

Surgical antimicrobial prophylaxis

Surgical site infection is a potential risk of surgery that needs to be managed effectively as part of good patient care. Appropriate surgical antibiotic prophylaxis in concert with oxygenation, glycaemic control, surgical anti-sepsis and advances in clinical practice has reduced surgical site infections. However, the increase in antimicrobial resistance (AMR) across the globe is limiting the ability of the antibiotics we have at our disposal to provide safe and effective care for patients.

The overuse and misuse of antibiotics, wherever this occurs, impacts the efficacy of surgical antibiotic prophylaxis. Many current infections are no longer responsive to first line antibiotic choices. Complex infections are now being treated with potentially more toxic, costly and complicated regimens than in the past due to emerging antimicrobial resistance, which creates additional risks for patients.

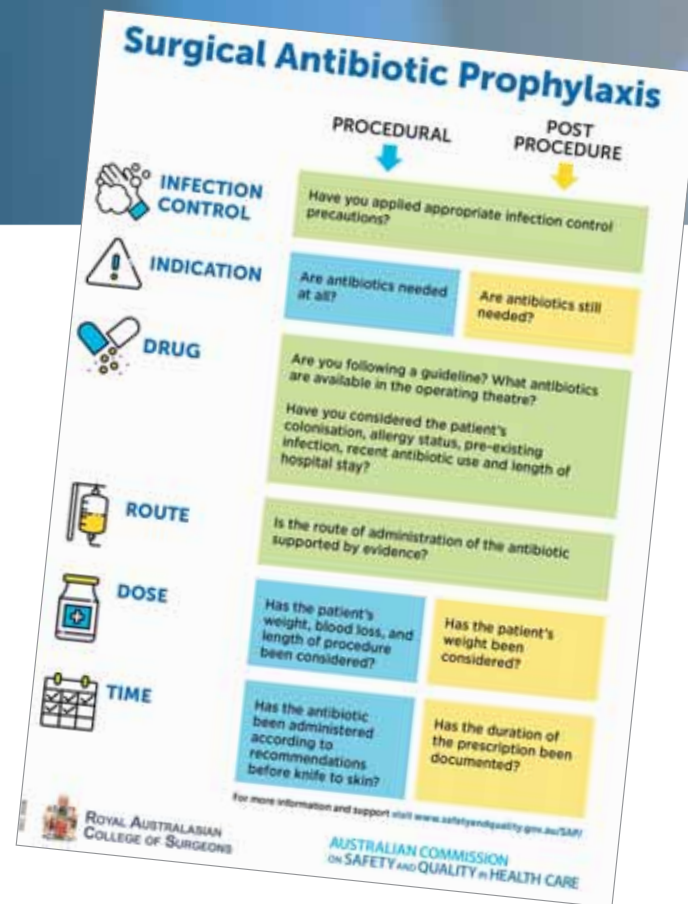
The Australian Commission on Safety and Quality in Health Care coordinates the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System, which provides a range of AMR and antibiotic use surveillances, and a platform for voluntary standardised audits of surgical prophylaxis through the Hospital National Antimicrobial Prescribing Survey (NAPS) framework. Data from participating hospitals in 2017 showed that 30.5 per cent of surgical prophylaxis prescriptions for inpatients extended 24 hours beyond the time of surgery. This is despite guidelines generally recommending surgical prophylaxis durations of less than 24 hours. Commonly, surgical antibiotic prophylaxis was found to be too broad or too narrow for the likely organisms, inconsistent with guidelines, or the wrong dose was prescribed.

Variation in surgical antibiotic prophylaxis prescription is often the result of individual clinician preferences. There may be a perception of reduced adverse outcome with longer and broader spectrum intravenous courses. Topical or deep surgical site administration has also been reported. Despite evidence to the contrary, some of these perceptions remain^{1,2}.

The increased healthcare-associated complications of prolonged or novel intra-operative antibiotic use, also need to be considered, particularly where the evidence base for alternative practices is poor.

Process issues still account for many variations from guidelines-based practice. Improved standardisation could harmonise our practice towards more consistent and reliable delivery of antibiotic prophylaxis. There are many opportunities for improvement including:

- Consistency in documentation of fixed antibiotic duration.
- Development and adherence to evidence- or consensus-based guidelines.
- Administration timing for optimal concentration during the procedure.



It is well established that the timing of prophylactic antibiotics is crucial. Anaesthetists are well placed to have a significant impact on this aspect of surgical antibiotic prophylaxis. The optimal timing is dependent on the pharmacokinetics of the antibiotic utilised. For example, cefazolin should be commenced within 60 minutes of knife to skin to optimise tissue concentrations. Vancomycin (and antibiotics with a longer half-life) should be commenced within 120 minutes of knife to skin, and the infusion does not have to be completed prior to the commencement of surgery. Vancomycin, when administered rapidly, can cause red man syndrome.

Anaesthetists play an important role in delivering appropriate surgical prophylaxis determining the appropriate dose of the antimicrobial in relation to the patient's weight and co-morbidities and the requirement for redosing for longer procedures. Collaboration between anaesthetics and surgical specialties regarding the choice of antibiotics for surgical prophylaxis may aid in more consistent administration practices within organisations³.

Under the National Safety and Quality Health Service (NSQHS) Standards, every hospital is required to have a local antimicrobial stewardship program to optimise use of antimicrobials and improve the use of surgical antimicrobial prophylaxis within hospitals. This may include facilitating audit and feedback procedures or dedicated quality improvement projects. We all want the same outcome – safe and effective care for our patients. To achieve this, we need to understand how to balance the risks and benefits of antimicrobial use by utilising specialty knowledge.

The commission is working with ANZCA to provide you with resources to assist in this. Go to www.safetyandquality.gov.au/our-work/healthcare-associated-infection/antimicrobial-stewardship/surgical-antimicrobial-prophylaxis/ to find out how you can improve surgical antibiotic prophylaxis in your organisation.

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References:

1. Harbarth S, Samore MH, Lichtenberg D, Carmeli Y. Prolonged antibiotic prophylaxis after cardiovascular surgery and its effect on surgical site infections and antimicrobial resistance. *Circulation*. 2000 Jun 27;101(25):2916-21
2. Improvisation versus guideline concordance in surgical antibiotic prophylaxis: a qualitative study, Broom, J., Broom, A., Kirby, E. et al. *Infection* (2018) 46: 541.
3. Understanding antibiotic decision making in surgery—a qualitative analysis, *Clinical Microbiology and Infection*, Volume 23, Issue 10, 752 – 760, Charani, E. et al.

WebAIRS news



WebAIRS is an anaesthetic incident reporting tool available to all anaesthetic departments throughout Australia and New Zealand. The system was developed by the Australian and New Zealand Tripartite Anaesthetic Data Committee (ANZTADC).

Susan Considine joined us as the new ANZTADC Coordinator in January. Susan has a background in health information management, with experience in clinical coding, and has previously worked at the Geelong Hospital, the Melbourne Clinic and the Peter MacCallum Cancer Centre.

Strategy

Last year webAIRS refined the website to provide more information to users via the five green buttons on the home page. In 2019 we plan to continue to provide regular feedback with a number of initiatives including increasing the number of safety alerts and incident case reports in the *ANZCA Bulletin*.

Case report from webAIRS

An incident was reported recently relating to the failure of an anaesthetic circuit following a collision with the operating table. This is a summary of the original report: "Shortly after commencing an ENT procedure the surgeon asked that the patient be positioned head up and the

operating table rotated 180 degrees. As the table was being repositioned a large leak occurred after contact with the anaesthetic circuit. It was found that the HME filter had broken off. However the broken end of the filter remained in the anaesthetic circuit which made rapid replacement impossible. This required the use of a self-inflating bag to ventilate the patient until the circuit could be repaired. Fortunately no harm resulted to the patient."

This incident identifies two key hazards areas: the risks of moving operating tables and the lack of backup equipment in a timely manner. Another issue was the need for clear plans to address failures in the anaesthetic delivery system.

Have you had a similar event during the adjustment of an operating table? Please report it to webAIRS.

Planned newsletter

WebAIRS is considering the publication of an individual webAIRS newsletter several times a year which would include cases like the one above and we would value your feedback on the usefulness of this information.

This would be in addition to the current arrangement of articles within the e-news and the *Bulletin*.

Please email your feedback to anztadc@anzca.edu.au. Find out more about ANZTADC/WebAIRS at www.anztadc.net/.

Are you contributing to quality improvement in anaesthesia? Register yourself on webAIRS: www.webairs.net.

Safety alerts

Safety alerts are distributed in the "Safety and quality" section of the monthly *ANZCA E-Newsletter*.

A full list can be found on the ANZCA website: www.anzca.edu.au/fellows/safety-and-quality/safety-alerts.

DayCOR Registry website now live



The Day Care Anaesthesia Registry website has gone live, and promises to be a vital resource for not only advice, but the dissemination of outcome results and improvement in care. Dr Ken Sleeman, Chairman of the ACE Day Care Anaesthesia Special Interest Group, welcomes feedback from interested fellows, via the website – www.daycorregistry.com.au.