physical preparation

analyse different sports in order to determine priority preventive strategies and how adequate preparation may prevent injuries

There is no guarantee policy to ensure that an athlete won’t incur an injury when participating in sport; however, suitable preparation both during training and immediately before the sports event can help prevent injuries. Mental and physical ‘readiness’ is vital when playing sport, and this is the responsibility of both the sports coach and the participating athlete. Knowing the history of the athlete through pre-screening, developing skills and technique, wearing appropriate clothing and protective equipment, a suitable fitness level, and applying the correct warm up, flexibility and cooling down procedures are all contributing factors in the prevention of sport injuries.

– pre-screening

Pre-screening an athlete provides information about their history, capabilities and any pre-existing medical conditions. This information is valuable to the training methods and skill development of the athlete. The purpose and benefits of the screening are to:

• highlight any predisposing factors that may lead to injury
• reveal risk factors to injury so that personalised interventions can be used to rectify any musculoskeletal problem areas and reduce the likelihood of future injury
• pre-screen athletes before events to ensure they are fit and injury-free for competition
• assess any current injuries
• assess any musculoskeletal factors that may impact on performance
• design individual injury prevention programs based on results
• review previous experience in the sport
• investigate the level of development, both with the technical and tactical skills of the sport as well as their level of physical fitness
• discuss goals and aspirations in the sport.

An example of a pre-screening system used by Sports Medicine Australia (SMA) is given in Figure 3.1. It suggests that if the athlete presents in two or more areas in the list, they present as a risk, and therefore greater attention has to be given to their sport participation levels.
## Figure 3.1
Pre-screening sample system

### Pre-exercise screening system 2005
Sports Medicine Australia (SMA) - Stage 1 questionnaire

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Gender</th>
<th>M</th>
<th>F</th>
<th>Phone</th>
<th>Date</th>
</tr>
</thead>
</table>

1. **Have you ever had a heart attack, coronary revascularisation surgery or a stroke?** No Yes
2. **Has your doctor ever told you that you have heart trouble or vascular disease?** No Yes
3. **Has your doctor ever told you that you have a heart murmur?** No Yes
4. **Do you ever suffer from pains in your chest, especially with exercise?** No Yes
5. **Do you ever get pains in your calves, buttocks or at the back of your legs during exercise which are not due to soreness or stiffness?** No Yes
6. **Do you ever feel faint or have spells of severe dizziness, particularly with exercise?** No Yes
7. **Do you experience swelling or accumulation of fluid about the ankles?** No Yes
8. **Do you ever get the feeling that your heart is suddenly beating faster, racing or skipping beats, either at rest or during exercise?** No Yes
9. **Do you have chronic obstructive pulmonary disease, interstitial lung disease, or cystic fibrosis?** No Yes
10. **Have you ever had an attack of shortness of breath that developed when you were not doing anything strenuous, at any time in the last 12 months?** No Yes
11. **Have you ever had an attack of shortness of breath that developed after you stopped exercising, at any time in the last 12 months?** No Yes
12. **Have you ever been woken at night by an attack of shortness of breath, at any time in the last 12 months?** No Yes
13. **Do you have diabetes [IDDM or NIDDM]? If so, do you have trouble controlling your diabetes?** No Yes
14. **Do you have any ulcerated wounds or cuts on your feet that do not seem to heal?** No Yes
15. **Do you have any liver, kidney or thyroid disorders?** No Yes
16. **Do you experience unusual fatigue or shortness of breath with usual activities?** No Yes
17. **Is there any other physical reason or medical condition, or are you taking any medication(s) which could prevent you from undertaking an exercise program, or that you are concerned about?** No Yes

### Notes:
- Some of these conditions might include a history of blood clotting, osteoporosis, bone fractures or serious musculoskeletal disorders, or if they have recently lost a large amount of body mass without trying to. Other types of conditions might include psychiatric disorders, later-stage pregnancy or those with a history of health problems during pregnancy. Those people taking medication(s) for medical conditions listed may also need medical clearance.
- Also, if any one or more of the risk factors [below] are extreme then the health and fitness professional should use professional judgement as to whether medical clearance may be required.

**Source:** Sports Medicine Australia
skill and technique

An athlete’s lack of skill development and poor technique in their chosen sport can contribute to an increased risk of injury during play, not only to the athlete themself, but also to another player due to poor execution. For example, two soccer players contesting a ball in the air, and one player inflicts a head injury to another, or a player with poor execution in a ‘one-on-one’ contest for the ball, can inflict injury to the other player’s ankles.

The understanding and development of skills related to a chosen sport is of utmost importance to prevent injury. Some examples of these are:

- correct tackling technique in rugby league to prevent head, neck or shoulder injury
- correct technique when ‘packing into a scrum’ in rugby union to prevent neck injury
- correct catching technique in netball to prevent finger injuries
- correct technique in the basketball ‘jump shot’ to prevent knee and ankle injuries
- correct vault landing technique in gymnastics to prevent ankle injuries.

As the athlete’s skill development and technique increases, along with the level of competition, they will become more experienced in playing situations, and so will reduce incidence of injury.

physical fitness

Physical fitness does not only refer to an athlete having the ability to play a whole game without getting fatigued, but involves a balance of all the components of fitness—both health and skill related. Returning to play after an injury, pre-season training or general all-year-round participation in physical activity requires constant maintenance of all components of fitness to minimise the risk of injury.

Health-related components

Health-related components are factors that relate to how well the body systems work. These include:

- Cardiovascular fitness—the ability of the circulatory system (heart and blood vessels) to supply oxygen to working muscles during exercise.
- Body composition—the relative percentage of body fat compared to lean body mass, such as muscle, bone and water.
- Flexibility—the range of movement possible at various joints.
- Muscular strength—the amount of force that can be produced by a single contraction of a muscle.
- Muscular endurance—the ability of a muscle group to continue muscle movement over a length of time.

Skill-related components

Skill-related components are aspects of fitness which form the basis for successful sports participation. These include:

- Speed—the ability to move quickly from one point to another.
- Agility—the ability of the body to change direction quickly.
- Balance—the ability to maintain an upright posture while still or moving.
- Coordination—the integration with hand and/or foot movements with the input of the senses.
- Reaction time—the amount of time it takes to respond to a stimulus.
- Power—the ability to do strength work at an explosive pace.

warm-up, stretching and cool down

Before the commencement of any exercise or sport, it is very important to do a warm-up that includes stretching exercises, and then complete the session with a cool down. These vital components of a session can help the body prevent injuries and prepare it for activity. The benefits of a warm-up include:
• improved flexibility—the soft tissues of the muscles increase in elasticity
• improved strength—the motor units of the muscles are stimulated and prepared for a heavy workload
• increased blood flow—exercise-related problems are reduced by the increase in coronary blood flow and blood to the muscles
• reduced fatigue—warm-ups prevent early lactic acid buildup and fatigue that could shorten the training or playing time
• improved mental preparation—mentally prepares the athlete for the event by clearing the mind, increasing focus, reviewing skills and strategy. Positive imagery can also relax the athlete and build concentration.

There are two different types of stretching exercises. Stretches are either dynamic (which involve motion) or static (which involve no motion). The diagram in Figure 3.3 illustrates a variety of basic static stretches that can be completed before or after a physical activity.

Dynamic stretches, for example, slow controlled leg and arm swings and proprioceptive neuromuscular facilitation (PNF) stretches with a partner are common examples of stretching exercises before activity. In game-specific warm-ups, a skill session is also valuable in the warm-up phase to promote preparation for the competition ahead.

Static stretches are more appropriate to the cool-down phase, as they help muscles to relax and increase their range of movement. An appropriate cool down is an important phase of the training session or game. A well-designed cool down session will:
• aid in the dissipation of waste products, including lactic acid
• reduce the chances of dizziness or fainting caused by the pooling of venous blood at the extremities
• reduce the level of adrenaline in the blood
• reduce the potential for ‘delayed onset muscle soreness’ (DOMS). Muscle soreness that occurs some 24–48 hours after intense exercise usually involves eccentric contractions. This causes increases in intracellular pressure that irritates the nerve endings, producing swelling and local pain. The soreness can be an indication of potential muscle adaption to follow, but if it persists or gets consistently worse, this could indicate over training and large muscular tissue damage.

![Figure 3.3: Static stretching exercises](image-url)
Beckham admits lack of fitness behind injury

London—David Beckham admitted Friday that a lack of fitness contributed to the knee injury that, it has now been confirmed, will keep him out of England’s crucial Euro 2008 qualifiers next month.

Beckham suffered the injury, which scans showed to be a sprained medial collateral ligament, after twisting awkwardly in a game for LA Galaxy against Mexican side Pachuca Wednesday.

The midfielder’s recent career has been hampered by an ankle injury, which delayed his debut for his new side, and he acknowledges he is still suffering from the after effects.

‘I was overcompensating and went into the tackle a little bit weaker than I would have done fully fit,’ he said.

SOURCE: SOCCER NEWS, 31 AUGUST 2007

sports policy and the sports environment

Critically analyse sports policies, rules and equipment to determine the degree to which they promote safe participation, eg heat rules, rugby union scrum rules

Governing sporting bodies in Australia provide guidelines and policies that schools, sporting organisations and associations, clubs, coaches, facility administrators and other support staff have a responsibility to adhere to, so as to promote a safe playing environment for participants.

All sport and recreation organisations have the responsibility to provide a fair and safe environment for players, coaches, referees and spectators, in order to reduce the potential of injury and foremost to meet legal duties of care. Risk management planning is becoming an increasingly common practice in the sport, recreation and physical activity sector.

rules of sports and activities

The rules or laws that govern an organisation are in place to protect all participants and spectators. Besides the policies set out by governing bodies of organised sport and recreation, clubs generally have a set of rules and regulations which often include the club’s constitution and policies, such as member protection policy, by-laws, codes of conduct, the rules of the game and behaviour guidelines.

modified rules for children

Where children are concerned, applying simplified or modified rules, especially for juniors, will contribute to a more enjoyable, safer and satisfactory sporting experience. Modifications made to sports to accommodate children’s participation include:

• decrease in the size of the playing field or court
• smaller, and sometimes softer, playing equipment
• rule changes
• timing of games shortened
• increased use of body protection and/or protective equipment.
## SMARTPLAY CHECKLIST

The following checklist is not exhaustive, but can be used as a guide to assessing your club's safety practices. It could also form the basis of your club's annual sport safety review.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are regular safety inspections of playing areas and equipment conducted?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do new and existing members complete a pre-participation medical assessment form each year?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Are members aware of club policies regarding illness and medical conditions which may affect participation?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Is the use of protective equipment promoted and mandatory for certain age groups?</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

What protective equipment is mandatory at your club?

What protective equipment is recommended but is not mandatory?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are coaches and officials encouraged to attend approved education courses and to seek accreditation?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do your members have access to quality coaching and skill development?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Are warm-up, stretching and cool-down sessions promoted for all training and competition?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Is water/fluid provided for participants (especially during hot weather)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are correct fluid replacement practices actively promoted?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are members given the opportunity to receive training in sports injury prevention and treatment?</td>
<td></td>
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</tr>
</tbody>
</table>

**Figure 3.4**
'Smartplay' checklist for assessing a sport club's safety practices

Australia’s front rowers give scrum changes the thumbs up

One of the major talking points from last weekend’s opening round of the 2007 Investec Super 14 was the effect of the new law on scrum engagement on the flow of the game.

The new call of ‘crouch, touch, pause, engage’ was introduced to improve safety in scrums after a spate of injuries to front-rowers over the past few seasons.

Players and referees tried to come to grips with the new call during last weekend’s Super 14 action, with many scrums having to be reset, on occasion causing significant chunks of stoppage time.

The new law has had its fair share of fans and detractors since it was first implemented in a Heineken Cup match in Europe early this year.

There are concerns the new law has diminished the contest of the scrum engagement and due to the time lost to resets, has fuelled claims that it will reduce the game as a spectacle.

NSW Waratahs and Qantas Wallabies prop Al Baxter came out in support of the new scrum law earlier this week, after one scrum had to be reset six times during his team’s first-up win over the Lions in Johannesburg last Saturday.

‘It was one of those things that was done with the right intention,’ Baxter said.

‘Because of the number of front rowers going down with neck and shoulder injuries, it had to be done.’

Brumbies and Qantas Wallabies hooker Jeremy Paul defused the theory that the new law has reduced the impact of the scrum engagement, saying that it simply provides the referee with more control over the spacing between the two packs prior to engagement.

‘I don’t think that (the law) has de-powered the hit at all,’ said Paul, who played his 100th Super Rugby match for the Brumbies against the Chiefs in Hamilton last weekend.

‘It just gives the referee more control over the space and should help to reduce the number of collapsed scrums, which is where a lot of the neck and back problems are coming from for front-rowers.’

The benefits of modified rules for children are to reduce excessive physical demands placed on them from using adult equipment and field sizes. The emphasis is on fun and promoting participation and skill development rather than competition, and reducing the likelihood of domination by physically stronger or early maturing players. Modifications also allow it to resemble the sport from which it is derived, making it safe to play, yet still challenging for young people, and providing younger players with skills that are a relevant base or foundation for progressing to the parent sport.

Modified sport decreases the risk of injury for children by teaching them the correct rules and skills of the sport in a safe environment. This will ensure that children continue playing sport in the long term through encouragement, with an emphasis on fun and enjoyment. Some examples of modified sports are:

- netball
- kanga cricket
- walla rugby—rugby union
- rooball—soccer
- Auskick—AFL
- go go golf.

Matching of opponents, eg growth and development, skill level

Physical activity is required for normal growth and development, and for young people to reach their potential in muscle and bone development. Sport is an ideal way to provide this necessary activity, as it also brings psychological and social benefits to young people. When choosing teams, children should be evenly matched on weight, height, size, skill and ability, rather than age, as this will encourage participation in a balanced competition.
There are certain sports such as rugby union, which promote ‘weight for age’ competitions, where players compete under weight categories to reduce the incidence of injuries associated with size and contact. Combat sports such as boxing and judo are also examples where competitors are based on weight category.

– use of protective equipment

Protective safety equipment has been developed and recommended for many different sports and physical activities to help prevent and reduce the severity of injuries. A piece of protective equipment is not only designed for an athlete, but also for sports officials, such as baseball umpires.

The type of protective equipment an athlete wears depends on the type of sport being played, particularly in team sports where it can be specific to the field position of the player. Protective equipment includes appropriate footwear; wrist, elbow and knee guards; shin pads; shoulder padding and body protectors; helmets; ankle taping and braces; gloves; mouthguards; boxes; and for hot conditions, sunscreen, sunglasses and a hat.

Protective equipment should be worn at all times, including training sessions, be correctly sized and fitted, regularly checked and maintained, tried out before competition and used according to the manufacturer’s guidelines.

– safe grounds, equipment and facilities

People are more likely to participate in physical activity if equipment and environments are safe and their needs are met. It is in the interest of the whole community, especially service providers such as fitness and leisure centres and local councils, to ensure that their facilities and equipment are maintained to promote maximum participation.

Local councils have the responsibility of playing fields and courts, which includes maintaining the playing surface, permanent equipment, like goal posts and netball rings, and associated amenities. Councils are also responsible for recreational facilities, such as children’s playgrounds and backyard pools.

Clubs and associations are responsible for the safety of equipment such as gymnastics apparatus—ensuring the condition and the appropriate modifications suit the skill level of users—and smaller equipment such as bats and balls.

■ environmental considerations

■ evaluate strategies an athlete could employ to support the body’s temperature regulation mechanisms

■ analyse the impact of climatic conditions on safe sports participation

– temperature regulation (convection, radiation, conduction, evaporation)

Environmental conditions impact the way an athlete’s body controls their body temperature and therefore can affect their performance when they participate in a sports event.

The body can tolerate relatively small variations in deep body (core) temperature. To maintain an internal temperature of 36–38°C, there needs to be a balance between heat gain and heat loss. Heat gain can result from muscular activity, metabolism of food, shivering and hot environmental conditions.

Contributing factors to the body’s heat loss are:

• convection—movement of air or water adjacent to the skin, and cool windy conditions increase the loss of heat
• conduction—direct contact with a colder object, such as water
• evaporation—where body heat is lost from the skin when sweat is vaporised
• radiation—where heat is transferred from the body to the surrounding environment.

In hot climates, heat stress creates cardiovascular strain and can lead to thermal injuries, such as heat cramps, heat exhaustion, or potentially fatal heat stroke. Evaporation of sweat is the most important method of temperature regulation in hot environmental conditions. In colder climates, athletes such as snow skiers must ensure that they wear appropriate clothing to prevent body heat being lost.
- climatic conditions (temperature, humidity, wind, rain, altitude, pollution)

Weather conditions should be carefully assessed before participating in any physical activity or sports event.

In cold and windy conditions, participants should dress in layers to trap heat and prevent heat loss. Individual athletes can remove layers as necessary according to exercise levels and conditions. Windproof clothing, head, face and neck coverings can also reduce heat loss in the body, and any wet clothing should be removed as soon as possible to prevent heat loss.

In hot conditions the temperature and humidity can affect body temperature and athletic performance. To prevent sunburn, dehydration and heat illness take advantage of shaded areas; wear light-coloured and lightweight clothing to cover exposed skin; wear broadrimmed hats and sunglasses; and apply SPF 30+ sunscreen. If the weather condition is too hot or humid, then activity should be postponed or cancelled.

The higher the atmosphere, the thinner the air becomes due to less oxygen being available. Thinner air means there is less air resistance, so athletes who sprint, jump or cycle will perform better at high-altitude venues. But thinner air provides less oxygen, so the pace of hard endurance training and competition—which depends on high rates of oxygen consumption—gets slower.

The most important adaptation for the endurance athlete is an increase in the number of red blood cells, which are produced in response to greater release of the hormone erythropoietin (EPO) by the kidneys. Red blood cells carry oxygen from the lungs to the muscles. So when there are more red blood cells, blood can carry more oxygen, which partly makes up for the shortage of oxygen in the air. In order to compete in an endurance event at high altitude, the athlete should live at that altitude for several weeks before the event.

Air pollution is a growing concern for physical activity. Weather conditions can increase the levels of pollution and inhibit participation and performance by irritating the respiratory system. Strategies to reduce discomfort to the athlete include: being aware of personal sensitivity to air pollution; paying attention to local information on air quality; changing physical activity patterns when appropriate; and following medical advice to protect health and to care for any respiratory or other illnesses.

\[\text{Figure 3.6} \quad \text{Runners pass through a drink station at a half marathon. Staying hydrated is particularly difficult in endurance events such as marathons}\]
Olympics: Pollution over Beijing? Don’t worry, it’s only mist, say officials

As Beijing’s polluted air came close to exceeding levels even the Chinese consider dangerous yesterday, one of the International Olympic Committee’s most senior figures dismissed the yellow-grey haze that periodically hangs over the city as mist, and blamed the media for overstating pollution problems.

Air quality in Beijing remains a big cause for concern three days before the start of the games. Members of the US athletics team arrived in the city wearing face masks yesterday and organisers are preparing to postpone or relocate endurance events including the marathon and road cycling if smog levels reach dangerous limits.

But yesterday Arne Ljungqvist, chairman of the IOC’s medical commission, said he was confident that pollution would not harm athletes or visitors, and suggested media coverage had created a false impression of pollution levels.

‘The mist in the air that we see in those places, including here, is not a feature of pollution primarily but a feature of evaporation and humidity,’ he told the IOC’s annual session. ‘We do have a communication problem here. Once the misconception has become sort of established in the minds of people, it’s not that easy to get the right message through.

‘I would not discourage athletes from wearing protection devices if they are concerned, but I do not think it is necessary. I would not wear one whether I was an athlete or not.’ Two days of haze gave way to sunshine yesterday afternoon, but the official measure of air quality remained close to dangerous levels.

Official readings collated by Beijing’s municipal environmental protection bureau yesterday gave an air pollution index (API) of 91 for Beijing as a whole, and 87 at the Olympic stadium. The World Health Organisation regards an API of more than 50 as high, and a reading of 100 or more is considered unsafe. The authorities monitor air quality hourly, including levels of particulates, carbon monoxide and nitrogen dioxide, and take limited readings for ozone.

Ljungqvist said the readings were in line with the WHO’s interim targets for developing countries, and that the pollution did not pose a threat to the health of athletes visiting for the Olympics.

guidelines for fluid intake

Proper hydration is especially important during exercise. Adequate fluid intake for athletes is essential to comfort, performance and safety. The longer and more intensely the athlete exercises, the more important it is to drink the right kind of fluids.

Excessive sweating places demands on the body’s fluid reserves. Sweat is over 99% water, with most of the water derived from blood plasma, which is 91% water. When the body sweats during exercise, it reduces blood volume and creates dehydration; so if fluids are not replaced, the body’s core temperature may rise to dangerous levels. Fluid replacement maintains plasma volume so that circulation and sweating can work at optimal levels.

The general guidelines for fluid replacement during exercise include:
• Up to 2–3 standard glasses (400–600 ml) of fluid should be taken at least 30 minutes before activity commences.
• Up to 1–2 glasses (200–300 ml) of fluid every 15 minutes during physical activity in hot humid conditions.
• For events up to 90 minutes, plain cold water is the best fluid to take. Heavily concentrated salt or sugar solutions should be avoided as they reduce water absorption.
• In events of intense exercise over 90 minutes in the heat, commercially available carbohydrate or electrolyte replacement fluids may improve endurance performance by increasing glucose availability.
• After exercise replenish fluid deficit to ensure that the body is fully rehydrated but not overhydrated.
• Complete rehydration should occur before participating in another event or training session.

acclimatisation

An athlete preparing to exercise under hot or cold conditions should include a period of acclimatising to the conditions, especially if the athlete is travelling from a cool or temperate climate to compete in hot or humid conditions. The ability for an athlete to acclimatisate is dependant on age, sex, physical fitness and the humidity level of the climate.

Regular exercise in hot conditions will facilitate climate adaptation to help prevent the athlete from deteriorating in their performance or suffering from heat illness during later competitions. Sixty minutes acclimatisation activity each day for 7–10 days prior to an event provides substantial preparation for safe exercise in the heat.

Repeated exposure to hot environments causes the athlete’s body to progressively adapt to thermal stress. It results in an improved capacity for the body to sweat, leading to cooler skin and core temperature, so that a decreased level of skin blood flow is required to regulate body temperature. The athlete’s exercise capacity will improve and there will be less discomfort on their subsequent exposures to heat.

Taping can be used:
• to prevent an injury
• to isolate an injury—immobilise and support a bone or joint injury
• for immediate treatment of an injury—compression bandage to control bleeding and swelling from trauma.
Steps for strapping an ankle injury

1. Anchors are applied (green). Their function is to firmly attach the stirrups (red, first stirrup).

2. Three stirrups are generally applied (blue, stirrups 2 and 3). These attach to the anchors starting from the medial (inside) to the lateral (outside) in a U-shape formation.

3. Figure 6s are applied to further counteract the inversion movement that causes injury. These are applied from the medial to the lateral side returning to the medial side after crossing the front of the foot (first figure 6, red; second figure 6, blue).

4. Half heel lock is applied to provide further support to the posterior ankle region. Begin the heel lock on the anterior lateral aspect of the lower leg (green), and move inferiorly across the medial aspect of the ankle (obscured) towards the front of the heel. Pass the tape under the foot and across the lateral aspect of the heel at a 45° angle (pictured). The tape then passes back to the medial side of the ankle to finish the lateral aspect of the lower leg where originally started. Another half heel lock may be applied in the opposite direction, following exactly the same technique.

To see a video of ankle strapping go to:

preventive taping

Strapping or taping with adhesive tape is important to prevent joint injuries—especially in the ankle and hand—and is essential during early treatment management of injury and rehabilitation. An injured athlete who wears supportive taping is less likely to have a recurring injury when they recommence training.

A variety of sports use taping to prevent injury. For example, in karate the foot is taped, the ankles are taped in soccer, and the hands in boxing.

Tape is generally applied in two stages; the first is an underlay of a thin, porous, and foam-like material, often referred to as pre-wrap. The tape, an adhesive, is then applied over the pre-wrap in thin strips. There are a number of taping methods, each individually designed to suit a specific athletic need.

taping for isolation of injury

The primary objective of taping is to provide additional support for the specific joint, while not hindering its degree of movement. Due to the combined effects of movement and sweating, the athletic tape will not maintain its degree of rigidity for extended periods and it is common to see an athlete being re-taped at a break in play, to ensure that the joint is still well supported.

The location of the joint and the range of motion it has will depend on the effectiveness of the taping. For instance, taping of the shoulder is less effective than the ankle, because it is more difficult to isolate particular movement, such as inversion of the ankle.

bandaging for immediate treatment of injury

Bandaging is used both in administering first aid to an injury and for ongoing treatment. Bandaging is the immobilisation and compression aspect of the RICER (compression) treatment (Table 2.1), which is commonly administered in the event of a soft tissue injury or to restrict bleeding. When compression is properly administered, it should be tight without restricting blood flow.

When bandaging an open wound to stop it bleeding, ensure that a sterile pad is first applied to the wound.

Activity 1 (Page 242)
In a group, design a FLOW diagram to outline the steps of physical preparation in sport and strategies to prevent injury. Give examples of each strategy.

Activity 2 (Page 246)
Investigate the protective equipment for the following sports, and describe how each is used to prevent injury.

- athletics
- baseball
- basketball
- cricket
- cycling
- fencing
- soccer
- ice hockey
- motor sports
- netball
- rugby league
- snowboarding
- squash

Activity 3 (Page 246)
In a group, research the laws relating to junior players in walla, mini and midi rugby union provided on the website. Discuss how the new scrum laws prevent player injuries and how the laws of the game change for varying age groups.

Activities cont.

**Activity 4 (Page 250)**
Design a flyer that will be given to athletes, which outlines strategies to reduce ‘over heating’ when playing sport.

**Activity 5 (Page 250)**
Research the information given in the online document, *How to become a Smartplay Club*, then design a club sports policy to prevent injuries and maximise participation for all sports participants, officials and support staff. Include briefs on:

- sports environment
- environmental conditions.


**Activity 6 (Page 253)**
View the following website and use the interactive assistant and video about taping techniques to practise them in the following scenarios:

- ankle injury
- shoulder injury
- knee injury
- thumb injury.

Evaluate the role taping plays in both the prevention and treatment of injury.


**Review Questions**

1. **Identify** the safety factors to be considered in the physical preparation of an athlete.
2. **Identify** sports where fatigue can contribute to the risk of injury. Suggest strategies to decrease this risk.
3. **Explain** how the warm-up and cool-down phases of a training session can decrease the risk of injury.
4. **Outline** the importance of modified games for children. Use TWO examples to explain how this can prevent injury in children.
5. **Explain** why protective equipment must be properly fitted to the body.
6. **Discuss** the need for awareness of thermoregulation when coaching children?
7. **Analyse** the risk of inadequate fluid intake during activity.