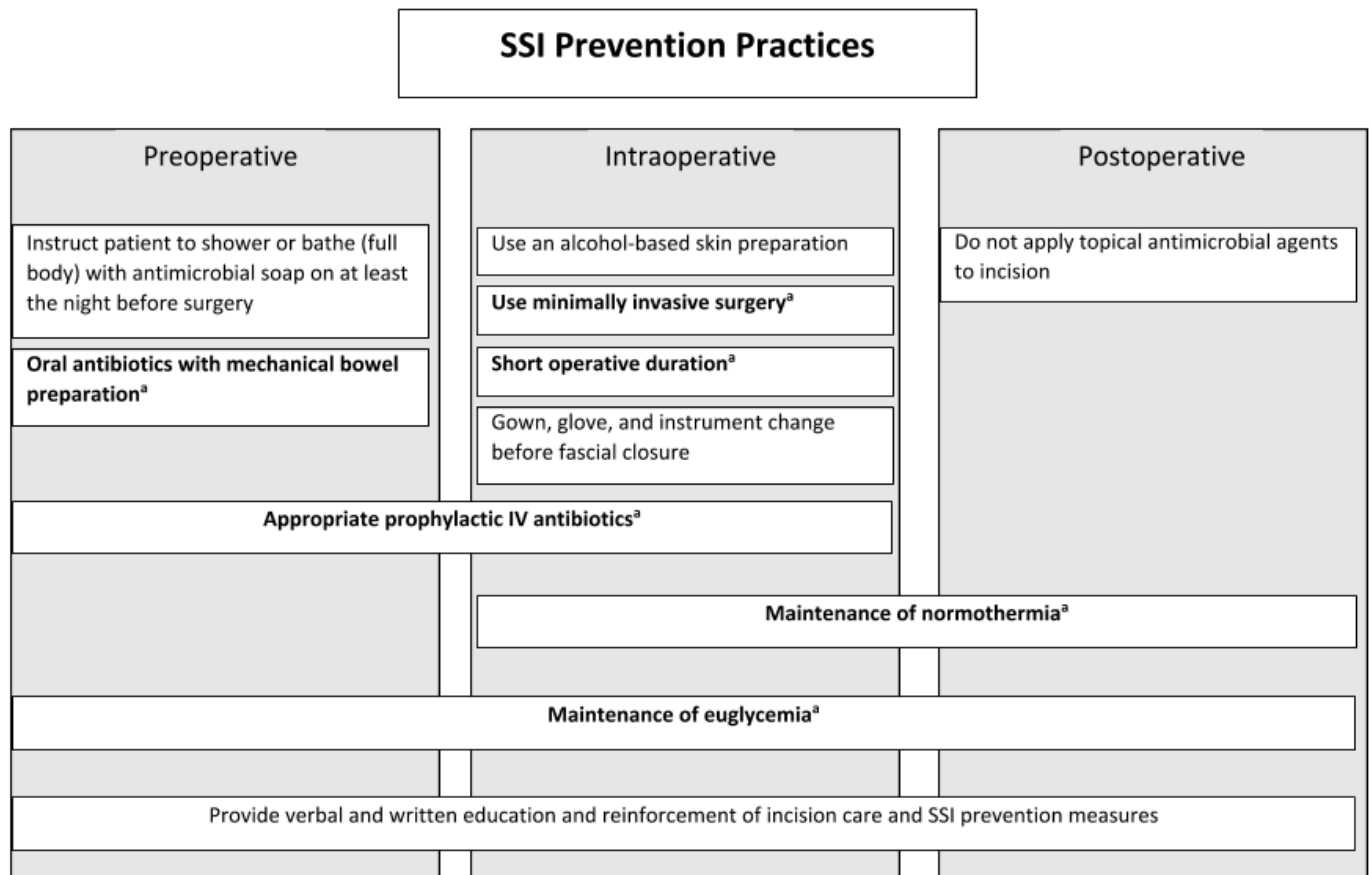




Michigan Surgical Quality Collaborative

MSQC Colectomy Bundle Recommendations and Tool

The MSQC is dedicated to improving the quality of patient care processes and outcomes. Surgical site infection (SSI) is the most common nosocomial infection and contributes substantially to a patient’s morbidity and mortality after surgery. SSI drastically elevates costs by increasing lengths of postoperative hospital stay, elevating rates of readmission and threatening health outcomes. The first step in the treatment of SSIs is prevention. MSQC has developed a data-driven process care bundle focused on SSI prevention for colectomy procedures. Supported by numerous research findings, implementation of the bundle is associated with a decrease in SSI⁹.



^a MSQC Evidence-based Colectomy Bundle Recommendation

MSQC Colectomy Bundle Implementation Tool	
Preoperative Oral Antibiotics with Mechanical Bowel Prep ^{1,2}	
<p>NuLytely Bowel Prep 4000 mL <u>Instructions:</u> At 9 am the day before surgery, start drinking 8 oz of NuLytely every 10 minutes until 4 liters are consumed. This will take about 3 hours.</p> <p>Neomycin 500 mg, 6 tabs. <u>Instructions:</u> Take 2 tabs (1000 mg) at 1pm, 2pm, and 10pm the day before surgery</p> <p>Metronidazole 500 mg, 3 tabs. <u>Instructions:</u> Take 1 tab (500 mg) at 1pm, 2pm, and 10pm they day before surgery</p>	
Appropriate Prophylactic IV Antibiotics ^{3,4}	
Preoperative Cefazolin + Metronidazole	
<p>Cefazolin 2 g IV 30-60 minutes prior to incision. If patient weighs ≥ 120 kg, consider 3 g for <i>weight-based dosing</i></p> <p>Metronidazole 500 mg IV 30-60 minutes prior to incision.</p>	
Intraoperative Redosing	
<p>Redose Cefazolin 4 hours from initiation of preoperative dose if patient still in surgery.</p> <p>Redose Metronidazole 8 hours from initiation of preoperative dose if patient still in surgery.</p>	
Exceptions/Alternatives	
Cephalosporin Allergy	Metronidazole Shortage
<p>Clindamycin + Aztreonam</p> <p>Clindamycin 900 mg IV 30-60 minutes prior to incision. Redose 6 hours from initiation of preoperative dose if patient still in surgery</p> <p>Aztreonam 2 g IV 30-60 minutes prior to incision. Redose 4 hours from initiation of preoperative dose if patient still in surgery</p>	<p>Cefoxitin</p> <p>Cefoxitin 2 g IV 30-60 minutes prior to incision. Redose 2 hours from initiation of preoperative dose if patient still in surgery</p>
Postoperative Normothermia in PACU (>96.8F, 36.0C)	
<p>Intraoperative warming to maintain normothermia</p> <p>Active warming in PACU. Bair Hugger PRN to maintain postoperative normothermia</p>	

MSQC Colectomy Bundle Implementation Tool

Postoperative day 1 glucose <140 mg/dL ⁵⁻⁸
DIABETIC
Preoperative HbA1C
Check HbA1C level. If time allows and glucose not controlled, adjust home regimen. Consider referral to endocrinology or medicine for management.
Intraoperative Glucose Monitoring
Check glucose on arrival and every 30-60 minutes for surgeries >1 hour. Insulin infusion is preferred. Avoid subcutaneous insulin.
Postoperative Glucose Monitoring
When NPO, check POC glucose every 6 hours and utilize insulin infusion or basal insulin. Once diet advanced, check POC glucose before meals/bedtime and utilize basal-bolus regimen. Consider consult to endocrinology or medicine for management.
NON-DIABETIC
Preoperative HbA1C
Consider checking HbA1C or fasting blood glucose with preoperative labs. If abnormal, consider referral to endocrinology or medicine.
Intraoperative Glucose Monitoring
Check glucose on arrival and if elevated, check intraoperative every 30-60 minutes for surgeries >1 hour. Insulin infusion is preferred. Avoid subcutaneous insulin.
Postoperative Glucose Monitoring
If patient had elevated glucose before or during surgery, monitor 24-48 hours postoperatively. If patient had normoglycemia, consider checking POC glucose on morning of POD 1 before meal. Utilize insulin infusion or basal insulin if patient NPO. Once diet advanced, utilize basal-bolus regimen. Consider consult to endocrinology or medicine for management.
Use of Minimally Invasive Surgery ^{9,10}
Maximize use of laparoscopic approach unless contraindicated.
Short Operative Duration ^{9,10}
For all surgical techniques, facilitate intraoperative care processes to maximize efficiency in the operating room. When performing open surgery, target operative duration is <100 minutes.

MSQC Colectomy Bundle Implementation Tool

Resources:

Mechanical Bowel Prep

¹ Anjum, N., Ren J., Wang, G., Li, G., Wu, X., Dong, H., . . . Li, J. (2017). A Randomized Control Trial of Preoperative Oral Antibiotics as Adjunct Therapy to Systemic Antibiotics for Preventing Surgical Site Infection in Clean Contaminated, Contaminated, and Dirty Type of Colorectal Surgeries. *Disease of the Colon & Rectum*, 60(12), 1291-1298. doi: 10.1097/DCR.0000000000000927

² Hjelmaas, A., Kanters, A., Anand, R., Cedarbaum, J., Chen, Y., Ly, L., . . . Regenbogen, S. (2018). 28.08 Bowel Preparation with Antibiotics Decreases Surgical-Site Infection for Both Left & Right Colectomy [Abstract]. Retrieved from <http://www.asc-abstracts.org/abs2018/28-08-bowel-preparation-with-antibiotics-decreases-surgical-site-infection-for-both-left-right-colectomy/>

Appropriate Prophylactic IV Antibiotics

³ Bratzler, D., Dellinger, E., Olsen, K., Perl, T., Auwaerter, M., Bolon, M., . . . Weinstein, R. (2013). Clinical practice guidelines for antimicrobial prophylaxis in surgery. *American Journal of Health-System Pharmacy*, 70(3), 195-283. doi: 10.2146/ajhp120568

⁴ Hendren, S., Fritze, D., Banerjee, M., Kubus, J., Cleary, R., Englesbe, M., Campbell, D. (2013). Antibiotic Choice Is Independently Associated with Risk of Surgical Site Infection After Colectomy: A Population-Based Cohort Study. *Annals of Surgery*, 257(3), 469-475. doi: 10.1097/SLA.0b013e31826c4009

Glucose Management

⁵ Duggan, E., Carlson, K., Umpierrez, G. (2017). Perioperative Hyperglycemia Management: An Update. *Anesthesiology*, 126(3), 547-560. doi: 10.1097/ALN.0000000000001515

⁶ Kiran, R., Turina, M., Hammel, J., Fazio, V. (2013). The Clinical Significance of an Elevated Postoperative Glucose Value in Nondiabetic Patients after Colorectal Surgery: Evidence for the Need for Tight Glucose Control? *Annals of Surgery*, 258(4), 599-605. doi: 10.1097/SLA.0b013e3182a501e3

⁷ Thompson, R., Broussard, E., Flum, D., Wisse, B. (2016). Perioperative Glycemic Control During Colorectal Surgery. *Hospital Management of Diabetes*, 16(32). doi: 10.1007/s11892-016-0722-x

⁸ Takesue Y, Tsuchida T. (2017). Strict glycemic control to prevent surgical site infections in gastroenterological surgery. *Ann Gastroenterol Surg*, 1, 52–59. doi: 10.1002/ags3.12006

Colectomy Bundle

⁹ Vu, J., Collins, S., Seese, E., Hendren, S., Englesbe, M., Campbell, D., Krapohl, G. (2018). Evidence that a Regional Surgical Collaborative Can Transform Care: Surgical Site Infection Prevention Practices for Colectomy in Michigan. *Journal of the American College of Surgeons*, 226(1), 91-99. doi:10.1016/j.jamcollsurg.2017.10.013

¹⁰ Waits, S. A., Fritze, D., Banerjee, M., Zhang, W., Kubus, J., Englesbe, M. J., . . . Hendren, S. (2014). Developing an argument for bundled interventions to reduce surgical site infection in colorectal surgery. *Surgery*, 155(4), 602-606. doi:10.1016/j.surg.2013.12.004