Joint project targets prevention for colorectal surgical infections

Seven hospitals working with the Joint Commission and the American College of Surgeons (ACS) on a 2-year project to reduce colorectal surgical site infections (SSIs) have saved more than $3.7 million by avoiding an estimated 135 SSIs, the commission announced in November 2012.

The commission is pilot testing the approach used in the project with the aim of rolling out targeted solutions for all accredited hospitals in 2013.

Joint Commission President Mark Chassin, MD, FACP, said colorectal surgery was chosen as a focus because it’s a common major surgery with a significant rate of complications, particularly SSIs. Also, complication rates vary widely, suggesting there is room to improve.

Through the project, led by the Joint Commission’s Center for Transforming Healthcare, the participating hospitals:

- reduced their rate of superficial incisional colorectal SSIs by 45% and reduced colorectal SSIs overall by 32%.
- decreased the average stay for patients with any type of colorectal SSI from 15 days to 13 days, compared to an average 8-day stay for patients with no SSIs.

Data-driven process

Participating hospitals followed a data-driven process using surgical outcomes data from the ACS National Surgical Quality Improvement Project (NSQIP) to pinpoint specific risk factors for their patients and to develop targeted interventions to reduce their colorectal SSI rates.

Dr Chassin emphasized the importance of each hospital identifying the risk factors of its own patient population and developing interventions targeted to those risk factors.

“There is no one-size-fits-all way to prevent SSIs,” he said. “We have learned that you have to use sophisticated tools like rapid process improvement, including Lean Six Sigma and change management, to find out exactly how poor outcomes occur.”

Two hospitals represented on a Joint Commission press call achieved a sustained reduction of at least 50% in their colorectal SSI rates. Cedars-Sinai Medical Center in Los Angeles saw its colorectal SSI rate fall from 15.5% to 5.5% during the 2 1/2 year project and decline to less than 5% since July 2012. The Mayo Clinic, Rochester, Minnesota, reduced its rate from 9.8% to 4%.

Targeted solutions

The participants identified 34 variables that increased SSI risk including patient characteristics, surgical procedure, antibiotic administration, perioperative processes, and measurement challenges.

Among targeted solutions for reducing superficial incisional SSIs were:

- standardizing preop instructions for skin cleansing
- establishing specific criteria for wound management.

Solutions for reducing all types of colorectal SSIs were:
Surgical Site Infection Bundle: Reducing Risk in Colorectal Surgery Patients

Preoperative Elements

1. **CHG SHOWER***
   During the last pre-surgery visit, instruct your patients to shower with a special antiseptic soap that contains Chlorhexidine.

Intraoperative Elements

1. **ANTIBIOTICS***
   Use Cefotetan 1g alone for all Procedures.
   - If >80kg, use 2g.
   - If allergic, use Levofloxacin/Metronidazole 500mg/500mg.
   If patient is already receiving IV antibiotics (Cefotetan, Zosyn or Flagyl) for treatment, give a pre-incision dose if the last dose was administered more than 1hr prior.

2. **ANTIBIOTIC REDOSING***
   Re-dose antibiotics if the case is prolonged beyond 4hrs (examples includes Cefotetan, Zosyn, and Flagyl)

3. **CHG SKIN PREP***
   **ALWAYS USE**: Chloraprep
   **EXCEPT**: Betadine
   - Permanent Stoma
   - Open wound (optional)

Intraoperative Elements

4. **WOUND PROTECTOR***
   Wound Protectors are clinically proven to decrease the risk of wound infection and maintain moisture at the incision site.

5. **OBSERVE HAND HYGIENE***
   - Gel in prior to entry to OR room
   - Wash your hands with soap and water after degowning and degloving.

6. **SKIN CLOSURE PROTOCOL***
   1. Surgeon announces “Time to Close.”
   2. Surgeon confirms Wound Classification (clean-contaminated, contaminated, or dirty)
   3. Scrub Nurse removes all dirty instruments, including:
      - Forceps, Needle holder
      - Suction tip
      - Bovie cautery pen
      - Light handles
   4. Sterile gloves and gown change by all team members
   5. Clean closure instruments are brought to field
   6. Saline irrigation of wound after fascia is closed
   7. Dressing application of occlusive dry dressing (e.g., Island dressing, gauze with tape or Tegaderm).

Postoperative Elements

1. **WOUND DRESSING/CARE***
   - Daily post-operative CHG bathing and discharge patient with CHG*
   - Maintain dry occlusive dressing; change dressing as needed.
   - Dressing removal within 48 hours after surgery*
   - Consider wound probing or wicks if dirty or contaminated wound
   - Culture wounds if concern for infection

Preoperative Optional Element

1. **BOWEL PREP (OPTIONAL)**
   Use of bowel prep may vary by surgeon.
   On day prior to surgery:
   Mechanical Prep +/- Oral Antibiotic Prep
   - Choice of antibiotics:
     (First antibiotic dose to be taken AFTER completing mechanical prep, and second 4hrs later)
     Neomycin Sulfate 1g, two doses in the evening
     AND EITHER
     Erythromycin Base 1g, two doses in the evening OR
     Metronidazole 1g, two doses the evening before OR the morning of surgery

*Required bundle elements

Source, Cedars-Sinai Medical Center, reprinted with permission.

- warming patients to maintain temperature throughout the surgical episode
- weight-based antibiotic dosing.
  - There were 2 interventions all 7 hospitals agreed on:
- standardizing patient instructions on use of preop skin cleansing with wipes containing chlorhexidine gluconate (CHG)
- changing to clean gloves, gowns, supplies, and instruments for the skin closure.

‘No magic bullet’
At Cedars-Sinai, the surgeon champion, Shirin Towfigh, MD, FACS, worked with a multidisciplinary team of surgeons, nurses, performance improvement specialists, and others to analyze risk factors of the hospital’s surgical population and develop interventions. In all, 46 surgeons were involved.
“We knew there was no magic bullet to prevent all SSI,” she says. She met with each surgeon, including the 10 colorectal surgeons, to see what was feasible to change in their practices to improve quality.

“We tried to make it as simple and easy as possible and not to impinge on the independence of the surgeon’s practice,” she says.

The major interventions are summarized on a one-page sheet (illustration, p 6).

Dr Towfigh says 2 factors were key in achieving the SSI reductions:

• having a surgeon champion rather than an administrator as the project leader
• making sure the interventions were evidence-based.

Interventions were planned so as not to interfere with efficiency.

For example, for the skin closure, the OR staff arranged to change to clean supplies and instruments as seamlessly as possible by having the items available in the room. Rather than having a separate closure tray, closing instruments and supplies are set aside at the beginning of the case.

In another change, Cedars-Sinai converted from povidone-iodine to alcohol-chlorhexidine gluconate (CHG) for surgical skin antisepsis, first for colorectal cases and then for other specialties and procedures. However, patients with colostomy stomas that are not being reversed are still prepped with povidone-iodine.

Surgeons were informed the change would be made, and then povidone-iodine for surgical site antisepsis was simply removed from the supply stock, Dr Towfigh says. When nurses expressed concern about pushback from some surgeons, Dr Towfigh told them to refer the surgeons to her, and she would review the evidence with them.

At the Mayo Clinic, Rochester, Minnesota, interventions once adopted are embedded in patient care “so they are part of our system whenever possible,” said Jenna Lovely, PharmD, surgical pharmacotherapy manager.

An example is patients’ body mass index (BMI), which emerged as an SSI risk factor in the Mayo data set. An electronic trigger now automatically identifies patients with a BMI over 30.

“We have moved from this being a QI project to being the way we work,” Lovely said. ✤

—Pat Patterson

For more about the colorectal SSI prevention project go to www.centerfortransforminghealthcare.org/projects/detail.aspx?Project=4