Endoscopes linked to outbreak of drug-resistant E. coli

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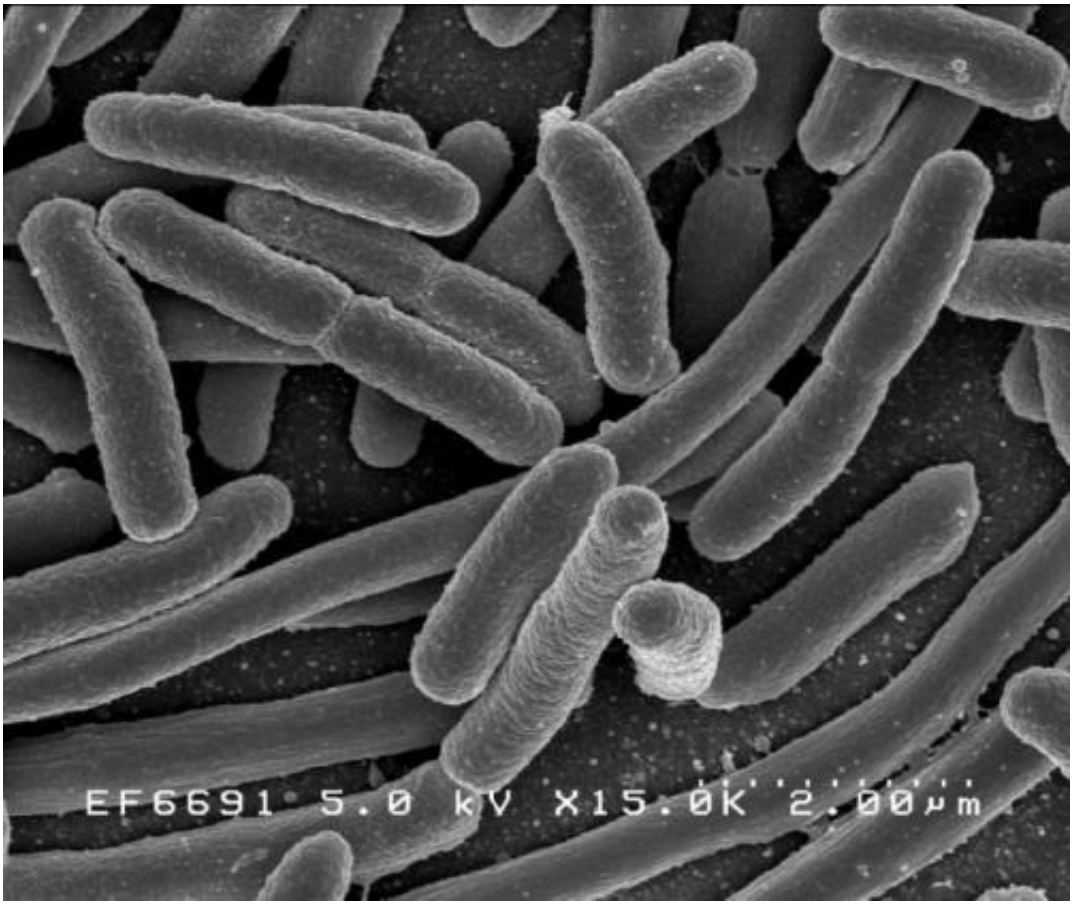

Escherichia coli. Credit: Rocky Mountain Laboratories, NIAID, NIH

An outbreak of a novel *Escherichia coli* (*E. coli*) strain resistant to antibiotics has been linked to contaminated endoscopes in a Washington state hospital. The study indicates that industry standard cleaning

guidelines, which were exceeded by hospital staff, may not be sufficient for sterilizing endoscopes adequately. The research was published online in *Infection Control & Hospital Epidemiology*, the journal of the Society for Healthcare Epidemiology of America.

"Although the endoscopes had been reprocessed according to industry standards, we identified contaminated endoscopes that might have facilitated the transmission of the multidrug-resistant organism," said Kristen Wendorf, MD, MS, lead author of the study. "In the wake of the recent outbreak of CRE due to contaminated endoscopes, we suspect endoscope-associated transmission of bacteria is more common than recognized and not adequately prevented by current reprocessing guidelines."

During a period of November 2012-August 2013, a hospital in Washington state experienced an outbreak of the rare *E. coli* bacteria, initially identified through molecular testing of isolate bacteria by the Washington State Public Health Laboratory. Testing identified a cluster of carbapenem-resistant *E. coli* with distinct genetic markers, suggesting a common source.

Researchers collaborated with hospital staff to conduct a public health investigation to determine the extent of the outbreak, identify potential sources of transmission and design, and implement infection control measures to prevent future cases.

The investigation identified 32 patients with the specific bacteria. All patients had severe pancreatic or biliary disease and had undergone endoscopic retrograde cholangiopancreatography (ERCP). A manufacturer review of the endoscope cleaning procedures found the hospital's process to be above industry standards. However, the review found serious defects in the endoscopes that were not apparent during hospital testing. While testing the scopes for bacteria, researcher also

found half of the reprocessed scopes harbored bacteria, including the two used in ERCP procedures that tested positive for the specific *E. coli* bacteria. Even after an overhaul by the manufacturer, these scopes harbored bacteria in the elevator channel.

More than 30 percent of patients infected with the bacteria died during the investigation and seven of the deaths occurred during hospitalization within 30 days of the date the *E. coli* isolate was obtained, although it is not possible to determine whether an infection contributed to the deaths. The primary diagnoses for the patients who diedincluded pancreatic cancer, colon cancer, primary sclerosing cholangitis, and renal/pancreatic transplant.

"The outbreak was detected through a public health surveillance program that was enhanced with the addition of molecular testing, and would likely have gone undetected otherwise," said Wendorf. "Routine surveillance is crucial for promptly recognizing outbreaks and monitoring and responding to the ongoing threat from multidrug-resistant organisms in healthcare facilities."

As a result of this outbreak, the hospital has undertaken costly and extraordinary measures to minimize risk for endoscope-related infection transmission. The facility now quarantines ERCP scopes after cleaning and does not release them for use until cultures are negative at 48 hours. Despite these additional safeguards, the hospital's scopes continue to show signs of bacteria after cleaning and require additional cleaning before the next use.

While there are industry standards for cleaning these devices, maintenance guidelines are not available from the manufacturers. The researchers note the need to include evaluation and maintenance schedules in the approval processes of these devices in moving forward to ensure adequate cleaning processes.

More information: Kristen Wendorf, Meagan Kay, Christopher Baliga, Scott Weissman, Michael Gluck, Punam Verma, Maria D'Angeli, Jennifer Swoveland, Mi-Gyeong Kang, Kaye Eckmann, Andrew Ross, Jeffrey Duchin. "Endoscopic Retrograde Cholangiopancreatography-Associated AmpC Escherichia coli." Infection Control & Hospital Epidemiology. Web. (March, 2015).

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