



Surgical Prophylaxis: Timing is Everything

Surgical site infections (SSIs) may occur after surgery.¹ Surgical antimicrobial prophylaxis has been shown to reduce incidence of SSIs;² therefore, it is recommended by surgical prophylaxis guidelines and implemented in many hospitals.

Clinical Question: Does administration time of surgical prophylaxis matter?

Successful prophylaxis requires sufficient serum and tissue antimicrobial concentrations at the time of incision and for the duration of procedure.³

Multiple studies have investigated surgical prophylaxis timing. In an early prospective cohort, Classen and colleagues studied 2847 patients who underwent elective surgery within 48 hours of admission.² Of those patients, 369 (13%) received antibiotics between 2-24 hours before the incision; 1708 (60%) had antibiotics administered within 2 hours of surgical incision; 282 (10%) received antibiotics within 3 hours post-incision; and 488 (17%) received antibiotics more than 3 hours after incision.² Patients receiving surgical prophylaxis within 3 hours after incision (1.4%), more than 3 hours after incision (3.3%), or 2-24 hours before incision (3.8%) were more likely to develop SSIs than those receiving antibiotics within 2 hours before incision (0.59%).²

In another study of 2048 patients undergoing coronary bypass graft or valve replacement surgery receiving vancomycin prophylaxis, the incidence of SSIs was significantly lower in patients whom an infusion was started 16–60 minutes before surgical incision when compared with infusions given 0–15 minutes before surgical incision ($p < 0.01$) and 121–180 minutes before incision ($p = 0.037$).⁴

Surgical Prophylaxis Guidelines: The 2013 surgical prophylaxis guidelines recommend that surgical prophylaxis be administered within 60 minutes prior to incision to ensure high concentrations at the time of initial incision. For antimicrobials with longer infusion times, such as vancomycin and fluoroquinolones, administration within 120 minutes is recommended.³

Key Takeaway: Timing of surgical antibiotic prophylaxis matters. Surgical prophylaxis should be administered within 60 minutes (120 minutes if vancomycin or a fluoroquinolone) prior to incision. Antibiotic prophylaxis administered too early (> 60 minutes or > 120 minutes if vancomycin or a fluoroquinolone) or too late (after incision) is expected to be less effective.

References:

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