



Cleveland Clinic

# Sparring with Spores: Ultrasounds as a vector for pathogen transmission in the intensive care unit



think beyond the possible



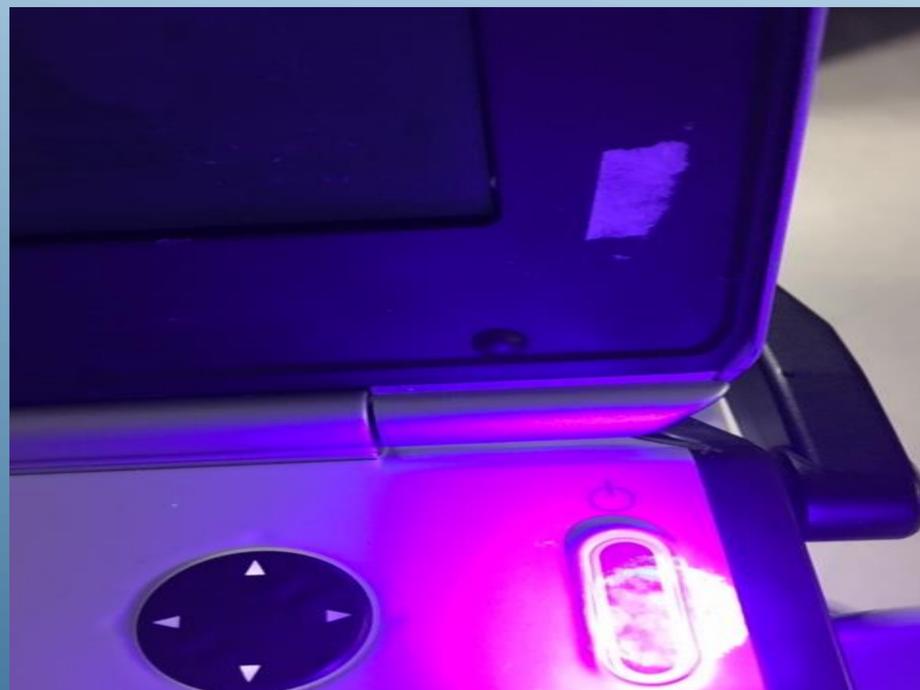
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## Background

- Portable equipment that is shared among patients can be a potential source of pathogen dissemination.
- In busy healthcare settings, cleaning of shared medical equipment may be suboptimal.
- In addition, equipment such as ultrasound probe heads present a challenge because sporicidal cleaning solutions such as bleach cannot be used.

## Methods

- We conducted a culture survey of ultrasounds in 15 intensive care units (ICUs) at a large tertiary care referral center, including medical, surgical, neurology, cardiology, and cardiovascular ICUs.
- Multiple high-touch surfaces on different types of ultrasound equipment used in the ICUs were swabbed to assess for the presence of *Clostridium difficile* and gram negative bacilli.
- To assess cleaning, a fluorescent marker visible only under UV light was placed on high-touch surfaces on each of the cultured ultrasounds and a black light was used determine if the marker was removed after 24 hours and again after 1 week.



## Results

- Of 15 ultrasounds cultured, 7% were contaminated with *C. difficile* spores and 7% were contaminated with gram-negative bacilli.
- Based on fluorescent marker removal, only 20% of the ultrasounds were cleaned within 24 hours and only 31% were cleaned within 1 week.
- Ultrasounds with touchscreens were cleaned more frequently than those with no touchscreen. For equipment with a combination of touchscreen features and knobs, the touchscreens were cleaned more often than the knobs which often had residual marker even after 7 days.

## Conclusions

- Ultrasound equipment can be a vector for transmission of *C. difficile* and other pathogens in critical care settings.
- In our facility, cleaning of ultrasound equipment was suboptimal, particularly for ultrasounds that did not have a touchscreen interface.
- Since ultrasounds are being employed in critical care settings with increasing frequency, there is a need for improved methods for cleaning and disinfection.

## References

- Attia F1, Whitener CJ, Hnatuck P, Stolberg D, Julian KG. Monitoring of cleaning practices for portable, multiuse medical equipment. *Infect Control Hosp Epidemiol.* 2013 Dec;34(12):1331-3. doi: 10.1086/673991.
- Rogues AM, Boulard G, Allery A, Arpin C, Quesnel C, Quentin C, Bebear C, Labadie JC, Gachie JP. Thermometers as a vehicle for transmission of extended-spectrum-beta- lactamase producing *Klebsiella pneumoniae*. *J Hosp Infect.* 2000 May;45(1):76-7.
- Skowronek P, Wojciechowski A, Leszczyński P, Olszewski P, Sibiński M, Polgaj M, Synder M. Can diagnostic ultrasound scanners be a potential vector of opportunistic bacterial infection? *Med Ultrason.* 2016 Sep;18(3):326-31. doi: 10.1152/mu.2013.2066.183.sko.