

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Alcohol for Skin Preparation During Minor Procedures: Clinical Effectiveness

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Research Question

What is the clinical effectiveness of alcohol wipes for adults undergoing skin preparation for minor procedures?

Key Findings

One systematic review, two randomized controlled trials, and two non-randomized studies were identified regarding the clinical effectiveness of alcohol for skin preparation during minor procedures.

Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL) the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were alcohol, antisepsis and minor procedures. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2009 and May 23, 2019. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Adults undergoing skin preparation for minor procedures (e.g., intravenous insertion, drawing blood, core biopsies, other procedures performed outside of the operating room)
Intervention	Alcohol swabs/wipes
Comparators	Chlorhexidine gluconate; Other swab preparations; No treatment
Outcomes	Clinical effectiveness (e.g., prevention of skin infections, ease or speed of drying) Safety
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

One systematic review, two randomized controlled trials, and two non-randomized studies were identified regarding the clinical effectiveness of alcohol for skin preparation during minor procedures. No relevant health technology assessments or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One systematic review,¹ two randomized controlled trials,²⁻³ and two non-randomized studies⁴⁻⁵ were identified regarding the clinical effectiveness of alcohol for skin preparation during minor procedures.

The authors of the systematic review aimed to assess the clinical effectiveness of isopropyl alcohol wipes with isopropyl alcohol in a two-step procedure to prevent contamination of blood collection; however, relevant studies were identified.¹

The authors of one randomized controlled trial aimed to assess the clinical effectiveness of isopropyl alcohol with chlorhexidine gluconate (CHG) compared to isopropyl alcohol and CHG alone. The authors found a significant difference in catheter related infections between the three antiseptic solutions, with the CHG-isopropyl alcohol formulation being the most effective in preventing infection.² The authors of a second randomized controlled trial³ aimed to compare 75% isopropyl alcohol to 5% sodium bicarbonate and found that disinfecting central venous catheters with sodium bicarbonate improved pain, and that patient and nurse satisfaction were greater with sodium bicarbonate than when using isopropyl alcohol.³

The authors of a non-randomized study that assessed the effectiveness of isopropyl alcohol in preventing catheter associated infection found that disinfecting catheter caps with isopropyl alcohol reduced contamination, organism density, and central-line associated bloodstream infection.⁴ The authors of another study⁵ compared isopropyl alcohol with isopropyl alcohol with povidone-iodine and found no significant difference in contamination rates between the two groups.

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Webster J, Bell-Syer SE, Foxlee R. Skin preparation with isopropyl alcohol versus isopropyl alcohol followed by any antiseptic for preventing bacteraemia or contamination of blood for transfusion. *Cochrane Database Syst Rev*. 2015 Feb 12(2):Cd007948.
[PubMed: PM25674776](#)

Randomized Controlled Trials

2. Hamed S, Nezarali M, Ebrahim Ebrahimi T, Enayatollah S, Somayeh J. Comparison of the Effects of Isopropyl alcohol, Chlorhexidine and Isopropyl alcohol-Chlorhexidine on Local Catheter-Related Infections Rate: A Double-Blind Clinical Trial Study. *Med Surg Nurs J*. 2018;7(2):1-6.
3. Wu HL, Xu YH, Shi JH. 5% NaHCO₃ Is Appropriate for Skin Cleaning With Central Venous Catheters. *Am J Med Sci*. 2017 Jan;353(1):12-16.
[PubMed: PM28104097](#)

Non-Randomized Studies

4. Wright MO, Tropp J, Schora DM, et al. Continuous passive disinfection of catheter hubs prevents contamination and bloodstream infection. *Am J Infect Control*. 2013 Jan;41(1):33-38.
[PubMed: PM23084024](#)
5. Kiyoyama T, Tokuda Y, Shiiki S, Hachiman T, Shimasaki T, Endo K. Isopropyl isopropyl alcohol compared with isopropyl isopropyl alcohol plus povidone-iodine as skin preparation for prevention of blood culture contamination. *J Clin Microbiol*. 2009 Jan;47(1):54-58.
[PubMed: PM18971366](#)

Appendix — Further Information

Previous CADTH Reports

6. Chlorhexidine Gluconate for Skin Preparation During Stereotactic Core Biopsy of the Breast: Clinical Effectiveness and Guidelines. (CADTH rapid response report: summary of abstracts). Ottawa (ON): CADTH; 2019:
<https://www.cadth.ca/chlorhexidine-gluconate-skin-preparation-during-stereotactic-core-biopsy-breast-clinical-0> Accessed 2019 May 30
7. Use of Chlorhexidine Gluconate with Alcohol for the Prevention of Peripheral Intravenous Device Infections: A Review of Clinical and Cost Effectiveness, and Guidelines. (CADTH rapid response report: summary with critical appraisal). Ottawa (ON): CADTH; 2014:
<https://www.cadth.ca/use-chlorhexidine-gluconate-alcohol-prevention-peripheral-intravenous-device-infections-review> Accessed 2019 May 30
8. Preoperative Skin Antiseptic Preparations and Application Techniques for Preventing Surgical Site Infections: A Systematic Review of the Clinical Evidence and Guidelines. (CADTH systematic review). Ottawa (ON): CADTH; 2011:
https://www.cadth.ca/sites/default/files/pdf/htis/june-2011/M0025_Pre-Operative_Skin_Prep_Final.pdf Accessed 2019 May 30

Systematic Reviews and Meta-Analyses - Aqueous versus Alcohol-Based Antiseptics

9. Maiwald M, Chan ES. The forgotten role of isopropyl alcohol: a systematic review and meta-analysis of the clinical efficacy and perceived role of chlorhexidine in skin antiseptics. *PLoS One*. 2012;7(9):e44277.
[PubMed: PM22984485](https://pubmed.ncbi.nlm.nih.gov/22984485/)

Non-Randomized Studies – Pediatric Population

10. Bjorkman L, Ohlin A. Scrubbing the hub of intravenous catheters with an alcohol wipe for 15 sec reduced neonatal sepsis. *Acta Paediatr*. 2015 Mar;104(3):232-236.
[PubMed: PM25399485](https://pubmed.ncbi.nlm.nih.gov/25399485/)

Review Articles – Aqueous versus Alcohol-Based Antiseptics

11. Echols K, Graves M, LeBlanc KG, Marzolf S, Yount A. Role of antiseptics in the prevention of surgical site infections. *Dermatol Surg*. 2015 Jun;41(6):667-676.
[PubMed: PM25984901](https://pubmed.ncbi.nlm.nih.gov/25984901/)
12. Sidhwa F, Itani KM. Skin preparation before surgery: options and evidence. *Surg Infect (Larchmt)*. 2015 Feb;16(1):14-23.
[PubMed: PM25761076](https://pubmed.ncbi.nlm.nih.gov/25761076/)