Use of plastic adhesive drapes during surgery for preventing surgical site infection (Review)

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*Use of plastic adhesive drapes during surgery for preventing surgical site infection (Review)*  
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Use of plastic adhesive drapes during surgery for preventing surgical site infection

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ABSTRACT

Background
Surgical site infection has been estimated to occur in about 15% of clean surgery and 30% of contaminated surgery. Using plastic adhesive drapes to protect the wound from organisms that may be present on the surrounding skin during surgery is one strategy used to prevent surgical site infection. Results from non-randomised studies have produced conflicting results about the efficacy of this approach but no systematic review has been conducted to date to guide clinical practice.

Objectives
To assess the effect of adhesive drapes used during surgery on surgical site infection, cost, mortality and morbidity.

Search methods
For this second update we searched the Cochrane Wounds Group Specialised Register (searched 10 November 2010), the Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 4, 2010), Ovid MEDLINE (2008 to November Week 2 2010), Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations (November 9, 2010), Ovid EMBASE (2008 to 2010 Week 44), EBSCO CINAHL (2008 to 5 October 2010).

Selection criteria
Randomised controlled trials comparing any plastic adhesive drape with no adhesive drape, used alone or in combination with woven (material) drapes or disposable (paper) drapes in patients undergoing any type of surgery.

Data collection and analysis
Two review authors independently selected and assessed studies for trial quality and both independently extracted data. Study authors were contacted for additional information.

Main results
We identified no new studies for this second update. The review includes five studies involving 3,082 participants comparing adhesive drapes with no drape and two studies involving 1,113 participants comparing iodine-impregnated adhesive drapes with no drape. A significantly higher proportion of patients in the adhesive drape group developed a surgical site infection when compared with no
drape. (Risk ratio (RR) 1.23, 95% Confidence Intervals (CI) 1.02 to 1.48, p=0.03). Iodine-impregnated adhesive drapes had no effect on the surgical site infection rate (RR 1.03, 95% CI 0.064 to 1.66, p=0.89). Length of hospital stay was similar in the adhesive drape and non-adhesive drape groups.

**Authors’ conclusions**

There was no evidence from the seven trials that plastic adhesive drapes reduces surgical site infection rate and some evidence that they increase infection rates. Further trials may be justified using blinded outcome assessment to examine the effect of adhesive drapes on surgical site infection based on different wound classifications.

**PLAIN LANGUAGE SUMMARY**

**Use of plastic adhesive drapes during surgery for preventing surgical site infection**

Following surgery, up to 30% of wounds may become infected. This complication of surgery may cause distress for the patient and lead to higher treatment costs. Many interventions have been designed to reduce postoperative infections. One of these is the use of a drape which adheres to the skin and through which the surgeon cuts. It is thought that adhesive drapes prevent germs, which may be on the skin, from entering the open wound. This updated review of over 4,000 patients in seven separate trials could find no evidence that adhesive drapes reduces surgical site infection rates and some evidence that they may increase infection rates.
### Summary of Findings for the Main Comparison

**Adhesive drape versus no adhesive drape for preventing surgical site infection**

**Patient or population:** Patients undergoing surgery  
**Settings:** Hospital  
**Intervention:** Adhesive drape versus no adhesive drape

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>No of Participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>Assumed risk</td>
<td>Corresponding risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical site infection (all wound classifications)</td>
<td>Medium risk population</td>
<td>RR 1.23 (1.02 to 1.48)</td>
<td>3082</td>
<td>⊕⊕⊕⊕ high</td>
<td></td>
</tr>
<tr>
<td>Inspection of the wound&lt;sup&gt;1&lt;/sup&gt; (follow-up: 5 to 24 weeks)</td>
<td>109 per 1000 (111 to 161)</td>
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<tr>
<td>Adhesive drape versus no adhesive drape</td>
<td>134 per 1000 (111 to 161)</td>
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</tbody>
</table>

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).  
CI: Confidence interval; RR: Risk ratio;  
GRADE Working Group grades of evidence:  
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.  
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.  
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.  
**Very low quality:** We are very uncertain about the estimate.

<sup>1</sup> Various definitions of infection were used; we accepted the authors’ definition in each case.  
<sup>2</sup> In one trial (Psaila 1977) the follow-up period was not nominated.  
<sup>3</sup> Generation of random allocation sequence was unclear in two trials (Chiu 1993 and Psaila 1997). Allocation concealment was unclear in four trials (Chiu 1993, Cordez 1989, Jackson 1971 and Psaila 1997). Outcome assessment was blinded in only one of the 5 studies.
(Ward 2001). However, although information about these quality issues were not available for some trials, results were similar across trials so we do not believe results were compromised by these omissions in reporting.

4 The total sample met requirements for optimal information size and the total number of events exceeded 300.
**BACKGROUND**

**Description of the condition**

Surgical site infection (SSI) is one of the most common postoperative complications and has been estimated to occur in about 15% of cases of clean surgery and 30% of contaminated surgery cases (Bruce 2001). SSI is associated with longer recovery and further risks of additional complications, therefore increasing the risk of morbidity and mortality (Mangram 1999). However, the incidence rate depends on a number of factors including the definition of infection used, the intensity of surveillance, whether patients are followed-up after discharge and the prevalence of risk factors in the population studied (Smyth 2000). Risk factors associated with SSI have been grouped into two main categories: patient or host-related and operation or procedure-related (Mangram 1999; Smyth 2000). Patient characteristics include age, obesity, co-morbidities such as diabetes, remote infection, American Society of Anesthesiologists score (ASA) status, immunosuppressive therapy and length of pre-operative hospital stay. Operative risk factors include length of surgery, skin preparation (including shaving and antiseptic skin preparation), type of procedure, antimicrobial prophylaxis and surgical technique (Mangram 1999; Smyth 2000). Surgical wounds are frequently classified as either ‘clean’, ‘clean contaminated’, ‘contaminated’ or ‘dirty-infected’ with the latter categories associated with a higher infection rate (Lilani 2005). Many countries now benchmark their SSI rate using the National Nosocomial Infections Surveillance (NNIS) system risk index, in which wound classification is combined with the ASA status, length of surgery and whether surgery was undertaken laparoscopically to assess risk of SSI (Gaynes 2001). The additional per patient cost of surgical site infection has been estimated to be between £959 (UK £) for abdominal hysterectomy to £6103 for limb amputation (Coello 2005).

**Description of the intervention**

The high additional costs associated with SSI have led to the adoption of strategies that could reduce the incidence of SSI. These strategies include administration of prophylactic antibiotics, use of antiseptic solutions for skin preparation, and the use of sterile disposable materials. One of the commonly used operative strategies to reduce SSI is the plastic adhesive drape (referred to hereafter as adhesive drape). This was first tested 50 years ago on a cohort of patients undergoing a range of abdominal surgeries (Payne 1956). The study had three main aims: 1) to test adherence of a polyvinyl drape to the skin; 2) to assess the level of wound contamination; and 3) to assess skin and wound reaction to the drape. Problems were found with adherence of the drape to the skin, despite trialing a number of skin preparation solutions. Positive cultures were recovered from two of the 51 wounds but no skin or wound reactions to the polyvinyl sheet were recorded. Since that time, use of adhesive drapes has become widespread and the product has undergone modifications to improve effectiveness (Ritter 1988; Yoshimura 2000). This review will focus on plastic (defined as polyethylene or polyurethane or polyvinyl) adhesive drapes through which an incision is made; for example OpSite (Smith and Nephew); Ioban (3M Company, USA), Steridrape (3M United Kingdom). Drapes may be either plain or impregnated with an antibacterial agent such iodine.

**How the intervention might work**

For most SSIs, the source of the invading pathogen (or disease causing biological agent) is the patient’s skin (Nichols 1996). Consequently, pre-operative skin preparation is intended to render the skin as free as possible from bacteria that may enter the surgical wound. Although skin disinfection prior to surgery drastically reduces the number of bacteria on the skin’s surface, re-colonisation with bacteria from deeper skin layers and hair follicles may occur during the operation (Fleischmann 1996). Sterile surgical drapes, made of either linen or impervious paper, are used to prevent any contact with unprepared surfaces. Adhesive drapes are also used for this purpose and, generally used in combination with other draping techniques but have an additional function. Theoretically, they act as a microbial barrier, to prevent migration of contaminating bacteria from the skin to the operative site, for which there is some evidence (French 1976; Ha’eru 1983).

**Why it is important to do this review**

Although there is theoretical plausibility for the use of adhesive drapes, conflicting reports have been published regarding their usefulness in limiting bacteria around the surgical site (Karthagen 1992; Lilly 1970) and for preventing SSI (Ritter 1988). In a related systematic review, Edwards et al, found no benefit in using iodophor impregnated adhesive drapes to prevent post operative surgical wound infection, when they were used as part of preoperative skin antisepsis (Edwards 2004). As there has been no systematic review of the possible benefits and harms of adhesive drapes and because their use is widespread, this review is justified to guide practice.

**OBJECTIVES**

The primary objective of this systematic review is to assess the effect of adhesive drapes used during surgery on SSI rates. The secondary objectives are:

1. to determine the cost effectiveness of using adhesive drapes;
2. to assess if there are any adverse effects associated with the use of adhesive drapes;

3. to determine whether different types of adhesive drapes (polyethylene/polyurethane/polyvinyl) have differential effects on SSI.

METHODS

Criteria for considering studies for this review

Types of studies
Randomised controlled trials (RCTs) were included if they evaluated the effectiveness of adhesive drapes (used alone or in combination with other drapes), in preventing surgical site infection.

Types of participants
Trials recruiting people of any age or gender, undergoing any type of inpatient or outpatient surgery, were considered for inclusion.

Types of interventions
The primary intervention was adhesive drapes (polyethylene, polyurethane or polyvinyl), through which an incision is made. Adhesive drapes may have been used alone or in combination with other drapes: woven (material) drapes or disposable (paper) drapes and with any antiseptic skin preparation. The comparison intervention was no adhesive drape; other drapes such as woven (material) drapes or disposable (paper) drapes may have been used. Trials evaluating plastic ‘ring drapes’ or ‘V’ drapes were excluded as the incision is not made through the drape.

Comparisons included:
- Adhesive drape (without added antimicrobial properties) compared with no adhesive drape;
- Adhesive drape (with added antimicrobial properties) compared with no adhesive drape;
- Adhesive drape (without added antimicrobial properties) compared with adhesive drape (with added antimicrobial properties);
- Adhesive drape (with added antimicrobial properties) compared with no adhesive drape (woven or disposable).

Types of outcome measures

Primary outcomes
We included trials reporting the primary outcome: Rates of surgical site infection. For the purposes of this review we accepted the definition of surgical site infection used in the trial.

Secondary outcomes
Studies reporting secondary outcomes were only included if the primary outcome was reported and were:
- Mortality (any cause).
- Length of hospital stay.
- Costs.
- Hospital re-admissions.
- Adverse reactions (e.g. contact dermatitis, anaphylaxis).
- Other serious infection or infectious complication such as sepsicaemia or septic shock.

Search methods for identification of studies

Electronic searches
For an outline of the search methods used in the first update of this review see Appendix 1. For this second update we searched the following electronic databases:
- Cochrane Wounds Group Specialised Register (searched 10 November 2010);
- The Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 4);
- Ovid MEDLINE (In-Process & Other Non-Indexed Citations, November 9, 2010);
- Ovid EMBASE (2008 to 2010 Week 44);
- EBSCO CINAHL (2008 to 5 October 2010).

We searched The Cochrane Central Register of Controlled Trials (CENTRAL) using the following strategy:

#1 MeSH descriptor Surgical Wound Infection explode all trees
#2 MeSH descriptor Surgical Wound Dehiscence explode all trees
#3 MeSH descriptor Infection Control explode all trees
#4 surg* NEAR/5 infection*
#5 surg* NEAR/5 wound*
#6 wound* NEAR/5 infection*
#7 (postoperative or post-operative) NEAR/5 infection*
#8 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7)
#9 plastic NEAR/3 drape*:ti,ab,kw
#10 adhes* NEAR/3 drape*:ti,ab,kw
#11 skin NEAR/3 drape*:ti,ab,kw
#12 incis* NEAR/3 drape*:ti,ab,kw
#13 iodophor NEAR/3 drape*:ti,ab,kw
#14 iodine NEAR/3 drape*:ti,ab,kw
#15 opsite or steridrape or ioban:ti,ab,kw
#16 (#9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15)
#17 (#8 AND #16)

The search strategies for Ovid MEDLINE, Ovid EMBASE and EBSCO CINAHL can be found in Appendix 2, Appendix 3 and Appendix 4 respectively. The Ovid MEDLINE search was combined with the Cochrane Highly Sensitive Search Strategy for
identifying randomised trials in MEDLINE: sensitivity- and precision-maximizing version (2008 revision); Ovid format (Lefebvre 2009). The EMBASE and CINAHL searches were combined with the trial filters developed by the Scottish Intercollegiate Guidelines Network (SIGN) (SIGN 2009). No date or language restrictions were applied.

Searching other resources
We contacted researchers and manufactures in order to obtain any unpublished data. Reference lists of potentially useful articles were also searched. There were no restrictions by language, date or publication status.

Data collection and analysis

Selection of studies
For the initial review, two authors independently assessed the title and abstracts of references identified by the search strategy. We then retrieved full reports of all potentially relevant trials for further assessment of eligibility based on the inclusion criteria. We settled differences of opinion by consensus or referral to the editorial base of the Wounds Group. There was no blinding of authorship. For this updated review, trials were excluded by JW and their exclusion verified by the Managing Editor of the Wounds Group.

Data extraction and management
Two review authors independently extracted the following data, using a piloted data extraction sheet: type of study, country, study setting, number of participants, sex, mean age, type of surgery, pre-operative wound classification, predisposing risk factors by treatment groups, type of drape, draping procedure, type of pre-operative skin preparation, prophylactic or therapeutic antibiotic use, all primary and secondary outcome measures reported and authors' conclusions. Clarification about aspects of the trial were required from all of the authors; five were untraceable (Chiu 1993; Cordz 1989; Jackson 1971; Pailla 1977; Ward 2001). Additional trial details were received from Dewan 1987 and from the second author of the Segal 2002 trial. We also contacted manufacturers of plastic adhesive drapes (Johnson & Johnson, 3M Company and Smith & Nephew) to request details of any unpublished trials. A representative of each of these manufacturers responded; no current trials are underway and they were unaware of any unpublished trials.

Assessment of risk of bias in included studies
Two review authors independently assessed the quality of eligible trials, using a pre-defined quality assessment form, based on the assessment criteria outlined below. Disagreements between review authors were again resolved by consensus or referral to the editorial base of the Wounds Group. We contacted investigators of included trials to resolve any ambiguities. For this update each included study was assessed using the Cochrane Collaboration tool for assessing risk of bias (Higgins 2008). This tool addresses six specific domains, namely sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting and other issues (e.g. extreme baseline imbalance) (see Appendix 5 for details of criteria on which the judgement will be based). Blinding and completeness of outcome data was assessed for each outcome separately. We will complete a risk of bias table for each eligible study. We will discuss any disagreement amongst all authors to achieve a consensus.

We presented an assessment of risk of bias using a 'risk of bias summary figure', which presents all of the judgments in a cross-tabulation of study by entry. This display of internal validity indicates the weight the reader may give the results of each study. We defined high quality trials as those receiving a 'low risk of bias' rating for the criterion of allocation concealment (central computerised randomisation service or sealed opaque envelopes) and for blinding of outcome assessment.

Assessment of heterogeneity
Heterogeneity was tested for using the chi-squared statistic with significance being set at p < 0.10. In addition, the degree of heterogeneity was investigated by calculating the I^2 statistic (Higgins 2008). If evidence of significant heterogeneity was identified (> 50%), we explored potential sources of heterogeneity and a random-effects approach to the analysis was undertaken. We conducted a narrative review of eligible studies where statistical synthesis of data from more than one study was not possible or considered not appropriate.

Data synthesis
We analysed data using the RevMan 5 software. One review author entered the data and the other author cross checked the printout against their own data extraction forms. Relative risks (RR) and 95% confidence intervals (CI) were calculated for dichotomous outcomes (relative risk is the risk of infection in the intervention group divided by the risk of infection in the control group; a relative risk of less than one indicates fewer infections in the intervention or adhesive drape group). Mean differences (MD) and 95% CI were calculated for continuous outcomes. Where appropriate, results of comparable trials were pooled using a fixed-effect model and the pooled estimate together with its 95% CI are reported. We included all eligible trials in the initial analysis and carried out pre-planned sensitivity analyses to evaluate the effect of trial quality. This was done by excluding trials most susceptible to bias based on the quality assessment: those with inadequate allocation concealment and uncertain or unblinded outcome assessment.
Subgroup analysis and investigation of heterogeneity

We had planned four sub-group analyses:
1. Clean surgery compared with contaminated surgery.
2. Individual compared with cluster allocation.
3. Prophylactic antibiotic compared with no prophylaxis.
4. Hair clipping compared with shaving.

The only sub-group analysis that was possible based on available data was of clean compared with contaminated surgery. Nor was it possible to undertake a planned sensitivity analysis based on the type of material the drape was made from due to insufficient detail about the products.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

The initial search identified 84 possibly relevant titles, of these 19 were still considered potentially useful after the titles were screened. Abstracts or full-texts were retrieved and reviewed against the inclusion criteria, independently, by the two review authors. The Characteristics of excluded studies table contains reasons for excluding 11 of these studies. In summary, four were not RCTs (Duvvi 2005; Fairclough 1986; Maxwell 1969; Yoshimura 2003), three did not report SSI rates (French 1976; Ha’erri 1983; Manncke 1984), one did not report the number of participants in each group (Lewis 1984) and an adhesive drape was not used in the remaining three trials (Nystrom 1980; Nystrom 1984; Williams 1972). In the first review update, one trial Breitner 1986, which was waiting assessment has now been excluded as it reported colonisation rates but not SSI rates. The new searches undertaken for the first update identified 44 new citations, none of which met the inclusion criteria. In this second update, six new citations were identified. The full text of one potentially relevant trial was retrieved but it was not a randomised controlled trial (Swenson 2008). Details are included in the table Characteristics of excluded studies.

From the initial search, seven RCTs (Chiu 1993; Cordtz 1989; Dewan 1987; Jackson 1971; Psaila 1977; Segal 2002; Ward 2001) met the inclusion criteria (see Characteristics of included studies). These seven trials of 4,195 participants were included in the review with individual trial sizes ranging between 141 to 1,340 participants. Five of the trials compared an adhesive drape with no adhesive drape (Chiu 1993; Cordtz 1989; Jackson 1971; Psaila 1977; Ward 2001) and two compared an iodine-impregnated adhesive drape with no adhesive drape (Dewan 1987; Segal 2002). One study was a multi-centre trial (Cordtz 1989); the remaining trials were single centre. An a priori sample size calculation, based on a 50% reduction on the infection rate, was reported in one study (Ward 2001). Segal 2002 reported a sample size calculation based on an analysis of results of a pilot study of 120 patients, the trial was then continued, recruiting a further 64 patients.

Surgical procedures included caesarean section (Cordtz 1989; Ward 2001), general or abdominal surgery (Dewan 1987; Jackson 1971; Psaila 1977), hip surgery (Chiu 1993) and cardiac surgery (Segal 2002). Surgical site infection was not defined in one study (Chiu 1993); the Characteristics of included studies table contains details of other definitions used.

Four trials used iodine and alcohol to prepare the operative site (Chiu 1993; Cordtz 1989; Dewan 1987; Jackson 1971); one used Savlon and alcoholic chlorhexidine (Psaila 1977); an iodophor/alcohol water insoluble film was used in the Segal 2002 trial; and in the Ward 2001 trial, skin was swabbed with alcoholic chlorhexidine. In the Cordtz 1989 trial, participants were also randomised to have their wound re-disinfected prior to wound closure. Jackson 1971 ran a concurrent test of antibiotic spray in random cases. Prophylactic cephalosporin was given to each patient at anaesthetic induction in the Chiu 1993 trial and all patients in the Ward 2001 trial received 1g of cephalazolin when the baby’s cord was clamped, unless antibiotics were already being administered for therapy or prophylaxis. Antibiotic use was recorded by Cordtz 1989 and Segal 2002 but not reported by group. No information about antibiotic use was provided by other authors (Dewan 1987; Jackson 1971; Psaila 1977).

Risk of bias in included studies

(See risk of bias Figure 1; Figure 2)
Figure 1. Methodological quality graph: review authors’ judgements about each methodological quality item presented as percentages across all included studies.

Random sequence generation (selection bias)
Allocation concealment (selection bias)
Blinding (performance bias and detection bias)
Incomplete outcome data (attrition bias)
Selective reporting (reporting bias)
Other bias

0% 25% 50% 75% 100%

Low risk of bias
Unclear risk of bias
High risk of bias
Figure 2. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

<table>
<thead>
<tr>
<th></th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Blinding (performance bias and detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other bias</th>
</tr>
</thead>
</table>
Generation of random allocation sequence
In all trials, authors stated that participants were randomly allocated to the intervention. It was unclear how the allocation sequence was generated in three trials (Chiu 1993; Psaila 1977; Segal 2002). In the Cordtz 1989 trial, the National Centre for Hospital Hygiene was responsible for the randomisation process; Dewan 1987 and Ward 2001 used a random number table and in the Jackson 1971 trial, a ‘spin of the coin’ was used.

Allocation concealment
Allocation concealment was adequate in three studies. Segal 2002 asked surgeons participating in the trial to draw the treatment allocation from a ‘closed sack’ at the beginning of surgery and Ward 2001 and Dewan 1987 used sealed envelopes for group allocation. In other studies the information was not available to judge (unclear), although authors were contacted where possible (Chiu 1993; Cordtz 1989; Jackson 1971; Psaila 1977).

Blinding of outcome assessment
In the Ward 2001 and Dewan 1987 trials, outcomes were assessed by staff who were unaware of group assignment. The study investigators inspected wounds for signs of infection in the Jackson 1971 and Segal 2002 trials. In all other trials it was unclear who was responsible for assessing outcomes, and whether those who did inspect wounds for signs of infection were aware of group assignment (Chiu 1993; Cordtz 1989; Psaila 1977).

Intention to treat analysis
None of the trials reported group assignment violations, so it is difficult to assess whether patient outcomes were analysed in the group to which they were assigned. None of the trials specifically reported that they used an intention to treat analysis.

Baseline comparability
No information was available about baseline comparability for five trials (Chiu 1993; Cordtz 1989; Jackson 1971; Psaila 1977; Segal 2002). In the Dewan 1987 trial, the author stated that groups were similar for all risk factors but no data was presented. Ward 2001 stated that, apart from age and parity, groups were comparable at baseline but again, no data were available for comparison.

For completeness of primary outcome reporting
One trial did not indicate the period of follow-up (Psaila 1977). In the remaining trials, follow-up ranged between 5 days and 6 months (Table: Characteristics of included studies). In the Dewan 1987 trial, 46 patients (4.2%) were unable to be tracked and were excluded from the analysis. Based on reported data, follow-up appeared to be complete in all of the other included trials. However, the absence of detailed participant flow charts, or any reference to the number who started the trial and were unable to be followed-up, makes assessment of rates difficult, particularly as the follow-up periods were lengthy in some studies, increasing the likelihood of incomplete follow-up.

Effects of interventions
See: Summary of findings for the main comparison; Summary of findings 2
This review includes seven studies involving 4,195 participants of whom 2,133 were in the treatment group and 2,062 formed the control group. All seven trials recorded incidence of surgical site infection as an outcome. Surgical procedures included general or abdominal surgery (Dewan 1987; Jackson 1971; Psaila 1977), Caesarean section (Cordtz 1989; Ward 2001), cardiac surgery (Segal 2002) and hip surgery (Chiu 1993). Based on our quality criteria, the trials of Dewan 1987 and Ward 2001 were considered to have a low risk of bias. The remaining five trials Chiu 1993; Cordtz 1989; Jackson 1971; Psaila 1977; Segal 2002 contained a moderate risk of bias. However, as results from all trials were not dissimilar, all of the eligible trials were combined in the meta-analyses.

Two comparisons were undertaken: adhesive drapes compared with no adhesive drapes (Analysis 01) (Chiu 1993; Cordtz 1989; Jackson 1971; Psaila 1977; Segal 2002) and iodine-impregnated adhesive drapes compared with no adhesive drapes (Analysis 2.1) (Dewan 1987; Segal 2002).

Adhesive drape compared with no adhesive drape (Analysis: 01)

Primary outcome

Surgical site infection (SSI)
Five studies were included in this comparison (Cordtz 1989; Chiu 1993; Jackson 1971; Psaila 1977; Ward 2001). These studies included 3,082 participants, of whom 1,556 were in the adhesive drape group and 1,526 were in the no adhesive drape group. Although the studies covered a 30 year time span and included a range of different types of surgery, no heterogeneity was detected ($I^2 = 0\%$). Pooling these studies (fixed effect model) indicated significantly more SSIs in the adhesive drape group, (RR 1.23, 95% CI 1.02 to 1.48, p=0.03, Analysis 1.1). The overall event rate was
13.7% and 11.2% in the adhesive drape group and no drape group respectively.

**Surgical site infection - by preoperative wound classification**

A single trial of 921 participants analysed infection rates based on pre-operative infection risk classifications (Jackson 1971). In this trial there was no significant effect of using an adhesive drape overall, although infection rates were lower for the no adhesive drape group. Results did not vary depending on baseline risk of infection. Overall RR = 1.20 (95% CI 0.86 to 1.66); RR for clean wounds = 1.37 (95% CI 0.53 to 3.53); RR for potentially infected wounds = 1.24 (95% CI 0.80 to 1.92) and RR for infected wounds = 1.03 (95% CI 0.60 to 1.75) (Analysis 1.2). We have reported results from this trial as they were presented in the published paper, even though there was a minor discrepancy between results in the text and those in the tables. For example, in the text, 52 of the 448 cases in the in the no adhesive drape group became infected. In the table, when cases were classified as clean, potentially infected and infected, totals were 51 infections among 445 cases. Similarly in the adhesive drape group, 67 infections were reported in 473 patients in the text and 67 of 476 in the tables. Attempts to contact investigators were unsuccessful however, using either set of results did not affect the overall level of significance for this outcome.

None of the trials provided information about any of the other pre-defined secondary outcomes (mortality, cost, hospital re-admissions, adverse reactions e.g. contact dermatitis, anaphylaxis) or other serious infection or infectious complication such as septicemia or septic shock.

**Iodine-impregnated adhesive drapes compared with no adhesive drape (Analysis:02)**

**Primary outcome**

**Surgical site infection**

Two studies compared iodine-impregnated adhesive drapes with no adhesive drapes (Dewan 1987; Segal 2002). These studies included 1,113 participants, of whom 577 were in the iodine-impregnated adhesive drape group and 536 were in the no adhesive drape group. In the absence of heterogeneity (I²=0%) the studies were pooled. There was no significant difference in SSI rates between the two groups (RR 1.03, 95% CI 0.66 to 1.60, p=0.89 Analysis 2.1).
**ADDITIONAL SUMMARY OF FINDINGS**

Iodophore impregnated adhesive drape compared with no adhesive drape for preventing surgical site infection

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>No of Participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical site infection</td>
<td>[Medium risk population](follow-up: 3 to 6 weeks)</td>
<td>RR 1.03 (0.66 to 1.6)</td>
<td>1113</td>
<td>⚫⚫⚫⚫ moderate</td>
<td></td>
</tr>
<tr>
<td>Inspection of the wound.</td>
<td>45 per 1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>46 per 1000 (30 to 72)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

**GRADE Working Group grades of evidence**

**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

**Very low quality:** We are very uncertain about the estimate.

---

1. A number of definitions of wound infection were used across the trials. We accepted the authors’ definition in all cases.
2. Although information about allocation concealment was unclear in one trial ([Dewan 1987](#)) and outcome assessment not blinded in the Segal (2002) trial, we have judged that this has not compromised the result.
3. There was imprecision on at least two counts. The total sample size was too small to meet optimal information size and the total number of events were less than 300.
**DISCUSSION**

The conclusions from the original version of this review remain unchanged in this update. Although adhesive drapes are widely used in surgery to prevent SSIs, an evidence based guideline for their use is unavailable (Mangram 1999). Consequently, the primary focus of this review was to address the effectiveness of adhesive drapes in preventing surgical site infection. Seven studies, including 4,195 patients, were identified. The main finding of this review is that adhesive drapes are not associated with a reduced infection rate compared with no adhesive drapes and appear to be associated with an increased risk of infection. The most obvious explanation for the result is that, if adequately disinfected prior to surgery, the patient’s skin is unlikely to be a primary cause of SSI; so attempts to isolate the skin from the wound, using an adhesive drape, may be pointless and potentially harmful as excessive moisture under plastic drapes may encourage bacteria residing in hair follicles to migrate to the surface and multiply (Chiu 1993).

In the only trial to report on length of stay, the use of adhesive drapes did not appear to affect the duration of hospitalisation. There was no available evidence for our other pre-planned outcomes of interest; mortality, cost, hospital re-admissions or adverse reactions.

Three of the trials included in the review had concurrent interventions. Segal 2002 had four arms to the study, two of which did not involve a comparison between draping methods. In the analysis, we included the two arms of the study that included a draping comparison only. We believe it is unlikely that this design would have had an impact on the outcome as patients were mutually exclusive. Similarly, in the Psaila 1977 trial, ring drapes were used in a third group. Cordtz 1989 allocated patients to four groups, adhesive drape or no drape adhesive drape combined with re disinfection or no re-disinfection. Although there was a lower rate of SSI in the re-disinfection group, the reduction was similar irrespective of the type of drape used.

Studies were of variable quality with only two trials (Dewan 1987; Ward 2001) meeting our criteria for high quality (receiving an A rating for the criterion of allocation concealment and for blinding of outcome assessment). Reporting aspects of other trials were poor, making it difficult to assess study quality. However, results of all but one of the trials were in a similar direction, favouring no adhesive drapes, providing some confidence in results. Verification remains a problem with many older studies, where contact with authors is impossible. Only the Psaila 1977 trial had a non-significant trend favouring adhesive drapes. This was a small study of 116 participants, the authors randomly allocated patients to two groups (adhesive drape and ring drape) and then stated, “in a control group linen towels alone were used”. We included outcomes from the control group in this study as the ‘no adhesive drape’ group in our analysis, but it was unclear how this group was selected. We are uncertain if any publication bias affected results, no unpublished studies were found.

Finally, it is unclear if all of the products used in the trials were similar. Trade names of adhesive drapes have changed over the 30 year time span this review covers. Whether this has led to a qualitative improvement in the product is unclear. No specific details were provided about, for example, the density of the material or its adherability. Irrespective of this, results have remained consistent over time suggesting that any improvements or changes to the product have not affected SSI rates.

**AUTHORS’ CONCLUSIONS**

**Implications for practice**

Evidence from this review suggests that use of intraoperative, incisional adhesive drapes is unlikely to reduce SSI rates and may increase them.

**Implications for research**

A large, high quality definite RCT may be warranted to determine whether modern adhesive drapes do prevent or reduce SSI.

**ACKNOWLEDGEMENTS**

The authors would like to acknowledge the contribution of the Wounds Group Editors; Nicky Cullum, Andrea Nelson and David Margolis, the TSC Ruth Foxlee for assistance with the search strategy, Gill Worthy the Statistical Editor, referees Allyson Lipp, Jac Dines and Durhane Wong-Rieger and to the copy editor, Elizabeth Royle for her valuable suggestions. Thanks also to Sally Bell-Syer for her advice, for being always available and keeping the process moving so efficiently.
References to studies included in this review

Chiu 1993  [published data only]

Cordtz 1989  [published data only]

Dewan 1987  [published data only]

Jackson 1971  [published data only]

Psaila 1977  [published data only]

Segal 2002  [published data only]

Ward 2001  [published data only]

References to studies excluded from this review

Breitner 1986  [published data only]

Duivi 2005  [published data only]

Fairclough 1986  [published data only]

French 1976  [published data only]

Ha’eri 1983  [published data only]

Lewis 1984  [published data only]

Manncke 1984  [published data only]

Maxwell 1969  [published data only]

Nystrom 1980  [published data only]

Nystrom 1984  [published data only]

Swenson 2008  [published data only]

Williams 1972  [published data only]

Yoshimura 2003  [published data only]

Additional references

Bruce 2001
Coello 2005

Edwards 2004

Fleischmann 1996

Gaynes 2001

Higgins 2002

Katthagen 1992

Lefebvre 2009

Lilani 2005
   Lilani SP, Jangale N, Chowdhary A, Daver GB. Surgical site infection in clean and clean-contaminated cases. *Indian Journal of Medical Microbiology* 2005;23:249–52.

Lilly 1970

Mangram 1999

Nichols 1996

Payne 1956

Ritter 1988

SIGN 2009

Smyth 2000

* Indicates the major publication for the study
### Characteristics of included studies  
*ordered by study ID*

#### Chiu 1993

| Methods                  | Study type: Single-centre RCT  
<table>
<thead>
<tr>
<th></th>
<th>Follow-up period: 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>People undergoing acute hip fracture surgery</td>
</tr>
<tr>
<td>Interventions</td>
<td>Opsite (Smith &amp; Nephew) adhesive plastic incisional drape compared with no incisional drape</td>
</tr>
</tbody>
</table>
| Outcomes                 | Surgical wound infection (reported as deep and superficial infection). No definition of infection provided.  
|                         | Bacterial colonization |

#### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Method not described</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Method not described</td>
</tr>
</tbody>
</table>
| Blinding (performance bias and detection bias)  
All outcomes | High risk | Masking was impossible for surgeons.  
It is unclear if patients were aware of their group allocation.  
Whether outcome assessors were masked is unclear. The author states ”After the operation, the wound was observed for clinical infection” but there was no indication of who undertook this assessment nor if those assessing the outcome were aware of the group allocation |
| Incomplete outcome data (attrition bias)  
All outcomes | Low risk | The authors state that 120 patients were enrolled and results were available for all of these patients. No mention of intention to treat analysis was made |
| Selective reporting (reporting bias) | Low risk | Results for all expected outcomes were reported |
Chiu 1993  (Continued)

Other bias | Low risk | No competing interests were declared. Although no data was shown, the authors stated that patients were matched for relevant risk factors at baseline

Cordtz 1989

Methods | Study type: multi-centre RCT
Follow-up period: 14 days

Participants | Women undergoing caesarean section. Includes infected and possibly infected cases

Interventions | Adhesive plastic incisional drape compared with no adhesive plastic incisional drape

Outcomes | Surgical wound infection (defined as possibly infected if there was localised erythema and/or serous secretion without the presence of pus)

Notes

Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Random allocation, using block design, in blocks of eight.</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Not described. However, the study, which included eight hospitals, was carried out under the supervision of the Danish National Centre for Hospital Hygiene, so it is likely that an appropriate method of allocation concealment was used</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias) All outcomes</td>
<td>High risk</td>
<td>Masking was impossible for surgeons. It is unclear if patients were aware of their group allocation. Whether outcome assessors were aware of their group allocation was unclear. The author states “Post-operative observations of the wounds were continued in hospital until the fourteenth post-operative day” but there was no indication of who undertook this assessment nor if the assessors were aware of the group allocation</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias) All outcomes</td>
<td>Low risk</td>
<td>64 patients were excluded before randomisation but details by group were not provided. No mention of intention to treat analysis was made</td>
</tr>
</tbody>
</table>
### Cordtz 1989  *(Continued)*

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>Results for all expected outcomes were reported.</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>No competing interests declared. No baseline data reported.</td>
</tr>
</tbody>
</table>

### Dewan 1987

**Methods**
- Study type: single-centre RCT
- Follow-up period: 3 weeks

**Participants**
- People undergoing general surgery

**Interventions**
- Ioban (3M Company) iodine impregnated adhesive plastic incisional drape compared with no incisional drape

**Outcomes**
- Surgical wound infection (defined as a wound that discharged pus or if the fluid discharging from the wound was associated with a positive bacterial culture or if erythema was present more than 1cm lateral to the wound).
- Death.
- Bacterial colonization.

**Notes**

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Random number table</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Surgeons sequentially selected the allocation from the random numbers table located in the operating room. Consequently, surgeons would have been aware of the next allocation</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias) All outcomes</td>
<td>High risk</td>
<td>Masking was impossible for surgeons. It is unclear if patients were aware of their group allocation. Outcome assessment was masked &quot;Postoperatively, wound follow-up was carried out by the infection control nurse who was unaware whether the drape had been used or not&quot;</td>
</tr>
</tbody>
</table>
Dewan 1987  (Continued)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>86 (7.8%) patients were excluded after randomisation (40 for incomplete records and 46 because they were unable to be followed-up for the three-week period considered necessary). These were not displayed by group</td>
</tr>
<tr>
<td>All outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>Results for all expected outcomes were reported.</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>No competing interests declared. Patients equally distributed for all major risk factors for surgical site infection</td>
</tr>
</tbody>
</table>

Jackson 1971

<table>
<thead>
<tr>
<th>Methods</th>
<th>Study type: single-centre RCT Follow-up period: 1 month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>People undergoing general surgery</td>
</tr>
<tr>
<td>Interventions</td>
<td>Adhesive plastic incisional drape (Band-aid) compared with no adhesive plastic incisional drape</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Surgical wound infection (defined as a wound discharging pus and included stitch abscess)</td>
</tr>
</tbody>
</table>

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Spin of a coin</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>The coin was 'spun' at the beginning of the operation. Allocation would have been concealed until then and the next allocation would be unpredictable</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias)</td>
<td>High risk</td>
<td>Masking was impossible for surgeons. It is unclear if patients were aware of their group allocation. Two of the authors, who were also surgeons involved in the trial, followed up all patients until one month after the surgery to record</td>
</tr>
</tbody>
</table>
Jackson 1971  
(Continued)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>Follow up data was reported on all enrolled participants</td>
</tr>
<tr>
<td>All outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>Results for all expected outcomes were reported.</td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear risk</td>
<td>The investigators &quot;ran a concurrently a test of an antibiotic spray in random cases” Results were to be reported separately. It is unclear if the spray was used equally between groups. No baseline data was reported. No competing interests reported</td>
</tr>
</tbody>
</table>

Psaila 1977

<table>
<thead>
<tr>
<th>Methods</th>
<th>Study type: Single-centre RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Follow-up period: Not defined</td>
</tr>
<tr>
<td>Participants</td>
<td>People undergoing abdominal surgery</td>
</tr>
<tr>
<td>Interventions</td>
<td>Adhesive plastic incisional drape compared with no adhesive plastic incisional drape and a ring drape</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Surgical wound infection (defined as erythema around sutures or wound edge with an accompanying pyrexia; discharge or exudate from the wound; wound breakdown). Bacterial colonization</td>
</tr>
</tbody>
</table>

Notes

Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Method not described</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Method not described</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias)</td>
<td>High risk</td>
<td>Masking was impossible for surgeons. It is unclear if patients were aware of their group allocation. Wounds were inspected daily after the third day to identify evidence of infection but it is not clear who did this; nor if the assessors</td>
</tr>
</tbody>
</table>
**Psaila 1977**  *(Continued)*

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All enrolled patients were accounted for in the results.</td>
</tr>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>Results for all expected outcomes were reported.</td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear risk</td>
<td>No baseline data was reported. No competing interests reported</td>
</tr>
</tbody>
</table>

**Segal 2002**

**Methods**
- Study type: Single-centre RCT
- Follow-up period: 6 weeks

**Participants**
- People at high risk undergoing cardiac surgery

**Interventions**
- Iodine impregnated adhesive plastic incisional drape compared with no incisional drape

**Outcomes**
- Surgical wound infection. No clear definition of infection but included drainage, redness, tenderness or instability

**Notes**

**Risk of bias**

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Pieces of paper marked with equal numbers of the different allocations were placed in a sack</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>When an eligible patient was identified, a piece of paper containing the allocation was drawn out of the sack by the operating room Charge Nurse</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias)</td>
<td>High risk</td>
<td>Masking was impossible for surgeons. It is unclear if patients were aware of their group allocation. The person assessing the outcome was aware of the patients allocation group</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>All enrolled patients were followed-up.</td>
</tr>
</tbody>
</table>
### Segal 2002 (Continued)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting (reporting bias)</td>
<td>Low risk</td>
<td>Results for all expected outcomes were reported.</td>
</tr>
<tr>
<td>Other bias</td>
<td>Low risk</td>
<td>Patients equal at baseline for risk factors (communication with authors). No competing interests</td>
</tr>
</tbody>
</table>

### Ward 2001

<table>
<thead>
<tr>
<th>Methods</th>
<th>Study type: Single-centre RCT Follow-up period: 5 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Women undergoing caesarean section</td>
</tr>
<tr>
<td>Interventions</td>
<td>Incise (Smith &amp; Nephew) adhesive plastic incisional drape compared with no adhesive plastic incisional drape</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Surgical wound infection (defined as having to include 2 of the following: Erythema around sutures or wound edge; seropurulent discharge from the wound; positive swab culture). Number of days in hospital.</td>
</tr>
</tbody>
</table>

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Low risk</td>
<td>Random number table</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Low risk</td>
<td>Allocation contained in opaque unmarked envelope.</td>
</tr>
<tr>
<td>Blinding (performance bias and detection bias)</td>
<td>Low risk</td>
<td>Masking was impossible for surgeons. Patients were blind to their allocation as the drape was placed after anaesthetic induction. Outcome assessment was blinded, post operative care was provided by staff unrelated to surgery</td>
</tr>
<tr>
<td>Incomplete outcome data (attrition bias)</td>
<td>Low risk</td>
<td>Of the 620 patients randomised, 15 (2.4%) had critical data missing from their records and further two patients were excluded, one for an existing infection and one for early discharge</td>
</tr>
<tr>
<td>Study</td>
<td>Reason for exclusion</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Breitner 1986</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>Duvvi 2005</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>Fairclough 1986</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>French 1976</td>
<td>Did not report wound infection rate</td>
<td></td>
</tr>
<tr>
<td>Ha’er 1983</td>
<td>Did not report wound infection rate</td>
<td></td>
</tr>
<tr>
<td>Lewis 1984</td>
<td>Number of participants in each treatment arm not reported</td>
<td></td>
</tr>
<tr>
<td>Manncke 1984</td>
<td>Did not report wound infection rate</td>
<td></td>
</tr>
<tr>
<td>Maxwell 1969</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>Nystrom 1980</td>
<td>Plastic incisional drape not used</td>
<td></td>
</tr>
<tr>
<td>Nystrom 1984</td>
<td>Plastic incisional drape not used</td>
<td></td>
</tr>
<tr>
<td>Swenson 2008</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
<tr>
<td>Williams 1972</td>
<td>Plastic incisional drape not used</td>
<td></td>
</tr>
<tr>
<td>Yoshimura 2003</td>
<td>Not a randomised controlled trial</td>
<td></td>
</tr>
</tbody>
</table>

**Selective reporting (reporting bias)**

<table>
<thead>
<tr>
<th>Study</th>
<th>Risk</th>
<th>Results for all expected outcomes were reported.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward 2001</td>
<td>Low risk</td>
<td>Patients were only followed for 5 days; some infections would have occurred after this time. Baseline risk factors were equally distributed between groups</td>
</tr>
</tbody>
</table>

**Other bias**

<table>
<thead>
<tr>
<th>Study</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward 2001</td>
<td>Unclear risk</td>
</tr>
</tbody>
</table>
## DATA AND ANALYSES

### Comparison 1. Adhesive drape versus no adhesive drape

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Surgical site infection (all wound classifications)</td>
<td>5</td>
<td>3082</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.23 [1.02, 1.48]</td>
</tr>
<tr>
<td>2 Surgical site infection (by wound classification)</td>
<td>1</td>
<td>921</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.20 [0.86, 1.66]</td>
</tr>
<tr>
<td>2.1 Clean</td>
<td>1</td>
<td>363</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.37 [0.53, 3.53]</td>
</tr>
<tr>
<td>2.2 Potentially infected</td>
<td>1</td>
<td>486</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.24 [0.80, 1.92]</td>
</tr>
<tr>
<td>2.3 Infected</td>
<td>1</td>
<td>72</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.03 [0.60, 1.75]</td>
</tr>
<tr>
<td>3 Length of hospital stay</td>
<td>1</td>
<td>Totals not selected</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3.1 Infected wound</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>3.2 No infected wound</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
</tbody>
</table>

### Comparison 2. Iodine-impregnated adhesive drape vs no adhesive drape

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Surgical site infection</td>
<td>2</td>
<td>1113</td>
<td>Risk Ratio (M-H, Fixed, 95% CI)</td>
<td>1.03 [0.66, 1.60]</td>
</tr>
</tbody>
</table>
## Analysis 1.1. Comparison 1 Adhesive drape versus no adhesive drape, Outcome 1 Surgical site infection (all wound classifications).

**Review:** Use of plastic adhesive drapes during surgery for preventing surgical site infection

**Comparison:** 1 Adhesive drape versus no adhesive drape

**Outcome:** 1 Surgical site infection (all wound classifications)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Adhesive drape n/N</th>
<th>No adhesive drape n/N</th>
<th>Risk Ratio M-H,Fixed 95% CI</th>
<th>Weight M-H,Fixed</th>
<th>Risk Ratio 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson 1971</td>
<td>67/473</td>
<td>52/448</td>
<td>30.9 % 1.22 [ 0.87, 1.71 ]</td>
<td>30.9 %</td>
<td>1.22 [ 0.87, 1.71 ]</td>
</tr>
<tr>
<td>Psaila 1977</td>
<td>8/51</td>
<td>10/47</td>
<td>6.0 % 0.74 [ 0.32, 1.71 ]</td>
<td>6.0 %</td>
<td>0.74 [ 0.32, 1.71 ]</td>
</tr>
<tr>
<td>Cordtz 1989</td>
<td>99/662</td>
<td>74/678</td>
<td>42.3 % 1.37 [ 1.03, 1.82 ]</td>
<td>42.3 %</td>
<td>1.37 [ 1.03, 1.82 ]</td>
</tr>
<tr>
<td>Chiu 1993</td>
<td>6/65</td>
<td>5/55</td>
<td>3.1 % 1.02 [ 0.33, 3.15 ]</td>
<td>3.1 %</td>
<td>1.02 [ 0.33, 3.15 ]</td>
</tr>
<tr>
<td>Ward 2001</td>
<td>34/305</td>
<td>30/298</td>
<td>17.6 % 1.11 [ 0.70, 1.76 ]</td>
<td>17.6 %</td>
<td>1.11 [ 0.70, 1.76 ]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>1556</strong></td>
<td><strong>1526</strong></td>
<td><strong>100.0 % 1.23 [ 1.02, 1.48 ]</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>1.23 [ 1.02, 1.48 ]</strong></td>
</tr>
</tbody>
</table>

Total events: 214 (Adhesive drape), 171 (No adhesive drape)

Heterogeneity: Chi² = 2.30, df = 4 (P = 0.68); I² = 0.0%

Test for overall effect: Z = 2.15 (P = 0.032)

Test for subgroup differences: Not applicable
Analysis 1.2. Comparison 1 Adhesive drape versus no adhesive drape, Outcome 2 Surgical site infection (by wound classification).

Review: Use of plastic adhesive drapes during surgery for preventing surgical site infection

Comparison: 1 Adhesive drape versus no adhesive drape

Outcome: 2 Surgical site infection (by wound classification)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Adhesive drape</th>
<th>No adhesive drape</th>
<th>Risk Ratio</th>
<th>Weight</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H Fixed 95% CI</td>
<td></td>
<td>M-H Fixed 95% CI</td>
</tr>
<tr>
<td>1 Clean</td>
<td>10/185</td>
<td>7/178</td>
<td>13.4 %</td>
<td>1.37</td>
<td>0.53, 3.53</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>185</td>
<td>178</td>
<td>13.4 %</td>
<td>1.37</td>
<td>0.53, 3.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Potentially infected</td>
<td>40/252</td>
<td>30/234</td>
<td>58.2 %</td>
<td>1.24</td>
<td>0.80, 1.92</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>252</td>
<td>234</td>
<td>58.2 %</td>
<td>1.24</td>
<td>0.80, 1.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Infected</td>
<td>17/39</td>
<td>14/33</td>
<td>28.4 %</td>
<td>1.03</td>
<td>0.60, 1.75</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>39</td>
<td>33</td>
<td>28.4 %</td>
<td>1.03</td>
<td>0.60, 1.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>476</td>
<td>445</td>
<td>100.0 %</td>
<td>1.20</td>
<td>0.86, 1.66</td>
</tr>
</tbody>
</table>

Heterogeneity: not applicable
Test for overall effect: Z = 0.66 (P = 0.51)

Test for subgroup differences: Chi² = 0.40, df = 2 (P = 0.82), I² = 0.0%
Analysis 1.3. Comparison 1 Adhesive drape versus no adhesive drape, Outcome 3 Length of hospital stay.

Review: Use of plastic adhesive drapes during surgery for preventing surgical site infection

Comparison: 1 Adhesive drape versus no adhesive drape

Outcome: 3 Length of hospital stay

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Adhesive drape</th>
<th>No adhesive drape</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Infected wound</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward 2001</td>
<td>34</td>
<td>10.4 (3.9)</td>
<td>30</td>
<td>10.2 (3.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.20 [ -1.71, 2.11]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No infected wound</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward 2001</td>
<td>271</td>
<td>5.2 (1.3)</td>
<td>268</td>
<td>5.2 (0.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0 [ -0.19, 0.19 ]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis 2.1. Comparison 2 Iodine-impregnated adhesive drape vs no adhesive drape, Outcome 1 Surgical site infection.

Review: Use of plastic adhesive drapes during surgery for preventing surgical site infection

Comparison: 2 Iodine-impregnated adhesive drape vs no adhesive drape

Outcome: 1 Surgical site infection

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Iodine-impregnated drape</th>
<th>No adhesive drape</th>
<th>Risk Ratio</th>
<th>Weight</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td></td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>Dewan 1987</td>
<td>36/529</td>
<td>34/487</td>
<td>0.97 [ 0.62, 1.53 ]</td>
<td>97.3 %</td>
<td></td>
</tr>
<tr>
<td>Segal 2002</td>
<td>3/48</td>
<td>1/49</td>
<td>3.06 [ 0.33, 28.42 ]</td>
<td>2.7 %</td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>577</td>
<td>536</td>
<td>100.0 %</td>
<td>1.03 [ 0.66, 1.60 ]</td>
<td></td>
</tr>
</tbody>
</table>
APPENDICES

Appendix 1. Search strategy for the first review update - 2009

For this update, we performed searches of the following:
The Cochrane Wounds Group Specialised Register (Searched 24/2/09)
The Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 1, 2009)
Ovid MEDLINE (2007 to February Week 2 2009)
Ovid EMBASE (2007 to 2009 Week 08)
EBSCO CINAHL (2007 to February Week 3 2009).
The search strategies for Ovid MEDLINE, Ovid EMBASE and EBSCO CINAHL can be found in Appendix 2, Appendix 3 and Appendix 4 respectively. The Ovid MEDLINE search was combined with the Cochrane Highly Sensitive Search Strategy for identifying randomised trials in MEDLINE; sensitivity- and precision-maximizing version (2008 revision); Ovid format (Lefebvre 2008). The EMBASE and CINAHL searches were combined with the trial filters developed by the Scottish Intercollegiate Guidelines Network (SIGN) (SIGN 2009). No date or language restrictions were applied.
We searched The Cochrane Central Register of Controlled Trials (CENTRAL), (The Cochrane Library, latest issue) using the following strategy:
#1 MeSH descriptor Surgical Wound Infection explode all trees
#2 MeSH descriptor Surgical Wound Dehiscence explode all trees
#3 MeSH descriptor Infection Control explode all trees
#4 surg* NEAR/5 infection*
#5 surg* NEAR/5 wound*
#6 wound* NEAR/5 infection*
#7 (postoperative or post-operative) NEAR/5 infection*
#8 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7)
#9 plastic NEAR/3 drape*:ti,ab,kw
#10 adhes* NEAR/3 drape*:ti,ab,kw
#11 skin NEAR/3 drape*:ti,ab,kw
#12 incis* NEAR/3 drape*:ti,ab,kw
#13 iodophor NEAR/3 drape*:ti,ab,kw
#14 iodine NEAR/3 drape*:ti,ab,kw
#15 opsite or steridrape or ioban:ti,ab,kw
#16 (#9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15)
#17 (#8 AND #16)
We contacted researchers and manufactures in order to obtain any unpublished data. Reference lists of potentially useful articles were also searched. There were no restrictions by language, date or publication status.

Appendix 2. Ovid MEDLINE search strategy

1 exp Surgical Wound Infection/
2 exp Surgical Wound Dehiscence/
3 exp Infection Control/
4 (surg* adj5 infection*).ti,ab.
5 (surg* adj5 wound*).ti,ab.
6 (wound* adj5 infection*).ti,ab.
7 ((postoperative or post-operative) adj5 infection*).ti,ab.
8 or/1-7
9 (plastic adj3 drape*).ti,ab.
10 (adhes* adj3 drape*).ti,ab.
11 (skin adj3 drape*).ti,ab.
12 (incis* adj3 drape*).ti,ab.
13 (iodophor adj3 drape*).ti,ab.
14 (iodine adj3 drape*).ti,ab.
15 (opsite or steridrape or ioban).ti,ab.
16 or/9-15
17 8 and 16

**Appendix 3. Ovid EMBASE search strategy**

1 exp Surgical Wound Infection/
2 exp Surgical Wound Dehiscence/
3 exp Infection Control/
4 (surg* adj5 infection*).ti,ab.
5 (surg* adj5 wound*).ti,ab.
6 (wound* adj5 infection*).ti,ab.
7 ((postoperative or post-operative) adj5 infection*).ti,ab.
8 or/1-7
9 (plastic adj3 drape*).ti,ab.
10 (adhes* adj3 drape*).ti,ab.
11 (skin adj3 drape*).ti,ab.
12 (incis* adj3 drape*).ti,ab.
13 (iodophor adj3 drape*).ti,ab.
14 (iodine adj3 drape*).ti,ab.
15 (opsite or steridrape or ioban).ti,ab.
16 or/9-15
17 8 and 16

**Appendix 4. EBSCO CINAHL search strategy**

S19 S8 and S18
S18 S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17
S17 TI (opsite or steridrape or ioban) or AB (opsite or steridrape or ioban)
S16 TI iodine N3 drape* or AB iodine N3 drape*
S15 TI iodophor* N3 drape* or AB iodophor* N3 drape*
S14 TI iodophor N3 drape* or AB iodophor N3 drape*
S13 TI incis* N3 drape* or AB incis* N3 drape*
S12 TI skin N3 drape* or AB skin N3 drape*
S11 TI adhes* N3 drape* or AB adhes* N3 drape*
S10 TI plastic N3 drape* or AB plastic N3 drape*
S9 (MH “Surgical Draping”)
S8 S1 or S2 or S3 or S4 or S5 or S6 or S7
S7 TI (postoperative* N5 infection* OR post-operative* N5 infection*) or AB (postoperative* N5 infection* OR post-operative* N5 infection*)
S6 TI wound* N5 infection* or AB wound* N5 infection*
S5 TI surg* N5 wound* or AB surg* N5 wound*
S4 TI surg* N5 infection* or AB surg* N5 infection*
S3 (MH “Infection Control”)
S2 (MH “Surgical Wound Dehiscence”)
S1 (MH “Surgical Wound Infection”)

---

Use of plastic adhesive drapes during surgery for preventing surgical site infection (Review)
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Appendix 5. Risk of bias assessment definitions

1. Was the allocation sequence randomly generated?

Low risk of bias
The investigators describe a random component in the sequence generation process such as: referring to a random number table; using a computer random number generator; coin tossing; shuffling cards or envelopes; throwing dice; drawing of lots.

High risk of bias
The investigators describe a non-random component in the sequence generation process. Usually, the description would involve some systematic, non-random approach, for example: sequence generated by odd or even date of birth; sequence generated by some rule based on date (or day) of admission; sequence generated by some rule based on hospital or clinic record number.

Unclear
Insufficient information about the sequence generation process to permit judgement of low or high risk of bias.

2. Was the treatment allocation adequately concealed?

Low risk of bias
Participants and investigators enrolling participants could not foresee assignment because one of the following, or an equivalent method, was used to conceal allocation: central allocation (including telephone, web-based and pharmacy-controlled randomisation); sequentially-numbered drug containers of identical appearance; sequentially-numbered, opaque, sealed envelopes.

High risk of bias
Participants or investigators enrolling participants could possibly foresee assignments and thus introduce selection bias, such as allocation based on: using an open random allocation schedule (e.g. a list of random numbers); assignment envelopes were used without appropriate safeguards (e.g. if envelopes were unsealed or non opaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure.

Unclear
Insufficient information to permit judgement of low or high risk of bias. This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement, for example if the use of assignment envelopes is described, but it remains unclear whether envelopes were sequentially numbered, opaque and sealed.

3. Blinding - was knowledge of the allocated interventions adequately prevented during the study?

Low risk of bias
Any one of the following.
- No blinding, but the review authors judge that the outcome and the outcome measurement are not likely to be influenced by lack of blinding.
- Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken.
- Either participants or some key study personnel were not blinded, but outcome assessment was blinded and the non-blinding of others unlikely to introduce bias.
High risk of bias
Any one of the following.
- No blinding or incomplete blinding, and the outcome or outcome measurement is likely to be influenced by lack of blinding.
- Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken.
- Either participants or some key study personnel were not blinded, and the non-blinding of others likely to introduce bias.

Unclear
Any one of the following.
- Insufficient information to permit judgement of low or high risk of bias.
- The study did not address this outcome.

4. Were incomplete outcome data adequately addressed?

Low risk of bias
Any one of the following.
- No missing outcome data.
- Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias).
- Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
- For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate.
- For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size.
- Missing data have been imputed using appropriate methods.

High risk of bias
Any one of the following.
- Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups.
- For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate.
- For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size.
- ‘As-treated’ analysis done with substantial departure of the intervention received from that assigned at randomisation.
- Potentially inappropriate application of simple imputation.

Unclear
Any one of the following.
- Insufficient reporting of attrition/exclusions to permit judgement of low or high risk of bias (e.g. number randomised not stated, no reasons for missing data provided).
- The study did not address this outcome.

5. Are reports of the study free of suggestion of selective outcome reporting?

Low risk of bias
Any of the following.
The study protocol is available and all of the study’s pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way.

The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)

**High risk of bias**

Any one of the following.

- Not all of the study’s pre-specified primary outcomes have been reported.
- One or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not pre-specified.
- One or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect).
- One or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis.
- The study report fails to include results for a key outcome that would be expected to have been reported for such a study.

**Unclear**

Insufficient information to permit judgement of low or high risk of bias. It is likely that the majority of studies will fall into this category.

**6. Other sources of potential bias**

**Low risk of bias**

The study appears to be free of other sources of bias.

**High risk of bias**

There is at least one important risk of bias. For example, the study:

- had a potential source of bias related to the specific study design used; or
- had extreme baseline imbalance; or
- has been claimed to have been fraudulent; or
- had some other problem.

**Unclear**

There may be a risk of bias, but there is either:

- insufficient information to assess whether an important risk of bias exists; or
- insufficient rationale or evidence that an identified problem will introduce bias.
WHAT'S NEW

Last assessed as up-to-date: 14 November 2010.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 August 2011</td>
<td>Amended</td>
<td>Contact details updated.</td>
</tr>
</tbody>
</table>

HISTORY

Protocol first published: Issue 1, 2007
Review first published: Issue 4, 2007

<table>
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<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 November 2010</td>
<td>New search has been performed</td>
<td>Second update, new search, one additional citation was excluded (Swenson 2008). No change to conclusions.</td>
</tr>
<tr>
<td>27 February 2009</td>
<td>New search has been performed</td>
<td>New search (February 2009), no new citations were identified. A study awaiting assessment (Breitner 1986) has been assessed and excluded from the review. Risk of bias tables and Summary of findings tables added. No change to conclusions</td>
</tr>
<tr>
<td>8 May 2008</td>
<td>Amended</td>
<td>Converted to new review format.</td>
</tr>
<tr>
<td>19 June 2007</td>
<td>New citation required and conclusions have changed</td>
<td>Substantive amendment</td>
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</table>

CONTRIBUTIONS OF AUTHORS

JW and AA co-wrote the protocol, identified studies from the search, independently extracted data and judged the quality of studies. JW contacted the trial authors and drape manufacturers, performed the meta-analysis and wrote the 'Description of Studies', 'Methodological Quality' and 'Reviewers Conclusions' sections of the review and constructed the 'Tables of Comparisons'. AA and JW co-wrote the 'Results' and 'Discussion' sections.
DECLARATIONS OF INTEREST

None known

SOURCES OF SUPPORT

Internal sources
- School of Nursing and Midwifery, Queensland University of Technology, Queensland, Australia.
- School of Nursing and Midwifery, Griffith University, Brisbane, Australia.

External sources
- NIHR/Department of Health (England), (Cochrane Wounds Group), UK.

INDEX TERMS

Medical Subject Headings (MeSH)
- Adhesives; Bedding and Linens; Plastics; Iodine [therapeutic use]; Length of Stay; Randomized Controlled Trials as Topic; Surgical Wound Infection [*prevention & control]

MeSH check words
- Humans