Transmission of multidrug-resistant organisms and other pathogens via contaminated endoscopes: Can buildup biofilm be eliminated by routine cleaning and high-level disinfection?

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1. Introduction

• Endoscopes are reusable devices that undergo through cleaning and high-level disinfection (HLD) after each use.
• Biofilm can develop not only in biologically kill or remove and biofilm-damaged formations.
• Our endoscopic cleaning and high-level disinfection (HLD) use and biofilm-damaged formations.
• Biofilm consists of a layer of biofilm-removable biocidal agents that can detect and clean a risk to patient safety.
• Endoscopes are reusable devices that undergo through cleaning and high-level disinfection (HLD) after each use.

2. Aim

To assess the effectiveness of current reprocessing methods at preventing biofilm formation or removing it from endoscope channels.

3. Methods

• Sample collection and biopsy processing: Before disinfection, endoscope channels were sampled for analysis.
• Re-processing deficiencies due to complex endoscope design.
• Studies were carried out in 141 patient-ready GI endoscope channels from 56 endoscopes in clinical use.
• More than 10% of 1,489 channels tested positive for organic debris after manual cleaning. (Figure 2)

4. Results

• Multidrug-resistant (MDR) organisms (e.g., MDR Pseudomonas aeruginosa) were detected in various endoscope channels in clinical use.
• Biofilm can develop not only in EGD, but also in ERCP, colonoscopy, and bronchoscopy channels.
• Nonadherence with reprocessing guidelines was common and led to infection transmission.
• Residual contamination was detected in various endoscope channels in clinical use. (Figure 2)
• More than 10% of 1,489 channels tested positive for organic debris after manual cleaning.
• Analyzing endoscope contamination after cleaning or HLD in clinical studies. (Table 1)

5. Conclusions

Recommended reprocessing may not eliminate clinically-relevant biofilm.
• Biofilm biofilm can persist in fully reprocessed endoscope channels.
• Pathogens reside in biofilm biofilm and increase the risk of infection for exposed patients.
• Further research is needed to:
  - Evaluate the occurrence of residual biofilm after reprocessing.
  - Evaluate the role of residual biofilm in transmitting infections.
  - Determine the importance of active patient surveillance and routine instrument monitoring to ensure patient safety.
  - Develop reprocessing products with greater effectiveness against biofilm biofilm.

References


Table 2: Pathogens found in biofilm biofilm after reprocessing.

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Figure 1: Microbial growth in 85 endoscopes in clinical use.

Figure 2: Organic debris remaining in various endoscope channels after cleaning.

Figure 3: Guideline nonadherence and reprocessing steps performed incorrectly.

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