Antimicrobial Stewardship - Surgical Antimicrobial Prophylaxis

Document Type	Guideline
Function	Clinical Practice
Directorate(s)	All Directorates
Department(s) affected	All clinical departments
Applicable for which patients, clients or residents?	All patients (adults & children) undergoing surgical procedures
Applicable for which staff members?	All clinicians involved in the care of patients undergoing surgical procedures
Key words (not part of title)	peri-operative, infection,
Author – role only	Antimicrobial Stewardship Pharmacist
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1. Purpose of guideline

The purpose of this guideline is to maintain best practice for surgical antimicrobial prophylaxis at Auckland District Health Board.

Appropriate use of surgical antimicrobial prophylaxis reduces the risk of surgical site infections in procedures where bacterial contamination may occur and in procedures where prosthetic devices are implanted because the consequence of infections in this setting is high, whilst minimising the adverse consequences of antimicrobial use.

2. Guideline management principles & goals

All surgical antimicrobial prophylaxis should comply with the following guideline including choice of agent, dose, timing and duration of prophylaxis. Any deviation from this guideline should be documented in the patient's clinical record for audit purposes.

A single dose of antimicrobial prophylaxis is usually sufficient. There are a limited number of procedures where post-operative doses can be given for up to a maximum of 24 hours. Re-dosing may be required when there is excessive blood loss or a prolonged surgical duration.

A patient presenting for surgery with an active infection should continue their current antimicrobial treatment regimen and receive their scheduled peri-operative doses. Standard surgical antimicrobial prophylaxis should also be administered at the correct time to minimise the risk of surgical site infection.

Administration of antimicrobial solutions, dusting the surgical bed with antimicrobial powder or instilling antibiotics directly into wounds is of no proven benefit, and in fact may be harmful. The inappropriate use of antimicrobial agents in this manner is not supported within Auckland DHB. Appropriate use of antimicrobial loaded cement in orthopaedic sepsis surgery may be used with targeted antimicrobial agents (gentamicin and vancomycin) for known or likely pathogens.

In exceptional circumstances, the Infectious Diseases, Clinical Microbiology or Antimicrobial Stewardship services may recommend alterative regimens.

It is the joint responsibility of both the surgical and anaesthetic teams to ensure correct prescribing, administration and documentation of surgical antimicrobial prophylaxis occurs for every patient (see associated Auckland DHB documents section).

This guideline will be reviewed on an annual basis by the Antimicrobial Stewardship Committee.

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3. Selection of prophylactic agent

Antimicrobial prophylaxis agents and doses have been selected based on their; activity against the pathogens most likely to contaminate the surgical site, ability to reach adequate serum and tissue levels, safety profiles, and are administered for the shortest effective period to minimise adverse effects and development of resistance.

No dose adjustments are recommended for renal or hepatic impairment. Paediatric doses are weight-based but in an adult, no adjustment is necessary for extremes of weight.

MRO
If surgical antimicrobial prophylaxis is indicated for a patient colonised or infected with MRSA then they should receive vancomycin in addition to the standard regimen. A patient colonised or infected with ESBL or other MRO should be discussed with either Infectious Diseases or Clinical Microbiology, as an alternative prophylactic regimen may be required.

Penicillin allergy
As most standard regimens are first-generation cephalosporin-based, a patient with anaphylaxis to penicillin or cephalosporins should receive alternate prophylaxis. For intra-abdominal surgeries, the cephalosporin should be replaced with gentamicin and for all other surgeries; the cephalosporin should be replaced with vancomycin or clindamycin.

4. Timing of prophylaxis

The optimal timing for administration of peri-operative dosing is within 60 minutes before surgical incision (knife to skin). Agents requiring extended administration times eg vancomycin should begin within 120 minutes before surgical incision.

The following antimicrobial prophylaxis should be re-dosed, at the same dose, when there is excessive blood loss (greater than 1500 mL in an adult) or when duration of surgery exceeds the re-dosing period:

antimicrobial	re-dosing period (from last dose)
cefazolin	4 hours
cefuroxime	4 hours
clindamycin	6 hours
metronidazole	7 hours
vancomycin	9 hours
gentamicin	NOT REQUIRED
others	Discuss with ID/Micro/Pharmacy

In situations where microbiological sampling for diagnosis of suspected infection is required, surgical prophylaxis should be withheld until after sampling is completed.

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5. Audit

Directorates who utilise surgical antimicrobial prophylaxis are responsible for auditing their compliance to this guideline on an annual basis with focus on the choice of agent, dose, administration time and re-dosing. ≥ 95 % compliance is considered acceptable.

The Health Quality & Safety Commission's National Surgical Site Infection Improvement Programme includes the capture of this information and these results can be used for reporting purposes.

6. Supporting evidence

- Bratzler DW, Dellinger EP, Olsen KM et al Clinical practice guidelines for antimicrobial prophylaxis in surgery. Am J Hosp Sys Pharm 2013; 70: 195-283

- Peter Mac Surgical Antibiotic Prophylaxis-Flowchart and Decision Support Poster. Antimicrobial Stewardship Committee & therapeutic Drug Committee, August 2011, Peter MacCullum Hospital, Melbourne, Vic, Australia

7. Associated Auckland DHB documents

- Antimicrobial Stewardship - Antimicrobial Therapy
- Medication - Administration
- Medications - Allergies & Adverse Drug Reactions (ADRs) Identification, Documentation & Reporting
- Medications - Prescribing
- Medications - Restricted Antimicrobials
- Renal Transplant Adult Recipient: Anaesthesia & Surgery

Other resources

- Liver Transplant Guideline

8. Disclaimer

No guideline can cover all variations required for specific circumstances. It is the responsibility of the health care practitioners using this Auckland DHB guideline to adapt it for safe use within their own institution, recognise the need for specialist help, and call for it without delay, when an individual patient falls outside of the boundaries of this guideline.

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9. Corrections and amendments

The next scheduled review of this document is as per the document classification table (page 1). However, if the reader notices any errors or believes that the document should be reviewed ***before*** the scheduled date, they should contact the owner or the Clinical Policy Advisor without delay.

10. Appendix 1: Level 4 and Level 8 Operating Rooms

11. Appendix 2: Level 9 Operating Rooms

12. Appendix 3: Paediatric Operating Rooms

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