Surgical site infections: prevention and treatment (NG125)

NG125

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Surgical site infections: prevention and treatment

Introduction

This guideline covers preventing and treating surgical site infections in adults, young people and children who are having a surgical procedure involving a cut through the skin.

Information for patients and carers

- Offer patients and carers clear, consistent information and advice throughout all stages of their care. This should include the risks of surgical site infections, what is being done to reduce them and how they are managed. For more guidance on providing information to adults and discussing their preferences with them, see the NICE guideline on patient experience in adult NHS services.
- Offer patients and carers information and advice on how to care for their wound after discharge.
- Offer patients and carers information and advice about how to recognise a surgical site infection and who to contact if they are concerned. Use an integrated care pathway for healthcare-associated infections to help communicate this information to both patients and all those involved in their care after discharge.

Always inform patients after their operation if they have been given antibiotics.

Preoperative phase

Preoperative showering

- Advise patients to shower or have a bath (or help patients to shower, bath or bed bath) using soap, either the day before, or on the day of, surgery

Nasal decolonisation

- Consider nasal mupirocin in combination with a chlorhexidine body wash before procedures in which Staphylococcus aureusis a likely cause of a surgical site infection. This should be locally determined and take into account:

– the type of procedure
– individual patient risk factors
– the increased risk of side effects in preterm infants
– the potential impact of infection.

- Maintain surveillance on antimicrobial resistance associated with the use of mupirocin. For information on antimicrobial stewardship programmes, see the NICE guideline on antimicrobial stewardship: systems and processes for effective antimicrobial medicine use.

Hair removal

- Do not use hair removal routinely to reduce the risk of surgical site infection.
- If hair has to be removed, use electric clippers with a single-use head on the day of surgery. Do not use razors for hair removal, because they increase the risk of surgical site infection.

Patient theatre wear

- Give patients specific theatre wear that is appropriate for the procedure and clinical setting, and that provides easy access to the operative site and areas for placing devices, such as intravenous cannulas. Take into account the patient's comfort and dignity.

Staff theatre wear
- All staff should wear specific non-sterile theatre wear in all areas where operations are undertaken.

Staff leaving the operating area
- Staff wearing non-sterile theatre wear should keep their movements in and out of the operating area to a minimum.

Mechanical bowel preparation
- Do not use mechanical bowel preparation routinely to reduce the risk of surgical site infection.

Hand jewellery, artificial nails and nail polish
- The operating team should remove hand jewellery before operations.
- The operating team should remove artificial nails and nail polish before operations.

Antibiotic prophylaxis
- Give antibiotic prophylaxis to patients before:
– clean surgery involving the placement of a prosthesis or implant
– clean-contaminated surgery
– contaminated surgery
- Do not use antibiotic prophylaxis routinely for clean non-prosthetic uncomplicated surgery.
- Use the local antibiotic formulary and always take into account the potential adverse effects when choosing specific antibiotics for prophylaxis.
- Consider giving a single dose of antibiotic prophylaxis intravenously on starting anaesthesia. However, give prophylaxis earlier for operations in which a tourniquet is used.
- Before giving antibiotic prophylaxis, take into account the timing and pharmacokinetics (for example, the serum half-life) and necessary infusion time of the antibiotic. Give a repeat dose of antibiotic prophylaxis when the operation is longer than the half-life of the antibiotic given.
- Give antibiotic treatment (in addition to prophylaxis) to patients having surgery on a dirty or infected wound.
- Inform patients before the operation, whenever possible, if they will need antibiotic prophylaxis, and afterwards if they have been given antibiotics during their operation.

Intraoperative phase

Hand decontamination
- The operating team should wash their hands prior to the first operation on the list using an aqueous antiseptic surgical solution, with a single-use brush or pick for the nails, and ensure that hands and nails are visibly clean.
- Before subsequent operations, hands should be washed using either an alcoholic hand rub or an antiseptic surgical solution. If hands are soiled then they should be washed again with an antiseptic surgical solution.

Incise drapes
- Do not use non-iodophor-impregnated incise drapes routinely for surgery as they may increase the risk of surgical site infection.
- If an incise drape is required, use an iodophor-impregnated drape unless the patient has an iodine allergy.

Sterile gowns
- The operating team should wear sterile gowns in the operating theatre during the operation.

Gloves
- Consider wearing 2 pairs of sterile gloves when there is a high risk of glove perforation and the consequences of contamination may be serious.

Antiseptic skin preparation
- Prepare the skin at the surgical site immediately before incision using an antiseptic preparation.
- Be aware of the risks of using skin antiseptics in babies, in particular the risk of severe chemical injuries with the use of chlorhexidine (both alcohol-based and aqueous solutions) in preterm babies.
- When deciding which antiseptic skin preparation to use, options may include those in the table below.

Diathermy
- If diathermy is to be carried out: use evaporation to dry antiseptic skin preparations and avoid pooling of alcohol-based preparations.
- Do not use diathermy for surgical incision to reduce the risk of surgical site infection.

Maintaining patient homeostasis
- Maintain patient temperature in line with NICE's guideline on hypothermia: prevention and management in adults having surgery.
- Maintain optimal oxygenation during surgery. In particular, give patients sufficient oxygen during major surgery and in the recovery period to ensure that a haemoglobin saturation of more than 95% is maintained.
- Maintain adequate perfusion during surgery.
- Do not give insulin routinely to patients who do not have diabetes to optimise blood glucose postoperatively as a means of reducing the risk of surgical site infection.

Wound irrigation and intracavity lavage
- Do not use wound irrigation to reduce the risk of surgical site infection.
- Do not use intracavity lavage to reduce the risk of surgical site infection.

Antiseptics and antibiotics before wound closure
- Only apply an antiseptic or antibiotic to the wound before closure as part of a clinical research trial.
- Consider using gentamicin-collagen implants in cardiac surgery.

Closure methods
- When using sutures, consider using antimicrobial triclosan-coated sutures, especially for paediatric surgery, to reduce the risk of surgical site infection.

Table 1

When	Choice of antiseptic skin preparation
First choice unless contraindicated or the surgical site is next to a mucous membrane	Alcohol-based solution of chlorhexidine
If the surgical site is next to a mucous membrane	Aqueous solution of chlorhexidine
If chlorhexidine is contraindicated	Alcohol-based solution of povidone-iodine
If both an alcohol-based solution and chlorhexidine are unsuitable	Aqueous solution of povidoneiodine

- Consider using sutures rather than staples to close the skin after caesarean section to reduce the risk of superficial wound dehiscence

Wound dressings
- Cover surgical incisions with an appropriate interactive dressing at the end of the operation.

Postoperative phase

Changing dressings
- Use an aseptic non-touch technique for changing or removing surgical wound dressings.

Postoperative cleansing
- Use sterile saline for wound cleansing up to 48 hours after surgery.
- Advise patients that they may shower safely 48 hours after surgery.
- Use tap water for wound cleansing after 48 hours if the surgical wound has separated or has been surgically opened to drain pus.

Topical antimicrobial agents for wound healing by primary intention
- Do not use topical antimicrobial agents for surgical wounds that are healing by primary intention to reduce the risk of surgical site infection.

Dressings for wound healing by secondary intention
- Do not use Eusol and gauze, or moist cotton gauze or mercuric antiseptic solutions to manage surgical wounds that are healing by secondary intention.
- Use an appropriate interactive dressing to manage surgical wounds that are healing by secondary intention.
- Ask a tissue viability nurse (or another healthcare professional with tissue viability expertise) for advice on appropriate dressings for the management of surgical wounds that are healing by secondary intention.

Antibiotic treatment of surgical site infection and treatment failure
- When surgical site infection is suspected by the presence of cellulitis, either by a new infection or an infection caused by treatment failure, give the patient an antibiotic that covers the likely causative organisms. Consider local resistance patterns and the results of microbiological tests in choosing an antibiotic. For information on antimicrobial stewardship programmes see the NICE guideline on antimicrobial stewardship: systems and processes for effective antimicrobial medicine use.

Debridement
- Do not use Eusol and gauze, or dextranomer or enzymatic treatments for debridement in the management of surgical site infection.

Specialist wound care services
- Use a structured approach to care to improve overall management of surgical wounds. This should include preoperative assessments to identify people with potential wound healing problems. Enhanced education of healthcare workers, patients and carers, and sharing of clinical expertise is needed to support this.

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MHRA: Medicines and Healthcare products Regulatory Agency

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ChloraPrep™: setting a new standard in operating procedures

1 STERILE 2% CHG / 70% IPA SOLUTION

- Manufactured sterile from the inside out, the solution (terminally sterilised post ampoulisation) is maintained in a glass ampoule prior to activation
- Sterile dye is introduced upon activation

2 STERILE APPLICATOR

- Designed to facilitate proven back and forth application technique, whilst maintaining user asepsis (ANTT®)
- With everything contained in a single unit, there is only one thing to open and throw away, helping protect the sterile operating field

3 STERILE SPONGE

- Polyester urethane sponge does not chemically interact with the solution
- Designed for comfort, with minimal dermal abrasion
- Helps to regulate flow, preventing splashing or pooling during application, which mitigates the risk of chemical and thermal burns

ONLY 2% CHG / 70% IPA IN THE CHLORAPREP APPLICATOR HAS BEEN PROVEN TO CUT SSIs **BY 41%[1]***

MITIGATING FIRE RISKS

The most common source of surgical fire is from the presence of flammable skin antiseptic[2]

On the basis of evidence, Public Health England's Rapid Review Panel gave ChloraPrep its highest recommendation (Recommendation 1)[3]

"Alcohol-based skin preparation solutions should be applied using a purpose-built applicator that ... minimizes pooling and excess application of solution"[2]

Annals of The Royal College of Surgeons of England, 2012

*Compared with povidone iodine
ANTT®: aseptic non-touch technique; CHG: chlorhexidine gluconate; IPA: isopropyl alchohol

View the ChloraPrep range at www.bd.com

References:
1. Darouiche R et al. *N Engl J Med* 2010; 362(1): 18-26. **2.** Rocos B, Donaldson LJ. *Ann R Coll Surg Engl* 2012; 94(2): 87-9. **3.** www.hpa.org.uk (Last accessed 01 July 2016).

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Prescribing information can be found overleaf

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