CORE-INFO:
Thermal injuries on children

CORE INFO
Cardiff Child Protection Systematic Reviews

NSPCC
Cruelty to children must stop. FULL STOP.

The information in this leaflet is based on a systematic review of the quality work in the world literature about scalds and burns sustained by children. This information should help you to know when to be concerned about thermal injuries that may be the result of abuse or neglect.
Full details are available at: www.core-info.cardiff.ac.uk

Burns include scalds from hot liquids, contact burns from hot objects (such as an iron), burns caused by flames, chemical and electrical burns.

Most burns are accidental. It is estimated that of the children admitted to burns units, 10-14 per cent sustain burns that are the result of abuse. Burns due to neglect outnumber intentional burns by a ratio of nine to one.

If a doctor suspects that a child has sustained a significant burn they should always seek the attention of a burns specialist.

Scalds

What do we know about scalds in children?

A child will be scalded far more quickly than an adult. It takes only one second for a child to sustain a scald when exposed to liquid at 60°C (the average hot water setting in British homes is 55°C). A scald will cause immediate and severe pain.

What are the features of accidental scalds in children?

Accidental scalds usually occur as “spill injuries”, where a toddler reaches out and pulls a hot drink or cooking liquid over themselves. This typically leads to a scald affecting the upper trunk, face and/or arms. The scald usually has an irregular edge, is variable in depth and deepest at the initial point of contact. Children may accidentally scald themselves from hot flowing water, by turning on the hot tap in a sink or bath for example. In this case too, the scald is generally asymmetrical with an irregular edge, and usually involves the limbs.

What are the features of intentional scalds in children?

Most research in this field deals with scalds that require hospital admission.

- Intentional scalds from hot tap water usually affect the back or lower limbs with or without the buttocks or perineum. International scalds are often bilateral and symmetrical. They may also affect both arms and/or both legs in a “glove” or “stocking” manner. Characteristically, there is a clear upper limit to the scalded skin area, which is of uniform depth.

- Intentional immersion scalds may not affect the skin behind the knee, in the crook of the elbow or the central part of the buttocks: the limbs may be bent at the time of immersion or the buttocks may press against the surface of the bath, which is cooler than the liquid the child is immersed in.

- Intentional scalds may be accompanied by other intentional injuries or signs of neglect. Fractures which are not clinically apparent (occult fractures) may be detected on skeletal x-ray images.

We know very little about the incidence and characteristics of less serious intentional scalds.

What social/historical features are associated with intentional scalds?

- Previous child abuse or domestic violence.
- A trigger event such as minor misbehaviour by the child, or a toileting accident.
- Previous burns or repeated previous hospital attendance for accidental injuries.
- A sibling blamed for causing the scald.

Burns

What are the features of accidental burns on children?

Toddlers sustain accidental contact burns when they reach out and grab hot objects. These burns are typically on the palm of the hand, and are often a single burn. Hair straighteners may leave a burn on each side of the hand or ankle. A small child may pull the flex of a hot object, such as an iron, down on themselves. Again, this is likely to cause a single burn on an exposed area of skin, or at most two burn areas. The edge may not be well demarcated if the skin has only had a glancing contact with the object.

What are the features of intentional burns on children?

Intentional contact burns are frequently multiple. They have a clearly demarcated edge, and the shape may match that of the implement used – eg the grid of a hairdryer or iron. Burns involve areas of the body other than the hands for example the back, shoulders or buttocks.

Cigarette burns are very commonly described as intentional burns, though there is no study in the current scientific literature which sets out to distinguish between intentional and accidental cigarette burns. Several case reports describe intentional cigarette burns on the hands or trunk of the children. These may be multiple, circular in shape with a central cratered lesion one to two millimetres in width and of uniform depth. There is no detail in the literature on the features of accidental cigarette burns on children.

What other intentional burns and scalds may a child be subjected to?

There are case reports of small infants who have been burned by boiling oil, put in the microwave, held in flames, had acid poured into their ears or been burnt with other caustic substances. These burns are usually very deep and may be extensive, and are found on unusual parts of the body.

Traditional remedies using heat

Intentional burns may be inflicted on a child as part of a cultural belief or traditional remedy. This is particularly common in areas of south-east Asia. Such treatments include moxibustion – burning the moxa herb under a glass over the part of the body that is affected to draw out the illness. Other remedies include cupping, which causes superficial circular burns, usually found on the back, and the rubbing of bruised skin with a hot, freshly boiled egg, which can cause a superficial burn.

Conditions that mimic intentional burns

Accidental caustic burns

These may occur, and parents may be unaware of the cause. One example was a child who had an extensive caustic burn to the buttocks. On examining the child's clothing and car seat, it became apparent that it had been caused by leaking batteries. In these circumstances, the caustic material may not cause pain immediately. It is essential with unexplained burns to examine the child's clothing and establish what happened over the previous 24 hours.

Skin conditions

Many skin conditions may mimic burns. These include:

- Photodermatitis – a blistering skin condition caused by a combination of a chemical and sunlight. This can occur where perfume or plant oils, such as those found in citrus fruit, wild parsnip and other wild plants are present on the skin and the child is subsequently exposed to sunlight. Gradual reddening of the skin occurs, followed by a blistering rash over the affected area. This will often appear out of the blue, and it is essential to take a detailed history.

- Skin diseases such as impetigo, where the rash is usually scaly (unlike a burn) and may spread to other areas of the skin, particularly where two areas of skin touch one another – eg, the inside of the arm and the side of the chest.

- Hereditary skin disorders such as congenital curvilinear hyperpigmentation, causing a loop-like raised area of skin on the back of the calves.

- Hypersensitivity reactions eg, to detergents, laxatives or cetirimide shampoo.

Factors to consider when undertaking an assessment

Seeing the child

- Does the description of how the burn was caused fit with this child's stage of development?
- Does the pattern of the burn fit with the description of cause given?
- Is the description of how this burn occurred consistent with the environment where it took place?
- Do the clinical features of the burn fit with the mechanism described?

Seeing the home

- If the injury is alleged to be a hot water scald, it is helpful to record the precise temperature of the domestic water supply and of the hot water at the site of the incident.
- If the child is said to have climbed into a bath or sink and turned the tap on, look at the room layout. Could the child have climbed into the bath? If so, could they have come into contact with the hot water as described?
- If the burn was a contact burn, is there a household object such as a hairdryer or lighter which would match that burn?

Further support from the NSPCC

If you are worried about a child, the NSPCC is here to help, 24 hours a day, seven days a week, free of charge.

Phone 0808 800 5000
Email help@nspcc.org.uk
Text 88858 (Text 07786 200001 in Channel Islands, standard call rates apply)
Or visit www.nspcc.org.uk/help

NSPCC's information service

The NSPCC's library is the most comprehensive collection of specialist resources relating to child protection in the UK. It contains over 40,000 records and you can access it online at **www.nspcc.org.uk/inform**

You can also subscribe to CASPAR, a news service that signposts you to the latest policy, practice, and research in child protection.

Sign up at www.nspcc.org.uk/inform

To download this leaflet for free, or for printed copies of this leaflet, please go to **www.nspcc.org.uk/core-info** for price details.

Systematic review updated April 2011.
Core-info leaflet updated November 2012.
For the most up to date information on this review and the project's other systematic reviews visit the Core info website **www.core-info.cardiff.ac.uk**

Further details of this review can be found by scanning the QR code below.

This is a collaborative project between the Early Years Research Programme, Cochrane Institute of Primary Care & Public Health, School of Medicine, Cardiff University and the NSPCC.

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