

# Microbial Surveillance Testing of Internal Channels of Flexible Endoscopes

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## Extraction of Samples from Flexible Endoscopes

Regulatory bodies like AAMI, AORN and SGNA in the United States recommend that healthcare facilities consider implementation of a microbial surveillance program for endoscopes

To detect bacteria in internal channels of flexible endoscopes, the following channels were extracted and tested with traditional microbial cultures and rapid gram negative bacteria tests:

- 90 channels from two endoscopy units from a multisite healthcare system
- 202 channels received from third party endoscope repair facility

## Test Approach

- Endoscope channel samples were flushed with sterile water and the sample extract was aliquoted to perform microbial cultures and rapid gram negative bacteria testing.
- The two test methods were compared to check the level of agreement between each other.

## Gram Positive and Gram Negative Bacteria

Gram Positive Bacteria: Mostly normal skin flora, non pathogenic e.g. *S. epidermidis*, *S. salivarius*

Gram Negative Bacteria: Implicated in hospital acquired infections e.g. *E. coli*, *Legionella*, *Pseudomonas*, *Klebsiella*, *Salmonella*

## Rapid Testing for Gram Negative Bacteria

- Test based on enzyme technology that detects Gram Negative bacteria.
- Enzymes specific to gram negative bacteria hydrolyze the substrate in the reagent vial.
- This generates a fluorescence read by the fluorometer, which in turn gives a reading.
- Test is sensitive to up to 10 CFU of gram negative bacteria
- Testing can be performed directly in the endoscopy clinic or healthcare facility, thus not requiring sending the sample to a laboratory for testing or waiting days for a culture result.
- Complies with AAMI ST91

## Healthcare Facility Testing

- A study was conducted at 2 endoscopy units within a multisite healthcare system in midwestern United States.
- Prior to the study the locations were found to be compliant with each manufacturer's most recent IFU.
- At each facility, instrument channels from 45 scopes were sampled with a total of 90 scopes being sampled between the 2 facilities:
  - 30 post manual cleaning
  - 30 post high level disinfection
  - 30 in storage
- Each of the 90 endoscopes were tested for microbial growth via agar plate and rapid gram negative culture test.
- The rapid gram negative test had similar results to the microbial culturing.

## Results from Culturing and Gram Negative Testing From Samples Obtained From the 2 Healthcare Facilities

- Out of the 30 endoscopes sampled post manual cleaning, all 30 showed growth in culture and gram negative bacteria test.
- Out of the 30 endoscopes sampled post high level disinfection, 29 scopes showed no growth in either test. 1 scope failed in the gram negative test but had no growth in the culture plate (MacConkey agar).
- Out of the 30 endoscopes sampled in storage, there was a 1 CFU count on 2 scopes and 1 scope failed in the gram negative test.
- The analysis showed good level of agreement between the two tests.

## Results from Culturing and Gram Negative Testing from Channels sent by Third Party Repair Facility

- Out of the 202 channel samples received till from Jan. 2017 to Dec. 2018, gram negative bacterial growth was observed in 22 samples.
- There were no instances of positive readings for gram negative bacteria test without growth on culture plates.
- 15 of the 22 (~68%) of the channels that were positive for gram negative bacteria on culture plates, had positive results for the NOW! test.

## Discussion

With both the sets of channels tested, the results for the rapid gram negative tests and microbial culturing showed a substantial level of agreement. This suggests that gram negative testing can be a useful rapid tool for post disinfection microbial surveillance of endoscopes. While the test does not replace culturing, it certainly can be used on a more frequent basis because of its quicker turnaround time as compared to traditional culturing.