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Major Article

How do professional relationships influence surgical antibiotic prophylaxis decision making? A qualitative study

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Background: Surgical antibiotic prophylaxis (SAP) is a critical area to optimize to reduce the escalation of antimicrobial resistance. This article explores the ways by which interpersonal relationships influence SAP decision making.

Methods: Twenty surgeons and anesthesiologists participated in in-depth semistructured interviews on SAP prescribing. Results were analyzed using the framework approach.

Results: Analysis revealed 3 ways by which interpersonal relationships influence SAP: relationship dynamics between the surgeon and the anesthesiologist determine appropriateness of SAP, particularly operative risk ownership; perceived hierarchies within, and between, surgical and anesthesiologist specialties influence antibiotic prescribing decisions; and surgical distance from the antimicrobial stewardship team, which influences use of antimicrobial stewardship principles.

Conclusions: Interventions to optimize SAP are more likely to be effective in enacting sustained change if they consider the interpersonal and social contexts, including issues of familiarity and cohesiveness, hierarchical patterns, and sense of place within a team. Significant relational dynamics in SAP decision making are centered around risk; that is, personal/reputational risk to different professional groups and ownership of risk for individual patient outcomes. Risk must therefore be considered for sustainable SAP optimization interventions.

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Surgical antibiotic prophylaxis (SAP) is a high-volume area of hospital antibiotic use in Australia and internationally. In Australia, SAP is the most frequent indication for antimicrobial therapy, accounting for 15.5% of 22,021 hospital antimicrobial prescriptions in 2015, 40.5% of which were inappropriate.¹ During 2015, this survey was performed in 281 hospitals and included 22,021 prescriptions, in-

dicating a substantial burden of inappropriate SAP in Australian antibiotic use. SAP optimization is a critical goal in the global effort to limit inappropriate antimicrobial agent use to stem the rapidly escalating global problem of multiresistant bacteria.

SAP guideline concordance

Despite well-established guidelines for SAP in Australia and internationally, compliance with established guidelines for SAP is variable and almost universally suboptimal (in some audits as low as 2%-10%) with different compliance issues documented relating to the domains of timing, dose, antibiotic agent choice, and SAP duration.²⁻⁶ SAP is commonly inappropriately prolonged, despite recommendations that a single perioperative dose is sufficient for the majority of procedures.^{7,8} In addition, where an operation is prolonged and redosing intraoperatively is indicated, compliance is also commonly low.⁹ The reasons for this widespread and persistent non-compliance with apparently well-protocolized clinical guidance remain opaque and are discordant with the urgent international need to optimize use of antimicrobial agents.

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Conflicts of interest: None to report.

Social influences on antibiotic use

The influence of social and behavioral factors on antibiotic prescribing more broadly is well established in Australia, as well as elsewhere, with social dynamics and cultural sensibilities such as power differences identified to influence antibiotic agent prescribing in different countries, and at the institutional level and through interpersonal interactions.¹⁰⁻¹³ Hierarchy within medical teams, fear of adverse clinical outcomes, local cultures of prescribing, specialty ownership of decision making, and interprofessional interactions can significantly influence antibiotic prescribing within hospitals.^{10,13-16} Yet, less attention has been paid to how such factors may influence the prophylactic use of antibiotics within surgery. To this point, no study has examined the perspectives of surgeons and anesthetists about interactions that occur around SAP that have the potential to significantly influence their prescribing decisions.

Social influences in surgery

The operating theatre environment involves interaction among a number of significant participants, with important roles for surgeons, anesthetists and nurses—professional groups that may have inherently different values and attitudes, and whose interactions may be influenced by the organizational, medical, and social contexts.¹⁷ This was revealed in the results of a mixed-methods qualitative study performed in Italy of anesthetists, surgeons, and nurses involved in pediatric surgery, which showed substantial disagreement about the basic aspects of SAP such as the value of prolonged prophylaxis, antibiotic choice, and even the definition of SAP.¹⁸ Moreover, another recent analysis composed of a review of interventions to optimize SAP identified “providing education or individualised performance feedback to address clinician knowledge, attitudes, beliefs and behaviour” as a potentially efficacious intervention style.¹⁹ There has been an international call for surgical leadership in the stewardship of SAP and also recognition that surgical specialties face distinct and specific challenges in antibiotic use that require specialty-specific research.²⁰⁻²² Driven by the premise that engaging surgeons requires a detailed understanding of the issues they face in SAP decision making, this study aimed to examine in depth the perspectives of surgeons and anesthetists on interpersonal and cultural SAP prescribing influences.

METHODS

Institutional context

This study was conducted at a teaching hospital in New South Wales, Australia, during 2017. This is a 450-bed tertiary referral hospital in which there is an antimicrobial stewardship (AMS) service that includes computerized antimicrobial approvals for a list of restricted antimicrobial agents, including glycopeptides, third-generation cephalosporins, carbapenems, and quinolones among others. There is an approved SAP procedure that is visible on operating theatre walls and is based predominantly on the national Australian electronic therapeutic guidelines. Antibiotic administration according to this protocol is preapproved. When SAP decisions require restricted antimicrobial agents outside the SAP guidelines, approval can be granted via the computerized system or via a telephone call to the AMS registrar. Whilst this process is clearly formalized, in practice issues of prolonged prophylaxis (for example) are observed, consistent with national and international data around SAP compliance issues.

Qualitative methodology

Ethical approval was granted by Prince of Wales Hospital (Sydney) HREC/15/POWH/246. A formal invitation letter and participant information and consent form (via E-mail) was sent to 71 surgeons and anesthetists of all levels of training. Of these, 20 doctors (17 surgeons and 3 anesthetists) volunteered to participate in semistructured qualitative interviews during 2016 and 2017. Of the 17 surgeons, 10 were senior and 7 were junior. The 3 anesthetists included 2 senior and 1 junior participant. Fourteen participants were men and 6 were women. The interviews were focused on the following domains: experiences with antibiotic use and antimicrobial resistance more broadly, experiences and perspectives on the use of surgical antibiotic prophylaxis, experiences of interprofessional work within the operating theatre, and perspectives on AMS and the place of AMS within surgery. The thematic analysis of the data was driven by a framework approach, which included the following steps: familiarization, in which the researchers reviewed the manuscripts; identification of framework; that is, key themes and issues identified around which the data were organized; indexing, which includes application of themes to text; charting, or use of headings and subheadings to build a picture of the data as a whole; and mapping and interpretation, in which associations were clarified and explanations worked toward. Independent coding of the data was provided initially by members of the research team, which was then cross-checked to facilitate the development of themes, moving toward an overall interpretation of the data. Analytic rigor was enhanced by searching for negative, atypical, and conflicting or contradicting cases in coding and theme development.²³⁻²⁵ Interrater reliability was ensured by integrating a number of research team members in the final analysis.^{25,26} All audiorecordings, transcripts, coding reports, and notes were retained and added to documentation of research aims, design and sampling, and recruitment processes and practices to form an audit trail.

RESULTS

Here we report on the themes emergent from our analysis of the interviews. The analysis revealed 3 key relationship dynamics that influenced antibiotic prescribing decisions. First, the relationship between the surgeon and the anesthetist was perceived to be of critical importance in determining antibiotic prescribing decisions. Second, the critical role of hierarchy in influencing decision making both within the surgical team, and between different levels of seniority between surgical and anesthetist teams. The third significant social relationship dynamic revealed by our analysis was among the surgical team and the AMS team and the infectious diseases specialty service.

The relationship between surgeons and anesthetists

Participants reflected extensively on the relationship between surgeons and anesthetists and how this influenced decision making and practice. The most common dynamic discussed within the interviews revealed a desire on the part of surgeons for anesthetists to take ownership of routine guideline-based antibiotics decisions. At the same time, the surgeons talked at length about their preference for effective communication around decision making with anesthetists in situations where a patient required an alternative antibiotic or had a risk for multiresistant infections. This was described as particularly important for antibiotics that would delay surgery by a prolonged infusion such as vancomycin (for indicative quotations see [Table 1](#)). Private hospital surgical lists (compared with public hospital lists) were described by participants who worked both in public and private settings (data collection was within a

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