

Hazard
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May 1990

Victorian Injury
Surveillance System

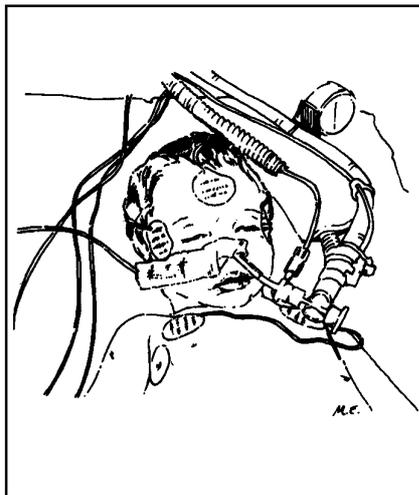
Royal Children's Hospital
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VicHealth

The fifth edition of Hazard from the Victorian Injury Surveillance System examines the risks of 3 important domestic hazards. One, home swimming pools, is a killer that we have known about for a long time, but have failed to act upon. This is despite the fact that we know now to save the lives of most of the toddlers drowned each year. The other 2 hazards are less well known, but each has the potential to inflict serious injury with life long consequences. The electric water heating urn and the home exercise bike can readily be rendered safer through design alterations which take into account the injury hazards they represent.

Drownings and near-drownings at home

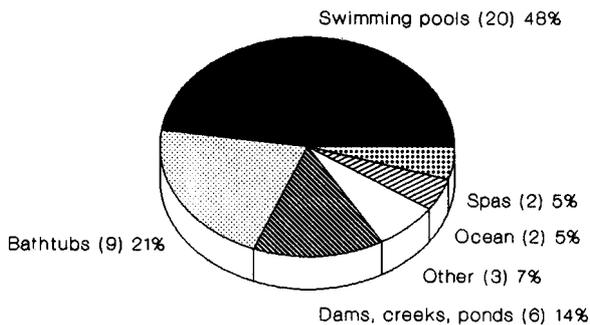


There are about 145,000 private swimming pools in Victoria, of which 55,000 are in-ground pools. We know that each year about 8 children under the age of 4 years drown in domestic swimming pools in Victoria. Many more nearly drown, but are rescued and resuscitated in time to save live. The tragedy is that most of these drownings are probably preventable through the use of simple pool isolation fencing. At this time, there is no Victorian state law to require pools to be fenced. New South Wales and Queensland are on the verge of introducing such a law.

In order to better understand the problem in Victoria, we used VISS data to look more closely at all cases of drowning or near drowning that were identified at a VISS hospital between January 1988 and February 1990. It is important to note that this is only a sample of all such similar episodes that occurred statewide over this period.

A total of 42 cases of drowning and near drowning occurred over the 2 year study period. One-third of these incidents (14) occurred in private swimming pools. Seven of the 14 children involved in swimming pool incidents died. The pie chart shows the relative importance of pool immersions.

All Immersions



Of all these immersion incidents, 27 took place in or near the child's own home. In 6 others, the child was a guest of the home owner.

Swimming Pools and Spas

Focussing on swimming pool immersion episodes, especially those in domestic swimming pools, the following table shows immersion episodes for all types of pools and spas.

Location	Number
pool in own home	9
pool in other home (guest)	4
pool in other home (intruder)	1
spa	2
public pool	5
not stated	1
Total	22

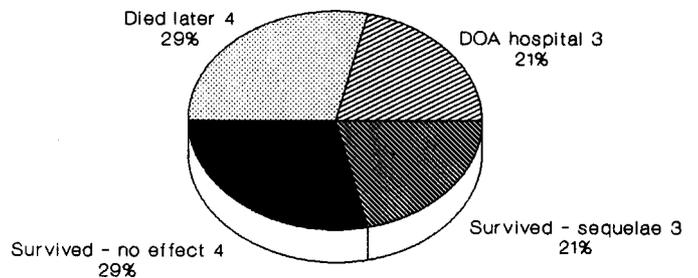
Home Swimming Pools

Fourteen drowning or near drowning incidents occurred in private swimming pools, the most significant location for drowning incidents.

Consequences of Immersion In Home Pools

Seven of the 14 children died. Three were dead on arrival at hospital. Of the 7 survivors, 4 had no long-term physiological consequences. One survivor suffered severe hypoxic insult with significant neurological deficit, that is, brain damage.

Outcomes



Ages of children

All children were aged between 1 and 4 years.

	All cases	Fatalities	Survivors
N	14	7	7
Mean (months)	32	30	34
Range (months)	11-51	11-42	18-51

Preventative measures

There was information on pool fencing in only 7 of the 14 reported cases. It was not noted in the medical history as a factor in 6 cases (3 of whom died), and was not applicable in 1 case, where a child took off her "floaties" while being supervised by both parents.

For those seven cases where information was given:

No Fence	2 cases (1 died)
Fence	5 cases (3 died)

In all 5 cases where there was a fence, the fence was penetrated by the child climbing over or burrowing under (3 cases), or the gate was left open (2 cases). It is not known whether any of the fences or gates complied to present Australian safety standards (AS 1926- 1986 Fences & Gates for Private Swimming Pools).

Resuscitation efforts and later outcome

In only half of the 14 cases was an attempt made to resuscitate the child (cardio-pulmonary resuscitation, or CPR) at the scene of the immersion.

	Fatalities	Survivors
Immediate CPR	0	4
On-site CPR (outside help)	1	2
No CPR	6	1

None of the 7 children who died received immediate CPR. On-site CPR (that is, from ambulance officers or others who were called to the scene) was applied in one case, immediate EAR (expired air, or mouth-to-mouth resuscitation) was applied in 1 other case.

Of the 7 survivors, immediate CPR was used in 4 instances. For these children, there were no known long-term physiological consequences. On-site CPR was applied in 2 cases. One child had significant neurological disability, one was experiencing behaviour problems (temper tantrums, extreme mood swings) for at least a month after the incident. In 1 case, no CPR or other resuscitation was applied, and the child had no physiological or other consequences. However, the child was immersed for only 45 seconds.

Length of immersion

The length of immersion was known for 6 of the 7 surviving children, and 5 of the 7 children who died. For survivors, the immersion time ranged from 45 seconds to 12.5 minutes. The median immersion time was 4 minutes. For children who died, immersion time ranged from 4 to 14 minutes. Their median immersion time was 10 minutes.

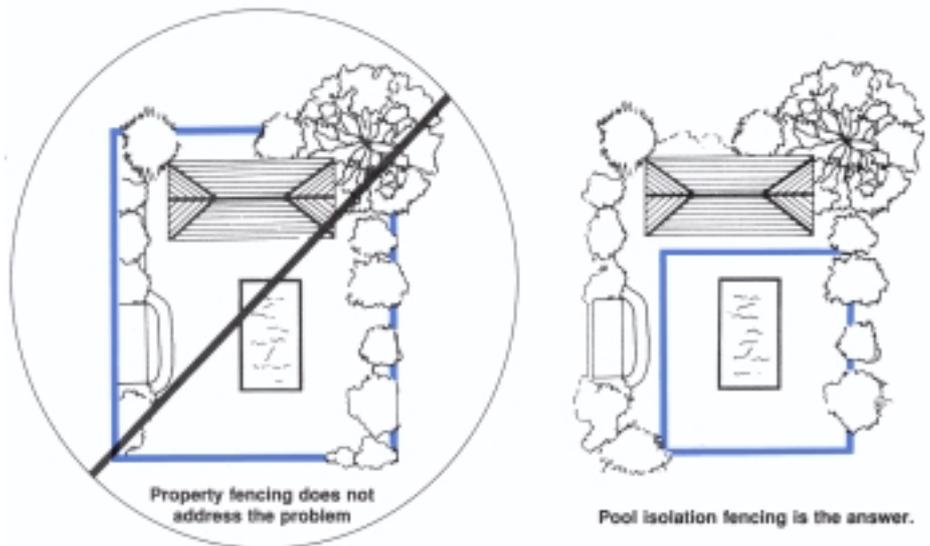
Supervision of Immersion Victims

Reliable information was available about the level of child or adult supervision at the time of the immersion incident.

Supervision	Survivors	Fatalities
None	4	6
Sibling	1	1
Parent	1	0
Not known	1	0
Total	7	7

Conclusions

A significant number of children have drowned or nearly drowned during our study period. Of these immersion episodes, 50% were fatal. Of the 7 survivors, only 1 had significant residual brain damage. It is striking that CPR was much less likely to have been used in these children who died ($p = .03$). On two important prevention strategies, namely isolation pool fencing and parent supervision, the data are instructive. Although information on the existence of barrier fencing was not present in all cases, and no information on type of fencing was given for any of the incidents, there were 5 cases of fence or gate penetration. This has implications for (1) the proper maintenance of installed isolation fences, (2) Australian safety standard AS 1926-1986, and (3) the manufacturers of fences and gates.

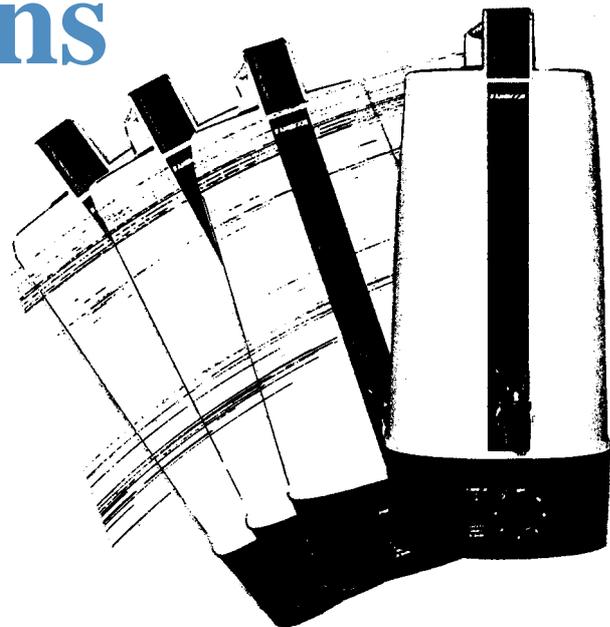


The single most effective primary prevention measure is still likely to be isolation fencing around a pool. In Victoria, property fencing is required under the state building code. But as these findings, and data from elsewhere have repeatedly shown, property fencing (as distinct from isolation pool fencing) will not prevent drowning to any great extent because nearly all of those drowned did so in their own pool, or were invited guests. Uniform state legislation is required because of the large numbers of local government authorities in Victoria which makes it impractical to leave it to shire building codes.

Concerning supervision, in none of the fatal incidents was the child being supervised by an adult. Parent supervision remains essential for pre-school children in homes with pools. Awareness of this truism is heightened by comparing a pool in the backyard to a loaded gun. They are equally lethal, and no responsible parent would ever dream of leaving a loaded weapon in the backyard with an unsupervised toddler.

In terms of favourably influencing the outcome of an immersion incident, the acquisition and maintenance of CPR skills should be a pre-requisite to owning a pool and CPR instructions should be posted on the isolation fence of every home swimming pool.

Kambrook Urns and Burns



Four cases involving Kambrook urns are registered in the VISS data base. All 4 cases involved the urn toppling over, the lid coming off, and the contents (up to 8 litres of hot or boiling water) spilling, resulting in scalds to the child. All cases were admitted to the Royal Children's Hospital.

Although the number of cases was small, the injuries sustained were significant, with children requiring hospitalisation for between 4 days and 4 weeks.

Age and location

All four children were aged between 5 and 7. Two were boys, two were girls. Two incidents occurred at parents' workplaces, one at home, one in a caravan.

What happened

Two children knocked against cupboards on which the urn was standing, causing the urn to tip over and spill hot water from the top after the lid fell off. One child knocked against the urn itself and in one case, the child's foot caught in the urn's cord. In all cases, the lid came off the urn and boiling or hot water spilt over the child.

Injuries and consequences

All the children received scalds. The percentage of body surface scalded ranged from 2% to 40010. Two children were hospitalised for 3 and 4 weeks respectively, and required skin grafts.

The Kambrook urn meets the requirements of the present standard (AS-3172: Electrical Cooking Appliances for Household Use) for stability and electrical components. However, we believe that the test for stability may be inadequate as the urn is almost cylindrical, tall, made of light weight materials and can hold up to 8 litres of boiling water. Furthermore, at present the lid is not secured in any way. If the urn is knocked over, the lid falls off easily, allowing hot water to pour quickly out of the top.

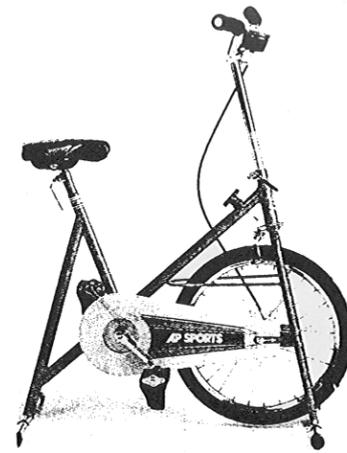
The ABC Investigators program produced a story (18 April 1989) following one of these incidents, highlighting the dangers of the unsecured lid in the Kambrook urn. The Ministry of Consumer Affairs also publicized this problem last year, issuing a press release by the Minister.

Following action by the parents of an injured child, VISS, the Child Safety Centre and the Ministry of Consumer Affairs in 1989, the Electrical Approvals Board of the State Electricity Commission of Victoria has proposed an amendment to the relevant standard to incorporate a 'limitation of spillage test'. Standards Australia has approved this in principal. The amendment is likely to come into effect in May, and would apply to the manufacture of new urns and kettles.

In October 1989 Kambrook has taken independent steps to reduce further similar incidents by redesigning the K-6 urn. It now has clips on the lid and two warning labels, one on the power cord (Attention: locate this appliance wisely before use, especially when children are present), the other as part of the user instructions (Careful: Note, as with most electrical appliances, this urn should be kept out of children's reach).

Kambrook undertook to prepare a newspaper advertisement warning of the potential danger associated with the urn, and this is due to be published soon.

Exercise Bikes are not Toys



With the growth of a culture of health and fitness in Australian society has come the increased purchase and use of home exercise equipment. However, the design of home exercise equipment does not necessarily take into account the safety of child household members. Children's injuries associated with exercise bikes provide an example of this. Between 4 January 1988 and 28 February 1990, 27 children presented to the Royal Children's Hospital with injuries resulting from exercise bikes.

Age of children, location of incident

Fifteen of the children were less than 3 years old at the time of the incident. Twenty-two were under 7. Sixteen of the incidents occurred in the child's own home. A further 7 occurred at relatives' or friends' homes, making a total of 23 (85%) of all incidents taking place in private homes and gardens.

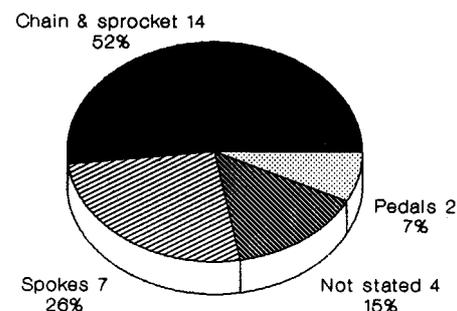
Nature of injuries

Twenty of the injuries were finger injuries. The remaining 7 injuries were foot injuries. Fifteen of the finger injuries resulted in the child being admitted to hospital. None of the foot injuries required admission to hospital, or referral to outpatients/general practitioner. Eleven of the finger injuries were fractures, partial or full amputations, and/or loss of fingernails.

What happened and what went wrong

Four children were using the bike in the manner for which it was designed, i.e. riding on it. These children had foot injuries - foot caught in pedal and/or chain, foot slipped & twisted. The remaining children were playing on and around the bike, or sitting by the bike while an adult was on it. Seven of the injuries resulted from fingers or foot being caught in the wheel spokes. Thirteen resulted from fingers (and one foot) being caught in the chain, sprocket or a combination of chain and sprocket. Two of the bikes had covers on the chains - but these covers still allowed access to the chain.

Exercise Bikes Components causing injury



Conclusion

Exercise bikes might be good for parents' health, but they pose a hazard to offspring - especially the chain and socket mechanism. Over half the injuries resulted from fingers caught in chain and sprocket. There were chain guards in only two of these incidents. It would appear that the chain and sprocket mechanism on exercise bikes needs to be more adequately protected.

Changes at VISS

Marga Penny has resigned from VISS to become the mother of a beautiful daughter. Our congratulations and warm appreciation are extended to Marga. The new VISS coordinator is Ingrid Hagstrom.

Victorian Injury Surveillance System

The VISS database records details of child and adolescent injuries treated at the five VISS hospitals, Royal Children's Hospital, Preston and Northcote Community Hospital, Western Hospitals in Footscray and Sunshine and the Royal Victorian Eye and Ear Hospital. It is based on information provided by parents of injured children and the attending doctor. Please contact us for further information on data and interpretation. If you wish to be on our mailing list, please contact us. The material in this publication is not copyright, but acknowledgement of VISS as the source is required by those who wish to use it.

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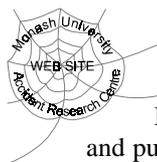
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How to Access VISS Data:

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.

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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>



**HEWLETT
PACKARD**



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This .pdf issue of Hazard was reconstructed by Glenda Cairns

