

COVID-19 CADTH REFERENCE LIST

Hand Washing for Health Care Workers to Reduce the Transmission of Infection: Clinical Effectiveness and Guidelines

**This report was published on
March 31, 2020**

To produce this report, CADTH used a modified approach to the selection, appraisal, and synthesis of the evidence to meet decision-making needs during the COVID-19 pandemic. Care has been taken to ensure the information is accurate and complete, but it should be noted that international scientific evidence about COVID-19 is changing and growing rapidly.

Version: 1.0
Publication Date: March 2020
Report Length: 9 Pages

Authors: Diksha Kumar, Hannah Loshak

Cite As: *Hand Washing for Health Care Workers to Reduce the Transmission of Infection: Clinical Effectiveness and Guidelines*. Ottawa: CADTH; 2020 Mar. (CADTH Reference List).

Disclaimer: The information in this document is intended to help Canadian health care decision-makers, health care professionals, health systems leaders, and policy-makers make well-informed decisions and thereby improve the quality of health care services. While patients and others may access this document, the document is made available for informational purposes only and no representations or warranties are made with respect to its fitness for any particular purpose. The information in this document should not be used as a substitute for professional medical advice or as a substitute for the application of clinical judgment in respect of the care of a particular patient or other professional judgment in any decision-making process. The Canadian Agency for Drugs and Technologies in Health (CADTH) does not endorse any information, drugs, therapies, treatments, products, processes, or services.

While care has been taken to ensure that the information prepared by CADTH in this document is accurate, complete, and up-to-date as at the applicable date the material was first published by CADTH, CADTH does not make any guarantees to that effect. CADTH does not guarantee and is not responsible for the quality, currency, propriety, accuracy, or reasonableness of any statements, information, or conclusions contained in any third-party materials used in preparing this document. The views and opinions of third parties published in this document do not necessarily state or reflect those of CADTH.

CADTH is not responsible for any errors, omissions, injury, loss, or damage arising from or relating to the use (or misuse) of any information, statements, or conclusions contained in or implied by the contents of this document or any of the source materials.

This document may contain links to third-party websites. CADTH does not have control over the content of such sites. Use of third-party sites is governed by the third-party website owners' own terms and conditions set out for such sites. CADTH does not make any guarantee with respect to any information contained on such third-party sites and CADTH is not responsible for any injury, loss, or damage suffered as a result of using such third-party sites. CADTH has no responsibility for the collection, use, and disclosure of personal information by third-party sites.

Subject to the aforementioned limitations, the views expressed herein do not necessarily reflect the views of Health Canada, Canada's provincial or territorial governments, other CADTH funders, or any third-party supplier of information.

This document is prepared and intended for use in the context of the Canadian health care system. The use of this document outside of Canada is done so at the user's own risk.

This disclaimer and any questions or matters of any nature arising from or relating to the content or use (or misuse) of this document will be governed by and interpreted in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein, and all proceedings shall be subject to the exclusive jurisdiction of the courts of the Province of Ontario, Canada.

The copyright and other intellectual property rights in this document are owned by CADTH and its licensors. These rights are protected by the Canadian *Copyright Act* and other national and international laws and agreements. Users are permitted to make copies of this document for non-commercial purposes only, provided it is not modified when reproduced and appropriate credit is given to CADTH and its licensors.

About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

Questions or requests for information about this report can be directed to requests@cadth.ca

Research Questions

1. What is the clinical effectiveness of hand washing with soap and water compared with hand sanitization solutions for health care workers in direct contact with patients?
2. What are the evidence-based guidelines regarding the use of hand washing with soap and water for health care workers in direct contact with patients?

Key Findings

One systematic review and one non-randomized study were identified regarding the clinical effectiveness of hand washing with soap and water compared with hand sanitization solutions for health care workers in direct contact with patients. In addition, three evidence-based guidelines were identified regarding the use of hand washing with soap and water for health care workers in direct contact with patients.

Methods

A limited literature search was conducted by an information specialist on key resources including Medline via OVID and CINAHL via EBSCO, 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 hand hygiene and health care workers. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and January 1, 2020. 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	Health care workers (in direct contact with patients) in any setting
Intervention	Hand washing with soap and water
Comparator	Q1: Hand sanitization solution (alcohol-based and other solutions) Q2: Not applicable
Outcomes	Q1: Clinical effectiveness (e.g., spread of infection, disease progression) Q2: Recommendations regarding the use of hand washing with soap and water for health care workers taking care of patients
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, and evidence-based guidelines

Results

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

One systematic review¹ and one non-randomized study² were identified regarding the clinical effectiveness of hand washing with soap and water compared with hand sanitization solutions for health care workers in direct contact with patients. In addition, three evidence-based guidelines³⁻⁵ were identified regarding the use of hand washing with soap and water for health care workers in direct contact with patients. No relevant health technology assessments or randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One systematic review¹ and one non-randomized study² were identified regarding the clinical effectiveness of hand washing with soap and water compared with hand sanitization solutions for health care workers in direct contact with patients.

The authors of the systematic review¹ included one randomized controlled trial that compared hand washing with soap and water to an alcohol rub plus additional hydrogen peroxide and found no significant difference in the risk of surgical site infection between the groups. Overall, the authors concluded that there was no firm evidence that demonstrated any single type of hand antisepsis was more effective than others in preventing surgical site infections.¹ Conversely, the authors of the non-randomized study² found that a persistent, alcohol-based hand sanitizer was significantly more effective in reducing the rate of hospital-acquired infections compared to hand washing alone.

Guidelines from the Australian government³ recommend that soap and water be used for hand hygiene when hands are visibly soiled. Health care workers in contact with known or suspected *Clostridium difficile* and non-enveloped viruses such as norovirus should wash with soap and water if their hands are visibly contaminated.³ Otherwise, they may use an alcohol-based rub.³

Similar recommendations are included in guidelines from the Association of periOperative Registered Nurses,⁴ who recommend using soap and water whenever hands are visibly soiled, following exposure to blood or body fluids, after care is provided to patients who are infected with spore-forming organisms or norovirus, and after the use of a restroom. The guidelines recommend alcohol-based hand rub products when hands show no visible soiling.⁴

Finally, the National Institute for Health and Care Excellence suggests that health care workers should decontaminate their hands using an alcohol-based rub in most situations.⁵ The guidance suggests that soap and water should be used when hands are visibly soiled or contaminated with bodily fluids, or if there is a potential spread of alcohol-resistant organisms such as *Clostridium difficile*.⁵

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-Analyses

1. Tanner J, Dumville JC, Norman G, Fortnam M. Surgical hand antisepsis to reduce surgical site infection. *Cochrane Database Syst Rev*. 2016(1):CD004288.
[PubMed: PM26799160](#)

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

2. Kampiatu P, Cozean J. A controlled, crossover study of a persistent antiseptic to reduce hospital-acquired infection. *Afr J Infect Dis*. 2015;9(1):6-9.
[PubMed: PM25722844](#)

Guidelines and Recommendations

3. Australian Government. Australian guidelines for the prevention and control of infection in healthcare. Canberra (AU): National Health and Medical Research Council; 2019:
<https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019>. Accessed 2020 Mar 30.
See: Recommendation #5, page 1; Recommendation #6, page 2
4. Goldberg JL. Guideline implementation: hand hygiene. *AORN J*. 2017;105(2):203-212.
[PubMed: PM28159079](#)
5. National Institute for Health Care and Excellence. Healthcare-associated infections: prevention and control in primary and community care (*Clinical guideline CG139*) 2017;
<https://www.nice.org.uk/guidance/cg139/chapter/guidance#terms-used-in-this-guidance>. Accessed 2020 Mar 31.
See: Section 1.1.2.2.

Appendix — Further Information

Previous CADTH Reports

6. Hand washing for patients: clinical effectiveness and guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2020: <https://www.cadth.ca/hand-washing-patients-clinical-effectiveness-and-guidelines>. Accessed 2020 Mar 31.
7. Hand antiseptis procedures: a review of guidelines. (*CADTH Rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2017: <https://www.cadth.ca/hand-antiseptis-procedures-review-guidelines>. Accessed 2020 Mar 31.
8. Non-alcohol-based hand rubs: clinical effectiveness and guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2015: <https://www.cadth.ca/non-alcohol-based-hand-rubs-clinical-effectiveness-and-guidelines>. Accessed 2020 Mar 31.
9. Techniques and products for surgical hand antiseptis: a review of guidelines. (*CADTH Rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2014: <https://www.cadth.ca/techniques-and-products-surgical-hand-antiseptis-review-guidelines>. Accessed 2020 Mar 31.
10. Hand hygiene for the prevention of infection transmission: clinical evidence and guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2010: <https://www.cadth.ca/hand-hygiene-prevention-infection-transmission-clinical-evidence-and-guidelines-0>. Accessed 2020 Mar 31.

Randomized Controlled Trials — Alternative Outcomes

11. Nasution TA, Yunita R, Pasaribu AP, Ardinata FM. Effectiveness hand washing and hand rub method in reducing total bacteria colony from nurses in Medan. *Open Access Maced J Med Sci*. 2019;7(20):3380-3383. [PubMed: PM32002055](https://pubmed.ncbi.nlm.nih.gov/32002055/)
12. Siddiqui N, Friedman Z, McGeer A, Yousefzadeh A, Carvalho JC, Davies S. Optimal hand washing technique to minimize bacterial contamination before neuraxial anesthesia: a randomized control trial. *Int J Obstet Anesth*. 2017;29:39-44. [PubMed: PM28341129](https://pubmed.ncbi.nlm.nih.gov/28341129/)
13. Wolfe MK, Wells E, Mitro B, Desmarais AM, Scheinman P, Lantagne D. Seeking clearer recommendations for hand hygiene in communities facing Ebola: a randomized trial investigating the impact of six handwashing methods on skin irritation and dermatitis. *PLoS One*. 2016;11(12):e0167378. [PubMed: PM28030544](https://pubmed.ncbi.nlm.nih.gov/28030544/)

Non-Randomized Studies — Mixed Intervention

14. Saito H, Inoue K, Ditai J, et al. Alcohol-based hand rub and incidence of healthcare associated infections in a rural regional referral and teaching hospital in Uganda ('WardGel' study). *Antimicrob Resist Infect Control*. 2017;6:129.
[PubMed: PM29299303](#)

Clinical Practice Guidelines

15. Care of the adult critically ill COVID-19 patient annex D. Edmonton (AB): Provincial Critical Care Communicable Disease Working Group, Critical Care Strategic Clinical Network Alberta Health Services; 2020:
<https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-care-adult-critically-ill.pdf>. Accessed 2020 Mar 31.
See: Infection Prevention Precautions, Point #4, page 7.
16. Department of Health and Social Care, Public Health Wales, Public Health Agency Northern Ireland, Health Protection Scotland, Public Health England. COVID-19: guidance for infection prevention and control in healthcare settings – adapted from pandemic influenza: guidance for infection prevention and control in healthcare settings; 2020:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/874316/Infection_prevention_and_control_guidance_for_pandemic_coronavirus.pdf. Accessed 2020 Mar 31.
See: Technique for hand washing and rubbing, page 15.
17. Infection prevention and control for COVID-19 in healthcare settings. Stockholm (SE): European Centre for Disease Prevention and Control; 2020:
<https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-infection-prevention-and-control-healthcare-settings-march-2020.pdf>. Accessed 2020 Mar 31.
See: Priorities for use of alcohol-based hand rub, page 8.
18. Rational use of personal protective equipment (PPE) for coronavirus disease (COVID-19). Geneva (CH): World Health Organization; 2020:
<https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPE-use-2020.2-eng.pdf>. Accessed 2020 Mar 31.
See: Preventive measures for COVID-19 disease, page 1.
19. Assessment standards - infection prevention and control: hand hygiene. Vancouver (BC): College of Physicians and Surgeons British Columbia; 2019:
<https://www.cpsbc.ca/files/pdf/PPEP-AS-Hand-Hygiene.pdf>. Accessed 2020 Mar 31.
20. Manitoba Health, Seniors and Active Living. Routine practices and additional precautions: preventing the transmission of infection in health care; 2019:
<https://www.gov.mb.ca/health/publichealth/cdc/docs/ipc/rpap.pdf>. Accessed 2020 Mar 31.
See: Principles Upon Which This Document is Based, Point #4, page 14; Hand Hygiene, page 69

21. Yan Y, Chen H, Chen L, et al. Consensus of Chinese experts on protection of skin and mucous membrane barrier for healthcare workers fighting against coronavirus disease 2019. *Dermatol Ther*. 2020:e13310. [online ahead of print]
[PubMed: PM32170800](#)

22. Moore DL. Infection prevention and control in paediatric office settings. *Paediatr Child Health*. 2018;23(8): 547-548.
[PubMed: PM30894793](#)

23. IF0200: hand hygiene guidelines. Kelowna (BC): Interior Health; 2017:
<https://www.interiorhealth.ca/AboutUs/QualityCare/IPCManual/Hand%20Hygiene%20Guidelines.pdf>. Accessed 2020 Mar 31.
See: Section 3.4, Hand hygiene infrastructure, page 2; Section 3.6, page 2; Section 4.4, Hand Hygiene Using Soap and Water, page 4.

24. Infection Prevention and Control Canada. IPAC Canada practice recommendations: hand hygiene in health care settings; 2017: https://ipac-canada.org/photos/custom/Members/pdf/17Jul_Hand%20Hygiene%20Practice%20Recommendations_final.pdf. Accessed 2020 Mar 31.
See: Hand washing with soap and water, page 2; After caring for a patient with Clostridium difficile infection (CDI), page 4.

25. Katz K, Vearncombe M, Deeves M. Recommendations for conjunctivitis prevention in ophthalmology/optometry clinical office practice. *Can J Infect Control*. 2017;32(3):154-155.

26. Nursing: infection and prevention control. Toronto (ON): Choosing Wisely Canada; 2017: https://choosingwiselycanada.org/wp-content/uploads/2017/11/Nursing_Infection-prevention-and-control.pdf. Accessed 2020 Mar 31.
See: Section 3, page 1.

27. Guide to infection prevention for outpatient settings: minimum expectations for safe care. Atlanta (GA): Centers for Disease Control and Prevention; 2016:
<https://www.cdc.gov/infectioncontrol/pdf/outpatient/guide.pdf>. Accessed 2020 Mar 31.
See: Key recommendation #2, page 9.

Review Articles

28. Haque M, Sartelli M, McKimm J, Abu Bakar M. Health care-associated infections - an overview. *Infect Drug Resist*. 2018;11:2321-2333.
[PubMed: PM30532565](#)

29. Labreche T, Maclver S, Furtado NM. Optometric infection control guidelines assessing patients with methicillin-resistant Staphylococcus aureus. *Clin Exp Optom*. 2018;101(6):727-731.
[PubMed: PM29572957](#)

30. Ataee RA, Ataee MH, Mehrabi Tavana A, Salesi M. Bacteriological aspects of hand washing: a key for health promotion and infections control. *Int J Prev Med*. 2017;8:16.
[PubMed: PM28382192](#)

Additional References

31. Alberta Health Services Primary Care Networks Incident Response Task Force. COVID-19 frequently asked questions for primary care; 2020: <https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-primary-care-faq.pdf>. Accessed 2020 Mar 31.
See: Infection, Prevention and Control (IPC), Question #11, page 3.
32. Wigglesworth N. Infection control 6: hand hygiene using soap and water. *Nurs Times*. 2019;115(11):37-38.
33. Alternatives to triclosan-based products for hand hygiene in healthcare facilities. Plymouth Meeting (PA): ECRI Institute; 2018: www.ecri.org. Accessed 2020 Mar 31.
See: Executive Summary, page i.
34. Field epidemiology manual wiki: hand hygiene methods. Stockholm (SE): European Centre for Disease Prevention and Control; 2016: <https://wiki.ecdc.europa.eu/fem/Pages/Hand%20hygiene%20methods.aspx>: Accessed 2020 Mar 31.