

### 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.

**Local epidemiology** - modify prophylaxis if there is a high local incidence of specific infections.

### 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 **teicoplanin** can be given over 5 minutes and should be administered within 120 minutes before surgical incision.
- > 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.

#### Dosing in patients with obesity

- > **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/m<sup>2</sup> or more, use [adjusted body weight](#) (up to a maximum of 100kg) to calculate the gentamicin dose.
- > **Teicoplanin:** Consider increased dose of teicoplanin (800mg) for adult patients weighing more than 80kg.
- > **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), 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.

For elective implantation of prosthetic material, consider *Staphylococcus aureus* screening (for both methicillin-susceptible and methicillin-resistant strains). If the results of screening are positive, perform decolonisation. Refer to SA Health Methicillin-resistant *Staphylococcus aureus* (MRSA): Infection prevention and control [clinical guideline](#).

Applying antimicrobials (e.g. ointments, solutions, powders) to the surgical incision to prevent surgical site infection is not recommended because there is potential for harm (e.g. hypersensitivity reactions, bacterial resistance) and inadequate evidence to support a benefit.

### Recommended Prophylaxis

Surgery	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Coronary Artery Bypass Surgery (CABG) Cardiac Valve Surgery	<b>cefazolin 2g IV</b>  <u>HIGH risk of MRSA infection (e.g. reoperation of prosthetic valve):</u> <b>ADD vancomycin# 1 g IV infusion (1.5g for patients more than 80kg actual body weight)</b>	<b>vancomycin# 1g IV infusion (1.5g for patients more than 80kg actual body weight)</b>  PLUS <b>gentamicin 5mg/kg IV (single dose only – do not give postoperative dose)</b>
	<b>Postoperative doses can be considered for all cardiac procedures for up to 24 hours</b>  Give <b>cefazolin 2g IV</b> 8-hourly for another 2 doses commencing 8 hours after the first dose	Check kidney function first – if CrCl > 40 mL/min, give 1 additional dose of <b>vancomycin# 1g IV infusion (1.5g for patients more than 80kg actual body weight)</b> 12 hours after the first dose

# Note: Teicoplanin may be given as an alternative to vancomycin. A dose of **400mg IV (800mg for patients more than 80kg actual body weight)** can be considered. If a post-operative dose is required, give 1 additional dose of **teicoplanin 400mg IV (800mg for patients more than 80kg actual body weight)** 12 hours after the first dose.

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

## Postoperative Care

Postoperative antibiotics (> 24 hours from first dose) 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 according to clinical condition and microbiology results.

## Definitions / Acronyms

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

## References

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