How are antibiotics prescribed for Open Reduction Internal Fixation procedures?

RESEARCH WEEK
5-9 OCTOBER 2020
INSPIRED RESEARCHERS
Northern Health

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Introduction

Surgical antimicrobial prophylaxis (SAP) is a common indication for antibiotic use in hospitals.[1] The inappropriate use of SAP can lead to the development of **antimicrobial resistance,** an extended **length of hospital stay** and increase **healthcare costs.**

Open reduction and internal fixation (ORIF) of closed fractures is a widely performed orthopaedic procedure, however substantial variability exists for how antibiotics are prescribed.

In April 2019, the Australian Therapeutic Guidelines updated their recommendations for SAP in orthopaedic surgery, in which a single pre-operative dose (2g cefazolin) is recommended for internal fixations, with no further doses to be given once surgery is complete.[2] Prophylaxis beyond 24 hours provides little benefit and can increase the risk of antibiotic resistant infections.

Aim

The aim of this study was to determine the prescribing pattern for patients undergoing ORIF of closed fractures of upper and lower limbs at Northern Health following guideline update.

Methods

Retrospective study	• Review of medical records
Inclusion criteria	• ORIF of closed fractures of either the hip, ankle, clavicle or long bone • Procedure undertaken between July and December 2019
Exclusion criteria	• Patients undergoing an arthroplasty • Cases other than a closed extremity fracture • Patients receiving treatment doses of antibiotics

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Results

- 205 patients were included in this study
- Pre-operative antibiotics were charted for 96% of patients
  - Most patients received cefazolin 2g pre-operatively as per guideline recommendations (93%) **(Figure 1)**
- Duration of prophylaxis from time of induction ranged from 0 to 50.5 hours
  - 11% of patients had antibiotics administered for more than 24 hours **(Figure 2)**
- **80%** of patients received **post-operative doses (Figure 3)**
- 1 patient developed a superficial surgical site infection

Figure 1. Doses of pre-operative antibiotics prescribed

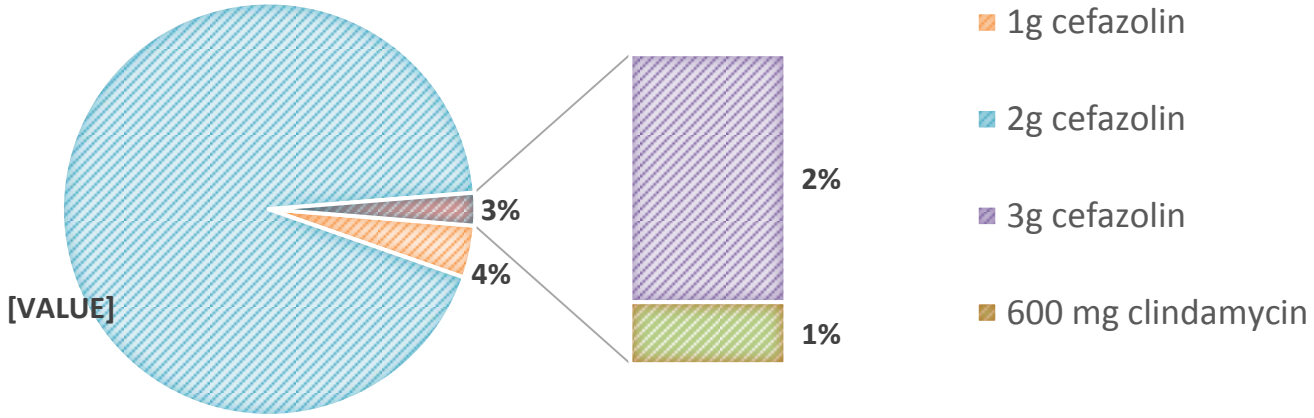
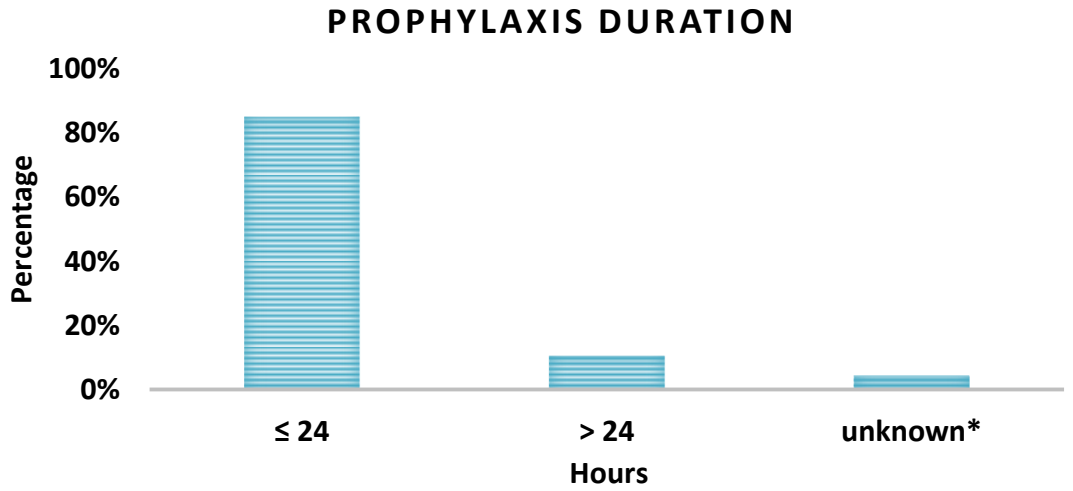


Figure 2. Duration of prophylaxis from time of induction



unknown*= pre-operative antibiotic details not recorded thus duration of prophylaxis from time of induction is unknown

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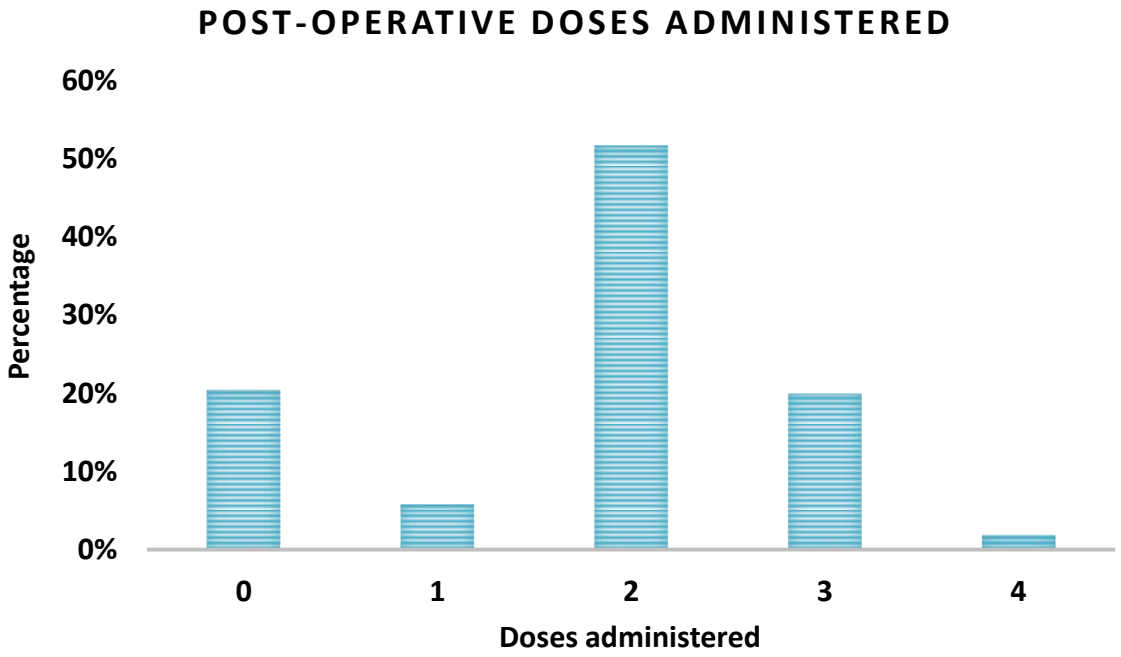
Results

Figure 3. Number of doses administered on the ward post-surgery



Discussion

- Antibiotic choice and dose prescribed is quite consistent in the pre-operative setting, however, variability exists in post-operative prescriptions
- Our audit showed that 11% of patients received antibiotics for more than 24 hours, with a maximum duration of 50.5 hours
  - Reasons for extended prophylaxis remains unclear
  - Extended duration of prophylaxis (beyond 24 hours) can increase the risk of infection with *Clostridium difficile* as well as contribute to antimicrobial resistance
  - This can also increase costs to the healthcare system due to the management of antibiotic resistant infections
- The Therapeutic Guidelines currently advocates for single dose prophylaxis for internal fixations
  - The vast majority of patients received post-operative antibiotics (80%), with up to 4 doses administered on the ward
- These findings highlight the need to identify the factors that contribute to an extended duration of prophylaxis

References

1. Ierano C, Manski-Nankervis J, James R, Rajkhowa A, Peel T, Thursky K. Surgical antimicrobial prophylaxis. *AustPrescr.* 2017;40:225-9.
2. Surgical prophylaxis for orthopaedic surgery [published 2019 Apr]. In: *eTG complete* [digital]. Melbourne: Therapeutic Guidelines Limited <https://www.tg.org.au>

Conclusion

Further research is required to understand what influences prescribing practice in this setting as well as the factors that may influence guideline uptake.

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