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Preoperative Shower or Bath With Antiseptics Before Knee Arthroscopy: A Rapid Review

Health Quality Ontario

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Evidence Development and Standards Branch at Health Quality Ontario

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Conflict of Interest Statement

All authors in the Evidence Development and Standards branch at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

Rapid Review Methodology

Rapid reviews are completed in 2–4-week time frames. Clinical questions are developed by the Evidence Development and Standards branch at Health Quality Ontario, in consultation with experts, end users, and/or applicants in the topic area. A systematic literature search is then conducted to identify relevant systematic reviews, health technology assessments, and meta-analyses. The methods prioritize systematic reviews, which, if found, are rated by AMSTAR to determine the methodological quality of the review. If the systematic review has evaluated the included primary studies using the GRADE Working Group criteria (http://www.gradeworkinggroup.org/index.htm), the results are reported and the rapid review process is complete. If the systematic review has not evaluated the primary studies using GRADE, the primary studies in the systematic review are retrieved and the GRADE criteria are applied to 2 outcomes. If no systematic review is found, then RCTs or observational studies are included, and their risk of bias is assessed. All rapid reviews are developed and finalized in consultation with experts.

About Health Quality Ontario

Health Quality Ontario is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. The Evidence Development and Standards branch works with expert advisory panels, clinical experts, scientific collaborators, and field evaluation partners to conduct evidence-based reviews that evaluate the effectiveness and cost-effectiveness of health interventions in Ontario.

Based on the evidence provided by Evidence Development and Standards and its partners, the Ontario Health Technology Advisory Committee—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policy-makers.

Health Quality Ontario's research is published as part of the *Ontario Health Technology Assessment Series,* which is indexed in MEDLINE/PubMed, Excerpta Medica/Embase, and the Centre for Reviews and Dissemination database. Corresponding Ontario Health Technology Advisory Committee recommendations and other associated reports are also published on the Health Quality Ontario website. Visit http://www.hqontario.ca for more information.

About Health Quality Ontario Publications

To conduct its rapid reviews, the Evidence Development and Standards branch and its research partners review the available scientific literature, making every effort to consider all relevant national and international research; collaborate with partners across relevant government branches; consult with expert advisory panels, clinical and other external experts, and developers of health technologies; and solicit any necessary supplemental information.

In addition, Evidence Development and Standards collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario add an important dimension to the review. Information concerning the health benefits, economic and human resources, and ethical, regulatory, social, and legal issues relating to the intervention may be included to assist in making timely and relevant decisions to optimize patient outcomes.

Disclaimer

This rapid review is the work of the Evidence Development and Standards branch at Health Quality Ontario, and is developed from analysis, interpretation, and comparison of published scientific research. It also incorporates, when available, Ontario data and information provided by experts. As this is a rapid review, it may not reflect all the available scientific research and is not intended as an exhaustive analysis. Health Quality Ontario assumes no responsibility for omissions or incomplete analysis resulting from its rapid reviews. In addition, it is possible that other relevant scientific findings may have been reported since completion of the review. This report is current as of the date of the literature search specified in the Research Methods section. Health Quality Ontario makes no representation that the literature search captured every publication that was or could be applicable to the subject matter of the report. This rapid review may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations.

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List of Abbreviations

GRADE	Grading of Recommendations Assessment, Development, and Evaluation
QBP	Quality-Based Procedures
RCT	Randomized controlled trial
SR	Systematic review
SSI	Surgical site infection

Background

As legislated in Ontario's *Excellent Care for All Act*, Health Quality Ontario's mandate includes the provision of objective, evidence-informed advice about health care funding mechanisms, incentives, and opportunities to improve quality and efficiency in the health care system. As part of its Quality-Based Procedures (QBP) initiative, Health Quality Ontario works with multidisciplinary expert panels (composed of leading clinicians, scientists, and administrators) to develop evidence-based practice recommendations and define episodes of care for selected disease areas or procedures. Health Quality Ontario's recommendations are intended to inform the Ministry of Health and Long-Term Care's Health System Funding Strategy.

For more information on Health Quality Ontario's Quality-Based Procedures initiative, visit www.hqontario.ca.

Objective of Analysis

The objective of this analysis was to assess the effectiveness of preoperative antiseptic showers or baths on reducing surgical site infections (SSI) after knee arthroscopy.

Clinical Need and Target Population

Surgical site infections can occur after microbial contamination, most often from endogenous skin flora, of a surgical site. Rates of infection after knee arthroscopy have been cited as ranging from 0.01% to 0.48%. (1) Although SSIs after knee arthroscopy are rare, they can result in substantial morbidity, delayed patient recovery, or mortality. (1) Appropriate measures need to be taken across the various surgical phases in order to reduce the risk of infection.

Technology/Technique

Antiseptic solutions are defined as soap products that contain antimicrobial ingredients, such as chlorhexidine, povidone-iodine, or hexachlorophene. (1) Showering or bathing with skin antiseptics before surgery is intended to reduce the number of transient skin flora and therefore the risk of SSI. While some evidence indicates the effectiveness of skin antiseptics in reducing the number of bacteria on the skin (1;2), whether preoperative bathing or showering with a skin antiseptic is effective in reducing the incidence of SSIs remains uncertain.

Rapid Review

Research Question

What is the effectiveness of preoperative showers or baths with skin antiseptics before knee arthroscopy to prevent surgical site infections?

Research Methods

Literature Search Strategy

A literature search was performed on April 16, 2014, using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, and EBM Reviews, for studies published from January 1, 2004, to April 16, 2014. (Appendix 1 provides details of the search strategies.) Abstracts were reviewed by a single reviewer, and full-text articles of studies meeting the eligibility criteria were obtained. Reference lists were also examined for any additional relevant studies not identified through the search.

Inclusion Criteria

- English-language full-text publications
- published between January 1, 2004, and April 16, 2014
- randomized controlled trials (RCTs), observational studies, systematic reviews (SRs), and meta-analyses
- knee arthroscopy population
- evaluating the use of preoperative showers or baths with skin antiseptics compared with use of preoperative shower or bath with nonantiseptic soap or no shower or bath
- evaluating 1 or more outcomes of interest

Exclusion Criterion

- Studies comparing only various types of antiseptics or infection prevention regimens with skin antiseptics (i.e. different doses of or timing of antiseptic showers or baths) before surgery

Outcomes of Interest

- Surgical site infection
- Mortality

Expert Panel

In December 2013, an Expert Advisory Panel for Patients Undergoing Knee Arthroscopic Surgery was struck. Members of the panel included physicians, personnel from the Ministry of Health and Long-Term Care, health care administrators, and allied health professionals.

The role of the Expert Advisory Panel was to provide advice on primary patient groupings, review the evidence, guidance, and publications related to defined patient populations, identify and prioritize

interventions for review, and to advise on the development of a care pathway model. The role of Panel members was to provide advice on the scope of the project, the methods used, and the findings. However, the statements, conclusions, and views expressed in this report do not necessarily represent the views of the expert panel members.

Results of Rapid Review

The database search yielded 319 citations published between January 1, 2004, and April 16, 2014 (duplicates removed). Articles were excluded on the basis of information in the title and abstract. The full texts of potentially relevant articles were obtained for further assessment.

No studies identified in the literature search evaluated the effectiveness of showers or baths with skin antiseptics before knee arthroscopy.

Additional Resources

Although no literature was found evaluating the use of preoperative showers with antiseptic washes among the knee arthroscopy population, scoping efforts identified 3 systematic reviews published in the last 5 years evaluating the use of showering or bathing with skin antiseptics among the broader surgical population. (2-4) A 2012 Cochrane review assessed the use of *any* antiseptic preparation for preoperative bathing or showering among patients undergoing *any* surgery. (3) The systematic review included 7 RCTs, all of which assessed participants undergoing elective surgery. The review concluded that there is no clear evidence that preoperative showering or bathing with chlorhexidine prevented SSIs better than placebo or bar soap. This conclusion was in agreement with that from another recently published systematic review and meta-analysis evaluating the use of preoperative chlorhexidine showers or baths.(4) The third review, by the Canadian Agency for Drugs and Technologies in Health, concluded that preoperative antiseptic showers are effective at reducing bacterial colonization, but inconclusive results were obtained regarding effectiveness at preventing SSIs. (2)

It is unclear, however, whether the lack of effectiveness in reducing SSIs among the broader surgical population is generalizable to the knee arthroscopy population. Further research in this area among a knee arthroscopy population is needed.

Conclusions

- No literature was identified that evaluated the use of preoperative showers or baths with antiseptic skin solutions before knee arthroscopy.
- Scoping of the literature in the broader surgical population identified 3 systematic reviews among the broader surgical population suggesting evidence does not support, or is inconclusive in regards to, the use of chlorhexidine showers or baths before surgery to prevent surgical site infections. It is unknown whether these results can be generalized to the knee arthroscopy population, and further evidence is required.

Acknowledgements

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Expert Advisory Panel on Episode of Care for Patients Undergoing Arthroscopic Knee Surgery

Name	Affiliation(s)	Appointment(s)
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Dr James Waddell	St. Michael's Hospital University of Toronto	Orthopedic Surgeon Professor, Division of Orthopedic Surgery
Orthopaedic and Reconstructive Surgery		
Dr Mark MacLeod	Victoria Hospital, London Health Sciences Centre	Orthopaedic Surgery
Dr Steven Charles Reed	Humber River Regional Hospital	Orthopaedic Surgery
Dr John Semple	Women's College Hospital	Chief of Surgery
Primary Care		
Dr Christopher Jyu	Rouge Valley Health System The Scarborough Hospital	Primary Care Lead
Anesthesiology		
Dr Nick Lo	St. Michael's Hospital University of Toronto	Staff Anesthesiologist Assistant Professor
Dr Jean Wong	Women's College Hospital University Health Network	Staff Anesthesiologist
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Executive Administration		
Tiziana Silveri	North Bay Regional Health Centre	Vice President of Clinical Services
Leslie Gauthier	Hamilton Health Sciences	Director, Perioperative Services
Winnie Doyle	St Joseph's Healthcare, Hamilton	VP President Patient Services, Chief Nursing Executive

Appendices

Appendix 1: Literature Search Strategies

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to March 2014>, EBM Reviews - ACP Journal Club <1991 to March 2014>, EBM Reviews - Database of Abstracts of Reviews of Effects <1st Quarter 2014>, EBM Reviews - Cochrane Central Register of Controlled Trials <January 2014>, EBM Reviews - Cochrane Methodology Register <3rd Quarter 2012>, EBM Reviews - Health Technology Assessment <1st Quarter 2014>, EBM Reviews - NHS Economic Evaluation Database <1st Quarter 2014>, Ovid MEDLINE(R) <1946 to April Week 1 2014>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <April 15, 2014>

Search Strategy:

#	Searches	Results
1	Arthroscopy/	17240
2	exp Knee Joint/ or exp Knee Injuries/	53990
3	and/1-2	6522
4	Anterior Cruciate Ligament/ or Medial Collateral Ligament, Knee/ or Posterior Cruciate Ligament/ or Anterior Cruciate Ligament Reconstruction/	12101
5	(((arthroscop* or reconstruct* or repair* or surg* or orthop*) and (anterior cruciate ligament* or posterior cruciate ligament* or meniscal or menisci or meniscus or menisectom* or semilunar cartilage* or ACL or PCL or MCL)) or (arthroscop* and knee*)).ti,ab.	20103
6	or/3-5	25189
7	exp Anti-Infective Agents, Local/	181718
8	exp Sterilization/	23702
9	Surgical Wound Infection/pc [Prevention & Control]	10824
10	exp Antisepsis/	4219
11	exp Detergents/	28636
12	Baths/	4307
13	exp Iodophors/	2972
14	exp Alcohols/	578280
15	(((anti infect* or antiinfect*) adj2 agent*) or antiseptic* or microbicid* or detergent* or wipes or shower* or bath* or wash* or cleans* or iodophor* or povidone-iodine* or providone iodine* or betadine* or chlorhexidine* or triclosan* or hexachlorophene* or benzalkonium* or alcohol or alcohols or antiseptic* or anti septic* or soap* or antibacterial* or anti bacterial* or antimicrobial* or anti microbial* or steriliz* or sterilis* or disinfect* or antisepsis or swabs or bactericide* or bactericidal or soluprep* or asepsol*).ti,ab.	598772
16	or/7-15	1223001
17	6 and 16	596
18	limit 17 to (english language and yr="2004 -Current") [Limit not valid in CDSR,ACP Journal Club,DARE,CCTR,CLCMR; records were retained]	338
19	remove duplicates from 18	295

CINAHL

#	Query	Results
S1	(MH "Arthroscopy")	6,025
S2	(MH "Knee Joint+")	9,278
S3	(MH "Knee Injuries+")	7,585
S4	S2 OR S3	15,258
S5	S1 AND S4	1,772
S6	(MH "Anterior Cruciate Ligament") OR (MH "Medial Collateral Ligament, Knee") OR (MH "Posterior Cruciate Ligament") OR (MH "Anterior Cruciate Ligament Reconstruction")	3,616
S7	((arthroscop* or reconstruct* or repair* or surg* or orthop*) and (anterior cruciate ligament* or posterior cruciate ligament* or meniscal or menisci or meniscus or menisectom* or semilunar cartilage* or ACL or PCL or MCL)) or (arthroscop* and knee*)	7,287
0S8	S5 OR S6 OR S7	7,899
S9	(MH "Antiinfective Agents, Local+")	7,178
S10	(MH "Sterilization and Disinfection")	6,825
S11	(MH "Surgical Wound Infection/PC")	2,366
S12	(MH "Detergents+")	1,074
S13	(MH "Bathing and Baths")	1,972
S14	(MH "Iodophors+")	515
S15	(MH "Alcohols+")	22,847
S16	((anti infect* or antiinfect*) N2 agent*) or antiseptic* or microbicid* or detergent* or wipes or shower* or bath* or wash* or cleans* or iodophor* or povidone iodine* or providone iodine* or betadine* or chlorhexidine* or triclosan* or hexachlorophene* or benzalkonium* or alcohol or alcohols or antiseptic* or anti septic* or soap* or antibacterial* or anti bacterial* or antimicrobial* or anti microbial* or steriliz* or sterilis* or disinfect* or antisepsis or swabs or bactericide* or bactericidal or soluprep* or asepsol*	96,667
S17	S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16	116,395
S18	S8 AND S17	99
S19	S8 AND S17 Limiters - Published Date: 20040101-20141231; English Language	74

References

(1) Babcock HM, Matava MJ, Fraser V. Postarthroscopy surgical site infections: review of the literature. Clin Infect Dis. 2002;34(1):65-71.

(2) Kamel C, McGahan L, Mierzwinski-Urban M, Embil J. Preoperative skin antiseptic preparations and application techniques for preventing surgical site infections: a systematic review of the clinical evidence and guidelines [Internet]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2011. Available from: http://www.cadth.ca/index.php/en/hta/reports-publications/search/publication/2773.

(3) Webster J, Osborne S. Preoperative bathing or showering with skin antiseptics to prevent surgical site infection. Cochrane Database Sys Rev. 2012;9(Art. No.: CD004985):1-49.

(4) Chlebicki MP, Safdar N, O'Horo JC, Maki DG. Preoperative chlorhexidine shower or bath for prevention of surgical site infection: a meta-analysis. Am J Infect Cont. 2013;41(2):167-73.

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