



Robots show Marin, Sonoma hospitals the light on disinfection

Hospital bacteria, watch out. Incredibly efficient germ zapping robots are winning the fight against deadly hospital acquired infections.

Used at Marin General Hospital and Sonoma Valley Hospital in the North Bay, the Xenex LightStrike Germ-Zapping Robots disinfect a room's surfaces using ultraviolet light hundreds of times more intense than sunlight. The light flashes like a strobe in a 14-foot bubble bathing everything in its path, including difficult surfaces like bedrails and light switches, killing 99.9 percent of bacteria.

"It would take a human hours and hours to get the same level of disinfection," said Melinda Hart, Xenex spokesperson.

The robots stand about 5 feet tall when in use, and resemble R2-D2 from the "Star Wars" films. The technology does not replace any environmental services personnel. Environmental services team members still change the linens, take out the trash and operate the robot.

The robot costs about \$100,000, but with the prevention of two to three major infections, the robot can pay for itself, the company said.

"Within four to five months, hospitals see a return on their investment," Hart said.

Hospital-acquired infections kill nearly 200 people in the U.S. every day, and affect one in 25 hospital patients. And these numbers do not include infections acquired at skilled nursing, long-term acute care and outpatient surgery facilities, according to the Centers for Disease Control and Prevention. CDC figures also show that these infections cost the U.S. health care industry upwards of \$30 billion annually.

Sonoma Valley Hospital was gifted with a LightStrike robot by a donor in fall 2014. Kathy Mathews, coordinator for infection prevention and risk management for the hospital, said the system has greatly enhanced their cleaning process. The robot is programmed each day, and hospital administrators can keep track of where it's been and how many rooms it has cleaned. The reports allow the hospital to track where infections are coming from.

LightStrike is routinely used to clean rooms after a patient's discharge, in the operating and emergency rooms, and in the skilled nursing facility isolation rooms. Here, with long term patients who have infectious diseases, the robot is routinely used to clean the bathroom.

In 2015, Sonoma Valley Hospital, which typically has a low infection rate, had only one case of hospital-acquired infection, or HAI.

"It has dramatically reduced our HAI rate," Mathews said. "It's been quite significant."

The robot emits intense C-band ultraviolet light, or UV-C, that kills bacteria, spores, fungus, and viruses in four minute intervals and can completely disinfect a room in 12 minutes or less. It works by preventing cell replication by causing germs' DNA to break down, preventing cell replication. It knocks out germs as strong as Ebola, and Methicillin-resistant Staphylococcus aureus. Commonly known as MRSA, the bacterium causes infections in different parts of the body and is tougher to treat than most strains of Staphylococcus aureus — or staph — because it's resistant to some commonly used antibiotics.

Mathews said it has also helped to stem cases of Clostridium difficile infection, an organism that is a particular challenge in California.

Xenex Disinfection Services is based in San Antonio, Texas. The company rolled out the first robot in 2010 and the latest model in January. More than 350 hospitals across the country use the robots.

UV technology for disinfecting has been around for decades but used with toxic mercury bulbs.

"Xenon [can produce light that] is 500–2,000 times more intense than the sun and is an inert gas, more environmentally friendly than mercury," said Hart.

While UV-A and UV-B are potentially harmful wavelengths in sunlight, Xenex uses UV-C, which can't penetrate glass, plastic, clothing or the top layer of skin. While prolonged UV-C exposure can be harmful to eyes and skin, the Xenex robot has several safety features to prevent accidental exposure.

The robot is designed to operate only in an unoccupied room. If someone walks in while the device is operating, a triple-sensor motion detector will stop the light pulses in milliseconds if the room door is opened, before anyone can enter. An external "stop" button also provides an immediate shutdown should anyone need to re-enter the room before a cycle is complete.

CLARIFICATION: Xenon is 500 - 2,000 times more intense than the sun, not 20,000.

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