

## HOSPITAL HAD HIGHEST "INAPPROPRIATE" ANTIBIOTIC PRESCRIPTION RATE IN AUSTRALIA

### Background

Although collated National Antimicrobial Prescribing Survey (NAPS) data are de-identified, anonymity is difficult within smaller jurisdictions. A local media report with misinterpreted data generated a heightened awareness around the hospital's AMS program. This provided a unique opportunity to stimulate engagement to optimise antibiotic prescribing practices. Surgical prophylaxis was targeted given pre, peri and post-operative data had consistently been identified as an area for improvement (see graphs from 2016 below).

### Results

25% of Surgeons (responsible for approximately 75% of the hospital's surgical workload) have responded to date. 15 Cards have been developed and made available; five generic for particular surgical specialties (Figure 1), and 10 specific to individual Surgeons (Figure 2). Concordance with national guidelines was very high. Guidelines were followed with respect to procedure, antibiotic, dose, timing, duration, alternatives due to allergies or MRSA (risk or proven) except with regard to two procedures (Figure 3 and 4).

Figure 1. Example of a Generic Surgical Prophylaxis Preference Card

Surgical Prophylaxis Preferences for Orthopaedic Surgery	
<b>GENERIC</b>	
Prophylaxis is <b>NOT</b> indicated for:	
<ul style="list-style-type: none"> <li>Routine arthroscopy (unless they involve insertion of prosthetic or transplant material or avascular tissue, or the patient is immunocompromised).</li> </ul>	
Prophylaxis <b>IS</b> indicated for:	
<ul style="list-style-type: none"> <li>Procedures involving insertion of prosthetic or transplant material</li> <li>ORIF of fractures of larger bones</li> <li>Spinal surgery</li> <li>Open fractures</li> </ul>	
Therapeutic Guidelines Antibiotic recommend:	
<ul style="list-style-type: none"> <li>Cephazolin 2g IV 15-30 mins pre-incision (child 30mg/kg up to 2g) For patients at risk of MRSA, <b>ADD</b></li> <li>Vancomycin 15mg/kg IV started 30-120 mins pre-incision (rate 10mg/min) For patients with hypersensitivity to penicillins</li> <li>Replace cephazolin with vancomycin as above</li> </ul>	
<b>Lower Limb Amputation</b>	
Therapeutic Guidelines Antibiotic recommend:	
<ul style="list-style-type: none"> <li>Cephazolin 2g IV 15-30 mins pre-incision (child 30mg/kg up to 2g) For patients at risk of MRSA <b>ADD</b></li> <li>Vancomycin 15mg/kg IV started 30-120 mins pre-incision (rate 10mg/min) For patients with immediate hypersensitivity to penicillins or cephalosporins</li> <li>Vancomycin 15mg/kg IV started 30-120 mins pre-incision (rate 10mg/min) Plus</li> <li>Gentamicin 5mg/kg IV 15-30mins pre-incision For an ischaemic limb <b>ADD</b></li> <li>Metronidazole 500mg IV (child 12.5mg/kg up to 500mg) 15-30 mins pre-incision</li> </ul>	

Figure 2. Example of a Surgical Prophylaxis Preference Card for an individual Surgeon

Surgical Prophylaxis Preferences for ENT Surgery			
ENT: Dr X Y			
Procedure	Antibiotic	Dose	Timing
Stapedectomy, I/O prosthetic material	Cephazolin	2g IV (child 30mg/kg)	15-30 mins pre
Incision through mucosal surface	ADD Metronidazole	500mg IV (child 12.5mg/kg)	15-30 mins pre
Tonsillectomy for recurrent infections	Cephazolin	2g IV (child 30mg/kg)	On Induction
Tonsillectomy for sleep apnoea	No Antibiotic		
Simple septoplasty (removal of spur or submucous resection of septal cartilage)	No Antibiotic		
Septoplasty (reconstruction cartilage/bone graft)	Cephazolin	2g IV (child 30mg/kg)	On Induction

For immediate hypersensitivity to Penicillin with unknown cephalosporin status:

- Clindamycin 600mg IV 15-30mg 15-30 mins pre-incision (child 15mg/kg up to 600mg)

Therapeutic Guidelines Antibiotic recommend prophylaxis not indicated for:

- Endoscopic sinus surgery
- Uncontaminated neck dissection

Antibiotic prophylaxis is recommended in patients with the following cardiac conditions:

- Prosthetic valve or prosthetic material used for valve repair
- Previous infective endocarditis
- Congenital heart disease involving
  - Unrepaired cyanotic defects
  - Completely repaired defects involving prosthetic material or devices during the first six months post insertion
  - Repaired defects with residual defects
- Rheumatic heart disease in high risk patients

Surgical Prophylaxis Preferences for Urology

Dr A B				
Procedure	Antibiotic	Dose	Timing	Duration
Cystoscopy (sterile urine)	Nil			
Stent	Cephazolin or Gentamicin	2g IV or 2mg/kg	Start of case	Single dose
TURP	Cephazolin or Gentamicin	2g IV or 2mg/kg	15-30 mins pre	Single dose
Biopsy (transrectal)	Ciprofloxacin	500mg PO	BD	7 days preop + DOS

Figure 3. Example of non-compliance with regard to duration of therapy (guidelines recommend a single dose 60-120 mins prior to procedure).

Surgical Prophylaxis Preferences for General Surgery

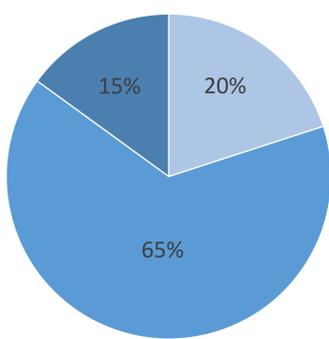
Dr C D				
Procedure	Antibiotic	Dose	Timing	Duration
Biliary (including laparoscopic)	Cephazolin	2g IV	15-30 mins pre-incision	Single dose
Small Intestine	Ceftriaxone	1g IV	15-30 mins pre incision	Single dose
If obstruction add	Metronidazole	500mg IV	15-30 mins pre incision	Single dose

Figure 4. Example of non-compliance with regard to antibiotic choice (guidelines recommend cephazolin 2g IV).

### Conclusion

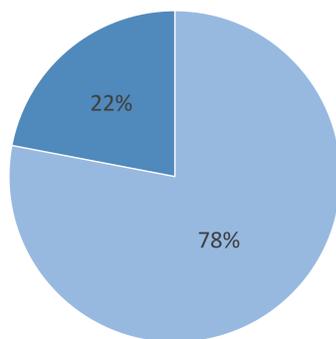
Without Pharmacist resources allocated to Theatre, improving AMS in surgical prophylaxis is challenging. Whilst a repeat Surgical NAPS will measure the outcomes and impact of this intervention, the collaboration was possible due to media attention (albeit misled) and high engagement of key Surgical Stream staff. The process of Card development was extremely valuable as the Surgeons were required to reflect on their practice. Given the surprisingly high concordance with national guidelines, it is presumed these guidelines were referred to before responding.

65% Non-compliance with guidelines (per surgical episode)



■ Compliant ■ Noncompliant ■ Other

78% Inappropriate prescribing (per surgical episode)



■ Inappropriate ■ Appropriate

% of patients prescribed Surgical Prophylaxis for > 24 hrs (best practice < 5%)



% of surgical episodes where antimicrobial prophylaxis given (perioperatively or postoperatively) when prophylaxis is not required



### Aim

To describe a fresh approach to improving AMS engagement with regard to surgical prophylaxis.

### Method

The concept of Surgeon Antibiotic Preference Cards for use in Theatres (similar to those currently used at the hospital by Anaesthetists for preferred equipment and medications), was agreed to after collaboration between the AMS team, the Medical Director of the Surgical Specialties Stream (MD-SSS) and an enthusiastic Anaesthetist. All Surgeons were consulted on their preferred antibiotics and dosages for each surgical procedure and responses were collated and assessed for concordance with national guidelines. Feedback from the AMS team was provided where there was divergence and once agreed, data were systematically presented on a single, A4 page which was laminated into a Card and made available in each theatre.