

Poisoning in Children in Western Australia

A review of best practice,
stakeholder activity,
legislation and recommendations.





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Title

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EXECUTIVE SUMMARY

Background

Although death through injury has steadily declined in Australia over the last decade, injury remains a major cause of death, hospitalisation, disability and health care expenditure. In 1996, injury accounted for just under 6% of all deaths in Australia and constituted 11.3% of the total Years of Life Lost (YLL) in that year. Approximately 8.3%, or \$2.6 billion, of Australia's total health expenditure in 1993/1994 related to direct health system costs due to injury. In Western Australia, an average of 733 persons die each year through injury, at a rate of 43.5 deaths per 100,000 population. Of the various sources of injury death, intentional harm (suicide), transportation, falls and poisonings are leading causes, accounting for approximately 81% of all injury deaths in Western Australia for 1998.

Objectives

The overall aim of this project was to develop 'evidence-based' recommended interventions for selected sources of injury in Western Australia to assist with the development of statewide priorities and countermeasures. The areas of injury selected for review were: Burns and Scalds, Drowning, Falls in the Elderly, Falls in Children, Poisoning in Children, Road Crashes and Suicide.

The objectives for each of the areas of injury were to:

- Identify the nature and extent of the injury problem,
- Describe major risk factors for the injury problem,
- Identify key stakeholders in Western Australia for the injury problem,
- Report on the current activities of the key stakeholders,
- Identify relevant, existing legislation for the injury problem, and
- Develop recommended interventions for the injury problem in line with published evidence on best practice and effective countermeasures.

Methods

Descriptive information on the extent and nature of the problem was identified from available data. Information on risk factors was identified for the published research literature. Key stakeholders and their injury initiatives were identified via the Injury Research Centre's network of contacts and from print and Internet sources. Interviews were conducted with stakeholders where necessary. Relevant legislation for each area of injury was identified and summarised for brevity. Key recommendations were based on the findings of systematic reviews, meta-analyses and key research articles for each of the injury areas. This information was identified in Medline and the Cochrane Database of Systematic Reviews for injury. Relevant studies have been cited to support the recommended interventions. For some areas of injury, summary reviews have been provided.



Findings and recommendations

Literature searches for each of the areas of injury provided considerable variation in the amount and quality of information concerning identified risk factors.

The review of Western Australian stakeholders and their activities, whilst not exhaustive, revealed a vast array of government and non-government agencies involved in the surveillance, research, prevention and control of injury. Some overlap and duplication of activities was evident.

Legislation for the selected areas of injury varied in terms of state and national responsibilities and the degree of regulation and control. From this, opportunities for legislative and regulatory reform were identified.

The literature search similarly demonstrated considerable variation in the quality and detail regarding the effectiveness of injury countermeasures. Based on this review, a number of recommendations were made for the development of injury countermeasures.

ACKNOWLEDGEMENTS

The Injury Research Centre would like to thank the identified stakeholders who contributed to this report. In particular, we would like to acknowledge the assistance of Dr Sven Silburn, Ms Kate Miller and Ms Stephanie Jackiewicz at the TVW Telethon Institute of Child Health Research.



1. INTRODUCTION

1.1 BACKGROUND

Since 1989, injury deaths in Australia have steadily declined from 51.3 deaths per 100,000 population to 42.4 per 100,000 population in 1998 (see Figure 1). Despite this decline, injury remains a major cause of mortality, morbidity and disability in Australia, and places a substantial burden on health care expenditure. In 1996, injury accounted for just under 6% of all deaths and constituted 11.3% of the total Years of Life Lost (YLL) in that year (Mathers et al, 2000). Approximately 8.3%, or \$2.6 billion, of total health expenditure in 1993/1994 related to direct health system costs due to injury (Mathers et al, 2000).

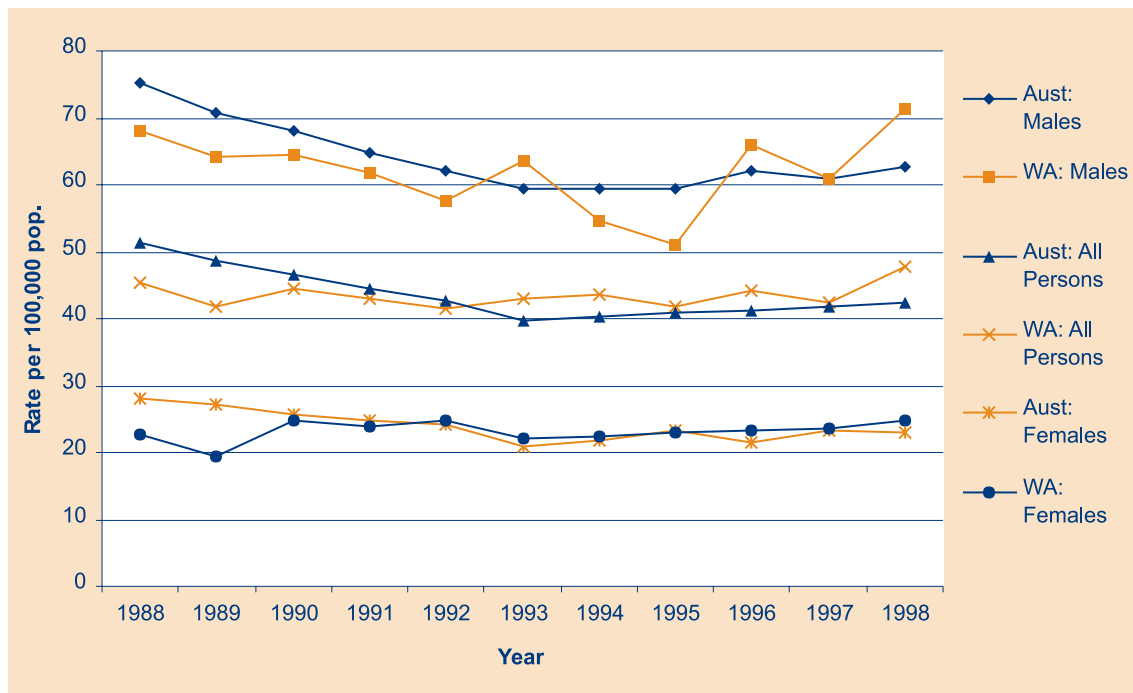


Figure 1: All-cause injury mortality rate for Australia and Western Australia 1989-1998; by all persons, males and females. (Source: NISU 2002)

In Western Australia, the decline in the rate of injury death for the period 1989-1998 has been less consistent across all persons and genders. Over this period, an average of 733 West Australians (43.5 deaths per 100,000 population) died every year as a result of injury (NISU, 2002). Males and persons aged 15-34 years account for the bulk of the burden of injury, accounting for 72% and 41% respectively of all injury deaths in 1998 (NISU, 2002). Of the various sources of injury death, intentional harm (suicide), transportation, falls and poisonings are leading causes, accounting for approximately 81% of all injury deaths in Western Australia for 1998 (NISU, 2002).

1.2 OBJECTIVES OF THE PROJECT

The overall aim of this project was to develop 'evidence-based' recommended interventions for selected sources of injury in Western Australia to assist with the development of statewide priorities and countermeasures. In consultation with the Injury Prevention Unit of the Health Department of Western Australia, the following areas of injury were selected for review: Burns and Scalds, Drowning, Falls in the Elderly, Falls in Children, Poisoning in Children, Road Crashes and Suicide.

The objectives for each of the areas of injury were to:

- Identify the nature and extent of the injury problem,
- Describe major risk factors for the injury problem,
- Identify key stakeholders in Western Australia for the injury problem,
- Report on the current activities of the key stakeholders,
- Identify relevant, existing legislation for the injury problem, and
- Develop recommended interventions for the injury problem in line with published evidence on best practice and effective countermeasures.

1.3 METHODOLOGY

The methods used in the project are summarised in the following points:

- Descriptive information on the nature and extent of the problem was based on the most recent, available statistical data.
- Relevant risk factors for each of the areas were identified from the research literature.
- Key stakeholders for each of the areas in Western Australia were identified through the Injury Research Centre's network of contacts and relevant published information. Details of the stakeholder's initiatives were obtained from relevant websites and other published materials. Where necessary, key stakeholders were contacted and interviewed to obtain further details on their current injury initiatives. It should be noted that the details of stakeholders and their injury initiatives do not represent a complete audit of this information.
- Legislation relevant to each area of injury was identified and summarised for brevity. Where appropriate, both national and state legislation has been presented.
- To assist with the development of key recommendations, systematic reviews, meta-analyses, and key research articles relevant to the development of injury countermeasures were identified in Medline and the Cochrane Database of Systematic Reviews for injury. These studies have been cited to support recommended interventions. For some areas of injury, summary reviews have also been provided and are presented in the accompanying appendices.

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The following report is an excerpt of the Best Practice document and deals with only one specific injury area. The complete document is available from the Injury Prevention Unit: Phone 9222 2135 Fax: 9222 4100

POISONING IN CHILDREN

2.1 NATURE AND EXTENT OF THE PROBLEM

The National Injury Intervention Plan (Commonwealth of Australia, 2001) identified poisoning among children as an area of high priority for injury prevention in Australia. Poisoning is very rarely a cause of mortality in children; however, in young children (0-4 years) poisoning represents the second highest cause of morbidity due to injury in Australia. In 1999-2000, there were 3,711 hospitalisations of children aged 0-14 for accidental poisoning, with a hospitalisation rate of 96.9 per 100,000 (Al-Yaman et al, 2002). The rate is highest in children aged one to four years with a hospitalisation rate of 285.7 per 100,000 children.

Males represented 54% of cases admitted to hospital in children aged zero to four years, and higher hospitalisation rates were apparent for children living in rural areas (O'Connor, 2001). In Western Australia from 1988-1993, males had a higher hospitalisation rate of 357 per 100,000 compared to 294 per 100,000 for females for children aged zero to four years. Children in rural areas were more likely to be hospitalised due to poisoning, at a rate of 511 per 100,000 population, compared to a metropolitan rate of 227 per 100,000 population. Aboriginal children were also at greater risk of accidental poisoning in Western Australia from 1988-1993 with a hospitalisation rate of 619 compared to a non-Aboriginal rate of 303 per 100,000 (Gillam et al, 1995).

Children are accidentally poisoned with various agents. The Poisons Information Centre (PIC) is usually the first place contacted in cases of poisoning. From July 1993 – June 1997 medicinal products were involved in 33% of poisoning related calls for children aged less than 18 years; household products, pesticides and chemicals were involved in 46% of cases; bites and stings were responsible for 11%; and plants or food were the cause of 10% of poisoning related calls (Finn et al, 1998).

Of all Western Australian children aged zero to four years hospitalised by poisoning during 1988-1993, medicinal substances accounted for 59% of accidental poisonings. Non-medicinal substances including gardening, hardware, petroleum and cleaning products were involved in 26% of cases. Solids, liquids, gasses and vapours (including carbon monoxide) not classified in the above categories accounted for 8% of cases. Foodstuffs and poisonous plants represented 6% of poison related hospital admissions and alcoholic beverages and alcohol-based products made up the remaining 1%. Of the medications that children were accidentally poisoned with, 17% of cases were due to sedative-hypnotics and other psychotropic agents; 16% of cases were due to analgesics (such as paracetamol), antipyretics and antirheumatics; 12% of cases due to other drugs acting on the central nervous system; and the remaining 55% of cases were accidentally poisoned by various other drugs (Gillam et al, 1995).

2.2 RISK FACTORS

Poisons not kept in Child-Resistant Closures (CRC's) and poisons kept in reach of children

With children aged zero to four years most at risk of poisoning, the storage of poisons is especially important in reducing the chances of poisoning incidents. Reduction in poisoning rates due to the use of CRC's has demonstrated that poisons not kept in CRC's are at greater risk of causing a poisoning incident (Clark and Walton, 1979; Rodgers, 1996; Scherz, 1970; Sibert et al., 1977; Walton, 1982). While CRC's are helpful in reducing risk, the safe storage of poisons is also required to reduce poisoning incidents (Hoy et al, 1999).

Lack of parental awareness of poisons

Parental knowledge about poisons, and the various prevention strategies, is also important. Several studies have demonstrated that increasing parental awareness about poisoning leads to improvements in home safety practices, such as knowing the PIC phone number and storing poisons safely (Krenzelok and Garber, 1981; Woolf et al, 1987, 1992).

Medicinal products, household cleaning products pesticides and herbicides

Medicinal products represent a great risk for serious poisoning, with 59% of poisoning related hospitalisations of children aged zero to four years being due to medicinal substances. Household cleaning products, pesticides and herbicides were also at high risk of causing hospitalisation (Gillam et al, 1995).

2.3 KEY STAKEHOLDERS IN WESTERN AUSTRALIA

State Government:

- Department for Community Development
- Department of Health
- Environmental health division
- Department for Consumer and Employment Protection
- Department of Housing and Works (Homeswest)
- Department of Education

Federal:

- Therapeutic Goods Administration (Australian Department of Health and Aged Care)
- Standards Association of Australia
- National Return and Disposal of Unwanted Medicines Ltd

Health Services:

- WA Teaching Hospitals
- St John Ambulance
- Poisons Information Centre
- General Practitioners

Other Local:

- Kidsafe WA, The Child Accident Prevention Foundation of Australia
- Healthway
- Manufacturers of drugs and poisons
- Child care centres



2.4 CURRENT ACTIVITIES OF KEY STAKEHOLDERS IN WESTERN AUSTRALIA

WA Poisons Information Centre

The Western Australian Poisons Information Centre (PIC) is a government funded telephone information service. Its function is to provide members of the general public and health professionals with information about poisoning. The centre provides emergency first-aid advice in the event of poisoning or suspected poisoning, follow-up treatment advice and also provides information on the safe use, storage and disposal of toxic materials. From 1993/94 to 1996/7 in Western Australia the average number of calls to the PIC was 27,160 per year, or about 75 calls per day. The majority (66%) of poisoning related calls to the PIC were related to patients under the age of 18, with 45% relating to children one to four years of age (Finn et al, 1998).

Of importance to the health system is that only 20% of callers were advised to see a doctor or go to hospital. This helps prevent an unnecessary burden on hospital emergency departments. The PIC is also in a position to provide information about safe use, storage and disposal of poisons to people at high risk of poisoning. This information is provided verbally and in the form of pamphlets, stickers with the telephone number on it, posters and fact sheets.

- **Poisons Information Centre** phone 13 11 26

Kidsafe WA and Healthway

The Poisons Prevention Project was undertaken by Kidsafe WA between September 1995 and February 1997. The project was aimed at reducing the number of children hospitalised as a result of accidental poisoning. This was done through health promotion which targeted parents and carers of children under five years of age. The project was funded by Healthway with the main message of the campaign focussing on the safe storage of poisons with the catch phrase of "Poisons. Lock up and away." This message was used for its simplicity and because it was believed that preventing children gaining access to poisons was the best intervention to prevent poisoning. The Kidsafe Resource Centre also stocked cabinets with child resistant locks. The campaign also promoted ringing the PIC as the recommended first action in a poisoning incident (Duncan and Wilshire, 1997).

The campaign message was conveyed through a launch of the program which received news coverage, radio, newspaper and shop-a-docket advertising, and shopping centre promotions. The message was also distributed through health care professionals such as nurses, pharmacists, general practitioners, midwives and community nurses. Display kits were also supplied to interested libraries, hospitals and public health units (Duncan and Wilshire, 1997).

The campaign was evaluated through pre and post-testing of parents with children under the age of five. It was successful in increasing knowledge and the use of locking poisons away from children prevention strategy, but was unsuccessful in increasing awareness of the strategy of keeping poisons out of reach. Ringing the PIC was more likely to be a first action in a poisoning emergency and the PIC number was also more likely to be beside the telephone at post-testing. While the Poisons Prevention Project is not a current activity, it did raise public awareness and increase the use of poisons prevention strategies. The use of healthcare professionals to distribute information to target parents and carers of young

children should have an ongoing impact on poisoning prevention through continued promotion of the need for safe storage of poisons, and the use of the PIC as first action in a poisoning incident (Duncan and Wilshire, 1997).

Return Unwanted Medicines (RUM) project

The RUM project is a free disposal service for out of date and unwanted medicines. It operates through pharmacies and is backed through Commonwealth funding from the Australian Department of Health and Aged Care. One of the principal aims of this project is to reduce the likelihood of poisoning from medicinal products. By encouraging the disposal of medicines at pharmacies, it should reduce the amount of poisons near young children (in the home), and by doing so reduce the chance of poisoning. In media releases relating to this project other poison prevention messages are also promoted, such as the use of child resistant containers and child restraint locks.

Department for Community Development

The Parenting Line is operated through the Department for Community Development to provide advice and education to parents. It provides no specific poison prevention education sessions but provides home safety advice and general safety information to parents.

- **Parenting Line** Metro: 9272 1466; Regional: 1800 654 432

Department of Consumer and Employment Protection

This Department runs the Think-Safe program. In relation to childhood injuries they have the Think-Safe club and website which promotes and actively encourages children to “Spot the hazard. Assess the risk. Make the changes” for unsafe situations (<http://www.safetyline.wa.gov.au/club/>). These are arranged on the website so that children can look through them, or teachers can print off activity sheets for children to write on and talk about hazardous situations. One of these situations includes the storage of medicines and poisons.

Safety Rules OK

The Safety Rules OK program is a school based project focussing on promoting safety in schools. The project is a joint initiative of Kidsafe WA, the Department for Consumer and Employment protection, Department of Health WA, Healthway and the Department of Education of WA. A large number of schools participated in the program in 1998 and 1999 with multiple activities, fact sheets, a quiz and other methods used to promote injury prevention. While the focus is on school based injury prevention, the fact sheet for poisoning is relevant to home poisoning and provides general information about who is most at risk, common poisoning agents and statistics on how poisoning occurs in the home with examples. The following prevention strategies are promoted in this fact sheet: disposing of unnecessary poisons, keeping poisons out of reach and sight in locked cupboards if possible, keeping poisons in original packaging (with warnings and child resistant closures) and keeping the PIC number near the phone in case of emergency. The Safety Rules OK website can be viewed at: <http://www.safetyrules.health.wa.gov.au/>

Homeswest

Homeswest fit one cabinet with a child resistant lock on a bathroom, laundry and kitchen cupboard in all of their new homes.



2.5 RELEVANT LEGISLATION

Commonwealth

Therapeutic Goods Act 1989

Commonwealth requirements for the labelling and packaging of poisons are set out in the *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP: Commonwealth of Australia, 2001b). Manufacturers of drugs and poisons must comply with this standard under the Therapeutic Goods Act 1989. In this standard the labelling and packaging requirements are stated for drugs and poisons from each classification schedule. There are nine schedules. These include three schedules for pharmacy and prescription medicines (Schedules 2, 3 and 4), four schedules for other poisons (Schedules 5, 6, 7, and 8), one schedule for substances prohibited by law except for scientific purposes approved by federal or state health authorities (Schedule 9), and one (Schedule 1) which is intentionally left blank. The labelling and packaging requirements vary depending on the classification schedule of the product.

Each schedule has particular requirements for labelling of the product. These requirements include minimum sizes for each warning or instruction. For example a Schedule 6 poison requires the following warning at the top of the label:

POISON
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING OR USING

This warning is altered depending on the size of the bottle, and must also state the name and concentration of the poisonous substance, safety directions and first aid instructions. The warnings on packaging are designed to be informative and promote the safe storage and use of drugs and poisons.

Australian Standard AS 2216 – 1997 Packaging for Poisonous Substances

The SUSDP stipulates that poisons must meet the requirements of *Australian Standard AS 22167 – 1997, Packaging for Poisonous Substances* for packaging of solid and liquid poisons. This standard does not apply to medicines.

Australian Standard AS 1928 – 2001 Child-Resistant Packages

This standard stipulates the requirements of Child-Resistant Closures (CRC's) on specified poisons. The poisons that must have CRC's are a list of various oils, alkaline salts, acids, hydrocarbons, and some other substances, however, not medicines. Included in this standard are requirements for non-reclosable packages such as blister and strip packages that medicines are typically packaged in. The standard does not require testing of these packages to determine whether children find these packages difficult to open. The standard for these packages is to ensure that these packages provide a physical barrier, that medicines cannot leak, and that they will show signs of tampering.

State

Poisons Prevention Act 1964

This legislation is designed to regulate and control the possession, sale and use of poisons. It regulates licensing and authorisation of people who can sell and produce poisons. This legislation does not impact on the use of CRCs and the scheduling of drugs and poisons as set out in the SUSDP.

2.6 RECOMMENDED INTERVENTIONS

(1) Increase use of child-resistant closures (CRCs)

The emphasis on primary prevention from accidental poisoning has focussed on the use of child resistant packaging. Primary prevention of poisoning through the introduction of CRCs in the late 1970's and early 1980's in Australia and other countries has proved to be successful in reducing the rates of death and hospitalisation from accidental poisoning (Clark and Walton, 1979; Rodgers, 1996; Scherz, 1970; Sibert et al, 1977; Walton, 1982). While CRCs are clearly stated in the SUSDP for some poisonous substances, this list does not include medicinal products.

Given the strong support in the literature it is recommended that the use of CRCs be continued and expanded for use with medications. As a large proportion of child poisoning hospitalisations are due to medicinal substances, the regulation of child resistant packaging for all medications where there is potential for poisoning should be explored.

(2) Make CRCs more user friendly (while maintaining child resistant properties)

While CRCs do provide considerable protection to children they are not necessarily 'child proof' (O'Connor, 2001). For instance, many poisonings occurred when the CRC had been removed while the substance was in use, or between uses, when the child managed to remove the CRC, or the poison had been transferred into an alternative container without a CRC (Gillam et al, 1995). Transferring of poisons often results from difficulties older people have with CRCs, and steps have been taken in the United States to improve child-resistant packaging so that older people can use them with minimal effort whilst still maintaining child-resistant characteristics (Rodgers, 1996). The more user friendly the closures are the more likely they are to be used as intended.

(3) Evaluate the effectiveness of non-reclosable packaging for reducing poisoning in children

Non-reclosable packaging such as blister packs and foil wrappers to package medicines is included in the Australian Standard for child-resistant packaging, however, there appears to be no specific evidence that these forms of packaging are child resistant and reduce child poisoning. They are not required to be tested to determine whether children find these packages difficult to open. Testing of these packages merely tests that the packaging provides a physical barrier to ensure medicines cannot leak, and show signs of tampering.

Given the lack of supporting evidence for the child-resistance of blister and strip packaging, CRCs would be better suited to medicinal products commonly associated with poisoning. Blister and strip packages should be tested for child-resistant properties. In the United



Kingdom this will be implemented shortly and Australian Standards should follow and be based on this (BSI, 2002). Further research is required to determine if non-reclosable packaging provides any assistance in reducing poisoning in children.

(4) Parental education to increase awareness about poisons

Education programs typically advocate safe storage of poisons, detail what types of substances can be poisonous to children (and adults) and promote the use of the PIC if poisoning occurs. While child resistant packaging of poisons has been described as the most effective measure to reduce accidental child poisoning, Hoy et al. (1999) have stated that poisoning prevention is optimal when this is combined with safe storage. Safe storage is promoted through legislation which requires the phrase “keep out of reach of children” to be present on poisonous products, however, this can also be done through education campaigns.

Educational interventions aimed at families with children aged five years and under have found that knowledge of what substances are poisonous and the PIC number was higher, cupboard locks were used more frequently and poisons were disposed of more often in the intervention groups (Krenzeloek and Garber, 1981; Woolf et al, 1987, 1992). General safety education for parents in the form of safety counselling and community based programs combined with the presence of a child safety centre where information and products relating to home safety are available have also been evaluated and found to be effective in increasing awareness of injury hazards and improving home safety practices (Gielen et al., 2002; Ozanne-Smith et al, 2002). In a recent review of child injury prevention it was stated that education was most likely to be effective in reducing injuries if there was a focus on enhancing access to discounted safety devices, and when education was delivered over several occasions or the program took 30 minutes or more (State of Victoria, 2001).

Whilst future research is required to determine if education programs do reduce the rate of hospitalisation due to poisoning, they have been demonstrated to be effective in changing attitudes and behaviour, and therefore should continue. Education in the form of seminars over an extended period of time was most effective and it is recommended that future poisons prevention be conducted in this manner, possibly as part of general home safety awareness programs. Safety device discounts at safety centres like the safety house run by Kidsafe WA were also effective in increasing prevention strategy use, therefore Kidsafe WA should continue to stock these devices and discounts for these products should be considered.

(5) Maintain Poisons Information Centres

Poisons Information Centres provide valuable emergency first-aid information in the event of poisoning or suspected poisoning, follow-up medical treatment, and advice and information on the safe use, storage and disposal of poisonous material (Finn et al, 1998). Their role in emergency situations is valuable to the health system in terms of morbidity and mortality because they provide expert advice when it is required. Of importance to the health system is that only 20% of callers are advised to see a doctor or go to hospital. This helps prevent an unnecessary burden on hospital emergency departments. In Louisiana, where a PIC was closed, self referral to health care facilities increased to four times that of a state which previously had an equivalent rate but that continued to fund a PIC. The annual cost of closing the PIC was three times that of the PIC budget before it was closed

(King and Palmisano, 1991). Given these findings, the funding of a PIC with a 24 hour hotline is recommended to continue.

The PIC is also in a position to provide information to people who ask for methods to minimise the risk of poisoning in children. Importantly the PIC can also provide information to parents and guardians of children who have had a poisoning incident. This information focuses on prevention strategies such as storage of medicines and other poisons. It also provides stickers with the PIC phone number on it to place on or near the telephone. While the impact of this role on the incidence of poisoning in children has not been evaluated (and it would be difficult to do so) it is clear that the PIC should continue in its education role for risk minimisation.

2.7 EMERGING ISSUES AND FUTURE DIRECTIONS

With respect to primary prevention, the use of CRCs is the most successful method in reducing rates of poisoning in children. Whilst other countermeasures such as education and PICs play a role in prevention, harm and health system cost reduction, their impact on poisoning rates has not been determined. Likewise the Return Unwanted Medicines (RUM) project needs to be evaluated for its impact on poisoning rates. Future research should focus on hospitalisation (and PIC call rates) based outcomes to determine whether prevention measures other than safe storage are indeed effective at reducing the risk of poisoning in children. Furthermore meaningful data collection and analysis of PIC events and hospital and emergency admissions is needed in Western Australia to determine if there are specific products, circumstances or groups of people who are at greater risk of poisoning. This research is required to guide prevention programs, legislation and education to target specific poisoning risks.

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