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### COVER STORY

**HEALTH CARE-ACQUIRED INFECTIONS**

18 Get Ready for the Next Pandemic
Sadly, COVID-19 Might Just Be the First of Many
By Jan Dyer

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2. Reference list: nozin.com/clinical-outcomes. Outcomes reported by actual users. Your results may vary. Nozin® Nasal Sanitizer® antiseptic is for nasal deconjugation. ©2021 Global Life Technologies Corp. All rights reserved. Made in USA. Nozin®, Nasal Sanitizer®, Popswab® and NOVA™ are trademarks of Global Life Technologies Corp. Nozin® Nasal Sanitizer® antiseptic is an OTC topical drug. No claim is made that it has an effect on any specific disease. Patent nos.: nozin.com/patents.
As COVID-19 Wanes, New Threats Arise

We’re getting our lives back this year. Infection, hospitalization, and death rates from coronavirus disease 2019 (COVID-19) have plummeted, as of this writing. Vaccination rates are soaring. So far, the variants have been kept in check. As COVID-19 wanes, new threats arise.

Jan Dyer’s cover story on page 18 looks at the challenges IPs will face in the future thanks to the growth of multidrug-resistant organisms. In another article on page 31, Dyer writes about sexually transmitted infections and diseases (STIs/STDs) and the problems they cause (April marks the Centers for Disease Control and Prevention’s STD Awareness Month).

Linda Spaulding, RN, BC, CIC, CHEC, CHOP, and a member of our Editorial Advisory Board, is the subject of our Q&A on page 28 in which she talks about the importance of endoscope disinfection.

Long-term care facilities need a lot more love than they’ve been getting. COVID-19 underscored the systemic problems. Cedric Steiner on page 22 writes about one such facility that does it right.

Nobody thought that N95 masks would need to be reused and decontaminated until COVID-19. Christina Yen, MD, on page 26 explains different decontamination strategies.

Like the Roman god Janus, this issue looks both ahead and behind as we extricate ourselves from the COVID-19 mire. But we’re moving forward.

Please send your ideas, comments, or questions to Editorial Director Alexandra Ward at award@mjlifesciences.com.

Thank you for reading,
Mike Hennessy Sr
Chairman and Founder
MJH Life Sciences™
Reducing blood culture contamination to zero. How do we get there?

BY BARBARA DeBAUN, MSN, RN, CIC, CYNOSURE HEALTH

Every year, more than 40 million blood cultures are drawn in the U.S. to evaluate patients known or suspected of having sepsis. Unfortunately, nearly half of the positive test results for sepsis are falsely positive due to blood specimen contamination.1

This preventable error equates to more than 1.4 million patients being seriously impacted and subjected to increased overall morbidity and mortality.2

In addition to creating significant patient safety risks for millions of Americans every year, false positive blood culture tests fuel the antimicrobial resistance crisis, both nationally and globally, while creating approximately $6 billion in wasted costs annually within the U.S. healthcare system.3

These contamination events represent an enormous and avoidable economic and public health burden. Due in part to the lack of a national consensus standard for contamination rates, most hospitals have defined an “acceptable” blood culture contamination rate of below 3.0% as an appropriate target.

And while training, education and best practices are essential in the reduction of blood culture contamination, they alone are not enough. A human-factor engineered device such as Magnolia Medical’s Steripath® Gen2 Initial Specimen Diversion Device® (ISDD®) is required to maintain sustained contamination rates of under 1.0% in the emergency department and throughout the hospital.3

A recent landmark Stanford Health Care study titled “Getting to Zero, Eliminating Blood Culture Contamination with the ISDD,” reported zero blood culture contamination events (0.0% contamination rate) and zero false-positive CLABSIs out of 4,462 blood cultures drawn with the Steripath Gen2 ISDD during a four-month hospital-wide study, versus 29 contaminated sets in 922 blood cultures using traditional methods (3.15% contamination rate).4 The ISDD is a device that integrates user-controlled negative pressure to divert and sequester the initial 1.5 to 2.0 mL of blood collected for culture, the portion known to most likely contain contaminants.5

This study concluded that adoption of the Steripath led to a substantial decrease in contaminated blood cultures and false-positive CLABSIs, which can guide appropriate antibiotic usage, improve accurate diagnoses, minimize patient discomfort, and reduce healthcare-associated infections related to longer stays—all of which improve patient safety and outcomes.6 It led to Stanford Health Care adopting Steripath hospital-wide.

To further support the necessary use of a novel blood culture diversion device to substantially reduce contamination rates, The Emergency Nursing Association (ENA) clinical practice guidelines and Infusion Nurses Society’s (INS) guidelines recommend the diversion of 1.0-2.0 mL and 1.5 mL or more of blood, respectfully, prior to specimen collection.

Steripath is the only FDA-cleared device indicated to reduce blood culture contamination,6 and is backed by compelling supportive clinical evidence in its ability to significantly reduce overall blood culture contamination rates to below 1.0%.7

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6. Indicated for use as a blood collection system that diverts and sequesters the initial specimen prior to collection of a subsequent test sample to reduce the frequency of blood culture contamination when contaminants are present in the initial blood sample compared to blood cultures drawn with standard procedure without manual diversion.

DISCLOSURE
Author provides clinical consultation to Magnolia Medical Technologies®

WWW.STERIPATH.COM
Do you want to know who should be able to make infection preventionists and vascular access teams work more closely? I should. I am one opportunistic pathogen that can come at you in a lot of ways.

A couple of my favorite methods of infecting you, though, are via catheters and central lines. I’m the CLABSI (central line-associated bloodstream infection) and the CAUTI (catheter-associated urinary tract infection) that should make you lose sleep. I am one of the 5 most common causes of health care-acquired infections.

I am a gram-positive, sphere-shaped bacteria, and although I often start out as a skin infection, I can cause pneumonia, and infect heart valves and bones. I can also cause sepsis, bacteremia, meningitis, osteomyelitis, endocarditis, and toxic shock syndrome.

I can take the form of a bloodstream infection and can also do a number on your joints. I am present in the nose for about 30% of adults, and on the skin for about 20% of adults. I can also be found in the lower reproductive tract of women. Of course, those percentages are higher for patients in a hospital or anybody who works in a hospital, as well as for residents and workers at long-term care facilities (LTCFs).

And if I get into intensive care units, look out! I can be very opportunistic there. Each year I infect about 500,000 patients in hospitals, leading to about 50,000 deaths. I like to go after certain groups: people with diabetes, cancer, vascular disease, eczema, lung disease, and people who inject drugs. Be careful with certain surgeries, too. I often start to show myself within 180 days in 5.9% of patients following gastric or esophageal surgery, 1.9% of patients after coronary artery bypass graft surgery, and 2.3% following hip surgery.

Here’s the thing, though. I most often hitch a ride on persons I don’t infect: asymptomatic carriers. Does that remind you of anyone?

Usually, I spread when a noninfected person has direct contact with an infected person. Or if someone inhales droplets let loose by an infected person who sneezes or coughs.

You’ll never guess what simple thing a health care provider or anybody can do to either slow me down or stop me in my tracks. Yep. Hand hygiene. Now, does that remind you of anyone? I’ll bet you never heard that term before, especially over the last year or so. Also, you may want to keep infected areas covered and clean, and avoid sharing personal items like razors, towels, and needles.

How health care providers treat me depends on the type of infection I cause. Of course, they hit me with antibiotics, but they need to be careful about which one, or even if they need to throw more than one at me. I am very adaptable and have become resistant to several or more antibiotics, and sometimes providers have to resort to the use of intravenous antibiotics, but those of course come with the potential for more adverse effects.

To discover who I am, visit InfectionControlToday.com/view/april-2021-bug-month

Who am I?
BREAKING NEWS AND INSIGHTS
for professionals in infection prevention and control right at your fingertips
Health care continues to extend beyond the traditional hospital setting. Recent decades have seen the growth of stand-alone clinics, ancillary clinics to hospital systems, clinics in retail pharmacies, urgent care centers, and even hybrid clinic–primary care physician offices. But with this growth comes concern over whether these clinics meet safety standards.

Investigators with the University of Texas wanted to find out how well clinics are ventilated. “Overall, the results indicate that the evaluated outpatient clinics did not fully meet health care ventilation standards as listed in the Standard 170 for Ventilation in Health Care Facilities,” the research team concluded in a recent preprint study in the American Journal of Infection Control. The standard, which establishes the parameters for ventilation of health care facilities, is set forth by 3 organizations: the American National Standards Institute, the American Society of Heating, Refrigerating and Air-Conditioning Engineers, and the American Society for Health Care Engineering.

“Lower than standard air changes per hour [ACH] were observed and could lead to an increased risk of spread of diseases when conducting advanced procedures and evaluating persons of interest for emerging infectious diseases,” the study states.

Investigators argue that this is an especially important issue as the coronavirus disease 2019 (COVID-19) pandemic continues. “These findings are pertinent during the SARS-CoV-2 pandemic, as working guidelines are established for the health care community.”

Procedures such as bronchoscopy, tracheal intubation, nebulizer treatment, colonoscopies, suction during intubation, and endotracheal aspiration can all generate airborne microorganisms, the investigators note. Those microorganisms can also be generated by simple everyday things like coughing or sneezing, talking, or even just breathing.

Investigators looked at ventilation in 105 rooms at 22 outpatient clinics geared toward different specialties. The clinics are affiliated with a medical practice group in a major city.

They used the Gammaitoni-Nucci model to measure ventilation and estimate disease transmission rates in the buildings. “When compared to Standard 170, 10% of clinic rooms assessed did not meet the minimum requirement for general exam rooms, 39% did not meet the requirement for treatment rooms, 83% did not meet the requirement for aerosol-generating procedures, and 88% did not meet the requirement for procedure rooms or minor surgical procedures,” the study states.

Investigators used a smoke tube to determine how well the ventilation systems worked. They would puff out smoke at the height of the health care worker standing in the center of a room and count how many seconds it took for the puff to dissipate. They placed the rooms into different categories.

“Medical office building” was defined as the medical or dental clinic being the only occupant in the building, the study states. “Shopping center” meant the clinic was attached to nonmedical commercial buildings. “Stand-alone clinic” was defined as the clinic building not being attached to any other buildings. “Building age, number of floors, and total clinic square footage was obtained from the building lease management office, websites or clinic lease agreements.”

Investigators argue that good ventilation, along with the proper use of personal protective equipment, are the best means to thwart disease transmission in a health care setting.

“An additional concern is the increasing role outpatient clinics play in response to evaluating patients during outbreaks of emerging infectious diseases,” the study states.
states. “These responses commonly recommend that patient evaluations be conducted in a negative pressure isolation room that is required to have 12 ACH. When working in outpatient clinic space with a lower than minimum standard ACH, the ability to safely perform assessments and patient care may inadvertently increase the risk to workers and the potential spread of the disease within the clinic.”

ACH were lower than the standard in all the buildings that investigators observed, but newer one-story buildings had higher ACH than older buildings.

“Lower ACH in outpatient clinic rooms conducting more advanced procedures can lead to an increased risk of spread of infectious diseases,” the study states. “We echo the concern that ventilation standards are not being met and should be integrated into clinic design and reaffirm that there are challenges in compliance with ventilation standards in non-hospital settings.... Factors such as national ventilation standards, intended use, and services provided should be considered when designing and leasing all health care settings. These findings are pertinent during the SARS-CoV-2 pandemic as we establish working guidelines for the health care community.”

REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM

Intense Infection Control Stops C Auris Spread

BY FRANK DIAMOND

With mortality rates ranging anywhere from 30% to 60% and an ability to fight off most antibiotics, Candida auris has health care professionals sounding the alarm when they spot the superbug in their facility. Investigators with the University of British Columbia found that immediate implementation of stringent infection prevention and control measures at one hospital in the greater Vancouver area stopped the spread of this deadly fungal infection, limiting it to 4 patients. Investigators say that event was the first outbreak of C auris in Canada.

“Infection control measures, including surveillance, education, cleaning/disinfection, patient cohorting, isolation, and hand hygiene, effectively contained the outbreak; it was declared over within 2 months,” they write in a study in the American Journal of Infection Control (AJIC). According to the Centers for Disease Control and Prevention (CDC), the spread of C auris these days may be aided by all the attention given to coronavirus disease 2019 (COVID-19), and people with COVID-19 are particularly vulnerable to C auris. The outbreak in the AJIC study began at the 218-bed community hospital in August 2017. The first patient had just returned from India and went to the hospital for post-surgical complications for pancreatitis. C auris was found in ascitic fluid that was drained from the patient. Health care providers thought it resulted from colonization rather than infection. However, subsequently, 3 other patients—men from 61 to 89 years old—were found to have C auris.

“After the third case was identified, a decision was made in conjunction with the medical health officer for the region to declare an outbreak of C auris in the ICU of the facility,” the study states. “Efforts were undertaken to educate staff on the risks of transmission of the organism and reinforce standard infection control procedures.” Staff from different departments huddled daily, and physicians conducted one-on-one education sessions with hospital employees. A multidisciplinary team was formed,
which included representation from IPAC [infection prevention and control], public health, hospital communications and administration, clinical teams, and the BCCDC [British Columbia Centre for Disease Control],” the study states. “Daily debriefs and reports were dispersed by the IPAC team, while weekly meetings were held with the multidisciplinary team to communicate updates and coordinate further outbreak interventions. The team engaged national and international colleagues to solicit advice and support.”

As the CDC notes, one of the problems with battling C auris is that it can be difficult to spot. “Whole-genome sequencing conducted by our federal public health colleagues provided molecular epidemiological evidence linking the cases,” the study states. “It is unclear, however, as to how the C/uni00A0auris strain was introduced into the facility. One patient expired during the outbreak secondary to causes unrelated to C/uni00A0auris; the remaining patients were all eventually discharged home in stable condition.”

The reason C auris often eludes detection is because laboratories sometimes have difficulty identifying the C auris yeast. In this case, the yeast from the clinical specimens was identified as C auris using the Biotyper MALDI-TOF (6903 database). Then the isolates were forwarded to the provincial reference laboratory to confirm if the specimens were indeed C auris.

“At the time of the outbreak, there were no commercial selective media options available for screening of C auris,” the study states. “Screening swabs were planted to Brilliance Candida chromogenic agar (Oxoid Ltd, UK) and incubated in ambient air at 42.0 °C (107.6 °F) for 5 days.”

The plates were re-examined after 48 hours to see if there had been growth, and green and blue colonies were set aside because it was determined that they were not C auris.

“All beige, brown, or white colonies, which may represent a number of different Candida species, were identified using MALDI-TOF,” the study states. “Isolates with an acceptable MALDI-TOF identification score for species other than C auris were ignored. Any isolates identified as C auris were reported as presumptive C auris and forwarded to the provincial reference laboratory for confirmatory testing.”

The lab work confirmed the presence of C auris in time. “In contrast to other outbreaks described in the literature, we were able to limit transmission to only 4 patients,” the study states. “Immediate infection control measures that were implemented included contact isolation, exclusive use of cleaning agents with sporicidal activity, contact tracing, weekly ward surveillance cultures, decluttering, frequent laundering of patient linens and gowns, and staff education. Later in the course of the outbreak, chlorhexidine washes of C auris-colonized patients were implemented, but it is unclear as to whether this contributed to the cessation of transmission.”

Investigators note how C auris represents not only a threat, but a growing threat. “Our experience demonstrates that timely detection of the organism and rapid implementation of infection control measures are capable of limiting transmission; however, there are currently few guidelines to advise on strategies for effective admission screening protocols.”

“INFECTION CONTROL MEASURES, INCLUDING SURVEILLANCE, EDUCATION, CLEANING/DISINFECTION, PATIENT COHORTING, ISOLATION, AND HAND HYGIENE, EFFECTIVELY CONTAINED THE OUTBREAK; IT WAS DECLARED OVER WITHIN 2 MONTHS.”

REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM
Robots Disinfect Hospital Rooms With Ultraviolet Light

BY FRANK DIAMOND

The robots would not come to take the jobs of environmental services (EVS) teams, but rather help those workers disinfect hospital surfaces. At least for now, according to a study in the journal Antimicrobial Resistance & Infection Control.1

“Presently, disinfection robots do not replace routine (manual) cleaning but may complement it,” says the study by investigators with several European hospital systems, foremost the Medical University of Vienna. “They might in the future provide validated, reproducible, and documented disinfection processes. Further technical developments and clinical trials in a variety of hospitals are warranted to overcome the current limitations and to find ways to integrate this novel technology into the hospitals of today and the future.”

The robots seem to offer an opportunity to disinfect hospital rooms quickly and might, in the long run, lead to cost savings by “reducing cleaning staff.” Such a development would not only affect EVS teams but also the infection preventionists who often play a major part in training those teams, as Infection Control Today® pointed out in its January/February issue.2

And though the pandemic has spurred companies with an entrepreneurial bent to develop the robots, “there is little information about their operational details,” the study states. Investigators note that hospital administrators increasingly see the potential of robots—such as the ones manufactured by UVD Robots ApS, Lumalier, or RMiRob—for disinfecting surfaces in a cost-effective manner. The study defines robots as machines programmed to perform tasks that, up until now, have been done by humans.

One of the limitations of using robots involves turnover, the need to clean and disinfect a hospital room quickly after one patient vacates and before the next one occupies it; that need is especially urgent during COVID-19 (coronavirus disease 2019) surges. The robots add a layer of work that takes extra time. In addition, while the robots emit an ultraviolet (UV) wavelength of 254 nm (UV-C) that works as a virucidal, bactericidal, sporicidal, and fungicidal, they cannot remove pathogens or pathogen-laden debris. “Thus, manual cleaning is a prerequisite for the use of UV-C disinfection, which needs staff and additional time,” the study states. And while the robots may eventually take EVS jobs they may also add jobs because “robots need an expert supervisor for setting and overseeing the program, and to reset after encountering unforeseen obstacles. Using a disinfection robot like a vacuum cleaner, in addition to routine measures, adds work instead of exploiting its full potential.”

In addition, hospitals are built to enhance human traffic, not robot maneuverability. Ideally, the robots would know when to come and go, which rooms need them, and which don’t, and would also know when to turn off the UV light (in instances when a person may be standing in the way). The study states that “unplanned cluttering of patient rooms and wards...limits robots navigating in space and reaching surfaces to be disinfected....Planners and future architects should integrate robotic disinfection in their structural design.”

Still, the technology is worth refining. Investigators note that COVID-19 pushes the boundaries of scientific and medical innovation, and interest in hospital-cleaning robots that utilize UV light springs from that disease, as well.

The study states that the benefits of refining and utilizing the technology include:

- “Robotic disinfection will work in an unmanned and standardized fashion, without the need for ongoing human presence at the disinfection site. Therefore, exposure of health care workers to harmful UV radiation can be avoided during the process.”
- Applying UV-C as a final disinfection step after manual cleaning and manual disinfection provides an additional hygiene benefit in reducing cross-transmission and health care associated infections.
- UV light does not leave any residues, making this an environmentally friendly disinfection method.”

But there’s still a long way to go before the robots can be fully integrated into hospital systems. The technology needs to advance to a point where the robots “know” exactly the right amount of UV disinfection to apply.

REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM
Beware Pitfalls of Reopening Too Quickly

BY SASKIA V. POPESCU, PhD, MPH, MA, CIC

There’s been a lot of talk about things reopening. From restaurants to schools and so many places in between, it seems as if we’re moving full steam ahead. Vaccines are being deployed and cases of coronavirus disease 2019 (COVID-19) are down, which we’ve been working toward and should celebrate. Two things come to mind, though: Are we being cautiously optimistic or blindly optimistic? Also, how do we handle this challenging time where developments are trending in the right direction but there are still many unknowns and much work to be done?

First, vaccine distribution is increasing as several states have successfully administered a first dose to at least 17% of their population. Now is the time that we work to deploy more doses and address perhaps one of the bigger issues we knew would occur—vaccine hesitancy. This is not a new issue and with a pandemic and vaccine development process that was so politicized, it’s not surprising this would be a byproduct.

Data on vaccine distribution, specifically demographics, have been lagging and the data we do have access to have shed light on significant disparities in recipients. As a recent article in Politico points out, “Limited data continues to show that people in hard-hit minority communities are getting vaccinated at a much slower pace than people in wealthier white ones.” Coupled with hesitancy, we have a long road to go. Vaccine equity is a global issue, and the variants are a prime reason why we should be emphasizing this. As the United States and many industrialized countries distribute their vaccines, there is a still a huge disparity as many countries are struggling to gain access. These larger issues are important as we look to the future and what the next few months or even years will look like.

One of the trends I’ve noticed is that, as states reopen, they have often failed to do so in an incremental manner. We learned this in Arizona, and unfortunately, the United States has a bad habit of rushing things when the case counts start to decrease the burden on public health and health care. As more people become vaccinated, we will be navigating the aspects of a partially vaccinated public. This will be especially challenging as we learn more about prevention of infection and not just severe disease. As virologist Angela Rasmussen, PhD, noted recently in The New York Times: “Many scientists are reluctant to say with certainty that the vaccines prevent transmission of the virus from one person to another. This can be misinterpreted as an admission that the vaccines do not work. That’s not the case. The limited data available suggest the vaccines will at least partly reduce transmission, and the studies to determine this with more clarity are underway. There should be more data within the next couple of months. Until then, precautionary measures like masking and distancing in the presence of unvaccinated people will remain important.” While we wade through this optimistic but unknown period in COVID-19 response, it’s important to continue vigilance and patience in these reopening efforts—both within the hospital and in the public.

REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM
According to a news release, a modeling study published in the Journal of the American Heart Association led by researchers at the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts University estimated that, of the 906,849 total coronavirus disease 2019 (COVID-19) hospitalizations as of November 18, 2020, 30% were attributable to obesity, 26% to hypertension, 21% to diabetes, and 12% to heart failure. In all, the model suggests that 64%, or 575,419, of COVID-19 hospitalizations might have been prevented.

“While newly authorized COVID-19 vaccines will eventually reduce infections, we have a long way to go to get to that point,” Dariush Mozaffarian, lead author and dean of the Friedman School, says in the release. “Our findings call for interventions to determine whether improving cardiometabolic health will reduce hospitalizations, morbidity, and health care strains from COVID-19. We know that changes in diet quality alone, even without weight loss, rapidly improve metabolic health within just 6 to 8 weeks. It’s crucial to test such lifestyle approaches for reducing severe COVID-19 infections, both for this pandemic and future pandemics likely to come.”

The model estimates that age also resulted in disparities due to these conditions, with about 8% of hospitalizations among patients 50 years old or younger attributable to diabetes, while the disease accounted for about 29% of hospitalizations among those over 65. Obesity was equally detrimental across all age groups, the release says.

“Medical providers should educate patients who may be at risk for severe COVID-19 and consider promoting preventive lifestyle measures, such as improved dietary quality and physical activity, to improve overall cardiometabolic health,” first author Meghan O’Hearn, a doctoral candidate at the Friedman School, says in the release. “It’s also important for providers to be aware of the health disparities people with these conditions often face.”

Reference

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Blue Light, Food Oils Combo Kills Superbugs, Says Study

BY INFECTION CONTROL TODAY® EDITORIAL STAFF

As Ravi Starlz, PhD, told Infection Control Today® in December, when it comes to humanity’s battle against bacterial infections, the bacteria have a head start. “If you’re constantly focused on trying to escalate the war of destruction, I think that the bacteria will always win that war,” said Starlz, an adjunct professor at Carnegie Mellon University. “They just have too many countermeasures available to them, and our rate of developing new antibiotics is far slower than their rate of developing countermeasures.”

Which brings us to the problem that multidrug-resistant organisms (MDRO) pose to infection preventionists, and for that matter, to the entire health care system.

It’s a problem that investigators at Harvard Medical School and Shanghai Jiao Tong University School of Medicine hope will one day be solved, and that their work will have helped to solve it. Investigators say that surface bacteria can be illuminated using a blue light along with carvacrol, which is a phenolic monoterpeneoid that can be found in oils made from oregano, thyme, peppermint, wild bergamot, and other plants. It’s common, but also uncommon, in that it contains hydrophilic molecules and the phenol moiety. That combined with the blue light can effectively treat skin and soft tissue infections (SSTIs), according to their study in Science Translational Medicine.

Investigators wanted to see how their method would fare against Acinetobacter baumannii and methicillin-resistant Staphylococcus aureus, and results were promising.

The 2-step process for SSTIs can also conceivably be used to treat patients with diabetes who suffer from wounds, the sort of wounds that are not always easily treated with antibiotics.

“A growing number of patients with compromised immunity, such as cancer and diabetic patients, invasive medical procedures, and the associated surgical site infections all have contributed to the increasing incidence of SSTI over the past decade,” the study states. “It has been suggested that the ability to control the surface of the wound contamination below 10 CFU/g of tissue is crucial to prevent sepsis, which might be achievable by blue light combined with carvacrol.”

According to the Centers for Disease Control and Prevention (CDC), MDROs infect about 2.8 million people in the United States each year, killing about 35,000 of them. The CDC says, “Dedicated prevention and infection control efforts in the US are working to reduce the number of infections and deaths caused by antibiotic-resistant germs, but the number of people facing antibiotic resistance is still too high. More action is needed to fully protect people.”

Disinfecting bacteria on a wound would probably lessen instances of nosocomial infections, according to the authors of the study in Science Translational Medicine. MDROs “are commonly colonized on the wound surface and openly exposed to the atmosphere, becoming one of the major sources for contaminating the health care environment and posing high risk to vulnerable patients to contract the bacteria in hospitals,” the study states. “Therefore, quick and efficacious eradication of surface wound bacteria could effectively minimize nosocomial infections.”

The blue light and carvacrol not only killed the bacteria, but also produced no adverse events to the animals used in the study. “We ascribe this safety profile to initiation of the phototoxic cascade reaction by blue light excitation of endogenous porphyrin-like molecules. These porphyrin-like molecules are primarily tetrapyrrole macrocycles—such as protoporphyrin, uroporphyrinogen III, coproporphyrinogen III, and coproporphyrin III—based on their absorbance and excitation spectra and ability to respond to blue light similarly as PPIX [protoporphyrin IX],” the study states.

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In a way, SARS-CoV-2 resembled science fiction’s hypothetical dark matter: its existence could be inferred but couldn’t be clearly defined—until it appeared. In other words, coronavirus disease 2019 (COVID-19) may have taken a lot of people by surprise, but its possibility wasn’t in doubt. As Anthony Fauci, MD, director of the National Institute of Allergy and Infectious Diseases (NIAID), and David Morens, MD, NIAID’s senior scientific adviser, write, this has been “but the latest example of an unexpected, novel, and devastating pandemic disease…[w]e have entered a pandemic era.”

But while coronaviruses aren’t new to us, COVID-19 shifted our recent experiences with SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome) into hyperspeed. “We weren’t prepared for it. It put us on our heels,” David Aronoff, MD, tells Infection Control Today. He speaks to the way infectious disease experts live now—always on the qui vive for the next pathogenic threat. “We’re constantly concerned that something will be around the corner. And we’re living on a street that’s all corners.”

Aronoff is director of the Division of Infectious Diseases, Department of Medicine, and professor and Addison B. Scoville Jr. Chair in Medicine at Vanderbilt University Medical Center. He has a lot to do in his regular jobs, but like his colleagues in infectious disease, he pretty much dropped everything else to concentrate on COVID-19—“to just lean into it,” he says. That includes, for instance, giving 2 lectures on COVID-19 one day, and 3 the next.

But that doesn’t mean that he, or others in the field, have abandoned preparations for other pathogenic threats. There’s always something else on the radar. In fact, “we haven’t gone a generation without emerging threats,” Aronoff says. “It characterizes the profession that we’re confronted by them on a regular basis.”

With the current pandemic running everyone in health care ragged, this may not be the best time to ask, “What’s next?” But…but what’s next? What pathogen(s) not called COVID-19 should we be most concerned about? And where will it (they) be coming from?

You Can Run But…
On Aronoff’s list of concerns: Diseases that might not cause pandemics, but cause small epidemics. “I get particularly nervous about antibiotic-resistant infections that we thought we had control over, but then lost control of. Gonorrhea is a good example. It’s increasingly hard to treat with antibiotics, and increasingly easy to spread.”

Priya Nori, MD, also puts antibiotic-resistant infections at the top of her list. Nori is associate professor of medicine (infectious diseases) and of orthopedics at Albert Einstein College of Medicine and medical director of the Antimicrobial Stewardship Program at Montefiore Health System. She also co-developed the Infectious Diseases Society of America and the Centers for Disease Control and Prevention (CDC)’s COVID-19 Real-Time Learning Network resource page for stewardship during COVID-19. This includes up-to-date information from infectious diseases physicians, pharmacists, and infection preventionists (IPs) on personal protective equipment, vaccines, therapeutics, stewardship—“anything you can think of related to the pandemic,” she says.

As she speaks on a Zoom call, enormous COVID-19 molecules loom over her shoulders, a sad metaphor for these days (“I put the background up for a med student lecture weeks ago, and now I don’t know how to take it down,” she says).

“If we think of it in the immediate COVID-
of the world, "That's why we're seeing a lot of "squeezing the balloon," and that one thing does that good thing balance out some of the bad things?" Potentially," Nori says. "But then you worry that you're just sort of "jump to humans."

In addition to home-grown pathogens, we have to worry about others that come from far-flung regions. Both Aronoff and Nori point to what some of our deadliest contagions have had in common: The viruses were transferred via air. "If you look back over the history of the world," Nori says, "it's really respiratory viral pandemics that have been the ones that have infected and killed people across borders and have gone on and on for many years and sometimes revisit."

"As far as long-term concerns," she adds, "definitely what's likely to lead to a pandemic state is another respiratory viral pathogen, without a doubt, because these are the things that spread most quickly, that are most transmissible between human beings, and have extensively high viral loads that make it very easy to spread between individuals."

WHAT PATHOGEN(S) NOT CALLED COVID-19 SHOULD WE BE MOST CONCERNED ABOUT?

What's more, it's very likely, she predicts, that the next pandemic could be due to a respiratory viral pathogen that hasn't been seen before, because of some kind of mixing of genetic elements from different species. The species-mixing element concerns Aronoff as well: As we've discovered, many viruses that live in animals can jump to humans.

However, the next big threat could also very well be an old one. In many ways, the world has been becoming more hospitable to pathogens we thought we'd seen the end of. And it's hard to fight the 2 main things that drive the threat, Aronoff says: evolution and opportunism. Pathogens like cholera, diphtheria, tuberculosis (TB), and malaria take advantage of people gathering or living in crowded spaces, people with already poor health.

"Infectious disease is a kind of barometer for other causes, geopolitical, social disturbances or inequities, even political," says Aronoff. "TB is a great example. It hits on all cylinders: crowding, lack of effective vaccines, malnutrition, poverty. It's a disease that's been around forever, but scares us in ID as a newly forming threat. It's both a looming and perennial threat."

On the other hand, Nori says, "That's what makes this whole area of study so fascinating. It's the convergence of the climate crisis, politics, conflicts, infectious diseases that we previously eradicated, or things that really should be under control in the year..."

19 aftermath, we're greatly concerned that we'll see emergence of lots of multidrug-resistant bacteria and fungi," Nori says. "And these are not novel pathogens necessarily, these are things we had before but that were starting to get lots of attention the past few years before COVID-19 because they had become so widespread. These are the most concerning things, I think, to the folks who practice infection prevention and ID infectious disease. As soon as COVID-19 starts calming down because of control measures and vaccinations, I think we're going to unmask all these other things that COVID-19 left in its wake.

One reason, she says, is that there was a lot of excess antibiotic use, especially in the early stages of the pandemic, which has probably abated now that people are more aware of how the disease works and its long-term effects. "But we're worried because lots of patients, if they're fortunate enough to survive COVID-19, unfortunately end up in a sort of chronically medicalized state. There's a whole new population of long-term-care residents who are now bed-bound, plugged in to lots of devices, meaning catheters, tracheostomy tubes, PEG [percutaneous endoscopic gastrostomy] tubes, urinary catheters. This is exactly the type of host who becomes colonized with multidrug-resistant pathogens, which can spread within health care facilities, like long-term care and acute care."

One of the things that CDC infectious disease experts have found to be a problem, possibly re-emergent due to the COVID-19 pandemic, is carbapenem-resistant Acinetobacter, Nori says. "Any kind of carbapenem-resistant Enterobacteriaceae, especially the extensively drug-resistant ones, like New Delhi metallo-beta-lactamase-producing Enterobacteriaceae, these are definitely the things to watch for."

Moreover, people who have been hospitalized with COVID-19 are particularly vulnerable to all the "old" hospital-acquired infections. They may have survived COVID-19, but they survive with substantial damage, immunologically and to organs, and then pick up other infections along the way.

However, in some interesting ways, COVID-19 may actually have contributed to the benefits side of the ratio in hospitals. Nori says, "Because of the really heightened control measures for COVID-19 in hospitals, somehow Clostridium difficile has not played a role in this as we initially thought. Part of that is that we were not testing as much for C diff, but even if you correct for that, it seems like C diff has maybe not been as much of an issue as some of these other pathogens."

Does that good thing balance out some of the bad things?" Potentially," Nori says. "But then you worry that you're just sort of squeezing the balloon, and that one thing gets better but at the expense of another thing. So, it's probably a little too early to celebrate. Maybe 3 years down the road, if it seems this really mitigated that issue, then I think it is definitely a win."

Small World

In addition to home-grown pathogens, we have to worry about others that come from far-flung regions. Both Aronoff and Nori point to what some of our deadliest contagions have had in common: The viruses were transferred via air. "If you look back over the history of the world," Nori says, "it's really respiratory viral pandemics that have been the ones that have infected and killed people across borders and have gone on and on for many years and sometimes revisit."

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2021, like cholera, diphtheria, those are reemerging because of regional conflicts.”

Another factor, climate change, is also driving changes in infectious disease. As animals and people migrate, searching for a more livable environment, we see vector-borne or insect-borne diseases shift with them. “There may not be emerging or entirely new diseases, but arrival in new areas,” Aronoff says.

“We need more advocacy, we need more resources diverted toward really bolstering very strong IP programs in hospitals and long-term care. The decisions we make, the policies we put into place, they’re impacting the entire system, and not just the one patient at a time. I hope that resources are allocated accordingly after all this, whereby it’s a more proactive approach, rather than trying to fix a problem after it’s too late. If you really invest in that workforce, the ones leading prevention and patient safety, then collateral damage to the system won’t be nearly as bad.

“Health leaders recognize it, definitely, now. They see where the holes are. Unfortunately, where hospitals find themselves now in terms of the bottom line, that type of resources investment is probably not going to be possible for a long time. What’s awesome, though, is that the new CDC director [Rochelle Walensky, MD, MPH] is an infectious disease physician who practiced medicine. She gets it. She gets what we all do, and I think once the dust settles on all this, she’s going to be a tremendous advocate for IPs.”

As we scrounge for silver linings to the COVID-19 cloud, one might be the growing recognition of how crucial the IP job is. “It’s certainly been a really interesting year for our discipline,” Nori says. “Finally, I think people understand what we try to do on a day-to-day basis. Infection prevention has really come into the forefront.”

In fact, given all that’s been going on, and all that could be going on, Nori thinks it’s time for a loud shout-out to IPs. “I want to advocate for our people. They’re holding this whole thing together. And by extension, infectious disease physicians. We hold the fort. We’re the glue. We keep the hospital running, make sure elective surgeries can still happen. We continue to think about these things when everybody else goes to sleep at night.

“If this country, the world, successfully emerge from this whole crisis...thank your neighborhood IP, basically.” She chuckles. “Give ‘em a hug and kiss. Well, maybe not a kiss.”

When the world gets back to some kind of normal, maybe it will include some positive change coming out of this health crisis. In the meantime, to avoid turning the world into one huge disaster movie, Aronoff warns, “It’s really important that we keep our head in the game.”

“We remain at risk for the foreseeable future,” say both Fauci and Morens. “COVID-19 is among the most vivid wake-up calls in over a century. It should force us to begin to think in earnest and collectively about living in more thoughtful and creative harmony with nature, even as we plan for nature’s inevitable, and always unexpected, surprises.”

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REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM

**Priya Nori, MD, gives infection preventionists a lot of credit:** “We hold the fort. We’re the glue. We keep the hospital running, make sure elective surgeries can still happen. We continue to think about these things when everybody else goes to sleep at night.”

Now add in human mobility (as in global travel), and it’s a recipe for another worldwide catastrophe. The reality is that plagues have been a part of human life since hunter-gatherer days—it’s just that nowadays the diseases get around the world much faster. It took the Black Plague roughly 2 years to travel from Italy to Scandinavia. It took SARS-CoV-2 about 4 months to travel from China to Seattle, Washington, to New York, New York. Dengue, chikungunya, Zika—they’re all on the move. Zika, for one, started out in a relatively small area of the world, and is now found in 86 countries and territories.²

**Getting Ready...Again**

It all sounds ominous, but Aronoff is reassuring, in a restrained sort of way. We might not have been prepared for COVID-19, he says, “but we’ve learned lessons about how to deal with other pathogens. It’s possible to be frozen in anxiety and fear about what’s next, but this is what we’re trained to do. We’re trained to look for emerging threats and figure out how to deal with them.”

What can be done to make the next pandemic—and there will be one—less traumatic? “We need more,” Nori says.
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How One Long-Term Care Facility Held Off COVID-19

By Cedric Steiner, MBA

DISCLOSURE: The author was directly involved in resourcing the response at the COVID-19 unit mentioned here and continues to advocate and provide similar resources for other facilities. However, he is not an employee, nor has he received compensation from this provider. It is with sincerity and after discussion with other providers, deemed highly successful, that he provides this model because of its uniquely positive contribution in providing COVID-19 treatment within the community. He would like to acknowledge the emotional decisions and accompanying conflicts that providers are facing during this time.

Coronavirus disease 2019 (COVID-19) found many long-term care facilities (LTCFs) splashed across the front page of national newspapers, but not in the manner that they desired. The well-cultivated images associated with beautifully groomed gardens and formal dining settings were replaced by exhausted care workers wheeling hospital beds to waiting ambulances. These gloomy images captured a severe health care crisis unfolding as quarantining Americans watched and wondered about their elderly loved ones. The LTCF industry watched expectantly as well. As these events unfolded, each organization wondered how they might sidestep a similar crisis, maintain care standards, and avoid an ensuing public relations storm. The efforts of each organization would rely on the ability to manage infection control within buildings, routines, and staffing structures all foundationally not inclined to prevent disease transmission. In retrospect, which organizational response model produced the best outcomes for infection control?

Run
President Joe Biden’s pick for United States assistant secretary of health, then Pennsylvania’s Health Secretary Rachel Levine, MD, confirmed on May 11, 2020, that the state of affairs in Pennsylvania was so compelling that it warranted the removal of her mother from a personal care home. As the Pennsylvania’s governor’s choice in leading the pandemic response, Levine had a bird’s eye view of the unfolding crisis. The view from above showed that although only a minority of elderly individuals receive care at LTCFs, the pandemic had disproportionate effects in these facilities. By May 2020, of the COVID-19 deaths in Pennsylvania, 70% had occurred in LTCFs, and these locations accounted for 21% of the reported cases. These staggering statistics were enough for some family members to remove loved ones from facilities.

Systemic Risk
For those in the industry, removing residents was not an option. They would have to face down the systemic risks rooted in an industry lacking any significant innovation since its inception. These risks included buildings designed for efficient congregant living, communal dining, and shared overextended staffing. In defense of the nursing home industry, these risks are largely a byproduct of decreased assistance in the form of reimbursement. Thus, LTCF providers must continue to consolidate costs to manage historic and continued underfunding. According to a 2016 American Health Care Association report, the cost to nursing homes to care for Medicaid patients exceeded their actual Medicaid reimbursement by $25.43 per day in 2015. This means the average Medicaid resident would cost in excess of $27,000 over their expected 3-year care period.

Robust Response
Systemic risks associated with the intersection of long-term care and infectious diseases required a successful response in the form of a combination of robust measures. Facilities placated with business as usual, the checking-off of survey boxes, and hopes that daily Centers for Disease Control and Prevention (CDC), Centers for Medicare & Medicaid Services (CMS), and state health department guidelines would provide the organization protection, soon reported facility wide outbreaks of COVID-19 and accompanying deaths.

Culture
A robust response required an organizational structure with components previously in place and an ability to modify existing structures. The organization needed the ability to sustain and achieve new goals within short time frames. These included new regimes in sanitation, dining, laundry, cleaning, and supplies, among others. At the forefront was a culture of trust associated between employees and the organizations’ directors. Managers would need an established trust

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and support from those working within departments to maintain morale during difficult times. This trust would hopefully avoid extensive turnover and short staffing during a time when the organization needed to maintain high levels of care. Sadly, this has been a significant issue in long-term care, where a recent study in Health Affairs found that the mean annual turnover nationally for total nursing staff was roughly 128%.¹

**Personnel**

The best prepared organizations had previous investments in disease prevention personnel. Outside the traditional medical team, 2 important roles include an infection preventionist nurse and a respiratory therapist. These roles, with the associated training and professional development, were required to provide competences in personal protective equipment (PPE) fitting and infection control practices. Respiratory therapists with hospital training and previous treatment experience in infectious diseases were a strong asset able to provide nursing facilities novel respiratory insight and treatment.

**Facilities**

COVID-19 spread quickly in high-density congregant living spaces. Most residents live in shared rooms and have between 3 and 6 caretakers a day. The average resident has about 100 sq ft of living space with limited associated air supply. The entire air in this space is shared with others for 15-minute increments. Difficulties in communicating with the elderly necessitate close speaking. These circumstances present a ripe atmosphere for spreading respiratory diseases. Although residents were largely isolated from the broader population, their caretakers were not. Those organizations that could afford to decrease the interactions of infected individuals within stood the best chance of keeping the virus from spreading. Many measures attempted by organizations focused on this area of containment: screening staff and vendors, suspending or modifying visitations, freezing admissions, isolating residents in their rooms, dedicated isolation floors, masking, decreasing or prohibiting shared staffing between organizations. All of these measures had unintended consequences of isolating and depressing social interaction and thus the quality of life for residents, but they worked. They worked like a porous block of Swiss cheese (ie, James Reason’s Swiss cheese model [SCM]). Reason’s SCM model proposes multiple layers of protection like slices of Swiss cheese to manage risk. The more layers of protection (slices), the greater the likelihood of preventing the transmission of infections.

**Timing**

The timing of precautionary measures was an important contributing factor. Instituted too late, even the strictest of measures are bypassed by a spike in community spread. Records I collected in Lancaster County, Pennsylvania, revealed that facilities that instituted early isolation measures with extensive prohibitions fared the best at keeping the virus out of the facility. Had the pandemic been shortened, these measures might have provided significant returns. However, these early prohibitions were akin to a city under siege. They lasted for some time, but the virus ultimately seems to have “acquired” each facility.

**Defying Purpose**

The purpose and mission of long-term care is to provide life-affirming health care services to populations that have no other means or access to skilled care. However, hospital emergency departments and case managers relate stories of elderly individuals for whom they could find no accommodations during the pandemic. Some states had limited programs involving COVID-19–only facilities. This was an attempt to avert the commingling of hospital and nursing home populations. The low quality of the care and poor
performance within these facilities has been a topic within CMS advocacy groups. Otherwise, skilled nursing facilities mostly closed their doors to protect internal populations. This was arguably a logical component to a broader infection control program. However, defying purpose by closing off resources to a community in urgent need of assistance and causing hospitals the additional burden of providing extended care during a health crisis is hardly a model approach. So, what could have been done?

Here’s How It’s Done
One facility attempted a novel approach, which I hold up as a model in maintaining the essential purpose and mission of long-term care providers. The facility proactively established a negative pressure zone in its therapeutic center modeled alongside university research engineers. Nursing staff obtained training and expertise from a respiratory therapist with hospital experience in infectious diseases involving PPE and proper isolation techniques. Additionally, they consulted nursing staff at research hospitals operating COVID-19 centers. They then promptly began providing COVID-19 assistance to the elderly within their community, strictly within their designated unit.

The measure was proactive, and the facility experienced no COVID-19 cases outside of the designated unit for several months. During this time, the facility garnered experience in managing COVID-19 while keeping the virus isolated to a uniquely engineered zone. This experience in managing COVID-19 became a resource when the virus “acquired” the facility a few months of working through layers of isolation protections (SCM). The virus entered the facility not from the COVID-19 unit as some feared would happen, but a separate location most likely associated with staff and community spread. The ensuing results were similar yet somewhat better than what other facilities experienced. The facility, sufficient in size with 114 beds, was one of the last in the associated area and broader state to acquire the virus outside its designated COVID-19 zone.

This novel approach is the only one I know of where a nursing facility was able to record assisting more COVID-19-positive residents within the community than it would have original exposure to. This approach benefited community hospitals, prepared facility staff, and provided economic resources to the organization. The intent to provide this care and the labor and risk that this organization expended deserves recognition. It is to this that I commend Jerry Lile and the employees past and present at Fairmount Homes in Lancaster, Pennsylvania.

CEDRIC STEINER is a licensed nursing home administrator in Lancaster County, Pennsylvania. Contact him at steiner@gshealthcare.org to learn more about the use of negative pressure for immediate or future COVID-19 relief.

REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM

DIFFICULTIES IN COMMUNICATING WITH THE ELDERLY NECESSITATE CLOSE SPEAKING.

THESE CIRCUMSTANCES ARE A RIPE ATMOSPHERE FOR SPREADING RESPIRATORY DISEASES.

WHILE RESIDENTS WERE LARGELY ISOLATED FROM THE BROADER POPULATION, THEIR CARETAKERS WERE NOT.
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Infection Control
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Personal protective equipment (PPE) remains in short supply across the United States during the ongoing coronavirus disease 2019 (COVID-19) pandemic. During this time, the N95 respirator has emerged as a critical piece of PPE to protect health care workers during aerosol-generating procedures. What makes an N95 respirator different from standard surgical masks is that it is a particulate-filtering face piece worn to filter at least 95% of airborne particles measuring as small as 3 microns in diameter. To extend the quantity of available respirators, PPE reuse—something once done only in low-resource settings—has become necessary in resource-rich settings as well, as recommended by the Centers for Disease Control and Prevention in situations where PPE is running low.1

To complement reuse strategies, PPE decontamination has become a topic of great interest and research. First, it is important to distinguish the difference between cleaning and decontaminating PPE. Cleaning is the initial step of removing organic material including microorganisms from equipment, but it does not necessarily inactivate enough microorganisms to render the equipment safe for usage. Decontamination inactivates or eliminates pathogenic microorganisms, allowing for safe usage. Therefore, in all of the following decontamination strategies, masks with visible soiling are discarded prior to decontamination during the quality assessment phase. Finally, to increase the PPE supply, a successful decontamination method must achieve adequate target organism inactivation without compromising respirator fit and filtration. Here, we will review 3 common sterilization modalities currently in use for N95 respirator decontamination, how they work, and their strengths and limitations.

UV Germicidal Irradiation
Ultraviolet (UV) light has long been used for environmental disinfection in health care; UVC wavelength (as opposed to UVA or UVB) light has been studied and approved by the National Institute for Occupational Safety and Health for use in health care settings to kill organisms harder than viruses, such as Mycobacterium tuberculosis.2 Ultraviolet germicidal irradiation (UVGI) works by exposing nonporous surfaces, water, or air to UV-light–producing lamps, usually to a peak UVC wavelength of 254 nanometers. That light breaks and creates new bonds in the organismal RNA and DNA nucleic acid, preventing replication and inactivating pathogens. No residual byproducts remain on the masks that would result in user injury once decontamination is complete. One of the earliest N95 respirator reprocessing protocols to emerge during the ongoing COVID-19 pandemic was from the University of Nebraska, utilizing UVC-based UVGI.3 Subsequent studies have further demonstrated that UVC irradiation successfully inactivates severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; the virus that causes COVID-19) while UVA and UVB irradiation do not.4

A key consideration with UVGI reprocessing is the need to ensure that both the interior and exterior surfaces of the N95 are not obscured from the lamp, which would prevent UVC from reaching and subsequently sterilizing those areas. Practically, this means personnel must be trained to properly hang masks and to...
include quality assurance steps prior to and after irradiation to look for shadowing. Another issue is the adequate decontamination of mask straps; this can be achieved, but only at higher wavelengths, which risks strap and mask damage.5

Heat and Humidity
Heat, with or without humidity, has been a decontamination strategy of significant research interest, given its easy accessibility and low cost. This involves exposing N95 respirators to heat sources such as autoclaves, which are often readily available in health care settings and are easy to adapt. Furthermore, most hospitals already use heat-based sterilization for nonporous equipment and have personnel who are familiar with the technology, eliminating the need for a training period. In one study, SARS-CoV-2 inactivation occurred when N95 respirators were exposed to 70 °C dry heat. However, quantitative fit testing found that those heat-treated N95s were able to maintain acceptable fit only for 1 to 2 rounds of decontamination, leading the authors to conclude that heat was a less practical real-world option compared with vaporous hydrogen peroxide (VHP) and UV treatments for masks. Masks treated with the latter 2 methods retained adequate filtration and fit for 3 or more rounds.6 Studies on moist heat have also been successfully applied to inactivate influenza virus on N95 respirators.7

While one major obstacle to the widespread usage of heat is the aforementioned change to fit, a second is filtration retention, which diminishes with higher temperatures and multiple cycles, and a third is the need for different temperatures and humidity levels depending on the mask model.8 Studies recommend a range of temperatures between 70 °C and 80 °C and humidity percentages of 50% to 85% for decontamination.9 This can be a challenge for health care settings which use several respirator models: Some may have disparate heat and humidity needs, and others may have not yet been assessed for an ideal temperature and humidity. Finally, while other reprocessing strategies have been shown to inactivate bacteria and mold on respirators, heat/humidity sterilization has not yet been demonstrated to do so, and it has yet to be proven to inactivate SARS-CoV-2.9,9

Vaporous Hydrogen Peroxide
VHP has been used widely in health care environmental decontamination for many years. The vaporization of liquid hydrogen peroxide inactivates pathogens, including SARS-CoV-2, when the covalent bonds between oxygen and hydrogen break; this releases free oxygen radicals. These radicals then penetrate cell walls, inactivating microorganisms, and the atoms then take new form as molecules of water vapor and oxygen gas. Safety and efficacy when VHP has been applied to N95 respirators have been confirmed to a maximum of 50 cycles in 1 study and 20 in others without fit or filtration failure. Furthermore, 2 protocols were published early in the pandemic by both Duke and Yale universities that confirmed SARS-CoV-2 inactivation and feasibility with VHP.10-12

Of the 3 reprocessing methods, VHP is the most time-consuming, requiring a decontamination period lasting 40 to 45 minutes, not including the time required for several other critical steps in the process, including the vaporization of liquid hydrogen peroxide. Depending on the manufacturer’s protocol, there can also be recommendations for a longer or shorter dwell phase to provide time for adequate amounts of gaseous hydrogen peroxide to settle on the exposed surfaces of the N95 respirators and straps. Moreover, an aeration phase of at least 2 hours is required. Aeration of the VHP room and respirators is necessary, allowing any residual hydrogen peroxide gas to break down into water vapor and oxygen; otherwise, lingering gas can cling to the mask and cause skin irritation to the end-user. The entire process from start to finish can thereby last upwards of 2 hours. VHP also requires the presence of trained personnel, who may not be available at every institution, to monitor hydrogen peroxide gas levels throughout the decontamination process. Ultimately, all 3 methods have either the potential or evidence to demonstrate SARS-CoV-2 inactivation; however, CONTINUED ON PAGE 30

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**Table. Comparison Across UVGI, Heat/Humidity, and VHP N95 Decontamination Strategies**3-5

<table>
<thead>
<tr>
<th>Decontamination period</th>
<th>FDA EUA obtained?</th>
<th>Studies confirming SARS-CoV-2 inactivation</th>
<th>Cost</th>
<th>N95 damage with reprocessing</th>
<th>Maximum recommended cycles</th>
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<tr>
<td>UVGI</td>
<td>15 minutes</td>
<td>Yes</td>
<td>$$</td>
<td>Seen with higher UV doses</td>
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<tr>
<td>Heat/humidity</td>
<td>30-60 minutes</td>
<td>Yes</td>
<td>$</td>
<td>Seen with increasing</td>
<td>Variable depending on</td>
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<td></td>
<td></td>
<td></td>
<td>temperatures</td>
<td>the N95 model</td>
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<tr>
<td>VHP</td>
<td>~45 minutes</td>
<td>Yes</td>
<td>$$$</td>
<td>None if kept to 20 cycles; 20-50</td>
<td></td>
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<tr>
<td></td>
<td>(full process can</td>
<td></td>
<td></td>
<td>at 30, strap damage</td>
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</tr>
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<td></td>
<td>be closer to 2-3</td>
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<td></td>
<td>hours)</td>
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EUCA, emergency use authorization; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; UV, ultraviolet; UVGI, UV germicidal irradiation; VHP, vaporous hydrogen peroxide.
Endoscope Cleaning: What Infection Preventionists Should Know

In the life-or-death battle that infection preventionists and other health care professionals have been engaged in with coronavirus disease 2019 (COVID-19) this past year, some rudimentary infection control practices may have been sidelined due to elective procedures being sidelined. That concerns infection control expert Linda Spaulding, RN, BC, CIC, CHEC, CHOP. Spaulding, a member of Infection Control Today’s Editorial Advisory Board, worries that in the post–COVID-19 health care setting, proper cleaning of endoscopes might not happen, at least not right away. Spaulding says she believes that “we have to start having buddies in the hospitals, in clinics, in long-term care. We [need to] keep an eye on each other and remind each other about infection prevention practices.” Health care should be looked at in a completely different manner after COVID-19, she says, so “we can fix a lot of things before our next pandemic.”

Infection Control Today: What are your thoughts about the cleaning of endoscopes?

Linda Spaulding, RN, BC, CIC, CHEC, CHOP: We’ve talked a lot about COVID-19. I think now it’s time to try to get back to other things, post–COVID-19 or in conjunction with it. [Previously], we had been working a lot to prevent infections being transmitted from endoscopes. What I mean by that is that the endoscopes are used on [a patient’s] internal parts, [and] inserted…in multiple patients. Processing these scopes in between each patient is extremely important so you don’t take bacteria from 1 patient and accidentally insert it into the next patient and cause an infection.

Over the years, we’ve had many outbreaks of infections related to endoscopes not being processed correctly. …The CDC’s [Centers for Disease Control and Prevention] HICPAC [Healthcare Infection Control Practices Advisory Committee]… worked on new endoscope guidelines for probably a couple years before they were published, and they were published January 25, 2017. And what we found is that we got a little bit of traction, but not as much as we had…hoped…. When people are hired in the endoscopy department, sometimes they do the endoscopy and assist the physician as well as clean the scopes. If you’re having a really busy day, the scopes might not get cleaned as [well] as they should. If [they had been] cleaned properly, we wouldn’t have clusters of infections related to them. So, one of the things that is essential for us to get out to people post–COVID-19—to start thinking about these things again, trying to get back into some normalcy—is that people…and managers of these departments need to go on the HICPAC website. They need to download this document that I have right here…called “Essential Elements of a Reprocessing Program for Flexible Endoscopes—Recommendations of the Healthcare Infection Control Practices Advisory Committee.” This is an incredible tool that I wish I [had] had earlier in my infection control career. Not only does it give you good information related to scopes and processing, but if you don’t have a strong program setup, it gives you everything to put that program in place. It gives you a policy format [and] audit tools. It gives you a competency verification tool so you can make sure your people are competent, [and]…an inventory repair and maintenance log, so you can log every single time a scope breaks and when it goes out. You can identify if you have a problem scope because it keeps going out for repair. And it also gives you a gap analysis tool and an RCA [root cause analysis] template. Now, some people may not know what a gap analysis tool is, but this is the actual tool that’s on the website. And it goes through everything you need to look at to make sure you have a good strong program in place. As you go through this, if you can answer yes to all of this, then you can be comfortable you probably have a pretty good program in place. If not, it gives you the chance to say, “OK, we don’t have this in place” or “We’re weak in this area.” And that’s what you focus on improving.

I’ve gone in to do accreditation for hospitals where they didn’t even track their scopes. They didn’t know what scope was used on what patient or… that a particular scope kept breaking down. And that’s the same one they kept sending out, because their tracking programs just aren’t there. …HICPAC… has put every single document together you need to…have a strong, effective, and safe program. CDC has their HICPAC meetings on campus in Atlanta, and the general public are allowed to make comments at the end of the meeting. I was a liaison on HICPAC for 5 years. At the end, when [people] would get up and ask questions, we would have family mem-
bers...come to the mic and tell us how we needed to concentrate on endoscopes because their husband, their father, their daughter had died because of an infection contracted from an endoscope. We want to think that all hospitals do everything correct, they all have best practices at heart. Nobody wants to do something wrong, but some [people] just don’t have the tools to know what they’re supposed to be doing. They were hired, they were shown how to clean the scope, and then they’re out of orientation. If they were taught wrong, they’re cleaning the scopes wrong. There has to be verification and validation of everything.

ICT®: Who physically cleans the scopes? Is this something infection preventionists oversee, or do they clean the scopes themselves?

Spaulding: No, usually infection preventionists don’t have anything to do with it. If there’s an outbreak, then infection preventionists will be all over it. But, essentially, you could be hired by a hospital tomorrow and... told you’re going to be the endoscopy scope cleaner or tech. They’ll bring you in,...work with you, ...put you through training on how to clean the scope, show you where everything is. And then you’re the endoscopy cleaning person. In some hospitals, it might be a nurse, because the nurse is helping the physician do the scope. Then the nurse is cleaning the scope afterward, getting it ready to use on the next patient and for the next doctor who is coming in. You can see how shortcuts could be taken. So anybody can be trained to clean the scope. But how well are they trained, and is the person training them really doing it correctly?

Usually, when we have outbreaks in these areas, we find that somebody was trained wrong. Or somebody says, “Yes, I follow all the steps on this poster.” And then when you observe them, you find out they missed 1 or 2 steps. Those 1 or 2 steps are critical. We were talking about central line infections in another talk, I think I brought it up. It’s the same thing [here]. If somebody’s not visually verifying and validating that the person is still doing it right, even if that person has been there 25 years, then things can go wrong, and you can end up with infections. You have some people that have been there 25 years. All they’ve done is scope cleaning. “Of course I’m really good at it, I’ve been doing it for 25 years.” Yet we still find shortcuts. Because somewhere in their career, they decided to take a shortcut because they had to turn the scope over really fast. And then it’s, “Oh, well, it worked that time. I’ll just keep doing it this way, because it’s quicker.” And nobody’s going to know that there’s an outbreak from endoscopes until enough physicians identify for themselves that, “Oh, I have a patient that got infected.” Then they hear from another doc, “You know, I have a patient that got infected after an endoscope.” And then they hear the third doc. And then the docs kind of put it together. “Wait a minute, there are 3 patients that had endoscopes here.”

But if each physician is only seeing 1 [patient] at a time, nobody’s putting it all together that there’s a problem, because the likelihood of 1 physician—unless he’s the only one that does the endoscopes—being able to identify an infection and [know how many people got infected is unlikely.] And if the docs aren’t talking and sharing that information, then nobody really knows until you have a whole lot of people infected.

We’ve had CRE [carbapenem-resistant Enterobacteriaceae] transmitted by endoscopes. There has been C difficile [Clostridioides difficile] transmitted to multiple patients through endoscopes. Our goal would be “Wouldn’t it be great if we had disposable endoscopes?” We were talking about that prior to COVID-19 and then all that stopped. So, we have to get back to basics...and start looking at our programs again. Because most likely, during COVID-19, people got out of the routine of cleaning endoscopes;...we weren’t doing [endoscopies] because they were elective. And those scopes have been sitting there for how many months now? We have to get back together and put together better programs and make sure we’re safe from there on.

ICT®: And finally, where do infection preventionists fit in this? Should they insist on having more oversight on the endoscope cleaning process, or will people be wary of that?

Spaulding: No. Infection preventionists need to learn how to clean an endoscope, or at least observe
limitations of the 3 sterilization methods lie in the number of processing cycles that can be performed until fit and filtration are compromised (Table).13-15

As the pandemic continues and PPE remains in short supply, more real-world, controlled studies are required to assess a safe duration of N95 respirator reuse until production can meet demand. To complement these efforts, innovations in N95 respirator decontamination must continue to augment the supply of available PPE.

Ultraviolet germicidal irradiation, heat and humidity, and vaporous hydrogen peroxide all have either the potential or evidence to demonstrate SARS-CoV-2 inactivation; however, limitations of the 3 sterilization methods lie in the number of processing cycles that can be performed until fit and filtration are compromised.

Numerous studies from environmental and occupational health, infection prevention, and other disciplines have since emerged to translate traditional environmental decontamination technologies into PPE decontamination strategies, as well as to test the safety and efficacy of these processes. Whether this innovation will be a temporary feature of the infection prevention and PPE landscape, or a permanent addition, has yet to be seen. However, it behooves the infection control community to consider the viability and longevity of these technologies and their roles in PPE stewardship, environmental waste, and ascertaining the true lifespan of N95 respirators.

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REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM
The STDs Infectious Disease Experts Hate Most

BY JAN DYER

There are dozens of sexually transmitted infections and diseases (STIs/STDs), running the gamut from A for asymptomatic chlamydia to Z for Zika. Here’s a poser. If you could magically erase any sexually transmitted infection or disease instantly, which one would you choose?

Michelle Collins-Ogle, MD, who spent 20 years as medical director of a dedicated HIV clinic, let out a little groan at having to decide, but took only a moment: “gonorrhea.”

That was also the top choice for Ina Park, MD, associate professor at University of California San Francisco School of Medicine; medical director of the California Prevention Training Center; and author of Strange Bedfellows: Adventures in the Science, History, and Surprising Secrets of STDs.

And, “gonorrhea,” says David Aronoff, MD, director of the Division of Infectious Diseases in the Department of Medicine at Vanderbilt University Medical Center.

On any given day in 2018, according to the Centers for Disease Control and Prevention (CDC), 1 in 5 individuals had an STI. Gonorrhea actually comes a low fifth on the CDC’s list of STI prevalence, but the number of cases had recently jumped 63% in only 4 years.

April happens to be the CDC’s STD Awareness Month and the reason these infectious disease experts worry most about gonorrhea is primarily because of the fear that it’s becoming resistant to all antibiotics. “I need gonorrhea to go away before we won’t be able to treat it,” Collins-Ogle says. “So if I could wipe it off the face of the earth, I would.”

Aronoff classes it with those infections that “we thought we had control over—but then lost control. Gonorrhea is increasingly hard to treat, and increasingly easy to spread.”

Even with effective screening, treatment, and education, STIs can be like movie villains who just won’t die, who change form, and who keep coming back to wreak havoc.

We may be running out of time to stop it. “We’re down to 1 class of antibiotics left to treat it, and while there are a few others in the pipeline being studied in clinical trials, none is quite ready for prime time,” Park explains. In December 2020, she notes, the CDC modified its guidelines, which used to recommend dual treatment with ceftriaxone and azithromycin as first-line therapy for gonorrhea. Due to concerns over increasing antibiotic-resistance as well as stewardship, azithromycin was removed, and the dose of ceftriaxone was doubled.

“In the few cases of multidrug-resistant gonorrhea that failed all conventional therapies,” Park says, “patients had to be hospitalized and treated with broad spectrum IV antibiotics such as ertapenem. We really don’t want to have to resort to that for an infection as common as gonorrhea.”

Eliminating Gonorrhea

Collins-Ogle, who’s now an assistant professor of pediatric infectious disease at Albert Einstein College of Medicine and an attending pediatrician for infectious diseases and adolescent medicine at Children’s Hospital at Montefiore, has a second reason for wanting to rid the world of gonorrhea: what happens when it’s untreated. “Gonorrhea is no joke,” she says. “It causes really harmful sequelae when it’s not treated. And complications of gonorrhea are more serious in women who aren’t treated. Women get [pelvic inflammatory disease] very easily. They can have scarring, they can have sterility. Genital gonococcal ophthalmia in newborns. It’s just a horrible bacterium.”

With gonorrhea gone, what would rise to No. 2 on the list? Syphilis.

After a near disappearance in the US in 1999-2000, Park says, “Syphilis has come back with a vengeance, and one of the biggest concerns I have is over the resurgence of congenital syphilis.”

Indeed, according to the CDC’s 2018 STD surveillance report, cases of primary and secondary syphilis rose 71% between 2014 and 2018, and congenital syphilis cases increased dramatically, by 185%.

“Syphilis, to me, is the most fascinating STI we have,” says Collins-Ogle. “It sort of quieted down, but then when its resurgence occurred, it occurred in a demographic we hadn’t seen before. The last time we saw syphilis rear its head it was in the ‘80s, with pregnant women and newborns born to mothers who weren’t treated. Now we’re seeing it in men who have sex with men (MSM), particularly young men of color.”

This resurgence is completely different than in the 1980s to 1990s, she says, in part because of changes in screening. “I would say that because we had the resurgence of
The problem is, we're also still not doing a great job of screening women for syphilis. And we all made sure that babies were tested as well, so I think we did a better job of screening, diagnosing, and treating in that demographic. But we didn't see it coming when it happened in MSM.

Screening is better now. "Now," she says, "if you get diagnosed with HIV, you get screened for everything else. Or if you get an STI, you get syphilis or gonorrhea, chlamydia, you automatically—well, we don't do a good job universally—but you should be screened for HIV."

However, "I just saw a young guy a couple weeks ago who had gone to an emergency [department] with symptoms consistent with an STI. He got tested for STIs but he didn't get an HIV test. So he came to our center and asked for an HIV test. We're still not doing a good job of making those connections in that demographic."

The problem is, we're also still not doing a great job of emphasizing prevention, Collins-Ogle says. "Our health care system and education system lag behind reality and what's happening in the real world. We lag in our understanding of even how to speak to the various demographics and how to educate them. It's all of that, kind of wrapped into why we continue to see these epidemics the way we do."

And the right messages aren't getting to the right people. For instance, 30 years or so after the worst of the AIDS epidemic, "We still have a lack of understanding about the role of condom use," Collins-Ogle says. "I keep telling people, if only they'd use condoms, we wouldn't have this problem with HIV."

Messaging Problem
Moreover, the messages aren't targeted enough. "We're taking one message and assuming that it's well received and understood among all demographics—and it's not. For example, for men in their 50s and 60s, their understanding of condom use was to prevent pregnancy. For women who are older, the purpose for having condoms was to prevent pregnancy, not STIs. And now we're trying to tell young people that condoms are used to prevent STIs and can prevent pregnancies." In other words, we're trying to make one message fit all circumstances.

Age, culture, and education all make a difference. The issue, Collins-Ogle emphasizes, is that we aren't talking about sex, and we aren't talking about it in a comprehensive way, "to reach all the different ways people have sex. There's no sex [education] for MSM, there's no sex ed for lesbians, gay women, there's no sex ed for bisexual people." Depending on where you live, you're going to get a different message about how infections are spread and how to prevent them, she says. "I find out from my young male patients: They don't know how to use a condom! Nobody ever showed them how! I'm not kidding you."

STI/STDs are a threat to all humans, but nearly half of new STIs in 2018 were in the age group of 15 to 24 years. "We've failed at making sure we've adequately prepared these kids to be safe," Collins-Ogle says. "They don't know, they're only going by what they're told by other people or what they've read online."

One method of reaching them might be to use the social media they're most comfortable with, as investigators in a 2019 study did. They found that MSM who used sex-seeking social media platforms were more likely to share HIV information than those who were mostly on generic platforms. This echoes what Collins-Ogle is fervent about: People are more willing to ask for help and receive help in a non-judgmental, accepting environment.

Even with effective screening, treatment, and education, STIs can be like movie villains who just won't die, who change form, and who keep coming back to wreak havoc. There are some bright spots, though. Syphilis is still very susceptible to penicillin, Collins-Ogle points out. And Park says, "We already have a fantastic vaccine against [human papillomavirus]." What's more, she adds, "We've managed to nearly eliminate mother-to-child transmission of HIV in the [United States] through aggressive screening and treatment. But we also need to mobilize around reducing morbidity and mortality around congenital syphilis, which is preventable with screening and prompt treatment during pregnancy."

Several drugs for gonorrhea have been studied, or are being studied in clinical trials, Park says, including zoliflodacin, closthoamide, gepotidacin, and solithromycin. "There's also a very interesting study going on in the United States and Thailand looking at the meningococcal
group B vaccine (which prevents against *Neisseria meningitidis*) that induces antibodies that may also protect against *Neisseria gonorrhoeae*. These are, however, still earlier-stage clinical trials."

**No Vaccines**

But why on earth can’t we get a vaccine for any of these infections and diseases? In short, “it's complicated,” says Aronoff. “To get vaccines into trial you need unlimited money, interest in the disease, participants for the trials—and lots of disease.” All of those components were in place for coronavirus disease 2019, which is why vaccines could zip through (relatively speaking) to public distribution.

Also, he notes, “Some diseases lend themselves to vaccines. It’s incredibly hard to arm the immune system against HIV, malaria, tuberculosis, because they all have a different relationship to the immune system than do diseases that we’ve been able to develop vaccines for, like measles and smallpox. A complicated virus like HIV, for instance, integrates into the DNA.”

Which probably explains why Operation Warp Speed has not yet been translated into STI/STD vaccine research. “Operation Warp Speed had a $12 billion-plus price tag,” Park says. “If that much was poured into STI vaccine research, I’m sure we’d be much further along with various STI vaccine candidates than we currently are.”

Effective treatments may be on the way, but in the meantime, good reliable data are critical, especially when infections attack in packs. “Back in the ’80s, we didn’t have a direct correlation between STIs and AIDS,” says Collins-Ogle. “Now we know having syphilis predisposes you to HIV acquisition. We also know having herpes simplex virus [type] 2 predisposes you to HIV. When we started seeing syphilis in gay men it wasn’t necessarily equated to HIV. At that time, they weren’t going hand in hand. Now we definitely know they’re a couple. I think that may be why syphilis caught us off guard with men and HIV. We didn’t have the data to make that link.”

The resurgent STIs seem to be stronger than before, but in the last several years, the CDC has “embraced bigger, faster, stronger countermeasures” like the Sexually Transmitted Disease Surveillance Network (SSuN). 4

SSuN, a collaboration of state, county, and city health department sentinel sites, allows health care providers to access and use updated, specific data to monitor and track rates for several STDs simultaneously. The “timely data snapshots,” as the CDC calls them, give users a comparison group for trends; if gonorrhea rates go up in one location, for instance, a public health expert can use the SSuN data to determine whether it’s a local or broader trend.

**CERTAINLY STIs CAN BE RELENTLESS. BUT SO IS SCIENCE.**

The surveillance system integrates data across multiple diseases. For instance, SSuN data offer an extensive breakdown of HIV co-infection rates among people diagnosed with gonorrhea or seeking care in STD clinics. Moreover, SSuN provides complete demographic, clinical, and behavioral information, helping clinicians and investigators monitor and combat emerging antibiotic resistance.

**A Continual Battle**

The ongoing fight to eradicate (or at least prevent, or at the very least control) STIs is a little reminiscent of the story of poor Sisyphus, doomed to push a massive rock uphill, whereupon it would roll back down again…and again, eternally. But there are successes, both in treatments and encouraging behavior change. As intractable as gonorrhea and syphilis can be, targeted public health campaigns can help.

In Alaska, for instance, cases of early syphilis had spiked from 24 to 97 between 2017 and 2018—a 300% increase. The Alaska Division of Public Health (ADHP) teamed up with the CDC’s Division of STD Prevention to build a relationship with the community, in particular with MSM. ADPH organized testing and community outreach events, and by January 2019, more than 300 people had been screened for syphilis. 3

And Hawaii is taking a layered approach. The state is a critical site for monitoring antibiotic-resistant gonorrhea (resistance historically emerges in the East and moves into the mainland United States through Hawaii). Participating in the Gonococcal Isolate Surveillance Project to collect samples of *N gonorrhoeae*, Hawaii’s STD clinics collect a higher percentage of samples for monitoring resistance than in any other state. When test results from 7 patients at the Hawaii State Department of Health’s STD clinic showed possible resistance to both drugs in the last recommended treatment, local public health professionals acted quickly, handing off the information to the “next link in the chain,” disease intervention specialists (DIS). The DIS made sure the 7 patients were cured by the treatment they received, and also began contact tracing to prevent spread of the potentially resistant strain. Within a matter of weeks, all but 1 of the patients were tested (and retreated in 1 case). 4

The Sisyphus tale is usually considered a metaphor for futility. Still, one theory holds that it’s a metaphor for the sun rising and setting. And rising again. Certainly STIs can be relentless. But so is science. By winning battle after battle, we may win the war.

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**REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM**

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**Towards the Next Level of STI and STD Prevention**

**By Kathy Park, MD, and Anna Collins-Ogle, MD**

How do we get克斯 towards the next level of STI and STD prevention? An important first step is making sure we have reliable data to know what’s going on. The CDC has “embraced bigger, faster, stronger countermeasures” like the Sexually Transmitted Disease Surveillance Network (SSuN). This collaborative effort among state, county, and city health department sentinel sites allows health care providers to access and use updated, specific data to monitor and track rates for several STDs simultaneously. The “timely data snapshots,” as the CDC calls them, give users a comparison group for trends; if gonorrhea rates go up in one location, for instance, a public health expert can use the SSuN data to determine whether it’s a local or broader trend.

The surveillance system integrates data across multiple diseases. For instance, SSuN data offer an extensive breakdown of HIV co-infection rates among people diagnosed with gonorrhea or seeking care in STD clinics. Moreover, SSuN provides complete demographic, clinical, and behavioral information, helping clinicians and investigators monitor and combat emerging antibiotic resistance.

**Effective Treatments**

Effective treatments may be on the way, but in the meantime, good reliable data are critical, especially when infections attack in packs. “Back in the ’80s, we didn’t have a direct correlation between STIs and AIDS,” says Collins-Ogle. “Now we know having syphilis predisposes you to HIV acquisition. We also know having herpes simplex virus [type] 2 predisposes you to HIV. When we started seeing syphilis in gay men it wasn’t necessarily equated to HIV. At that time, they weren’t going hand in hand. Now we definitely know they’re a couple. I think that may be why syphilis caught us off guard with men and HIV. We didn’t have the data to make that link.”

The resurgent STIs seem to be stronger than before, but in the last several years, the CDC has “embraced bigger, faster, stronger countermeasures” like the Sexually Transmitted Disease Surveillance Network (SSuN). 4

SSuN, a collaboration of state, county, and city health department sentinel sites, allows health care providers to access and use updated, specific data to monitor and track rates for several STDs simultaneously. The “timely data snapshots,” as the CDC calls them, give users a comparison group for trends; if gonorrhea rates go up in one location, for instance, a public health expert can use the SSuN data to determine whether it’s a local or broader trend.

**A Continual Battle**

The ongoing fight to eradicate (or at least prevent, or at the very least control) STIs is a little reminiscent of the story of poor Sisyphus, doomed to push a massive rock uphill, whereupon it would roll back down again…and again, eternally. But there are successes, both in treatments and encouraging behavior change. As intractable as gonorrhea and syphilis can be, targeted public health campaigns can help.

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The Sisyphus tale is usually considered a metaphor for futility. Still, one theory holds that it’s a metaphor for the sun rising and setting. And rising again. Certainly STIs can be relentless. But so is science. By winning battle after battle, we may win the war.
Clorox Takes Aim at *Clostridioides Difficile*

*Clostridioides difficile* has been a constant and deadly problem that infection preventionists and other health care providers have had to face for decades. It costs acute care facilities about $1.5 billion a year, infecting almost 500,000 people annually. In response to this threat, Clorox Healthcare unveiled the Clorox Healthcare Spore Defense Cleaner Disinfectant, available through the Clorox T360 System, to help health care facilities more effectively and efficiently combat the spread of *C. diff*. The disinfectant uses “an electrostatic sprayer that combines proven electrostatic technology with trusted Clorox solutions to easily provide superior coverage in even the hardest-to-reach places,” the company said in a press release. In addition to *C. diff*, the disinfectant can kill 42 other pathogens.

As any member of a hospital environmental services (EVS) team can attest, disinfecting surfaces can be challenging and time-consuming. In the press release, Clorox cited studies that suggest that only 50% of surfaces in patient rooms and operating rooms are disinfected in an effective way. “Proper disinfection of portable and shared medical equipment is also an important component of infection prevention as this equipment frequently becomes contaminated with health care-associated pathogens,” Clorox Healthcare said in a press release.

Curtis Donskey, MD, an infectious disease specialist at the Louis Stokes Cleveland Veterans Affairs Medical Center, said that “when it comes to *C. diff.*, the disinfectant can kill 42 other pathogens. As any member of a hospital environmental services (EVS) team can attest, disinfecting surfaces can be challenging and time-consuming. In the press release, Clorox cited studies that suggest that only 50% of surfaces in patient rooms and operating rooms are disinfected in an effective way. “Proper disinfection of portable and shared medical equipment is also an important component of infection prevention as this equipment frequently becomes contaminated with health care-associated pathogens,” Clorox Healthcare said in a press release.

Curtis Donskey, MD, an infectious disease specialist at the Louis Stokes Cleveland Veterans Affairs Medical Center, said that “when it comes to cleaning and disinfection of shared and portable medical equipment such as wheelchairs and gurneys, thoroughness of cleaning is often suboptimal and application can be challenging and time-consuming.... This is what makes the development of this sporicidal solution and its ability to be used with electrostatic technology a substantial innovation....”

https://www.cloroxpro.com

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Small Wipe Created for Small Medical Tools

The adage that the best things come in small packages might have been on the minds of PDI officials when they developed the idea for, and recently launched, its product: the Sani-Cloth Bleach Clinical Size Wipe. It’s a 6 x 5 in disinfecting wipe that the company says is ideal for cleaning and disinfecting smaller medical equipment.

Sean Gallimore, the senior vice president and general manager at PDI Healthcare (one of PDI’s divisions), said in a press release that “the new Sani-Cloth Bleach Clinical Size Wipe provides our powerful bleach formulation in the ideal size for disinfecting smaller medical equipment. By offering a smaller wipe size, we can provide more than double the disinfection applications per canister.”

The wipe can neutralize 50 different microorganisms, the company says. That includes SARS-CoV-2, the virus that has caused the coronavirus disease 2019 (COVID-19) pandemic. Gallimore said in the press release that “the increased demand driven by COVID-19 has resulted in PDI taking a critical look at optimizing all variables of the supply chain while continuing to meet the needs of our customers.” PDI wants to send out the initial shipment to COVID-19 testing sites.

https://wearepdi.com/

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Device Said to Disinfect Small Spaces

And then there are those hard-to-reach spaces that need cleaning such as dental exam rooms, ambulances, and cockpits. Or, more to the point, need disinfecting. For that, a company called Xenex Disinfection Services recently unveiled something called Deactivate, a handheld LED device that the company claims can quickly disinfect surfaces in “confined spaces.”

Deactivate doesn’t need warmup or cooldown time, and kills pathogens using ultraviolet (UV) light that has been proven effective against SARS-CoV-2, according to the company. In a press release, the company says that the device “achieves a 99% level of disinfection against SARS-CoV-2 in 30 seconds at 1 meter, 99% against vegetative bacteria (methicillin-resistant *Staphylococcus aureus* [MRSA], *Escherichia coli*) in 1 minute at 1 meter, and 99% against bacterial spores in 2 minutes at 1 meter.”

Irene Hahn, Xenex’s senior vice president of sales and marketing, said in a press release that “our mission is to stop the pain and suffering caused by infections by destroying the pathogens that cause them. There are many businesses that need targeted, rapid disinfection, especially compact areas like dental exam rooms, ambulances, office cubicles, and cockpits. We wanted to offer an effective technology for disinfecting small spaces that are hard to clean and that’s what Deactivate provides.”

https://xenex.com/
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Learn more at www.DefendWithProfend.com


*Healthcare-associated infections