

BC Provincial Antimicrobial Clinical Expert Committee (PACE)

Surgical Antibiotic Prophylaxis – Adults (General Surgery)

The PACE Committee has undertaken a series of reviews of surgical antibiotic prophylaxis (for adults) in all clinical settings. This series, which begins with the General Principles section, will also be accompanied by an FAQ document, to assist and provide rationale for practitioners on the latest evidence-based guidance.

GENERAL SURGERY	
PROCEDURE	RECOMMENDED PROPHYLAXIS
Breast Surgery- Low risk <ul style="list-style-type: none"> • lumpectomy/local excision 	prophylaxis is not routinely recommended
Breast Surgery- High Risk <ul style="list-style-type: none"> • breast reduction • reconstruction mammoplasty • previous breast biopsy/surgery • placement of prosthetic material • morbid obesity (>100 kg) • skin irradiation • breast cancer including: <ul style="list-style-type: none"> ○ axillary node dissection ○ primary non-reconstruction surgery 	cefazolin 2 g IV x 1 dose If placement of prosthetic material AND MRSA colonization / past infection, consider adding: vancomycin 15 mg/kg IV x 1 dose
Gastroesophageal Endoscopy- Low risk	prophylaxis not routinely indicated
Gastroesophageal Endoscopy- High risk <ul style="list-style-type: none"> • variceal ligation/sclerotherapy in patients with: <ul style="list-style-type: none"> ○ cirrhosis with GI bleed ○ severe neutropenia < 500/mm³ ○ advanced hematologic malignancy ○ vascular graft (< 6 months) 	cefazolin 2 g IV x 1 dose Note: prophylaxis unneeded if patients currently on antibiotics for GI bleed
Percutaneous endoscopic gastrostomy (PEG) Peroral endoscopic myotomy (POEM)	cefazolin 2 g IV x 1 dose
Endoscopic ultrasound: <ul style="list-style-type: none"> • cyst gastrostomy • necrosectomy of walled off necrosis • fine needle aspiration of cystic lesions of pancreas or mediastinum • celiac plexus blocks/neurolysis 	ceftriaxone 1 g IV x 1 dose

GENERAL SURGERY

PROCEDURE	RECOMMENDED PROPHYLAXIS
Gastric / Duodenal Surgery <ul style="list-style-type: none"> • duodenal/gastric resection for cancer/ulcer • perforated ulcer procedures • bariatric surgical procedures (gastric bypass, gastric banding, gastroplasty, biliopancreatic diversion) • gastroplasty in high risk patients: <ul style="list-style-type: none"> ○ gastric outlet obstruction ○ decreased gastric acid/motility ○ obesity ○ hemorrhage ○ 	cefazolin 2 g IV x 1 dose
Pancreaticoduodenectomy (Whipple's)	piperacillin-tazobactam 3.375 g IV x 1 dose
Hepatobiliary surgery - Low risk <ul style="list-style-type: none"> • elective laparoscopic cholecystectomy • liver biopsy 	prophylaxis not routinely indicated
Hepatobiliary surgery - High risk <ul style="list-style-type: none"> • open cholecystectomy • acute cholecystitis • emergency procedure • biliary colic within 30 days • biliary spillage • biliary obstruction / jaundice / common bile duct stones • previous biliary surgery • non-functioning gallbladder • insertion of prosthetic device/ catheters/biliary tube exchange • > 65 years / diabetes/pregnancy/obesity/ immunosuppression • hepatectomy 	cefazolin 2 g IV x 1 dose
Hepatic embolization / chemoembolization / radioembolization Hepatic tumour ablation	prophylaxis not routinely indicated unless: <i>incompetent sphincter of Oddi</i> cefazolin 2 g IV x 1 dose

GENERAL SURGERY

PROCEDURE	RECOMMENDED PROPHYLAXIS
Endoscopic Retrograde Cholangiopancreatography (ERCP) if: <ul style="list-style-type: none"> • <u>incomplete</u> drainage of biliary obstruction (eg. hilar obstruction) • sclerosing cholangitis • cholangioscopy • liver transplant patients • advanced hematologic malignancy • severe neutropenia < 500/mm³ 	ceftriaxone 1 g IV x 1 dose
Trans-hepatic cholangiography	cefazolin 2 g IV x 1 dose
Tumour ablation (lung/adrenal/bone/solid tumour)	prophylaxis not routinely indicated
Paracentesis Tunneled peritoneal drainage catheter for palliative fluid management	prophylaxis not routinely indicated
Bowel Surgery <ul style="list-style-type: none"> • perforated viscus/ peritonitis/ gangrene /abscess 	Institute treatment for secondary peritonitis rather than prophylaxis
Bowel surgery <ul style="list-style-type: none"> • small intestine (non-obstructed) 	cefazolin 2 g IV x 1 dose
Bowel surgery <ul style="list-style-type: none"> • appendectomy • emergency bowel surgery • bowel obstruction • fistulas/discontinuous bowel segments 	cefazolin 2 g IV x 1 dose + metronidazole 500 mg IV x 1 dose
Elective colorectal surgery (open or laproscopic):	<u>Day before surgery, consider:</u> mechanical bowel preparation and neomycin 1 g PO + metronidazole 1 g PO at 1 pm / 3 pm / 8 pm <u>Day of surgery, pre-operatively:</u> cefazolin 2 g IV x 1 dose + metronidazole 500 mg IV x 1 dose

GENERAL SURGERY

PROCEDURE	RECOMMENDED PROPHYLAXIS
Lower gastrointestinal procedures - Low risk <ul style="list-style-type: none"> • sigmoidoscopy • colonoscopy* • fissurectomy • fistulectomy / fistulotomy • hemorrhoidectomy (ligation / banding) • anal sphincterotomy 	prophylaxis not routinely indicated
*Colonoscopy in setting of peritoneal dialysis	ceftriaxone 1 g IV x 1 dose
Lower gastrointestinal procedures- High Risk <ul style="list-style-type: none"> • sphincteroplasty • rectovaginal fistula closure / repair • proctocolectomy 	cefazolin 2 g IV x 1 dose + metronidazole 500 mg IV x 1 dose
Hernia surgery <ul style="list-style-type: none"> • laparoscopic hernia repair 	prophylaxis not routinely indicated
Hernia surgery <ul style="list-style-type: none"> • herniorrhaphy (suture repair) • hernioplasty (mesh insertion) • bilateral open repair • recurrent hernia repair 	cefazolin 2 g IV x 1 dose <i>If MRSA colonization/past infection, add:</i> vancomycin 15 mg/kg IV x 1 dose
Splenectomy	cefazolin 2 g IV x 1 dose
Peritoneal dialysis <ul style="list-style-type: none"> • catheter placement 	cefazolin 2 g IV x 1 dose <i>If MRSA colonization/ past infection, add:</i> vancomycin 15 mg/kg IV x 1 dose
Insertion long-term tunneled central venous catheter (e.g. Hickman/Broviac) Insertion implantable vascular access catheter/devices (e.g. Port-a-cath, Powerport) Non-tunneled hemodialysis catheter	prophylaxis not routinely indicated unless immunocompromised: cefazolin 2 g IV x 1 dose <i>If MRSA colonization/past infection, add:</i> vancomycin 15 mg/kg IV x 1 dose
Insertion CVC for monitoring/medication/ blood draws Tunneled hemodialysis catheters	prophylaxis not routinely indicated
Varicose vein procedures <ul style="list-style-type: none"> • sclerotherapy/laser/radiofrequency ablation 	prophylaxis not routinely indicated

References

General Surgery

1. Abis GS, Stockmann HB, Bonjer HJ, van Veenendaal N, van Doorn-schepens ML, Budding AE et al. Randomized clinical trial of selective decontamination of the digestive tract in elective colorectal cancer surgery (SELECT trial). *Br J Surg* 2019; 106: 355-363
2. Anjum N, Ren J, Wang G, Li G, Wu X, Dong H et al. 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. *Dis Colon Rectum* 2017; 60: 1291-1297
3. Ariyan S, Martin J, Lal A, Cheng D, Borah GL, Chung KC et al. Antibiotic prophylaxis for preventing surgical site infection in plastic surgery: An evidence based consensus conference statement from the American Association of Plastic Surgeons. *Plast Reconstr Surg* 2015; 1723-1739
4. ASGE Standards of Practice Committee. Antibiotic prophylaxis for GI endoscopy. *Gastrointest Endosc* 2015; 81: 81-89
5. Bellows CF, Mills KT, Kelly TN, Gagliardi G. Combination of oral non-absorbable and intravenous antibiotics alone in the prevention of surgical site infections after colorectal surgery: a meta-analysis of randomized controlled trials. *Tech Coloproctol* 2011; 15: 385-395
6. Colan-Hernandez J, Sendino O, Loras C, Pardo C, Pardo A, Gornals J, et al. Antibiotic prophylaxis is not required for endoscopic ultrasonography-guided fine-needle aspiration of pancreatic cystic lesions, based on a randomized trial. *Gastroenterol* 2020; 158: 1642-1649
7. Domagk D, Oppong KW, Aabakken L, Czako L, Gyokeres T, Manes G et al. Performance measures for ERCP and endoscopic ultrasound: A European Society of Gastrointestinal Endoscopy (ESGE) quality improvement initiative. *Endoscopy* 2018; 50: 1116-1127
8. Drinane JJ, Chowdhry T, Pham T, Ritter E. Examining the role of antimicrobial irrigation and capsular contracture: A systematic review and meta-analysis. *Ann Plast Surg* 2017; 79: 107-113
9. Drinane JJ, Kortess MJ, Bergman RS, Folkder BL. Evaluation of antibiotic irrigation versus saline irrigation reducing the long-term incidence and severity of capsular contracture after primary augmentation mammography. *Ann Plast Surg* 2016; 32-36
10. Fry D. Antimicrobial bowel preparation for elective colorectal surgery. *Surg Infect* 2016;17: 269-274
11. Gao T, Ding R, Yang J, Wu P, Liu P, Liu Z et al. Evaluation of different antibiotic prophylaxis strategies for hepatectomy: A network meta-analysis. *Medicine* 2019; 98: 2-7
12. Gavazzi F, Ridolfi C, Capreotti G, Angiolini MR, Morelli P, Casari E, Montorsi M, Zerbi A. Role of preoperative biliary stents, bile contamination and antibiotic prophylaxis in surgical site infections after pancreaticoduodenectomy. *BMC Gastroenter* 2016; 16: 1-11.
13. Gomez-Ospina JC, Zapata-Copete JA, Bjarano M, Garcia-Perdomo HA. Antibiotic prophylaxis in elective laparoscopic cholecystectomy: A systematic review and network meta-analysis. *J Gastrointest Surg* 2018; 22: 1193-12-3
14. Grafinkle R, Abou-Khalil J, Morin N, Ghitulescu G, Vasilevsky CA et al. Is there a role for oral antibiotic preparation alone before colorectal surgery? ACS-NSQIP analysis by coarsened exact matching. *Dis.Colon Rectum* 2017; 60: 729-737.
15. Guenaga KK, Matos, D, Wille-Jorgensen P. Mechanical bowel preparation for elective colorectal surgery (Review). *The Cochrane Collaboration*. 2009, Issue 1.
16. Gutt C, Schlafer S, Lammert F. The treatment of gallstone disease. *Deut Artz Int* 2020; 117: 148-58
17. Haskins I, Fleshman J, Amdur R, Agarwal S. The impact of bowel preparation on the severity of anastomotic leak in the colon cancer patients. *J Surgl Oncol* 2016; 114: 810-813.

18. Hata H, Yamaguchi T, Hasegawa S, Nomura A, Hida K, Nishitai R. Oral and parenteral versus parenteral antibiotic prophylaxis in elective laparoscopic colorectal surgery (JMTO PREV 07-01). *Ann Surg* 2016;263:1085-91
19. Hseuh L, Hu SL, Shah AD. Periprocedure peritonitis prophylaxis: A summary of microbiology and the role of systemic antimicrobials. *Kidney Dis* 2021; 7: 90-99
20. The HerniaSurge Group. International guidelines for groin hernia management. *Hernia* 2018; 22: 1-165
21. Huang N, Liu M, Yu P, Wu J. Antibiotic prophylaxis in prosthesis-based mammoplasty: a systematic review. *Int J Surg* 2015; 15: 31-37
22. Jahibandeh S, Popova P, Rehman S. Extended postoperative antibiotics versus no postoperative antibiotics in patients undergoing emergency cholecystectomy for acute calculous cholecystitis: A systematic review and meta-analysis. *Surg Innov* 2019; 26: 485-496
23. Jones DJ, Bunn F, Bell-Syer SV. Prophylactic antibiotics to prevent surgical site infection after breast cancer surgery. *The Cochrane Library* 2014; 3: 1-54
24. Khashab MA, Chithadi KV, Acosta RD, Bruining DH, Chandraesekhara V et al. ASGE Standards of Practice Committee: Antibiotic prophylaxis for GI endoscopy. *Gastrointest Endosc* 2015; 81: 81-89
25. Khorasani S, Dossa F, McKechnie T, Englesakis M, Brar M, van Overstraeten AD. Association between preoperative oral antibiotics and the incidence of postoperative *Clostridium difficile* infection in adults undergoing elective colorectal resection: A systematic review and meta-analysis. *Dis Colon Rectum* 2020; 63: 545-561
26. Koullouros M, Khan N, Aly EH. The role of oral antibiotic prophylaxis in prevention of surgical site infection in colorectal. *Int J Colorectal Dis* (2017) 32:1-18
27. Lewin R, Elander A, Thorarinsson A, Kolby L, Sahlin P, Lundberg J et al. A randomized prospective study of prophylactic cloxacillin in breast reduction surgery. *Ann Plast Surg* 2015; 74: 17-21
28. Matsui Y, Sato S, Kaibori M, Toyokawa H, Yanagimoto H, Matsui K, et al. Antibiotic prophylaxis in laparoscopic cholecystectomy: A randomized controlled trial. *PHOS One* 2014; 9: 1-9
29. Maselli R, Olivia A, Badalamenti M, Galtieri PA, Belletrutti PJ, Spadaccini M et al. Single-dose vs. short course prophylactic antibiotics for peroral endoscopic myotomy: A randomized controlled trial. *Gastrointest Endoscop* 2021; 94: 922-929
30. Meyer GW (2022). *Antibiotic prophylaxis for gastrointestinal endoscopic procedures*. Up-To-Date February 2022. [Link](#) [March 8, 2022]
31. Migaly J, Bafford AC, Francone TD, Gaertner WB, Eskicioglu C, Bordeianou L et al. The American Society of Colon and Rectal Surgeons clinical practice guidelines for the use of bowel preparation in elective colon and rectal surgery. *Dis Colon Rectum* 2019; 62: 3-7
32. Melloul E, Hubner M, Scott M, Snowden C, Prentis J, Dejong CH, et al. Guidelines for perioperative care for liver surgery: Enhanced Recovery After Surgery (ERAS) Society recommendations. *World J Surg* 2016; 40: 2425-2440
33. Nelson RL, Gladman E, Barbateskovic M. Antimicrobial prophylaxis for colorectal surgery. *Cochrane Library* 2014; 5: 1-262
34. Nelson RL, Hassan M, Grant MD. Antibiotic prophylaxis in colorectal surgery: Are oral, intravenous or both best and is mechanical bowel preparation necessary? *Tech Coloproctol* 2020; 24: 1233-1246
35. Ngui N et al. Pre-operative factors prolonging the length of stay in elective colorectal surgery. *ANZ J Surg* 2011; 81: 624-628.
36. Ohman K, Wan L, Guthrie T, Johnston B, Leinicke J et al. Combination of oral antibiotics and mechanical bowel preparation reduces surgical site infection in colorectal surgery. *J Am Coll Surg* 2017;225: 465-471

37. Orelia CC, van Hessen C, Sanchez-Manuel FJ, Aufenacker TJ, Scholten RJ. Antibiotic prophylaxis for prevention of postoperative wound infection in adults undergoing open elective inguinal or femoral hernia repair. *Cochrane Database Syst Rev* 2020; 1-6
38. Pasquali S, Boal M, Griffiths EA, Alderson D, Vohra RS. Meta-analysis of perioperative antibiotics in patients undergoing laparoscopic cholecystectomy. *Br J Surg* 2016; 103; 27-34
39. Rollins KE, Javanmard-Emamghissi H, Acheson AG, Lobo DN. The role of oral antibiotic preparation in elective colorectal surgery. *Ann Surg* 2019; 270: 43-57
40. Roos D, Dijkstra LM, Tijssen JG, Gouma DJ, Gerhards MF, Oudemans-van Straaten HM. Systematic review of perioperative selective decontamination of the digestive tract in elective gastrointestinal surgery. *Br J Surg* 2013; 100: 1579-1588
41. Ruagnsin S, Laohawiriyakamol S, Sunpaweravong S, Mahattanobon. The efficacy of cefazolin in reducing surgical site infection in laparoscopic cholecystectomy: A prospective randomized double-blind controlled trial. *Surg Endosc* 2015; 29: 874-881
42. Scarborough J, Mantyh C, Sun Z, Migaly J. Combined mechanical and oral antibiotic bowel preparation reduces incisional surgical site infection and anastomotic leak rates after elective colorectal resection. *Ann Surg* 2015;262: 331-337
43. Shortt R, Cooper MJ, Farrokhyar F, Bain J. Meta-analysis of antibiotic prophylaxis in breast reduction surgery. *Plast Surg* 2014; 22: 91-94
44. Xue DQ, Quian C, Yang L, Wang XF. Risk factors for surgical site infections after breast surgery: A systematic review and meta-analysis. *EJSO* 2012; 38: 375-381

DOCUMENT DEVELOPMENT AND ENDORSEMENT		
PACE	Development	June 23, 2022
	Endorsement	July 16, 2024
BC P&T Committee	Presentation for Information	