The Scoop on Scopes: Microbial Culturing and Borescope Examination of Endoscopes to Increase Patient Safety in an Acute Care Hospital

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Background

Endoscopes are diagnostic tools used for imaging and biopsies in healthcare settings. These devices contain complex channels and components that can be difficult to clean and assess for damage. Literature describes endoscopes as a potential vector for transmission of multi-drug resistant organism outbreaks and hospital acquired infections (HAIs) if improperly reprocessed. A comprehensive endoscope maintenance program involving microbiologic cultures (MC) and borescope examination (BE) of the internal channel can increase patient safety.

Methods

Endoscopes were determined to have MC and BE performed quarterly, biannually, or annually based on a risk assessment.

Endoscope Reprocessing — Endoscopes are reprocessed per facility protocol in the Central Sterile Processing (CSP) Department or Endoscopy Department.

BE Method — A disinfected borescope is sent through the endoscope channel. A BE competency is used to determine if moisture/damage is minor (1), moderate (2), or major (3).

MC Method — A "flush, brush, flush" method is utilized for MC. 20mL of sterile water is flushed through the channel, a brush is sent through the channel and then cut into the specimen cup followed by a final flushing with 20mL of sterile water.

Culturing Results

Between January 2022 and December 2023, 302 MC were performed with 91 (30%) having at least one colony forming unit (CFU) of bacterial growth.

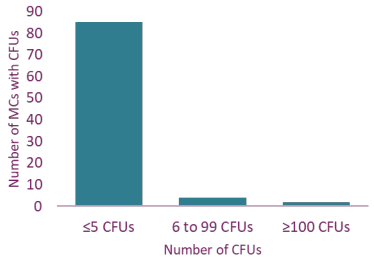


Figure 1. MC Results by CFU. The majority of MC (85) had ≤5 CFUs of microbial growth (93%). Out of those, 62 MC only had 1 CFU of growth (68%). Only 2 MC (2%) had colony counts that were ≥100 CFUs and were considered too numerous to count (TNTC).

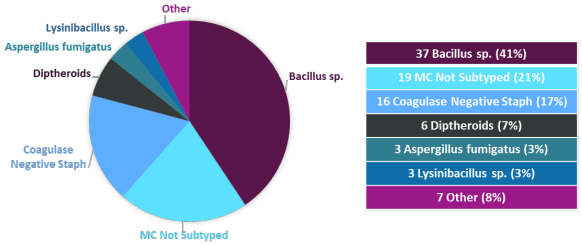
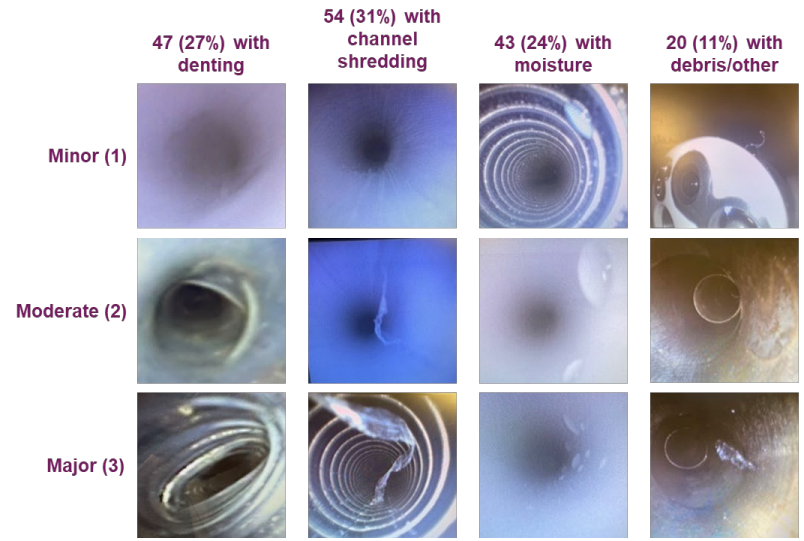


Figure 2. MC Results by microbial type. Bacillus sp. was the most common type of microbe identified after MC. Due to laboratory speciation limitations, 21% of MC could not be subtyped. This included the 3 MCs with the highest microbial counts.

Borescope Results

- BE was performed on 177 endoscopes and findings were ranked based on the BE competency
- The most common borescope findings were internal and external denting, channel shredding resulting in filamentous debris, moisture and various other debris and channel discoloration
- 30 endoscopes with major damage seen on BE or positive MC were recommended to be sent to the manufacturer for repair



Implications

- MC of endoscopes monitors device reprocessing and enhances surveillance of potential areas of contamination. This aims to reduce the risk of HAIs related to endoscope transmission events in patients
- BE ensures device quality monitoring, and when used with an established competency, helps to determine the need for manufacturer repair.
- Development of an endoscope maintenance program with collaboration of key stakeholders is crucial to this active surveillance process

Future Actions

Positive MC Results	• Our team will continue to perform MC surveillance • Any positive result will be investigated, retested to confirm the result, and sent for repair if needed
Moisture Retention	• Upon seeing varying degrees of moisture, our teams initiated an extra scope drying step after reprocessing • After implementation, we have seen a vast reduction in water retention in endoscopes
Denting	• Education is continuing with our teams to ensure that devices are stored, utilized and transported in ways to reduce internal and external device denting
Debris/Other	• Continued education on proper cleaning and brushing of endoscope internal channels • The CSP Department purchased a borescope with plans to implement internal visualization in their reprocessing steps

References

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