seattle Children’s Hospital, the site of an outbreak that prompted the closure and renovation of 10 operating rooms and 2 equipment rooms last year. Six-month-old Elizabeth Hutt died February 12 as a result of an Aspergillus mold infection after undergoing 3 heart surgeries at the hospital, KOMO News in Seattle reports. The mold was detected in the hospital’s operating rooms on November 10, shortly after Elizabeth underwent her third operation.

A class action lawsuit against the hospital was filed last December on behalf of the families of children sickened by the Aspergillus mold. According to
KOMO News, Elizabeth’s family has joined that suit, which claims that the hospital “engaged in years of cover-up designed to reassure its patients, doctors, nurses and the public that its premises were safe, when in fact they were not.”

The hospital conducted an investigation that found that *Aspergillus* has been in the air since at least 2001 and caused the deaths of 6 children in all (Elizabeth would be the 7th). *Aspergillus* spores can cause illnesses in people with weakened immune systems, damaged lungs, and asthma. Infections caused by *Aspergillus* include invasive aspergillosis, allergic bronchopulmonary aspergillosis, chronic pulmonary aspergillosis, and aspergilloma.

The hospital said on February 13 that it is “deeply sorry for the impact the air quality issues in some of our operating rooms have had on our patients and families” echoing a statement made by Jeff Sperring, MD, Seattle Children’s CEO, on November 18 in which he too said that the system that circulates air through the hospital’s operating rooms is thought to be the cause of the infections.

“At the time, we believed most of these were isolated infections,” Sperring said about the deaths of the infants over decades. “However, we now believe that these infections were likely caused by the air handling systems that serve our operating rooms. Looking back, we should have recognized these connections sooner. As CEO, I hold myself—and Seattle Children’s—to a higher standard.”

The hospital is in the process of installing high-efficiency particulate air (HEPA) filters in every operating room. Last year, Sperring said that, “HEPA is an extremely effective filtration system that removes 99.97% of particles from the air that passes through the filter. This is the highest level of filtration found in operating rooms today.”

**bloodstream infections** are ones that bring a chill to most working in healthcare and infection prevention. Such infections can be deadly and are often followed by infection prevention program surveillance efforts to keep an eye out for healthcare-associated cases. Unfortunately, the opioid epidemic has also played a role in those community-onset cases.

A recent study analyzed the increase in injection drug use (IDU) in Tennessee, which then drove a spike in bloodstream infections (BSI). The link between bloodstream infections and IDU is not new, but this particular case study sought to understand the burden of those IDU-related bloodstream infections involving methicillin-resistant *Staphylococcus aureus* (MRSA) using data from the National Healthcare Safety Network (NHSN). Since most hospitals are required to report laboratory-confirmed MRSA bloodstream infections, this resource was helpful. The team pulled more patient-specific data, though, through the Tennessee Hospital Discharge Data System (HDDS), which helped identify those patients with ICD-10-CM codes related to injection drug use.

The research focused on those community-onset MRSA bloodstream infections (CO-MRSA BSI), which were identified on or before day 3 of hospitalization. The MRSA bloodstream infection was classified as IDU-related if any of those visits documented in the hospital discharge data system had a diagnosis code for drug use within six months (before or after) the MRSA diagnosis. The authors note that this method has been used previously for estimating IDU in hospitalized patients with infectious diseases.

First, the investigators pulled data on 7646 MRSA bloodstream infections identified from 2015-2017. Nearly a quarter (1839, 24.1%) of these cases were related to IDU. Those patients less than 13 years of age were excluded. During this study time, overall IDU-related bloodstream infections rose by 118.9%, mostly among those who were seen in emergency departments (ie, that’s where the blood draw/culture occurred). Moreover, the authors noted that there was a statistically significant association between IDU and uninsured, white women aged 18-48 years. The median age in those with IDU-related infections was 40 years, although it was 63 years in those without IDU. A total of 61.8% of those with MRSA bloodstream infections had at least 1 IDU-related diagnosis that was documented within...
6 months before or after MRSA onset.

“We postulate that Tennessee’s unique epidemiology of CO-MRSA BSIs might be reflective of geographic differences in injection drug use (IDU) practices associated with the opioid epidemic,” the authors wrote. “These patients might have clinical manifestations and risk factors that vary from those identified in previous literature. In the 2000s, opioid use was largely associated with abuse of prescription opioids, but during the past decade, the rise in opioid use and overdose deaths has been attributed to an increase in commonly injected drugs such as heroin and fentanyl.”

These findings are particularly relevant for a number of reasons. First, they offer insight into multiple susceptible populations that perhaps require additional interventions during visits to emergency departments. Since healthcare-onset MRSA bloodstream infections are tracked for hospital surveillance and reimbursement, those medical providers should be cognizant of blood cultures during the 3-day window. This is not to say that surveillance cultures be drawn, as diagnostic and culture stewardship is critical to avoiding unnecessary testing and antibiotic usage, but rather that medical providers attending to those patients with IDU-related diagnoses, be proactive in identifying symptoms of infection.

Injection drug use (IDU) related bloodstream infections rose by 118.9%, mostly among those who were seen in ERs. There was a statistically significant association between IDU and being uninsured.

In a move intended to speed up the response to the novel coronavirus, COVID-19, the US Food and Drug Administration (FDA) leapfrogged over the usual regulatory hurdles and fast-tracked a reverse transcriptase polymerase chain reaction (PCR) diagnostic test. The move allows the test to be shipped and used in labs across the country that are approved to perform high-complexity tests, about 100 labs in all.

Nancy Messonnier, MD, of the US Centers for Disease Control and Prevention (CDC), cheered the move. “Initially, 200 test kits will be distributed to US domestic laboratories and another 200 will be distributed to selected international laboratories,” Messonnier, the director of the CDC’s National Center for Immunization and Respiratory Diseases, said during a telebriefing. “Each test kit can perform 700 to 800 patient samples. What that means is that by the start of next week, we expect there to be much enhanced capacity for laboratory testing closer to our patients.”

Up until now, the specimens all had to be shipped to the CDC’s labs in Atlanta. The FDA’s emergency use authorization (EUA) rolls the CDC’s 2019-nCoV Real-Time RT-PCR Diagnostic Panel into the battle against COVID-19. The test had previously only been allowed to be used in CDC labs. It provides presumptive detection of COVID-19 from respiratory secretions, such as nasal or oral swabs. And although a positive result indicates infection, a negative result doesn’t necessarily mean lack of infection. In other words, the test shouldn’t be used as the sole basis of treatment, FDA officials say.

The FDA can issue an EUA for some medical products in times of a public health emergency.

Alex Azar, director of the US Department of Health and Human Services (HHS), labeled the coronavirus just such an emergency on January 31.

“Availability of this test is a starting place for greater commercial availability of diagnostic testing for novel coronavirus.”

FDA Commissioner Stephen M. Hahn, MD, said that the move underscores how health agencies across the US government and around the world are working together to deal with the outbreak. “This continues to be an evolving situation and the ability to distribute this diagnostic test to qualified labs is a critical step forward in protecting the public health,” Hahn said.

“Our collaboration with the CDC has been vital to rapidly developing and facilitating access to this diagnostic test. The FDA remains deeply committed to utilizing our regulatory tools and leveraging our technical and scientific expertise to advance the availability of critical medical products to respond to this outbreak in the most expeditious, safe and effective manner possible.”

The FDA on January 27 outlined its approach speeding up the development and availability of some medical products to be used against COVID-19.
NICUs Offer Infection Preventionists Opportunity to Show Their Worth

By Saskia v. Popescu, PhD, MPH, MA, CIC

Neonatal intensive care units (NICUs) can be breeding grounds for infection, but they also offer opportunities to provide better care through infection prevention. They do this, in part, by relying on infection preventionists (IPs) to perform one of the more delicate maneuvers in healthcare: Trying to educate laypeople about infection prevention.

It’s one thing to monitor and police fellow healthcare workers on the need to take extra precautions to prevent NICU infections. It’s quite another to try and stop family members from visiting these most vulnerable of patients. Parents or other relatives visiting in these units often hold the babies, as it is an important part of their care, but this can put the child into direct contact with infectious droplets or dirty hands.

That being said, any person going in and out of a NICU poses a challenge for infection prevention efforts. This can put the IP in a tough position. Although hand hygiene, isolation precautions, and staying home while sick are all practices emphasized among healthcare workers, family and visitors don’t often get that message. Educating anyone coming into the NICU about the vulnerability of the patients and their role in infection prevention efforts is vital.

Make Them Understand

Having conversations, empathy, and providing visitors/parents with the resources to avoid sharing germs goes a long way. Personal hand-gel containers, face masks, and requiring hand hygiene upon entrance can be helpful.

Overall, there might be pushback and although you can’t prevent parents from visiting their children, working with them to understand the risks if they’re sick and giving them the tools to be a part of the care process through infection prevention can help empower them and reduce risk for the neonate.

Engaging family members and visitors in infection prevention efforts can help make them feel part of the care process while keeping the patient safe. However, that often requires 1-on-1 conversations and making accommodations. These are hospital units with extremely vulnerable patients, but they also provide a place for IPs to shine in their abilities to adapt and enhance measures without impacting patient care and family experiences.
NICU’s History
Created in the 1950s, the use of NICUs has resulted in a neonatal mortality rate decline from 18.73 per 1000 live births in 1955 to 4.04 per 1000 live births in 2002. The use of these units has also been increasing. Overall NICU admission rates have grown from 64 per 1000 live births in January 2007 to 77.9 per 1000 live births in December 2012. Investigators analyzing 18 million live births in the US during this time period found the increase across all birth weight categories, noting that in 2012 there were 43 NICU admissions per 1000 normal birth weight infants, while the admission rate for very low birth weight infants was 844.1 per 1000 live births. The March of Dimes reports that in 2018, 10% of all US live births were preterm. Congenital malformations and low birth weight tend to account for the largest portion of infant mortality in the United States. Interestingly, neonatal mortality is higher in the US than in comparable countries like Canada or Switzerland.

Increased Risk
Since many newborns in the NICU are premature, their immune systems are not fully developed, which makes them susceptible to infections, especially opportunistic ones. Moreover, NICU patients are typically admitted for longer periods of time and often require invasive medical devices and/or procedures from central lines to ventilators and even Foley catheters, which increase the risk of healthcare-associated infections (HAI) and require the most diligent of infection prevention efforts. Infections in NICUs typically stem from methicillin-resistant Staphylococcus aureus (MRSA), and other bacterial pathogens. Prematurity inherently puts these patients at more of a risk as their natural defense systems—immune system and even skin—are not fully developed and more likely to have weaknesses. The design of most NICUs is particularly unique and can create hurdles for infection prevention. NICUs are one of the few healthcare environments that allow for an open configuration, versus single-family room. The pinwheel configuration is unique in that it can include multiple neonates in several pods within a larger room. Although this setup may be helpful for nursing workflow, it also means that there is often more shared space and family/visitors are more likely to come into contact with surfaces/objects that are shared across babies. Studies have shown that those single-family rooms, despite being more costly, are more conducive to family-centered care and enhanced medical progress through reduced nosocomial sepsis and mortality. Since neonates frequently require less space during the care process, this design not only makes patient care easier, but also utilizes less space. Ultimately, a single-family room is not only preferable, but helps reduce the risk that a sick visitor or healthcare worker would expose multiple babies.

Outbreak
There have been several NICU-centric outbreaks over the years that have offered hard lessons. One 1997 outbreak of drug-resistant Enterobacter cloacae that occurred in a NICU resulted in extensive screening and changes in care. Ultimately, screening efforts identified ready-to-use “disinfected” thermometers as the probable cause of the outbreak, likely due to rushed disinfection practices that led to such contamination. In fact, investigators determined that, despite banning the use of these thermometers, newly admitted neonates in the NICU became colonized and the unit ultimately had to be temporarily closed. Extensive screening efforts were implemented that encompassed all thermometers and rectal temperature probes.

The research team there noted that “observation of disinfection procedures and a laboratory investigation revealed that ‘rushed’ disinfection with alcohol 80% led to a 1 in 10 chance of thermometers still being contaminated. Furthermore, alcoholic hand rub used for convenience disinfection failed to disinfect thermometers in 40% and 20% of the cases when done in a ‘rushed’ or ‘careful’ fashion, respectively.” Once adequate disinfection was enforced, the outbreak subsided and several months went by without additional cases. This is a prime example of not only the susceptibility of this patient population, but also how failures in environmental disinfection can be devastating to the entire unit.

Although all patients require vigilant infection prevention measures and the goal should always be zero infections, the stakes are sometimes higher in the NICU, as infections there have higher potential for death.

Saskia v. Popescu, PhD, MPH, MA, CIC, is a hospital epidemiologist and infection preventionist. During her work as an infection preventionist, she performed surveillance for infectious diseases, preparedness, and Ebola response practices. She holds a doctorate in biodefense from George Mason University where her research focuses on the role of infection prevention in facilitating global health security efforts. She is certified in infection control and has worked in both pediatric and adult acute care facilities.

References available at InfectionControlToday.com.
Susan G. Klacik, BS, CRCST, FCS, is a clinical educator with the International Association of Healthcare Central Service Materiel Management (IAHCSMM), and a liaison to the Guidelines Advisory Board of the Association of periOperative Registered Nurses (AORN). Klacik is also a representative to the Association for the Advancement of Medical Instrumentation. She engaged *Infection Control Today®* in a wide-ranging discussion about environmental services (EVS) in general and AORN’s new guidelines on environmental cleaning. The guidelines offer advice about the selection and use of cleaning products, cleaning procedures, personnel education and competency verification, and monitoring cleanliness through performance improvement processes. It also expands on previous guidelines for measuring cleaning effectiveness using qualitative measures, such as visual inspection and fluorescent markings, and quantitative measures, such as taking cultures and adenosine triphosphate (ATP) monitoring. AORN’s guidelines also stress the need to form an interdisciplinary team to oversee EVS that would include infection preventionists (IPs), EVS staff, and sterile processing experts, among other healthcare workers.

**ICT®:** How do the new AORN guidelines affect the way EVS staff does its job?

**Klacik:** They provide more feedback about what kind of a job they’re doing. Because they’re talking about qualitative and quantitative measures. How clean is this getting? Are we really, really doing a good job?

**ICT®:** What do you think is the most important takeaway from the new guidelines?

**Klacik:** I think they need to have an interdisciplinary team. I love the team concept. We need to work together, identify the areas that really need cleaning, you know, the high-touch areas. Have policies and procedures in place about how to clean. And education is very important. But also, I really like the idea of having accountability and asking: Am I truly cleaning this product?

**ICT®:** Why do the new guidelines stress the need for an interdisciplinary team?

**Klacik:** The AORN guidelines are heavily based on research and they say we should have an interdisciplinary team involving sterile processing, perioperative nursing (which is the operating room), environmental services, and infection prevention. They recommend that because that allows input from personnel who perform the environmental cleaning in the perioperative areas and also people who have expertise in other areas. We get a 360-degree view of cleaning. There are so many really good recommendations in the guidelines that could really be applied throughout the hospital. For instance, we should identify the...
high-touch objects and surfaces to be cleaned, [such as] control panels and our work areas. As an interdisciplinary team, we need to identify those areas and say this is what needs to be cleaned. The interdisciplinary team can even go as far as recommending how to clean it, meaning what cleaning products and disinfectants to use. Of course, we’re always going to go back to the manufacturer’s instructions for use, because they may have a preferred detergent or might point out what chemical not to use. For instance, some manufacturers say do not use bleach on my product. So, we’re always going to go back to manufacturer’s instructions.

**ICT**: What else is new within the updated AORN guidelines?

**Klacik**: It wasn’t just added, but I like where they say they’re going to test for cleaning efficacy—quantitative methods versus qualitative methods. Qualitative is when I walk into a room and I could see that it’s not really clean. Or maybe I think it’s clean and maybe you don’t, or vice versa. If I’m using a quantitative method such as ATP or culture, I’m going to swab the surface. And then I’ll get a readout of how clean that surface is.

The AORN guidelines talk about establishing cleaning thoroughness. We can establish a process to evaluate how good we’re doing. Let me tell you, you and I clean quite differently. I’m a really, really good cleaner and if you compare my surface to yours after we both clean, I’m going to get a better result.

This interdisciplinary team can go around and do the highest high-touch areas and also determine how often should we clean this. Obviously, you’re not going to clean the door handle every time somebody touches it. But there should be a schedule of how often to clean these high-touch areas. And the other thing is there should be assigned responsibility so that nursing personnel don’t just assume environmental services are going to clean the door handle or the computer keyboard. Not just making the assumption that somebody else is going to do it. It should be written down exactly. Who is responsible to clean what?

**ICT**: That hasn’t been automatically laid out in the past?

**Klacik**: I was in the business for a very long time and I’ve seen [oversights] happen. Identify who’s responsible for cleaning and those people should be aware that it is their responsibility for cleaning and that comes with education. And again, this is based on research. You should perform cleaning in a methodical pattern that limits the transmission of microbial organisms. We’re going to clean from clean to dirty. We’re not going to go to the dirtiest part of the room and clean over to the clean side. We should have a method. We should have a routine. We should always use the same types of cleaning materials so we’re getting a consistency. That’s sterile processing. We don’t mix the decontamination cleaning with sterile processing cleaning. That outer perimeter is cleaner than the center of the OR where the procedures are being performed. You’re going to get most of the blood and body fluids. The recommendation is start from the outside and then work your way in. And if you’re going to take that logic to nursing units, obviously you would clean the patient room and then the bathroom.

**ICT**: Who would lead the interdisciplinary team?

**Klacik**: That’s a good question. It would probably be between infection prevention and environmental services. I would say one of them. Each facility differs.

**ICT**: How can institutions ensure that EVS staff are adequately trained on infection prevention?

**Klacik**: The one way is obviously showing the cleaning efficacy by using those cleaning verification tools—the quantitative and qualitative. AORN has an entire section on that. What they recommend is providing education and competency verification activities related to the principles and processes. So housekeeping, the worker should have an idea of infection prevention [and] exactly what it is, [as well as] some basic principles of microbiology. They should also know, if we’re educating them, how do they know that they’re going into an isolation room? So, they need to understand what the signs are and the labels coding throughout the hospital. That’s the education that they need. They need to understand that you’re going into a contaminated room, like the sterile processing has a decontamination room. They need to be educated that they have to wear personal protective equipment (PPE) in that room. If they’re going after surgery, they’re going to have to wear a specific type of attire. Sterile processing, the same. They need to be educated: This is what you need to wear. They need to know the location of the safety data sheets, the hazardous materials, how to handle hazardous and medical waste disposal. They need to identify what is hazardous and what is not. And how do I handle this to protect myself and the environment?
ICT®: Is that a big issue?
Klacik: Oh, absolutely, it is. What could occur is you could actually record. And I’ve seen this happen. People take their cell phones and they record the techs or the staff cleaning a room. So, you record them cleaning your room and you go back and you review it maybe with a couple of other people. You might say: This staff person is going back and forth an awful lot of times. There are wasted steps that they’re doing. So that’s one way to get more efficiencies.

ICT®: Is there a tradeoff between efficacy and the time it takes to perform these tasks?
Klacik: When it comes to that tradeoff, you’ve got to go to work with quality every time. You might find ways to be more efficient to maybe use new products that are more efficient when you’re talking about cleaning and disinfecting. And here’s another thing that’s very important, especially with disinfection. Many disinfectants have a specified wet time or contact time. That’s on their instructions. That has to be also figured in. And that’s part of the education process—which is how to use these chemicals. How long do they have to stay there? More information that’s very important. How often do I change my water? My cleaning solutions? That would be an EVS issue. I believe they do it after each room, or when the water appears dirty.

ICT®: Is always EVS staff that cleans the operating rooms?
Klacik: In different hospitals, they have different staffing patterns. I would say most use EVS, but not all of them. During the day, they may have patient care technicians. That might be part of their job. But they have to follow the guidelines up there. In as far as being intimidated: We have a big push in hospitals now. We don’t want to bully people. We need to really work together as a cohesive team.

ICT®: Who would be on the interdisciplinary teams?
Klacik: Typically, you get the team leads. The leadership of the department. The way that I understand it is you would have the head of infection prevention, the nursing head, which here we’re talking about OR. We have a big push in hospitals now. We don’t want to bully people. We need to really work together as a cohesive team.

ICT®: And how often would it meet? Weekly? Monthly?
Klacik: That’s determined by the interdisciplinary team. And the AORN guideline talks about that also. You should inspect the area, have a walk through. Even with plant operations. If you have, for instance, a stainless-steel ceiling tile, this team can look at that and say, “Well, that needs to be replaced.” Are the ventilation vents clean? Are the doorknobs clean? Are the work surfaces being cleaned? Because we don’t want any dust bunnies hanging around. Sometimes you could actually see a herd of them. It often comes down to nobody knowing who’s supposed to clean the work surfaces. It’s either they don’t know, or they’re not held accountable.

ICT®: Does this mostly come down to communication?
Klacik: Absolutely it’s communication. And accountability. It’s about making the rounds and about using tools, the qualitative and the quantitative. You really need to look at the instructions for the products you’re using and determine your own level from the facility. For the disinfectant, do you know the EPA registration number that you should be using and looking at that? Because when we’re cleaning, we’re using low- to intermediate-level disinfectants. Now for cleaning agents for cleaners? Detergents? There’s no oversight on those products.

ICT®: Are we talking about cleaning operating rooms only?
Klacik: You’re talking the whole hospital, and I’m basing the whole hospital off of the AORN recommendations even though they’re not for the whole hospital. But why wouldn’t we do it? I mean they have some really, really good recommendations, talking about scheduled cleaning, making rounds. And when you’re making rounds you have a checklist so that you know exactly what it is you’re going to be looking at. You’re looking at the floors, the ventilation, new doors. Making sure that everything is thoroughly cleaned. In surgery, we definitely have checklists. And in sterile processing we have checklists. Every time we do a tray, there’s a checklist to make sure that everything is in that tray perfectly.

ICT®: Have you ever seen that happen in real life?
Klacik: I’ve been out of the hospital a couple years, but we did used to make rounds. I made 2 different rounds. One was with the interdisciplinary team and another one was…they would send a person from EVS to make rounds with me and it was like the shift leader or a supervisor. And they did have a checklist and we would go through the department and at the end, I would go through with them at the very end of the process. They had the checklist. And we talked about it as we went through the department and at the very end, they signed it and I signed it. I don’t know if all facilities do that, but I thought it was a good process. [21]

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Think of it, says Vineet Chopra MD, MSc, as being a sort of Good Housekeeping Seal of Approval for infection prevention products. Chopra is chief of the division of hospital medicine at VA Ann Arbor Health System. He’s also the corresponding author of an article that lays out a new system that infection preventionists (IPs), hospital administrators, and others on the frontlines of infection control can use to evaluate infection control devices.

“That’s precisely what we were thinking about when we were creating the tool,” Chopra tells Infection Control Today® of the Good Housekeeping analogy. “If you’re a busy IP in a hospital and are thinking about investing in new technology, how could you tell if it was worth it? This approach also focuses on what data sources/evidence matters when you need to make the choice and sends a signal to industry as to what sources of truth we will be considering when reviewing products.”

Chopra and co-investigators published the article outlining how the tool—a 2-page framework form—works last November in the Annals of Internal Medicine.

Healthcare officials can access the framework in the article or on the US Centers for Disease Control and Prevention’s (CDC) website. The tool was created by the Products and Practices Workgroup of the CDC’s Healthcare Infection Control Practices Advisory Committee (HICPAC).

The Process

HICPAC was charged with developing a process that would educate healthcare officials at the CDC, hospitals, and other settings about product choices. That covers a lot of ground, from ultraviolet light cleaning enhancers used by the environmental services (EVS) staff to the silver alginate dressings for the prevention of central line-associated bloodstream infections (CLABSIs) that Chopra’s article uses as one of its examples.

“It was purposefully defined to be as broad as possible,” Chopra says. “So, our definition includes the gamut of devices from dressings, coatings, disinfectant devices, et cetera.”

The tool involves use of what the article calls nodes, lettered A to O. The Products and Practices Workgroup, which met quarterly from July 2017 to November 2018, included representatives of the US Food and Drug Administration (FDA), the CDC, and members of medical professional societies.

The workgroup wanted product assessments to “span labeling, marketing, and regulatory data; evidence supporting use of a product; a summary of benefits and harms; consideration of effectiveness and generalizability; and resource implications,” the article states. “The workflow provides, for the first time, a rigorous, standardized method for reviewing products for infection prevention. It also broadens the type of information guideline writers will be able to review when considering products within
infection prevention recommendations.”

Chopra says that, “Our initial indicators are that it has many page views. As to whether it will catch on? Time will tell.”

Linda Spaulding RN, CIC, BC, CHEC, CHOP, an infection prevention consultant, thinks that the tool will provide hospital administrators and IPs with some direction. “There have been so many products coming on the market that it is more important than ever for hospitals and IPs to do complete evaluations,” says Spaulding, who served as a liaison member of the HICPAC working group.

Future Applications
Connie Steed, MSN, RN, CIC, FAPIC, the president of the Association for Professionals in Infection Control and Epidemiology (APIC), says that the tool was designed for HICPAC and CDC and won’t necessarily affect the day-to-day for IPs or hospital administrators; they may use it way down the line, though.

“I think it’s a very comprehensive tool,” says Steed. “There’s so much innovation going on that when they’re reviewing guidelines, they need to look at what’s out there.”

She adds that the framework’s rigorousness makes it time-consuming. “It was not intended for infection preventionists to use but I could see where it would be helpful to infection preventionists,” says Steed, adding that it’s not really ready for hospitals to use either—yet.

“In the future, you may see this used by a healthcare organization,” says Steed.

On the other hand, manufacturers of infection control devices might find the tool very useful. “It gives you really a roadmap to what HICPAC and CDC is looking at in a product that they would recommend and a guideline for you to reduce infection risk. It’s very detailed. I’ve learned a lot by looking at the tool and understanding things that we need to be looking for as we assess products.”

Chopra said Steed is correct in saying that the tool right now is designed to determine how HICPAC will make product recommendations. He adds, however, that Steed is also correct that hospital administrators and IPs will hopefully find the tool useful someday.

“We didn’t design this to be a research tool,” Chopra says. “Rather, it was designed to be a pragmatic approach to looking at the evidence and data. One that we hope will diffuse beyond CDC and HICPAC.”

As the article states, the manufacture and sale of such devices represents a $27 billion industry, with an annual growth rate of 4.9%. In the beginning and throughout most of its history, the CDC focused on healthcare delivery practices in infection prevention and not so much on the products used in that effort, confining its focus in that arena to “general categories,” as the article puts it.

Bridging the Gap
Chopra tells ICT® that “manufacturers and industry often will focus on specific outcomes. Evidence and peer-review may or may not focus on these. And FDA labels may or may not support the use of a product for that specific indication. This tool bridges the gap.”

HICPAC found instances where an FDA-approved device was used for something other than what it was meant for. “When we did our review of the silver alginate and mupirocin products, for example,” Chopra says. “This may not all be negative—but the gaps are important to know.”

HICPAC did 3 test runs on products that might be used on neonatal intensive care units (NICUs). They included, as mentioned, silver alginate dressings for the prevention of CLABSI.

“The tool was extremely useful when assessing the closed medication delivery system for the NICU CLABSI guideline because it led to the discovery that the product was not FDA-approved but rather a homemade, institution-specific device,” the article states. “The algorithm did identify clinically relevant human outcomes and the possibility of increased workload for nurses using the equipment. Evidence on generalizability, effect, and superiority of this product was not available, and the quality of the evidence in the guideline-review process was low. Therefore, the balance of benefits and harms assessed was unclear, and data summated from the tool did not support a recommendation that the product be used in neonates to reduce CLABSI.”

Chopra tells ICT® that he can see several ways in which the tool can be used. “First, when choosing product A vs. product B for a specific need, this tool can help examine the data for both in a systematic way,” he says. “Second, the tool can be a great way for IPs to look for evidence for existing products to determine whether or not there is support for continued use. Third, the ability to think about resource implications to maintain a product is a new and important dimension that IPs and clinicians can use when looking at products and making decisions.”
Hand Sanitizers

The tool may also help avoid situations of false advertising with infection prevention products such as hand sanitizers. For instance, in January the FDA fired off a warning letter to GOJO Industries, the makers of Purell hand sanitizer products, saying that some of the claims made about those products on social media platforms were misleading. Specifically, the agency took umbrage with Purell’s claims that its products can reduce or prevent infection from Ebola, methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococcus (VRE), norovirus, influenza, and Candida auris.

“Failure to promptly correct these violations may result in legal action without further notice, including, without limitation, seizure and injunction,” the letter stated.

Samantha Williams, GOJO’s senior director of corporate communications, told ICT in February that the company took “immediate action” upon receiving the FDA letter, adding that “it is our responsibility to ensure that we comply with all requirements of FDA regulations and federal law, and we take that responsibility very seriously.”

She also said that the letter was not related to the safety or quality of Purell products, or to the company’s manufacturing processes.

When asked how the HICPAC algorithm might have helped to prevent this situation, Chopra said “hindsight is 20/20.”

“The first few nodes of our algorithm that examine what the listed FDA indications for the product are would have caught this issue as it is currently written,” he told ICT. “Of course, this all assumes that the nodes are followed and the directions are acted on by those using the tool.”

Spaulding points to what Chopra describes as the “high degree of variation in the process through which hospitals make decisions about devices and products.

“Our hope is that this will streamline that approach—provide guidance where none truly exists.”

HICPAC INFECTION PREVENTION PRODUCT ASSESSMENT ALGORITHM

The tool below, developed by the CDC’s Healthcare Infection Control Practices Advisory Committee, assesses the evidence for a novel product or class of products to gauge how well they control and/or prevent infection. It gathers evidence from several sources, including the FDA, CDC, and EPA, as well as peer-reviewed studies. It’s ready for real-world application, say its creators.

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Hand hygiene is one of the most basic and important infection prevention efforts in the fight against infectious diseases, yet it is also often the most neglected. Although recent headlines on the novel coronavirus, COVID-19, have focused more on masks and personal protective equipment (PPE), it is imperative to remember and reiterate the role of hand hygiene and the complexities of recent research on the topic. The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) each consider hand hygiene to be the best way to prevent the spread of infectious diseases.

For many infection preventionists (IPs), hand hygiene in healthcare facilities is often subpar. National compliance rates tend to fall well under 50% and even with interventions, sustainable improvement is a unicorn IPs are always in search of. Hand hygiene compliance is tricky though, as healthcare workers are constantly going in and out of rooms, interacting with patients, and performing other activities that would necessitate hand hygiene protocols per the WHO guidance. The development of alcohol-based hand sanitizer has relieved some of this stress by making the process faster and more efficient. Unfortunately, this is not without some exclusions, though. One of the most important lessons IPs can teach staff is when to use hand sanitizer and when to wash with soap and water. The CDC notes that “alcohol-based hand sanitizers can quickly reduce the number of microbes on hands in some situations, but sanitizers do not eliminate all types of germs.” Current education holds that hand sanitizer is a great option, but washing with soap and water should be standard protocol when hands are visibly soiled/dirty or when caring for a patient with norovirus or Clostridioides difficile.

For years, the ability to rapidly clean one’s hands with sanitizer alone was truly an invention that healthcare workers and IPs alike were excited about. But some cracks in the foundation of the beloved hand sanitizer began to show in late 2019. The limitations of hand sanitizers have been known from the beginning, but it was a new study that raised red flags about its utilization for respiratory viruses, like influenza. Flu season has always been a time for reiterating “don’t forget to clean your hands!” so of course the finding that hand sanitizer might be less effective than handwashing against flu was deeply concerning.

A recently published study examined the infection control capabilities of alcohol-based hand sanitizers during flu season, focusing specifically on the influenza A virus. What the research team found was fascinating, but also troubling: The hand sanitizer’s ability to inactivate the virus changed when the mucus (sputum) of an influenza A-infected person was present, meaning that the efficacy of the alcohol-based hand sanitizer decreased in the...
Prompt Action Demanded

Moreover, the FDA called out GOJO for the claims, which would designate the hand sanitizer in the “drug” category per FDA regulations. The letter heavily emphasized that the claims made by GOJO regarding the product were not supported by adequate or well-controlled clinical trials and published literature, noting that “you should take prompt action to correct the violations cited in this letter. Failure to promptly correct these violations may result in legal action without further notice, including, without limitation, seizure and injunction.”

Samantha Williams, GOJO’s senior director of corporate communications, told Infection Control Today® in February that the company took “immediate action” upon receiving the FDA letter. She added that the letter was not related to the safety or quality of Purell products.

Overall, the efficacy of hand sanitizers has taken a hit over the past 6 months. Although this is not to say these products are not effective against microbes, it’s a stark reminder of the need for a wholistic approach to hand hygiene. It’s important to educate and reiterate with healthcare workers and all hospital employees—as well as visitors and patients—that hand sanitizers can be effective tools in specific situations, while handwashing with soap and water can be used in all situations.

Although infection prevention efforts often focus on when hand sanitizers can’t be used, perhaps it is time to shift gears and explore when they can be used. An effective strategy for this might be incorporating a more positive approach while reminding people that sanitizers, like any technology or medical intervention, are not be-all, end-all products. Overall, the role of hand sanitizer has always been one where explanation was required and with the recent literature and concerns from the FDA, perhaps it is time infection prevention efforts adjust how hand hygiene is communicated. Reiterating the importance of effective handwashing for all who enter a healthcare facility is critical to ensure patient safety. We all have a role in infection prevention and as research changes what can and can’t be used, it’s important that such efforts also evolve.  

Saskia v. Popescu, PhD, MPH, MA, CIC, is a hospital epidemiologist and infection preventionist. During her work as an infection preventionist, she performed surveillance for infectious diseases, preparedness, and Ebola-response practices. She holds a doctorate in biodefense from George Mason University where her research focuses on the role of infection prevention in facilitating global health security efforts. She is certified in infection control and has worked in both pediatric and adult acute care facilities.

References available at InfectionControlToday.com.

www.infectioncontroltoday.com
Over the last decade, the world has experienced many outbreaks, pandemics, and epidemics, from severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) to H1N1 influenza and now novel coronavirus (COVID-19). Since the symptoms of coronaviruses are similar to that of influenza, it is important to identify outbreaks early, contain them, and prevent person-to-person spread until identification of the cause of the outbreak can be determined.

Coronaviruses can be found in many animal species including snakes, pangolins, camels, cattle, cats, and bats. It is uncommon for an animal coronavirus to infect people and then keep spreading person-to-person. But over the past decade, we have seen just that: 3 coronaviruses infecting humans and causing ongoing person-to-person transmission.

First Came SARS
In February 2003, there was an epidemic of SARS first reported in Asia. SARS, or SARS-associated coronavirus (SARS-CoV), spread to countries in North America, South America, Europe, and Asia before it was contained. An estimated 192 people were infected/detected with SARS-CoV in the United States. Since 2004, no further episodes of SARS-CoV infection have been reported any place in the world.

Next came the coronavirus called Middle East respiratory syndrome (MERS). First reported in Saudi Arabia in 2012, MERS has spread to several countries, including the United States. The largest MERS outbreak took place in South Korea in 2015.

In May 2014, 2 of 1300 patients tested were diagnosed with MERS-CoV infection in the United States. These 2 people were identified as imported cases from Saudi Arabia. One case was in Indiana and the other was found in Florida. Both infections were thought to have arisen from healthcare workers from Saudi Arabia. Both patients made a full recovery. The US Centers for Disease Control and Prevention (CDC) completed an investigation of household members and the healthcare workers who cared for the 2 MERS cases. They all tested negative for the virus.

Common human coronaviruses (types NL63, OC43, and HKU1) usually cause respiratory tract illnesses, such as the common cold. At some point in our lives, most of the population will become infected with a human coronavirus.

Despite advances in medicine, global travel has complicated the ability to control the spread of infectious diseases. Both the 2003 SARS epidemic and the 2009 H1N1 pandemic were spread via air travel. Because of this, all healthcare providers must be aware of and alert to possible emerging diseases and understand how to identify, report, investigate, and contain any outbreak until the cause of the infection can be determined. But what is necessary to control any outbreak situation, whether it is a multidrug-resistant organism, influenza, or a novel virus like COVID-19?
**CDC’s Role**

In a recent interview with *Infection Control Today®*, Bill Jarvis, MD, president of the consulting company Jason and Jarvis Associates, shared information about the CDC’s role in outbreak investigations. Whether an outbreak is suspected within or outside of the United States, the CDC can provide the following assistance, if invited:

- **Trained Epidemic Intelligence Service (EIS) officers** can travel onsite to assist with the investigation (in collaboration with local infection control personnel).
- **Diagnostic specimen or samples of the suspect pathogen** can be sent to the CDC’s laboratories for identification, serologic, or genetic testing. In the case of COVID-19, samples sent to the CDC would be processed in appropriate containment areas in the Division of Virology or Special Pathogens/Pathology Laboratories. Once new pathogens, such as COVID-19, are identified, gene sequencing and rapid diagnostic testing can be performed and sent to state and local health departments or even to ministries of health throughout the world. Depending upon the pathogen, the specimen/organism would be directed to the appropriate laboratory (ie, bacterial, fungal, viral, protozoan, etc.). A wide variety of specialized laboratories are available.
- Once the pathogen is identified, the CDC can then develop both rapid diagnostic tests (gene probes, serologic tests, etc.) and can provide such rapid or other diagnostic test kits both nationally and internationally to assist in the diagnosis, prevention, and control of the pathogen/outbreak.
- **In addition**, either EIS officers or other members of the Division of Quarantine or taskforce personnel can be assigned to critical areas to assist in the control of the outbreak. With COVID-19, this has been seen by assigning CDC and state health department personnel to logistically important airports to assist in screening passengers for COVID-19 and assisting in the isolation of infected or potentially infected people.

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**Components of an Outbreak Investigation**

- Early identification of a suspected outbreak.
- Start an investigation.
- Define a case and an outbreak and pre-outbreak period.
- Communicate to all healthcare professionals who need to know.
- Identify all individuals who meet the case definition (patients and staff).
- Determine if the number of “cases” exceeds the background rate (ie, it is an outbreak).
- If reportable to local and state agencies, report those concerns. Local and state agencies can aid with case identification, development of investigative approach, prevention and control measures, and assist with specimens.
- Appropriately isolate all individuals who meet the case definition.
- Collect appropriate clinical specimens and save all outbreak-specific isolates from potential “cases.”
- Confirm a diagnosis (rule out a pseudo-outbreak).
- Be sure proper precautions are in place to contain the outbreak once a diagnosis is confirmed. You may decide to implement proper precaution prior to the diagnosis depending on the situation.
- Continue to monitor and control the outbreak in order to prevent future spread.
- Develop a line listing of “cases.”
- Compare exposures of “cases” to better understand the route of transmission and potential risk factors.
- Consider conducting additional epidemiologic studies (ie, case-control or cohort studies).
- Consider performing genetic studies of the pathogen (especially if previously unrecognized or unusual).
- Institute additional control measures, if needed.
- Evaluate the efficacy of the control measures.
- When control measures have terminated transmission, declare the outbreak is over.
- Communicate to all individuals and agencies involved in the investigation that the outbreak is over.
- Prepare your final outbreak investigation report.
- Provide the opportunity for a debrief to identify strengths and weaknesses in the investigation. Information should be obtained from all affected staff.
- Develop opportunities for improvement and action plans to avoid another outbreak.
It is important to understand that the CDC is a non-regulatory US agency (aside from the National Institute for Occupation Safety and Health—NIOSH). Thus, whether the outbreak is located within or outside the United States, the CDC must be invited to assist by the local/state/national government and/or healthcare facility. The World Health Organization (WHO) also must be invited and has asked China if it needs any help in preventing and controlling the COVID-19 outbreak. Only very recently has China accepted the help of a small team to travel to meet with Chinese authorities and to work out potentially having a larger WHO/CDC team provide assistance.

**Recognizing an Outbreak**

Possible outbreak situations are usually identified by an astute clinician, infection preventionist, or a clinical laboratory worker. First, a previously unrecognized (COVID-19) or unusual pathogen (MERS), or a pathogen with an unusual antimicrobial susceptibility pattern (vancomycin-resistant *Staphylococcus aureus*), or an unusual number of cases of a disease (cluster of plague) are noticed. For example, on a Monday morning, it is reported that 4 patients on 1 unit have developed cold symptoms. By Tuesday morning, the number of individuals sick with cold symptoms numbers 6. The continued increase in patients with the same symptoms should be investigated to determine whether there is a respiratory tract infection (RTI) of some type spreading through the facility. Since many coronavirus infections have the same signs and symptoms, it is important to contain the RTIs until the etiology/pathogen identification can be made.

It will have to be determined whether it is the common cold, influenza, or possibly COVID-19. It is the responsibility of every medical professional to remain vigilant for early signs of a cluster or outbreak and to report possible outbreaks caused by new or novel pathogens or unusual multidrug-resistant organisms to the appropriate authorities (in many, if not most, states, legislation requires reporting of outbreaks to county and state health departments). For very unusual or novel outbreaks, both the countries’ ministries of health and the WHO and CDC should be notified as

<table>
<thead>
<tr>
<th>compare_keyclinicalfeatures_B</th>
<th>SARS-CoV</th>
<th>MERS-CoV</th>
<th>COVID-19</th>
<th>Annual Influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>Fever, headache, dry cough and shortness of breath, without upper respiratory tract symptoms</td>
<td>Fever, cough, shortness of breath</td>
<td>Fever, cough, shortness of breath</td>
<td>Fever, chills, cough, sore throat, runny nose, body aches, headaches, fatigue, with or without vomiting and diarrhea</td>
</tr>
<tr>
<td><strong>Incubation period</strong></td>
<td>2-10 days</td>
<td>14 days</td>
<td>2-14 days</td>
<td>Infectious 1 day before symptoms until 5-7 days after becoming ill</td>
</tr>
<tr>
<td><strong>X-ray</strong></td>
<td>Confirmed pneumonia by day 7-10</td>
<td>Not always seen</td>
<td>No published data at this time</td>
<td>May or may not develop pneumonia</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Lymphopenia in most cases</td>
<td>Mild to severe symptoms</td>
<td>Mild to severe symptoms</td>
<td></td>
</tr>
<tr>
<td><strong>Person-to-Person Transmission</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, and surface transmission</td>
</tr>
<tr>
<td><strong>Annual Cases</strong></td>
<td>No current cases are being reported</td>
<td>945 cases with 348 deaths as of Jan. 2015</td>
<td>Outbreak ongoing</td>
<td>Oct. 2019 to Feb. 2020: 26,000,000 to 36,000,000 cases</td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td>10% of those ill but can increase to 50% in persons over 60</td>
<td>3-4 out of every 10 infected</td>
<td>Currently unknown outbreak still in progress</td>
<td>14,000 – 36,000 per year</td>
</tr>
</tbody>
</table>

COVID-19 indicates coronavirus disease; MERS-CoV, Middle East respiratory syndrome-related coronavirus; SARS-CoV, severe acute respiratory syndrome-associated coronavirus.

*Annual influenza is not considered a coronavirus. It is placed in this table to show how symptoms of coronaviruses can be mistaken for Influenza.*

*Table developed by the author based on data from the US Centers for Disease Control and Prevention.*

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Comparison of Key Clinical Features of MERS-CoV, SARS-CoV, COVID-19, and Annual Influenza*
promptly as possible. Initial prevention and control (containment) can prevent spread within and outside the country of origin and potentially prevent a larger outbreak or pandemic.

**Development Of A Line Listing Or Tracking Sheet**

It is important to track all information using a tracking sheet. A tracking sheet can be adjusted depending on the symptoms identified in each outbreak situation. A well-developed tracking sheet is necessary to analyze all the data that is collected during an outbreak situation. Depending on the situation, the tracking sheet may be small such as for an influenza outbreak or more extensive to track things such as all the rooms a patient had been transferred to or what roommates they may have had, and possibility of exposure.

**Components of a simple tracking sheet include:**

1. First and last name
2. Unit, wing, or floor
3. Date of birth
4. Gender
5. Age
6. Date of onset of illness
7. Date specimen was collected
8. Result of specimen tested
9. Flu vaccination given y/n (if it’s flu season)
10. Date of vaccination
11. Symptoms (ie, cold, sore throat, malaise, chills, muscle aches, diarrhea, vomiting, headache, pneumonia)
12. Date hospitalized (if from a nursing home, etc.)
13. Mortality
14. Treatment

Developing a tracking sheet makes it easier to systematically collect data, add new data, and analyze the existing data. Data can then be reviewed from any data point.

Linda Spaulding, RN, CIC, BC, CHEC, CHOP, is an infection prevention consultant and founder of InCo and Associates International, Inc.

**To practice outbreak investigations go to**

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[cdc.gov/flu/about/keyfacts.htm](http://cdc.gov/flu/about/keyfacts.htm)

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Throughout the evolution of antimicrobial stewardship (AMS) programs in healthcare, the role of the infection preventionist (IP) has not been clearly defined. AMS programs are an effort to coordinate the activities of pharmacy, providers, nursing, infection prevention, and administrators to align policy and practice around antimicrobial prescribing in ways that are optimal for patient care and appropriate for maintaining proper use to help alleviate the burden of antimicrobial resistance and other potential negative outcomes that can result in patient harm.

Those harms have long been noted. The continued misuse of antimicrobials is driving up the resistance of numerous types of pathogens and prodding the US Centers for Disease control and Prevention (CDC), the World Health Organization (WHO), and other national and international health authorities to focus more on AMS programs.

The IP has always been called on as a partner and collaborator of AMS programs, as the goals of AMS dovetail with many of the goals of IP programs. However, depending on many factors, how involved the IP is in the program varies from facility to facility.

In some facilities, the IP is seen as the champion for the AMS program and would be instrumental in getting the program started and building support to move forward with the effort. Commonly the IP is the chair or co-chair of the committee. Pharmacy representatives are also usually a co-chair, as well as perhaps infectious disease physicians.

The specialty of an infectious disease pharmacist is not available in many settings, therefore the leadership of the committee often has a learning curve about the principles and concepts of AMS and how that could be implemented in their organization. IP is a useful partner in the establishment of new committees and initiatives, as much of the work of an IP involves gathering stakeholders, researching best practices, and working with a multidisciplinary team to reach mutual objectives. Also, the IP often has relationships with the various groups involved in AMS committees, so they are a good resource to bring those parties together. However, IPs are not the expert in prescribing and administering antimicrobials, so the knowledge of providers and pharmacists is essential in taking the core concepts and then translating them into operational models for the organization.

Educational Tools
Numerous professional societies have seen the need for the promotion of AMS activities and have developed toolkits, training courses, online resources, and professional education that is available for practitioners who are new to the concepts or need some help in developing AMS programs in their facilities. The Joint Commission and other accrediting bodies have included AMS programs in...
requirements for survey. The CDC included AMS programs in its 2019 Conditions of Participation. Based on data from the CDC, these efforts have increased the percentage of hospitals with active AMS programs from 41% in 2018 to 85% in 2018.1

**Outcome Data**

One role that IPs bring to AMS is to provide outcomes data related to multidrug-resistant organisms and negative patient outcomes, such as healthcare-onset *Clostridioides difficile* occurrences. Along with providing data, IPs often perform case review of healthcare facility infections and potential impacts that antimicrobial use may have had in those cases.

When doing case reviews, it is important that the IP alone is not looking at the prescribing, as a joint review with pharmacy or infectious disease physicians can provide a deeper insight into the selection based on patient diagnosis.

As AMS programs become more established, the role of the IP can move away from the leader of the group and take on other duties in order to innovate the program and bring other related concepts to the team. Staff and patient education are a huge part of what an IP does on a daily basis. Often frontline staff are not aware of the AMS activities in their facility and how they can contribute to the program.

This is an opportunity for the IP to develop educational programs and share with staff about AMS and how it impacts their work, and vice versa. Nurses in particular can also be a vital part of AMS work, as they are interacting with the patients, assessing signs and symptoms, and communicating with providers routinely. By providing some insight into the concepts of AMS at the facility, the nurses can act as an advocate from the patients with providers and also educate patients on why antibiotics may not be necessary or why a certain medication is not appropriate.

**IPs Partner With Providers**

IPs can also help educate patients. Often we hear of patients going to the physician and expecting to walk out of the office with something tangible, so a prescription for an antimicrobial may be given to ensure patient satisfaction. IPs can partner with providers in the inpatient and outpatient arenas to teach patients about when an antimicrobial is needed, and when other alternatives should be used. Scripting can be developed so that a consistent message is sent to the patient from the moment they walk in the door, get checked in, and get called back for the initial assessment to when the provider sees them.

Diagnostic stewardship is becoming the new hot topic, which is a perfect companion to AMS activities. IPs have been looking at diagnostic stewardship for many years, focusing on educating about the signs and symptoms associated with urinary tract infections or *C. difficile*, and providing guidance on appropriate testing.

These activities can be overseen by the AMS committee and policy and procedures can be established, utilizing electronic medical records and other platforms, to set up criteria that make clinical sense when ordering tests. For instance, pan culturing is still commonly seen in healthcare systems and should be considered a possible inappropriate use of resources that can potentially lead to inaccurate interpretation of test results if the full clinical picture of the patient is not considered.

Though CMS and some medical associations want outpatient, non-acute healthcare facilities to have robust AMS programs, there still exists a gap in the implementation of AMS in settings such as primary care offices, long-term care facilities, acute rehabs, behavioral health settings, dental clinics, and pediatric offices. IPs in these settings may have to be the champion to initiate AMS programs. There are resources for outpatient settings available, however the oversight that is seen in hospitals is not the same and can be a barrier to support, as there are many other competing priorities. This is where the IP can leverage expertise in developing that burning platform, call to action, and determine and engage those stakeholders within their organization who can help drive change.

AMS and IP programs are strong partners in the work to decrease multidrug-resistance and promote positive patient outcomes. IPs can bring their perspective and strengths to the AMS program and offer ways to bring the work to the bedside and engage the partnerships that already exist to make AMS programs successful. [31]

Rebecca Leach, RN, BSN, MPH, CIC, has been an infection preventionist since 2010, with a background in nursing and epidemiology. Leach, a regular contributor to Infection Control Today®, currently works at a healthcare system in Phoenix that includes 5 hospitals and more than 100 outpatient treatment centers.
Fastest Biological Indicator for Hydrogen Peroxide Sterilization Given 510(k) FDA Clearance

What’s being called the fastest hydrogen peroxide biological indicator (BI) has been given 510(k) clearance by the US Food and Drug Administration (FDA). Made by Advanced Sterilization Products (ASP), the Sterrad Velocity Biological Indicator Process Challenge Device is up to 38% faster than the competition in providing instrument sterility assurance, according to ASP, with a 15-minute time to result.

The device is used to monitor loads and assess process performance for vaporized hydrogen peroxide (H₂O₂) sterilization. This is a crucial step to verify load sterility for critical and semi-critical surgical instruments prior to releasing them to the operating room, according to ASP, which designs and sells infection prevention technology.

Amy Smith, vice president for Global Marketing for ASP, says that cutting BI read time in half “allows customers to assure sterility for every instrument per AAMI [Association for the Advancement of Medical Instrumentation] guidelines while keeping up with the pace of a busy SPD. This is just another way ASP continues to partner with the healthcare community to elevate the standard of care by protecting patients at their most critical moments.”

Frequent monitoring may mitigate the many factors that could affect cycle variation and reduce risk to patients, according to the AAMI. The organization recommends using a PCD with the appropriate BI daily, but preferably in every sterilization cycle.

www.ASP.com

MolecuLight i:X Helps Detect Infections in Clinical Setting

A device that emits violet light on wounds excites bacteria, making them glow in different colors and directing healthcare workers’ treatment. The i:X, manufactured by MolecuLight, was recently used at University Hospitals Ahuja Wound Care Center.

“The i:X device can detect bacteria at loads that delay wound healing and go undetected with standard of care wound assessment,” said Windy Cole, DPM, the wound care center’s medical director. “This means we’re now able to see what’s happening on and below the surface of these wounds, beyond the naked eye and before problems arise.”

Chronic wounds that take weeks, months, or even years to heal often afflict people with diabetes and poor circulation. Such wounds are susceptible to infection, and sometimes can lead to patients having to be hospitalized to receive IV antibiotics, surgery, or even amputation.

The i:X makes real-time detection of concerning bacterial levels possible, which physicians can’t otherwise see. According to a University Hospitals press release, “a wound may look normal to the human eye during an exam, but when a portion of the wound glows red or cyan in an image from the i:X, it reveals that dangerous amounts of bacteria are present. The physician can then treat the affected tissue and/or prescribe medication. Follow-up images with the MolecuLight i:X can also monitor progress, measure wound size, and help guide the patient’s treatment plan.”

www.MolecuLight.com

Demand Grows for SteraMist Products in Face of COVID-19 Outbreaks

COVID-19 outbreaks have increased demand for SteraMist products worldwide, including what is ground zero for this novel coronavirus, China. SteraMist is now the industry standard throughout China after the company that makes the products, TOMI Environmental Solutions, recently received approval and registration for two (2) separate registrations—SteraMist equipment registration and BIT solution registration—from the Chinese Center for Disease Control and Prevention (China CDC), the company said in a press release. SteraMist produces a germ-killing aerosol that works like a visual non-caustic gas. “Routinely used to disinfect high traffic areas, SteraMist iHP technology has treated public transportation, ambulances, hotel rooms, offices, and universities to stop the spread of this virus,” the company said. “With more than 50 international customers and partners ranging from countries in Asia, Europe, and the Mideast using hundreds of SteraMist units, many of which have been deployed to stop the spread of COVID-19.” The company has shipped a number of SteraMist units to Thailand and Hong Kong to help in containing COVID-19.

www.mintie.com
75,000 deaths occur annually in US hospitals due to HAIs

(It's time to take proven infection prevention further)

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