Evaluating the Use of UVC Light Devices in a Clinical Setting to Reduce Pathogens on Computer Workstations

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Hospitals are challenged with trying to enforce infection control policies. Traditional chemical disinfection practices have been used in hospitals for decades. Typical chemical disinfection products rely on a surface to be completely covered, and to remain wet for upwards of 5 minutes, to effectively kill viruses and microorganisms.

UVC is an extremely effective form of disinfection, killing a wide array of harmful organisms including bacteria, viruses, moulds, and spores. This method was studied as an addition to traditional surface disinfection practices.

Small UVC devices are starting to be made available to disinfect high touch surfaces like touchscreens, kiosks, keyboards, and mice. These devices mount on a screen or over a keyboard and emit a low dose UVC light. These devices run routinely (5 minutes / hour) and have a motion sensor that will turn off the light when a user approaches, and will turn on again when there is no activity. Testing in laboratory settings have seen a 99.996% reduction in C. diff after 30 minutes of UVC exposure and a 99.998% reduction in MRSA after 15 minutes of UVC exposure.

In March of 2019, HCA Houston South East, in Houston, Texas, installed 53 UVC devices on computer workstations throughout their MICU. These devices were installed on 16 mobile carts and 37 in room computer workstations. Prior to installation of the UVC devices, 53 keyboards were swabbed and cultured revealing 71% of the keyboards having bacteria (Staphylococcus, Bacillus, Diphtheroid and Enterococcus). One keyboard contained a Vancomycin-resistant Enterococci also referred to as a “super-bug”. The UVC devices ran for 2 weeks, and all subsequent swabbing turned up negative for any organisms.

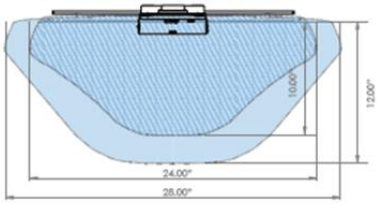
Continuing advancements in automation in all industries have led to increased productivity, efficiency, reliability, and confidence in effectiveness. Automation in infection control, specifically in using UVC automated disinfection devices, is an enhancement to traditional infection control practices that require human intervention, accuracy, and reliability. Ultimately this automation has the ability to significantly reduce HAIs.

COVERAGE AREA

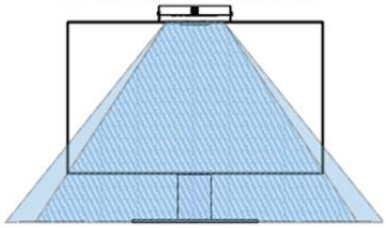
0° Rotation Coverage Area

15° Max Rotation Coverage Area

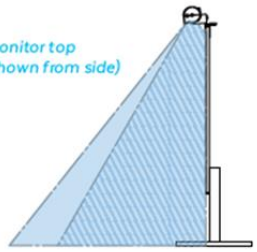
monitor top (shown from above)



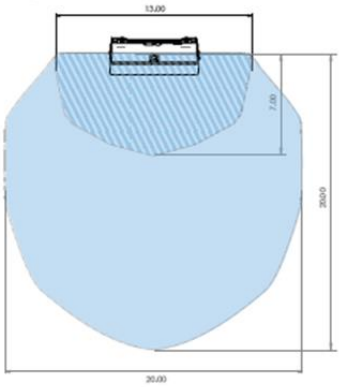
monitor top (shown from front)



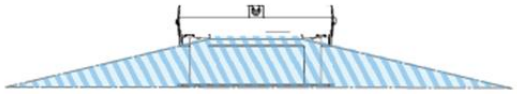
monitor top (shown from side)



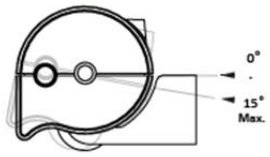
keyboard stand (shown from above)



keyboard stand (shown from front)



rotational adjustment for tilt



keyboard stand (shown from side)

PRE-DISINFECTION KEYBOARD ANALYSIS

Bacteria Isolated	Percent of Keyboards Positive
Bacillus spp.	40.4%
Staphylococcus spp.	30.8%
Enterococcus spp. Non-VRE	3.8%
Enterococcus spp. VRE	1.9%
Diphtheroid spp.	1.9%

POST-DISINFECTION KEYBOARD ANALYSIS

Bacteria Isolated	Percent of Keyboards Positive
Aerobic Bacteria	0%
Anaerobic Bacteria	0%
methicillin-resistant Staphylococcus aureus (MRSA) Screening.	0%
vancomycin-resistant Enterococci (VRE) Screening	0%