

Evaluation of Surgical Antimicrobial Prophylaxis in Paediatric Patients Undergoing Orthopaedic Surgery and Resulting Organisational Change

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Introduction

Surgical antimicrobial prophylaxis (SAP) refers to the use of antimicrobials to prevent the development of infection that may occur as a result of a surgical procedure.¹ However, inappropriate SAP prescribing can lead to the emergence of microbial resistance and potential development of surgical site infection.²

The use of Electronic Medical Records (EMR) helps to ensure standardised prescribing and minimise errors, but discrepancies can occur especially in areas where paper charts are used simultaneously.

Aim

To assess the appropriateness of SAP for paediatric orthopaedic procedures, and to explore reasons for non-compliance.

Method

- A retrospective audit was conducted between March to April 2022, and included 55 paediatric patients who underwent orthopaedic surgery.
- Data was collected from EMR and scanned handwritten surgical notes, including: patient age and weight; type of procedure; date of surgery; duration of surgery; wound classification; and antibiotic choice, dose, route and timing of administration.
- Data was entered into the National Antimicrobial Prescribing Survey online portal, and SAP prescribing was assessed for compliance against local antimicrobial prescribing guidelines.

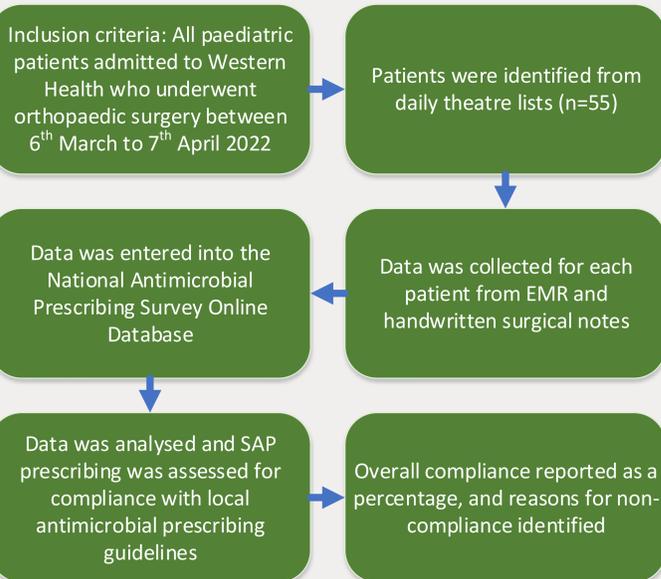


Figure 1. Method flow chart

Results

OVERALL SAP COMPLIANCE RATE

■ Non-compliant ■ Compliant

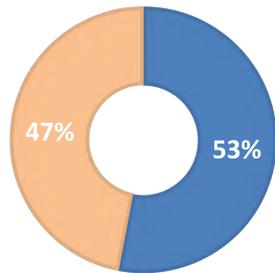


Chart 1. Results of SAP compliance

Compliance was assessed based on the indication for SAP, choice of antimicrobial, administration time, dose and route of administration of SAP. Where SAP was indicated, cefazolin was prescribed as the antimicrobial of choice, which aligns with local guidelines. SAP was deemed compliant with local guidelines in 53% (n=29) of patients and non-compliant in 47% (n=26) of patients, as per Chart 1. The breakdown of the results and reasons for non-compliance are presented in Figure 2.

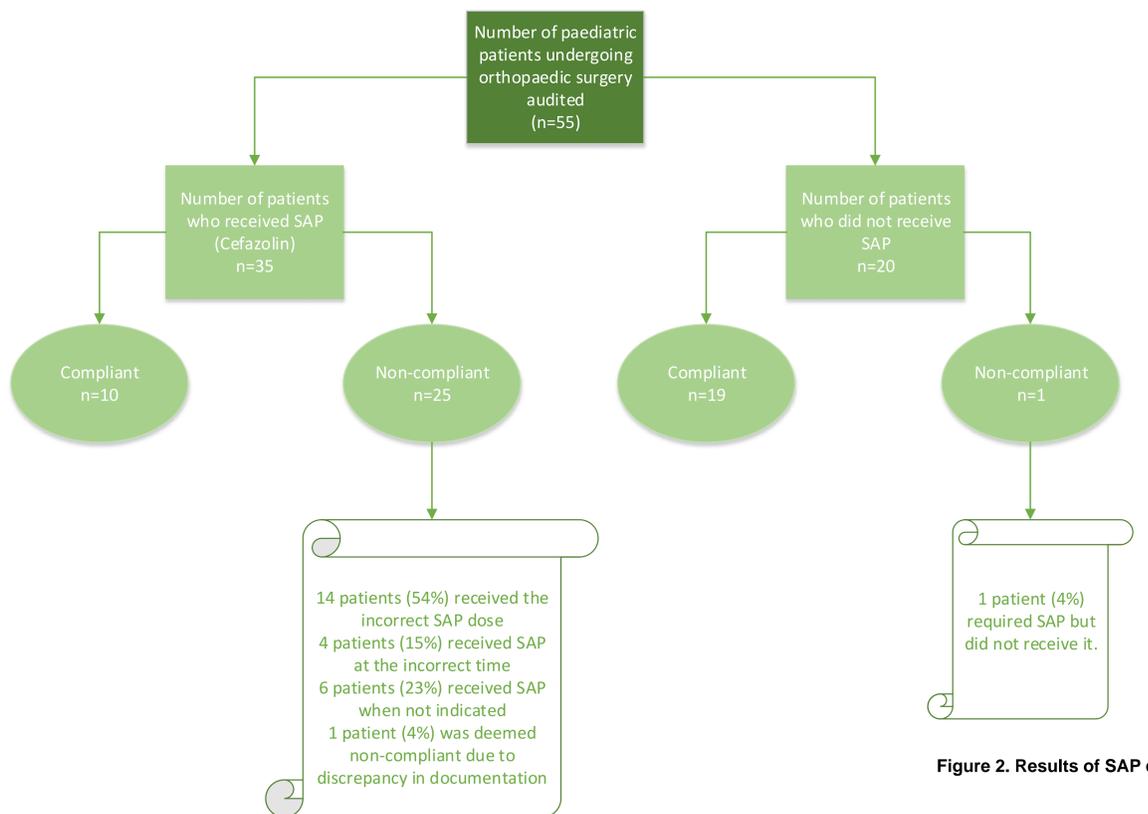


Figure 2. Results of SAP compliance

Discussion

This audit revealed that the paediatric order-set in EMR used to prescribe peri-operative medications including SAP had a pre-filled dose of cefazolin inconsistent with local guidelines. This was found to be a significant contributor to the high rate of SAP non-compliance.

Inconsistency between hand-written surgical notes and EMR documentation may also have contributed to reasons for non-compliance and made it challenging to audit. Prescribing of SAP for one patient was deemed non-compliant due to discrepancy in documentation; SAP was documented as administered in the surgical notes but was not charted and documented in EMR.

Conclusion

This audit demonstrated that SAP in paediatric patients can be improved, and highlights the risks of EMR order-sets and hybrid paper-EMR workflows.

This work has contributed to our organisation enhancing the EMR order-set review governance processes and spotlighted the importance of full EMR implementation in surgical areas.

References

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2. Rangel S.J., Fung M, Graham D.A., Ma L, Nelson C.P., Sandora T.J. Recent trends in the use of antibiotic prophylaxis in paediatric surgery. Journal of Pediatric Surgery 2011; 46(2):366-371. DOI: <https://doi.org/10.1016/j.jpedsurg.2010.11.016>