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Research Article

Peri-operative Antibiotic Prophylaxis: Improving Compliance with Local and National Guidelines

Nosaiba Ezzelarab *

*Correspondence to: Nosaiba Ezzelarab, Princess Royal University Hospital & Orpington Hospital, UK.

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Abstract

Background: *Surgical site infections (SSIs) are a major contributor to postoperative morbidity and extended hospital stays. Appropriate perioperative antibiotic prophylaxis correct agent, dose, route, and timing is critical in reducing SSI risk. Initial observations at two NHS hospitals revealed inconsistent compliance and challenges accessing up-to-date local antibiotic guidelines.*

Objective: *To evaluate adherence to national (NICE, SIGN) and local perioperative antibiotic prophylaxis standards and to assess the impact of targeted interventions aimed at improving compliance.*

Methods: *A prospective two-cycle audit was undertaken across Princess Royal University Hospital (PRUH) and Orpington Hospital. Cycle 1 comprised 35 patients and Cycle 2 included 36. Data collected included antibiotic selection, dose, route, timing, documentation, and the source used to guide decision-making. Interventions—such as departmental teaching and promotion of the EOLAS digital guideline app—were introduced before Cycle 2.*

Results: *Cycle 1 demonstrated variable compliance, with surgeon preference influencing antibiotic choice in 57.1% of cases. Following interventions, Cycle 2 showed significant improvement: 88.9% used the local guideline and 69.4% used digital apps (EOLAS/MicroGuide). Documentation of antibiotic timing exceeded 90%. Remaining non-compliant cases were predominantly related to weight-based dosing in obese patients.*

Conclusion: *Improving accessibility of local guidance and delivering structured education markedly enhanced compliance with perioperative prophylaxis standards. Continued emphasis on accurate weight-based dosing and periodic re-audit will help ensure sustained improvement.*

Keywords: *Surgical Site Infection, Antibiotic Prophylaxis, Anaesthesia, Audit, Compliance, EOLAS, NICE, SIGN.*

Introduction

Surgical site infections are a persistent cause of postoperative morbidity, extended hospitalisation, and increased healthcare expenditure. Perioperative antibiotic prophylaxis, when administered according to evidence-based standards, is one of the most effective strategies for reducing SSI risk. National bodies such as NICE, SIGN, and the BNF outline firm recommendations on antibiotic choice, timing—typically within 60 minutes before incision—and documentation.

Despite these established standards, real-world adherence is often inconsistent. Barriers include reliance on personal experience or surgeon preference, variable clinician awareness, and difficulty accessing updated guidance. An initial audit undertaken at Princess Royal University Hospital (PRUH) and Orpington Hospital identified discrepancies in guideline adherence and documentation quality.

This two-cycle re-audit aimed to measure current compliance, implement targeted educational and digital interventions, and reassess performance to determine the impact of these changes.

Methods

Study Design:

A prospective two-cycle audit was conducted across PRUH and Orpington Hospital.

Cycle 1: 35 cases

Cycle 2: 36 cases

Elective and emergency surgeries requiring antibiotic prophylaxis were included.

Data Collection:

For each cycle, the following were documented:

- Antibiotic choice, dose, and route
- Timing of administration
- Rationale for antibiotic selection

- Source of guideline used
- Documentation quality in the anaesthetic record
- Whether weight-based dosing was applied
- Perceived ease of guideline access

Cycle 2 additionally assessed the impact of digital guideline access (EOLAS/MicroGuide) and updated policy dissemination.

Audit Standards:

Standards were derived from:

- NICE CG74 (2019)
- SIGN 104 (2014)
- BNF recommendations
- Local Trust antimicrobial policy

Compliance required:

- Correct antibiotic choice
- Correct dose and route
- Administration within 60 minutes before incision
- Clear documentation

Interventions Between Cycles:

- Promotion of the EOLAS app to improve access to local guidelines
- Teaching sessions delivered to anaesthetic trainees and theatre staff
- Circulation of updated Trust antibiotic policy
- Reinforcement of anaesthetists' responsibility to independently confirm dose and timing

Results

Cycle 1:

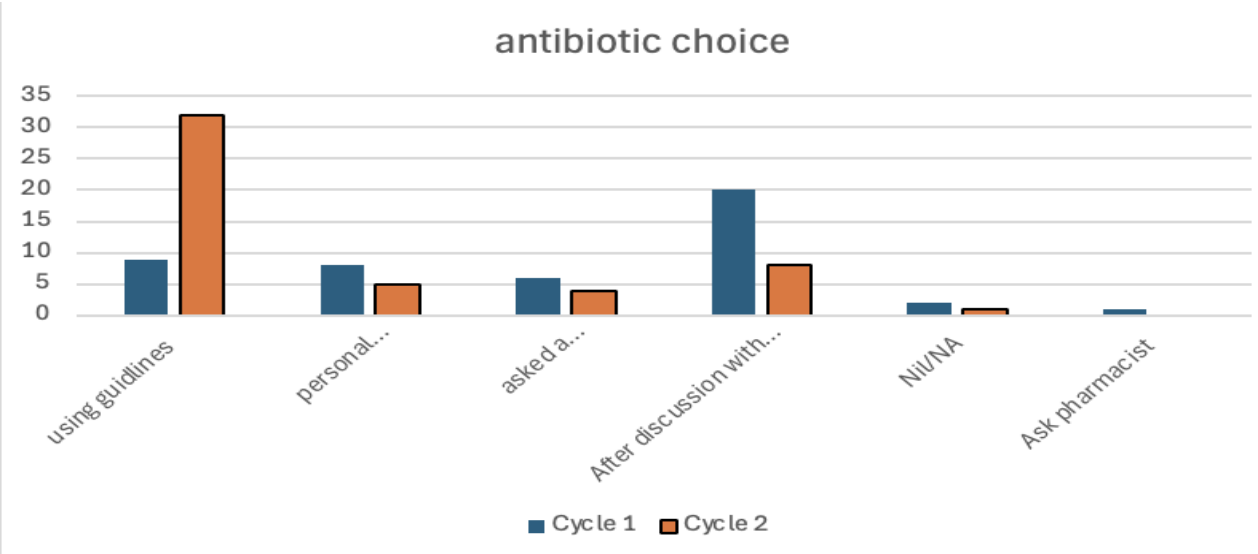
- Surgeon discussion influenced antibiotic choice in 57.1% of cases.
- Only 25.7% used guidelines to inform decisions.
- Personal experience (22.9%) and consultant advice (17.1%) were also common drivers.
- Documentation of antibiotic selection and timing was inconsistent.

Cycle 2:

Use of appropriate sources has improved markedly.

Sources of Guidance:

- Local hospital guideline: 88.9%
- EOLAS/MicroGuide app: 69.4%
- Surgeon recommendation: 22.2%
- Personal knowledge: 13.9%
- NICE/BNF: 11.1%



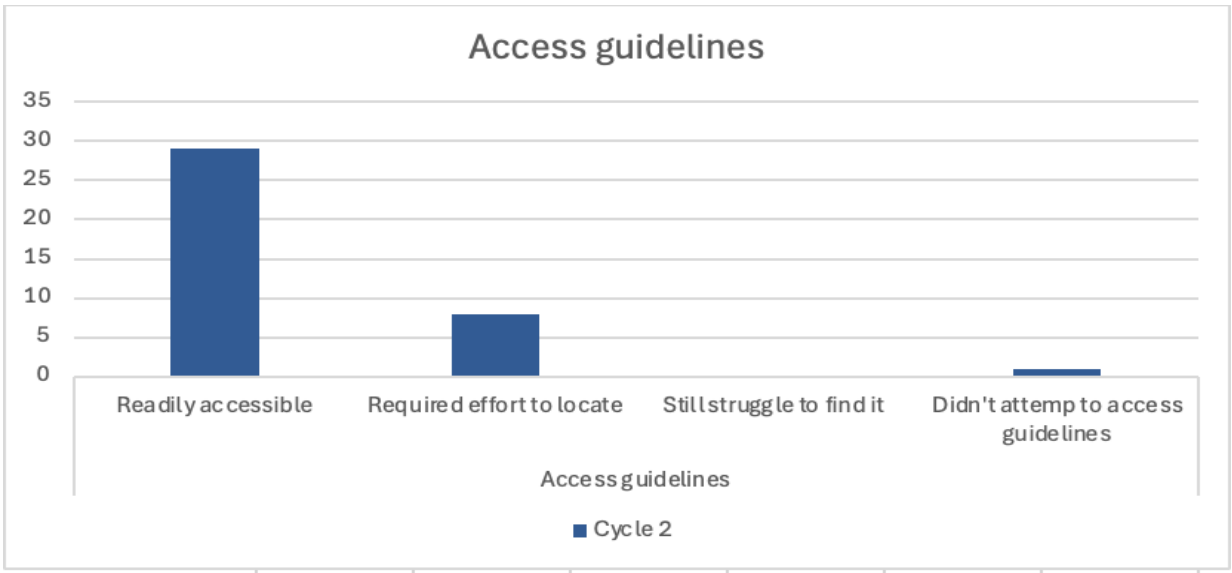
Compliance and Documentation:

Over 90% documented timing clearly in Cycle 2.

Non-compliant cases were predominantly due to incorrect weight-based dosing in obese or high-risk patients.

Accessibility:

Most clinicians reported the guideline was now easy or very easy to access, largely attributable to digital app use and QR-code distribution.



Discussion

This audit demonstrates that improving access to guidance significantly enhances compliance with perioperative antibiotic prophylaxis standards. The EOLAS app, in particular, played a critical role by reducing reliance on memory or surgeon preference and promoting consistent, evidence-based practice.

Documentation improved substantially in the second cycle, reflecting strengthened antibiotic stewardship and enhanced awareness of perioperative standards. However, challenges persist particularly weight-based dosing, which is frequently overlooked despite its clinical importance. This mirrors national trends, where default dosing is often applied even in obese or renal-impaired patients.

Ongoing challenges and opportunities include:

- Ensuring accurate, measured patient weights.
- Reinforcing dosing adjustments during pre-operative checks.
- Regular updates and dissemination of local guidelines.
- Continuing education for rotating staff.
- Institutional encouragement of app-based guideline use.
- Sustaining progress requires periodic re-audit every 6–12 months, continued staff engagement, and integration of digital guidance into routine practice.

Conclusion

This two-cycle audit demonstrates clear improvements in compliance with perioperative antibiotic prophylaxis standards following targeted interventions. Key successes include:

- Marked increase in guideline-driven decision making.
- Widespread adoption of digital guideline access
- High accuracy in documentation and timing
- Reduced reliance on surgeon preference

Remaining gaps, particularly weight-based dosing, require focused educational reinforcement. Embedding regular audit and maintaining robust access to local guidance will help sustain long-term improvement.

References

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Medtronic