

# Nonoperative treatment of appendicitis is increasing, may raise death risk

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About twice as many U.S. adults with appendicitis are being treated without an operation compared with 20 years ago, and nonoperative management of an infected appendix is tied to a higher death rate in the hospital, according to new study findings. The study results, presented at the American College of Surgeons Clinical Congress 2017, are concerning given that an operation usually cures the appendicitis, the researchers report.

Acute, or sudden, appendicitis has long been considered a surgical emergency, with an estimated 300,000 cases occurring yearly in the nation.<sup>1</sup> However, over the past 20 years several European studies have found that some patients with uncomplicated appendicitis—meaning the appendix has not "burst"—can successfully treat their appendicitis by taking antibiotics alone.<sup>2</sup>

"Recent data from European studies appear to have changed surgical practice for appendicitis in the United States," said the study's principal investigator, Isaiah R. Turnbull, MD, PhD, FACS, assistant professor of acute and critical care surgery, Washington University School of Medicine, St. Louis. "Of concern, we found the risk of dying during an appendicitis hospitalization—although still rare—was significantly higher in patients receiving nonoperative management than in patients who had an operation early in their hospitalization."

The researchers analyzed the type of treatment for 477,680 adults with a primary diagnosis of appendicitis between 1998 and 2014 included in

the National Inpatient Sample, a database of hospitalized patients representing more than 96 percent of the U.S. population.

Although the database did not specify whether the appendix had ruptured, Dr. Turnbull said they excluded patients from the study who had a peritoneal abscess, a fluid collection in the lining of the abdominal and pelvic wall that is usually linked to a ruptured appendix.

Additionally, in 135,856 patients with appendicitis from 2010 to 2014, the investigators compared patient characteristics and outcomes. A total of 131,162 patients underwent an early operation—primarily an appendectomy (surgical removal of the appendicitis) on the day of hospital admission or the next day. Another 4,694 patients received nonoperative management, defined as no operation or placement of an abdominal drain (done usually to treat an abscess). Whether these patients received antibiotic therapy was unknown from this dataset, according to Dr. Turnbull.

Over the study period, the proportion of patients treated with an early operation decreased from 94.6 percent to 92.1 percent, the investigators reported. Use of nonoperative management increased twofold, from 2.3 percent of patients with appendicitis in 1998 to 4.9 percent in 2014. Most of the remaining patients had an operation later than the second day in the hospital.

In the subgroup of patients from the most recent five-year period, those receiving nonoperative management were, on average, eight years older than patients in the early operation group (49 versus 41 years), according to the analysis. They also had a significantly higher comorbidity index (score of 1.35 versus 0.78), indicating more coexisting illnesses

The researchers found that the odds of dying, of any cause, during the hospitalization was 2.4 times higher for patients who had no operation

compared with those who underwent an early operation. Even after matching the cases in both treatment groups by age, sex, and comorbidity index, the investigators reported a nearly sixfold increased death rate in the nonoperative care group. Compared with 0.08 percent of surgically treated patients with appendicitis, 0.47 percent of the nonoperatively managed patients died in the hospital.

"Our findings suggest that U.S. surgeons are selecting elderly, sicker patients for nonoperative management, possibly because they believe these patients are not good candidates for an operation," Dr. Turnbull said.

"However," he continued, "these patients are at increased risk of a poor outcome if nonoperative management fails because they lack the physiologic reserve, or ability to tolerate illness."

Many of the European studies of antibiotic treatment of appendicitis excluded elderly patients<sup>3</sup> and had an average patient age that was much younger than in this U.S. database, Dr. Turnbull noted.

"I am concerned that surgeons here may be overextrapolating the European data and applying nonoperative management of appendicitis to patients for whom it is inappropriate," Dr. Turnbull said. "We as a community of surgeons need to consider whether nonoperative management of uncomplicated appendicitis, such as an antibiotics-first approach, is appropriate for these high-risk patients."

Dr. Turnbull stated that their study findings will inform future treatment decisions for patients with appendicitis at his institution, in the hope of improving patient selection for nonoperative management. More research is necessary, he added, to find the best way to manage elderly, sick patients with [appendicitis](#).

Provided by American College of Surgeons

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