Robots Help Fight Ebola

Using four wheels and ultraviolet (UV) light, robots may be a key player in helping to fight Ebola. Called the pulsed Xenon UV Disinfection system by its manufacturer, these robots clean hospital facilities more efficiently and thoroughly than a human-staffed cleaning crew.

The robots are manufactured by Xenex Disinfection Services, a company located in San Antonio, Texas, and are starting to prove essential for sterilized environments. Appearing like a tall R2D2 from Star Wars, the drones currently operate in three military medical centers treating Ebola and 250 other U.S. hospitals.

Ultraviolent light comes in three types: UV-A, UV-B, and UV-C. The A and B types exist naturally on Earth and are best known causing sunburns. UV-C is filtered out by ozone layer and does not exist in nature. As such, bacteria and viruses have no defense against it and when exposed to those rays, the infectious organisms die.

Xenex robots send out 1.5 pulses of UV-C light per second around a 10-foot radius. It takes about five minutes to thoroughly clean a room and the light penetrates tight spots that are either overlooked or inaccessible to humans.

Using UV light to disinfect is not a new technology. Previously, UV light was produced by mercury vapor bulbs that were not only toxic but slow acting, making it an unsuitable means of keeping hospitals clean. The new technology uses Xenon, which is a non-toxic gas. It can create the rays and eradicate germs much more quickly than any previous UV technology.

To use them, the robot is wheeled in the room by a human operator. The operator leaves the device in the room, closes the door, and activates it remotely. This precaution is necessary since UV-C rays can cause eye damage. UV-C cannot penetrate windows, walls, or glass but as an extra safety precaution, the robot deactivates immediately if it detects motion.

Besides disinfection, other applications are also being considered for robots so they can help fight Ebola. With human contact being the primary means of spreading the infection, robots can facilitate interviews between patients and health workers. They can also haul biohazard waste and even move living patients or dead bodies.

One possibility for these applications is already being considered. The General Dynamics Land Systems MUTT is a robotic wagon that could be retrofit for medical purposes and help West African and U.S. military health workers. However, challenges remain as hospitals in West Africa do not offer the same pristine conditions these robots are designed for including flat floors, Wi-Fi access, enough electricity, and batteries.

While applications are recognized, there are no plans to send robots to West African hospitals as of yet. However, they are used in the military facilities where health care workers find them efficient and reassuring.

The Xenex robots can not only help fight Ebola, but they are proving essential for controlling opportunistic infections in hospitals. The rate of hospital-contracted infections steadily increased even in advanced Western countries, putting additional strain on medical resources. Hospitals that started using Xenex's UV-C technology reported a significant reduction in secondary infections.

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