

DEVELOPING A SURGICAL ANTIBIOTIC PROPHYLAXIS GUIDELINE

Background

Prevention of surgical site infection (SSI) was the most common reason for antimicrobial prescriptions in Australian hospitals during 2013-2015.¹ Around 40% of these prescriptions were deemed inappropriate due to prolonged duration, incorrect dose or the procedure not requiring antimicrobials for prophylaxis.¹

Purpose of this document

Guidelines for surgical antibiotic prophylaxis (SAP) are essential to provide evidence based recommendations to support optimal prophylactic antibiotic prescribing and reduce inappropriate prescribing. This document provides guidance to facilities or districts that are developing their own SAP guideline.

The Therapeutic Guidelines are the national antimicrobial prescribing guidelines in Australia and include recommendations for SAP. These guidelines may be amended at the local level to allow for variations for local patient demographics and antibiotic resistance patterns.

The process of guideline development can provide an opportunity to involve a range of clinicians, expand their knowledge of the evidence base, and reduce variation in practice. It can also enable clinicians to assess their own performance against the recommendations for best practice. Guideline development has the capacity to help foster and strengthen relationships between staff in participating departments as well as create a sense of ownership of the guideline, promoting uptake and compliance.

Who to involve

The guideline development group should include individuals from all the relevant professional stakeholder groups; this may include surgeons, anaesthetists, surgical/anaesthetic trainees, antimicrobial stewardship, and/or clinical microbiologists, senior nurses working in theatres/anaesthetics/surgical wards and infection prevention and control specialists.

What to include in an SAP Guideline

Guidelines are designed to help clinicians assimilate, evaluate and implement the vast amount of evidence and opinion on best current practice. The SAP guideline will provide clinicians with an overview of the benefits and risks of antibiotic prophylaxis; indications for surgical antibiotic prophylaxis to prevent infection at a range of surgical sites; and choice, timing dosage and route of administration of prophylactic antibiotics. An SAP guideline should cover the following:

- **Intended audience:** The target users of the SAP guideline are medical staff including surgical and anaesthetic teams, nursing staff working in surgical wards and theatres, and clinical pharmacists.
- **Rationale for antibiotic prophylaxis:** To reduce the incidence/risk of post-operative SSIs. Patients undergoing procedures associated with high infection rates should receive perioperative antibiotics.
- **Risks of antibiotic prophylaxis:** The aim of rationalising SAP is to reduce the inappropriate use of antibiotics, thus minimising the consequences of misuse such as allergy, anaphylaxis, antibiotic-associated diarrhoea and antibiotic resistance.
- **Indications for SAP:** A list of procedures for which SAP is recommended, based on the evidence for the clinical effectiveness of prophylactic antibiotics in reducing the incidence of SSIs compared with the risk of antibiotic administration or exposure. Antibiotic prophylaxis should be used where evidence of benefit exists and should not be considered if there is no supporting evidence.
- **Screening and decolonisation:** Refer to any screening and decolonisation protocols applicable to your facility
- **Prescribing and administration of prophylactic antibiotics:** Considerations are listed in Table 1.
- **Summary table of recommendations:** A comprehensive SAP guideline can span many pages; having a concise summary table of recommendations made in the guideline would serve as a quick and practical

reference to users. Tabled recommendations can also be made into posters for display in operating theatres.

- **Off-label use of antibiotics:** Use of antibiotics outside its product license requires consultation and approval from the local Drug and Therapeutics Committee as per the [Approval Process of Medicines for Use in NSW Public Hospitals Policy Directive](#) (PD2016_033). It is also recommended that the AMS Committee is consulted about such decisions.
- **Prescribing and documentation:** SAP guideline should clearly indicate where to document antibiotic prophylaxis in the patient records (for example, the anaesthetic chart or the 'once only' section of the drug chart, SurgiNet or eMeds). An example of best practice may be a useful inclusion.
- **Disclaimer:** An SAP guideline should include a disclaimer such as "This guideline has been prepared based on the best available evidence at the time of writing. It is intended to be used with careful clinical judgement. Clinical management must always take into consideration the needs of the individual patient and the particular circumstance of each case." A date created, version number, and year for review should be included.
- **References:** Include any references used to develop your guideline.

How to implement

The SAP guideline should include an implementation plan suitable to support effective uptake of the guideline into practice. This should cover the following headings:

- Timeframe – usually in months
- Communication strategy – e.g. dissemination of guideline via Broadcast email, memo from Head of Department of Surgery, presentation at Surgical Grand Rounds, banner on the local intranet and utilising the Surgical Superintendent and DON to communicate messages
- Education strategy – e.g. in-service for target audience, online learning modules, case discussion
- Resources required – e.g. poster versions of the guideline recommendations for display in theatres, surgery specific quick reference guides, presentations for grand rounds, swing cards, smart phone apps
- System for monitoring compliance – evaluate progress through regular audit and review with feedback to the team.

It would be ideal to involve senior managers, hospital executive, individuals in charge of quality improvement and patient safety and those responsible for staff education and training to help advance the adoption and implementation of these guidelines.

Governance

The SAP Guideline should be endorsed by the Committee that oversees antimicrobial stewardship in the facility/local health district/specialty health network; this may also involve approval by the Drug and Therapeutics Committee and/or Infection Prevention and Control Committee.

The Executive Unit is responsible for governing compliance with the SAP Guideline; this may involve asking clinicians and/or antimicrobial stewardship teams to report on compliance and addressing ongoing non-compliance by an individual prescriber or a department.

Sample SAP Guidelines

South Australian expert Advisory Group on Antimicrobial Resistance (SAAGAR) - [Surgical Antimicrobial Prophylaxis Clinical Guideline](#) (2017)

Hunter New England Local Health District – [Surgical Antibiotic Prophylaxis Clinical Guideline](#) (2014)

Scottish Intercollegiate Guidelines Network (SIGN), Healthcare Improvement Scotland - [SIGN 104 – Antibiotic prophylaxis in surgery](#) (2014)

Sydney Children's Hospital Network – [Surgical Antimicrobial Prophylaxis Guideline](#) (2013)

Queensland Government, Metro South Health – [Surgical Antibiotic Prophylaxis Guidelines](#)

References

1. Australian Commission on Safety and Quality in Health Care (ACSQHC). AURA 2017: Second Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC, 2017

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Developing a surgical antibiotic prophylaxis guideline
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TABLE 1: CONSIDERATIONS FOR PRESCRIBING AND ADMINISTRATION OF ANTIBIOTICS FOR PREVENTION OF SURGICAL SITE INFECTION

Choice of antibiotic	<p>The antibiotics selected for prophylaxis must cover the organism(s) most likely to cause postoperative infection. Careful consideration of the following factors should be given when selecting an antibiotic for prophylaxis:</p> <p><i>Patient factors:</i></p> <ul style="list-style-type: none"> • pre-existing infection • co-morbidities (e.g. endocarditis prophylaxis for patients with a prosthetic cardiac valve) • current or recent antimicrobial use • known colonisation with multidrug-resistant organisms <p><i>Environmental factors:</i></p> <ul style="list-style-type: none"> • organisms causing infection within the institution and the patterns of antibiotic susceptibility • potential selection pressure of antibiotic use. <p>Guidelines may also offer additional guidance on the principles of gentamicin and glycopeptides in surgical prophylaxis.</p>
Alternative antibiotics	<p>Recommendations for alternative antibiotics for patients with allergies (non-immediate and immediate hypersensitivities) or contraindications to first line antibiotics.</p>
Dosage selection	<p>It is generally accepted as good practice that the dosage of an antibiotic required for prophylaxis should not exceed the dosage used for treatment of infection. Obesity is an independent risk factor for SSI. The pharmacokinetics of antibiotics are altered in obese patients, so dosage adjustments based on body weight may be necessary in this population.</p>
Timing of administration	<p>Appropriately timed prophylaxis is crucial to attain effective plasma and tissue concentrations at the time of incision and for the duration of the surgical procedure. Refer to the <i>Therapeutic Guidelines</i> for advice on recommended timing.</p> <p>Guidelines may also offer guidance on the administration of antibiotics, refer to the <i>Australian Injectable Drugs Handbook</i> for advice.</p>
Re-dosing of antibiotics	<p>Re-dosing may be necessary if there was a significant delay to starting the operation, a short-acting antibiotic is used (e.g. cephazolin) and the operation is prolonged beyond 3 to 4 hours or if there was excessive blood loss during the procedure.</p>
Duration of prophylaxis	<p>For the majority of procedures, there is consistent evidence that a single dose of antibiotic with a long enough half-life to achieve activity throughout the operation is adequate. Postoperative doses are only required for specific indications (e.g. some cardiac and vascular surgeries, lower limb amputation) for which a benefit for up to 24 hours of prophylaxis has been demonstrated in clinical trials. Sites with eMeds can consider building order sentences for indications requiring postoperative doses.</p>
Route of administration	<p>The route of administration for SAP is usually parenteral (either intravenous or intramuscular). Limited high-quality data is available on the use of antimicrobial irrigations, pastes and washes that are administered topically. As such, the use of topical antimicrobials is not recommended for surgical prophylaxis.</p>