Choosing a service provider

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Bye bye, bacteria
Hospital-born infections' tough, high-tech new foes

By Nancy Ryerson

Hospital bacteria lurk unseen between cracks and under tables. The infections they cause kill an estimated 99,000 people annually. And they're becoming more and more drug-resistant.

While these are not the horror movie viruses that spread rapidly around the globe and turn humans into zombies, hospital-acquired infections are still a very real and very expensive threat to deal with, costing healthcare more than $30 billion annually.

Diligent hand-washing and methodical mopping go a long way, but now, facilities are looking for more formidable measures to take down dangerous bacteria like MRSA, VRE and C. Difficile.

Two high-tech solutions growing in popularity are UV light disinfection systems and hydrogen vapor systems. Both are "no touch" machines, and the companies behind the technologies boast that they can reach the contaminated spots traditional cleaning misses. So far, the few clinical studies carried out using the systems suggest as much, and more information should be delivered in the near future.

Currently, around 4 percent of hospitals have invested in portable UV light disinfection systems, according to Charlie Whelan, Frost & Sullivan healthcare director. He predicts that number will triple over the next couple of years.

"They're heavy, they're expensive, and hospitals have been relatively slow to adopt them, but I think long term they will be much more commonplace," says Whelan.

Zap happy
UV light has been used in disinfection for a hundred years, but its portable incarnation only appeared in the last decade. The exact way the devices work varies from company to company, but basically, the systems use short-wavelength ultraviolet radiation UV-C, a wavelength that does not reach Earth from the sun, to zap microorganisms' DNA. It's especially effective on the troublesome bacteria
C. Difficile, a spore that forms a protective shell that protects it from alcohol-based cleaners.

"C. Difficile is the most difficult," says Mark Stibich, president of UV light disinfection company Xenex. "It's a little bit adhesive, too, so it can stick on a tray table or phone."

The company reports that Cooley Dickinson Hospital in Northampton, Mass. experienced a 53 percent reduction in hospital-acquired infection rates when the machine was used.

"Other organisms are more susceptible to disinfections, so for those, using Xenex is more a matter of thoroughness in the room," says Stibich.

Thoroughness is the most important benefit the systems boast, as that's where many traditional cleaning programs may fall short.

Lancaster General Hospital in Lancaster, Penn. invested in Xenex machines in April of this year. Though the facility has never had a disease outbreak, Deb Hess, supervisor of epidemiology at the hospital, says she sees the three Xenex machines she purchased as a preventive measure. The media coverage of this year's harsh flu season also encouraged the purchase.

"The Xenex enhances the cleaning procedures that we already have in place," says Hess. "Now we can say, 'not only do we have a clean room, but it's now disinfected.'"

She says that's comforting for patients and staff alike and gives the hospital an edge over local competition. The "flashiness" of the Xenex also helps bring attention to other elements of infection control, she says.

"Since we brought it in, we've had overwhelming success with the staff asking the appropriate questions, and even patients asking about it," she says. "They're asking questions, but there has been a lot of support."

Bringing the machines to the team

The systems' upfront cost is the largest barrier for many facilities; systems can cost up to $125,000, with replacement bulbs and service fees adding on to that price tag. And there's not much of an opportunity to bargain shop — because the equipment is new, there aren't many third-party options for service or replacement parts.

But once the initial cost is covered, operating the systems is simple. Hospitals can easily train the cleaning staff they already have on the basic safety functions and have the systems up and running quickly.

"I can do the training in a half hour," says Scott Garret, director of Environmental Services at Lancaster General. "You can actually learn the device in three minutes. The rest is science, the way you place it so that nobody walks in the room, and what to do if somebody does."

The main risk of being around the machines is eye damage. The Xenex takes 15 minutes to totally disinfect a room, with three different device positions lasting five minutes each.

The Tru-D, a UVC disinfection system from Lumalier Corporation, uses UVC dose measuring technology that automatically adjusts to each room, so it does not have to be moved.

"Rooms vary in space, geometry and how reflective the wall coatings are," says Chuck Dunn, president of Lumalier, which makes the Tru-D. "Tru-D reacts to those variables, by adjusting the cycle time to deliver the dose, and in doing so, we get a consistent outcome with each and every room we apply the device to."

Potential customers concerned about the equipment's safety may be comforted by STERIS Corporation's offering, the Pathogen. It had efficacy testing performed by EPA Good Laboratory Practice.

"There are no parameters for this kind of device now, but the EPA is starting to raise its eyebrows," says Jim Dacek, senior market development manager at STERIS. "We thought, why not get ahead?"

Vapor power

Another high-tech disinfection option utilizes hydrogen peroxide vapor. It disinfests by dispersing a bleaching agent into the air that kills bacteria. A study published in January by Johns Hopkins University found that patients in a room cleaned using HP vapor disinfection were 64 percent less likely to develop multi-drug resistant infections.

When the NIH Clinical Center experienced a cluster of CRE infections in 2011, the hospital used HP vapor to disinfect equipment and rooms that had been used for patients colonized with CRE and other multi-drug resistant bacteria, like acinetobacter.

"Although we did not study its effectiveness in preventing transmission in our facility, hydrogen peroxide vapor was part of a strat-
egy that successfully controlled CRE transmission in our hospital,” writes Tara Palmore, deputy hospital epidemiologist at the NIH Clinical Center, in an e-mail to DOTmed Business News.

HP vapor systems are more challenging to use, as they require rooms to be sealed when the machines are in use because the vapor is considered hazardous. Disinfection generally takes one to one and a half hours.

Bioquell, a HP vapor disinfection company, offers a variety of plans that can help hospitals adjust to the schedule.

“A number of different models are available, ranging from a hospital owning and operating a Q-10 themselves to a full service, where Bioquell provides the equipment, personnel and all consumables,” says Jon Otter, scientific director, health care, at Bioquell.

While Frost & Sullivan does not have data on the number of hospitals that have invested in HP vapor systems, Whelan says he believes numbers “would be lower because there are fewer companies in that space and a lot more limitations with that technology, i.e. the need to close off air vents and better seal the room.”

**Machines can’t do it all**

Studies so far support the efficacy of new technology, though one recent article in the Journal of Epidemiology concluded that, “Although ‘no touch’ room decontamination systems might aid in reducing/eliminating environmental contamination after terminal room disinfection, we still need to develop new practices or technologies to improve the thoroughness of daily room cleaning (e.g., tinted germicides that color surfaces when applied, but the color disappears once it dries).”

That means even if a facility does invest in high-tech cleaning, epidemiology experts stress the importance of not relying on just one cleaning method. Facilities should also be sure to educate the staff as well as patients on the safe use of the machines.

“I think whatever strategy we implement, we need to make it easy and make it part of their natural workflow,” says Karen Fingson, infection control specialist at Utah Valley Regional Medical Center, which has a top-performing infection control program. “The demands out on the frontline staff have just really increased, so [infection control strategies] can’t be a burden.”

Crystal Heishman, an infection preventionist who serves on the Association for Professionals in Infection Control and Epidemiology Communications Committee, warns against relying too much on technology, but encourages facilities to learn about the latest trends and keep infection control programs dynamic.

“I believe the biggest challenges for hospitals when it comes to infection prevention and control, is keeping up with the rapid change,” writes Heishman, in an email. “Letting go of held beliefs is difficult, but sometimes necessary in order to progress and protect.”

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