



Hazard
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**Victorian Injury
Surveillance System**

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This edition of Hazard describes burn injuries to all ages both as they present to VISS hospitals and for statewide hospital admissions. The major focus is on prevention. An update on dog bite injuries is also included.

Burns prevention

Marga Penny

Introduction

In order to prevent burns it is first necessary to define the size and nature of the problem. This report includes analyses of burns and related asphyxiation injuries from VISS hospital emergency departments in Melbourne and the Latrobe Valley and recommendations for prevention. It also includes an overview of state-wide Victorian hospital admissions for burns, and trend analyses between 1986 and 1991.

The cost of burns is high. In human terms, the pain, suffering and possible long-term disfigurement or disability affects the victim and the family. The economic cost is also great. Hospital treatment for burns patients costs the community an estimated \$1,500 per patient per day (Keogh 1992). Finally, property damage from fires is also a significant economic cost.

A combination of environmental and behavioural factors lead to burns. For example, in the most common burns scenario, a person leaves a cup of hot coffee within reach of a toddler who knocks it over onto himself. Wherever possible interventions should be aimed at environmental or design features that will minimise the risk or at least the severity of such injuries. In this case, a cup with a wide non-slip base and a lid would do just that (see section on Recommendations below for further details).

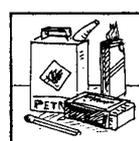
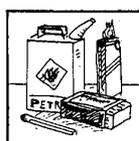
In other cases the possible solutions are not so readily apparent or straight forward. For example, the misuse of petrol in many of the flame burns or fires, or carelessness when opening a car radiator cap leading to facial scalds, may need more complex preventive measures.

Many of the burn causes discussed below can also be hazardous in other contexts (e.g. bath - drowning; steam inhalation - poisoning; irons - falling onto victims; cigarettes - poisoning by ingestion; faulty appliances electrocution).

Methods/definition

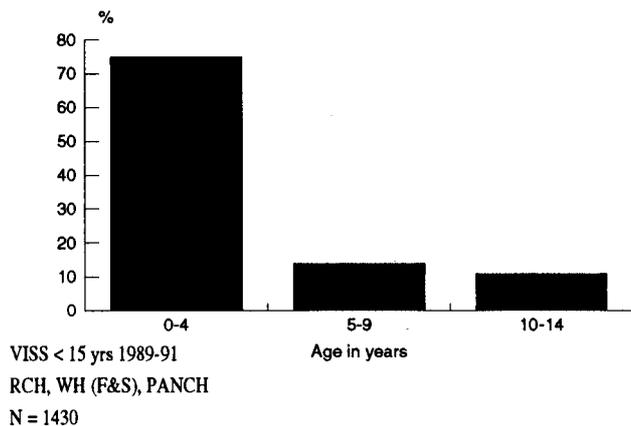
This article focuses on thermal injuries caused by contact with hot objects, scalds and flame burns or involvement with fire (including smoke inhalation). It does not include sunburn, electrical or chemical burns or exposure to cold. An effort has been made to match as closely as possible the burns categories as defined in the International Classification of Diseases (ICD-9) for comparative purposes¹. The data has been analysed using a combination of the Injury Surveillance and Information Systems reporting program, and analyses of case narratives.

1. The definition of thermal injuries (ICD-9 E codes) used in this article are E890-899, E924.0.8 & 9.)



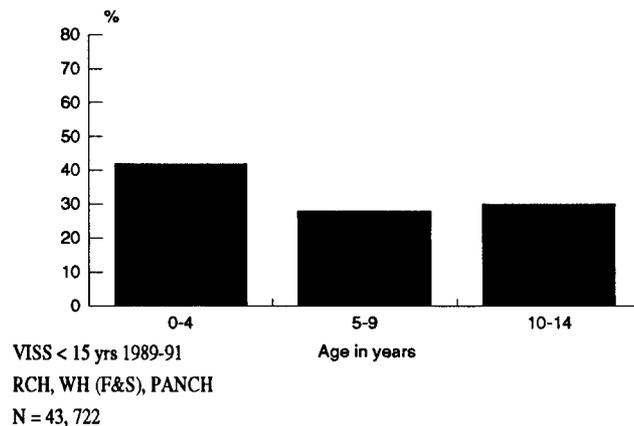
Burns

Figure 1a



All Injuries

Figure 1b



Burns to children

Emergency department presentations

The following analyses are based on data collected from the emergency departments of the Royal Children's Hospital (RCH), Preston and Northcote Community Hospital (PANCH) and Western Hospital (Footscray and Sunshine) (WH - F & S) for children aged 0 to 14 years over a three year period (1989-91).

During the past three years, 1,430 children presented to a VISS hospital with burns. Burns accounted for 3.3% of all injury presentations and 6.8% of injury admissions. This is compared to other specific causes of injury presentations such as falls (35%), motor vehicle-related trauma (7%) and poisoning (4.3%).

Background

Age pattern

The majority of children presenting with burns (75%) were aged 0-4 years.

(Figures 1a and 1b).

Major types of burns

For scalds and contact with hot objects, young children aged 0 to 4 years, particularly toddlers aged 1 year old are most at risk. The age pattern differs markedly for flame/fire injuries, with older children, especially teenage boys, most involved. (Figure 2).

Females are comparatively more prone to scald injuries (sex ratio 1.3 to 1.0) and males are over-represented in both the contact and fire/flame burns categories (1.7 to 1.0 and 1.9 to 1.0 respectively). The sex ratio for all types of injuries in this age group is 1.5 to 1.0 (males to females).

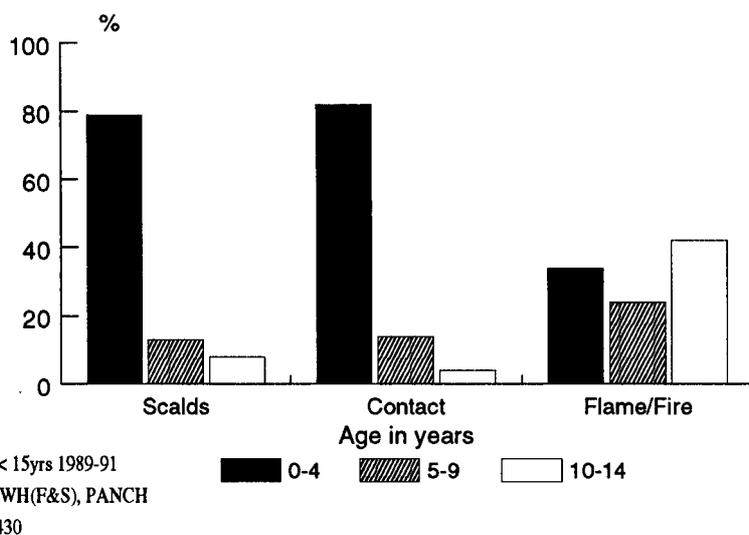
Most of the burns occurred between 8am and 9pm, with a peak time in the evening (6pm to 8pm). Burns were most common on weekends, with the highest frequency of injuries on Sundays. Overall there was little seasonal variation, with a slight peak in mid-winter (July). The patterns varied slightly for different types of burns: contact burns peaked in the summer holidays (December & January) and again in April.

The only specifically 'summer' items were barbecues which were small in number.

Burns to children generally occurred at home (78%), usually in the child's own home. The proportion occurring at home differed slightly according to the type of exposure: flame/fire (71%); contact (82%); and scalds (82%). The few incidents that were reported to have occurred in shops or restaurants (28) were similar to those that occurred at home - two thirds were the result of a hot drink being pulled or knocked onto the victim, usually by the victims themselves.

Age Pattern for Major Types of Burns

Figure 2



Outcome

Although the numbers are smaller, it is clear that flame/fire burns with an admission rate of 55% are generally more severe than either scalds or contact burns (38% and 21% respectively). (Table 1). However the overall number of admissions for scalds is very high and poses the greatest problem in terms of acute care service delivery. The admission rate for burns is 36% which is double the average for all types of injuries. A recent study of scalds in children in New South Wales showed that they had similar admission rates (36%) (Carey 1992).

Body Part Injured

Contact burns were most commonly to the hands or fingers - 60% of all contact burns and the rest of the upper limbs accounted for another 8% of contact burns. This is in contrast to the

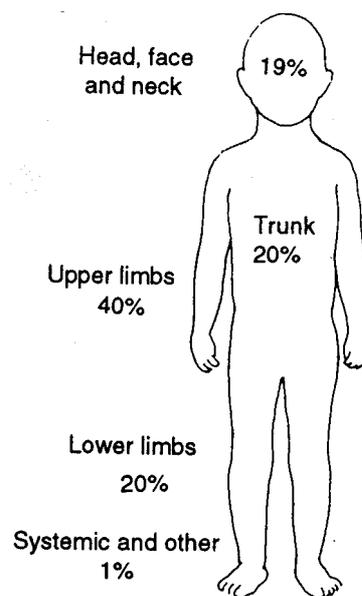
distribution for burns to the entire upper limbs caused by scalds (35%) and flame/fire (32%). A higher proportion of scald injuries were to the upper body - 25% to the neck, shoulders and chest (particularly the chest) and 12% to the face and scalp. Figure 3 shows the overall distribution of burns by body part.

Nature of injury

Of all burns, on presentation to emergency, 87% were partial thickness (PT) and 13% were full thickness (FT). This pattern varied according to the cause of the burns. Scalds were 91% PT; contact were 84% PT; and fire/flame were 67% PT. In addition, 18 children in the latter category suffered from asphyxiation or poisoning as a result of smoke inhalation. The final estimates of severity may vary from those determined in the emergency department.

Body Part Injured N (injuries) = 2373

Figure 3



Severity

Table 1

treatment	Scalds n = 961 %	Contact n = 302 %	Flame n = 158 %	All burns n = 1430 %
minor	11	18	12	13
major	51	61	33	51
admit/transf	38	21	55	36
total	100	100	100	100

Minor treatment' refers to those patients who only required treatment in Emergency.

'Major treatment' cases were treated in Emergency and had further follow-up care or referral.

VISS: <15 yrs 1989-91 - Burns

VISS: <15 yrs, 1989 - 1991

Burns (number of injured children = 1430)

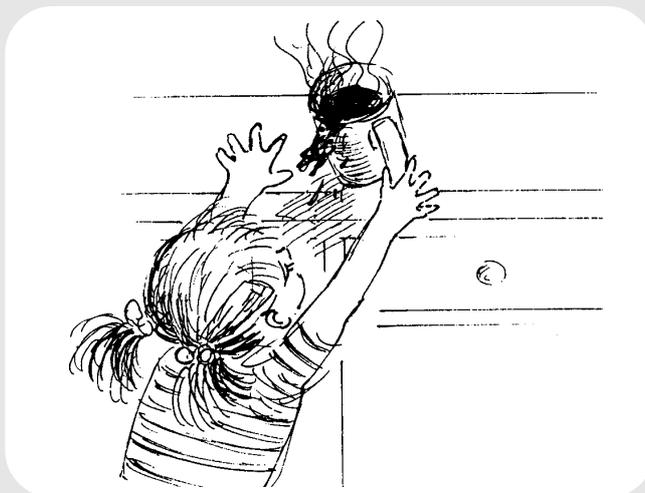
NB: Up to 3 injuries may be recorded per person

The clinical severity of a burn is calculated from the total body surface area (TBSA) and the depth of burn. It is also determined by the body part affected. For example, a 7% burn to the face or hand is more severe than a burn of the same size to the thigh. Full thickness burns require skin grafting. VISS does not record the TBSA.

Profile of a Typical Burns Patient

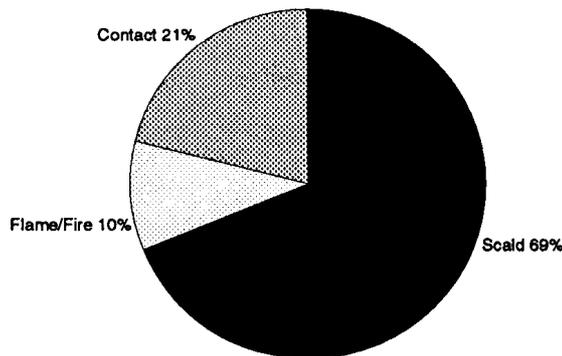
A toddler reaches up to the kitchen bench and pulls a cup of hot tea or coffee onto himself. The burn will cover about 10% of his body, usually his face, neck, shoulder, upper chest and arm. There is a one in five chance that he will require skin grafts as about 20% of these scalds patients sustain full thickness burns. He will need to spend about 10 to 14 days in hospital and further follow-up care may involve dressings, physiotherapy, check-ups and pressure therapy for scar management (Keogh 1992).

Very few people in the community realise how harmful spilling a hot drink can be to small children. **HOT WATER BURNS LIKE FIRE.**



What caused the injuries?

Types of burns to children



VISS < 15yrs 1989-91. RCH, WH(F&S), PANCH. N=1430

Two thirds of all thermal injuries were scalds. The single biggest cause of all types of burns to children was scalds from tea or coffee (26%) followed by scalds from other cooking liquids such as water or oil in kitchen utensils (19%), and tap water scalds (10%). Contact burns made up 21% of all burns - mostly kitchen appliances - and injuries from fire/flame made up 10%. Overall, at least half of all burn injuries to children occurred in the kitchen or involved hot food or drink.

Scalds (n=961)

(See Table 2)

Hot drinks (n=366)

The great majority of scalds from hot drinks were caused by toddlers pulling over or knocking cups of tea or coffee onto themselves. When the location of the hot drink was specified, tables (71),

or kitchen benches (47) were the most common sites.

In the remaining 248 cases (where the story provided enough details) someone else knocked or spilled a drink onto the victim in 29 cases, the child collided with someone holding a hot drink (8), and 12 children were reported to have been sitting in someone's lap or being nursed.

Hot water (n:450)

Cooking or food preparation (n=173)

Over half of these incidents (53%) involved kettles, jugs or urns. Most children pulled the appliance down or knocked it over onto themselves and in 19 cases it was reported that they pulled on the cords. Several of these toddlers were also in babywalkers at the time which gave them greater stability and height. Therefore they had easier access

to the cords. About a third of the cooking related injuries were caused by victims bumping into others who were holding kettles, or children were scalded when other people (often siblings) dropped or spilled water from kettles. A small proportion of older children were injured whilst they were preparing hot drinks.

Thirty children were injured after they pulled a saucepan off the stove, or knocked a bowl of hot water off a bench. Jugs of hot water that were used to heat babies' bottles were responsible for 22 scalds. There were 8 recorded cases where children were injured by water from 'airpots' or vacuum flasks mostly when airpots tipped over in the car.

Tap water (n=147)

The most frequent single source of hot water scalds was from tap water in baths, taps or sinks. Baths accounted for 81%. A combination of factors contributed - the level of supervision, the actions of others (siblings or adults) and in all cases the temperature of the water as it leaves the tap. The following descriptions are of interest. In 70 cases the children got into, or were placed into hot baths. It is known that adults were present in 10 cases and the children were with siblings in 19 cases. In most of the above cases (51) the baths were in the process of being run or had been run with hot water first. In another 39 cases, children accessed the hot water taps themselves - either turned on by the victims or by siblings.

Other hot water (n=92)

A variety of hazards have been identified including buckets of hot water used for domestic cleaning or soaking nappies (21), vaporisers (16), hot water services (4), hot water bottles (3) and car radiators (2). The vaporisers are of interest as only 3 were described as equipment designed specifically for that task. The other items used were electric frypans, bowls, or buckets containing hot water and usually an inhalant. There is some debate among respiratory physicians about whether or not steam inhalations have any therapeutic value. Buckets are also a special problem as they pose the additional hazard of chemical burns from cleaning agents, and the risk of drowning.

Scalds

Table 2

Mechanism Factor	N	%
hot drinks - tea, coffee	366	38
hot water - cooking	173	18
hot water - bath, tap, shower	147	15
hot water - other	92	10
cooking oil, fat	50	5
soup, gravy	46	5
hot water - N/S	38	4
other	49	5
Total	961	100

VISS < 15 yrs 1989-91



Oil, fat, soup or gravy (n=96)

Over half of these injuries were caused by the children pulling over or knocking objects which contained hot liquids (n=57). Almost half of these incidents occurred whilst the children were eating soup. Thirteen children were cooking - mostly fried foods - and another 3 younger children pulled on the cords of electric frypans. A further 28 children were burned when an other person spilled the liquid on them, usually because the child was in their way, or collided with them.

Other scalds (n=49)

The predominant factors in this category were cooked food (18) such as pasta, and toffee (6).

Contact burns (n=294)

Heaters (n=73)

Typically the precipitating factor in these burns was the child reaching out and touching the heater (41). Eight children had little or no protection from clothing since they were drying off after baths or getting dressed. Three children were in baby walkers. Seven children either touched hot grills/guards or reached through the grills to touch hot glass or the bars of the radiators. Thirteen children were burned when they fell onto or reached out and touched fireplaces or wood stoves.

Stoves, ovens (n=52)

Twenty-nine children - mostly young toddlers - touched a hot oven door and a further 16 touched hot plates.

Irons (n=48)

Children actively reached up and touched the irons with fingers or hands in most cases (28) or pulled/knocked over the irons, usually injuring their faces or feet in another 15 cases.

Barbecues (n=28)

Children touched, or brushed past barbecues (13); tripped or fell onto barbecues (9); or stepped onto or leaned against hot plates (5).

Kitchen appliances (n=19)

In the 13 cases where children touched hot kettles, pans or pots, they could also

Contact burns

Heat Source	N	%
heaters (elect., gas, wood)	73	25
ovens, stoves	52	18
irons	48	16
barbecues	28	9
kitchen appliances	19	7
cigarettes	14	5
other	60	20
Total	294	100

VISS < 15 yrs 1989-91

have been scalded by the contents had they knocked the object over.

Other (n=60)

This category includes 14 children who touched exhaust pipes, usually on motor bikes (5 of these children were riding motor bikes at the time), 8 children who touched tools or pieces of equipment (eg. soldering iron), 5 who picked up or stood on hot ashes or coals, 4 who touched or were eating very hot food, 3 who touched bedside lamps and 3 children who were in contact with hot seat belt buckles or car steering wheels.

Cigarettes (n=14)

In all cases the children walked into or were burned by adults holding cigarettes. Half of the children received burns to their eyes. Over the same period of time 16 cases of poisoning to children from ingestion of cigarettes were recorded in the VISS database.

Table 3

Flame/fire injuries (n=140)

Almost half (47%) of the injuries in this category involved boys aged 5 to 14 years, mostly aged 10 to 14 years. The majority of these injuries (32) were caused by the use of flammable liquids (usually petrol) or other sources of heat or fuel (eg matches/ lighters or aerosol cans). (Table 4.) In a few cases, other people were responsible (usually playmates), but most often the victims themselves started the fires.

The 'faulty equipment' category includes flames from gas stoves or hot water services which flared out whilst the appliance was being lit by a child (5). This could have been the result of incompetence or lack of experience on the part of the children, allowing too much gas to build up before ignition. There were also 8 similar cases among adults (see below).

Flame/Fire Injuries

Hazard	N	%
petrol, flammable liquids*	39	28
house or car fires	18	13
matches, cigarette lighters	15	11
faulty equipment	8	6
other, N/S	60	42
Total	140	100

Table 4

* Note: The above categories are mutually exclusive, however, many of the petrol or flammable liquids cases were ignited with matches or lighters

VISS < 15yrs 1989-91



Burns in adults and older adolescents

Method

One year of data from two VISS adult collections (15 years of age or greater) have been aggregated - 1991 for Western Hospital Footscray (WHF) and July 1991 to June 1992 for the Latrobe Regional Hospital, Traralgon and Moe campuses (LRH). Any major differences in the injury patterns are described below.

Injury Patterns

There was a total of 272 burns presentations to these hospitals during a twelve month period. This represents only 2% of all injury presentations, compared to 3.3% for children. The great majority of those injured (89%) were aged between 15 and 39 years, and almost half of these were in the youngest age group (15 to 24 years). A third of all burns (30%) were work related and of these 81 injuries, most occurred in the manufacturing (28%) or health sectors (23%).

The proportion of injury presentations accounted for by burns at the LRH was twice that for the WHF. Contact burns in particular were more common at LRH. A larger proportion of victims presenting to WHF than the LRH were injured at work, whereas there was a higher proportion of cooking injuries at LRH. The age distribution of the burns victims at the two hospitals was similar, but there was a difference in the sex ratio. At the LRH the ratio of males to females was 1.5 to 1, whereas at the WHF it was 1.8 to 1.

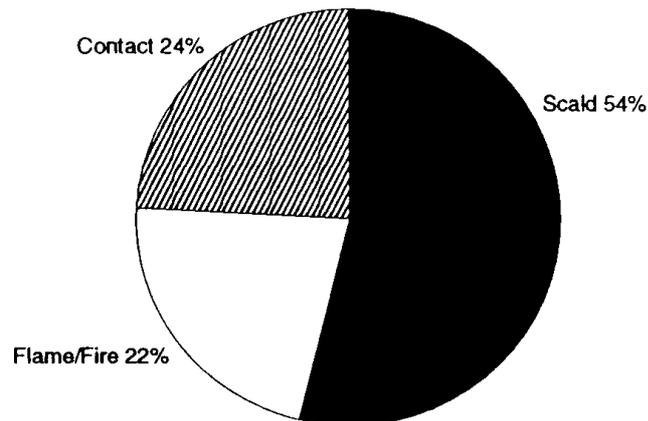
Mechanism of injury

Scalds (n:147)

Seventy-seven people were scalded by hot water. The largest single cause of scalds was water or steam from car radiators (36%). Cooking utensils (such as kettles, saucepans or cups) accounted for another 36% and four people were injured by hot water from high pressure hoses, shower hoses or taps. There were no immersion injuries in oaths. Nine incidents involved industrial equipment (e.g. cleaning out a boiler). Hot oil or fat injured 38 people. Over half were due to the victims dropping or otherwise

Type of burns to adolescents & adults

Figure 5



VISS ≥ 15 yrs. WH(F) 1991, N=95. LRH 1991/92, N=177

losing control of cooking utensils or pots containing hot fat. In the remaining "other" category (25), over half were caused by exposure to steam. Most occurred whilst the people were cooking and the remainder involved industrial equipment.

Contact (n=64)

The use of industrial or other equipment caused over a third of these injuries. Welders were the largest single category (19) and this included 9 flash burns, mostly to people's eyes. Food preparation was responsible for 19 contact burns mostly whilst people were removing things from ovens, or when they touched hot plates. Touching exhaust pipes on a variety of vehicles injured 5 people.

Fire/flame (n=61)

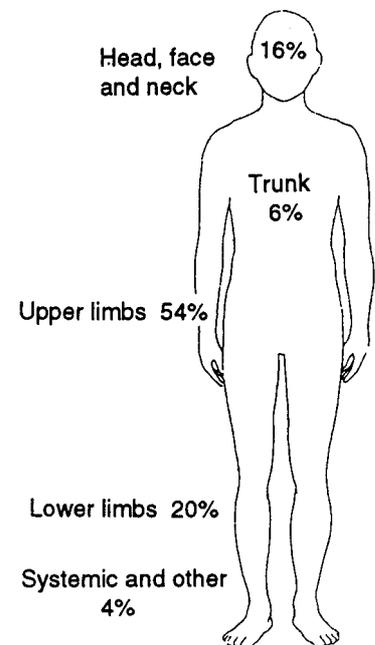
Flammable liquids or petrol engines were a dominant factor in causing flame burns or fires. There were 17 such injuries, and half of these were caused by active misuse of petrol. In the other incidents involving flammable liquids or engines the victim was passive standing nearby when fuel engines or motors caught fire, exploded or back-fired.

All of the latter burns, (where the victim was passive) were of partial thickness, but tended to be spread over a wider area of the body. Only one person in this group was admitted to hospital.

Two people were smoking in bed and started fires, and two people used cloth tea towels to remove pots from stoves. The towels caught fire. Lighting gas appliances proved hazardous for 9 people. Five were injured while lighting hot water services and 3 more were burned when there was a delay between the stoves or ovens being turned on and the time of ignition. Another 7 apparent product failures included house fires started by faulty electrical appliances.

Body Part Injured

Figure 6



VISS: ≥15 yrs, WHF (1991) and LRH (7/91 - 6/92)
Burns (N of injured people= 272)
NB: Up to 3 injuries may be recorded per person



Comparison of child and adult burns

The mechanism of injury in adult burns differed from that for children. There were proportionally fewer scalds in adults (54% of adults compared to 67% of children) and more flame/fire injuries (23% compared to 10%). The proportion of adults (24%) and children (21%) who

received contact burns was similar. Only 9% of adults required admission or transfer to hospital, compared to an admission rate of 36% for children. The skin of infants and young children burns more deeply and quickly and at lower temperatures than that of most adults (Wilson 1991). In addition, the relative surface area affected in a child is much

greater than for an adult for a similar exposure.

There were proportionally more burns to the upper limbs in adults than in children (54% compared to 40%) and adults received fewer burns to the trunk (6% compared to 20%). See Figures 3 & 6 for a comparison of body parts injured.

Victorian state-wide hospital admissions: data and trends for burns

Frequency and rate data for hospital admissions over the past five years in the State of Victoria (July 1986 to June 1991) have been reviewed in a recent study (Langlois 1992- in preparation).

The data show that for male children (less than 15 years old) there has been a decrease in the rate of hospitalisations for burns. The pattern is less clear for females in the same age group. There has been a general decrease in the rate of admissions for all unintentional injuries to children during this time, mostly accounted for by a reduction in transport injuries.

Age pattern

Figure 7 shows that children aged under 5 years have a much higher frequency of hospital admission for burn injuries than adults.

The burn rate for children aged 1-4 years was 115 per 100,000 compared to an overall rate for all ages of 25 per 100,000.

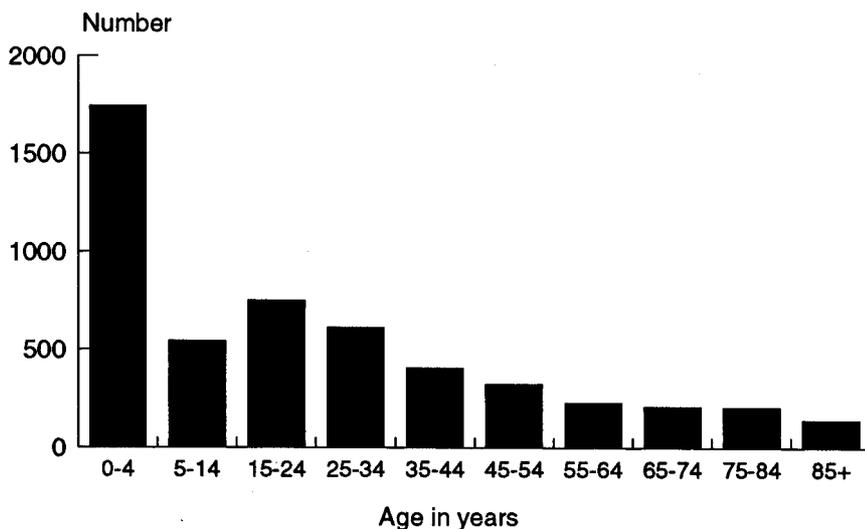
First Aid

Prompt first aid can lessen the severity of a burn and can improve the possible outcome for the victim (Mat thews et al 1991). The basic rules are that the victim should be removed from the heat source. In the case of a person who is on fire they should 'stop - drop - roll' to extinguish the flames. The clothing of scalds victims should be removed as heat will be trapped in the damp fabric. For all burns victims restrictive clothing such as shoes or jewellery should be removed before it cuts off the circulation.

All burns victims should have the affected area cooled as rapidly as possible - every second counts. For 10 minutes the burn should be either immersed in cold water or a cold compress applied. Care should be taken not to chill the patient. Once the burn has been cooled the affected area should be covered with clean dry cloth such as a sheet, pillowcase or tea towel. Do not apply any creams or ointments. The person should be taken to the nearest hospital or other treatment facility as quickly as possible.

Frequency of hospital admissions for burns* by age group Victoria 1986-1991

Figure 7



* includes smoke inhalation

N = 5,182



Recommendations for prevention

Some injury prevention devices or methods discussed below are well known but may not have been formally evaluated. Others have yet to be designed, developed or tested. Certain hazards which are specific to children will be addressed separately. Supportive measures such as warning labels, printed materials and public education campaigns in conjunction with the environmental, legislative and design measures discussed below may have an effective role to play.

Burns prevention - all ages

Tap water

Most of the hot water scald injuries resulted from hot tap water. These need to be prevented at the source of the problem - the high thermostat setting of domestic hot water services. The two most effective strategies are to either turn down the thermostat to lower the storage temperature of hot water or to install a thermostatic mixing valve as the hot water leaves the heating unit. Water temperatures of between 60 and 65°C can cause full thickness burns of adult skin in 2 and 6 seconds respectively (Erdman et al 1991). The water temperature in the average Victorian home is between 63 and 75°C (personal communication SEC 1992).

There is some controversy regarding the optimal temperature. If the setting is too low it may not be acceptable to householders and there is thought to be a slight risk that the Legionella bacteria may grow in temperatures below 55°C.

The Australia and New Zealand Burn Association recommends that the hot water service temperature should be kept at 55°C. According to some American researchers the temperature should be between 49 and 52°C and one stipulated that 51.6°C was the optimal temperature (McGloughlin 1990).

Legislation in Washington State (USA) was enacted in 1983 which required new water heaters to be preset at 49°C. Further education programs were aimed at persuading owners of existing services to voluntarily lower their water heater temperature. Both elements of this

program were successful in reducing the mean hot water temperature in people's homes throughout the state and this resulted in a reduction in the number of tap water scalds (Erdman 1991).

Devices that enable people to measure the temperature of the bath water in their own home are presently available in Australia at relatively low cost from a limited number of outlets. However these thermometers could be made available - free of charge or subsidised - to groups that are at high risk for scalds (parents of young children and the elderly) with the financial support of a sponsor.

Radiator caps

A thermostat could be developed which is attached to a safety catch that does not permit opening if the radiator water is above a certain temperature &/or pressure.

Airpots

Ideally the design of the airpot should be modified so that it can tip over without spilling hot water. There is a product safety regulation for Airpots (Statutory Rules 1992 No. 36) which includes labelling with the following words

"CAUTION: THIS AIRPOT MAY LEAK. KEEP UPRIGHT AT ALL TIMES. CLEAN PUMP THOROUGHLY AFTER USE".

In this present climate of deregulation attempts were made early this year to repeal the Regulation. VISS contributed to a successful submission by the Victorian Ministry of Consumer Affairs which led to its retention.

Heaters, fire places

A guard made of heat-resistant material that surrounds the item at a suitable distance would reduce contact burns. Consideration should be given to designing heaters to minimise the risk of contact burns. In addition fire screens should be used to prevent sparks or live coals from leaving the fireplace.

Welding & other industrial equipment

Ongoing training of workers and maintenance of equipment may reduce the number or severity of burns.

Secondary prevention may be achieved by wearing protective clothing, particularly eye covering.

Smoke detectors

Detectors are required to be installed in all new homes in Victoria, and in those undergoing renovation. Regulations requiring smoke detectors in all tenanted and public housing is recommended. In addition, all existing residential properties should be required to have a smoke detector installed when they are sold. Further consideration could be given to encouraging high-risk groups (the elderly and families with young children) to install smoke detectors through a subsidy scheme.

Cigarettes

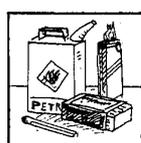
The introduction of legislation for the mandatory manufacture of low-fire risk cigarettes should be considered. Apparently an effective design has been available in the United States since the 1930's but various lobby groups have so far been unsuccessful in getting the necessary government support (Athey 1991). The cigarettes are designed so that when left unattended on mattresses or upholstered furniture they will not cause ignition.

Insurance

Companies could offer financial incentives for various safety features in the home such as smoke detectors and fire extinguishers. According to the Insurance Council of Australia some companies do offer a small 'home safety and security' discount if a house has deadlocks, window locks and smoke detectors fitted (personal communication September 1992).

Gas appliances

A sensor is needed that could detect excess amounts of gas that would either shut down the supply of gas or emit a warning (sound, flashing light or both) to prevent someone lighting the appliance.



Burns prevention for children

Hot drinks

A new spill-resistant cup with a narrow mouth, wide high friction base and a 'sip-through' lid is available in the United States. (Figure 8.) The mug is stable, and the lid remains on whilst the person is drinking, thus reducing the likelihood of a big spill and serious scalds. It has mostly been marketed in America as a travel accessory, particularly for coffee-drinking commuters, but more recently a campaign has begun in Seattle aimed at encouraging households with young children to use the mug as part of a scald prevention program (personal communication Blackard 1992).

There is enormous scope for introducing this product to Australia, either by importing it in bulk from the U.S.A. or by manufacturing it locally. If attractively designed and reasonably priced there could be a ready market for these as gifts to the new parent.

Other measures include: keeping hot drinks out of reach; adding milk/cold water to the drink to reduce its temperature; the use of placemats instead of table cloths so that children are less able to pull a cup or pot off the table; designing benches with a high

rounded lip to reduce access and to catch spills once they occur.

Tap water

Tap covers or safety taps will reduce the chances of children turning on the hot or cold water taps, this reducing the risk of scalds or immersion.

Heater

A grille should be made of heat-resistant or low-conducting metal so that it does not pose a hazard in itself and should be designed in such a way that small hands or fingers cannot penetrate. A heater guard around the entire heater at a suitable distance will prevent many contact burns.

Kitchen

Many burns occur in the kitchen during the evening meal time (5 to 8pm). This suggests that removing children from the kitchen during meal preparations, or at least physically separating them from the hazard is the key to preventing these burns. Examples of such measures include restraining younger children in a high chair or playpen, using kitchen gates to keep them out of the kitchen altogether, or installing stove and oven guards. Other simple measures which may help are cooking on the back burners only and turning pot handles out of reach.

Curly cords or short cords on electrical appliances should be used. Kitchen designs should take into account dangerous pathways between the key work areas - sink, benches and stove. For example, there should be no need to cross an open space whilst carrying a pot or pan full of hot liquid in order to drain it or to serve food.

BBQ

Perhaps the home barbecue could be isolated by using a playpen, or barbecue areas in any location could be designed with a barrier to reduce access by small children. The design of portable barbecues could be modified to reduce the temperature of exposed exterior surfaces.

Irons

Parents could iron clothes when the child is not present, or they could isolate themselves, and the hazard, by ironing in a playpen whilst their toddler played outside the playpen.

Cigarette lighters and matches

A low cost child-resistant cap needs to be developed for cigarette lighters. There is also potential for the development of a child-resistant container for matches. A less effective method could be compulsory labelling - 'Keep out of reach of children'.

Flammable liquids

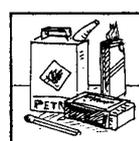
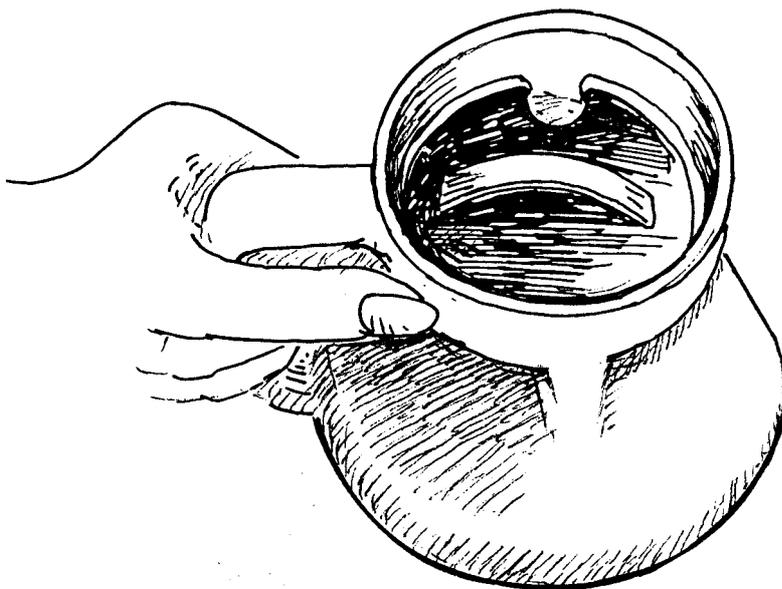
To reduce access to flammable liquids a range of measures may be required. Designing lockable containers and petrol caps to restrict access, plus legislation that sets a minimum age limit for purchasing flammable liquids may help to further restrict access by younger teenagers.

Baby walkers

These should not be used. Baby walkers give a young child unnatural mobility which leads to many preventable injuries including burns.

Spill resistant mug

Figure 8



Burns prevention summary

- ✓ Lower the water temperature of domestic hot water to around 50-55°C
- ✓ Use “non-spill” mugs for hot drinks
- ✓ Keep children out of the kitchen when cooking
- ✓ Remove radiator caps only after the car engine has cooled down
- ✓ Install smoke detectors
- ✓ Develop and mandat child-resistant cigarette lighters
- ✓ Immerse affected burn area(s) in cold water as soon as possible

Conclusion

This article provides information on the nature and dimensions of the burns problem and recommendations for prevention. VISS aims to disseminate this information and to encourage the enforcement or revision of current injury control measures and the development and implementation of new strategies. Reviews and updates in *Hazard* will monitor progress by responsible authorities and agencies towards the implementation of counter-measures.

Resources

For more information on prevention or first aid contact the following organisations:

The Child Safety Centre

Royal Children’s Hospital, Parkville, VIC, 3052. Phone (03) 9345 5085

Metropolitan Fire Brigade (MFB)

For general information on fire prevention measures phone the Fire Prevention Department on (03) 419 0122. Visit the MFB Fire Equipment Service show room at 10 Bakers Street, Richmond, Victoria (phone 9420 3744).

St John Ambulance Service

For first aid advice, information on training courses or references phone (03) 9670 5576.

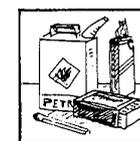
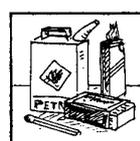
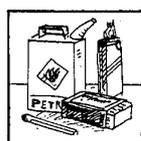
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Dog bite injuries

Stephen Goss

Emergency Department Presentations: VISS

In the 3 year period 1989 to 1991, 902 children presented to VISS participating hospitals (Royal Children's, Western Hospital-Footscray and Sunshine campuses and Preston and Northcote Community Hospital) as a result of dog related injuries. These represent 2% of all injury cases in children under 15 years that presented to a VISS hospital over this period.

Of these, 731 were dog bite injury cases and 171 were other dog related injury cases.

Children under 5 years, particularly toddlers, were the most at risk (42% of all cases).

Outdoors at home, such as in the garden, yard or garage was the most frequent location for dog bite injuries (56% of cases), while public areas such as roads, footpaths, ovals, playgrounds and fields made up a quarter of dog bite injury locations.

In a review of 130 dog bite injury descriptions, 60% occurred as a result of playing with a dog. Unfortunately, respondents rarely specified what breed of dog was responsible or whether or not the dog was known to the child.

The head including the face was the body part most frequently injured, accounting for a half of bite injuries. This is in contrast to dog bite injuries in adults in which injuries to the head or face amounted to 12%, while a third of injuries were to the fingers and hands.

Other dog related injuries, were made up of either falls (e.g. falling over a dog) (32%), losing control of an object such as a bicycle while being chased by or attempting to avoid a collision with a dog (18%) or collision with a dog (6%).

Bruising and fracture were the most frequent types of injuries in these cases.

Hospital Admissions: Victoria

In Victoria, the rate of dog bites severe enough to require hospital admission for children aged 1-4 years is 37 per 100,000 as compared with, for example, motor vehicle occupants which is 28 per 100,000 and child maltreatment which is 12 per 100,000.

Recommendations

As young children are especially at risk from dog bite injuries, it would be desirable for people with young children to avoid owning dogs, particularly dangerous breeds.

A study undertaken by the South Australian Health Commission (January 1991) indicated that German Shepherds, Bull Terriers, Dobermans, Rottweillers, Blue Heelers and Collies which make up 21.5% of the dog population were responsible for 73.6% of attacks on adults and children.

Separation of young children and dogs is recommended.

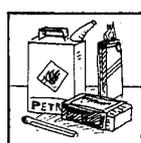
As a quarter of dog bite injury cases occur in public areas, local councils should strictly enforce dog control regulations. (Dog Act 1970).

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Langlois, J.A. 1992 'Non Fatal Injuries in Victoria: An Overview', Monash University Accident Research Centre (in preparation).

South Australian Health Commission Injury Surveillance Monthly Bulletin No.29 January 1991

Dog Act (1970) Victoria.



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How to Access VISS Data:

VISS collects and tabulates information on injury problems in order to lead to the development of prevention strategies and their implementation. VISS analyses are publicly available for teaching, research and prevention purposes. Requests for information should be directed to the VISS Co-ordinator or the Director by contacting them at the VISS office.

VISS is located at:

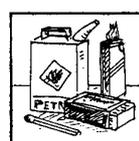
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Other VISS Publications

Injury Surveillance in the Latrobe Valley - an Overview
 Injury Patterns for Children Aged Under 15 Years 1989-91
 Injury Patterns Under 5 Years 1989-90
 Western Hospital Footscray: Injuries to Adults 1991
 Injuries In and Around the Home Under 15 Years 1989-91
 Summer Injuries December 1989- February 1990



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Melbourne University Department of Paediatrics & Royal Children's Hospital

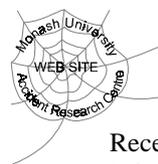
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Recent issues of *Hazard*, along with other information and publications of the Monash University Accident Research Centre, can be found on our internet home page:

<http://www.general.monash.edu.au/muarc>



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