



## Hot water safety in care homes

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### *Hot water safety in care homes*

The major risks related to the provision of hot water supplies in a care home environment are the risks to residents of scalding from water that is too hot and the risk of outbreaks of Legionnaires' Disease, a potentially deadly illness which can lead to pneumonia.

Both problems are usually linked and managing these two risks can be problematic as the prevention of one directly affects the other. The usual method for preventing Legionnaires' Disease is to keep water hot, however, hot water brings a risk of scalding which care home managers must also control.

### *Legal duties*

A legal duty is placed upon care home managers to control all of the risks associated with hot water supplies in the home. Under the Health and Safety at Work, etc Act 1974, for instance, care home managers have a duty to consider any risks that may affect those in their care. The Control of Substances Hazardous to Health Regulations 2002 also stipulate that managers must assess the risks to all staff and residents from bacteria such as Legionella and take suitable precautions.

The control of both hot water and Legionella risks is also included in the National Minimum Standards for Care Homes. Standard 25 of the standards for Older People, for example, stipulates that water in a care home should be stored at a temperature of at least 60°C and distributed at 50°C minimum to prevent risks from Legionella. As part of the same Standard, and to prevent risks from scalding, pre-set valves of a type unaffected by changes in water pressure and which have fail-safe devices should also be fitted locally to provide water close to 43°C.

### *Legionnaires' disease*

Legionnaires' disease is one of a group of diseases caused by victims ingesting or breathing in Legionella bacteria. The most common result of infection is pneumonia, victims often feeling confused and having high temperatures. Many develop acute septicaemia. For the elderly and those with immune system weakness, Legionella infection can be fatal or can result in severe complications such as renal failure.

Legionella bacteria are widespread in natural sources of water including rivers, streams and ponds, even in soil. They are also found in many recirculating and hot and cold water systems in buildings. Particularly susceptible to infection are large buildings with complex water systems, most outbreaks of Legionnaires' disease occurring in or near large building complexes such as hotels, hospitals, offices and factories where they are traced back to the water supply. Cooling towers, such as those which form part of an air conditioning system, represent a particular hazard because they readily generate fine water droplets and there is an air current to carry them away. Together with the fact that they are usually located on roof-tops this gives them great potential for infecting large numbers of people.

### *Preventing Legionnaires' disease*

Since Legionella is widespread in the environment, it cannot be prevented from entering water systems. However, the risk of an outbreak developing can be reduced by storing water at a temperature of at least 60°C and distributing it at 50°C minimum. Legionella bacteria can survive at low temperatures and thrive at temperatures between 20°C and

45°C but they are killed at higher temperatures, thus temperature is the main method used for their control.

Keeping water hot is effective in controlling Legionella but can present a scalding risk to users of the water, especially if those users are elderly, infirm or confused. To prevent risks from scalding, therefore, a range of different safeguards must be put in place.

Alternative methods of control to high temperatures include ionisation, the use of UV light, chlorine dioxide, ozone treatment or regular thermal disinfection of the system. However, these will need proper installation, maintenance and monitoring and may be prohibitively expensive or impractical. They also mean that homes need an alternative method of providing hot water for uses such as laundry.

In addition to temperature controls, water cisterns and pipe work should also be designed so that water is not allowed to stand undisturbed for long periods. They should also be well-covered to prevent the entry of dirt, debris and vermin, and should be periodically inspected, cleaned and disinfected. In addition, care home managers should:

- ensure that pipework is as short and direct as possible
- ensure adequate insulation of pipes and tanks
- use materials that do not encourage the growth of Legionella.

Cooling tower water systems need to be well-designed, maintained and operated and should be fitted with drift eliminators which reduce the escape of spray. Systems should be cleaned and disinfected at least every six months and the water should be treated to prevent scale, corrosion and microbiological growth. Where reasonably practical, cooling towers should be replaced with dry cooling systems.

### *Scalding risks in care homes*

Water does not have to be boiling to scald. Temperatures above 45°C can cause serious injury and it only takes five seconds for water at 60°C to cause a third-degree burn. At 70°C it takes less than one second.

In the past there have been many tragic cases where care home residents and hospital patients have been badly scalded through contact with hot water or hot water pipes and radiators. In some cases residents have even been lowered into baths of scalding water, care staff failing to check its temperature before immersing the resident. Some of these incidents have even led to deaths.

The risk of scalding to residents in care homes is covered in Health and Safety Executive Local Authorities Enforcement Liaison Committee (HELA) Local Authority Circular 79/5, Scalding Risks From Hot Water In Health And Social Care, published in 2003. This document alerts care home managers to the scalding risk to vulnerable service users caused by high water temperatures and suggests a number of safeguards which care home managers can put into place to ensure the safety of their residents.

Those most at risk, the paper concludes, are the elderly, those with mental illness, learning disability or reduced mobility and anyone with reduced sensitivity to temperature, or who cannot react appropriately, or quickly enough, to prevent injury. The elderly are particularly prone to scald burns due to their thinner skin and lack of sensitivity which means that they might not be able to pull away from hot water quickly enough to avoid scalding. They also tend to be less agile, so that they are at risk of injury while trying to escape from a scalding bath or a blast of hot water from a shower. Scalding injuries often cover a large area of the body, leading to high rates of morbidity and mortality, and

people who are physically or mentally impaired are particularly at risk due to their slower reaction times and inability to respond.

The HELA paper refers to approximately 13 fatal and 42 major injuries attributable to hot water scalds in health care premises alone between 1996 and 2003.

It also states that a survey of nursing homes and residential care homes, carried out by the Health and Safety Executive shows that the control of Legionella is not the main reason for care homes to store water at high temperatures, despite popular opinion that this is the case. Under 20% of the homes surveyed kept water at temperatures over 60°C just to control Legionella, most homes keeping water hot for other reasons including kitchen and laundry use, to ensure proper boiler operation and to take account of long pipe runs.

### *Reducing scalding risks*

HELA Local Authority Circular 79/5 suggests a number of ways that scalding risks should be controlled.

The key method of preventing scalding in care homes is for pre-set valves of a type unaffected by changes in water pressure and which have fail-safe devices to be fitted locally in care homes to provide water close to 43°C. Safe hot water systems include thermostatic mixers with fail-safe devices, single lever mixers or control mechanical mixers with built-in tamper-proof hot water limiting devices.

Thermostatic Mixing Valves (TMVs) reduce the discharge temperature of stored hot water to an appropriate level by blending it with cold water before it reaches the tap, thus ensuring a constant and safe outlet temperature. Care home managers should ensure that they obtain advice in this area from suitably qualified and experienced plumbers or trade associations and that all valves are fitted correctly and work properly.

According to the TMVA (Thermostatic Mixing Valve Association), established in 1999 to draw attention to the safe provision of hot water at the point of use, both scalding injuries and Legionella are wholly preventable by the use of appropriate safety products.

As well as fitting appropriate valves, a risk assessment should also be carried out to identify potential scalding risks from hot water temperatures and to assess the vulnerability of all those residents who have access to bathing and washing facilities. Questions to be asked should include the following.

- Can the service users get in/out, sit up and/or wash themselves unaided?
- Is the service user's sensitivity to temperature impaired?
- Is the service user's mental state such that they can recognise a bath which is too hot?
- Is the service user capable of summoning assistance if needed?
- Will any lifting or other aids limit the patient's mobility in the bath?
- Is the service user liable to try and run a bath/add water when unattended (a particular issue for confused service users and those with dementia)?

The results of the risk assessment should be recorded on individual service user care plans, which should include an assessment of capabilities and needs and should specify whether a service user is able to wash themselves or bathe unsupervised. Any special care requirements should be specified and made known to all care staff.

Hot Water warning notices should be posted in bathrooms and shower areas and adequate training and supervision should be provided to ensure that all staff involved in bathing service users understand the risks and precautions. All homes should have a set procedure to follow when bathing or showering a resident and this should be taught to all care staff, including locum or agency staff. This will include, in particular, filling the bath before the service user gets into it and monitoring the outlet temperature of the bath/shower water using a bath thermometer and by hand. If it is necessary to add water whilst the service user is in the bath, this should be done slowly and well away from the residents skin, the water being carefully tested as it is added. Final bath temperatures should always be double checked before lowering a resident into the bath from a hoist.

Access to bath areas should be restricted for vulnerable residents and on no account should service users who have been assessed as vulnerable be left unsupervised or unattended in the bath.

### *Other scalding risks*

The danger of scalding applies not only to baths, showers and sinks but also to central heating pipes and radiators. Cases where residents have fallen against a hot radiator and then have been unable to move away, for example, are not uncommon. The result can be severe burns or in some cases, fatalities.

Adequate risk assessments should be carried out wherever a risk may be present. Where the client group presents such a risk, surface temperatures should be reduced to 45°C, or surfaces guarded to protect against contact. The risk of burns from hot surfaces can also be reduced by providing low surface temperature heat emitters, eg cool wall systems and locating sources of heat, out of reach, eg at high level or under floor.

Advice can be obtained from specialist Corgi registered central heating providers.

### *Building maintenance*

Regular expert servicing of hot water systems, boilers and central heating systems is essential if water systems are to be kept safe and central heating is to work efficiently and not fail in cold weather. Such a failure could leave care home residents at risk in cold conditions. Residents and staff can also be at risk of carbon monoxide poisoning from damaged, faulty or poorly maintained boilers.

Water systems should also be maintained by a suitably qualified plumber experienced in the control of Legionella and in the risks of scalding in care homes. Water systems need to be routinely checked and inspected by a competent person and the risk assessment should be reviewed regularly.

It is particularly important that where thermostatic mixing valves are provided they are maintained to at least the standard recommended by the manufacturer. A number of cases of scalding in care homes have seen care home managers claim to Health and Safety Executive inspectors that they had discharged their duty of care by ensuring that valves were fitted. However, the valves were defective or badly maintained and therefore their defence failed.

A documented maintenance schedule, which takes into account local conditions (eg hard water) and the risk of valve failure, should be followed and recorded. Staff should be instructed that water in excess of 44°C coming from a tap should be reported to a responsible person, and access to the bath/shower concerned restricted until repairs to the thermostatic mixing valve have been carried out.

Care home managers should always use a reputable and suitably qualified Corgi registered maintenance contractor to work on the care home system. Maintenance should include regular servicing and safety checks as specified in the original product specifications.

Water monitoring records should be kept which include: details of formal risk assessments, schematic plans of the water system, details of the duties and responsibilities of named appointed persons, and details of weekly/monthly/quarterly/six monthly/annual checks to be carried out on the water system such as flushing of identified water outlets such as sinks and showers, temperature checks of hot and cold water outlets, dismantling, cleaning and de-scaling shower heads and hoses.

#### *Further information*

Other information available includes the following.

- L8 Approved Code of Practice and Guidance(Third edition), HSE Books.
- HSG220 Health and Safety in Care Homes, HSE Books.
- Health Guidance Note: Safe Hot Water and Surface Temperatures, prepared by NHS Estates, HMSO.
- An Introduction to the Control of Legionella Bacteria in Water Systems (Video), HSE Books.
- The Thermostatic Mixing Valve Manufacturers Association (TMVA) at [www.tmva.org.uk](http://www.tmva.org.uk).