



The
Global
Evidence
Mapping
Initiative

PUTTING
RESEARCH INTO
CONTEXT

EARLY COOLING OF BURNS



AUSTRALASIAN
COCHRANE CENTRE

EVIDENCE SUMMARY

In the early management of minor burn injury, what is the best method of cooling the burn wound?

Immediate cooling of burns is effective and safe at reducing the severity of tissue damage and relieving pain. Optimal duration and temperature of cooling is unclear. Exposure to ice or ice water may cause harm.



Inclusion/exclusion criteria

Studies

Systematic reviews, evidence-based clinical practice guidelines, health technology assessments and primary studies.

Participants

Inclusion: People of any age sustaining a minor burn injury due to heat.

Exclusion: Burns due to chemicals and radiation.

Phase of care

Included: Pre-hospital care setting (i.e. initial medical care given by a paramedic or other person before the patient reaches the hospital) OR Medical care given in an emergency department OR Primary care.

Excluded: Any care given outside of the ED in a hospital setting (i.e. following admission to a hospital ward or discharge).

Intervention

Cooling agents (i.e. water, cold, wet towels, ice)

Outcomes

The severity and depth of injury and degree of pain.

Results

Included studies

- One systematic review (Singer 2005) was identified which reviewed 42 studies. Of these, nine case series studies met the inclusion criteria and were selected for review. An update of this systematic review revealed no additional human studies.
- Eight studies reported that the immediate cooling of burns using cold towels or water reduced the severity of tissue damage and minimised the impact of pain
- The optimum duration and temperature of the cooling agent varied between studies, although one study reported that exposure to ice or ice water resulted in limb ischemia.



Authors' conclusions

What the evidence tells us

Cooling of burns is effective and safe at reducing the severity of tissue damage and relieving pain.

Implications for practice

Immediate cooling of burns is effective and safe at reducing the severity of tissue damage and relieving pain. Optimal duration and temperature of cooling is unclear, although animal studies have suggested that burns should be cooled immediately in running tap water for at least 20 minutes.

Implications for research

Investigations into the duration and optimal temperature are needed to reduce the severity of tissue damage as well as pain in patients with minor burns.

Search for evidence

A systematic search for evidence was conducted on 22nd February 2009 in the following databases: Cochrane, Medline and Embase.

Included studies

Berberian GM. *Temporary regional surface cooling and long-term heparinization in the therapy of burns.* *Surgery* 1960;48:391-3.

Grounds M. *Immediate surface cooling in treatment of burns.* *Medical Journal of Australia* 1967;2(19):846-7.

Li C, Yu D, Li MS. *Clinical and experiment study of cooling therapy on burned wound.* *Zhonghua Yi Xue Za Zhi* 1997;77(8):586-8.

Matthews RN, Radakrishnan T. *First-aid for burns.* *Lancet* 1987;1(8546):1371.

Nguyen NL, Gun RT, Sparnon AL, Ryan P. *The importance of immediate cooling—a case series of childhood burns in Vietnam.* *Burns* 2002;28(2):173-6.

Purdue GF, Layton TR, Copeland CE. *Cold injury complicating burn therapy.* *Journal of Trauma* 1985;25(2):167-8.

Raghupati N. *First-aid treatment of burns: efficacy of water cooling.* *British Journal of Plastic Surgery* 1968;21(1):68-72.

Rose HW. *Initial cold water treatment for burns.* *Northwest Medicine* 1936;35:267-70.

Shulman AG. *Ice water as primary treatment of burns. Simple method of emergency treatment of burns to alleviate pain, reduce sequelae, and hasten healing.* *JAMA* 1960;173:1916-9.

References

Singer AJ. *What is the safety, efficacy, and feasibility of cooling in the first aid management of a thermal cutaneous burn? 2005 International Consensus on Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) Science with Treatment Recommendations: Section 2: Stroke and First Aid Circulation, 2005:*

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