

# A retrospective analysis of IV amoxicillin-clavulanate prescribing in adult patients with suspected acute appendicitis: a tertiary hospital experience

Caitlin Goldblatt<sup>1,2</sup>, Sharmila Khumra<sup>1,2,3</sup>, Simone Taylor<sup>2</sup>, Andrew Mahony<sup>3,4</sup>, Jason Trubiano<sup>3,4</sup>

<sup>1</sup>Department of Pharmacy Practice, Monash University, AUS; <sup>2</sup>Pharmacy Department, Austin Health, AUS; <sup>3</sup>Infectious Diseases Department, Austin Health, AUS; <sup>4</sup>Department of Medicine, Melbourne University, AUS

## Introduction

- Acute appendicitis is one of the most common presentations to surgical emergency units, where appendectomy and surgical drainage have been the mainstays of treatment.<sup>1</sup>
- Antibiotic therapy is a bridge to surgery/interim measure whilst establishing the diagnosis.<sup>2,3</sup>
- Widespread emergence of antibiotic resistance has driven the development of guidelines that have adopted a more conservative approach to antibiotic prescribing.<sup>4</sup>
- At Austin Health, wide variation in antibiotic prescribing practices in general surgery inpatients, including appendicitis, led to the development of a local guideline in 2015.
- The guideline recommends intravenous (IV) amoxicillin-clavulanate (Augmentin®) as first line empirical therapy, based on international experience.<sup>5,6</sup>
- At the time of guideline development, IV Augmentin was available via the Special Access Scheme, however, since April 2017 it has been a registered product in Australia.
- There is limited experience of this antibiotic in an Australian hospital setting.

Duration of antibiotic therapy for acute appendicitis as outlined in the hospital guideline:

Appendicitis - classification	IV antibiotics	Oral antibiotics	Total duration
Mild-suppurative	Cease post-op	Nil	~ 24 hours
Gangrenous / localised perforation	Until tolerating food	Complete 5 days	5 days
Perforation / generalised peritonitis	2-3 days post-op	5 days	7-10 days
Peri-appendiceal phlegmon / abscess	3 days	5 days, longer if undrained	8+ days

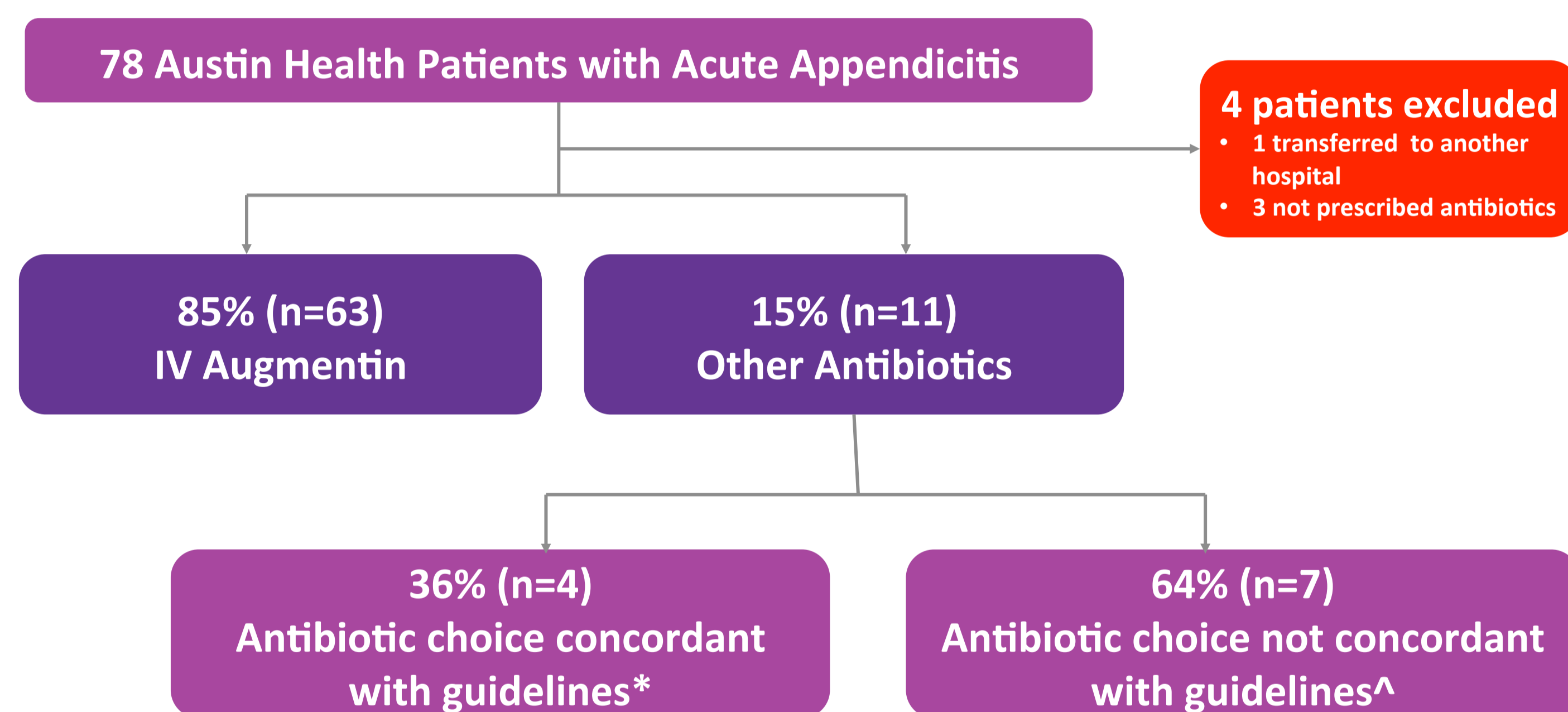
## Aim

- To determine concordance with IV Augmentin prescribing guidelines, specifically in patients with suspected acute appendicitis.
- To describe adverse events associated with IV Augmentin in an Australian hospital setting.

## Methods

- Design, setting and time period:** A retrospective review of clinical notes and electronic medication records of patients admitted over a 3-month period (October to December 2016) to Austin Health, an Australian metropolitan tertiary-referral hospital.
- Inclusion:** Patients with acute appendicitis identified from ICD-10 codes.
- Exclusion:** Patients not prescribed antibiotics or transferred to another hospital.
- Data collection:**
  - Patient characteristics (age, sex, renal function)
  - Severity of infection (mild-suppurative, gangrenous/localised perforation, generalised peritonitis and peri-appendiceal phlegmon/abscess)
  - Antibiotic therapy details (choice, dose regimen and duration of therapy)
  - Unplanned readmission, antibiotic allergy, *Clostridium difficile* infection and mortality
  - Prescribing concordance was assessed using the National Antimicrobial Prescribing Survey (NAPS)<sup>7</sup> appropriateness classification (optimal, adequate, suboptimal, inadequate)
- Endpoints:**
  - Primary endpoint: concordance with the guidelines in terms of antibiotic prescribing
  - Secondary endpoints: (i) unplanned readmission within 7 days; (ii) *Clostridium difficile* infection; (iii) 30-day all-cause mortality, (iv) antibiotic allergy

## Results – Guideline Concordance and Appropriateness

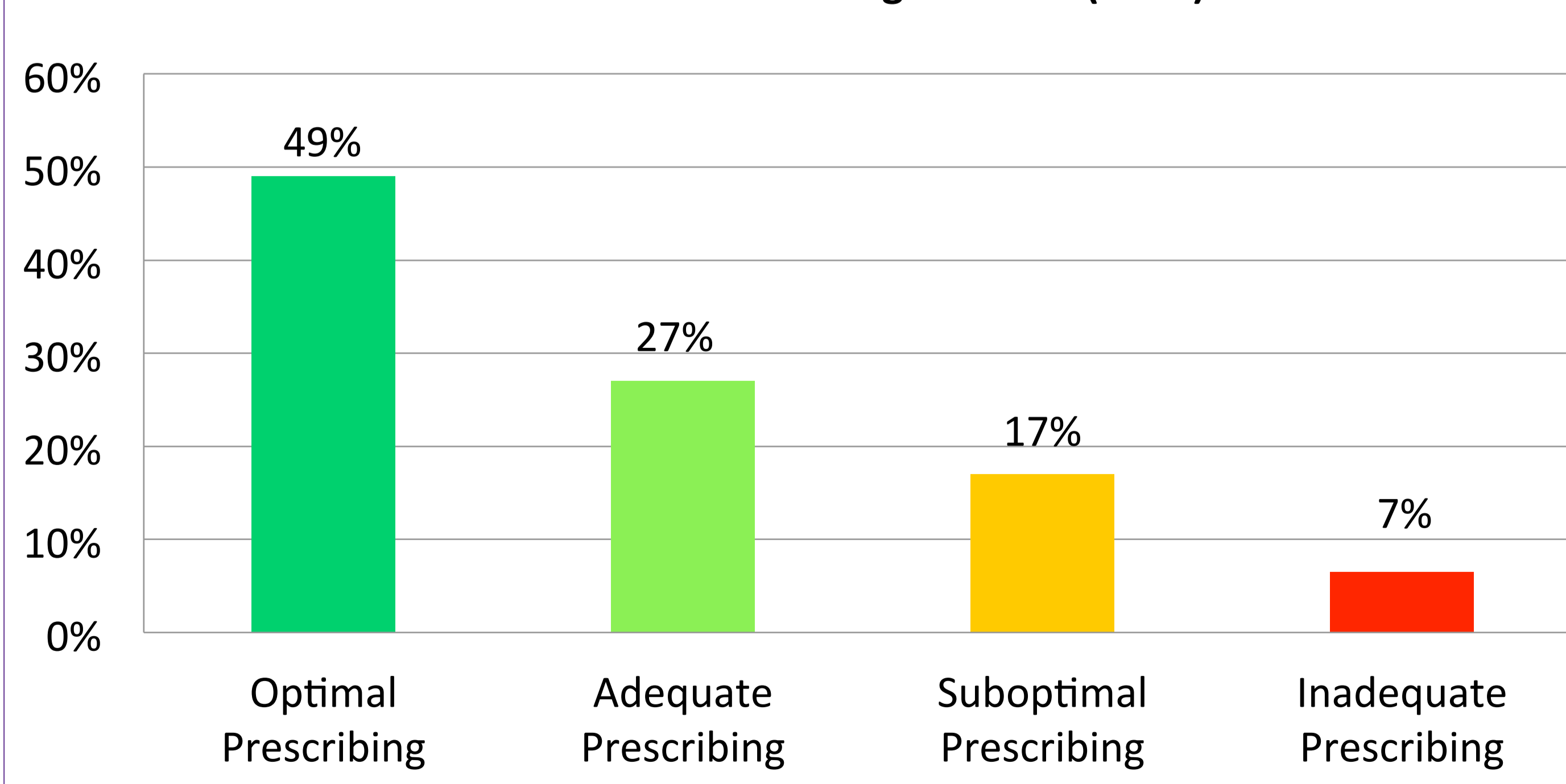


\* Includes appropriate antibiotics for penicillin allergy, recent travel history, severe sepsis  
^ Other antibiotics prescribed for example; ampicillin, metronidazole, ceftriaxone or gentamicin

Table 1: Characteristics of patients prescribed IV Augmentin for appendicitis

Patient characteristic	N=63; n (%)
Age (years), median (range)	38 (16-71)
Sex, female	34 (55)
Renal failure (eGFR<30ml/min)	2 (3.2)
<i>Clostridium Difficile</i> infection	0 (0)
Antibiotic allergy	0 (0)
Unplanned readmission within 7 days	3 (4.8)
Mortality, 30-day (all cause)	0 (0)

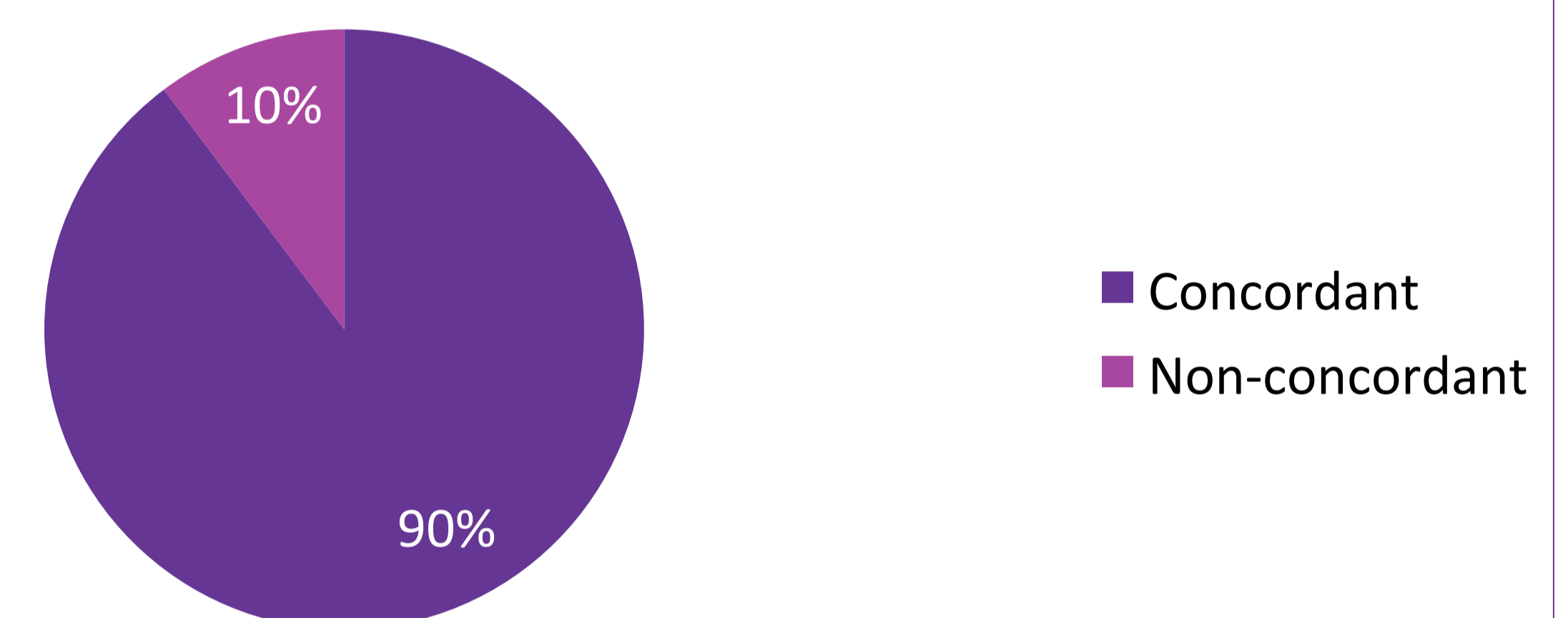
Figure 1: Appropriateness of prescribing IV Augmentin according to Austin Health guidelines (n=63)



### For IV Augmentin:

- Overall appropriate prescribing (optimal + adequate prescribing) = 76%
- Overall inappropriate prescribing (suboptimal + inadequate) = 24%
- No adverse events occurred i.e. *Clostridium Difficile* infection, antibiotic allergy or death

Figure 2: Concordance with IV Augmentin guidelines for suspected acute appendicitis (n=74)



## Discussion

- Overall, concordance with IV Augmentin prescribing was good; 90% of antibiotic courses were deemed concordant with hospital guidelines.
- Reasons for not prescribing IV Augmentin as per the guidelines may include prescriber preferences for other commonly used antibiotics or unfamiliarity of guidelines/IV Augmentin.
- Of the 63 courses (in 63 patients) of IV Augmentin, 76% were considered appropriate use.
  - Reasons for inappropriate use included prolonged surgical prophylaxis and late switch to oral therapy.
  - To address these issues, the Infectious Diseases Department have developed pocket cards summarising IV Augmentin prescribing guidelines, for medical staff to use at the point of prescribing and upon review of antibiotic therapy.
- There were 3 hospital readmissions within 7 days (2 for pain management; 1 for intra-abdominal collections) however, no deaths within 30 days occurred. No patients receiving IV Augmentin developed *Clostridium difficile* infection.
- IV Augmentin was well tolerated by patients; no adverse events were documented.
- Limitations of this study included the fact that data was retrospectively collected; incomplete documentation meant that information was not available to explain deviations from the guidelines.

## Conclusion

- There was good concordance with IV Augmentin prescribing guidelines in patients with suspected acute appendicitis. Identified areas for improvement included duration of therapy.
- IV Augmentin was well tolerated with no adverse events documented.
- This study provides useful data and experience for other hospitals considering introducing this antibiotic to their formulary now that it is TGA approved.

## References

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