FLEXIBLE ENDOSCOPES
Case Study

Device-Related Urinary Tract Infection Outbreak

Does your facility have a process for determining which endoscope was used for each patient?

Is there a process in place to evaluate the method used to reprocess endoscopes (for example, high-level disinfection versus sterilization)?

Do you follow the endoscope manufacturer’s instructions for the selection and use of channel-cleaning brushes, including the correct size and type of brush?

A urology resident in an academic medical center reported seeing five patients with signs of urinary tract infections in the emergency department over one weekend. The previous week, the surgical resident had performed ureteroscopy procedures on these patients using a flexible ureteroscope. Urine cultures obtained from the five patients in the emergency department grew an identical bacterial organism, a gram-positive cocci.

The attending surgeon contacted the OR manager, the sterile processing department manager, and the infection preventionist responsible for the unit. The infection preventionist initiated an outbreak investigation and removed from service all ureteroscopes that could have been used on the five patients. The microbiology lab cultured the ureteroscopes internally and externally. The vendor for the endoscope processor examined the processor to ensure it was working correctly. The sterile processing manager observed the personnel responsible for cleaning and sterilizing ureteroscopes for correct cleaning methods and adherence to established cleaning protocols. She discovered that processing personnel were not using a clean channel brush for each endoscope.

The first culture results for the five ureteroscopes came back positive for the gram-positive bacteria. The microbiology lab repeated the cultures after the endoscopes were recleaned and reprocessed, and three of the five ureteroscope cultures came back negative. Because of their design and incompatibility with sterilization, the two scopes that remained positive for bacteria were removed and replaced with endoscopes that require sterilization. No further infections occurred. The sterile processing department manager revised the policy to include using single-use brushes for cleaning and discarding them after each use, and it became part of the electronic record to document the endoscope serial number for each patient.

TAKEAWAY

Manual cleaning is the most important step in reprocessing flexible endoscopes. The manufacturer’s instructions should be followed in the selection and use of endoscope cleaning brushes. Either a single-use or a clean brush should be used for each endoscope reprocessed. Identifying which endoscope was used for each patient is a tracking mechanism that can be used in the event a device-related infection is suspected or a breach in the cleaning protocol is found.

Reference

Parton L, Schomer K. Urinary tract infection outbreak: investigation, interventions, and outcomes. Poster presented at: The 60th Annual AORN Congress; March 2013; San Diego, CA.

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Flexible Endoscope-Related Outbreak with a Multi-Drug Resistant Organism

Do you isolate patients who have a multi-drug resistant organism (MDRO) in your endoscopy suite?

Do you follow the manufacturer’s instructions for use when cleaning endoscopes?

Seven cases of carbapenemase-producing *Klebsiella pneumoniae* were identified by active surveillance in two tertiary hospitals. All seven patients had undergone endoscopic retrograde cholangiopancreatography (ERCP) at the same endoscopy center within the past 60 days. An investigative team initiated an outbreak investigation that included the state department of health. The investigation revealed two breaches in process: one of the referring hospitals did not isolate patients who tested positive for MDROs, and personnel at the endoscopy center were not following the manufacturer’s instructions for cleaning endoscopes.

The investigative team examined the elevator of an ERCP endoscope, a small movable piece at the distal end of the scope, and found biodebris in the elevator channel following cleaning. Samples obtained from the elevator cultured carbapenemase-producing *Escherichia coli*. The investigative team then requested screening of 46 additional patients who might have been exposed to an inadequately processed endoscope. The screening revealed that three more people were colonized with carbapenemase-producing organisms.

The endoscopy center personnel received instructions on how to correctly clean ERCP scopes, including special attention to cleaning the elevator channel with a specialized channel cleaning brush. Isolation precautions became part of the endoscopy center’s policy and procedure for MDRO patients upon admission.

**TAKEAWAY**

Prompt investigation of a potential flexible endoscope-related outbreak of infections prevented further exposure of patients. Forming a multidisciplinary team to investigate the outbreak, taking immediate action to prevent further exposure, and implementing best practices kept the outbreak contained and prevented further device-related infections.

**References**

Patient-to-Patient Transmission During Colonoscopy

Does your facility have a sufficient inventory of flexible endoscopes to allow for adequate processing time between uses?

Was a risk assessment conducted in your facility to determine which endoscopes and accessories require high-level disinfection versus sterilization?

A 55-year-old man (Patient 1) and his 54-year-old wife (Patient 2) presented to their physician with hepatitis-like symptoms that included nausea, abdominal pain, and conjunctival icterus, and both tested positive for hepatitis C virus (HCV). Both patients had frequently donated blood and had tested negative for HCV during their most recent blood donation, which had occurred approximately 10 months earlier. Seven months earlier, both patients had undergone a colonoscopy on the same day at the same clinic.

Suspecting that the infection could have resulted from the colonoscopy, a team of physicians undertook an investigation to determine whether any other HCV-positive patients had undergone colonoscopies on the same day as Patients 1 and 2, and whether any of the staff members performing endoscopies at the clinic were HCV-positive. The surgeon, anesthesia professional, nurse, and nurse’s aide who were involved in performing the endoscopies all tested negative for HCV. The surgeon had performed only one other colonoscopy procedure on the same day, for a 42-year-old woman (Patient 3) with a history of polypectomy. Patient 3’s history also included positive HCV serology for one year. Validation of patient-to-patient transmission of HCV was proven by sequencing the nucleotides in the various HCV isolates.

In investigating the procedures used for colonoscopy and endoscope disinfection, the team determined that the surgeon had used the same colonoscope for all three procedures. The sterile processing staff had cleaned the colonoscope between the procedures and then soaked the colonoscope in glutaraldehyde, a high-level disinfectant. The investigators’ report indicated the cleaning procedure did not include brushing the biopsy-suction channel with a cleaning brush, and the accessories that breached the mucosa were not sterilized after each use. The investigators suspected that inadequate processing of the endoscopes and accessories was the cause of infection transmission.

Omitting steps during cleaning of flexible endoscopes can allow debris and biofilm to remain in endoscope channels, which interferes with disinfection or sterilization. Tissue biopsy forceps breach the intestinal mucosa and can be an avenue to introduce pathogenic organisms. Inadequate cleaning and disinfection of endoscopes and accessories may result in patient-to-patient transmission of infection.

References