Targeted Timing: An Innovative Perioperative Antibiotic Administration Model

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Purpose

A major component of surgical site infection (SSI) prevention relies on optimal timing of prophylactic antibiotics, yet operational variability frequently undermines compliance. Our team redesigned perioperative antibiotic administration by shifting delivery to handoff between the preoperative nurse, circulating nurse, and anesthesia to assist with timely administration of prophylactic antibiotics. This project aims to address this gap by aligning antibiotic delivery with a standardized, interdisciplinary handoff between preoperative nursing and OR anesthesia and nursing staff.

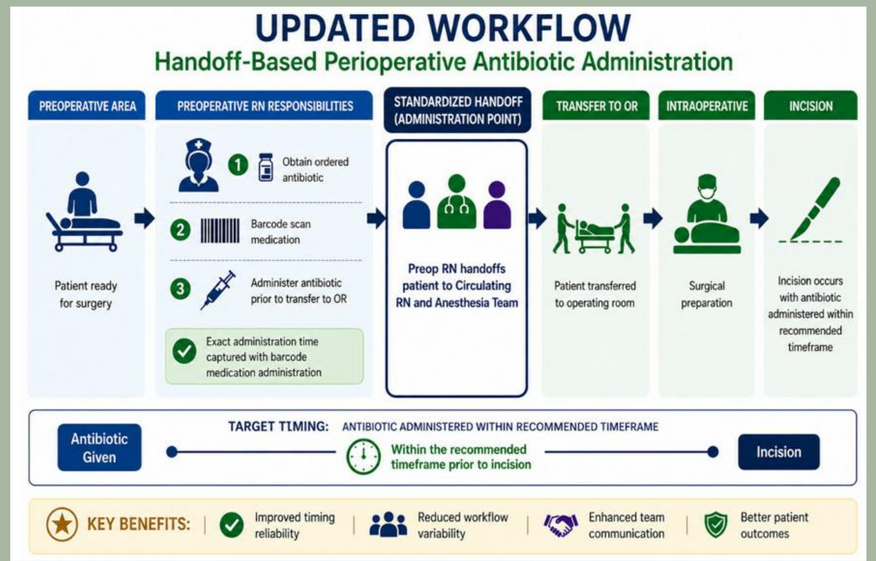
Background

Timely administration of prophylactic antibiotics is a well-established determinant of SSI risk, yet achieving consistent compliance remains operationally challenging. At our institution, ongoing compliance audits and surgeon feedback revealed variability in perioperative timing related to workflow handoffs, patient readiness, and competing preoperative tasks. Although guidelines emphasize administration within a defined pre-incision window, they offer limited guidance on who should administer antibiotics and where within the perioperative workflow this should occur.

At UAB, optimal administration of preoperative cefazolin occurs 15 to 60 minutes prior to incision to ensure adequate tissue and serum concentrations at the time of surgery start. Baseline review of perioperative timing data demonstrated inconsistent compliance with this benchmark, with only 54% of cases meeting recommended timing. To address this gap, a standardized antibiotic administration workflow was implemented in the preoperative area.

Intervention Detail

Using data to compare antibiotic administration time to surgical start time, multiple administration points were tested through iterative workflow adjustments. Initial strategies, including anesthesia administration, proved unsustainable and frequently resulted in dosing too close to incision. Earlier administration in the preoperative phase also failed to consistently meet the 60-minute window. Final standardization occurred at patient handoff, with the preoperative RN responsible for obtaining, scanning, and administering cefazolin immediately prior to transfer to the operating room, also allowing for an exact delivery time with barcode administration.



Key Take Aways

No additional resources required

- No new staffing
- No electronic alerts
- No additional technology

Improved workflow integration

- Standardized administration timing
- Reduced ambiguity in responsibility
- Clear barcode-documented administration times

Sustainable implementation

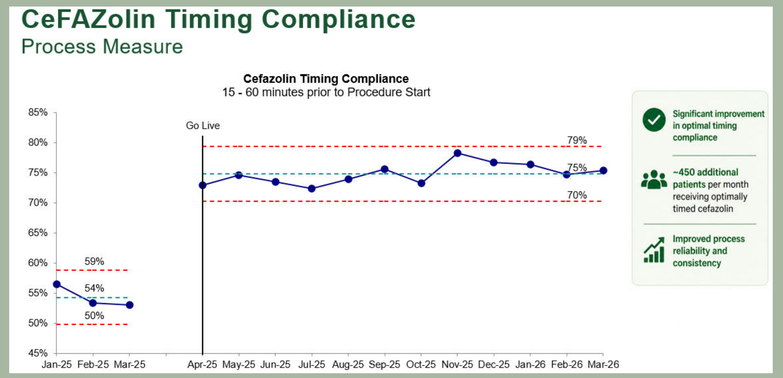
- Incorporated into existing perioperative workflow
- Easily reinforced during routine staff education and handoff practices

This workflow redesign demonstrates how:

- Small operational changes can produce measurable quality improvements
- Interdisciplinary collaboration can improve perioperative reliability
- Workflow standardization supports antimicrobial stewardship goals

Results

Timing compliance served as the primary quantitative metric and was benchmarked against the 15 to 60-minute recommendation. A retrospective review of perioperative data was conducted, followed by ongoing monitoring to assess improvement and sustainability.



At UAB Hospital's main operating rooms, cefazolin is administered in approximately 2,000 procedures monthly, representing 70% of perioperative antimicrobial use. Optimal timing compliance improved from 54% (Jan-Mar 2025) to 75% (Apr-Dec 2025), delivering timely antibiotics to approximately 450 additional patients per month while sustaining case volumes. The average time from administration to incision improved from 20 to 44 minutes. Cefazolin use is standard in all GI procedures, and colon surgery SSI rates achieved the lowest quarterly standardized infection ratio (SIR) since 2022 in CY Q3 2025.

Special Thanks

Special thanks to the Pre-Op, Anesthesia, Pharmacy, and Surgical teams for their collaboration, dedication, and support in improving perioperative antibiotic timing and helping advance this patient-safety initiative.