

# Thermostatic mixer valves could significantly reduce the risk of scalding in children, study finds

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Using a thermostatic mixer valve to control the maximum temperature of children's bath water can significantly reduce the temperature of hot bath water and should reduce the risk of scalding, according to researchers at The University of Nottingham.

The study, carried out in partnership with Glasgow Housing Association, found that families with a thermostatic mixing valve (TMV) fitted to the hot and cold [water pipes](#) in their bathroom had bath [water temperatures](#) that were up to 11°C cooler than those without and their baths were within the recommended temperature of 46 C.

The researchers are now calling for social and private landlords to commit to providing TMVs as standard in their properties, plumbers to fit them as good practice to all replacement baths and a change in the law to make them a requirement in home refurbishments as well as new builds.

They believe that other vulnerable people such as the elderly or those with disabilities could also benefit from TMVs to reduce their risk of hot water burns.

Professor Denise Kendrick, of The University of Nottingham's Division of Primary Care, led the study.

She said: "Figures show that every year emergency departments in the UK see around 2,000 cases of bath water scalds, most of which occur in children, and these result in about 500 children being admitted to hospital. Admissions mostly occur in children aged under five years old and often involve prolonged inpatient stays, transfer to a specialist hospital or burns unit. In addition, there can be longer-term effects, including disability, disfigurement or psychological damage.

"Scalds also place a significant financial burden on the NHS and society. In 2009, the total cost of scald injuries and deaths from hot tap water was estimated to be £61 million.

"Children from disadvantaged areas and younger children are at greatest risk of scalding. Burns most commonly happen when a child falls or climbs into the bath unsupervised or turns on a hot tap or a parent puts a child into water which is too hot.

"Home water heater thermostats are frequently set at 60°C or above, which can cause a full thickness burn in an adult in 5 seconds and more quickly in children."

Thermostatic mixing valves (TMVs) — not to be confused with less precise mixer taps — are fitted across bath hot and cold water pipes and set the hot tap at a fixed temperature without affecting the temperature of stored hot water or interfering with heating systems. Building regulations were recently updated to require TMVs be fitted into new build properties, extensions and conversions.

However, the Nottingham study is the first of its kind to test TMVs effectiveness and suitability in the home and on a population at a higher risk of scalding.

The study recruited more than 120 families with children aged under

five living in Glasgow Housing Association (GHA) — one of the UK's biggest social housing providers. The participants were split into two groups, one of which received an educational leaflet on bath safety, including the true story of a two-year-old who was scalded by hot bath water, and a TMV set at a maximum temperature of 45°C fitted by a qualified plumber from City Building LLP (Glasgow).

Before the start of the study, both groups had their bath hot tap water temperature measured, and these were measured again three and 12 months after TMVs were fitted. Families were also asked to provide feedback on their satisfaction with their bath water temperature and, in those with a TMV fitted, their views on the valve, fitting process and whether they would recommend it to a friend. The study found that in the homes of families in disadvantaged communities, TMVs and accompanying educational leaflets were effective in reducing bath water temperature to the current recommended 'safe' level for at least 12 months after installation.

Professor Kendrick said: "Most families were satisfied with the temperature and speed of flow of their hot water after fitting, and with the fitting process. Those with a TMV were significantly less likely to check the bath temperature of every bath, but we did not find a negative effect on other safety practices.

"In the event of being unable to detect a reduction in the incidence of bath tap water scalds — a very much larger study would be required to do this — measuring the [temperature](#) of the water is a good substitute."

Cost is often cited as an argument against fitting TMVs and the researchers are now conducting a full economic evaluation of the study to establish whether this has any basis in fact.

Provided by University of Nottingham

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