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The Effectiveness of Cleaning Protocols in Medical School OMM Labs by Medical Students

ROWAN-VIRTUA
Osteopathic Medicine

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Background

- Health care associated infections (HAIs) are infections transmitted while receiving treatment in healthcare settings. Proper and adequate cleaning of contaminated surfaces in healthcare settings is important for reducing microbial contamination of surfaces and subsequent risk for HAIs.
- The need for adequate cleaning has only increased in light of the COVID pandemic. This shift has also been seen in osteopathic medical school OMM labs.
- Observations have shown that medical students do not take the care necessary to adequately disinfect examination tables.

Methods

- ATP bioluminescence assay used to audit effectiveness of the existing cleaning protocols

$$Luciferase + D - luciferin + O_2 + ATP = luciferase + oxyluciferin + CO_2 + AMP + PP_i + light$$

- Assays performed using AccuPoint Advanced HC Reader (Neogen Corporation, Lansing, MI).
  o Sampler cartridges removed from refrigerator 1 hour prior to use and warmed to room temperature
  o For collection, sampler was removed from cartridge by handle with caution to not touch or allow tip to touch any other surface
  o Sample: Location A - Face cradle, where students position their face while lying prone (see picture)
  o Sample: Location B - Measured 10 cm x 10 cm box beginning 50 cm down from midline of face cradle (see picture)
  o Swabbing technique
    • Started in one corner of box and formed a continuous back-and-forth line in a zigzag pattern.
    • Repeated pattern with slightly less pressure from starting point 90° from the first (see diagram)
  o Sample processing
    • Sampler inserted into cartridge, fully depressed, swirled clockwise for 2 seconds and placed into sampler compartment of the AccuPoint Advanced HC Reader
- Standard benchmark threshold of ATP level of 500 RLU/100cm^2 was used

Discussion

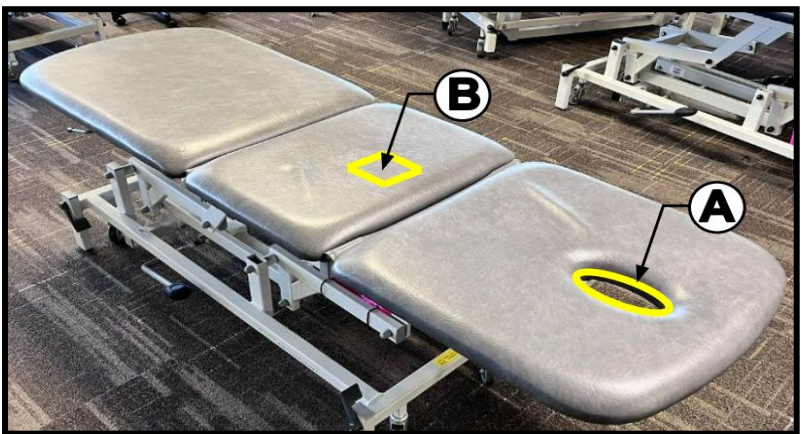**Table 1:** Failure rates in initial and terminal samples.

	Initial samples (N = 20)			Terminal samples (N = 20)		
	Passes	Fails	% Fails	Passes	Fails	% Fails
Location A (Face cradle)	8	12	60	0	20	100
Location B (Mid-torso)	20	0	0	5	15	75

**Table 2:** Median RLU and range of RLU data points of initial and terminal samples.

	Initial samples (N = 20)		Terminal samples (N = 20)		z-value	p-value	Effect size Cohen's d
	Median (RLU)	Range (RLU)	Median (RLU)	Range (RLU)			
Location A	769	29-2422	4295	2269-12919	-3.80	0.00008*	2.20
Location B	128	1-335	656	112-1922	-3.90	0.00012**	1.80

* p-value calculated from Wilcoxon signed rank test for location A initial and terminal samples

** p-value calculated from Wilcoxon signed rank test for location B initial and terminal samples

- Data shows that medical students failed to disinfect the face cradle (location A) in addition to missing the large the mid-torso area (location B).
- High pathogen presence in areas such as the face cradle is concerning due to this region's extensive direct skin contact and the increased potential pathogen infection given the close proximity to the nose and mouth.
- An incidental finding was also observed in the face cradle region regarding the initial samples. Even though Environmental Services cleaned the face cradle statistically better than the medical students (p = 0.0008), the data showed that the Environmental Services still did not adequately disinfect the face cradle. There was a 60% failure rate, 12 out of 20 samples failed.

OMM examination table with location A & B labeled.

Failed Disinfection Tests Between Initial and Terminal Samples
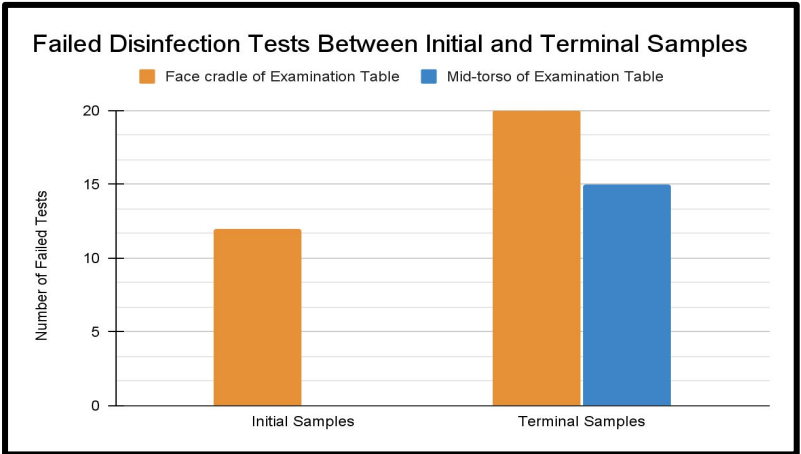
Number of Failed Tests in Initial and Terminal Samples

Osteopathic Medical Schools should **update current disinfection** protocols to **reduce** the **spread for pathogens.**