

SCARRRED FOR LIFE

**preventing bath water scalds in the home
discussion paper**

Baths are responsible for the highest number of fatal and severe scalding injuries among young children. Every day, one child under five is admitted to hospital with severe scalds caused by bath water. Four more children attend their local accident and emergency department as a result of bath water scalds.

It can take only seconds for a severe scald to occur – one that will require many years of painful treatment. Some children are disfigured for life, with their parents experiencing a life sentence of guilt.

This discussion paper aims to promote debate among housing providers, tenant and community groups, health and social care professionals, plumbing and heating engineers, manufacturers, builders, safety agencies and regulatory bodies on how best to prevent bath water scalds to young children.

It raises questions about:

- ✚ **The extent and nature of the problem**
- ✚ **How accidents typically happen**
- ✚ **Whether measures to reduce bath water scalds increase the risk of Legionnaires' disease**
- ✚ **Solutions offered by technology**
- ✚ **The duty of care to vulnerable groups**
- ✚ **The role played by the law**
- ✚ **What we can learn from around the world.**

It then examines how we can take forward partnerships for injury prevention.

WHAT IS THE EXTENT AND NATURE OF THE PROBLEM?

Baths are responsible for the highest number of fatal and severe scalding injuries. Every year, almost 600 children under five are admitted to hospital with severe scalds caused by bath water. A further 2,000 suffer less severe bath water scalds. Over two thirds of those admitted to hospital stay there for five or more days, or transfer to a specialist hospital or burns unit. In a very small number of cases, the scald is so severe that the child dies.

While the numbers suffering bath water scalds are relatively low compared to some other types of injuries, there are long-term repercussions for the children, their families and the health service. Children may require skin grafts at intervals until they stop growing, 15 to 20 years later. Even after this long and painful treatment, the child may still be permanently disfigured – leaving a lifetime burden of guilt on their parents.

Although most bath water scalds are preventable, as the Department of Trade and Industry's Home Accident Surveillance System shows, the injury figures have remained unchanged for several years.

Young children are most at risk from bath water scalds because their skin is far thinner and more vulnerable than that of adults. As a result, they sustain scalds more quickly and at lower temperatures, and often to a greater depth. A young child's small size intensifies the problem, as even a small amount of water can scald a large body area.

The degree of scalding depends on the temperature and volume of hot water, and the length of time a child's body is exposed to it. However, it can take only seconds for a severe scald to occur.

HOW DO ACCIDENTS TYPICALLY HAPPEN?

Young children learn by experimenting but are unaware of what will hurt them. Many bath water scalds occur when a parent leaves the bathroom to fetch a towel or answer the telephone, and their toddler plays with the hot tap. In some cases adult supervision is missing entirely, for example when older brothers and sisters are given responsibility for supervising a younger sibling in the bath. A small but disturbing number of scalds are intentional.

Some young children also fall into a hot bath run for an adult. Despite recommendations to the contrary, most people still fill baths by first running hot water and then adding cold water to regulate the temperature. This results in a period during which the bath contains dangerously hot water. The unstable gait and poor co-ordination of a toddler can easily turn experimentation into a serious accident. Children with a sensory, motor or learning disability are at even greater risk.

PREVENTING SCALDS BUT ENCOURAGING LEGIONNAIRES' DISEASE?

Water need not be boiling to scald. Indeed, temperatures above 45°C can cause serious injury to a young child very quickly. At 60°C, second degree burns occur in three seconds and third degree burns in five seconds. Safety campaigns advise householders that hot water should be 45°C or less, to reduce the risk of bath water scalds to young children.

However, as the Health and Safety Executive's Approved Code of Practice indicates, the bacteria that cause Legionnaires' disease proliferate between 20°C and 45°C. Legionella bacteria are naturally occurring organisms present in many household water systems. People exposed to the bacteria may contract Legionnaires' disease – a pneumonia-like illness with potentially fatal consequences. Infection is caused by breathing fine droplets of water contaminated by bacteria.

Legionella bacteria die at temperatures above 55°C. Best practice dictates that hot water is stored at temperatures of no less than 60°C to prevent bacteriological contamination. This also allows for compact storage cylinders that help reduce energy costs. However, a temperature high enough to kill Legionella bacteria will severely scald a young child.

Would Legionnaires' disease become a serious risk to public health if hot water storage temperatures were reduced to levels that would ensure the protection of small children from scalds?

Legionnaires' disease is primarily associated with institutional settings such as hospitals, nursing homes, large offices and factories. People with certain medical conditions – for example, weak immune systems, organ transplants, kidney disease, cancer, lung or respiratory problems, diabetes and those who are smokers or alcoholics – are at greater risk of contracting Legionnaires' disease and are advised to keep their hot water thermostats at 60°C. However, a substantial proportion of adults have antibodies to the Legionella bacteria, which suggests that many people have had contact with the organism without becoming ill.

Research from the United States reveals that states that have introduced legislation to reduce hot water temperature have shown no significant increase in Legionnaires' disease, when compared to states without this legislation. An article in the journal *Safety Science* states: 'For the healthy individual, the risk of contracting Legionella from any source is minimal and this has to be weighed up against the known and significant risk of thermal injury occurring as the result of dangerously hot household water.'

CAN TECHNOLOGY OFFER A SOLUTION?

There are a number of products on the market, including thermometers and temperature-sensitive plugs, that indicate whether a young child's bath water is at a safe temperature. While these products are useful, none do away with the need for constant adult supervision in the bathroom. And many bath water scalds occur not because a young child has been placed in water that is too hot for them, but because the adult's attention has been distracted for a few seconds and their toddler has run the hot tap.

Turning down the temperature of the hot water thermostat is one response to this problem. However, given the concerns about Legionnaires' disease for people with certain medical conditions, it is not a course of action that all households will be able to pursue.

There are now technological advances that allow water to be stored at a temperature high enough to kill Legionella bacteria but deliver water at a temperature low enough not to scald a young child.

For example, thermostatic mixing valves work by mixing hot and cold water as it enters the valve, and then delivering hot water from the tap at a pre-selected safe temperature (typically 43°C).

The valves respond to changes in water pressure or temperature to maintain the selected temperature. While they can be adjusted to suit individual preference, the maximum temperature is fixed at a safe level.

If correctly installed and maintained, thermostatic mixing valves significantly reduce the risk of scalding. However, these technological innovations are not in widespread use in the home. Why are they not fitted as standard in new and refurbished properties? Why are they not purchased in larger numbers by families with young children?

Price could well present an obstacle for some families – the valves retail at between £50 and £100, with additional costs for installation. But is price the only obstacle preventing their widespread installation by commercial house builders and social housing providers? Or are there other constraints?



WHAT IS THE DUTY OF CARE TO VULNERABLE GROUPS?

The Care Standards Act 2000 introduced new National Minimum Care Standards, which became operational on 1 April 2002. These standards apply to children's homes, residential family centres, residential special schools, boarding schools, homes used by independent fostering agencies and voluntary adoption societies, independent health care establishments and medical clinics, nursing homes and all residential homes regardless of their size.

Under Section 25.8 of the National Minimum Care Standards, temperatures are specified for the protection of vulnerable groups. These are 60°C for hot water storage, 50°C for hot water distribution and 43°C for hot water outlets.

What is preventing us from considering children in social housing as another vulnerable group and affording them the same protection as children living in premises regulated by these standards? Are social housing providers unaware of the problem of bath water scalds among young children? Are they concerned about the costs of installing and maintaining thermostatic mixing valves? Or are they worried about the risk of Legionnaires' disease, if they were to reduce hot water storage temperatures in their properties?

WHAT ROLE DOES THE LAW PLAY?

There are no national regulations prescribing safe limits for hot water in the home. In domestic premises, common law prevails. A householder who fails to ensure that family members and guests have access to facilities that are safe according to general construction standards would be in breach of their duty of care under the law of negligence.

While legal action would be unusual in the private home, the added complexities of the landlord and employer relationship could present a different outcome in rented housing. Under the 1974 Health & Safety At Work Act, social landlords whose maintenance engineers visit tenants' homes could find their properties classified as work environments. If this were the case, the landlords would have a responsibility to control known risks such as scalding, especially if the hot water facilities were open to the maintenance engineers to use.



CAN WE LEARN FROM OTHER COUNTRIES?

In 1983 in Washington state, USA, legislation was introduced requiring the pre-setting of new hot water cylinder thermostats to 49°C. The law also required water heaters in rented homes to be set at 49°C when a new tenant moved in, and warning labels to be provided on the water heaters. These measures led to a 50% decrease in tap water scalds treated in hospital.

In the 1980s in Wisconsin, USA, an intervention that included an educational programme and thermometer distribution led to 50% of those surveyed reducing the temperature setting of their water heater.

The American Academy of Pediatrics has included turning down hot water temperature as one of five goals to tackle the major causes of childhood mortality.

The "Hot water burns like fire" campaign in New Zealand in 1990 had a number of components including national media coverage on television and radio talk shows, and community groups lobbying for new building codes. The campaign led to a 20% increase in households with 'safe' temperatures (at that time set at 60°C).

A one year study of medically treated burns in Denmark in the mid 1980s found no children treated for tap water burns. This was attributed to a campaign to lower hot water temperatures. Campaign components included information in the press and on radio and television, a dialogue with industry to improve the safety of products, and government revision of legislation and regulations.

With evidence of effective injury prevention programmes, why are we in the UK still leaving young children exposed to bath water scalds?

HOW CAN WE WORK TOGETHER TO PREVENT BATH WATER SCALDS?

Only water delivered at temperatures of 43°C or less will eliminate the risk of bath water scalds among young children. Preventing injury to young children is the responsibility of adults, be they carers or policy makers. How can all those with a responsibility for the welfare of young children reduce the toll of death and severe injury from bathwater scalds? And which interventions are most successful?

Effective injury prevention often requires activity on a number of levels:

- ✚ Education to raise awareness of the problem and potential solutions
- ✚ Engineering changes, for example to products in the home
- ✚ Enforcement, whether in the form of legislation, regulation or codes of practice.

Arguably, one-off changes that require little or no effort on the part of the individual have more impact than changes the individual must remember to make on every occasion – for example, running cold water into a bath before the hot.

The Building Research Establishment is currently conducting research into the need for legislation prescribing UK-wide safe limits for hot water temperature in newly built properties. However – even if the research recommends in favour of legislation – this will have no impact on the 24 million existing homes in the UK.

Child Accident Prevention Trust is working with interested organisations to establish National Strategy Groups in England, Scotland, Wales and Northern Ireland. These time-limited task forces will investigate what action can be taken to prevent bath water scalds to young children. The groups will take account of the different social, economic and political situations in each of the four nations of the UK.

Child Accident Prevention Trust also plans to produce a practical toolkit for health and childcare workers, community groups and tenants associations. This will raise awareness of the problem and provide examples of community-level activities to reduce injuries from bath water scalds.

If you wish to become involved in a National Strategy Group, or to find out more about its work, please contact Greg Skelton, Project Manager, at the Northern Ireland address shown below.

For further information or to become involved in a National Strategy Group contact:

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The Child Accident Prevention Trust is a charity committed to reducing the number of children and young people killed, disabled and seriously injured as a result of accidents.

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