Leeds Safeguarding Children Board

Burns and Scalds

Multi-Agency Protocol for the Assessment of Suspected Neglectful or Inflicted Burn and Scald Injury

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1. Background

The assessment of burn and scald injury presents specific difficulties. Accurate assessment of such injuries will ultimately influence the nature of any intervention capable of safeguarding the injured child and any vulnerable siblings. It is therefore imperative that a comprehensive and timely assessment is undertaken.

The purpose of this protocol is to provide guidance to practitioners with regard to their responsibilities when dealing with a child who has sustained a burn or scald injury.

2. Burn injuries – the research perspective

11% of all accidental deaths were the result of burns or scald injuries including

Inhalation of smoke from house fires (Jackson 1985).

In 2002 in the UK:

(a) Over 42,000 children under 15 were injured in burn and scald accidents.

(b) The majority (over 28,000) were under 5 years old.

(c) 95 per cent of thermal injuries to children happened at home.

(dOver half of all severe burns and scalds happened in the kitchen.

(e) 32 children under 15 years died as a result of house fires.

Scalds

Hot liquids cause 70 per cent of all thermal injuries to children. The most common single cause of scalds is hot drinks. Babies and toddlers are particularly at risk when they grasp cups and mugs of hot tea or coffee. Other common causes include steam or water from kettles and hot oil or fat. Children may also be scalded by hot tap water.

Burns

Children can suffer burns after contact with heaters, open fires, cookers, barbecues, irons, fireworks, matches, cigarette lighters, candles or any other hot surface. Young children are also particularly vulnerable to sunburn.

Abuse

Deliberately inflicted burns and scalds are responsible for between 1 to 20% of all burns the higher figures from America the lower one from studies the UK.

NB:

1. Many cases are not recognized and reported because of the difficulties of diagnosis.

2. In the absence of other injuries the diagnosis of abuse may not be suggested.

3. There are no simple formulae for recognizing abuse.

4. The doctor's experience of abusive thermal injuries is important in accurate identification of abuse.

3. The assessment process - key issues in assessing burn and scald injuries

Burns and scalds to children are common.

- The majority of burn or scald injuries result from non-intentional injury, which may involve varying degrees of parental inattention
- Some cases are the result of neglect.
- Some cases involve deliberate abuse.

Staff in accident and emergency, plastic surgery and children's burns units see the more severe injuries at the time of presentation and their records and observations are vital to the overall assessment of the case.

If there are any concerns re possible abuse or neglect then a referral to an appropriate Paediatrician is required.

In cases of concern any burn dressings/coverings present upon admission or first presentation should be retained. Such dressings may well be the subject of further examination (forensic) as they may contain valuable evidence which supports a non-accidental or deliberate cause (eg. cigarette ash residue, chemical residues, paint deposits resulting from contact with heat sources).

The paediatrician will need to liaise with those responsible for the treatment of the burns and ensure that appropriate referrals to partner agencies have been made.

Less severe injuries may not be seen in hospital but may present to GPs, health visitors and school nurses or are discovered, for example, by nursery nurses or school teachers. The need to ensure these cases are properly assessed is equally important.

It should be borne in mind that most accidental burns and scalds in childhood occur in pre-school children and these should be preventable.

4. The initial assessment:

A critical stage in determining the causation factors for burn and scald injury is the examination, history and background of the child at the point of first contact with health services.

It is likely that this stage will provide the first opportunity for a doctor or health professional to identify any issues that may indicate concern.

The following issues may be an indication that further investigation is necessary:

- The injury does not fit the history
- Delay in seeking treatment.
- Surprising lack of pain described.
- History incompatible with the developmental level of the child e.g. age 15 months climbed into sink and turned taps on

- Vague or changing histories
- Speculative or absent accounts of what happened, un-witnessed burn
- Inadequate supervision but no admission of guilt / responsibility taken
- Denial that a lesion is a burn
- Burn attributed to sibling.
- Child contradicts the parents history

In a review of 139 **abusive** cases over a 4 year period in one study:

- 20% were under 1 year of age, 56% were aged 1-2years and only 6% were of school age.
- More than 2/3rds of the alleged perpetrators were female, the majority being mothers.
- Legs (35%), feet (25%) and hands (23%) were the commonest injured body locations.
- Bilateral burns occurred in 32% of cases.
- Contact burns accounted for 56%, scalds for 38% and flame 4%.
- Overall burns were present in 12% of all physical abuse cases and abusive burns constituted 10% of all admissions to the burn unit.
- Half the children had other injuries in addition to the burns. (Showers and Garrison, 1988)

Other conditions which may look like burns include include infections, e.g.' staphylococcus aureus infection can cause "the scalded skin syndrome" which resembles a scald. Impetigo can also be confused with burns.

When burns are old or become infected they are difficult to differentiate from a primary infected lesion. Precise ageing of injuries is also very difficult although experienced staff in the care of burns can make an approximate estimate in some cases of the age of an injury.

Burns can occur when cars are left in the sun (e.g. from a car seat or belt).

There is an association between sexual abuse and burns.

Repeated non-inflicted burns are a dangerous form of neglect.

5. Common patterns of abusive burn and scald injuries:

(a) Contact burns - clearly outlined mark from contact with hot objects branded onto the skin. (e.g. clothes iron, fire grid, cooker hot plate, hot fork, hot spoon, cigarettes and cigarette lighters).

(b) Deep, cratered, circular burns from cigarettes, which heal to leave scars.

(c) Immersion scalds most usually from hot water. Sometimes there are glove and stocking circumferential scalds of limbs/ parts of limbs/ buttocks from forced immersion.

Clear waterlines may be visible where the child has been held in the water. Splash marks may be absent. Most occur in the bathroom, kitchen or bedroom

(d) Scalds from poured or thrown liquids. E.g. hand held under tap, cup of coffee thrown at child

(e) Friction or carpet burns e.g. from dragging child across the floor.

(f) Bilateral burns are more commonly associated with abuse. They occurred in 32% of Showers and Garrison's cases.

6. Common sites of non-accidental thermal injury:

(a) Feet and hands especially the backs of hands.

(b) Legs and buttocks.

(c) Face.

(d) Genitalia

But anywhere can be affected.

7. Depth of burns and scalds and time taken to burn

The depth of burns depends on the temperature and duration of exposure. In the case of hot water immersion for adults in thin areas of skin, the following provides an approximate guide to times (DHSS 1977):

Relationship between temperature and time to produce injury in adults:

Temperature (0C)	Partial thickness burn (seconds)	Full thickness burn (seconds)
65	1	20
60	5	80-100
54	35	700-800
50	60	

Above 60°C (140°F) children's skin burns in one quarter of the time of adult skin. The temperature of hot water in many homes as it leaves the tap is as high as 60°C (140°F), thus increasing the risks of injury to children. In 1985 the Child Accident Prevention Trust suggested that the temperature should be set at 54°C. However, under the present BS 5546 specification for the installation of gas hot water supplies for domestic purposes, the maximum temperature of the cylinder thermostat and the BS 5549 maximum for forced circulation systems are both set at 60°C. In the United States new hot water heaters are set at 120°F (48·8°C).

Transfer of heat from hot water is more predictable than in other situations (e.g. contact burns from hot objects). Obviously maintenance of close contact, with air excluded, will be prevented by rapid reflex withdrawal of the part, which cannot occur in the same

way with a scald. For this reason the mechanism by which contact was maintained must be ascertained in anything other than minor contact burns. Deep contact burns are likely to occur only when enforced contact has taken place.

8. Action following initial treatment and assessment

1 Where there are identified concerns relating to a child presented at A&E the on call paediatrician must be contacted and consideration given to admission to a ward.

2 Consider risks to siblings

3 Where the initial assessment is uncertain then discuss the case with the Designated or Named Nurse or Doctor

9. Further assessment of burn injury (paediatrician, experienced nursing staff, plastic surgeon)

(a) The burn must be examined singly or together by all the above staff during pre-arranged dressing changes to assess details of the injury including the pattern and extent.

(b) Detailed drawing of the burn must include a record of measurements, site, pattern consider position child was in at the time of injury, depth of injury (in conjunction with surgical team) and estimated age of injury. Is there sparing (areas of skin which is not burned within an area affected and if so where? (e.g. soles/palms in immersion injury, diamond shaped areas behind knees indicating that knees were bent). Consider the modifying effect of clothes.

(c) Photograph the burn providing close-up and more distant views to enable the overall pattern to be appreciated (with measure applied). Use a medical or forensic photographer if possible.

(d) Assess child's development and ability to act in the way stated (e.g. can this child turn on a tap or climb into a bath?).

(e) Include genital and anal inspection (N.B. obtain separate consent) as child sexual abuse can occur with burns and scalds.

(f) The paediatrician will ensure that all appropriate referrals to partner agencies have been made in accordance with existing local safeguarding procedures.

Partner agencies will respond in accordance with existing Safeguarding procedures.

10. Scene assessment.

Whilst the history and examination will provide a significant level of information on which to base the initial assessment, the mechanism of many burn or scald injuries will benefit from a more detailed examination of the location where the burn or scald occurred (the scene). This may involve the need for a visit to the scene conducted jointly by the police, forensic science service personnel, paediatrician and other health/social care professionals as appropriate.

11. The need for a home visit

The need for a home visit jointly by the police, forensic specialist etc should be discussed at the strategy meeting. The visit will generally be co-ordinated by the police.

The purpose of a scene visit is to assess the environment where the injury allegedly occurred, secure and preserve all the available evidence and to ensure that the appropriate specialist input is secured at an early stage in the assessment process.

Technical experts are often of significant use in determining the mechanism of burn injuries. To ensure the integrity of any expert evidence provided by such witnesses the commissioning of their services will generally be undertaken by the police following liaison with the NPIA Crime Faculty.

Scene examinations may encompass the following issues:

(i) Examination of appliance/heater alleged to have injured the child.

(ii) Assessment of the height of bath or sink, water depth and materials from which bath or sink are made of.

(iii) Assessment of the likely temperature of appliance or water at time of alleged injury.

(iv) Assessment of the material alleged to have caused the injury, (e.g. bleach).

(v) Photography of the injury scene and any appliances.

(vi) Examination of any clothing worn (consider keeping clothing). Taking of any appropriate samples.

(vii) Re-create the scene according to the parent/carer's description.

(N.B. scientific advice, manufacturer's data etc. may be required).

(viii) Identification of the implement involved in producing a particular injury

Information must be freely shared and discussed with the investigative team including children's social care and surgical team.

NB The importance of regular dialogue between all professionals involved in the assessment and investigation of burn injuries is very important and strategy meetings may need to be re-convened in the light of emerging new findings, opinions and scientific evidence.

Discharge from hospital

There must be a coordinated plan which involves:

- Children's social care – key worker task will include arrangements for place where discharged to.
- Plastic surgery / trauma team – follow up re treatment / dressings
- Paediatrician with child protection responsibility / follow up of child's general progress / developmental concerns
- GP and primary care team / need to be notified and aware of situation and child protection planning.

Documentation

Each agency investigating should use the "**Case Sheet for Suspicious Burns (neglect or abuse suspected)**" which provides a proforma and aide memoir for the collection of critical information around the burn injury.

References

1 Jackson R.H. 1985 Report of a Working Party on Burn and Scald Accidents to Children. Child Accident Prevention Trust. Bedford Square Press, London. 2 Showers J, Garrison KM, 1988 Burn Abuse: a four year study. Journal of Trauma 28:1581-1583