



Active Alert

A report on the prevention of activity injuries in young people

It's a matter for everybody...

FACTS SHEET No. 6

APRIL 2000

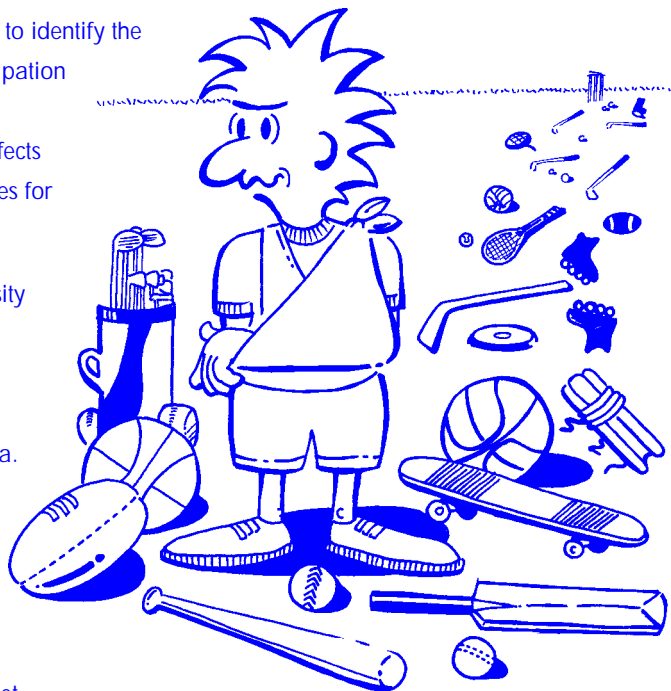
INTRODUCTION

Sport and physical activities are an important part of everyday life for a large number of children in South Australia. Activity not only helps to keep children fit and healthy, but also provides an opportunity for them to make new friends and experience being part of a team.

Australian Bureau of Statistics figures show that of people aged 18 years and over who dropped out of sport during 1995-96, injury was the second most common reason given (20.7% of males and 18.7% of females). (ABS 4156.0, 1997) While there are no comparable statistics for children, injuries, and the fear of injury are reasons for children dropping out of sport (Sale, 1991). By reducing the likelihood of sustaining an injury during participation, the dropout rate should decrease, leading to a more active and healthier population.

There are several purposes of this Facts Sheet: to identify the types of injuries children receive during participation in physical activity; to provide examples of preventative measures and demonstrate the effects of their implementation; and to provide avenues for further information.

The Centre for Allied Health Research (University of SA, City East Campus) together with Sports Medicine Australia, SA Branch have conducted a survey of years 7 and 10 children from 72 schools within South Australia. The results of this survey have recently been published (Young People's Participation in Sports and Recreational Activities, and Associated Injury, 1999) and have been used for participation and injury statistics contained in this Facts Sheet.



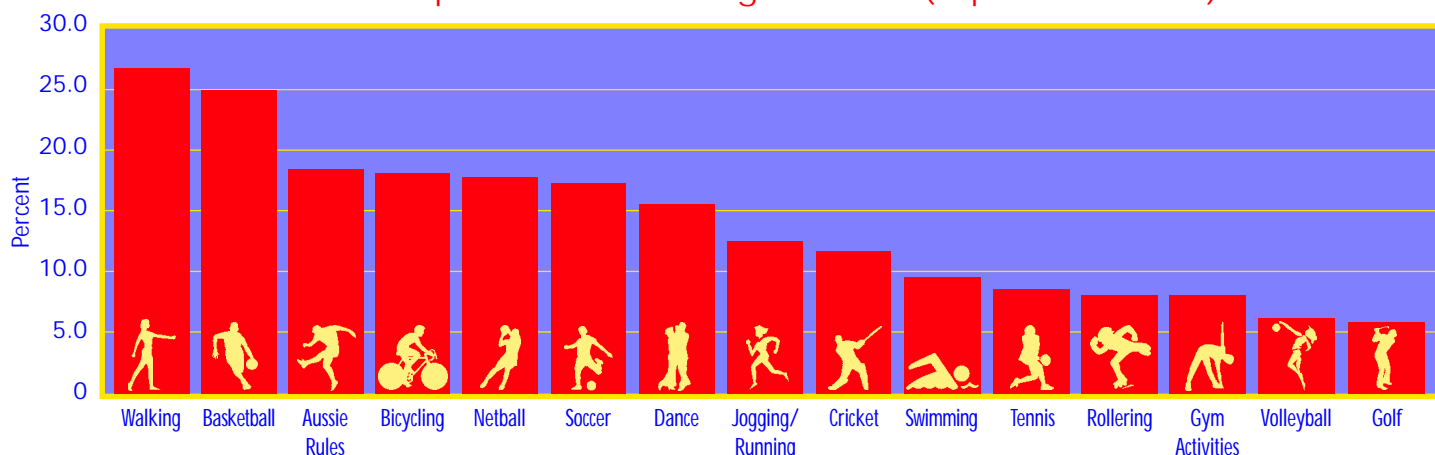
Participation In Physical Activities

Each student surveyed was asked to report up to three activities in which they had participated during the preceding week. Results showed that South Australian school children are actively involved in sport and physical activity, spending an average of 5.6 hours per week* participating in a range of activities.

*This includes activity during school hours, after school and on weekends.

The following graph shows the activities with the highest participation rates. An average of 2.5 activities were reported by students, hence the graph totals more than 100%.

Participation Rate Among Students (Top 15 Activities)



Source: Young People's Participation in Sports and Recreational Activities, and Associated Injury, 1999.

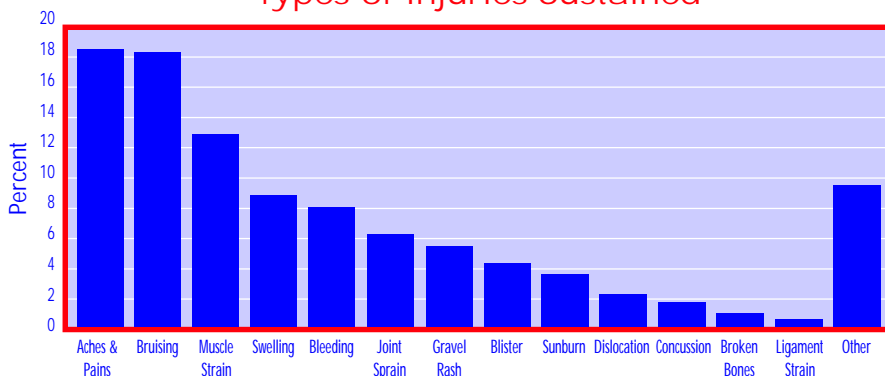
Injuries Sustained During Participation

Type of Injury

The majority of injuries sustained were minor, with aches and pains and bruising being the most common complaints (18.4% and 18.3% respectively).

Although one injury was reported every three times a child participated in an activity, the majority of injuries were minor.

Types of Injuries Sustained

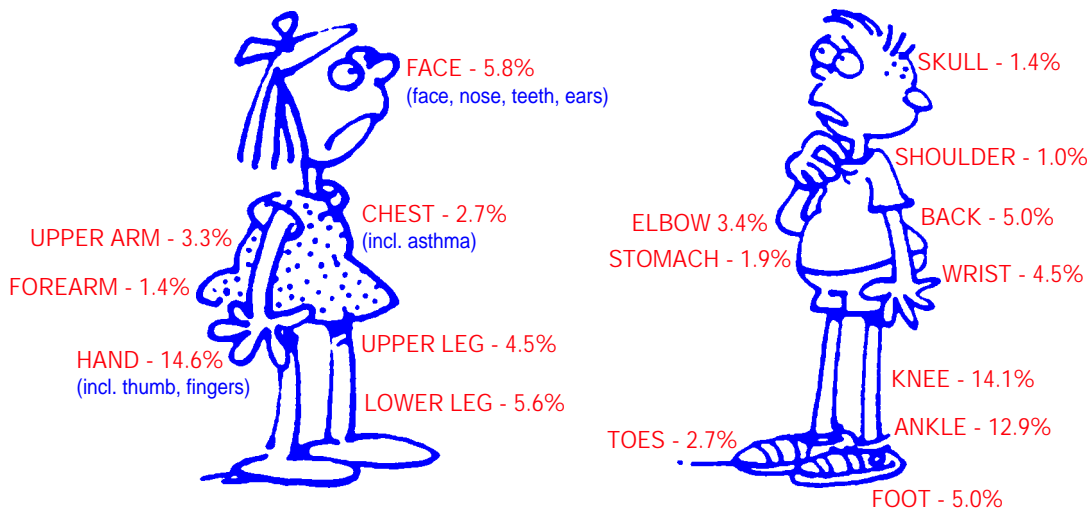


Source: Young People's Participation in Sports and Recreational Activities, and Associated Injury, 1999.

Location of Injury

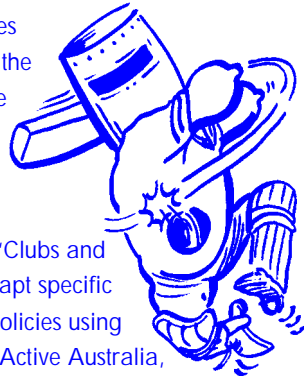
The most commonly reported sites of injury were the knees and ankles, making up 27% of all injuries sustained.

The legs and feet constituted nearly 45% of all injuries, which suggests that playing surfaces and footwear should be examined with taping/bracing being used during appropriate activities in order to prevent some of these injuries.



Injury Prevention

There are a range of counter-measures which can be implemented to reduce the likelihood of injuries occurring. These range from examining environmental factors, playing conditions and rules, to personal protective equipment.



SportSafe Australia recommend that 'Clubs and organisations should develop and adapt specific and relevant sport safety plans and policies using the resources of SportSafe Australia, Active Australia, Sports Medicine Australia and existing infrastructure...'. (SportSafe Australia - 'A National Sports Safety Framework', 1997, recommendation 2.1)

Following is information on some of the factors which help to prevent injuries in children and examples of sports which have adopted policies with the aim of reducing the number and severity of injuries sustained.

Policy Development

Thirteen State sporting organisations within South Australia have developed Junior Sports Policies (Australian Rules, Badminton, Baseball, Cricket, Golf, Judo, Lawn Bowls, Orienteering, Softball, Swimming, Tennis, Touch Football, Women's Soccer). These policies outline the level and duration of training for children in different age groups and recommend modified rules for competition.

The South Australian Baseball League developed a set of guidelines during 1997. Some of the points contained in their policy include:

- 5-7 y.o. Introduced to basic movement and coordination skills. No regular organised competition.
- 8-10 One training session (max. 60 minutes) per week. One game of tee ball per week (no premiership points or finals).
- 11-12 Modified 90 minute Pee Wee Baseball game. Players rotate position, limitation of 70 pitches per player. Training emphasises correct mechanics.
- 13-14 Modified 110 minute adult game. Smaller diamond with a limit of 80 pitches per player. Training includes physical fitness and conditioning.
- 15-17 Adult game with pitches limited to 90 per player for under 16's and 100 pitches for under 18's. Training includes physical fitness and conditioning.

Environment

Hot Weather Guidelines

Children have a poorly developed sweating mechanism and absorb heat more rapidly than adults due to their greater surface area/weight ratio, making them more susceptible to heat-related injuries.

Exercising in hot weather can lead to dehydration, heat exhaustion, heat stroke and even muscle meltdown, kidney failure and death.

Hot weather guidelines have been developed by Sports Medicine Australia. Copies of these guidelines are available free of charge from Sports Medicine Australia (SA Branch) and National Pharmacies.

Playing Surface

There are a variety of playing surfaces available, from asphalt and concrete to grass and artificial turf, wooden floors and synthetic surfaces. When selecting a playing surface, there are several factors which need to be considered. These include:

Cost of Installation and Maintenance - money is always a limiting factor but just as important is how regularly the surface will need to be maintained (eg cleaned, polished, mowed, resurfaced and repaired).

Location - is the surface indoors or outdoors? If the surface is outdoors, will soil movement or sunlight cause the surface to crack? Is there adequate drainage?

Grip - how much grip is required? Do players need to slide or dive along the surface, and if so, are they likely to be grazed or burnt?

Shock Absorption/Bounce - shock absorbing surfaces can play a vital role in the prevention of impact-related and overuse injuries, from general muscle soreness through to shin splints and stress fractures. The level of shock absorption depends not only on the level of impact of the activity, but also on other playing factors such as bounce. For example, ETSA Park has a triple-sprung wooden floor which is ideal for netball because it provides a high level of impact absorption.

Playground Surface

Each year 100,000 children require medical attention for injuries sustained on playgrounds and 7,000 require hospitalisation. The majority of these injuries occur as the result of a fall from equipment onto a hard surface. (NSW Health - 'How safe are children's playgrounds?')

Any equipment over half a metre high should have a cushioning surface underneath it. Ground surfacing material generally falls into one of two categories: loose fill materials such as pine chips and shredded rubber; or solid surfacing such as mats or wet pour substances.

Loose fill materials are generally cheaper to install but require significant maintenance. There can be problems associated with loose fill, such as splinters from bark or pine chips and with sharp objects becoming hidden beneath the surface.

Solid surfacing is generally more expensive to install but is often cheaper in the longer term and is accessible to wheelchairs and pambulators.

A Playground Manual is available from the South Australian Office for Recreation and Sport.



Modifications To Rules & Playing Equipment

Aussie Sport

AUSSIE SPORT started in 1986 with the aim of keeping children in sport and physical activities. Sports educators had noticed in the early 80s that playing adult versions of sports often had detrimental effects upon children and that many were abandoning sports which weren't suited to their needs.

The original AUSSIE SPORT program comprised exclusively of modified sports but has expanded to 'include a number of programs and resources which parents, teachers, club coaches and local community personnel can use to improve junior sport'. (AUSSIE SPORT - Developing Active Young Australians, 1998)

Since the implementation of AUSSIE SPORT, many sporting organisations have recognised the need to modify sport, not only to make it more suitable for young people, but also to prevent injuries to participants of all ages.



Examples of Modifications to Rules and Equipment

- reducing body contact (eg no tackling in junior football (Australian Rules), banning roundhouse kicks (in Karate))
- allowing player substitutions during play (eg Soccer, Netball)
- reducing the size of the playing area and number of players (AUSSIE SPORT)
- increasing the number of substitute players allowed
- using equipment suited to the age and ability of players (eg using a moulded plastic bat and stumps in Kanga Cricket, lowering the height of the basket in basketball)
- shorter playing time and/or more breaks (eg four 10-minute quarters in mini-touch, compared with two 25-minute halves for seniors)
- reducing penalties for mistakes (eg losing one run for a dismissal in Kanga Cricket, a dropped ball being counted as one 'touch' in mini-touch)
- compulsory use of protective equipment (eg eye protection in squash)

Rule and Equipment Changes - Junior Football, SANFL

The SANFL have a number of measures which they use to reduce injuries. These include: specifications for the number of players, playing area, playing time and ball size for children in years 3, 4-5 and 6-7; rules against tackling and barging (fending off and running into opponents) in younger age groups (year 5 and below); and compulsory padding of fixed goal posts. Nine-a-side games are also offered at all levels which incorporate the use of zones to prevent crowding around the ball. (SANFL Junior Policy Information Booklet)

Rule and Equipment Changes - Netball

Netball SA has recently introduced a number of changes to counteract injuries. These include: allowing unlimited player

substitutions during the game; increasing the total number of players in each team from 10 to 12; and making the use of padding around goalposts to a height of 10 feet compulsory for all clubs affiliated with their Association. Netball have also produced a Smartplay Policy that addresses all aspects of sports safety. (Netball SA)

Playing Equipment - Softball Bases

A study in the United States found that sliding into a fixed base contributed to 71% of all softball injuries. To combat this, a break-away base was designed which was found to reduce the rate of sliding injuries by 96%. (Janda et al., 1990)

Personal Safety Equipment

The selection of safety equipment on the market is extensive - shin guards, eye protection, helmets, cricket pads, strapping tape, knee and ankle braces, gloves - the list goes on and on.

While many pieces of equipment may seem expensive (especially when bought for children who are constantly outgrowing things), the pain and medical costs that they can save far outweigh their purchase cost. Demonstrated on a table on page 5 is a comparison between the cost of a mouthguard and dental injuries.

Mouthguards

Mouthguards help to prevent injuries to the teeth, lips and jaw. The two most common types of mouthguard are boil and bite, and custom fitted.

Boil and bite mouthguards are made of rigid plastic which is softened in hot water and moulded by placing in the mouth and biting. However, in some instances they may be uncomfortable and impair breathing and speech.



Custom fitted mouthguards are made by a dentist from a special shock-absorbing plastic. Because they are specially fitted to the teeth, they allow easy breathing and speech. Custom fitted mouthguards are more expensive, but their cost is minor compared with the cost of repairing or replacing a tooth and maintaining it over a lifetime.

It is generally accepted that custom-fitted mouthguards offer the best protection, however Sports Medicine Australia SA Branch believe that "the best type of mouthguard is the one which is being worn", or in other words, whether you're training or competing, any protection is better than none.

Bicycle Helmets

Since 1 July 1991, the wearing of helmets for pedal cyclists in South Australia has been compulsory. As a consequence, the number of hospital admissions from potentially preventable cycling accidents decreased by 24.7% over the two years after implementation (compared with the two years before implementation). (Evaluation of the Compulsory Helmet Wearing Legislation for Bicyclists in South Australia, Office of Road Safety, 1994)

Education For Injury Prevention

Coaching Children

When coaching children, it is important to match their training and competition level with their ability and interest in the activity. For example, when coaching younger children (5-7 years) emphasis should be placed on developing basic skills, positive attitudes and social skills rather than competition and tactics. Training activities should vary from session to session for children of all ages. Not only does this help to reduce the risk of overuse injuries, it also stops children from becoming bored.

The Australian Coaching Council (ACC) is the national body responsible for the coordination of coaching development in Australia through the National Coaching Accreditation Scheme. Many sports also offer 'orientation to coaching' courses through State/National bodies.

The ACC also have resources for coaches such as 'Coaching Children' - a publication written for coaches, teachers and parents who assist in coaching children. This contains information such as what children enjoy in sport, children's physical and social characteristics, developmental stages of learning, teaching skills and coaching hints.

Player Education

Educating children on how to prevent injuries is a role which should be shared by parents, coaches, teachers and sports trainers/first aiders.

Some areas for player education can include:

- warming up, stretching, fluid replacement and cooling down. The principles of each (why they are used and how they prevent injuries) should be explained and incorporated into all training sessions and games;
- how to select the correct playing and protective equipment, and how and why that equipment is used;
- teaching correct techniques (eg throwing, catching, how to fall without getting hurt); and
- how to manage minor injuries (RICER)

Part of teaching children about how to prevent injuries is to lead by example. Children's behaviour is often influenced by the adults they look up to, so the most effective way to teach injury prevention is to use those principles yourself.



Cost of a Mouthguard vs Lifetime Cost of Repairing and Replacing a Broken Tooth

The following fee estimate was prepared by a dental surgeon using the approximate cost of each procedure at that time. It provides an example of the fees involved in the repair, replacement and maintenance of a single tooth from the age of 12 to 80. These figures do not take into account additional dental work which may be required to adjacent teeth due to damage or loss of support caused by the loss of the tooth.

| Procedure | \$ | Procedure | \$ |
|--------------------------------|-------|----------------------------|----------|
| examination and management ... | 200 | extraction | 100 |
| restoration | 180 | partial denture | 800 |
| observation | 200 | fixed bridge | 3,000 |
| endodontics | 600 | replacement bridge | 3,000 |
| bleaching | 500 | implants | 4,000 |
| post crown | 1,250 | replacement implants | 4,000 |
| replacement crown | 950 | TOTAL | \$18,780 |

With custom-fitted mouthguards available at a cost of \$85-160 and boil-and-bite mouthguards from approximately \$7, the purchase of either one of these is a worthwhile investment.

Source: Dr Mark Earl, Dental Surgeon



Conclusion

It is encouraging to see that children in South Australia are active and although injuries are such a common occurrence, the majority of these are minor and in the main can be dealt with using basic first aid principles.

Children are generally receptive to information and by teaching injury prevention principles at a young age and by reinforcing those principles, children can establish good habits which will continue throughout their lifetime.

Through the use of preventative measures, many injuries could be avoided or their impact minimised. By making physical activity safer, the participation rate for both children and adults should increase due to a lower dropout rate and a safer perception of physical activity.

References

| | |
|--|---|
| Sports Medicine Australia SA Branch and Centre for Allied Health Research (University of SA, City East Campus) | Young People's Participation in Sports and Recreational Activities, and Associated Injury, 1999 |
| SportSafe Australia/Australian Sports Commission | A National Sports Safety Framework, 1997 |
| Australian Sports Commission | National Junior Sport Policy, 1994 AUSSIE SPORT - Developing Active Young Australians, 1998 |
| NSW Health - 'How safe are children's playgrounds?' | www.health.nsw.gov.au |
| Office for Recreation and Sport | Playground Manual |
| Sports Medicine Australia SA Branch | Safety Guidelines for Children in Sport and Recreation Hot Weather Guidelines Gear Up - protective equipment brochure Sports First Aid Course Manual |
| South Australian National Football League Inc | SANFL Junior Policy Information Booklet, 1996 |
| Janda DH, Wojtys EM, Hankin FM | A three-phase analysis of the prevention of recreational softball injuries. The American Journal of Sports Medicine, 18(2): 59-63, 1990 |
| Sale, B (Commissioned by South Australian Sports Institute) | Junior Sport in South Australia, 1991 |
| Australian Bureau of Statistics | 4156.0 Sport and Recreation: A Statistical Overview, Australia 1997 |

Acknowledgements

Jenny Williams and Lisa Holland, Sports Medicine Australia, SA Branch; Dr Mark Earl, Dental Surgeon.

The Office for Recreation and Sport and Sports Medicine Australia would like to thank Melanie Armistead for her valuable contribution in the collation of the data contained within this Facts Sheet.

Sports Medicine Information Brochures

The following brochures are available from National Pharmacies and Sports Medicine Australia SA Branch:

- Warm Up - stretching
- Gear Up - protective equipment
- Drink Up - beat the heat
- Fuel Up - food for sport
- Asthma and sport
- Diabetes and sport
- Drug Use - drugs in sport
- Hot Weather Guidelines

Sports Medicine Awareness Course

Sports Medicine Australia SA Branch run practical workshops on Injury Prevention and Management which includes:

- warm up, stretching and cool down
- protective equipment
- fluid replacement
- asthma management
- management of basic sporting injuries
- RICER management of soft tissue injuries

These workshops run for three hours and cost \$15 per participant.

For groups of 15 or more, a course can be run at your venue at a convenient time.

For information on this and other courses, telephone Sports Medicine Australia SA Branch on 8234 6369

For Further Information



OFFICE FOR
RECREATION & SPORT
DEPARTMENT OF INDUSTRY & TRADE

Office for Recreation and Sport
27 Valetta Road, Kidman Park, South Australia 5025
Arthur Konstad - Project Officer - Statistics
Phone: (08) 8416 6720 Fax: (08) 8416 6724
Email: konstad.arthur@saugov.sa.gov.au



Sports Medicine Australia SA Branch
27 Valetta Road, Kidman Park, South Australia 5025
Phone: (08) 8234 6369 Fax: (08) 8234 6352
Email: smasa@camtech.net.au
Websites: www.smasa.asn.au
www.smartplay.net