

Fewer urinary tract infections seen postoperatively at ACS NSQIP-participating hospitals

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A new study of procedure-specific trends in postoperative complications finds that most of 10 types of operations have improved rates of surgical site and bladder infections since 2008. However, the researchers did identify an area for prompt quality improvement for another operation, pancreatectomy, for which surgical site infections (SSIs) have significantly increased during the same timeframe. The study is published online as an "article in press" on the *Journal of the American College of Surgeons* website in advance of print publication.

"Some past studies have shown overall improvement in surgical outcomes when their authors combined all types of operations," said study principal investigator Jason B. Liu, MD, MS, a third-year general surgery resident at the University of Chicago Medicine and an American College of Surgeons (ACS) Clinical Scholar. "However, we were concerned this approach could mask opportunities to find areas needing improvement for specific surgical procedures."

Therefore, Dr. Liu and his co-investigators analyzed more than 1.25 million cases of 10 frequently performed operations at hospitals participating in the ACS National Surgical Quality Improvement Program (ACS NSQIP). ACS NSQIP is the leading nationally validated, risk-adjusted, outcomes-based program to measure and improve the quality of surgical care in the private sector. Besides its core program that allows benchmarking surgical results with other hospitals, NSQIP

has a Procedure Targeted Program that includes additional procedure-specific data. From this program, the researchers selected the 10 operations with the highest volume and hospital participation from 2008 to 2015.

In addition to pancreatectomy (surgical removal of all or part of the pancreas), the procedures studied included colectomy, esophagectomy, hepatectomy, proctectomy, and thyroidectomy—removal of part or all of the, respectively, large intestine (colon) and bowel, esophagus, liver, rectum, and thyroid—as well as hysterectomy (removal of a woman's womb). Also included were total hip replacement, total knee replacement, and repair of a ventral hernia, also called an abdominal wall hernia.

The investigators tracked trends in six complications that can commonly occur in the first postoperative month and were included in NSQIP from 2008 to 2015 without a change in definition. These complications were pneumonia, kidney failure, SSIs, unplanned intubation (insertion of a breathing tube), urinary tract infection (UTI, also called bladder infection), and death.

Dr. Liu said, "The complications studied should be considered potentially preventable and can lead to a longer hospital stay, higher hospital charges, greater patient suffering, and an increased risk of death."

The research team analyzed each complication rate (which they called "outcome") for each of the 10 selected operations. All data underwent risk adjustment, which Dr. Liu said allows them to "compare apples to apples by accounting for patient differences outside the surgeon's control."

Operation and Complication with Greatest

Improvement

According to the study results, hepatectomy, which is performed to remove a cancerous or otherwise diseased portion of the liver, demonstrated the greatest improvement in complications over the eight-year study period. Also called liver resection, the operation had statistically significant decreases in four complications: UTIs, unplanned intubation, death, and kidney failure. In statistical analyses, the researchers estimated that 362 complications were avoided out of 10,000 liver resections performed in 2015 because of cumulative quality effects over the eight years.

The complication that reportedly improved the most for all procedures was UTI, which decreased significantly over the study period in all operations except hysterectomy and hernia repair. In 2015, an estimated 989 UTIs were avoided for every 10,000 operations, according to the authors.

In the United States, UTIs are the most common health care-associated infection, approximately 75 percent of which are linked to placement of a catheter.

Need for Improvement

The investigators reported that most of the operations studied demonstrated [quality improvement](#) over time but varied in magnitude and by type of complication. Although pancreatectomy showed lower rates of UTI, unplanned intubation, and death over the eight years, it had significantly increased SSI rates, which Dr. Liu said uncovers "an urgent need" for more quality improvement initiatives in this area. All hospitals caring for surgical patients can collaborate to improve the rate of surgical wound infections after pancreas removal, he suggested.

"Hospitals could implement their own quality improvement project or agree to participate in large multicenter studies examining interventions to decrease SSI rates after pancreatectomies," Dr. Liu said.

He added, "Overall, in ACS NSQIP, we have made considerable strides at improving the quality of certain operations; however, much work remains to be done."

Senior study investigator, Bruce L. Hall, MD, PhD, MBA, FACS, professor of surgery at Washington University in St. Louis and ACS NSQIP Consulting Director commented that "this study shows the power and importance of conducting a national registry of surgical outcomes based on high-quality clinical information. It provides insights into areas that are succeeding at improvement, and areas that continue to face challenges and might need more focused effort. Some procedures have really improved overall over time, like liver resections. Similarly, some complications have improved over time across procedures, like urinary infections. But some procedure and complication combinations have been harder to improve and probably need redoubled efforts, like infections after pancreas surgery," he said.

A priority of all ACS quality programs is to identify and fix clinical problems and surgical complications, explained Clifford Y. Ko, MD, MS, MSHS, FACS, who directs NSQIP as the Director of the ACS Division of Research and Optimal Patient Care, and is also a professor of surgery at the University of California-Los Angeles David Geffen School of Medicine.

"ACS NSQIP is one of the best methods for identifying 30-day surgical occurrences such as SSI," said Dr. Ko who is also a study coauthor. "The ACS has a number of initiatives and research projects regarding the development of interventions and implementations for lowering SSI rates."

More information: Jason B. Liu et al. Procedure-Specific Trends in Surgical Outcomes, *Journal of the American College of Surgeons* (2017). [DOI: 10.1016/j.jamcollsurg.2017.09.019](https://doi.org/10.1016/j.jamcollsurg.2017.09.019)

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