

## BACKGROUND

Surgical Site Infection (SSI) is a potentially preventable major source of postoperative morbidity. Standardised administration of prophylactic antibiotics decreases the rate of SSI in Elective Orthopaedic Arthroplasty surgery. The routine use of prophylactic antibiotics has not been shown to be effective in selected elective soft tissue procedures. No benefit has been shown in extending courses of prophylactic antibiotics beyond 24 hours in Elective Orthopaedic Arthroplasty surgery.

### Antibiotic Choice / Spectrum of Activity

- The antibiotic used for prophylaxis should have a spectrum of activity against the likely infective organisms (primarily skin organisms, aerobic gram-positive cocci), have high tissue concentrations at the time of incision and be relatively inexpensive.
- Regional resistance patterns and patient allergies must be taken into account.

Routine elective prophylaxis	Cefazolin
$\beta$ -lactam <b>allergy</b>	Clindamycin
Known MRSA	Clindamycin (if susceptible to erythromycin), or Vancomycin

### Timing

- Timing and dosage should optimise efficiency of therapy.
- Antibiotics should be administered within 60 minutes, and at least 5 minutes from start, of surgical incision to optimise tissue levels at time of surgery.
- No benefit has been shown to antibiotics administered after surgical start time, with an **increase** in SSI in patients in whom antibiotic prophylaxis is commenced  $\geq 6$  hours after surgery.
- Vancomycin infusions should begin within 2 hours of surgical incision due to extended infusion times.
- Antibiotics should be completely administered 5 minutes prior to inflation of a tourniquet.
- Doses are patient weight-dependent (double Cefazolin dose in patients over 120 kg).
- For prolonged procedures, or following significant blood loss, additional doses of prophylactic antibiotics are recommended.

Cefazolin (all adults <120 kg)	2 gram IV with induction of anaesthesia Repeat every 2 - 5 hours intra-operatively
Cefazolin ( $\geq 120$ kg)	3 gram IV with induction of anaesthesia Repeat every 2 - 5 hours intra-operatively
Clindamycin	600 mg IV with induction of anaesthesia Repeat 3 - 6 hours intra-operatively
Vancomycin	1 gram to 250 mL of 0.9% Sodium Chloride prior to induction of anaesthesia over 2 hours (maximum rate of 10 mg / minute) Repeat 6 - 12 hours intra-operatively

### Duration of prophylactic Antibiotics

- Duration of antibiotic prophylaxis should not exceed 24 hours postoperatively for Orthopaedic Arthroplasty surgery and may contribute to the development of resistance.
- A single preoperative dose of prophylactic antibiotics only is required for complex arthroscopic procedures involving implants.

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Protocol Steward: Infectious Diseases Physician	Authorised by: Medical Director	

**SUMMARY**

**Elective Orthopaedic Surgery**

<b>Elective Joint Replacement Surgery</b>			
		<b>Preoperative</b>	<b>Postoperative</b>
Routine	<120 kg	Cefazolin 2g	Cefazolin-2g q8h 3 postoperative doses
	≥120 kg	Cefazolin 3 g	Cefazolin 3g q8h 3 postoperative doses
β-lactam allergy		Clindamycin 600 mg IV	Clindamycin 600 mg q8h 2 postoperative doses (or <u>preferably</u> 450 mg q6h if able to <u>take orally</u> )
MRSA colonised		Clindamycin as above if MRSA susceptible to erythromycin / clinda	
		Vancomycin 1 g over 2 hours	Vancomycin 1 g over 2 hours - <u>1 post-operative dose</u> 12 hours after pre-operative dose.
Shoulder replacement		Cefazolin plus clindamycin as above	

Note: Routine use of antibiotic-loaded PMMA cement

Preoperative clipping (not shaving) of surgical site (to be done in SAU / ward)

<b>Elective Non-Arthroplasty Surgery</b>		
	<b>Preoperative</b>	<b>Postoperative</b>
Spine surgery	Single dose of preoperative Cefazolin as per above weight related protocol	
Simple arthroscopic procedures	Not required	
Complex arthroscopic procedures (e.g. requiring implants, prolonged)	Single preoperative dose	Not required
Hand simple soft tissue surgery (CTR, Dupuytren's release)	Not required	
Hand surgery reconstruction / arthroplasty / prolonged	Single preoperative dose	Not required
Simple soft tissue procedures	Not required	
Complex soft tissue procedures	Single preoperative dose	Not required

<b>Acute Orthopaedic Surgery</b>		
	<b>Preoperative</b>	<b>Postoperative</b>
<b>Arthroplasty Surgery</b>	As for Elective Joint Replacement Surgery	
<b>Closed fracture fixation</b>	Single preoperative dose prophylactic antibiotics	Not required
<b>Open fractures</b>		
<ul style="list-style-type: none"> <li>The management of open fractures is different from Elective Orthopaedic Surgery.</li> <li>Treatment with antibiotics is required at the time of hospital presentation with appropriate wound management and assessment of tetanus immunisation status.</li> <li>Treatment should be continued until 72 hours after definitive wound closure for wounds of Grade 2 and over and then the need for antibiotics reassessed.</li> </ul>		
Grade 1 injuries	As for Elective Orthopaedic Surgery	
Grade 2 injuries	Add gram negative cover (gentamicin)	
Grade 3 injuries (extensive soft tissue injury, gross contamination, associated vascular injury)	Add gram negative and anaerobic cover (gentamicin and metronidazole)	

Note: Routine use of antibiotic-loaded PMMA cement  
Preoperative clipping (not shaving) of surgical site

- Gentamicin should be used at a 5 - 7 mg / kg once daily dose using Ideal Body Weight (IBW) adjusted to 3 mg / kg (IBW) in the case of renal impairment (maximum dose of 400mg) - patients requiring ongoing doses must be discussed with the Infectious Diseases (ID) team. See protocol MED.G3.1 Gentamicin Dosing for full details.
- Where the patient is able to take treatment orally, post-operative doses of metronidazole can be given orally.

#### **ASSOCIATED DOCUMENTS**

- Bay of Plenty District Health Board policy 4.1.11 Antibiotics and Antimicrobials
- Bay of Plenty District Health Board policy 4.1.11 protocol 1 Antibiotics and Antimicrobials - Restricted Antimicrobial List
- Bay of Plenty District Health Board policy 4.1.11 protocol 2 Antibiotics and Antimicrobials - Antibiotic Recommendations for Common Conditions in Adults
- Bay of Plenty District Health Board policy 4.1.11 protocol 5 Antibiotics and Antimicrobials - General Surgery - Recommendations for Pre-operative Antibiotic Prophylaxis
- Bay of Plenty District Health Board policy 4.1.11 protocol 6 Antibiotics and Antimicrobials - Surgical Specialties - Recommendations for Pre-operative Antibiotic Prophylaxis
- Bay of Plenty District Health Board Medications protocol MED.G3.1 Gentamicin
- Bay of Plenty District Health Board Medications protocol MED.V5.1 Vancomycin (IV and Oral)
- Bay of Plenty District Health Board policy 4.1.0 Infection Control Management

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