

FIGURE 1 SKATING INJURY TRENDS (INLINE AND SKATEBOARD) IN VICTORIA - HOSPITAL EMERGENCY DEPARTMENT PRESENTATIONS - VEMD JANUARY 1996 TO DECEMBER 2001

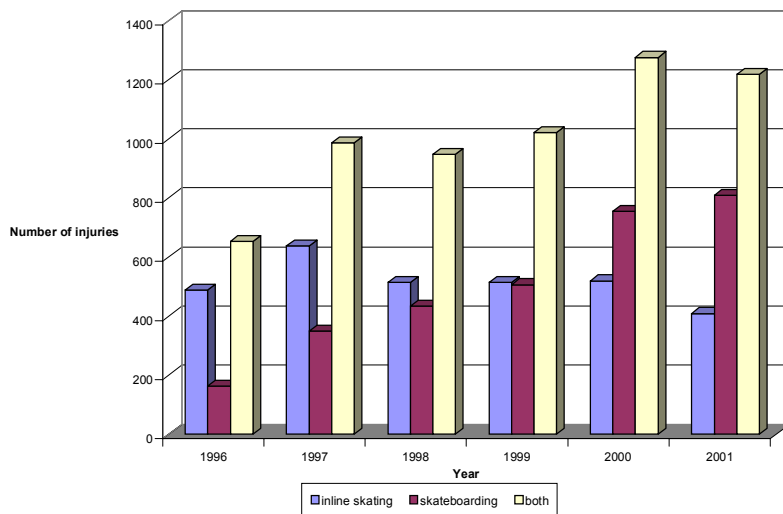
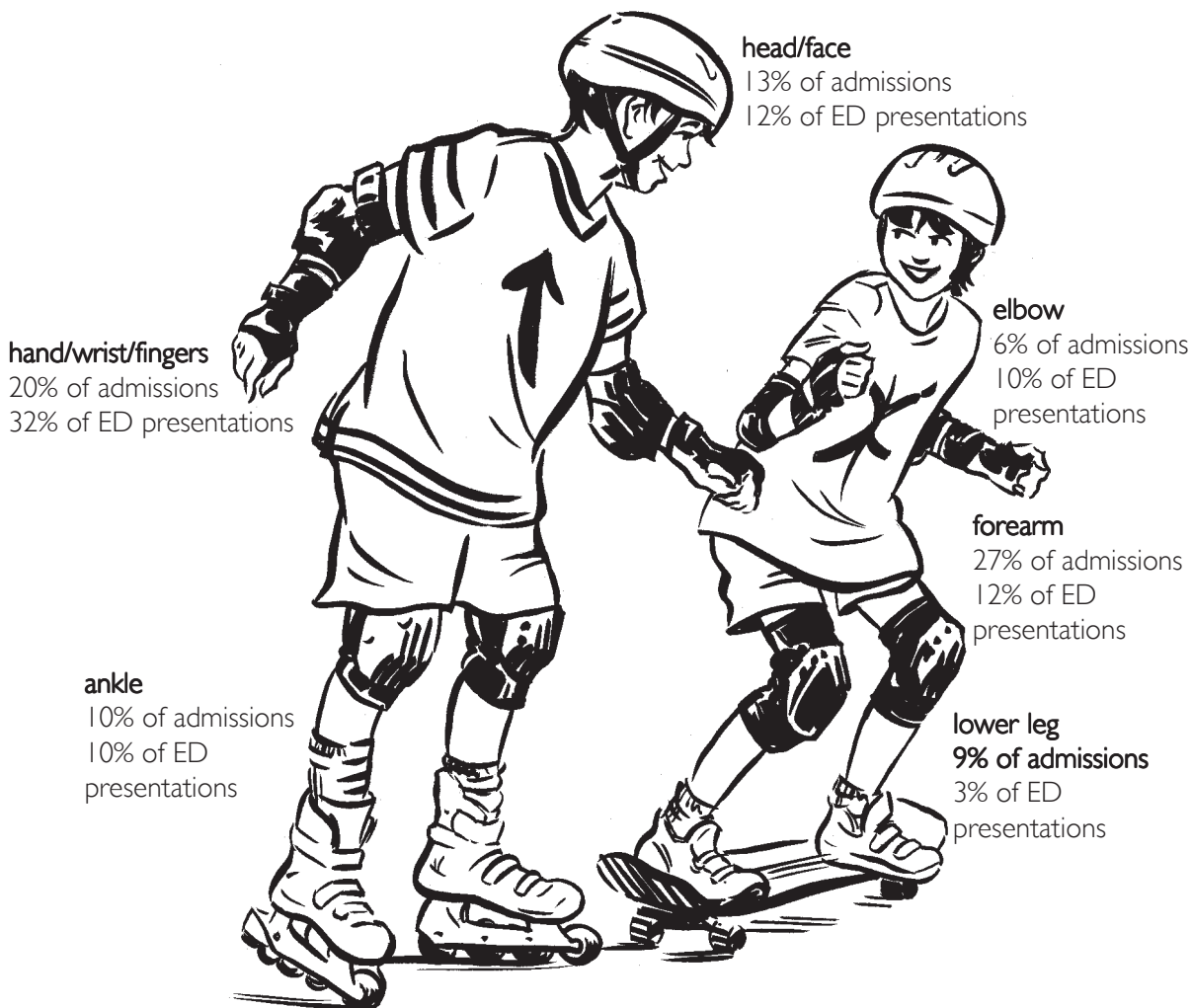


FIGURE 2 HOSPITAL-TREATED SKATING INJURY (INCLUDES SKATEBOARDING AND INLINE SKATING) BY BODY SITE AND SEVERITY



Source: Victorian Emergency Minimum Dataset (VEMD) January 1999 to December 2001
 Victorian Admitted Episodes Dataset (VAED) January 1999 to December 2001

What are the risk factors?

Currently, there is no strong evidence as to which factors put skaters at risk of injury. However, research indicates that the following factors may be involved:

- **Age**

- Skaters 10 – 14 years of age are most at risk of injury.
- Younger and less experienced skaters may have difficulty with balance, coordination, position sense, and spatial sense. They may also be unable to selectively attend to movement characteristics and thus avoid collisions. They may have inadequate knowledge of road rules since they are under driving age.

- **Gender**

The majority of injured skaters are males but this is related to their higher participation in skating.

- **Experience**

Novice skaters are the group most at risk of injury as they tend to lose control and fall.

Inability to brake is associated with a substantial number of inline skating injuries.

Advanced skaters are also at risk of injury while attempting tricks, often at considerable speed. Injuries of advanced skaters are also likely to be more severe than those of novice skaters.

- **Non-wearing of protective equipment**

Failure to wear protective equipment is associated with increased risk of injury. Inline skaters not wearing wrist guards have been found to be 10.4 times more likely to be injured, and those not wearing elbow pads 9.5 times more likely to be injured than skaters wearing protective equipment [5].

- **Skating location**

Obstacles, cracks and holes in the pavement are hazardous to skaters. Skating on roads puts skaters at a small but serious risk of death or severe injury by collision with vehicles. Irregular riding surfaces account for over half the skateboarding injuries due to falls [6].

- **Behavioural factors**

Travelling at high speed, attempting tricks, failing to maintain equipment and wearing unsuitable footwear for skateboarding may also contribute to the risk of injury while skating.

- **Peer influence**

The wearing of personal protective equipment appears to be influenced by the behaviour of peers. Skaters in groups are likely to wear the same pattern of protective equipment as their companions [7].

FACTS ON FALL INJURY AMONG SKATERS



Personal Protective Equipment

RESEARCH EVIDENCE BASE

There is strong evidence for the effectiveness of wristguards, elbow pads and weaker evidence for knee pads in protection against inline skating injuries. As the main mechanism of injury for inline skating and skateboard injuries is the same, that is falls, this equipment is expected to have similar protective effects for skateboarders. Similarly, the evidence to show the protective effect of helmets for bicycle riders indicates that helmets should provide protection against head injury for both inline skaters and skateboarders.

WRISTGUARDS

Level of use of wristguards

While an observational study of inline skaters in Boston, USA [8] found that 60.5% of observed skaters wore wristguards, a comparable study of Victorian inline skaters found that only 25.9% of observed inline skaters wore wristguards [7]. Novice inline skaters are the most likely group to wear wristguards and advanced skaters the least likely [8].

The level of use of wristguards by skateboarders in Victoria is unknown, but thought to be extremely low.

Effectiveness of wristguards

There is evidence to indicate that wristguards prevent wrist injuries with non-use of wristguards being found to account for 87% of all wrist injuries in one study [5, 9].

HELMETS

Level of use of helmets

Only 5.5% of Victorian inline skaters wear helmets while skating [7]. Overall, helmets are the least commonly observed form of protective gear worn by skaters [10]. Novice and expert inline skaters are more likely to wear helmets than average ability skaters [7].

Regulations

Currently there are no regulatory requirements for skaters to wear helmets while skating on Victorian roadways (where permitted) or footpaths.

Effectiveness of helmets

While there is evidence that helmets provide substantial protection against head injuries for cyclists [11], at this stage the effectiveness of multipurpose helmets or skating helmets has not been assessed. However, it is assumed, based on the effectiveness of cycling helmets, that the use of helmets by skaters would reduce the incidence and severity of skating-related head injuries.

KNEE PADS

Level of use of knee pads

Knee pads are used by only 23.5% of Victorian inline skaters [7]. Novice and expert inline skaters are more likely to wear knee pads than average skaters [7].

FACTS ON FALL INJURY AMONG SKATERS



Effectiveness of knee pads

The effectiveness of knee pads at this stage is unclear. A small increase in risk of injury has been associated with non-use of knee pads, but this difference was not statistically significant [5].

ELBOW PADS

Level of use of elbow pads

Only 6.9% of Victorian inline skaters wear elbow pads while skating [7]. Novice and advanced inline skaters are more likely to wear elbow pads than average ability skaters [8].

Effectiveness of elbow pads

Elbow pads provide substantial protection against elbow injury, with those not wearing pads being 9.5 times more likely to receive an elbow injury than those wearing elbow protection [5].

MOUTHGUARDS

A recent US study of skatepark injuries reported a number of dentoalveolar injuries [12]. The authors suggest that mouthguard use should be recommended for all skating activities.

RECOMMENDATIONS

The recommended actions aimed at decreasing injury risk to skaters by the use of personal protective equipment are:

- Promote the use of full protective gear to skaters of all ages and abilities.
- Consider mandating the use of protective gear in council-controlled skateparks.
- Identify and address barriers to wearing protective gear, especially among adolescents.
- Review and promote standards for helmets, both multi-purpose and specifically designed for skating (with extended coverage to protect the back of the head).
- Encourage all rental outlets for skating equipment to provide protective gear as part of the rental package.
- Undertake further biomechanical and ergonomic research into the design of protective equipment.
- Make wearing of protective gear a contractual requirement for competitive skaters.
- Promote editorial policy to skate magazine proprietors, publishers, advertisers and editors to only publish images of skaters wearing personal protective equipment.

RESOURCES

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

<http://www.general.monash.edu.au/muarc/rptsum/muarc133.pdf>

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

Safe skate facilities

The provision of purpose built facilities for skating is seen as a means of encouraging skaters to move away from public places and streets where they may create nuisance or face danger. Sport and Recreation Victoria have published guidelines for the design and development of public skate facilities: *The Skate Facility Guide*. Copies of this publication are available for download from www.sport.vic.gov.au.

RESEARCH DATA

A recent study of injuries incurred at a commercial skatepark in the USA [12] reported some evidence to indicate that the injury rate may be substantially less than injury rates for skaters not using skateparks. The study showed an estimated injury rate of 1.1 per 1000 for skatepark skaters compared to the rate of 7.0 to 7.5 per 1000 reported elsewhere for non-skatepark skaters. However, the extent to which this relates to unsupervised skateparks is unclear. The commercial skatepark in the study had the requirement for wearing safety equipment (helmet, knee and elbow guards) with reported 98% compliance. Further, staff were available to supervise the skating activities and to provide assistance. Therefore, it is not clear whether the reduced injury rates were due to the design of the park, the use of protective equipment, the presence of supervision or a combination of these factors.

While it has been assumed that skating in the controlled environment of skateparks provides a safer alternative to street skating, at this stage there is very little research to support this assumption.

RESOURCES

- *The Skate Facility Guide*. Sport and Recreation Victoria 2001 - www.sport.vic.gov.au.
- *Skate Park Facility Planning* Sport and Recreation WA - www.dsr.wa.gov.au
- Online guides to skate parks in Australia
www.sk8parx.com
www.skatelocate.com.au
- *Guidelines to establishing in-line skate trails in parks and recreational areas* - www.iisa.org/pdf/trails-01.pdf

RECOMMENDATIONS

- Provide purpose built skating facilities and skating trails separating skaters from other traffic and pedestrians.
- Maintain facilities and trails and clear them of debris such as branches, sand, stone and litter.
- Rate skating trails for difficulty and post rating clearly at start of each trail.
- Promote the compulsory wearing of personal protective equipment by skaters using commercial and public skateparks.



RECOMMENDATIONS

- Councils should develop “skate management plans” in consultation with local skater groups which include a skater code of conduct, provision and maintenance of safe skating facilities;
- Local Councils and skating venue managers should promote and enforce wearing of protective equipment on Council property and at skating venues.

REFERENCES

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11. Thompson, D., Rivara, F. and Thompson, R. *Effectiveness of bicycle safety helmets in preventing head injuries: a case control study*. Journal of American Medical Association, 1996. **276**(24): p.1968-1973.
12. Everett, W., *Skatepark injuries and the influence of skatepark design: a one year consecutive case series*. The Journal of Emergency Medicine, 2002. **23**(3): p.269-274.

OTHER RESOURCES

- Melbourne Inline Skating: www.freewebs.com/melbourneskating
- Roller Sports Victoria: www.rollersports.com.au
- An Australian online rollerblading publication: www.rollerblading.com.au
- Skateboard science: www.exploratorium.edu/skateboarding/

This kit is produced by Monash University Accident Research Centre (MUARC). Annual updates will be published on the MUARC website: <http://www.general.monash.edu.au/muarc>. We welcome your input especially information or access to useful resources and web sites. Multiple copies of the Facts on Falls brochures may be ordered through VISAR (contact details below). Local area fall injury data are available from Victorian Injury Surveillance and Applied Research (VISAR) at MUARC. Phone 9905 1805 or visit the VISAR website <http://www.general.monash.edu.au/muarc/visar/>