Help Needed on Hot Water Burns
KENNETH W. FELDMAN
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To the Editor.—

Tap water scald burns present a serious, yet highly preventable, injury to children. They can be most easily prevented by reduction of home water heater temperatures to safe levels. In order to protect a maximum number of children, efforts have been made to convince the US Consumer Product Safety Commission (CPSC) to modify water heater industry policy. In February 1981, the US Consumer Product Safety Commission rejected a petition requesting a maximum setting of 130°F on new water heaters for home use. They reasoned that this maximum might not provide adequate consumer flexibility and in rejecting the petition planned further efforts to encourage Underwriter’s Laboratories (UL) to reduce the preset temperature on new oil and electric home water heaters to 130°F or less (UL voluntarily reduced settings from 150° to 140°F during the initial petitioning process). In June 1982, noting no further efforts by UL, I petitioned the CPSC to require preset temperatures of 125°F on new oil and electric heaters. CPSC has replied that they will not accept the petition without documentation that injury has occurred with oil or electric heaters using settings of 140°F or less. They are particularly interested in those manufactured after January 1980 when the UL 140°F setting was begun. I feel that heaters under the current 125°F petition will provide consumers with an initially safe water heater while allowing the consumer adequate flexibility of higher heater settings, if they find 125°F unsatisfactory.

I have on file several cases of scald burns that occurred at settings less than 140°F, and I will submit these to the CPSC. I would appreciate it if pediatricians who see children with tap water burns would obtain a history of the injury scenario and water heater temperature and submit them to: Nancy Steorts, Chairman, US Consumer Product Safety Commission, Washington, DC 20207 (a copy sent to me would also be appreciated).

Without continued pressure, efforts to obtain safe home water temperatures will die in the bureaucracy.

In the past, experimental estimates of burning time with hot liquids have only discussed adults.1 Burning time is dependent on time for heat to penetrate to the basal layers of the skin. In turn, heat penetration is proportionate to skin thickness. With long, low temperature exposures, this penetration time is insignificant compared to the total time of hot liquid contact. At the low temperature extreme, both premature infants with their thin, fragile skin and adults sustain first degree burns with six-hour exposures to 45°C (113°F) water.2-4 With temperatures of greater than 54°C (130°F), the time of heat penetration predominates and burning times of children and adults differ.

Estimates of burning times and temperatures, using Henries equations 11 and 125 and the 0.5-mm skin

| TABLE. Minimum Times and Temperatures Causing Scald Burns in Children and Adults |
|-----------------------------------------------|------------------|------------------|------------------|
| Temperature | Subthreshold (s)† |
| Full Thickness Burns (s)‡ | | | |
| Adult Calculated 1 | Adult Experimental 1 | Child§ Calculated 1 | Adult Calculated 1 | Adult Experimental 1 | Child§ Calculated 1 |
| 0.5 | 1 | ... | 70°C (158°F) | 0.4 | ... |
| 1.0 | 2 | 0.5 | 65°C (149°F) | 1.0 | 0.7 | 0.3 |
| 3.0 | 5 | 1.0 | 60°C (140°F) | 2.3 | 2.6 | 0.5 |
| ... | ... | ... | 57°C (135°F) | ... | ... | 2.0 |
| 13.0 | 16 | ... | 55°C (133°F) | 8.1 | 8.3 | ... |
| 31.0 | 35 | 10.0 | 54°C (130°F) | 19.0 | 18 | 6.0 |

* As used in original paper, corresponds to minimum time and temperature causing deep second degree burns.
† Corresponds to minimum time and temperature causing first degree burns.
‡ Based on adult thigh skin thickness of 2.5 mm.4
§ Based on 0- to 5-year-old female child medial thigh skin thickness of 0.56 mm.4
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systems' health care resources to address their problems
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Consultants to Schools
To the Editor.—
Recent studies1–3 have shown that children use school
systems' health care resources to address their problems
of both “new” and “old” morbidity. Because schools
generally do not provide primary health care, such chil-
dren may be less than adequately served. Wright and
Vanderpool4 have proposed that pediatricians make in-
creased efforts to bolster schools' involvement with and
understanding of child health issues by serving as con-
sultants. This appears to be one rational strategy to follow
while we continue to strive to make comprehensive pri-
mary health care universally available to children.

We have recently reported in detail our experiences as
paid part-time pediatric consultants to a large (55,000
students) urban school district.4 The three of us, all
teachers of ambulatory pediatrics in a medical school
department of pediatrics, obtained a contract to provide
pediatric consultation (not direct care) to the school
system. This opportunity presented itself when the pre-
viously employed full-time school physician unexpectedly
resigned in late August. Our services have included one
half day per week by each of us on-site in the schools and
full-time telephone or telepager availability for questions
of a more urgent nature. The great majority of consulta-
tions have dealt with medical or educational management
of individual students. Relatively few requests were made
for advice on programmatic issues. Fully half of the
individual consultation requests were directed toward
behavioral or emotional problems and physically handi-
capping conditions. The school system that we serve uses
a tiered system of health clerks, nurses, and school nurse
practitioners to screen and address health problems.
These people have been not only receptive to this model
but also enthusiastic about our services. In addition to
consultation services, during the first year we developed
and presented a major in-service series attended by more
than 300 school personnel. We have found that the
schools also provide a substantial population base that
can be used for formulating and addressing research
questions.5

Our purpose in briefly reporting our experience here is
to provide pediatricians with evidence that Wright and
Vanderpool's suggestions can be practically carried out.
We encourage physicians with interests in the health of
children in schools to consider developing “official” con-
sulting relationships with their school systems. Finally,
we urge that others who have utilized opportunities to
set up workable models in this area share their experi-
ences.

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