

# Hot Substances

Chestnuts roasting on an open fire and hot cups of cider after a day in the snow are just two classic images of warmth for this time of year. At SMARTRISK and the Ministry of Health, we wish all of you a warm and happy holiday season. We also wish you and your loved ones a season free of injury, and thus we'd like to remind you that warmth can lead to burns.

During the holiday season, there are many circumstances during which one is exposed to a hot substance:

- Preparing and feasting on hot festive foods and drinks;
- Warming up in front of the fireplace;
- Ironing clothes and curling hair for the holiday party.

By recognizing the risk of hot substances, we can all enjoy a warm, happy, and injury-free season.

## An All-Too-Familiar Story

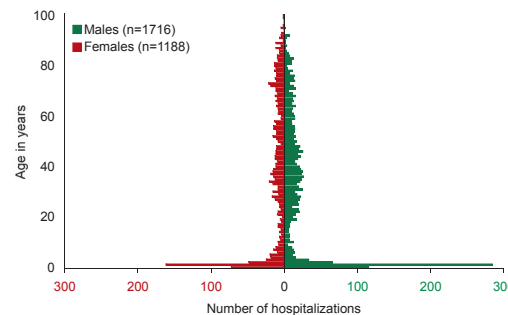
Nancy is getting ready for her holiday party. She is in the process of preparing the meal and decides to make herself a cup of tea. She pours the hot water into the teacup on the kitchen table and turns to tend to the food in the oven. Jason, an 18-month old, toddles over to the table. Curious, he reaches up and pulls the cup towards himself, knocking it over. It spills onto the side of his face and his shoulder and chest. He suffers second degree burns to more than 10% of his body surface and is admitted to hospital.

## The Ontario Picture

Hot substances accounted for 2,905 injury hospitalizations in Ontario over the 5-year period from 1997/98 to 2001/02. Approximately 60% of the injury hospitalizations occurred among males (Figure 1). The highest rates of hospitalization were observed among the very young (<5 years of age) and old (90+ years of age; Figure 2).

Hot liquids or vapours (including steam) were reported as the substance causing the injury in about 73% of the cases. Caustic/corrosive substances and other

**FIGURE 1. Injuries caused by hot substances by age and sex (Ontario, 1997/98-2001/02)**

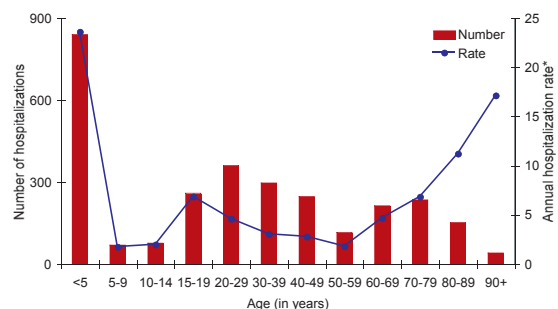


Note: Unknown age for 1 case.

substances such as electric heating appliances accounted for 9% and 17% of the cases, respectively. While hot liquids or vapours were the primary type of hot substance causing injury in all age groups, the proportion of injuries caused by caustic/corrosive substances and other substances was higher among adults compared to young children (Figure 3).

Burns were the most responsible diagnosis for hospital admission in 77.8% (2261/2905) of injuries

**FIGURE 2. Number and rate of injuries caused by hot substances by age (Ontario, 1997/98-2001/02)**



\*Age-specific rate per 100,000 population. Note: Unknown age for 1 case.

**TABLE 1. Description of injuries caused by hot substances in Ontario by region of residence (1997/98-2001/02)**

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
<b>Number of hospitalizations</b>								
Total over 5 years	444	287	475	301	744	223	391	<b>2905</b>
Average/year	89	57	95	60	149	45	78	<b>581</b>
<b>Annual hospitalization rate*</b>								
(95% confidence interval)	(4.7-7.1)	(3.7-6.3)	(3.8-5.6)	(2.4-4.0)	(4.9-6.8)	(2.0-3.7)	(6.8-10.7)	<b>(4.6-5.5)</b>
% male	60.7	56.8	59.8	51.5	59.9	59.2	62.7	<b>59.1</b>
<b>Length of hospital stay</b>								
Average days (range)	9 (1-99)	12 (1-166)	8 (1-220)	10 (1-79)	12 (1-265)	12 (1-192)	9 (1-328)	<b>10 (1-328)</b>

\* Age-standardized rate per 100,000 population

Note: 39 cases were hospitalized in an Ontario hospital but did not reside in the province and unknown age for 1 case.

# Ontario Injury Compass

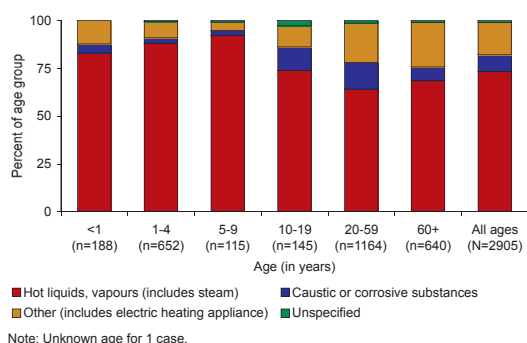
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**FIGURE 3. Type of hot substance by age (Ontario, 1997/98-2001/02)**



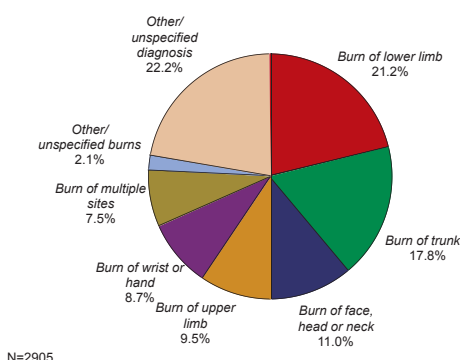
caused by hot substances. Burns of the lower limb (21.2%), trunk (17.8%), and face/head/neck (11.0%) were most common (Figure 4).

In Ontario, the annual age-standardized hospitalization rate for injuries caused by hot substances was 5.0 per 100,000 population (Table 1). By region, the annual hospitalization rate ranged from a low of 2.9 per 100,000 population in the East to a high of 8.8 in the North region (Table 1).

Injuries caused by hot substances accounted for 30,085 days in hospital in Ontario over the 5-year period. The average length of hospital stay was 10 days. By region, the average length of stay ranged from 8 to 12 days (Table 1).

In this analysis, it was not possible to determine the specific substance that caused the injury. Previous studies have focused primarily on children and report that injuries during food preparation or consumption (e.g., hot beverages, hot liquids from pots, steam from kettles), bath scalds, and contact injuries (e.g., irons, gas fireplaces, ovens) are frequent causes of hot substance injury<sup>1-3</sup>.

**FIGURE 4. Most responsible diagnosis for injuries caused by hot substances (Ontario, 1997/98-2001/02)**



## Methods

The source of these data is the Discharge Abstract Database from the Canadian Institute for Health Information. The Discharge Abstract Database (DAD) contains data on hospital discharges across Canada. Data include cases discharged from an acute care facility in Ontario for the fiscal years of 1997/98 to 2001/02. An injury caused by a hot substance, object, caustic or corrosive material, or steam is defined using code E924 in the International Classification of Diseases, 9th revision (ICD-9). Regions of Ontario are defined according to the Ontario Ministry of Health Region Code.

## Managing the risk

### Kitchen and Dining Room:

- Unplug appliances when not in use and keep cords away from the edge of the counter.
- Turn pot handles inward, toward the back of the stove. Cook on the rear burners whenever possible. Be aware of potential contact burns from oven doors and other hot appliances.
- Consider using placemats instead of tablecloths. Young children may pull themselves up or items such as wheelchairs or walkers may become entangled.

### Living Room:

- Be aware of potential contact burns from fireplaces, wood-burning stoves, irons, heaters, radiators, curling irons, and other hot objects.
- Teach children about the dangers of fire. Children are fascinated by heat and fire and may not understand the dangers.
- If you have a gas fireplace, keep small children way from it at all times. If you have a wood-burning fireplace, be sure to use a screen or doors that close.

### Bathroom:

- Adjust the thermostat setting on your water heater to produce a water temperature of 49 degrees Celsius (120 degrees Fahrenheit).
- For a bath, run the cold water first and then gradually add hot until you get the right temperature.
- Always check the water temperature before placing a child into the bath or before getting into the tub yourself. Seat your children away from the faucet handles in the bath.

### How to treat a burn or scald:

- Immediately remove the injured individual from the source of heat and carefully remove any hot or wet clothing or other items such as jewelry.
- Cool the burn by running cool water over the affected area. Do not apply ice or ice water. Cooling the burn is very important as damage caused by burns continues even after the heat source has been removed.

For more information see:

**Safe Kids Canada**  
[http://www.safekidscanada.ca/ENGLISH/Safety\\_Tips/ST\\_More\\_scald\\_tips.html](http://www.safekidscanada.ca/ENGLISH/Safety_Tips/ST_More_scald_tips.html)

**Canadian Health Network**  
<http://www.canadian-health-network.ca> search under "burns"

**Toronto Public Health**  
[www.city.toronto.on.ca/health/scalds\\_and\\_burns.pdf](http://www.city.toronto.on.ca/health/scalds_and_burns.pdf)

## References

1. Burns in young children: a study of the mechanism of burns in children aged 5 years and under in Hamilton, Ontario Burn Unit. *Burns* 1995;21:463-5.
2. Epidemiology of childhood burns in Critical Care Medical Center of Kinki University Hospital in Osaka, Japan. *Burns* 2000;26:465-9.
3. Burn injuries among young children in an urban emergency department. *Pediatr Emerg Care* 1994;10:98-101.