



The latest advice on burns



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presents

an update on burns and the rationale behind this change.

The General Dental Council (GDC), in its publication *Principles of dental team working*,¹ states that the person who employs, manages or leads a team in a dental practice should ensure that:

- There are arrangements for at least two people available to deal with medical emergencies when treatment is planned to take place
- All members of staff, not just the registered team members, know their role if a patient collapses or there is another kind of medical emergency
- All members of staff who might be involved in dealing with a medical emergency are trained and prepared to deal with such an emergency at any time
- The dental team practise together regularly in a simulated emergency so they know exactly what to do.

Maintaining the knowledge and competence to deal with medical emergencies is an important aspect of all dental professionals' continuing professional development. This means keeping on top of any updates in the recommended medical emergency procedures.

As of May 2019, the advice on how to deal with burns injuries has been updated and the advice is now to treat burns by running them under cool running water for a full 20 minutes.

The following update on burns advice is applicable for both work and home situations. This article explains the science and rationale behind the changes.

How serious are burns?

Burns can be extremely damaging and painful. Annually, 13,000 burns injuries are so severe that they are treated in hospital. Burns frequently become infected. Scarring can be

disfiguring and is often permanent. Fatalities total 200 people per year in Britain.

One third of adult burns are work-related. Thus, working in a dental practice where chemicals are used, there are extra risks to be aware of on top of the usual workplace burns hazards.

However, new research has shown that if a burn is treated in the recommended way, damage and scarring can be reduced.

Increased risk for children and the elderly

Seventy percent of all paediatric burn incidents occur in children under four-years-old.

Children's skin is especially sensitive and thin so a small child can still receive serious burns from a cup of tea that has been made for more than ten minutes. It is vital that children are protected from heat sources and additional measures taken to reduce the risk of burns.

Ten percent of burns affect elderly patients and the mortality rate is significantly higher for these cases. As with small children, older people's skin becomes thinner and more friable. Often, their nerve endings are less sensitive to the dangers too, so they might not immediately notice that they are being burned.

These higher-risk patients should be paid acute attention to.

New advice

Treatment has previously been to hold the affected area under cool running water for at least ten minutes. This has changed; as of May 2019, the latest advice from the Australian research team at their National Centre for Children's Burns – now adopted by the NHS, British Burn Association and more – is to extend the time that the burn should be treated to a full 20 minutes under cool running water.²

The previous recommendations were based upon conflicting published studies and an unproven idea of best practice. The burn researchers in Australia have reviewed published studies and undertaken further work to identify the latest advice for optimal burns treatment.

In brief:

1. Treatment should use cool running water of 2°-15°
2. Treatment should last a full 20 minutes
3. Ice should not be applied to a burn
4. Icy water should not be applied to a burn as this can lead to hypothermia.

The research supports that effective treatment of burns (ie following the steps

given above) will significantly reduce tissue damage, hasten wound re-epithelialisation and reduce scarring.

Problems with past research papers

Rats and pigs

Interestingly, research done in the past has had conflicting results and this is partly due to the types of animal used to conduct testing. Many studies chose rodents as their models, as rats and mice are easily available in laboratories and comparatively cheap to experiment with.

However, rodents' skin heals differently to humans as rather than the human process of wound re-epithelialisation (skin cell rebuilding), rodent wounds heal via contraction.

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Time issues

Studies have often been short-term – so they have failed to consider long-term scar formation. Current patients are often highly concerned about scar visibility.

The benefits of cool running water

Clinical studies have indicated a whole range of benefits including:

1. Decreased wound depth
2. Reduced time for wound re-epithelialisation
3. Decreased hospital stay/visits
4. Decreased requirement for grafting and scar management.³

Why running water?

It is not clear yet whether the treatment is more effective under running water, or whether the use of a large quantity of continually-refreshed water would also prove beneficial.³ So, it is possible that immersion in cool water would have the same beneficial effect. However, immersion in a bowl or sink will warm over time.

Practically, it is normally easiest to place the burned area under cool running water such as a tap. Wet towels (refreshed every three minutes) and water spray have been shown to be less effective.

The water should preferably be drinkable, to reduce risk of wound infection.² This means if you are in a country with non-drinkable tap water, you should use bottled water instead.

What's the problem with ice?

Although ice water may be more beneficial for wound outcome (including re-epithelialisation and cosmetic appearance), it has frequently led to cases of serious and potentially fatal hypothermia, particularly with larger surface area burns.

It is possible that ice water (2° that is) could be effective on small burns with minimal risk. However, studies have not yet been conducted on larger animals to test this, so currently cool water remains the recommended temperature for the treatment of burns.

How long is long enough? And how long is too long?

This is another area in which previous research has been conflicting and confusing – as recommended times have ranged from 30 minutes to three hours!

Studies have shown that the optimal time to run the burn under cool running water is for a full 20 minutes. After 20 minutes, there does not appear to be any further benefit.

People often continue treating their burn to relieve pain. The advice now is to treat the pain separately if it persists, with paracetamol or other analgesia.

Remove all jewellery and clothing covering the burned area.

If for some reason treatment to the burn is delayed: immediate treatment is recommended to reduce tissue damage and help reduce pain. But there is a lot of controversy about how long after the injury treatment can retain effectiveness.

Recent studies have shown that even if treatment is delayed for between one to three hours, running the burn under cool running water is still beneficial, improving wound re-epithelialisation and decreasing the amount of scar tissue.

Should I use hydrogels such as BurnShield, Burnfree and Water-Jel?

Thirty-seven percent of UK fire departments use water gels instead of cool running water. Seventy-six percent use them in addition to cool running water.² There have been limited studies with hydrogels, however studies have indicated that these gels may not offer additional healing benefits.

The problem with such gels are threefold:

1. They must be applied for an hour
2. Risks of hypothermia are increased in large burns
3. Viscous liquid from the gel can interfere with the burn.²

They may be useful in areas or situations where it is not possible to treat the burn under cool running water.

4. Burns are located on the face, perineum, feet or hands
5. The burn is blistered
6. Burns are caused by chemicals or electricity.

You should also seek medical help immediately if the affected person:

1. Has other injuries
2. Is showing signs of shock (rapid breathing, weakness and dizziness, cold, clammy skin or sweating)
3. Is pregnant
4. Is aged over 60 or under five
5. Has a medical condition (heart, lung, liver disease or diabetes)
6. Has a weakened immune system – such as AIDS or is undertaking chemotherapy.

3. Irrigate the affected area with copious amounts of water. Be careful of the runoff to prevent additional burns from the chemicals
4. Use tap or bottled water. Or, wherever possible, use Hartmann's or Normal Saline solutions
5. Seek medical attention as soon as possible.

It is strongly advised that you attend a fully regulated practical or online first aid course (such as <https://onlinefirstaid.com/>) to understand what to do in a medical emergency. Visit <https://firstaidforlife.org.uk> or call 0208 675 4036 for more information about First Aid for Life's courses.

First Aid for Life is a multi-award-winning, fully regulated first aid training provider specialising in first aid and medical emergency training for dental practices. First Aid for Life's trainers are highly experienced medical, health and emergency services professionals who will tailor the training to your needs. Courses for groups or individuals can be conducted at the venue or at your practice.

First Aid for life provides this information for guidance and it is not in any way a substitute for medical advice. First Aid for Life is not responsible or liable for any diagnosis made, or actions taken based on this information.

References

1. General Dental Council. Principles of dental team working. London: General Dental Council, 2005.
2. Cuttle L, Pearn J, McMillan J R, Kimble R M. A review of first aid treatments for burn injuries. *Burns* 2009; **35**: 768-775.
3. Battaloglu E, Greasley L, Leon-Villalpalos J, Young A, Porter K. Faculty of Pre-Hospital Care & British Burn Association Expert Consensus Meeting. Management of burns in pre-hospital trauma care. 2019. Available at: <https://fphc.rcsed.ac.uk/media/2621/burns-consensus-2019.pdf> (accessed October 2019).

<https://doi.org/10.1038/s41407-019-0186-3>

CPD questions

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Is using aloe vera effective?

Whilst studies have yet to confirm whether aloe vera could be effective in treating superficial burns and providing pain relief, it has been shown to have no beneficial effect on deeper burns. Therefore, it is not recommended as a treatment.

The official advice

Cool running water should be run over the affected area for a full 20 minutes. The running water should be tap temperature ie between 2° and 15°. 12° is optimal. The treatment should be started as quickly as possible (ideally within ten minutes).

After first aid

Having taken the recommended precautions, you'll need to decide whether to go to hospital and receive further treatment.

The casualty should be monitored for signs of hypothermia; try to keep the casualty warm whilst cooling the burn.

Seek medical attention if:

1. The casualty is a baby or child
2. The burn is larger than a 50p coin
3. A burn (of any size) has resulted in white or charred skin

If the casualty has been involved in a fire, symptoms of smoke inhalation include:

1. Coughing
2. Sore throat
3. Difficulty breathing
4. Singed nasal hair
5. Facial burns
6. Rasping voice.

These symptoms may be delayed and could indicate damage to the airway, which is extremely serious. Remove the casualty from danger, treat any obvious burns and seek medical attention immediately.

Chemical burns

Dental professionals must be particularly aware of the danger and treatment of chemical burns. Chemical burns can be caused by acids or bases.

The burn can continue to cause damage for many hours after contact with the irritant. Treatment should be immediate irrigation for at least 20 minutes.

You should also:

1. Wear gloves and protect yourself from contamination
2. Remove the casualty's contaminated clothing