Precise timing might not be crucial: when to administer surgical antimicrobial prophylaxis

The prevention of postoperative surgical site infection (SSI) involves measures before surgery; one such measure is surgical antimicrobial prophylaxis (SAP). Optimum practice for SAP includes choosing the right drugs, administration of these at the right time, and discontinuing them within 24 h after surgery. The recent WHO recommendations on preoperative measures for SSI prevention based on a review of the literature specify that SAP should be within 120 min before incision. However, scientific literature suggests a range of timing options including less than 30 min before surgery, 30–60 min, or 60–120 min before surgery. The Scottish Intercollegiate Guidelines Network recommend SAP within 60 min before the skin is incised, with a vancomycin infusion starting 90 min before skin incision. US guidelines advocate administration within 60 min of incision, but acknowledge the conflicting evidence in published work and the possible merits of administration as close as possible to the incision time. Administration of SAP needs to be sufficiently early to ensure adequate tissue levels but not too early such that these levels have decreased by the time the first incision is made.

In *The Lancet Infectious Diseases*, Walter P Weber and colleagues present the results of a well conducted randomised controlled trial (RCT) in general surgical adult patients to compare SAP (cefuroxime and with metronidazole in colorectal surgery) administered early in the anaesthetic room with it being administered later in the operating room. 5175 patients were assessed, 4596 (89%) of whom were followed up after 30 days. The overall SSI rate was 5·1%, 4·9% in the early administration group, where the median administration time was 42 min, and 5·3% in the late group, where the median time was 60 min before incision, with the difference not being statistically significant. Therefore, early administration of SAP did not reduce the risk of SSI compared with late administration. The results were similar after excluding patients who had an upgrade in their wound category during surgery.

In an earlier observational study from the same group involving 3836 patients, the SSI rate was higher in those patients where SAP was administered less than 30 min or more than 60 minutes before incision (ie, it was lowest in the 30–60 min window period). However, the investigators acknowledged the observational nature of that study, which might not have allowed for potential biases, hence the carrying out of the RCT. The trial has some limitations: it was done in two tertiary referral centres in Switzerland where the procedures and protocols might not be directly applicable elsewhere, the organisms isolated from patients with SSI were not multiantibiotic resistant unlike in some other countries and hence cefuroxime was an appropriate SAP drug, and the follow-up period of only 1 month might have been insufficient to detect SSI after implant surgery. The study investigated cefuroxime with or without metronidazole and consequently the findings are not applicable to other drugs with different pharmacokinetic properties. Nonetheless, the study was adequately powered and the SSI rate was within what might be expected.

Giving SAP within 1 h of surgery should be feasible in most centres and is likely to provide adequate serum concentrations to optimise the prevention of SSI. However, it is possible that for specific types of surgery, a more precise timing regimen might be better, but to determine this would require large, complex multicentre studies. Those wishing to improve the quality of SAP might want to consider focusing on other areas such as reducing the number of doses administered with the consequent reductions in costs, as recently documented in a single-centre Italian study.

The period before the first incision of an operative procedure is a crucial one. However, it is incumbent on the surgical team, anaesthetic team, pharmacist, and antimicrobial stewardship programme to ensure that the patient receives the first dose of antibiotics during this important 1 h window. A more precise determination of time is probably not justified for this and similar SAP regimens, but for other drugs commonly used in SAP treatment, data is required to inform and guide best clinical practice.
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I declare no competing interests.


