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## Systematic review and meta-analysis of preoperative antisepsis with chlorhexidine versus povidone-iodine in clean-contaminated surgery

A Noorani, N Rabey, SR Walsh, and RJ Davies.

Review published: 2010.

Link to full article: [\[Journal publisher\]](#)

### CRD summary

Preoperative cleansing of the [skin](#) with [chlorhexidine](#) had significant benefits compared with [povidone iodine](#) in reducing postoperative surgical site infections after clean-contaminated surgery. The poor quality of the included studies and some methodological flaws mean that the results should be interpreted with caution and that the reliability of the authors' conclusions is not clear.

### Authors' objectives

To determine whether [povidone iodine](#) or [chlorhexidine](#) was the preferred [agent](#) for cleansing of [skin](#) prior to clean-contaminated surgery.

### Searching

MEDLINE and EMBASE were searched to January 2010, and again in February 2010; search terms were reported. Conference proceedings from the Association of Surgeons from Great Britain and Ireland, American College of Surgeons Annual Congress, the American Congress of Obstetrics and Gynaecology, and the British International Congress of Obstetrics and Gynaecology were searched from 2000 to 2010 for relevant abstracts. Reference lists from retrieved articles were checked. The websites of manufacturers were searched for any additional publications or presentations

### Study selection

[Clinical trials](#) in surgical patients (aged 18 years and over) in which at least one clinical endpoint was reported were eligible for inclusion. Studies in orthopaedic and plastic surgery and other clean surgery trials were excluded, as were studies that examined infections at [catheter](#) sites.

The primary outcome was the incidence of postoperative surgical site [infection](#). The secondary outcome was intra-abdominal infection.

The included studies were of mixed patient populations who underwent clean or contaminated surgery. The surgical populations included patients who were undergoing general surgery, [vaginal hysterectomy](#), [laparotomy](#), mastectomy and caesarean section. The [povidone iodine intervention](#) was usually 10% povidone-iodine in scrub formulation. [Chlorhexidine](#) was typically given as 0.5% to 2% in a 70% isopropyl alcohol solution administered as a spray (where reported). Application of povidone-iodine and chlorhexidine were by soap, then scrubbing prior to painting. The definitions of [sepsis](#)

varied across the studies including reductions in bacterial colonisation, bacterial counts, the presence clinical [infection](#), [wound](#) infections and/or separation, haematoma, and seroma.

Two reviewers performed the study selection, but the authors did not state how any disagreements were resolved.

## Assessment of study quality

Methodological quality of the included trials was assessed using the Jadad 5-point scale for [randomisation](#), blinding, and reporting of losses to follow-up due to withdrawals and drop-outs.

The authors did not state how many reviewers performed the quality assessment

## Data extraction

Data were extracted to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for the post-operative surgical site [infection](#) and intra-abdominal infections.

The authors did not state how many reviewers performed the data extraction.

## Methods of synthesis

Pooled odds ratios and 95% confidence intervals were calculated using a DerSimonian and Laird random-effect model. Statistical heterogeneity was assessed using the Cochran's Q-statistic. A sensitivity analysis was performed by omitting the non-[randomised study](#). The authors investigated publication bias by visual inspection of funnel plots and using the Egger test.

## Results of the review

Six studies (n=5,031 patients) were included in the review, including five [randomised controlled trials \(RCTs\)](#) and one prospective study with a sequential implemental design. Two RCTs took place between 1982 and 1984; the remaining studies took place between 2005 and 2010. Sample sizes ranged between 27 and 987 patients. The studies were of moderate to poor quality, with five studies receiving Jadad scores under 3 points, and one RCT with a Jadad score of 3 points.

There was a statistically significant reduction in surgical site [infection](#) observed with [chlorhexidine](#) compared to [povidone iodine](#) (OR 0.68, 95%CI 0.50 to 0.94). When the non-[randomised study](#) was removed from the analysis, the benefit of chlorhexidine remained significant (OR 0.58, 95% CI 0.44 to 0.75). In three trials that reported intra-abdominal [sepsis](#), there were no significant differences between chlorhexidine and povidone-iodine.

There was no statistically significant heterogeneity observed across the studies.

No evidence of publication bias was observed in the results, although there were insufficient studies that reported on intra-abdominal [sepsis](#) to undertake an Egger's test.

## Authors' conclusions

Preoperative cleansing of the [skin](#) with [chlorhexidine](#) had significant benefits compared with [povidone iodine](#) in reducing postoperative surgical site infections after clean-contaminated surgery.

## CRD commentary

The review addressed a clear question and some criteria for the inclusion of studies were defined. Studies of "clean" surgery were excluded, but the studies included mixed populations of clean and contaminated surgery types, and data were not stratified by surgery type. Appropriate databases were searched. Attempts were made to identify unpublished studies. It was not clear if language restrictions were applied to the search. Steps were reported to minimise errors and bias in study selection, but not for quality assessment or data extraction.

The quality of the included studies was judged to be of poor to moderate quality. It was unclear if the pooling of the studies was justified given the heterogeneity in the surgery types, the application of the antiseptic [agents](#), and the definition of [sepsis](#).

The potential for bias and the poor quality of most of the included studies mean that the results should be interpreted with

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some caution and that the reliability of the authors' conclusions is not clear.

## Implications of the review for practice and research

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**Research:** The authors stated that further trials in each surgery type (clean surgery and clean-contaminated surgery) were required because a variety of different [pathogens](#) (for [vaginal hysterectomy](#) and [laparoscopy](#)) were present in the included studies in the review; there may be arguments for differing antiseptic regimens between different groups of contaminated surgery patients.

**Practice:** The authors did not state any implications for practice.

## Funding

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Not stated.

## Bibliographic details

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## Indexing Status

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Subject indexing assigned by NLM

## MeSH

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Adolescent; Adult; Anti-Infective [Agents](#), Local /[therapeutic](#) use; [Chlorhexidine](#) /therapeutic use; Humans; Middle Aged; Povidone-[iodine](#) /therapeutic use; Surgical [Wound Infection](#) /prevention & control; [Treatment](#) Outcome; Young Adult

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CRD has determined that this article meets the [DARE scientific quality criteria](#) for a systematic review.

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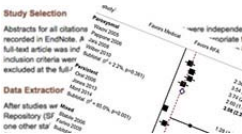
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