

Consideration of Minimum Inhibitory Concentration to Reduce Surgical Site Infections

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Introduction: Atlantic General Hospital's mission is to achieve high reliability and organizational excellence through zero harm (Atlantic General Hospital, 2024). This is demonstrated through continuous quality improvement utilizing rapid cycle change. This opportunity lies in the alignment of preoperative antibiotic administration timing to achieve minimum tissue perfusion required to prevent postoperative bacterial growth before the surgical incision (Baseel et al., 2022).

Identification of the Problem: Organizationally, FY23 noticed a significant increase in surgical site infections.

QI Question/Purpose of the Study: In surgical patients, how does consideration of MIC timing in prophylactic antibiotic administration affect SSI rates over one fiscal year?

Methods: An interdisciplinary subcommittee of the Infection Prevention Committee was assembled to formulate action plans for improved postoperative patient outcomes. Utilizing the PDSA Model it was determined to first implement changes related to the timing that prophylactic antibiotics are administered beginning with the most common, Ancef. Once a change in workflow was established, other preoperative prophylactic administration processes were reviewed and revised based on the identified minimum inhibitory concentration times for each.

Outcomes/Results: In FY24, a 64% decrease in SSIs was noticed from FY23. Antibiotic costs were reduced by \$4.37 per patient dose.

Discussion: Appropriate antibiotic usage and timing have resulted in a substantial decrease in SSI rates. Processes based on current evidence-based practice have been standardized within the surgical and preadmission testing departments to achieve this success in harm reduction.

Conclusion: The improvement in patient outcomes created through this PI project was a direct result of the interdisciplinary collaboration and implementation of evidence-based practices related to prophylactic antibiotic timing. Consideration of MIC, as opposed to attention only to nurse workflow and patient throughput, is accredited with the project's success.

Implications for perianesthesia nurses and future research:

- Collaboration with multidisciplinary team
- Partnership with PharmD to gain understanding of MIC times
- Developing workflows based on pharmacodynamics
- Understanding MIC times dependent upon antibiotic choice
- Inclusion of multiple factors in SSI prophylaxis- antibiotic timing and cut time

- Consideration of surgery length time when considering the need for redosing
- Awareness of patient flow and preparation of surgery in antibiotic dose timing
- SSI reduction is dependent upon multiple preventative measures