Helping Hospitals Attack C. diff And Other Superbugs

Interview by Amanda McGowan, editor

While the danger of infection for patients has always been a top concern at health care facilities, the increased cost associated with hospital-acquired infections makes finding solutions to manage infection-causing microorganisms even more crucial. Recently, a UK study [1] published in the June 1 print edition of the journal *Clinical Infectious Diseases* found that Clostridium difficile (C. diff) can spread through the air a second time even after it has settled, making it even more difficult to contain and remove from hospitals. C. diff is bacteria that causes deadly intestinal infections in patients, and it was previously thought to be spread only by contact with contaminated surfaces.

More than three million C. diff infections occur in U.S. hospitals each year. One of the “superbugs,” it is becoming increasingly difficult to treat due to antibiotic resistance. Additionally, C. diff is extremely difficult to remove from the hospital setting and, under current cleaning practices, has been shown to remain in the environment for months.

New technologies available today can quickly and safely disinfect hospital rooms of C. diff and many other deadly organisms. Here, Dr. Mark Stibich, the chief scientific officer for Xenex Healthcare Services, talks with *Surgical Products* about his company’s technology to help control these infection risks. The company’s unique pulse xenon UV technology has been proven effective in deactivating and removing C. diff from both surfaces and the air, helping to make hospitals safer for patients.

***Surgical Products:* Why is the new finding reported in *Clinical Infectious Diseases* about the spread of C. diff important to hospitals to know and understand?**

Dr. Stibich: The study shows that after they settle, C. diff spores can be spread a second time. It's clear that when a toilet flushes, for example, the spores are aspirated and they fly up all over the place, but this new study is reporting that they can then be disturbed by a passer-by or a curtain moving. This finding helps us see how the spore can migrate after it lands on a surface. This increases the range of contamination from the initial placement and is important to understand.

***Surgical Products:* How prevalent are infections caused from C. diff in hospitals today?**

Dr. Stibich: It varies. Some hospitals may be having a C. diff outbreak while other hospitals have it under control. Still, every infection control person I've spoken with is very concerned about C. diff., especially since the tools that are being used right now to clean the C. diff and other organisms out of hospital rooms are not sufficient. Hospital cleaning staff would have to wipe every surface in a room—from the floor to the ceiling—with bleach, and even then, it doesn't kill all the C. diff. So, the real challenge in infection control is how do we provide that clean, safe environment for the next patient given the current resources?

***Surgical Products:* Can you explain how Xenex's technology helps health**

care facilities solve this problem?

Dr. Stibich: Our product utilizes a pulse xenon ultraviolet light, a xenon flashlamp that flashes twice a second. Xenon is an inert gas, but when you pulse it with this high intensity, you produce ultraviolet C radiation (UVC). UVC is filtered out by the ozone layer, but it penetrates the cell wall and the DNA of microorganisms, such as viruses, bacteria, bacterial spores. The DNA in the organism absorbs that energy and becomes fused together. Once that happens, the organism can no longer reproduce and is no longer infections.

The is portable and can be wheeled from room to room in a hospital – making it easy to use by hospital cleaning staff. It produces a high intensity flash that lets us disinfect a room in less than 10 minutes. Our device fits in with operational and practical concerns in the facility. It is a major advance, is faster and is safer than other automated cleaning methods and quickly and effectively disinfects surfaces to provide a clean, safe environment for patients.

Surgical Products: **Can you explain the steps health care personnel would take in using this device in a hospital?**

Dr. Stibich: An operator, such as an environmental service worker or housekeeping staff member, would wheel the device in the room, clean the bathroom, wheel the device in the bathroom, set it, close the bathroom door, and then let it run for say three to four minutes in the bathroom.

While it’s in the bathroom, they can work on cleaning the main room. When the main room is “visually clean,” or when there is no visual dirt in the room, they would bring the device out and place it in one or two positions in the room, leave the room and let it run. After that is done, they would go in and retrieve the device. When the bulb is not flashing, the room is safe to enter.

It can be used in any department and in any unit. We recommend using the device

across the hospital - in isolation room terminal cleans, operating rooms or even using it in bathrooms and public spaces. However, we would also like to see it used for disinfecting isolation or contact precautions rooms. There are studies that show an increased risk for a patient entering these rooms based on the diagnosis of the previous patient, and that increased risk can be up to four times the baseline risk at the facility

By using the device in between patients, the next patient that is being admitted will be protected from whatever is left behind from the patient before them. That is one area we really prioritize when speaking with hospitals because of the data that is out there.

Surgical Products: **What microorganisms is UVC effective against?**

Dr. Stibich: The UVC at the intensity that the Xenex device uses is a broad spectrum disinfectant capacity, so it's effective against viruses, bacteria, and spores such as C. diff.

Surgical Products: **Why is it important for hospitals to find a solution for controlling infection?**

Dr. Stibich: There are two sides this. One is the moral argument that hospitals should be a safe place for a patient. Everything that can be done should be done to reduce the risk of acquiring an additional infection or an additional problem when coming to the hospital.

On the cost side, hospital-acquired infections cost the U.S. healthcare system more than $30 billion each year. A single MRSA infection costs about $60,000 in additional care. Our technology's cost, using it for a whole year, is less than the cost of one MRSA infection.

Given healthcare costs now and the increasing pressure on hospitals, we feel that the argument is very solid for advancing the technology used to disinfect the environment and saving hospitals money and protecting patients.

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http://www.surgicalproductsmag.com/articles/2010/06/helping-hospitals-attack-c-diff-and-other-superbugs?qt-recent_blogs_articles=0

Links:
[1] http://www.journals.uchicago.edu/doi/abs/10.1086/652648