

## **Fact Sheet: Surgical Site Infection**

This fact sheet was based on a similar sheet developed by the Centre for Healthcare Related Infection Surveillance and Prevention ([www.health.qld.gov.au/chrisp/](http://www.health.qld.gov.au/chrisp/)).

### **Overview**

Surgical site infections are reported to be the third most frequently occurring nosocomial infection among hospitalised patients. Such infections have been found to result in increased length of stay, additional costs and the potential for increased morbidity and mortality (The Joanna Briggs Institute, 2003).

### **Pre-Operative Length of Stay and Preparation**

Prolonged pre-operative length of stay is more commonly an indication of the severity of co-morbid conditions. However, long duration of hospitalisation has been established as a risk factor for surgical site infection. The mechanism by which prolonged hospital stay brings about an increased risk of infection is unknown. A long pre-operative stay may:

- Promote proliferation of endogenous micro-organisms, which can then heavily contaminate the surgical site,
- Promote the acquisition of hospital-acquired multi-resistant organisms,
- Permit the performance of procedural interventions that allow micro-organisms to access the body (Wong, 1999).

Even though pre-operative showers reduce the skin's microbial colony counts, they have not definitively been shown to reduce surgical site infection rates. The skin should be thoroughly washed to remove gross contamination prior to the application of antiseptic skin preparations (Queensland Health, 2001).

Where possible, surgery without hair removal is preferable unless the hair at or around the incision site will interfere with the operation. Clipping with electric clippers is the preferred method of hair removal and should be done as close as practical to the time of surgery, preferably within 2 hours prior to time of incision.

Following cleaning, the application of an appropriate antiseptic agent for the recommended contact time to 'prep' the skin around the operative site reduces the microbial load on the skin. Chlorhexidine and iodine-containing preparations are commonly used (Mangram, Horan, Pearson, Silver, Jarvis, *et al.*, 1999).

### **Evidence of Infection**

Whenever possible, infections in sites remote to the surgical site before an elective operation should be treated and surgery postponed until such infections have resolved (Wong, 1999).

### **Prophylactic Therapy**

Prophylaxis should be considered where there is a significant risk of infection, e.g., colonic resection, or where post-operative infection, even if uncommon, would have severe consequences, e.g., infection associated with a prosthetic implant.

Prophylactic antimicrobial therapy should be restricted to situations in which it has been shown to be effective or where the consequences of infection are disastrous.

Intravenous (IV) antibiotics should preferably be given in the hour prior to skin incision (except for Vancomycin which needs to be commenced earlier).

The critical period for successful prophylaxis is the 4 hours following implantation of organisms into a wound. This means prophylaxis should be administered so that the levels of antibiotic in the tissues are high at the time of skin incision. The optimum time for administration is within 1 hour prior to skin incision. In general, a single dose of a parenteral drug is sufficient. A second dose may be necessary under the following circumstances:

- A delay in starting the operation,
- If the operation is prolonged so that it continues beyond one-half of the usual therapeutic dosing interval after the initial dose, e.g., if the usual dosing interval is 6 hours, give a second dose after 3 hours,
- In specific circumstances, e.g. amputation of an ischaemic limb,
- Giving more than 1 or 2 doses post-operatively is not advised except where specifically recommended. Established infection should be treated (Antibiotic Writing Group. Therapeutic Guidelines: Antibiotic, 2003).

## References

Mangram, A.J. Horan, T.C. Pearson, M.L. Silver, L.C. Jarvis, W.R. and The Hospital Infection Control Practices Advisory Committee (1999). Guideline for Prevention of Surgical Site Infection. *Infection Control and Hospital Epidemiology*, 20(4) 247-278. Available: <http://www.cdc.gov/ncidod/hip/SSI/SSI.pdf> [2004, September 13].

Queensland Health (2001). *Infection Control Guidelines*. Queensland Government, Brisbane. Page 45. Available: [http://www.health.qld.gov.au/infectioncontrol/documents/pdf/QHICP\\_WEB.pdf](http://www.health.qld.gov.au/infectioncontrol/documents/pdf/QHICP_WEB.pdf) [2004, September 13].

The Joanna Briggs Institute (2003). The impact of preoperative hair removal on surgical site infection. *Best Practice*, 7(2), 1-6.

Therapeutic Guidelines Limited (2003). *Therapeutic Guidelines: Antibiotic*. 12<sup>th</sup> Edition. Therapeutic Guidelines

Wong, E.S. (2004). Surgical Site Infections. *Hospital Epidemiology and Infection Control*, 3<sup>rd</sup> Edition. Philadelphia: Lippincott Williams and Wilkins. Chapter 21, 287-310.

## **Guide for Investigation: Surgical Site Infection**

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### **Pre-Operative Length of Stay >24 Hours**

- What was the reason for the pre-operative length of stay?
  - Some patient factors require management pre-operatively (e.g., stabilisation of diabetes, cessation of smoking, steroid use, correction of malnutrition/obesity).
  - Is this usual practice?
  - Could this have been avoided?
- Was their pre-operative management appropriate for the type of procedure?
- Do you have a policy/guideline/procedure that guides pre-operative length of stay and management?
  - Is this document current and based on the latest literature?
  - Are the relevant staff aware of this document or recent changes to this document?

### **Evidence of Infection at Other Site**

- If infection was evident at another site:
  - Was this infection identified pre-operatively?
  - Was this infection being treated?
  - Was this treatment appropriate according to the Australian Therapeutic Guidelines: Antibiotic?
  - Could surgery have been postponed until the infection was adequately treated?
- Do you have a policy/guideline/procedure that this practice?
  - Is this document current and based on the latest literature?
  - Are the relevant staff aware of this document or recent changes to this document?

### **Antibiotic Prophylaxis**

- Was antibiotic prophylaxis indicated?
- Did this prophylaxis meet the Australian Therapeutic Guidelines: Antibiotic?
- Was the antibiotic administered within 1 hour prior to skin incision?
- If length of procedure >3hours, was prophylaxis repeated if indicated, according to Australian Therapeutic Guidelines: Antibiotic?
- Do you have a policy/guideline/procedure that encourages utilisation of these guidelines?
  - Is this document current and based on the latest literature?
  - Are the relevant staff aware of this document or recent changes to this document?

### **Previously Identified Issues**

- Are there similarities between this investigation and previous investigations?
- If there are similarities, are they related to:
  - Human Factors e.g. training, communications
  - Environment/Equipment e.g. adequate equipment
  - Policy/Procedures e.g. up to date, relevant and accessible
- Have recommendations from previous investigations been adopted?