



Best Practice

Evidence based information sheets for health professionals

Pre-operative hair removal to reduce surgical site infection

Recommendations

The recommendations are based on the best available evidence at the time of conduct of this systematic review. The systematic review finds insufficient evidence to state that pre-operative hair removal results in fewer surgical site infections than not removing hair.

The practice-related recommendations are supported by the evidence as follows:

- If it is necessary to remove hair then both clipping and depilatory cream result in fewer surgical site infections than shaving with a razor. **(Grade A)**
- If removing hair with a clipper it is suggested that this is carried out on the day of surgery. **(Grade B)**

There is an urgent need for rigorous research to study the following:

- 1) hair removal versus no hair removal, using razors, clippers or depilatory cream;
- 2) clippers versus depilatory cream;
- 3) timings for removal using razor, clippers and depilatory cream; and
- 4) to study whether the place of hair removal (eg. operating theatre, anaesthetic room or ward area) affects surgical site infection (SSI) rates.

Information Source

This *Best Practice* Information Sheet updates and supersedes the Joanna Briggs Institute information sheet 'The impact of preoperative hair removal on surgical site infection', published in 2003. More recent research has been derived from a Cochrane systematic review published in 2006.² The primary references on which this information sheet is based are available from the Joanna Briggs Institute in the form of a Technical Report³ which can be viewed at

www.joannabriggs.edu.au

The full systematic review report is available from The Cochrane Database of Systematic Reviews at www.cochrane.org/reviews/clibaccess.htm

Background

Preparation for surgery has traditionally included the routine removal of body hair from the intended surgical wound site. Hair is removed as its presence can interfere with the exposure of the incision and subsequent wound,

the suturing of the incision and the application of adhesive drapes and wound dressings. Hair is also perceived to be associated with a lack of cleanliness and hair removal is thought to reduce the risk of surgical site infections (SSIs). SSIs are experienced by around 10% of patients in the UK each year and can result in delayed wound healing, increased hospital stays, unnecessary pain and in extreme cases the death of the patient. Three methods of hair removal are currently used: shaving, clipping and chemical depilation.

Grades of Recommendation

These Grades of Recommendation have been based on the JBI-developed 2006 *Grades of Effectiveness*¹

Grade A Strong support that merits application

Grade B Moderate support that warrants consideration of application

Grade C Not supported

Definition of terms

For the purposes of this information sheet the following definitions are used:

Surgical site infection (SSIs) are either superficial incisional, deep incisional or organ/space. The presence of infection may include the presence of at least one of the following: pus, pain, tenderness, swelling or redness.

Shaving is the most common and cheapest method of hair removal. This method uses a sharp blade, held within the head of a razor, which is drawn over the patient's skin to cut hair close to the surface of the skin.

Depilatory creams are chemicals which dissolve the hair. This is a slower process than either shaving or clipping as the cream has to remain in contact with the hair for between 5 and 20 minutes. Additionally, there is a risk of irritant or allergic reactions to the cream and patch tests should be carried out 24 hours before the cream is applied.

Clipping is the use of clippers with fine teeth to cut hair close to the patient's skin, leaving a short stubble of usually around one millimetre in length. Heads of clippers are disposable or disinfected between patients to minimise the risks of cross infection.

Having a hairless surgical site may assist the application of dressings and reduce potential infection as hair is a source of bacteria. However, the process of removing hair might cause primary infection because of microscopic cuts to the skin. Shaving and clipping can be carried out in operating theatres, anaesthetic rooms, hospital wards or in people's homes by theatre staff, ward staff, or by patients

themselves. Chemical depilation is usually carried out on wards or in the home as it requires more time.

Objectives

The purpose of this Best Practice Information Sheet is to answer the following questions based on the findings of the systematic review:

- Does pre-operative hair removal result in fewer surgical site infections than not removing hair?

With regard to the following specific comparisons:

- What are the relative effects of shaving, clipping and use of depilatory creams compared with each other or no hair removal on SSI rates?
- What is the effect on SSI rates of hair removal on the day before surgery compared with hair removal undertaken on the day of surgery?
- Does the clinical setting where the hair is removed affect SSI rates?

Included studies

Studies were included if they were randomised controlled trials (RCTs) comparing: firstly, hair removal by any method (shaving, clipping, depilatory cream) with no hair removal; secondly, hair removal by one method compared with hair removal by a different method; thirdly, hair removal carried out at different times prior to surgery; and fourthly, hair removal carried out in different settings (eg. the operating room, compared with the anaesthetic room, the ward, or the home).

Types of Participants

Participants were adults undergoing surgery in a designated operating theatre.

Types of Intervention

The review includes comparisons between any of the following:

- no pre-operative hair removal;
- wet shaving;
- dry shaving;
- clipping;
- depilatory creams;
- hair removal in different environments; and
- hair removal conducted at different times pre-operatively.

Quality of the research

Eleven RCTs were included in this systematic review. The methodological quality and the reporting of methods of most of these trials were poor. None of the trials were identified as being of high quality. The study setting and timing of hair removal relative to surgery were often poorly reported. It was often not clear who carried out the tests and when they were carried out.

Findings

Shaving vs no hair removal

Two trials involving 358 people compared shaving with no hair removal. Participants in both trials had abdominal surgery and used observations and swabs to determine infection. Neither study reported full details of the method. Ten percent (17/177) of people who were shaved developed an SSI compared with 6% (11/181) who were not shaved. There is no statistically significant difference between shaving and no hair removal, however the trials are not of high quality and the sample size is 'underpowered', i.e. too small to say with confidence that the study would detect a significant difference.

Depilatory cream vs no hair removal

One trial compared depilatory cream with no hair removal. This trial was carried out in abdominal surgery and did not provide full details of methods. 8% (10/126) of people who had hair removed using depilatory cream acquired an SSI compared with 8% (11/141) people who had no hair removed. There are no statistically significant differences between the two groups. The sample size, however, is underpowered.

Clippers vs no hair removal

No studies were found.

Shaving vs clipping

Three trials were included where hair was removed by shaving or clipping prior to surgery, the type of surgery

Implications for practice

There is insufficient evidence to say whether hair removal increases or reduces SSI. However, if it is necessary to remove hair, clipping or using depilatory cream causes fewer SSIs than shaving. Although the evidence is limited on the timing of hair removal, if clipping is to be used it is suggested that it be carried out on the day of surgery.

was predominantly clean, such as hernia repair and cardiac surgery. No trials reported full details of the methods used. Three percent (46/1627) of people who were shaved prior to surgery developed an SSI compared with 2% (21/1566) of people who were clipped prior to surgery. This is a statistically significant finding. The trials involved similar types of surgery and showed that people are more likely to develop an SSI when they are shaved rather than when they are clipped prior to surgery.

Shaving vs depilatory cream

Seven trials involving 1213 people were included and most trials included a mix of surgical procedures within the same trial. There was variation in the timing of the outcome assessment ranging from 2 to 28 days and three trials did not report at what point the outcome assessment was made. The trials were of variable quality or did not report clearly. Overall 10% (65/670) of people who were shaved acquired an SSI compared with 7% (38/543) of people who had hair removed with a depilatory cream. This statistically significant finding shows that people are more likely to develop an SSI when they are shaved with a razor rather than having hair removed using a depilatory cream.

Clipping vs depilatory cream

No studies were found.

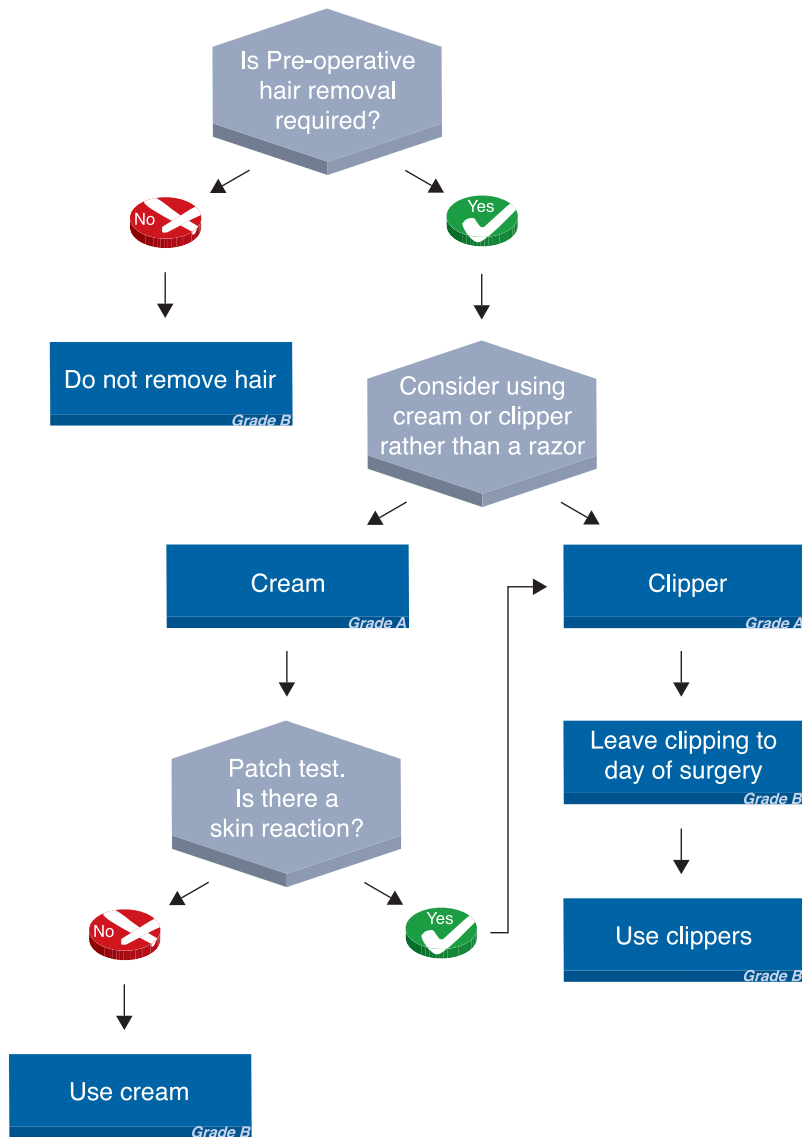
Shaving on the day of surgery vs shaving one day preoperatively

One large study compared shaving on the day of surgery with shaving one day preoperatively in 537 people undergoing elective clean surgery. When followed up at 30 days post-operatively, 9% (23/260) of people who were shaved the day before surgery developed an SSI compared with 10% (26/260) who were shaved on the day of surgery. This result is, however, not statistically significant.

Clipping on the day of surgery vs clipping one day preoperatively

One large study involving 476 people undergoing elective clean surgery compared clipping on the day of surgery with clipping one day preoperatively. When followed up at 30 days post operatively, 8% (18/241) of people clipped one day preoperatively developed an SSI compared with 4% (7/216) of people clipped on the day of surgery. This difference is not statistically significant but the sample the size is underpowered.

Pre-operative Hair Removal



Acknowledgments

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This *Best Practice* information sheet presents the best available evidence on this topic. Implications for practice are made with an expectation that health professionals will utilise this evidence with consideration of their context, their client's preference and their clinical judgement.⁴

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