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Lighting the Way for Disposable Devices

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Hand Hygiene
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Cooperation Key to Infection Preventionists Doing Their Jobs

When the Wuhan coronavirus reached the United States in January, it again reinforced the importance of infection control. Among the general public, that is. Readers of *Infection Control Today* do not need reminding and were watching what was going on ever since the virus first surfaced in the Chinese city of Wuhan at the very end of last year.

You’re on the frontlines, and we appreciate that you need timely and insightful information to help you do your jobs. We get it. We’re invested.

We want you to win the battle that is too often a life-or-death one. As coronavirus proved, pathogens continue to adapt in order to fight off what we throw at them. Coronavirus isn’t the only pathogen doing this.

As our story on page 24 proves, even common infections like *Clostridioides difficile* keep us guessing. We talked with experts about how this hospital-acquired infection is often transmitted by asymptomatic carriers. If further studies reinforce that finding, it could lead to changes in approaches to *C. diff* containment. That will take cooperation, which is a recurring theme in this issue of *ICT*.

Our story on page 22 addresses cooperation between hospital administrators and infection preventionists (IPs). As author Saskia v. Popescu, PhD, MPH, MA, CIC, notes, that relationship can be a somewhat delicate dance. IPs sometimes feel like the black sheep in the room because they are often delivering news nobody wants to hear and serving as a check and balance within the healthcare system.

That interaction isn’t limited to only healthcare professionals, either. As our story on page 27 demonstrates, the IP’s relationship with environmental services (EVS) personnel matters a lot as well. Author Rebecca Leach, RN, BSN, MPH, CIC, reports that IPs need to understand the competencies and training of the staff performing cleaning and disinfection in their facilities. This entails meeting with the EVS leadership to review what their competencies and training include, in particular for daily cleaning, terminal cleaning, special isolation rooms, and cleaning in procedural areas such as operating rooms (OR), cardiac catheterization labs, or interventional radiology suites.

IPs cover a lot of territory, but cooperation lessens their burden. Speaking of which, feel free to cooperate with us by sending comments or questions to Alexandra Ward, Associate Editorial Director, at award@mjhlifesciences.com.

Thank you for reading,

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Chairman and Founder
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You don’t want me creeping around your hospital room, that’s for sure! I am a gram-negative bacterium found commonly in the environment. However, I am known to lurk, form biofilms, and cause trouble when I find a humid surface to settle in. Tubes used in mechanical ventilation, IV lines, indwelling urinary catheters, and endoscopes are quite cozy! I also frequent medical solutions, such as saline rinses and humidifier water.

In healthy individuals, I’m not much of a threat. But I can cause serious infections in an immunocompromised host. How fitting then that those populations are the ones most likely to be hospitalized or receiving medical care.

A growing source of latent pulmonary infections, I mimic the symptoms of bacterial pneumonia—fever, cough, mucus, shortness of breath, and chest pain. I can also cause blood infections, with symptoms that may include fever, rapid heart rate, low blood pressure, abdominal pain, nausea, vomiting, diarrhea, and confusion.

But I don’t discriminate. I’ve been responsible for endocarditis, mastoiditis, peritonitis, meningitis, and cellulitis, among other infections.

I give those other healthcare-associated pathogens a run for their money, especially in the intensive care unit, where I contribute substantially to morbidity and mortality in the immunocompromised.

To make matters worse (for you, but better me), I’m multidrug-resistant. I have been found to be, in some cases, inherently resistant to multiple classes of antibiotics, including cephalosporins, carbapenems, and aminoglycosides.

Since I was first isolated in 1943, I’ve gone by many names, but the tongue-twister of a moniker I go by now is here to stay.

Who am I?

Stenotrophomonas maltophilia

What’s Bugging You?
Have an idea for our Bug of the Month? By all means, tell us. We’re also always looking for other story ideas to make Infection Control Today® required reading for those on the frontlines of healthcare. Contact Associate Editorial Director Alexandra Ward at award@mjhlifesciences.com.

- Have you missed any mysteries? Check out more Bug of the Month stories online! -

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Ultraviolet Irradiation Boosts Cleansers’ Effect, but Much Hinges on How Well EVS Teams Function

By Frank Diamond

Ultraviolet (UV) irradiation boosts the cleaning ability for all cleaners and disinfectants when it comes to reducing the bioburden in hospital patient rooms but really enhances the results of less potent solutions perhaps because there’s just more room for improvement. So say investigators with the Veterans Administration (VA) who looked at samples of methicillin-resistant Staphylococcus aureus (MRSA) and aerobic bacterial colonies (ABC) obtained from 5 high-touch surfaces in patients’ rooms: bedrail, call button, toilet seat, bathroom handrail, and tray table.

The study1 in Open Forum Infectious Diseases, a publication of the Infectious Diseases Society of America, was conducted at a 120-bed acute care VA hospital in Temple, Texas. Samples came from single-occupant rooms that had been used for at least 48 hours and in which the patient had been discharged before 3 PM on the day the samples were collected.

Collection occurred before manual cleaning, after manual cleaning using 1 of 3 disinfectants or 1 cleaner, and after UV irradiation, a total of 600 samples for each stage.

After collection of the post-cleaning samples, a UV device, manufactured by Xenex Disinfection Systems, was used 3 times—a 5-minute cycle on each side of the patient bed and a 5-minute cycle in the restroom. Post-UV samples were taken after completion of the UV irradiation. “Plated colonies were counted and recorded by a laboratory technician in a blinded manner,” the study states.

For ABC, the bacterial counts were 56% lower for post-manual plus UV versus manual cleaning alone. The cleansers and disinfectants used included sodium hypochlorite 10% solution, hydrogen peroxide with peracetic acid, or detergent.

Investigators also measured the effectiveness of the environmental services (EVS) cleaning crews. The study states that, “Variability in EVS staff performance was included in the analysis by allowing the baseline mean bacterial colony counts to vary with each individual staff member.”

Some EVS personnel cleaned better than others, according to the results.

The study’s corresponding author, Chetan Jinadatha, MD, a lead researcher with the Central Texas Veterans Health Care System, told Infection Control Today® “that guideline-based EVS training can definitely improve appropriate disinfection.”

Sylvia Garcia-Houchins, MBA, RN, CIC, director of infection prevention and control within the division of healthcare improvement at the Joint Commission, said that, in general, Commission surveyors use the tracer methodology to look at the cleaning and disinfection processes at facilities to identify potential vulnerabilities. “If issues are identified they might ask the organization for more specific information including applicable regulations, [US Centers for Medicare and Medicaid Services] requirements (if deemed), manufacturer instructions for use, and the organization’s chosen evidence-based guidelines and policies,” Garcia told ICT.

Jinadatha’s feedback is that, according to his study, the effectiveness of various chemical disinfectants and cleaners on some of the organisms varied. In addition, said Jinadatha, varying outcomes for each chemical could be attributed to how long the cleanser was used on the surface, the potency of the cleaner or disinfectant when used, or even how much ABC or MRSA was on the surface in the first place.

“If time, environmental, and cost permits, it is certainly beneficial to use UV in conjunction with any disinfectant/cleaner for additional reduction in microbial bioburden on hospital surfaces than disinfectant/cleaner alone,” Jinadatha said. “That reduction is more meaningful for cleaners with lowest or no disinfection properties such as detergents but, surprisingly [quaternary ammonium compound] also benefited immensely from UV in our study. Bleach and hydrogen peroxide show improvements but not as much as detergent or [quaternary ammonium compound] probably because they did a better job at disinfection to begin with and there wasn’t much for UV to kill.”

Reference
Infection control teams concerned about how hospital sink drains can breed reservoirs of antibiotic-resistant pathogens should consider having environmental services (EVS) personnel cleaning those drains every 3 to 5 days with a mixture of hydrogen peroxide, octanoic acid, and per oxyacetic acid foam.

That, according to results of a study published recently in *Infection Control & Hospital Epidemiology*. Investigators with the Medical College of Wisconsin compared the effects of 2 different disinfectants on colony-forming units (CFU). They’d found in an earlier study that sink drains adjacent to toilets in patients’ hospital rooms had more *Klebsiella pneumoniae* carbapenemase (KPC) genes than did sink drains farther away from toilets. In this earlier study, investigators then compared a hydrogen peroxide product with bleach, with the former being more effective at decreasing CFU.

“Here [in the new study], we aimed to determine the ideal frequency of sink drain disinfection and to compare the effectiveness of 2 different hydrogen peroxide disinfectants at decreasing CFU in sink drains,” the authors write.

Investigators conducted their study in 26 rooms of the medical intensive care unit of a 565-bed teaching hospital in Milwaukee. Each room has 2 sinks, 1 next to the toilet and 1 near the entrance of the room. Investigators only looked at the sinks next to the toilets.

Investigators named the 2 disinfectants involved products A and B. Product A consisted of hydrogen peroxide, octanoic acid, and peroxyacetic acid. Product B consisted of hydrogen peroxide-based disinfectant.

“Product A came ready to use and product B required dilution according to the manufacturer’s instructions (6 ounces of disinfectant per gallon of water),” the study stated. “Both products were applied using foaming devices by a single environmental services (EVS) staff member.”

The 26 sinks were assigned to 3 groups: product A, product B, and sinks that were not disinfected. An EVS team member designated the sinks and did not tell other team members until after the analysis was completed. The daily cleaning schedule was not changed.

To take samples, investigators inserted swabs as far down the sinks’ strainers as they could. The walls of the sinks were swabbed in 360-degree circular motions. The samples were taken the day before the products were used, and then again after their use on days 1, 3, 5, and 7. The samples were obtained in the morning and processed within 4 hours of collection.

“Quantification of gram-negative burden was determined by serial dilution.
Regular application of a mixture of hydrogen peroxide, octanoic acid, peroxyacetic acid foam should be used on sinks harboring pathogens.

was also a greater CFU reduction in the sinks treated with product A than sinks treated with product B.

“The CFU counts for all 3 groups returned to baseline levels on days 5 and 7,” the study states.

EVS staff said it took more work to apply product B than product A because product B needed to be diluted. “Both products required a maximum of 30 seconds per sink to apply, were easy to use and dispense, and created minimal odor,” the study stated.

The investigators did not determine the ideal frequency of disinfection.

“Based on our results, relative affordability and easiness of application, regular application of a mixture of hydrogen peroxide, octanoic acid, and peroxyacetic acid foam (every 3–5 days) should be considered in settings where there is concern that sink drains are acting as reservoirs of resistant pathogens,” the study states. “Nevertheless, the clinical relevance of sink disinfection using the products tested in this study and their impact on different pathogens should be further evaluated.” [1]

Reference
As global cases of the novel coronavirus (2019-nCoV) continue to multiply, there is an urgent need now more than ever to focus on facts and response measures. In this uncertain time of constantly changing news and updates that can burden response efforts, it is important to highlight opportunities for prevention and ensure that staff have the right information.

For infection prevention efforts, it can be challenging to know where to begin. When people hear “quarantine,” there is instant panic. It’s helpful to remind the public that we isolate individuals who are symptomatic and quarantine those who have been exposed to the virus but are not yet showing symptoms.

The current guidance from the US Centers for Disease Control and Prevention (CDC) includes criteria used to guide evaluation of patients under investigation for 2019-nCoV. These criteria include clinical features such as fever and/or symptoms of lower respiratory illness (such as cough and difficulty breathing), in addition to travel to Wuhan, China, in the last 14 days prior to symptom onset or close contact with a laboratory-confirmed case or someone under investigation for 2019-nCoV. The CDC also includes recommendations for reporting, testing, and specimen collection.

Now is the key time to ensure healthcare facilities have enough supplies of surgical and N95 masks, gowns, gloves, and eye protection. Moreover, this is a perfect time to ensure negative pressure rooms are functioning and frontline staff are vigilant in asking about recent travel history. Reminding staff of the importance of hand hygiene, staying home when they’re sick, and environmental disinfection is key.

As staff see images of mass quarantine efforts and over-hyped measures, now is the time to get in front of the hysteria-inducing news and provide correct information to the public and staff. Attending huddles and rounding, especially in emergency departments and urgent care centers, is a great way to share information and answer questions. Providing staff with simple guidance on isolation, contact information, and testing processes can help reduce the potential they will make a hasty decision in fear.

Perhaps one of the most important things to emphasize during this time is that these are not new skills staff need to learn. The current isolation precautions are Airborne + Contact, which means a gown/gloves, N95 mask, and eye protection. The employment of the i3 approach (identify, isolate, and inform) is a foundational tool that can be used for 2019-nCoV, but also future infectious disease outbreaks. The biggest challenge is that failure to follow these infection prevention practices occurs all too frequently. Adhering to the skills we possess and resources we have is a good lesson that will last beyond this outbreak.
Building Better NICU Infection Prevention

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

Premature babies and the neonatal intensive care units (NICUs) where they often require care are uniquely susceptible to infectious disease threats, making infection prevention efforts vital. The US Centers for Disease Control and Prevention (CDC) reported that in 2018, 1 in 10 babies were born early in the United States. Investigators have found that since the first NICU opened in the United States more than 55 years ago, the neonatal mortality rate has fallen by more than 4-fold and that there are roughly 78 NICU admissions per 1000 live births.

Outbreaks in NICUs are particularly challenging. Not only are the patients vulnerable to infections, but often the design and layout of these units (usually a pinwheel configuration), coupled with family visits, bring about inherent challenges. Hundreds of outbreaks have been reported in NICUs and, in 2007, a study noted that Enterobacteriaceae tended to be the most common culprit. In one 1997 outbreak, an outbreak of drug-resistant Enterobacter cloacae occurred in a NICU that resulted in the closing of the NICU to new admissions.

Ultimately, screening efforts found that ready-to-use “disinfected” thermometers were colonized and likely the cause, perhaps the product of rushed disinfection practices. From the infection prevention perspective, there have been several things that make NICU infection control efforts challenging.

NICUs are 1 of the few healthcare environments that allow for an open configuration, versus single-family room. The ability to use the pinwheel configuration and have multiple babies in several pods within a larger room is common and unique to the NICU environment. This setup, though, 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. 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.

For many infection preventionists with a NICU in their purview, a single case of a respiratory infection in the NICU can be alarming. NICUs can be especially vulnerable to things like respiratory syncytial virus (RSV) and influenza. Analysis of an outbreak involving 8 ill infants (resulting in 1 death) found that the attack rate was higher in preterm infants born at lower gestational ages, resulting in higher morbidity and mortality. Often these respiratory viruses are spread by close contact they have with the infants and the contamination of high-touch surfaces. Although it is critical for healthcare workers to stay home when sick, it is also critical to stress the importance of family/visitors staying home when sick. Too often a parent or family member, with good intention in an obligatory visit, does not realize the implications of transmitting these infections to the vulnerable populations within the NICU.

Infection prevention efforts are critical in this environment, but one must also consider the layout of the unit and how best to consider human factors and work processes that might put patients at risk. Educating and working with family/visitors to ensure hand hygiene and basic infection prevention efforts can make a huge difference. Moreover, rounding in these areas to observe if disinfection practices are being done appropriately, as well as other infection control measures, can help break the chain of infection.

Sepsis Responsible for 1 in 5 Deaths Worldwide

By Infection Control Today® Editorial Staff

Sepsis kills more than twice as many people worldwide than previously believed, according to investigators with the University of Washington School of Medicine in Seattle. They came to their conclusion, published in The Lancet, after analyzing more medical data from low- and middle-income countries.

“By using vital statistics and hospital admission data for more than 100 million individuals and by incorporating Global Burden
When investigators with the University of Miami Miller School of Medicine wanted to find out how well “hand hygiene ambassadors” (HHAs) would be received in healthcare settings, they got an unequivocal response. Not one person refused when HHAs stationed in various healthcare settings approached patients, staff, and visitors with alcohol-based handrub (ABHR) and offered to apply it to their hands.

The research team calculated that 11 million people died from sepsis in 2017—1 in 5 deaths that year.

“Furthermore,” the study stated, “the difference between these current estimates and previous global estimates was especially striking among children, such that more than half of all sepsis cases worldwide in 2017 occurred among children, many of them neonates.”

Low- and middle-income countries accounted for 85% of cases. Hardest hit regions included sub-Saharan Africa, South, East, and Southeast Asia, and the South Pacific Islands near Australia.

Even though the number of deaths attributed to sepsis is larger than previously thought, the actual number declined between 1990 to 2017, according to the study. About 60 million people died from sepsis in 1990.

Sepsis is the body’s immune system overreacting to infection and is the most common cause of death in US hospitals, costing the healthcare system more than $24 billion annually, investigators noted.

“Hand hygiene ambassadors” in various healthcare settings approached patients, staff, and visitors with alcohol-based handrub (ABHR) and offered to apply it to their hands.

Further, “when asked whether they think it is a good idea to have an HHA place ABHR on an entrant’s hands, the majority of staff, visitors, and patients agreed,” stated the study in the American Journal of Infection Control.

The use of HHAs has been shown to greatly increase the use of ABHR among patients, but this study probed just how visitors and staff would react as well.

Investigators looked at 225 encounters with HHAs at 5 lobbies in public and private hospitals, a surgical center, a cancer hospital, and a specialty hospital. The facilities were affiliated with a medical center.

Lobbies were chosen because everybody passes through them: medical professionals and other hospital staff, patients, and visitors. The HHAs were stationed in the lobbies between 9 AM and noon on random days over a 6-month period. The people were asked whether the HHAs

Hand Hygiene Ambassadors Welcomed With Open Arms

By Infection Control Today® Editorial Staff

More than half of all sepsis cases in the world in 2017 occurred among children, many of them neonates.

hand hygiene
Infection Preventionists Marginalized in Antimicrobial Stewardship Programs

By Infection Control Today® Editorial Staff

It’s a small study and certainly more studies will be needed, but investigators with the University of South Florida College of Public Health set out to determine how well infection preventionists (IPs) are used in antimicrobial stewardship programs (ASPs). They also wanted to look at what other members of ASPs think about IPs. The answer to both questions was “not much.”

In what investigators called the first evaluation of what multidisciplinary hospital-based peer groups think about the role of IPs in ASPs, the research team seemed to question whether IPs will be part of the programs in the future.

“The optimal engagement of IPs in ASPs is being challenged by varying expectations among ASP clinician peer groups,” according to the study published in the American Journal of Infection Control. “Additionally, the absence of a role definition for IPs in ASPs is likely hindering IPs from contributing in consistent, meaningful ways.”

But back to the mixed method study’s limitations. The survey sample size was 28 people spread out over 10 states. Participants included 8 IPs, 6 ID physicians, 10 pharmacists, and 4 hospital executives.

Other interventions to improve hand hygiene in the past have included education, reminder signs and cues, performance feedback and automated systems, facility design, surveillance and video monitoring, portable, mounted, and wearable alcohol-based handrub, and multimodal strategies.

“Nonetheless, a sustained impact on hand hygiene rates varies considerably, and the problem of suboptimal [hand hygiene] continues,” the study stated.

With the growing threat posed by antibiotic-resistant pathogens and the intractable problem of hand hygiene, some hospitals may want to consider innovative approaches such as HHAs.

“Although the cost of such an initiative should be considered prior to implementation, it should be weighed against the annual spending of almost $10 billion in the United States for healthcare-associated infections,” the study stated. “Based on the results of this study, a more targeted approach directed to health care providers in specific clinical areas may be appropriate, and educational programs using HHAs can be tailored to specific areas such as medical and surgical floors and the intensive care unit.”

I.Marginalized in Antimicrobial Stewardship Programs

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Cardinal Health Pulls 2.9 Million Presource Procedural Packs Off Market

By Infection Control Today® Editorial Staff

Following on the heels of its recall of 9.1 million potentially tainted AAMI Level 3 surgical gowns, Cardinal Health announced on January 30 that it will pull off the market 2.9 million Presource Procedure Packs that the gowns are stored in. Those packs were manufactured between September 2018 and January 2020.

The voluntary action includes about 2.5 million procedure packs that were not separated from the affected gown by inner, sealed packaging. In addition, the company is pulling 374,794 procedure packs that were separated from the affected gowns by the packaging because those packs can be over-labeled, which allows the components within the inner, sealed packages to be used after the gown is thrown out.

Cardinal Health officials caution that all components, including the gowns, should be removed and discarded and they don’t have enough knowledge about ASPs. “When asked whether political/social tensions hindered IP involvement, 38% indicated yes and were mostly physicians (21%),” the study stated. “The most common barriers cited were antimicrobial stewardship as a lower priority (58%), time constraints (54%), IP staffing levels (46%), and communication difficulties (46%). Interestingly, several participants cited that antimicrobial stewardship is not part of the IP role (33%) and some (21%) suggested no barriers exist.”

Again, more data are needed as the investigators said that their results suggest “that IPs are currently contributing to ASPs in some undefined ways. Clarifying the role and responsibilities of IPs in ASPs would help to define and recognize specific contributions.”
Coronavirus Vaccine On the Way

By Infection Control Today® Editorial Staff

The man who helped turn the tide in the fight against HIV/AIDS in the 1990s now has his sights set on coronavirus. Anthony Fauci, MD, the director of NIH’s National Institute of Allergy and Infectious Diseases, says that a coronavirus vaccine is in the works and the first human trials might start in 3 months.

“The bad news is that it happened,” Fauci told Bloomberg Law on January 22, speaking about the crisis surrounding coronavirus. The World Health Organization (WHO) labeled the outbreak a public health emergency of international concern (PHEIC) on January 30, the same day that a human-to-human transmission was reported in the United States.

Fauci told Bloomberg News that “the good news is that we have considerable experience with coronaviruses. Everything we’ve learned with working with coronaviruses, with SARS and MERS, are helping us very rapidly get a jump on things with regard to this new virus,” said Fauci.

Nancy Messonnier, MD, director of CDC’s National Center for Immunization and Respiratory Disease, said that “NIH has always been very active in this area [investigating a coronavirus vaccine] and there is early work and early conversations.”

However, Messonnier did not underplay the challenge of creating such a vaccine. “As you know, the development of a vaccine is a complex process,” she said. “It’s not something that’s going to be available tomorrow. But there are active conversations about vaccines as well as therapeutics.”

In the meantime, hospitals and infection control professionals should take the customary precautions. “It’s actually important to clarify that the precautions … are standard isolation precautions,” said Messonnier. “This is something many hospitals know how to do…."

She added that “a hugely important issue” is that healthcare workers stay safe. “The health of our healthcare workers is very important to all of us,” said Messonnier. [31]
n the face of outbreaks, consistent problems with high-level disinfection, and design flaws, duodenoscopes have been a hot topic in infection control and public health. Increasingly, the potential for single-use, disposable options have been promoted as a way to reduce risk to patients. Duodenoscopes, often called ERCP scopes as they are involved in endoscopic retrograde cholangiopancreatographies (ERCP), are complex medical devices involved in more than 500,000 procedures each year in the United States. These flexible, lighted tubes are threaded through the mouth, throat, and stomach to the top of the small intestine.

Thanks to concerns regarding the design and usage, reusable scopes are starting to appear, costing around $40,000. Those concerns began to bubble up in 2013 but boiled over during an outbreak in 2015.

Outbreaks, FDA Involvement

In 2013, the US Centers for Disease Control and Prevention (CDC) began to work with the Federal Food and Drug Administration (FDA) over
concerns of drug-resistant outbreaks being linked to duodenoscope usage. More concerning, epidemiological efforts revealed that even with proper reprocessing, these infections were still occurring.

Within 2 short years, in late 2015, a cluster of carbapenem-resistant Enterobacteriaceae (CRE) were found at the University of California, Los Angeles (UCLA) Medical Center and linked to the use of duodenoscopes. By January 2016, investigations pushed by Sen. Patty Murray (D—Washington) tied 25 outbreaks to duodenoscopes. The FDA reported that these adverse events resulted in 3 deaths, 45 patient infections, and 159 cases of device contamination related to inadequate reprocessing of the scopes. Nineteen of these outbreaks, including the UCLA one, were traced to scopes made by Olympus. Despite CDC interim guidance, advanced disinfection practices, and a recall by Olympus last year, there was still growing concern that the issues with the scopes were not truly remedied.

In fact, Murray highlighted a recent outbreak in Europe (location not disclosed within the FDA report) tied to the modified scopes. Murray noted that, “It is essential that patients and doctors are confident that the devices used in medical procedures are safe, and following the tragic impacts outbreaks have had on patients and families in my home state and across the nation, I remain absolutely committed to ensuring rigorous oversight of medical device safety.”

Although modifications made by Olympus were made in response to the previous outbreaks and meant to reduce the risk of bacteria getting into the device’s channels and preventing proper cleaning and disinfection, Murray later questioned Olympus regarding the devices and the role they played in the most recent outbreak. More specifically, Murray pushed for data proving that the repaired scopes could be properly disinfected between patient use. Olympus representatives have said the company intends to cooperate with Murray’s questions; however, this is most likely not the end of the duodenoscope dilemma.

In December 2018, the FDA provided interim results of studies it supported regarding duodenoscope reprocessing in real-world settings to help guide future recommendations. These post-market surveillance studies were ordered by the FDA for Olympus, Fujifilm, and Pentax. The studies involved 2 parts: sampling/culturing of reprocessed scopes in clinical use to understand the chain of contamination, but also human factor studies to assess those performing the reprocessing.

The interim results indicated that, for human factor samples, the process for reprocessing is quite difficult, directions by manufacturers are confusing, and the practice is prone to missteps. In regard to the sampling/culture studies, the results revealed that, at the point where 10% of samples had been collected, there was a higher-than-expected contamination rate after reprocessing “with up to 3% of properly collected samples testing positive for enough low concern organisms to indicate a reprocessing failure and up to 3% of properly collected samples testing positive for high concern organisms.” The FDA noted that organisms considered to be of “high concern” were those like *Escherichia coli* and *Pseudomonas aeruginosa*.

**Move to Redesign**

Not surprisingly, the FDA recently recommended that hospitals and endoscopy facilities transition away from those scopes with fixed endcaps to those with newer design features that either better support or totally remove the need for reprocessing. Currently working with manufacturers, the FDA is pushing for an increased supply of disposable cap duodenoscopes and other designs that can help reduce the risk to patient safety.

In mid-December 2019, the FDA cleared the first fully disposable duodenoscope, which would wholly eliminate the need for reprocessing as it would be single-patient use. The EXALT Model D Single-Use Duodenoscope is now the first approved disposable scope on the market. Jeff Shuren, MD, JD, director of the FDA’s Center for Devices and Radiological Health noted that “the availability of a fully disposable duodenoscope represents another major step forward for improving the safety of these devices, which are used in more than 500,000 procedures in the U.S. each year. Unlike duodenoscopes that are used on multiple patients, a fully disposable duodenoscope doesn’t need to be reprocessed, eliminating the risk of...
potential infection due to ineffective reprocessing."

Other recommendations for these devices included:

- Ensuring staff are meticulously following reprocessing instructions.
- Instituting a quality control program that includes sampling and microbiological culturing, and other monitoring methods.
- Considering reprocessing with supplemental measures such as sterilization or use of a liquid chemical sterilant processing system consistent with the device’s labeling.
- Monitoring reprocessing procedures. Examples of monitoring are sampling and culturing using the Duodenoscope Surveillance Sampling & Culturing: Reducing the Risks of Infection developed by the FDA-Centers for Disease Control and Prevention-American Society of Microbiology Working Group on Duodenoscope Culturing.
- Developing schedules for routine inspection and periodic maintenance in accordance with the duodenoscope manufacturer’s instructions.

The FDA also noted that patients should be aware of the risks but that ultimately, they are quite low given the work that has gone into reprocessing protocols, and not to cancel or delay any planned procedure without having a discussion with their provider.

Future Needs

The culture of duodenoscopes is changing as efforts like those from Murray and the FDA have put pressure on device manufacturers to be proactive in their efforts to enhance patient safety. The ease at which these devices support the transmission of drug-resistant organisms is one that also falls into those efforts combating antimicrobial resistance.

In the face of this transitional period, there is still a need at a healthcare facility-level to perform internal reviews, maintain close relationships, and conduct annual risk assessments. Infection prevention efforts must include observation and assessments of those reprocessing practices to not only ensure regulatory compliance, but also be proactive in opportunities for improvement.

Although the cost of the newly approved single-use scope is not available, making the case to hospital administrators is likely to be a challenge. However, it is in the best interest of the patient that the system moves to either disposable components or scopes, as duodenoscopes have shown a propensity for disease transmission and are prone to human factor failures. As more attention is focused on duodenoscopes, reprocessing, and now the availability for single-use devices, it will hopefully spur more innovation to push the industry to entirely remove the need for reprocessing.

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.

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The dynamic between an infection prevention and control (IPC) program and hospital administrators can make or break infection control efforts within a healthcare facility. Infection prevention isn’t easy. It often involves delivering bad news—findings of healthcare-associated infections (HAIs), poor hand hygiene compliance, or failures in practices that increase risk for patients and staff. The increasing attention to reducing HAIs and the financial penalties associated with them can create tension between IPC and hospital administrators, both of which may have competing priorities.

Although it’s not always a tenuous relationship—many IPC departments have harmonious dynamics with their administrators—there is an undeniable challenge in achieving such a balance. First, IPC programs are often seen as cost centers and not revenue generators. Often a regulatory requirement to check the box for surveillance reporting needs, the scope of the IPC program can easily be constrained by what leadership determines a priority. For some hospitals, the IPC program is robust and encompasses more than just those HAIs linked to mandated reporting and Medicare reimbursement. For others, the program’s scope is narrowed to what hospital administrators deem as a priority—sometimes reimbursement, sometimes environmental disinfection, sometimes something else entirely. This limits the scope of the IPC program in ways that do it a disservice.

An honest and respectful relationship between hospital administrators and IPC programs is crucial, but building one takes work. A 2017 survey of IPs at roughly 900 US acute care hospitals found that 53% reported strong or very strong support of the program from hospital leadership—which means nearly half the respondents did not think leadership strongly supported their work. So, how can the healthcare system create a strong foundation or improve a shaky relationship between IPC and hospital administrators?

There are a handful of things hospital administrators and other leaders can do to better support their IPC programs.

**Here’s How**

First, understand that infection prevention is a hard job. IPs are wholly dedicated to patients and staff but are often the bearers of bad news. IPs don’t want to find HAIs—not only do they mean a patient’s life has changed for the worse due to collective failures, but also that there is a lot of work to do to improve practices. Know that IPs often feel like the black sheep in the room—they are not always clinicians and do not offer bedside care or the most obvious of services, which some might feel diminishes an IP’s value. When people see IPs on units, it’s not uncommon for them to...
ask what is wrong. They are truly working to change that culture, but administrative support is critical.

Second, make sure IPC departments are well-staffed. Assessments have found that overall median IP staffing was 1.25 IPs per 100 inpatient beds, but more recent analyses have found that following needs assessments, the actual labor required a new benchmark of 1 IP per 69 beds.1 Given the wide scope of what IPC work entails, adequate staffing is critical to ensure the programs are effective. Since so much time is spent on mandated surveillance and reporting, it becomes critical to have the necessary IPs to make the rounds on hospital units, in addition to educating other employees, reviewing hospital policies, assessing risk at areas under construction, and more. IPs want hospital administrators to ensure their programs are staffed adequately and not at the bare minimum.

Third, don’t just focus on those HAIs related to reimbursement. Although HAIs tied to Medicare reimbursement and mandated reporting are important and carry an obvious financial incentive, don’t let administrative focus on IPC programs become restricted. It can be easy to put more energy or resources behind those HAIs linked to financial penalties, but they do not represent all HAIs that occur. There are more surgical site infections than just abdominal hysterectomies and colon surgeries. When attention is limited, it can create a culture that values only those HAIs linked to reimbursement, which does staff and patients a disservice.

Any HAI is important and worth the resources to prevent or investigate as they can be life-changing for the patient. Simply put, in healthcare, professionals should aim higher than only caring about HAIs that have to be tracked and reported. Hospital administrators should support and facilitate robust IPC programs that have the resources and bandwidth to focus on all HAIs.

Lastly, hospital leaders and administrators should want to be a part of IPC HAI investigations. Too often, the only time IPs work closely with administrators is when they are getting pushback. Having hospital administrators partake in the review of these HAIs with unit staff, directors, and the IP not only showcases their dedication to the program and reducing HAIs, but could also facilitate change.

Some Opportunities
The deep dives that IPs conduct with key stakeholders following the identification of an HAI are where gaps and failures are identified, but they’re also a great opportunity for improvement. Having a hospital administrator present could make all the difference and show frontline staff how important these efforts are. Review cases of central-line associated bloodstream infections with IPC and the staff at the table, because if they find that a device has been problematic for staff, the administrator can help correct it then and there.

Part of this involvement is also the awareness that failures do happen, and that IPC is evolving, which requires constant vigilance and support. Having a chief nursing officer (CNO), chief medical officer (CMO), or chief operating officer (COO) in HAI review meetings truly affects how HAIs are approached at the hospital. Accountability is crucial, but it doesn’t just fall on frontline staff; hospital leadership must also engage in these processes.

Infection prevention efforts are complicated and often messy. IPC brings up failures and opportunities that some would rather avoid or ignore, but to improve patient and healthcare worker safety, everyone has to push through to create a culture of change. The relationship between hospital leadership/administrator and the IPC program is critical for the success of these efforts, but often marred by complex nuances. Hospital administrators should see this as an opportunity to be a part of a cultural shift. Sit with IPC team members and ask them how to improve communication, how leadership can better assist, and how they can better help their patients/staff.

Investigators, like Sanjay Saint, MD, of the Institute of Healthcare Policy and Innovation at the University of Michigan, have noted that “leadership plays an important role in infection prevention activities. The behaviors of successful leaders could be adopted by others who seek to prevent HAI.”5 IPC and hospital leadership are all a team and part of that is understanding what hurdles they have accidently created for each other.5

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.
Andrew D. Racine, MD, senior vice president and chief medical officer at Montefiore Medical Center, did the math when *Infection Control Today*® (ICT) asked whether he was contemplating changing his facility’s approach to combatting *Clostridioides difficile* (*C. diff*) after the results of a recent study found that 10% of patients with the infection had contracted it outside of the hospital. “If 10% of the people coming to your institution are carriers of *C. diff*, that means that 90% are not,” said Racine, when asked whether universal screening would help ward off the infection. “So, you would be doing an awful lot of tests that would essentially be negative.”

Racine quickly adds that the research conducted recently at Montefiore does point “us in a direction where we might want to think about doing some further studies to figure out who should be targeted for testing. Clearly, there are some folks who come who have a much higher likelihood of being carriers. We need to find out what are the characteristics of those folks. Because then it would make sense to narrow testing for those.”

Published in *Infection Control and Hospital Epidemiology,* the study made headlines because it reported that *C. diff*, which strikes about 450,000 Americans a year, killing nearly 30,000 of them, isn’t always acquired in the hospital. Sometimes it just walks right in.

### Identifying Carriers

Investigators looked at data from about 220 patients who showed no symptoms of *C. diff* who were admitted to Montefiore (located in the Bronx) between July 2017 and March 2018. The patients were given perirectal swabs within 24 hours of admission and were then followed for 6 months. Upon admission, 21 patients were identified as carriers. Within 6 months, 38% of the carriers progressed to symptomatic *C. diff* infection compared with just 2% of the non-carriers.

Although prospectively identifying carriers is not a recommended strategy in everyday situations, the US Centers for Disease Control and Prevention (CDC) does call it a supplemental intervention to spur rapid evaluation and treatment of patients suspected of having *C. diff* when there’s concern about a possible outbreak, according to Sarah Baron, MD, the study’s lead author and an assistant professor of medicine at Montefiore. “It is possible that more and more hospitals will consider identifying carriers in their highest risk populations to protect the individual patient and the patients around them from acquiring symptoms of the disease,” Baron told ICT. “We hope that this [study] will actually help to fuel the conversation about enhanced infection control practices to prevent *C. difficile* spread.”

Those enhanced practices would in part target the many patients who carry *C. difficile*, but don’t yet exhibit symptoms. “Many of these patients may go on to develop the disease, and frontline staff will require..."
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have indicated that up to 50% of patients measured. The fact that fewer people admitted from skilled nursing facilities (SNFs) were testing about the study at Montefiore was PLOS Pathogens determine how many cases are occurring often all belonging to different health- emergency rooms, and hospitals, to urgent cares, primary care offices, "Because patients are able to present of centralized testing or surveillance. The research also points to a lack in monitoring infections in a variety of circumstances throughout the hospital," said Racine. C. diff also requires knowing when to isolate infected patients and also, as Baron mentioned, how best to disinfect hospital rooms. Racine said that "those are resources that are very well spent because they not only prevent the dissemination of this condition, but they prevent the dissemination of all other kinds of infections. And one of the risks of coming into a hospital is that you are aggregating lots and lots of people with lots and lots of infections in a single place."

**Team-Based Approach**

It’s also crucial to pay close attention to how “It is that we cohort patients with particular infections,” said Racine.

The PLOS Pathogens study stated that some mathematical models suggest that reducing transmission would require that patients with C. diff be placed in single rooms and the healthcare workers who care for them wear gowns and gloves. Clinical data supporting this method are missing, however. “Molecular epidemiologic studies attribute a relatively small minority of transmission events to carriers,” the PLOS Pathogens study states.

Mathematical models? Doffing? Environmental services? Food preparation? Racine iterates that infection control should permeate entire facilities, with everyone participating.

“We have teams of folks who are responsible for that kind of training,” he said. “We include input from our infection preventionists, hospital epidemiologists, infectious disease physicians. It’s a real combined effort so that folks who are on the frontline in facilities or in food handling or any of those things have input from experts that is going to be most helpful for them.”

Continuous input, he adds. “You don’t just expose this information to them once and that’s the end of it,” Racine said. “We have to maintain a constant state of readiness and preparation for these things. And that means when people first come to the institution as part of their orientation, and it also means exposure to this information over the time that they’re working here.”

Baron sees the results. She said that she hopes her study “highlights all of the amazing work that our infection prevention and control, environmental services, and antimicrobial stewardship teams do every day to keep our patients as safe as possible.”

References available at InfectionControlToday.com.
As the science behind the transmission of microbes on hospital surfaces becomes clearer, an appreciation of environmental services (EVS) departments grows stronger. At least 25% of surfaces in a patient room are contaminated with pathogens, which can then be transmitted to the patient. A study by Cohen et al found that patients have 5 to 6 times increased odds of acquiring an infection when they were placed in a contaminated room.

EVS staff in healthcare settings are either employees of the facilities or those working with outside vendors. In either situation, infection preventionists need to understand the competencies and training of the staff who are performing cleaning and disinfection in their facility. IPs should meet with the EVS leadership to review what their competencies and training include, in particular for daily cleaning, terminal cleaning, special isolation rooms (ie, Clostridioides difficile or norovirus), and cleaning in procedural areas such as operating rooms (OR), cardiac catheterization labs, or interventional radiology suites.

The IP can bring the standards and guidance from various national groups as references, such as the US Centers for Disease Control and Prevention (CDC) and the Association of Operating Room Nurses (AORN). The EVS leadership can bring standards from their national organization, such as the Association for the Healthcare Environment (AHE).

IPs can work with EVS to evaluate and approve the best cleaners and disinfectants that are used in the facility. Criteria to make the decision include: kill claims, contact time, how the product must be applied (ie, ease of use), personal protective equipment (PPE) that is required of the EVS staff when using, the dilution requirements of the product, whether a rinsing step is needed after application, compatibility of the disinfectants with the surfaces to be cleaned, and cost. Any time there are product changes proposed, the products need to be reviewed and approved through infection prevention.

Working With EVS
EVS should be part of the infection prevention committee of the organization and be included on agenda items as appropriate. The IPs can work with EVS leadership to develop quality assurance metrics that can be measured and reported out on a regular basis at the IP committee meetings. That venue allows for multidisciplinary review and discussion of any concerns or issues with EVS quality metrics or processes that need to be reviewed and implemented. Some ideas for quality measures for EVS include monitoring throughput to ensure that enough time is given for terminal or discharge cleaning; audits of high-touch surfaces being cleaned on a daily basis, terminal cleans utilizing fluorescent gel, or ATP programs; and audits of cleaning in procedural areas. Evaluation of cleaning practices can start at a basic level, depending on the amount of resources available.
available to the EVS program. As hospitals develop and launch these programs and gain resources, the auditing program can expand, in particular when or if there’s a spike in transmission of multidrug-resistant organisms or other hospital-associated infections (HAIs). IP and EVS can develop expectations based on CDC guidance and other industry standards. The CDC has developed an example of these types of auditing programs that are available for IP and EVS programs to use as templates for their own facilities.3

An Introduction
IPs can promote collaboration with EVS by attending staff meetings and huddles. IPs can introduce themselves and discuss how EVS contributes to the infection prevention activities of the facility. IPs can also learn from EVS staff about the challenges they face and provide a voice for EVS staff in hospital operations. IPs can provide education on topics of interest to the EVS staff and promote the role the EVS staff play in IP programs.

New technology has emerged in EVS practices that the IP can assist in reviewing in order to develop a proposal for the organization to adopt the technology. UV disinfection and hydrogen peroxide mist technology are both recent advances to supplement the cleaning and disinfection process for EVS. The IPs at the facility can assist with researching the latest technology, determine what would be the best fit for their organization, and work with EVS leadership to develop proposals for capital purchases and return on investment proposals for these innovative devices and products.

AHE provides certification in infection prevention. The certification for mastery of infection prevention for environmental services professionals (CMIP) is a national program that promotes the integration of infection prevention into environmental services programs. This program is aimed at EVS leadership. IPs can promote this certification in their organization. For EVS staff, there are education modules available from national organizations, such as APIC and AORN that can be utilized in developing training information that the IP can distribute at the facility based on the needs of the staff.

The APIC modules include such areas as: basic principles of infection prevention; safe PPE use; chemical safety; and surface disinfection processes. These trainings are available in Spanish as well. AORN has modules specific to cleaning in the OR for between case cleaning and terminal cleaning. The CDC offers training for EVS staff on the importance of infection prevention, and also provides posters and print materials. All of these resources are excellent ways to provide information to EVS staff and help them understand their role is integral for infection prevention.

Joint Checklist
IPs perform routine rounding in their facilities. EVS leadership can be included in those environmental rounds. A joint checklist can be developed for all areas of the facility that includes items for IPs and EVS to review on the rounds and issues can be discussed at the time of the observations. Construction meetings and rounds should also include EVS for the importance of cleaning during and after the completion of the project. EVS staff are involved in every area of the facility and are a resource that can be trained as covert hand hygiene observers. By including EVS staff in this process, they become eyes for the IP program and will also develop a stronger sense of the importance of hand hygiene and the appropriate times when hand hygiene is needed.

EVS should be included in the plans for a facility’s response for high-consequence diseases, such as Ebola, as well as other emergency preparedness scenarios. EVS needs to be included in the development of organizational plans, serve as subject matter experts in the disposal of biohazardous waste from such events, and participate in tabletops and drills. IPs can assist with the collaboration of EVS into emergency preparedness scenarios by ensuring those questions are asked during the creation of the plans and by interjecting those challenges into exercises that would bring EVS concerns to the forefront.

Infection preventionists have to be masters at collaboration across departments in order to achieve the goals for their programs. The work of EVS is one of the fundamental cornerstones of infection prevention and IP has the opportunity to connect with their partners in EVS and promote their importance in the organization as a key player in patient safety and the quality agenda.3

Rebecca Leach has been an infection preventionist since 2010, with a background in nursing and epidemiology. Her interests include social determinants of health and reproductive health.

References available at InfectionControlToday.com.
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Best Practices
Importantly, studies are pointing to an integrated, bundled approach as an effective and efficient process for comprehensive infection prevention within a healthcare facility. But reviewing data and conclusions from various studies only go so far in protecting patients.

Infection control specialists need to know how to successfully design and implement an effective infection prevention program. For evidence-based practices for room decontamination, as reported in the American Journal of Infection Control, healthcare facilities should establish strict cleaning/disinfection protocols, including both manual cleaning and automated, total room decontamination technology, combined with extensive training and compliance monitoring (eg, thoroughness of cleaning/disinfection) with feedback to staff.4

Manual Plus Automated
With significant data to support it, the consensus is that manual cleaning/disinfection, although a critical component in decontamination, alone does not adequately disinfect frequently touched objects in a patient’s immediate hospital environment. For example, one study revealed less than 50% of environmental hospital room surfaces were cleaned by standard terminal room cleaning and disinfection.5 As such, automated, total room decontamination technologies after discharge of patients on contact precautions, such as UVC systems, should be incorporated as a second step to rigorous manual disinfection. UVC systems have several advantages, including reliable, rapid, and safe decontamination activity against a wide range of healthcare-associated pathogens. Broad distribution of UVC energy throughout a room, including surfaces and equipment, is achieved through an automated monitoring system that doesn’t leave any residue or cause health and safety concerns. UVC technology, however, must not replace manual cleaning/disinfection as it cannot eliminate organic dirt, dust, and debris and persons must leave the room prior to decontamination.
Supporting Data
A study by Duke University, sponsored by the US Centers for Disease Control and Prevention (CDC) and published in the Lancet, demonstrated that enhanced room decontamination strategies (ie, bleach and/or UVC decontamination) decreased the risk of colonization and infection caused by epidemiologically important pathogens among patients admitted to the same room by as much as 30% in hospital settings with 93% compliance of standard disinfection protocols. Individual hospital results may vary.3

The investigators concluded that comparing the best strategy with the worst strategy revealed that a reduction of 94% in epidemiologically important pathogens led to a 35% decrease in colonization and infection.

These data demonstrated that a decrease in room contamination was associated with a decrease in patient infection. Based on this, hospitals should use a “no-touch” device for terminal room decontamination along with strict manual cleaning/disinfection procedures.3,7

Establish Standardized Protocols
One key component of effective infection control implementation is creating an organized, standardized set of protocols and steps for cleaning and disinfecting patient rooms and equipment throughout the hospital. Procedures need to include what items must be cleaned, the type of cleaning/disinfection, the order in which to clean the items, as well as what products and dilution of products to use. Specific products should be selected for “cleaning,” including removal of surface debris, dust, and organic material and “disinfection,” referring to the use of a disinfectant or germicide designed to kill microorganisms. Cleaning/disinfection products should have a broad antimicrobial spectrum and be fast acting and non-toxic.4

Educate All Levels of Staff
Another critical ingredient is the proper training and education of hospital staff, including environmental services, nursing, patient equipment, and clinical teams. A facility’s policy must assign specific cleaning and disinfection responsibilities and ensure sufficient time is allowed to perform the services. A curriculum and checklists should be developed to keep steps clear and consistent. Proper training should be provided at the beginning of employment and then later on an ongoing basis. Adequate staffing, supervision and adherence to the manufacturer’s label instructions are essential to the success of evidence-based cleaning and disinfection practices.4

Monitor Compliance
Systematic periodic monitoring of the staff’s compliance to the infection control process is also important. There are several methods of testing cleanliness, including fluorescent markers, as well as a new approach, which involves a color additive that improves visualization of surface coverage and contact time to improve thoroughness of cleaning/disinfection. Consistent feedback to staff is needed to keep the team informed and motivated.4

Cost Savings
Investing in a total room, automated disinfection system may seem like a large cost for a healthcare facility; however, it’s easy to see the benefits in terms of saving money and improving patient outcomes. The following examples illustrates how UVC can be a smart investment.

- If UVC usage reduced HAIs for approximately 20% of patients (eg, patients on contact precautions) by 10-30% as demonstrated in a randomized trial,3 the number of infections prevented in a 900-bed hospital with an infection rate of ~4 per 1000 patient days would be approximately 18-55 per year.
- If each HAI cost $24,000 on average9 the hospital would need to prevent only 23 HAIs in the first 2 years to cover the acquisition and operational costs of the UVC program for a 24-month period.
- If the hospital prevented 30% of infections per year (55 per year) for 2 years, the cost savings would be $2,085,000.

Simple Steps
A bundled approach to infection control requires all elements to be evidence-based and implemented consistently and completely. Once all the procedures are in place, a hospital needs to communicate its infection prevention measures throughout the organization and share its progress. Infection prevention is a collaborative effort that should be embraced from top to bottom in order to make a difference in improving patient outcomes and providing the cleanest environments possible.13

William A. Rutala, PhD, MPH, CIC, is a consultant for PDI. He is also director of the North Carolina Statewide Program for Infection Control and Epidemiology (SPICE) and a professor at the University of North Carolina School of Medicine.

References available at InfectionControlToday.com.
When Infection Control Today® ran a story last month about how infection preventionists (IPs), hospital administrators, and the rest of the healthcare system should tackle the next US outbreak caused by a special pathogen (“Preparing for Special Pathogens: An IP Perspective,” January/February 2020), we didn’t realize just how timely our article would be.

“Coronavirus” does not appear in that story. But type in “coronavirus” on any search engine these days and prepare to be swamped—727 million search results on Google as of this writing. “Wuhan coronavirus,” as the novel 2019-nCoV is known, produces some 251 million results.

Perhaps not surprisingly, personal protective equipment (PPE) generates a lot of interest as well. “For many, the memories of learning the donning/doffing process for the enhanced PPE that is required for Ebola are times of stress and excitement,” wrote Saskia v. Popescu, PhD, MPH, MA, CIC, in that ICT® article. “In some ways, it was highly interesting learning a new mechanism to protect against unusual diseases, however the changing guidelines and extreme precision that is needed for PPE was stressful. A single misstep in the process could result in deadly infection.”

Ah, yes, the stress. Wuhan coronavirus certainly triggers it. Neysa Ernst, RN, MSN, the nurse manager of the biocontainment unit at Johns Hopkins Hospital in Baltimore, tells ICT®. That’s the reason healthcare workers should sanitize their hands throughout the donning and doffing process.

“Almost every step of the way,” says Ernst. “When you’re questioning what you should do next? Just sanitize your hands so you have time to think.”

Or digest what you’re being told. Because there should be a trained observer watching.

“Someone is saying to you, ‘Now do this. Now do that,’” says Ernst. Again, stress. “You want to make sure that you’re calm and thoughtful,” says Ernst. “Because part of what happened in the Ebola epidemic is that people were fatigued and removing PPE too quickly.”

Hands should be washed frequently and thoroughly for at least 20 seconds. Use alcohol-based hand sanitizer if soap and water aren’t available, Ernst advises.

Proper PPE for the Wuhan coronavirus, according to Ernst, includes powered air purifying respirators (PAPRs), an N95 mask, eye protection, gloves, and gown. But that could change in a fluid situation. “I just spoke with the nurses last night and said we just need to go PAPR [for coronavirus],” Ernst said at the end of January.

The final step after PPE donning is to do a 360-degree turn to make sure that there are no breaks in the PPE. Only then would the IP or any other healthcare professional be cleared to enter a room and tend to patients.

The healthcare professional can also stay in the PPE for only so long. “In our biocontainment unit, which is really built for viral hemorrhagic fevers and Ebola, we have a 2-and-a-half-hour PPE limit,” says Ernst. “And we actually write that on our yellow gowns. And we do that because that way somebody can observe and say, ‘You’re almost at your limit, it’s time for you to start to get out.’” That’s about the limit for coronavirus as well, she adds.

**Hot, Warm, Cold**

Doffing begins in the patient’s room, moving from areas designated as hot, warm, and cold. “Hot is where the highest risk for disease transmission is,” says Ernst. “Warm is when you’re taking off some layers of your PPE, maybe a pair of gloves, maybe PAPRs. And then as you progress into the cool zone, you are doffing your PPE into some type of trash container.”
One of the biggest challenges to donning and doffing is that, too often, healthcare professionals find the process so time consuming that they worry it hinders patient care. “People are always looking for a shortcut and I understand that. But at the end of the day, I think that doing things correctly and safely matters a lot,” says Michael Bell, MD, deputy director of the division of healthcare quality promotion at the US Centers for Disease Control and Prevention (CDC) National Center for Emerging Zoonotic and Infectious Diseases. “Deliberate attention to safe practices is always warranted.”

Ernst says that many healthcare professionals view IPs as the gatekeepers who ensure correct donning and doffing and, as a result, might be blamed for insisting on the procedures. “And that’s unfortunate,” she adds.

There’s also no such thing as a 5-second rule, Ernst reminds. “Often I hear, ‘I am not going to touch the patient’ as an excuse for not donning PPE. They’ll say, ‘I’m standing at the end of the bed. I’m not touching the patient.’ In the meantime, the whole room is covered with things.”

Ernst works hard to prepare staff to treat patients with Wuhan coronavirus at Johns Hopkins. However, the battle’s terrain keeps shifting, Bell points out. Unlike 20 or even 10 years ago, patients can easily find the care they want at chain drugstore clinics or urgent care centers, among other ambulatory settings. “Medical care has moved so rapidly away from hospitals,” says Bell. “In hospitals, it’s not as difficult to get everyone together and train them in proper procedures for the facility. That’s incredibly doable. But when you have a distributed healthcare system where patients are moving around a lot, it creates a bit of a challenge in terms of making sure everyone’s doing the same thing the right way.”

Don’t get him wrong: Bell isn’t necessarily knocking the care provided outside of hospitals. “In many cases the patient is going to do better because he’s not stuck in a hospital waiting for help. We don’t want to take that away. But wherever they’re getting care, we want to make sure it’s being done correctly.”

Bell, who has been involved in the development of evidence-based infection control guidelines, also isn’t necessarily saying that training hospital staff is easy—a lot of factors are in play. Protocols, supplies, and training for PPE can differ depending on the hospital. “There are healthcare institutions around the country which, because of the Ebola scare, really invested heavily in personal protective equipment and training. There are some facilities in the country that still don’t get it.”

Johns Hopkins Hospital gets it. The Ebola scare spurred the creation of a tiered hospital system meant to ensure readiness. Of the roughly 6000 hospitals in the US, 10 have been designated regional Ebola and other special pathogens treatment centers (RESPTCs). Johns Hopkins is 1 of them.

IPs and others should use the correct PPE for the particular pathogen in question, says Ernst. “When Ebola first came out, you saw people and…those white suits. And that may be right for Ebola. I don’t know if it’s right for coronavirus. Do you need somebody in a spacesuit for something that doesn’t require a spacesuit?”

PPE training should be continuous, says Bell. He uses the metaphor of sweeping dust bunnies off the floor. In a few days: more dust bunnies. “This is the challenge,” he says. “It’s not a 1-and-done thing. If there was a great miracle vaccine that could prevent transmission of healthcare infections, and everybody got that shot once and you were done, I would be ecstatic. But there is no such thing.”

Bell also offers this bit of advice: PPE isn’t magic. “It doesn’t automatically protect you. You have to use it correctly like any other tool. I still see people with their noses sticking out of their masks, completely missing the point that their nostrils are now exposed.”

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It often comes down to education—or lack of it. “If we think about how nurses, doctors, and other clinical staff are trained these days, they don’t receive the same kind of microbiology training that they used to. A lot of that is shortened just because there’s so much to be taught and time is limited.”

Healthcare workers need to learn not only how to use PPE, but why and when they should use it.

Hospital Administrators
Hospital administrators should lean more on mentoring, and less on monitoring, Bell believes, adding that a lot of monitoring will be done digitally in the future anyway. Tailor PPE education to specific audiences; what IPs, doctors, and nurses need to know isn’t the same as what environmental services (EVS) staff and the cafeteria crew need to know. In addition, keep in mind that a lot of people who work in hospitals are contractors.

Healthcare workers aren’t the only ones who should wear PPE. If a patient is coughing, get a mask on him or her or else risk being splashed with mucus, pathogens, or other foreign bodies.

“Protect the bottom of your eyes, your nostrils, your mouth: Those are the areas that are most susceptible to infection by viruses and many bacteria,” says Bell. “That’s also why we’re less concerned by things like exposed forearms or the neck. They can be washed off fairly easily. Protecting your eyes, nose, and mouth is key.”

As ICT noted in last month’s cover story, “The level of readiness we saw in 2014 is not the same as in 2019. When the tiered hospital approach was developed and the outbreak was slowing, the push to throw resources to improve preparedness also waned. Hospital administrators no longer felt the need to spend thousands of dollars on PPE and training when the risk of Ebola was gone.”

It will be interesting to see what happens when the coronavirus scare wanes (if it wanes). Right now, healthcare professionals care very much about proper use of PPE.

“Which is actually good,” says Ernst. “It’s good because it’s a reminder to people. This is what we should do every day.”
Hospital Uses New Technique to Sterilize Mobile Devices

In the battle against hospital-acquired infections (HAIs), Robert Wood Johnson University Hospital Somerset in New Jersey has rolled out a tool that uses UV-C LEDs to sanitize mobile devices such as phones and iPads. The tools, called ElectroClaves™ and manufactured by Seal Shield, are located in the hospital’s physician lounge, operating room, and critical care and emergency departments.

Tony Cava, the hospital’s president and CEO, said in a press release that “studies have shown that viruses can be transferred from our hands to our touch screens. As part of our commitment to patient safety, we encourage our staff to disinfect their phones and iPads in addition to washing their hands to prevent the spread of germs and infections.”

The ElectroClaves™ do not use high heat in the sterilization process, which can be harmful to mobile devices. ElectroClaves™ also work fast, with the ability to charge, sync, and sanitize up to 10 phones and/or 4 tablets in less than 2 minutes.

Robert Wood Johnson University Hospital Somerset has gotten an “A” hospital safety score from the Leapfrog Group 9 times, in part because of its anti-infection efforts. The hospital, according to the press release, has low rates of catheter-associated urinary tract, central line-associated blood stream, methicillin resistant Staphylococcus aureus (MRSA), Clostrid-iodies difficile, and surgical site infections.

www.sealshield.com

Auto-Reader Allows for Rapid Detection of Positive and Negative Biological Indicators

Designed for the incubation and readout of biological indicators for steam sterilization process control, the Terragene® Auto-Reader Incubator and Biological Indicators allow for rapid detection of positive and negative biological indicators for 1 hour at 140°F to determine whether a sterilization process has been successful or not.

Manufactured by Healthmark Industries, the Auto-Reader Incubator has a feature that allows facilities to run different incubation times simultaneously. It has a height of 18 cm, diameter of 26 cm, and is manufactured with 12 metal positions (3.8 cm depth, 0.9 cm diameter) for incubation. It allows for rapid detection of positive and negative biological indicators for 1 hour at 140°F to determine whether a sterilization process has been successful or not. The dual temperature system has the option for the user to select between 2 different incubation temperatures of 37°C or 60°C.

The machine also has the ability for automatic detection and cancellation of biological indicator fluorescence reading. In addition, the auto-reader can be connected to computers by USB, and is also equipped with a readout system and a printer to record the results.

www.hmark.com

Advanced Medical Device Lumen Drying System Unveiled

Installing the LD 100 system in medical device drying cabinets effectively and efficiently dries endoscopes and robotic arm lumens without impeding the drying process of other devices in the cabinet. The LD 100 system can dry 2 endoscopes and 2 robotic arm lumens at a time in upright positions, per instructions, according to manufacturer Cenorin.

Drew Radford, president of Cenorin, said in a company press release that “assuring consistent and effective medical device drying during sterile processing is key to a facility’s infection control and patient safety programs. In addition to this critical function, the LD 100 system helps ramp up throughput and overall productivity, which can help optimize surgical scheduling. This drying advancement will help healthcare providers achieve significant return on their investment.”

Two brackets each hold up to 5 robotic devices and are stacked vertically to enable compliant simultaneous drying of all 10 lumens, according to the press release.

In a blog on the Association for the Advancement of Medical Instrumentation website, Mary Ann Drosnok, the AAMI’s co-chair of the organization’s working group responsible for endoscope processing, said that “previously, it was assumed that an alcohol flush and air purge in an automated endoscope reprocessor or an alcohol flush and syringe air flush for manual reprocessing were enough to produce a dry endoscope. We now know that this is not true and have seen that further forced air drying is necessary to achieve a dry scope.”

www.cenorin.com
75,000 deaths occur annually in US hospitals due to HAIs
(It’s time to take proven infection prevention further)

Figures released from the CDC make stark reading for Infection Preventionists. An estimated 722,000 healthcare-associated infections occur annually, resulting in 75,000 deaths and billions in additional costs. More than half of these occurred outside of the intensive care unit.

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