

Surgical Antimicrobial Prophylaxis Guidelines (adult)

Appendix 1: Abdominal, Gastrointestinal, & Biliary Surgery

Preoperative Considerations

Consider individual risk factors for every patient including the need for prophylaxis. Antibiotic choice/dose may need to be modified according to patient factors (e.g. immune suppression, presence of prostheses, allergies, renal function, obesity, malnutrition, diabetes, malignancy, infection at another site, colonisation with multi-drug resistant bacteria and available pathology).

Consider surgical wound classification (clean, clean-contaminated, contaminated, dirty-infected) when determining the need for, or choice of, antibiotic prophylaxis. Refer to [Surgical Antimicrobial Prophylaxis Prescribing Guideline](#) for further information.

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure but ensure the treatment regimen has activity against the organism(s) most likely to cause postoperative infection. Adjust the timing of the treatment dose to achieve adequate plasma and tissue concentrations at the time of surgical incision and for the duration of the procedure - seek advice from ID or the AMS team if unsure.

Prophylaxis against enterococcal endocarditis is indicated for patients with specific high risk cardiac conditions undergoing abdominal, gastrointestinal and biliary surgical procedures. Refer to [Antibiotic Prophylaxis for Prevention of Endocarditis in High Risk Patients](#) for further information.

Practice Points

Timing and administration of antibiotics

Surgical antibiotic prophylaxis must be administered before surgical incision to achieve effective plasma and tissue concentrations at the time of incision. Administration of any antibiotic after skin incision reduces effectiveness.

- > IV **cefazolin** can be given over 5 minutes and should be administered no more than 60 minutes before skin incision.
- > IV **gentamicin** can be given over 3 to 5 minutes and should be administered within 120 minutes before surgical incision.
- > IV **metronidazole** infusion can be given over 20 minutes and should be fully administered within 120 minutes of surgical incision. Maximum plasma and tissue concentrations occur at the conclusion of the infusion.
- > IV **vancomycin** infusion should be given at a rate of 1g over at least 60 minutes and 1.5g over at least 90 minutes. Vancomycin should be timed to begin 15 to 120 minutes before skin incision. This ensures adequate concentration at the time of incision and allows for any potential infusion-related toxicity to be recognised before induction. The infusion can be completed after skin incision.

Obese patients

- > **Cefazolin:** Consider increased dose of cefazolin (3g) for adult patients weighing more than 120kg.
- > **Gentamicin:** For adult patients with a [body mass index](#) 30 kg/m² or more, use [adjusted body weight](#) (up to a maximum of 100kg) to calculate the gentamicin dose.
- > **Vancomycin:** Consider increased dose of vancomycin (1.5g) for adult patients weighing more than 80kg.

High MRSA risk (defined as history of MRSA colonisation or infection OR frequent stays or a current prolonged stay in hospital with a high prevalence of MRSA OR residence in an area or aged care facility with high prevalence of MRSA OR current residence, or residence in the past 12 months, in a correctional facility):

- > Add vancomycin

Repeat dosing

A single preoperative dose is sufficient for most procedures; however repeat intraoperative doses are advisable:

- > for prolonged surgery (more than 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin dose should be repeated after 4 hours), OR
- > if major blood loss occurs (e.g. more than 1500 mL in adults), following fluid resuscitation.

When measuring the time to a second intraoperative dose, measure the interval from the time of the first preoperative dose rather than the surgical incision time.

Recommended Prophylaxis

Surgery	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Abdominal Surgery		
Appendicectomy (including laparoscopic procedures), exploratory laparotomy, division of adhesions, resection	cefazolin 2g IV PLUS metronidazole 500mg IV infusion <u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)	gentamicin 2mg/kg IV ^ PLUS metronidazole 500mg IV infusion <u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)
Splenectomy (Vaccination and post-splenectomy antibiotic prophylaxis required in all cases) See SA Health Clinical Guideline for Vaccination and Antimicrobial Prophylaxis for Adult Asplenic (Splenectomy) and Hyposplenic Patients available here .	cefazolin 2g IV <u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)	vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)

Recommended Prophylaxis

Surgery	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Gastrointestinal Surgery		
<p>Gastroduodenal and oesophageal</p> <p>Non-endoscopic procedures that enter the GI tract lumen OR</p> <p>Non-endoscopic procedures that do not enter the GI lumen but only if the patient has risk factors for postoperative infection (morbid obesity, gastric outlet obstruction, reduced gastric acidity/motility, GI bleeding, malignancy or perforation) i.e. gastric bypass, resection, ulcer oversew, oesophagectomy</p>	<p>cefazolin 2g IV</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>gentamicin 2mg/kg IV ^</p> <p>PLUS</p> <p>vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>
<p>Small intestinal</p> <p>Non-endoscopic small intestinal procedures</p>	<p>cefazolin 2g IV</p> <p><u>If the small intestine is obstructed:</u> ADD metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>gentamicin 2mg/kg IV ^</p> <p>PLUS</p> <p>metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>
<p>Colorectal</p> <p>Non-endoscopic colorectal procedures (e.g. colon resection, revision of anastomosis)</p> <p>Stoma</p>	<p>cefazolin 2g IV</p> <p>PLUS</p> <p>metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>gentamicin 2mg/kg IV ^</p> <p>PLUS</p> <p>metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>
Biliary Tract Surgery (including laparoscopic procedures)		
<p>Open cholecystectomy</p> <p>Laparoscopic surgery where the patient has risk factors for postoperative infection (e.g. older than 70 years, diabetes, obstructive jaundice, common bile duct stones, acute cholecystitis, non-functioning gallbladder)</p>	<p>cefazolin 2g IV</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>gentamicin 2mg/kg IV ^</p> <p>PLUS</p> <p>vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>
<p>Pancreatic</p> <p>Whipple's procedure, pancreatic necrosectomy, pancreatectomy</p> <p>Liver resection</p>	<p>cefazolin 2g IV</p> <p>PLUS</p> <p>metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>gentamicin 2mg/kg IV ^</p> <p>PLUS</p> <p>metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>
<p>Hernia repair with or without mesh insertion</p>	<p>cefazolin 2g IV</p> <p><u>If entry into the bowel lumen is expected:</u> ADD metronidazole 500mg IV infusion</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>	<p>vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p> <p>OR</p> <p><u>If entry into the bowel lumen is expected give INSTEAD:</u> metronidazole 500mg IV infusion</p> <p>PLUS</p> <p>gentamicin 2mg/kg IV ^</p> <p><u>High risk of MRSA infection:</u> ADD vancomycin 1g IV infusion (1.5g for patients more than 80kg actual body weight)</p>

*High risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

^ For procedures with a moderate likelihood that they will continue for longer than 6 hours a higher dose of gentamicin (5mg/kg) can be considered.

Special Considerations for Colorectal Surgery:

There is some evidence that oral non-absorbable antibiotics such as neomycin may improve outcomes in elective colorectal resections. Neomycin 500mg tablets are available via the Special Access Scheme. The recommended dose is 1 gram (2 x 500mg tablets) at 1pm, 3pm and 10pm the day before surgery.

For more information on the use of oral antibiotics prior to colorectal surgery refer to SAAGAR position statement – [Use of oral antibiotics prior to colorectal surgery](#). See [Use of neomycin prior to colorectal surgery](#) for consumer information leaflet.

Postoperative Care

Except where included above, postoperative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains. If infection is suspected, consider modification of antibiotic regimen accordingly to clinical condition and microbiological results.

Definitions / Acronyms

AMS	Antimicrobial Stewardship	DRESS	Drug rash with eosinophilia and systemic symptoms
ID	Infectious Diseases	IV	Intravenous
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>	SJS / TEN	Stevens-Johnson syndrome / Toxic epidermal necrolysis
GI	Gastrointestinal		

References

- Antibiotic Expert Group (2019). [Therapeutic Guidelines: Antibiotic, Version 16](#). Melbourne: Therapeutic Guidelines Limited.
- Anderson DJ., Sexton DJ. (2021). "Control measures to prevent surgical site infection following gastrointestinal procedure in adults". In: Harris A (Ed), UpToDate. Waltham, MA. [www.uptodate.com]. Accessed March 2021
- Anderson, DJ., Sexton, DJ. (2021). "Antimicrobial prophylaxis for prevention of surgical site infection in adults". In: Harris, A (ed). Up to Date. Waltham, MA. [www.uptodate.com]. Accessed March 2021.
- Bratzler, D, et al (2013). "Clinical practice guidelines for antimicrobial prophylaxis in surgery." *Am J Health Syst Pharm* 70 (3): 195-283.
- Tacconelli, E., et al. (2009). "Antibiotic usage and risk of colonisation and infection with antibiotic-resistant bacteria: A hospital population-based study." *Antimicrob Agents Chemother* 53(10): 4264-4269.
- Koskenvuo L, Lehtonen T, Koskensalo S, et al. Mechanical and oral antibiotic bowel preparation versus no bowel preparation for elective colectomy (MOBILE): a multicentre, randomised, parallel, single-blinded trial. *Lancet* 2019; 7(394): 840-8.
- Basany E, Solis-Pena A, Pellino G, et al. Preoperative oral antibiotics and surgical-site infections in colon surgery (ORALEV): a multi-centre, single-blind, pragmatic, randomised controlled trial. *Lancet Gastroenterol Hepatol* 2020; 5(8): 729-38.

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