Scald Burns can Occur in Children and Elderly at Lower Temperatures

Scald burns by domestic tap water constitute a painful, potentially debilitating, and sometimes fatal form of thermal injury.

With scald burns, the very young and older members of the population are particularly susceptible because in part they have thinner skin, which renders them more susceptible to thermal burns and injuries.

Various plumbing codes have set forth a safety standard for a maximum delivery temperature of domestic hot water at 120°F (48.9°C). This temperature limit was based on burn injury research conducted by Dr's Moritz and Henriques in burn studies conducted during the 1940's based on adult susceptibility to burns.

Recent studies have addressed the issue of how the current safety standard for tap water temperature could be adjusted to provide a level of protection to children equivalent to that for an adult at 120°F. Dr Kenneth Diller has developed a mathematical model for predicting burn injury as a function of applied surface temperature and time is used to identify these equivalent conditions. Data from the literature of ultrasound sonographic measurements indicate a representative ratio of child to adult skin thickness of 0.72. The mathematical model shows that the equivalent surface temperature for a threshold scald injury in children is dependent on the depth into the skin at which the injury is identified. For example, the injury produced by a 120 Degrees Fahrenheit with a ten-second exposure at a depth of 600 micrometers in an adult is matched in a child at 72% of the depth or 432 micrometers by an exposure of 115.9 degree Fahrenheit for the same duration. The recommendation is that existing hot water standards be reduced by 3 to 4 degrees Fahrenheit to provide an equivalent level of scald protection to children.

Source: K. Diller Report