

Johns Hopkins Patient Safety Pilot Program Slashes Colorectal Surgical Site Infections (SSIs) By 33 Percent

Researchers Estimate Similar Interventions Nationwide Could Save More than \$100 Million Annually

Release Date: July 30, 2012

A patient safety team including researchers in the [Johns Hopkins Armstrong Institute for Patient Safety and Quality](#) reported a one-third cut in the rate of costly and potentially lethal surgical site infections (SSIs) following colorectal operations after requiring use of a simple safety checklist and urging caregivers to speak up if they see potentially unsafe practices.

The decreased incidence of SSIs, described by Johns Hopkins researchers in the August issue of the *Journal of the American College of Surgeons*, suggests that systematic creation of a culture of patient safety in which front-line staff members are encouraged to challenge anyone and anything that puts patients at risk can effectively address complex safety concerns in high-risk patients. Researchers estimate that, if applied to all types of surgical procedures, locally developed checklists and similar culture change programs could reduce the total number of SSIs by 170,000 and result in a nationwide cost savings of \$102 million to \$170 million annually.

“Applied to other areas of medicine, that cost savings could make a sizable dent in medical inflation while saving lives,” says senior author Martin Makary, M.D., M.P.H., an associate professor of surgery at the Johns Hopkins University School of Medicine.

As the most common complication after colorectal operations, SSIs occur in 15 to 30 percent of these patients, resulting in longer hospital stays, frequent readmissions and subsequent need for treatment, at an estimated cost of \$1 billion annually. In addition, disability and quality of life often are affected.

“We’re thrilled to see such a positive outcome in an area where it has traditionally been very tough to move the needle,” says study leader Elizabeth Wick, M.D., an assistant professor of surgery at the Johns Hopkins University School of Medicine. “Until now, there’s been little evidence on how to effectively address SSIs among this group of patients,” Wick explains, adding that the nature of colorectal procedures — cutting in the bacteria-rich environment of the bowel — lends itself to a high risk of infection.

The Johns Hopkins study reflects increasing pressure on hospitals to reduce preventable harm, Wick notes. The U.S. Centers for Medicare and Medicaid Services already is using SSI rates as a quality indicator and, in some instances, the agency is refusing to reimburse hospitals for the costs associated with treating these infections. But despite heightened attention and required reporting on process measures, SSI rates remain high, even among hospitals with near-perfect compliance with national guidelines, Wick says.

Using a pilot study protocol for high risk patients set by the American College of Surgeons National Surgical Quality Improvement Program, Wick and her colleagues collected baseline SSI rates after colorectal surgeries at The Johns Hopkins Hospital for one year leading up to and following the Hopkins safety team’s checklist and “speak up” interventions.

In the first year of the study, beginning in July 2009, 76 of 278 patients at JHH or 27.3 percent, developed an SSI after colorectal surgery. The rate dropped to 18.2 percent in the subsequent year after interventions were in place, with 59 of 324 patients contracting an SSI. Procedures for which data was collected include colectomies and proctectomies, removal of part of or the entire colon and rectum, respectively.

Researchers estimate that 28 infections were prevented in 2010 to 2011, resulting in an estimated cost savings of between \$168,000 and \$280,000 for the hospital in just one year. Assuming a nationwide annual incidence of 1.7 million total SSIs per year, researchers estimate widespread application of the Johns Hopkins safety program across all surgical specialties could save more than \$100 million annually.

The team's approach is based on a program developed and championed by patient safety experts in Hopkins' Armstrong Institute for Patient Safety and Quality. The Comprehensive Unit-based Safety Program, or "[CUSP](#)" for short, emphasizes careful measurement of a safety issue, research to develop a likely solution and team-driven culture changes that eliminate barriers to challenging unsafe practice.

A similar CUSP program developed by Peter Pronovost, M.D., Ph.D., Armstrong Institute director and senior vice president for patient safety and quality at Johns Hopkins Medicine, dramatically reduced central line-associated bloodstream infections in intensive care units, first in the state of Michigan and now in hospitals across the country and around the world. Designed to make mistakes more transparent and use it and other tools to improve the culture of safety, CUSP relies heavily on "local staff" training in the science of safety — how to identify problems, report them, measure them, plan and implement corrections and measure again, Wick says. It also embraces discussions about improving communication and teamwork.

"The benefits of a bottom-up versus a top-down approach to patient safety were immediately obvious," says Wick, noting that after the CUSP team formed, front-line staff were quick to point out inconsistencies in delivering preventative antibiotics. "We were able to clear up misconceptions and concerns related to nephrotoxicity and medication allergies pretty quickly," she says.

Based on an initial safety survey and monthly meetings, a CUSP team of surgeons, nurses, operating room technicians and anesthesiologists directly involved in the care of colorectal surgery patients identified six key interventions. Those included standardization of skin preparation; prescription of preoperative chlorhexidine showers; restricted use of by-mouth bowel cleansing solution before procedures; warming of patients in the pre-anesthesia area; adoption of enhanced sterile techniques for bowel and skin portions of the case; and addressing lapses in prophylactic antibiotics.

Active support and participation by a senior hospital executive — a necessary component for the success of CUSP — ensured that staff had access to resources needed for quick, evidence-based interventions to reduce risks to patients, Wick reports.

"By bringing together front-line providers with hospital administrators, the program bridges a growing divide in health care," Makary says, noting one effect of what he describes as a record number of hospital mergers and acquisitions in recent years.

Other Hopkins researchers who participated in the study include Deborah B. Hobson, R.N., Jennifer L. Bennett, B.A., Renee Demski, M.B.A., M.S.W.; Sean M. Berenholtz, M.D., M.H.S.; and Martin A. Makary, M.D., M.P.H.