

IN Focus

The drive to zero surgical site infections

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The focus on surgical site infection (SSI) prevention has never been more important given current trends in health care, including the ongoing shift from inpatient to outpatient ORs, non-reimbursement for health care associated-infections, and mandated public reporting of infection rates in some states. The National Surgical Quality Improvement Program and Surgical Unit-based Safety Program have added important visibility and support to efforts already underway to achieve zero infection rates.¹ However, a sustained zero infection rate remains an elusive goal. Whether a surgical procedure is performed in an inpatient or outpatient OR or a physician's office, basic infection prevention practices should be consistently implemented.²

Basic SSI prevention measures

Surgical Care Improvement Project (SCIP) measures designed to reduce SSI risk are considered the gold standard for basic surgical infection prevention. These measures include hair removal only when absolutely necessary by clipping rather than using razors and appropriate prophylactic antibiotic administration. However, even when these measures are routinely implemented, sustaining a zero SSI rate often remains a challenge. An added challenge is that SCIP measures do not address all aspects of care. For instance, if patient hair is consistently removed with clippers as opposed to razors, compliance will be reported as good. However, the SCIP measure related to hair removal does not address where the hair should be removed. Clipping hair in the OR creates an avoidable risk by introducing bacteria-laden hair into the OR. Similarly, preoperative education for patients does not always include a restriction on shaving leg or pubic hair one week before surgery, although this can increase the risk of postoperative surgical infection.

According to the Hospital Compare website,

SCIP measures regarding administration of appropriate prophylactic antibiotics within one hour of incision are reported to be reliably performed by U.S. hospitals. However, if the dose is not adjusted based on patient weight and/or re-dosed if the case goes longer than planned, there is an added risk of SSI.³ To support reliable and safe patient care, some facilities are increasing the dose of preoperative antibiotics for typically heavy patient populations, such as those requiring Caesarean delivery and bariatric procedures, and some are increasing the dose for all patients.

Another basic surgical infection prevention practice is minimizing OR traffic.⁴ This is a priority in every OR, but it can be a complex and challenging aspect of care. To successfully minimize OR traffic, some facilities must accommodate union rules when coordinating staff member breaks. In all facilities, traffic control success requires coordination among many individuals (e.g., surgeons, sterile processing personnel, vendor representatives) to be certain that all instruments, supplies, and equipment are in place in the OR before the case starts. One of the most important factors in helping to ensure a successful SSI prevention program is a safety culture in the OR that prioritizes infection prevention and promotes mutual respect among all team members.

Beyond the basics: "plus measures"

Even when compliance with basic infection prevention measures is reliable and comprehensive, infections may still occur. In many ORs where a sustained zero infection rate has not been achieved, products and/or practices are being added to infection prevention programs to supplement basic prevention measures. These additional products or practices will be referred to within this article as "plus measures." For any plus measure, it is important to understand what level of evidence has been published. For example, there is a significant body of evidence

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supporting efficacy of products containing chlorhexidine gluconate (CHG) for use in preoperative patient bathing.⁵ Although the question remains of whether there is a preferred formulation (i.e., liquid or impregnated CHG cloths), the manufacturer's instructions must always be followed.

Because *Staphylococcus aureus* (*S. aureus*) is responsible for the majority of SSIs in the nation, targeted prevention strategies to reduce staphylococcal risk are important. In combination with preoperative CHG patient bathing, studies conclude that nasal decolonization with mupirocin before high-risk cases (e.g., spine, orthopedic, cardiac, Mohs procedures) can reduce the incidence of postoperative SSI resulting from *S. aureus* by as much as 50 percent.^{6,7} In addition to mupirocin, there are nasal antiseptic products that contain povidone-iodine, although research regarding efficacy is currently limited.⁸ Additionally, preoperative skin prep solutions can be used to reduce transient and resident bacteria on the skin before the surgical incision. Dual agent skin prep solutions combine alcohol and iodine or chlorhexidine. There is compelling evidence that supports dual agent surgical skin prep solutions as being more effective than single agent prep solutions (e.g., povidone-iodine).⁹

Conclusion

Comprehensive standard infection prevention measures should be consistently followed in every surgical setting. For instance, prophylactic antibiotics must be administered at the right time, re-dosed as needed, and adjusted based on patient weight. In addition to eliminating razors in the OR, it is also important to help ensure that patient hair is removed before transport to the OR and that patients are instructed not to remove pubic or leg hair at home before surgery. To supplement standard measures, if a zero infection rate has not been achieved in any category of surgical procedure, it may be prudent to consider adding plus measures. These measures include use of CHG impregnated cloths for preoperative antiseptic patient bathing, use of dual agent surgical skin prep solutions, and preoperative nasal decolonization for high-risk cases.

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