

Systematic Review Snapshot

TAKE-HOME MESSAGE

The practice of cleansing wounds with water is as effective as using isotonic saline solution.

METHODS

DATA SOURCES

This study was the fourth update of a systematic review on wound cleansing. In this update, the authors searched the Cochrane Wounds Group Specialized Register (searched November 2011), the Cochrane Central Register of Controlled Trials (CENTRAL) (Cochrane Library 2011, Issue 4), Ovid MEDLINE (2010 to October, week 4, 2011; In-Process and Other Non-Indexed Citations, November 2011), Ovid EMBASE (2010 to 2011 week 44), and Epton B. Stephens Company (EBSCO) CINAHL (2010 to November 2011). The authors reviewed the reference lists of relevant reviews and trials to identify additional studies.

STUDY SELECTION

Randomized and quasi-randomized studies comparing wound cleansing with water to other solutions (sterile normal saline solution, cooled boiled water) or no cleansing were reviewed. Trials that objectively measured wound healing or reported signs of wound infection were included. Studies were excluded if they involved the perioperative or intraoperative environment, dental wounds, burns, or ulcer dressings or used solution as a prophylactic intervention (eg, povidone-iodine).

Is Water Effective for Wound Cleansing?

EBEM Commentators

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Results

Risk of infection with wound cleansing.

Comparison Group	Trials (No. of Patients)	Cleansing Methods	RR of Infection (95% CI)
Tap water vs no cleansing	3 (1,138)	Postrepair shower vs dry	1.06 (0.07–16.50)
Tap water vs normal saline solution: acute adult wounds	3 (1,514)	Tap vs syringe +/- splash guard	0.63 (0.40–0.99)*
Tap water vs normal saline solution: acute pediatric wounds	2 (576)	Tap vs syringe +/- 18-g angiocatheter	1.07 (0.43–2.64)
Tap water vs normal saline solution: chronic wounds	1 (49)	Syringe + 20-g angiocatheter	0.16 (0.01–2.96)
Distilled water vs cooled boiled water	1 (66)	Bulb syringe	1.69 (0.68–4.22)
Distilled water vs normal saline solution	1 (55)	Bulb syringe	0.49 (0.19–1.26)
Cooled boiled water vs normal saline solution	1 (51)	Bulb syringe	0.83 (0.37–1.87)
Water (distilled or cooled boiled) vs normal saline solution	1 (86)	Bulb syringe	0.65 (0.31–1.37)

RR, Relative risk; CI, confidence interval.

*Statistically significant difference.

Eleven of 29 identified trials met inclusion criteria and were analyzed. Patients' age ranged from 2 to 95 years, with wounds consisting of lacerations (5 studies), open fractures (1 study), chronic wounds (1 study), and surgical wounds (4 studies). Ten trials were in hospital emergency departments (EDs) or wards; 1 trial occurred in community health centers. Cleansing solutions included tap water, cooled boiled water, distilled

water, and normal saline solution. A variety of cleansing methods were used: pressured syringe with or without angiocatheter or irrigation shield, showering, perineal toilet, and running tap water. Most studies did not report the volume or pressure of cleansing; patients cleaned their own wounds in 4 trials. Five of the 11 trials lacked essential information according to the Quality Scale Assessment tool. All studies used randomized al-

The primary outcome for this systematic review was wound infection; secondary outcomes included wound healing, pain, cost, and patient and staff satisfaction.

DATA EXTRACTION AND SYNTHESIS

Two authors independently reviewed trials and jointly decided on their inclusion for this review. Data extracted from each study included wound and patient characteristics, description of the intervention (eg, tap water quality), setting, duration of follow-up, number of withdrawals, and outcomes. Study quality was assessed with the Cochrane Collaboration Quality Scale Assessment tool. The Cochrane statistical package, RevMan version 4.2A, was used to calculate a weighted treatment effect, and statistical heterogeneity was reported according to the I^2 statistic.

location, 8 trials described inclusion and exclusion criteria, blinding was described in 3 trials, baseline characteristics of patients were given in 6 trials, and a wide range of outcomes were assessed.

Commentary

In acute wound management, wound cleansing may be the most important step in preventing infection and promoting healing.¹ Although there are many options for wound cleansing, there has not been a clear consensus on which solution is “best.” The use of antiseptics, such as iodine and alcohol, remains controversial because of toxic effects on tissue and lack of significant clinical benefit.² This systematic review found tap water to be as effective as other solutions in wound cleansing. In fact, tap water demonstrated a significant reduction in infection rates for acute adult wounds. Other water preparations, distilled or cooled boiled water, were also as effective as saline solution. In addition, there was no statistically significant difference in other clinically important outcomes when tap water was used.

This is not the first study to question wound care dogma in the ED. A small randomized controlled trial from 1989 found no significant difference in healing or infection rates when a surgically clean technique (hand washing, no mask, no drapes, no sterile gloves) was used compared with full sterile technique (antiseptic hand washing, mask, sterile drapes, sterile gloves) in simple laceration repair.³ Another randomized controlled trial

in 2004 showed no difference in infection rates when clean gloves were used compared with sterile gloves.⁴

Because of its availability, low cost, efficiency, and effectiveness, tap water should be strongly considered for wound cleansing in the ED.

Editor’s Note: This is a clinical synopsis, a regular feature of the *Annals’* Systematic Review Snapshots (SRS) series. The source for this systematic review snapshot is: Fernandez R, Griffiths R. Water for wound cleansing. *Cochrane Database Syst Rev*. 2012;(2):CD003861. <http://dx.doi.org/10.1002/14651858.CD003861.pub3>.

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2. Dire DJ, Welsh AP. A comparison of wound irrigation solutions used in the emergency department. *Ann Emerg Med*. 1990;19:704-708.
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Michael Brown, MD, MSc, Alan Jones, MD, and David Newman, MD, serve as editors of the SRS series.