INTERMEDIATE COACHING

GENERAL PRINCIPLES MANUAL

Disclaimer

This information is general in nature and should not be relied on as legal or professional advice. The Australian Sports Commission recommends that organisations obtain independent legal or professional assistance when using this information for their own purposes in a specific situation.

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Foreword

Coaches are crucial to the success of sport in Australia.

A great coach encourages and inspires; they attract and retain people in sport and this is why our continued support for education and training of coaches is essential.

The National Coaching Accreditation Scheme (NCAS), a partnership between the Australian Sports Commission and national sporting organisations, is a world-leading coach education system that aims to enhance the sporting experiences of participants through quality coaching.

This Manual covers the essential coaching skills of planning, management, safety, learning and teaching processes, and individualisation. It also provides an introduction to a range of sports science principles that can be applied to coaching to improve the performance of all sports participants.

I am confident that through this manual combined with sport-specific training programs you will gain the skills and knowledge required to contribute to Australia's fine coaching tradition.

I wish you well on your journey—and those you inspire along the way.

SIMON HOLLINGSWORTH
CHIEF EXECUTIVE OFFICER
AUSTRALIAN SPORTS COMMISSION

National Coaching Accreditation Scheme overview

The National Coaching Accreditation Scheme (NCAS) is an initiative of the Australian Sports Commission. It is a progressive coach education program offering accreditations at various levels, and provides the industry standard qualification for coaches.

The NCAS offers education, training and a nationally recognised accreditation to coaches working at all levels of sport, from coaching beginners through to elite-level athletes.

Accreditation programs developed in conjunction with national sporting organisations are designed to improve and recognise the competence of coaches.

Over 70 recognised national sporting organisations are part of the NCAS. Each year approximately 25 000 coaches gain accreditation.

The NCAS:

- increases confidence and competence in coaching ability
- promotes an ongoing progressive improvement of knowledge and expertise
- incorporates an involvement with, and understanding of, sports science, enabling a more in-depth approach to coaching
- promotes the use of safe and correct techniques
- aims to increase the enjoyment of sport for coaches and athletes.

Flexible accreditation framework

The levels within the NCAS have undergone some fundamental changes in recent years. The previous NCAS framework required sports to conform to a three-tier structure (Levels 1, 2 and 3). Under the flexible accreditation framework each sport now determines the number, name and levels of their NCAS accreditation programs to best meet the needs of their coaching education pathways.

To find out the coach accreditation pathway your sport has adopted, contact your state or national sporting organisation. Visit www.ausport.gov.au/coach for further information on the NCAS.

COACH ACCREDITATION

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Chapter 1:
The essence of coaching

by Jenni Banks

Coaching is a complex and varied pursuit. Coaches play a pivotal role in sport and operate in a range of different environments and capacities, from a part-time volunteer to a full-time professional. The most effective coaches seek to improve their own performance, and ensure that they continually evaluate and develop themselves as a coach. A combination of self-reflection and professional development activities assist in this pursuit.

A coach's impact can extend beyond the sporting environment into everyday life. If a coach is to positively influence the performance and behaviour of those in their charge, both inside and outside the sporting environment, then they must have a sound understanding of their role and potential impact. Coaches need a healthy, well-developed coaching philosophy and must ensure that they exhibit the professional standards and behaviours expected of a coach.

Evaluating and improving coaching performance

Effective coaching is not only about helping athletes to improve, it is also about constantly improving as a coach. Good coaches build on the things they do well and learn from their mistakes.

The importance of observing athletes and providing them with feedback is clear to all coaches. It is a vital part of helping athletes to improve, but who helps coaches to improve? Who observes the coach in action? Who provides the coach with feedback on their performance? In short, who coaches the coach?

There is a variety of ways coaches can learn and improve. These can range from formal coach education and accreditation programs, to informal learning and development activities.

Coaches can learn by:

- watching other coaches in action
- working with a more-experienced coach (mentor) to seek guidance and advice
- participating in a 'community' of coaches (for example, discussing issues with other coaches in their club)
- working as an assistant coach to a senior coach
- using self-reflection and evaluation, making use of video and self-analysis techniques.

Evaluating coaching performance

There are a number of practical methods that can be used for evaluating coaching performance. Some involve self-reflection and self-evaluation (that is, the coach evaluates themselves); others require feedback from others, generally the coach's athletes, peers or a mentor coach.

The self-reflection process

Consultation with athletes, mentors and peers can be a good source of feedback, but ultimately coaches need to take responsibility themselves. They need to develop the capacity to monitor and critically evaluate their own performance, and design and implement appropriate strategies for improvement.

Self-reflection is a mental activity, but in order for it to be of any benefit to a coach's performance, it needs to be linked to action. The overall process can be visualised as a continuous loop (see Figure 1.1 and Table 1.1). It is a cyclic process that encourages a coach to analyse their actions, consider their impact, identify things to improve, and plan and implement strategies to improve the effectiveness of their coaching.

Figure 1.1: The self-reflection cycle

Planning for improvement

Action

Identification of things to improve

Analysis and evaluation

Table 1.1: Example of self-reflective stages

Self-reflective stage	Football example
Action	Coach demonstrating an instep pass
Self-reflection	'Could they see what I was doing?'
Things to improve	'I need to position myself better so that everyone can see.'
Planning improvement	'I'll ensure that everyone is in front of me and can see the pass before commencing. If necessary, I'll demonstrate the skill several times from different angles.'
Action — implementing the changes	Demonstrating the new instep pass from a position that is easier for the players to see, and repeating the demonstration from a different angle
Follow-up reflection	'That worked much better, but I need to develop better activities to check that they have understood.'

Methods of self-reflection

All coaches self-reflect, but rarely in a deliberate and systematic manner. The value of the following three methods is that they help coaches structure their reflection and relate it directly to the goal of improving their coaching effectiveness.

Coaching diary

Keeping a diary that focuses on the coach's performance is one method of self-reflection. Coaching diaries can take a variety of forms, such as the example shown on page 4. The advantages of using a coaching diary for self-reflection are that it:

- is a simple method that can be used by anyone at any time

- provides a written record that can be referred back to

- can help the coach remember and keep things in perspective.

To be most useful, the diary should be completed as soon as possible after the coaching session that it evaluates. Entries should be kept simple and to the point (as clear and precise as possible) and should describe the performance before judging whether it was good or bad. In addition to recording what could be improved, it is also important to record what was done well.

When evaluating performance it is important to explain why the performance was good, needs to be improved, or whether another approach would be better. If a solution is not clear, a range of solutions can be recorded and, if improvement is slow or a solution does not work, then the coach should not be afraid to try again or consider other solutions. Change does not always happen immediately.

Coaching (self-reflection) diary

Date:	Session time:	Athletes/team:

Session description (including aims):

Focus area:

Things to improve:	Things to implement in the next session:
	Follow-up evaluation after next session:

Video self-analysis

Video self-analysis, whereby the coach arranges a video recording of their coaching in order to review their performance, provides an excellent way to assess and improve coaching effectiveness.

Some of the major advantages of this method are:

- the coach gets the opportunity to see themselves in action, as others see them. This can often help identify areas to improve
- the video provides the coach with very detailed feedback; a real-time record of events rather than the coach's memory
- video is very flexible. A coach can review their performance any number of times, analyse a sequence in slow motion, freeze-frame an instant, and send it to another coach for further feedback and advice.

Disadvantages include the need to have access to a video camera, tripod and, ideally, someone skilled in its operation. The video operator should be briefed on how they should record the session (what they should look for, whether they should remain static or mobile, etc.).

Key steps in video self-analysis include:

- record a training session
- self-reflection — view the tape, then identify things to improve and devise plans for change
- record a subsequent training session in which the plans for change are implemented
- follow-up self-reflection — consider how well the changes were implemented and what else needs to be done.

Mentor coaching

Mentoring involves a coach asking a more-experienced or senior coach to observe them in action, if they have not already, and then discuss their performance and advise what they can do to improve. It is a highly effective way for a new coach to learn the 'art' of coaching and put theory into practice, but can also be equally useful for an elite coach with many years of experience. Obtaining a different perspective from a more-experienced coach may help identify areas and strategies for improvement that might not otherwise have been identified.

One possible issue may be trying to identify an appropriate mentor who is willing to act in a mentoring capacity.

A mentoring relationship can be a formal or informal arrangement, and mentors might include a coach with more experience and greater technical expertise in the same or another sport, or in an area that the coach is interested in improving. In addition to their greater experience and technical expertise, mentors should:

*   have strong communication skills, especially one-on-one communication skills
*   have the willingness and time to be involved
*   adhere to and promote the Coach's Code of Behaviour
*   ideally be available for first-hand observations and face-to-face discussions.

Aspects of coaching to consider

Most coaches probably already have a good idea of the kinds of things that need to be considered. The following check list may help a coach identify aspects of their coaching that need improvement.

Table 1.2: Check list for aspects of coaching to improve

	Coaching aspect	Comment
Preparation	Session plan developed	
	Equipment organised	
	Introduction to the session	
	Dynamic warm-up	
Group management	Involvement of all athletes	
	Attention-gaining skills	
	Control of the group	
	Organisational skills	
Teaching	Adequate demonstrations provided	
	Skills broken into sequential steps	
	Key teaching points stressed	
	Error detection and correction	
	Progression	
	Overload of information	
	Variety of teaching methods	
	Individual needs catered for	
Communication	Clear instructions provided	
	Check understanding of instructions	
	Non-verbal cues	
	Individual feedback provided	
	Group feedback provided	
	Listening skills	
	Questioning skills	
	Professional manner	
	Enthusiasm and positive attitude	
Safety	Use of protective equipment	
	Checking the environment for hazards	
	Safety instructions	
	Adequate supervision of all athletes	
General	Appropriateness of session	
	Sequencing/progression/flow	
	Variety	
	Appropriate time on task	

Improving coaching performance

Once coaches have evaluated their performance, there are a number of different ways that they might make improvements. The path or paths chosen will be determined by the strengths and weaknesses identified in their evaluation. They might include undertaking technical and professional development activities, observing and working with other coaches, or seeking further information or support on particular aspects of their coaching.

- Technical and professional development activities — these might be sport-specific or generic, and should be pitched at a level appropriate for the needs of the coach. Activities might include a strength and conditioning course, further coach training programs (generic or sport-specific), or personal development workshops (for example, communication or people skills, time or stress management).

- Observing and working with other coaches (mentors) — in addition to helping a coach evaluate their performance, mentors can be tremendously beneficial in the ongoing development of a coach. Relationships might be established with different mentors to work on different areas.

- Seeking further information or support on particular aspects of coaching — this might include internet searches for coaching or related websites, or accessing books, magazines or journal articles on areas of interest. It could also include accessing professionals in areas in which improvement is sought.

Further information about evaluating and improving coaching performance can be found in the Australian Sports Commission's *Coaching Better and Video Self-analysis* Workbook and DVD.

CASE STUDY

Michelle has been coaching a squad of athletes for a few years. Recently Tom, an athlete who has a hearing impairment, joined her squad. Michelle felt capable of varying the way she provided instructions or used demonstrations in order to include Tom, but felt she could improve. Michelle contacted Deaf Sports Australia to see if they could identify a suitable mentor coach in her city. Deaf Sports Australia identified a suitable mentor and also identified some other resources that would assist her. The mentoring partnership proved to be very effective and Michelle's efforts to improve her ability to coach and communicate with Tom were successful. Michelle also found that improving her ability to coach and communicate with Tom actually improved her ability to coach and communicate with all squad members.

Professional standards and behaviours expected of a coach

Our society expects high standards of behaviour from people involved in sport, and it is vital that these expectations are met if the integrity and enjoyable aspects of sport are to be maintained. Codes of behaviour can be used to outline expected professional and behavioural standards and, ideally, should be developed with input from those affected. This creates a greater sense of ownership and awareness of the code.

In order to assist sporting organisations to develop a code of behaviour, the Australian Sports Commission has developed a Code of Behaviour for sport participants (at Appendix 1). This code replaces the Australian Sports Commission's Coach's Code of Ethics and is underpinned by four guiding principles: fairness, respect, responsibility and safety.

By introducing and consistently enforcing a sound code of behaviour, sporting organisations can assist in the provision of safe and appropriate environments and quality services to their members, stakeholders and customers. The coach's role is to ensure that they are aware of, exhibit and reinforce expected behavioural standards. Consciously or unconsciously, athletes, especially children, model the behaviour of significant people in their lives, including coaches. Coaches must act as role models.

Dealing with difficult situations and ethical dilemmas

Coaching can produce the 'highest of highs and the lowest of lows'. Throughout their coaching career, coaches may be faced with a number of difficult situations and ethical dilemmas. Coaches must be prepared and equipped to deal with these.

Following are some examples of difficult situations and ethical dilemmas that coaches may face and their role.

Reporting child abuse

Child abuse is a too-common occurrence in today's society. It is not a coach's responsibility to find evidence that abuse has occurred. However, coaches must be aware of the signs of child abuse, which can include:

- bruising, particularly in the face, head or neck region
- differing versions about how an injury occurred
- a child not relating well to others
- disruptive or aggressive behaviour and bullying.

Coaches must know where to get advice or report concerns. This is an ethical and, in some states and territories, a legal responsibility of coaches.

CASE STUDY

Jack noticed that one of his young athletes, a normally bubbly and outgoing girl called Jasmine, was becoming increasingly withdrawn. He also noticed some bruising on her arms. Concerned, Jack spoke to Jasmine after a training session. Jack told Jasmine that he had noticed she was less bubbly than usual and seemed a little withdrawn and asked if there was anything worrying her. Jasmine said, 'No!', but Jack was not convinced and asked her about the bruises on her arms. Jasmine told Jack that she had fallen off her bike and that she was fine. Jasmine was not convincing and the bruises seemed inconsistent with a bike accident; however, Jasmine was not prepared to discuss the matter any further. Jack expressed his concerns about Jasmine to the club's member protection officer before leaving training. The member protection officer advised Jack that she had also noticed Jasmine's change in behaviour and had asked about the bruises. Jasmine told her that she had got them after falling from the monkey bars at school. There was clearly something wrong. The member protection officer told Jack she would report the matter to the relevant authorities and seek their advice about what to do.

Inappropriate demonstration of a skill

There are occasions where a coach needs to physically demonstrate a skill with an athlete. This must be done appropriately — ask the athlete's permission first; perform the demonstration but keep it short; and touch the athlete in a way that is least intrusive. For example, if demonstrating an 'arm bar' to an opponent in basketball, a male coach might lower his arm to the female player's stomach instead of placing it across her chest. Clubs should provide coaches with clear guidelines about demonstrating skills and other times when physical contact might be necessary (such as dealing with an injury) and coaches should be aware of these guidelines.

Use of appropriate language/verbal abuse when coaching

The coaching environment can be frustrating at times; however, coaches must be able to control their temper and find constructive ways to assist their athletes. In instances of abuse, concerned parents or others should take action by talking to someone in authority or the club or organisation member protection officer. Coaches should be given guidelines to help them provide a safe and fair environment for all participants.

Abuse of officials

There is never any justification for abuse of an official. Even if their decision costs a game or a medal opportunity there are avenues for addressing officiating concerns. Abuse of officials is the main reason officials drop out of sport. The future of sport depends on recruiting and retaining officials. Everyone involved in sport needs to show support and respect for officials and to work with them for the betterment of sport. Young officials need to be encouraged, and coaches and parents need to be good role models for athletes in their dealings with officials. Sport should be enjoyable for everyone.

CASE STUDY

In recent weeks, officials in a local club competition have been regularly abused by players for decisions that did not go their way. A number of the officials felt their efforts were not appreciated and were threatening to quit and spend their limited spare time on more enjoyable pursuits. Recognising the key role that officials play in the local competition and the need to act to overcome the problems, Sal, a coach at one of the local clubs, organised a meeting with the officials and encouraged coaches at other clubs to do the same.

At the meeting, Sal recognised the key role that officials play in the conduct of the competition and identified the concerns of players and coaches in a calm, objective manner. Sal then encouraged a discussion about how officials, players and coaches might work together for the betterment of the competition and the enjoyment of all concerned. It was decided that the officials would provide an open forum at the club to discuss rule changes, decision-making and the role of all concerned (players, coaches and officials) in ensuring a strong and efficient competition.

This proved very effective, not only in the education of players but also in creating a better understanding and appreciation of the needs and roles of all parties. Separately, Sal also encouraged her team members to thank officials after each game and arranged for officials to be invited to key club functions. Over the following weeks, the 'them and us' feeling that had been present in previous weeks dissipated, and all parties found the competition more enjoyable.

Disability discrimination

Disability discrimination can affect self-esteem and is unlawful. Unfortunately, in sport discrimination is a common experience for people with a disability. Sports should try, where reasonable, to support participation. Coaches can assist this process by offering suggestions as to how an athlete with a disability might be included. For example, a junior netball club might refuse to include a young netballer because she has a hearing impairment. However, simple changes are often all that is necessary to safely include someone with a disability. In the case of the netball player, the umpire can wave a white handkerchief when they blow the whistle, and ensure that the player can see them when making decisions.

Racial discrimination

Racism damages sport and brings it into disrepute. It can affect athletes' lives and stop them becoming involved in sport. It is also unlawful under federal, state and territory anti-discrimination legislation. Racism is difficult for sporting associations and clubs to deal with. They need guidelines and procedures to prevent racism and deal with issues when they arise. Associations and clubs should encourage athletes who experience racism to report it. They should also have fair processes for dealing with complaints, provide athletes with codes of behaviour and provide officials with training on how to deal with racism. Coaches must support these measures and ensure that their own behaviour is free of any racial intolerance.

Giving all athletes fair attention

A common complaint in sport is that some athletes (for example, a very talented athlete or an athlete with additional needs) get all the attention at the expense of other athletes. Sometimes, however, the reverse is true. For example, a talented athlete might receive little or no attention because the coach (or management) feels they do not require assistance; or an athlete with additional needs might be excluded because the coach does not have time or does not know how to assist them. It is important that all athletes receive fair attention. If one athlete requires more attention than others and there is a risk that other athletes will receive insufficient attention as a result, then other measures (for example, assigning a 'buddy' or helper to assist the athlete) can be employed to ensure that all athletes receive fair attention.

Treatment of injured athletes

Athletes who are injured deserve and require the attention of the coach, but are frequently given little or no attention in favour of athletes who are able to train and perform. Coaches should involve injured athletes wherever possible (for example, in off-field roles if they are not able to train or compete) so that the athlete continues to be an included and valued member of the group. Coaches should also ensure that the athlete is getting appropriate medical care and does not return from either injury or illness until they have a medical clearance to do so. The health and safety of the athlete must always be paramount, no matter how important an upcoming game or event is.

Dealing with bullying or personality clashes within a team

Sporting groups are comprised of athletes with different personalities and backgrounds. From time to time bullying or personality clashes may occur within the group. Clearly, this is unacceptable and it is important that a coach takes action over these issues. The coach has a responsibility to ensure that all athletes are able to participate without fear of intimidation or abuse, whether physical, verbal or emotional. Depending on the severity of the incident, the coach might tell the athlete/s (the bully, or both athletes if it is a personality clash) to take 'time out' to give them the chance to calm down. The coach should make the athlete/s aware that their behaviour is not acceptable and remind the athlete/s of the relevant code of behaviour and their responsibility for maintaining a harmonious group environment.

The coach should also discuss with the athlete/s alternative ways of dealing with their frustration with other athletes. Another option is to empower the athlete group to manage group behaviour and to deal with minor indiscretions. A coach may find that the athletes will adequately manage situations such as this without the need for intervention by coaching staff. If the athlete group is empowered to deal with

these issues, then athlete behaviour should be monitored by the coach to ensure that the rights of all athletes are observed. More serious indiscretions should be dealt with at a higher level (by coaching staff, team management or sporting organisation management, as appropriate). In the case of bullying, the coach should also talk privately with the 'bully' to determine the reason for the bullying. Sometimes bullying is a response to abuse. If the athlete has been abused, then the coach should seek further advice or report the abuse to relevant authorities.

Doping in sport

The use of prohibited methods and substances, as defined by the World Anti-Doping Code Prohibited List, is banned in sport because they meet at least two of the following three criteria: they risk the health of the athlete, have a performance enhancing effect, and/or are against the spirit of sport. Coaches have an obligation to:

- be knowledgeable about, and comply with, all anti-doping policies and rules that are applicable to them or the athletes they support

- support and assist anti-doping organisations, including the Australian Sports Anti-Doping Authority, to conduct doping control

- use their influence on athletes' values and behaviour to foster anti-doping attitudes. This includes reporting any suspected violations of anti-doping rules to anti-doping authorities (for example, in Australia, to the Australian Sports Anti-Doping Authority).

Difficult situations can test a coach's resolve and be tremendously draining. However, they can also present opportunities for personal growth and development as a coach. A sound, well-developed coaching philosophy will greatly assist a coach to make appropriate decisions consistently.

For more information on any of these areas, a coach can visit the Play by the Rules website (www.playbytherules.net.au); the Australian Sports Commission Disability Sport unit and Sport Ethics program websites (www.ausport.gov.au); the Australian Sports Anti-Doping Authority website (www.asada.gov.au); the World Anti-Doping Agency website (www.wada-ama.org); or contact the relevant state or territory child protection agency, state or territory sport and recreation department, state or territory Disability Education Program coordinator, state or territory anti-discrimination agency, or the Human Rights and Equal Opportunity Commission.

Coaching philosophy and coaching style

CASE STUDY

Joe is a young coach who just wants to get out there and coach. He has completed an entry-level coach training program and has started the next level. Although the importance of a sound, well-developed coaching philosophy was discussed in the first program, he really had not taken much notice. Joe thought it was a bit of mumbo-jumbo and that it could wait until later, if at all. There were more important things to be done, such as planning and delivering training sessions and winning games.

Unfortunately, Joe's lack of a sound, well-developed coaching philosophy means that he coaches like 'a ship without a rudder'. He lacks direction and readily succumbs to external pressures from the athletes and parents. He is inconsistent in his application of training rules, style of play, discipline, codes of behaviour and competitive outlook, and this is frustrating and confusing for his athletes. A number of them have left Joe's squad and the sport as a result. Joe also does not enjoy coaching as much as he thought he would.

What is it that guides a coach's coaching and governs their actions? How can a coach ensure that they have a positive influence on those in their charge?

A coach's performance and behaviour is guided, consciously or unconsciously, by their coaching philosophy — that is, the set of personal guidelines they have about how they will operate as a coach and what they expect from and want for themselves and those in their charge. A coaching philosophy consists of:

• the coach's major objectives (the things they value and want to achieve)
• their beliefs or principles about how these objectives should be achieved.

Each coach's philosophy is individually determined and lifelong in its development. It is generally shaped by the coach's own experience (including the quality of the coaches or teachers to which they have been exposed) and knowledge, and generally evolves throughout their career as they gain further experience and knowledge, and face situations that test their philosophy.

Many coaches, however, never consciously consider their coaching philosophy. As a consequence, some coaches lack direction, have an inconsistent approach and/or succumb to external pressures (for example, from athletes, parents and administrators). Others have inflexible philosophies that limit the achievement of their objectives, or philosophies that are incongruous with society's values.

By taking time to develop and write down their coaching philosophy, a coach can clarify their objectives and better understand the values, beliefs and principles that guide their coaching and govern their actions. A written coaching philosophy also provides a tangible reference point that can be revisited to ensure their behaviour is consistent with their philosophy, and periodically reviewed to ensure that it remains consistent with current values, knowledge and experience. It helps a coach make choices, set priorities and ensure a consistent approach at any time, but especially when faced with difficult situations or ethical dilemmas where they may feel uncertain about the correct decision to make.

It is a coach's responsibility to develop, communicate and embrace a positive philosophy that will help those in their charge achieve their goals. The development of a sound coaching philosophy should be given as much attention as the development of technical knowledge of the sport.

Developing a coaching philosophy

To develop a coaching philosophy, a coach should ask themselves the following questions:

- Why do I coach?

- What am I trying to achieve as a coach?

- Why do athletes and others involved in sport (for example, officials, administrators, support staff, parents, partners, carers) participate? What are they trying to achieve?

- How can I achieve my objectives and help my athletes and others achieve theirs?

- What values, beliefs and principles are most important to remember in striving towards those goals? What qualities are most important to me?

- How do I want to be seen as a coach? What do I need to do to achieve that?

Once these questions have been answered, the ideas should be developed to produce a complete (written) philosophy.

Coaching philosophies will vary from coach to coach depending on their objectives, past experiences, beliefs, values and principles. However, some common elements of healthy coaching philosophies are:

- They are athlete-centred — the coaching objective is to assist athletes (regardless of their goals, age, gender, ability level, cultural background or socioeconomic status) to develop to their potential and to provide an environment that will allow the athletes to grow, not only as athletes but also as people and as a team. Athletes are provided with an environment in which they are motivated to do their best, empowered to make decisions, take ownership of their learning and responsibility for their performance, own the team culture, and enjoy the whole experience.

- There is a concern for the holistic development of the athlete — that is, not only their development as an athlete, but also their development as a person. There is recognition and consideration of the athlete's life both within and outside sport and, in the case of elite and professional athletes, preparation for life after sport.

- The importance of teamwork and collective effort in order to achieve objectives is understood and embraced.

An example of a healthy coaching philosophy is:

… to create within the athletes an interest and enthusiasm for the events … then direct that interest and enthusiasm along the lines of sound fundamentals, taught imaginatively, intelligently, purposefully and even inspirationally. It sounds rather simple, but it isn't.

(Kidman and Hanrahan 1997)

Working within a club or other sporting organisation structure

In developing their coaching philosophy, it is important that a coach not only considers their own objectives, beliefs, values and principles, but also those of the club or other sporting organisation with which they are involved. Clearly, if that relationship is to be successful, the philosophies of both the coach and the club or organisation must be compatible.

Typically, a club or other sporting organisation will have their guiding principles outlined in the sports policies that guide the organisation (for example, in their codes of behaviour, junior sport policy, member protection policy and/or disability action plan). Sometimes, however, there may be an unwritten agreement. A club may have a particular approach as to how juniors are rotated on and off the field in team sports, or a policy regarding the amount and/or type of training undertaken by juniors. They might have a plan with regard to the inclusion of athletes with a disability or masters athletes. There might also be expectations with regard to member duties. For example, it might be part of a coach's duties to help with fundraising activities or to provide advice on uniform requirements or equipment purchases in addition to 'normal' coaching duties. Importantly, however, if a club or sporting organisation is to function effectively and achieve its objectives, it should operate through the collective efforts of a number of people who have different roles to play rather than an expectation that a minority of members will do a majority of the work. Coaches should be aware of the requirements of their club or sporting organisation and be able to work within them.

Once a coach has developed their coaching philosophy, it is important to communicate it to those in their charge and establish a mutual direction. In the case of junior sport teams this might include parents, helpers or carers, and administrators, as well as athletes. In the case of more senior teams it might involve support staff, administrators and helpers or carers, as well as athletes.

Coaching philosophy and coaching style

The coaching philosophy that a coach adopts will influence how they see their role as a coach and, subsequently, their coaching style — that is, the way they approach their coaching and deal with people and issues. It might be in an authoritarian, business-like, 'nice guy', intense or easygoing manner or a combination of these styles. Different combinations of coaching philosophy and coach personality will result in different coaching styles and coaches. This is beneficial, firstly because different coaches suit different athletes, and secondly because it would be boring if coaches were all clones of each other. What is most important is that all coaches provide an environment that has a positive impact on their athletes' performance and behaviour, both within and outside sport.

Creating a welcoming and supportive environment

CASE STUDY

Craig runs a talent development program for a local sports club. Parents, club officials and administrators have all commented that the athletes love his sessions, and are always talking about him and the sessions he runs. They always look forward to the next one. Why do they love Craig's sessions? Craig is always happy to see all the athletes (and they him!). He always acknowledges them on arrival in a friendly and enthusiastic manner. Craig knows the names of the parents as well as the athletes, and is interested in them and what else they do, not just the program he provides. Craig is careful to ensure that the activities he provides are appropriate for the athletes involved. He is also good at varying the activities so that all athletes within the group are included and challenged. He empowers and engages the athletes by presenting them with questions and asking them to come up with solutions, either by themselves or by working in pairs or groups. Craig regularly praises the athletes in public and makes any corrections in a discreet and positive manner. The athletes thrive in this environment and not only improve their sports skills but also their ability to work cooperatively with one another, to include everyone, to focus on a task and to make decisions for themselves. The athletes and their parents love Craig and his sessions, and Craig gains a tremendous amount of satisfaction and enjoyment from working with the athletes.

All athletes, no matter what their background, learn and perform better in, and gain more enjoyment and satisfaction from, positive environments in which they feel welcome, valued and supported. The ability to create a welcoming and supportive environment is an important attribute for all coaches.

Welcoming and supportive environments have some consistent features:

- They are open to all participants — everyone is welcome. There is no discrimination based on age, gender, disability, ability level, ethnic or religious background, or socioeconomic status. In addition, the role of significant others (including parents, partners, and/or carers, where relevant) is acknowledged and embraced.

- They are safe — as a result of diligent risk management (for example, ensuring safe playing surfaces and equipment, appropriate warm-up and cool-down, demonstration of correct technique, appropriate matching of participants, and correct injury management) and adherence to expected professional and behavioural standards, participants are protected from physical as well as psychological and emotional harm.

- They are supportive — support is provided when and where it is needed. This support can take many forms, including:
  - positive reinforcement (which can increase athletes' feelings of self-worth, competence and motivation)
  - informational support (for example, advice or suggestions)
  - tangible or instrumental support (for example, equipment, transportation, facilities, additional funding for day-to-day living costs)
  - social support (positive support from coaches and other participants that creates a sense of connection and belonging, and enhances feelings of self-worth).

  There is regard for participants not only as athletes, but also as people, and concern for the wellbeing of participants both within and outside the sporting environment. Negative behaviour such as ridicule, silent treatment, sarcasm and anger are absent in a supportive environment.

- They are empowering — athletes have the opportunity to make decisions, take responsibility for their own performance, and own the team culture. This develops a greater sense of ownership, independence and self-belief.

- They are consistent yet challenging — there is consistency in terms of rules, expected standards and safety; however, variation in activities and experiences means that athletes remain challenged and do not become complacent or bored.
- They allow and cater for individual difference — the fact that different athletes bring different things to a group and have different needs is recognised and embraced. Coaches plan and provide activities that can be varied to accommodate all needs, and participants feel comfortable challenging themselves and trying new things. The focus is on each participant's improvements rather than how they compare to others.

Effective communication is also a key to providing a welcoming and supportive environment. Coaches should:

- be approachable and supervise sessions in a positive and enthusiastic manner
- provide clear, concise instructions
- check for understanding
- provide constructive feedback and corrections in a positive manner
- encourage feedback, and actively listen to and respond to questions.

Coaches must also be perceived as being honest and fair so that an atmosphere of trust is developed.

Individual versus group needs and inclusive coaching practices

In order to meet and balance the needs of the individual as well as the needs of the group a coach should:

- accept that there will be a range of ability levels within any one group, acknowledge that all athletes have a right to participate, and recognise that with careful planning and a bit of lateral thinking, it is possible to include and challenge athletes from a wide range of ability levels
- develop an awareness of the range of ability levels of athletes within the group. In doing so, the coach should never make assumptions about what a participant can or cannot do. Instead, they should ask and work with athletes to identify what is possible
- plan and deliver training sessions and activities that are appropriate for the athletes within the group. Be prepared to vary elements within activities (make them easier or harder) to accommodate the range of ability levels among athletes. Some of the elements that the coach can change include:
  - coaching or teaching style — for example, use of demonstrations, questions, role models and verbal instructions

- how the game is played — for example, rule changes, number of players and/or number of turns each player has, number of bounces or passes and time limits
- equipment — for example, different types, sizes, weights and materials, softer or larger balls or lighter bats with a bigger hitting surface
- where the game is played — for example, the size, shape, surface or location of the playing area.

These changes can accommodate the wide range of ability levels and backgrounds of athletes, including athletes with a disability and athletes from culturally and linguistically diverse backgrounds

• maintain the integrity of the activity — in other words, do not change activities so much that they are no longer the same activity

• only maintain changes to an activity for as long as they are needed. For example, sometimes it will be possible to progress to harder variations of an activity

• provide positive and constructive feedback, and reward effort. Recognise that different people learn and progress at different rates, and allow for this

• assign a buddy to assist if an athlete requires one-on-one support to understand and engage in an activity

• try, try again (if at first they do not succeed). Sometimes it is not immediately obvious how activities should be varied to include and challenge everyone. Learn from any mistakes and continue to work with participants to develop solutions.

The role of sport and the coach in society

Sport and coaches play a significant role in society. Sport has the power to bring people together, break down barriers, build new bridges of understanding between cultures and nations and within communities, and shape behaviour and values. It can inspire patriotism and the pursuit of excellence, and can teach responsibility, fair play, teamwork, and how to overcome adversity and win against the odds. It can also provide recognition, hope, a chance to dream and grow, and a pathway to a better life.

The power of sport to unite people and change people's lives for the better, both on and off the sporting field, is illustrated in the recent history of South Africa, where sport has been used as an instrument in the fight against apartheid. It is further demonstrated through the work of international agencies such as the Laureus Sport for Good Foundation, whose worldwide program of sport-related community projects use sport as a vehicle to promote social change and inspire hope in disadvantaged communities.

The power of sport, however, is not limited to disadvantaged communities. Elite and professional sporting events around the globe inspire patriotism and collective effort, create talking points and provide role models for people of all ages, genders, abilities, cultural backgrounds and socioeconomic strata. They are important not only to athletes, coaches, sporting organisations and fans but also to governments, business corporations and the media, as evidenced by the significant resources that are channelled into the preparation of national sporting teams and the staging of major international sporting events.

While sport clearly plays a powerful role in society, coaches — as the drivers, guides, directors, developers and facilitators of sport performance — also play a critical role, influencing not only performance but also behaviour inside and outside the sporting environment. Coaches have a significant influence on the athlete's achievement of their potential, and determine whether an athlete's experience of sport is positive or negative and whether they gain or lose self-esteem.

Although some of a coach's specific roles may change throughout their career — perhaps as they progress from coaching at club level to higher levels, including representative teams, or as their athletes become more experienced — their role as an influencer of performance and behaviour and the requirement to maintain high professional and behavioural standards, no matter who they are coaching, remain constant throughout their career.

Summary

Effective coaching is not only about helping athletes to improve, it is also about constantly improving as a coach. There are a number of practical methods that can be used for evaluating coaching performance. Three simple methods are keeping a coaching diary, video self-analysis and mentor coaching. Once areas for improvement are identified, appropriate improvement measures can be implemented. They might include undertaking technical and professional development activities, observing and working with other coaches, or seeking further information or support on particular aspects of their coaching.

Codes of behaviour provide benchmarks for expected professional and behavioural standards for all involved in sport, including coaches. Given their powerful role, coaches must act as role models at all times.

Throughout their coaching career, coaches are likely to be faced with a number of difficult situations and ethical dilemmas. Coaches must be prepared and equipped to deal with these. A sound, well-developed coaching philosophy can provide direction in these circumstances.

A sound, well-developed coaching philosophy is a set of personal guidelines about how a coach will operate and what they expect from and want for themselves and those under their charge. This helps a coach make choices, set priorities and ensure a consistent approach at any time. A coach's philosophy should take into consideration any requirements of the club or other sporting organisation with which they are involved.

All athletes, no matter what their age, gender, ability level or sport, learn and perform better in, and gain more enjoyment and satisfaction from, positive environments in which they feel welcome, valued and supported. The ability to create a welcoming, supportive and inclusive environment is an important attribute for all coaches.

Sport and coaches play a significant role in society and the impact of both frequently extends beyond the sporting environment into everyday life.

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Chapter 2:
Program management

by Peter Spence

The aim of program management is to provide integration of planned activities and support to enable athletes to achieve their short and long-term objectives. In essence, program management enables the coach to pull all aspects of the program together in order to satisfy the needs of each athlete. It is based on systematic planning and requires fluent, ongoing communication among athlete, coach and support personnel.

As a process, program management should be applied flexibly, so that it suits the personal style of the coach and satisfies the unique needs of each athlete and team/squad. As Tapscott and Williams (2006) noted in their book *Wikinomics*, at times ' … you should throw away some of your detailed plans' and 'manage chaos the way a kindergarten teacher manages her students … allow a degree of freedom at the start of the session, then intervene to stabilise desirable patterns and destabilise undesirable ones'. It is vital to plan thoroughly, but when it comes to the crunch, a coach needs to interest and inspire the athletes and enable them to do what they are capable of, not what others expect them to do. A coach and program manager should remember that athletes are all unique … and so are coaches!

The program network

The delivery of the program will be enhanced by a well-coordinated support network, which can comprise everyone associated with the plan and who has the potential to impact on an athlete's short and long-term performance. When identifying members of the network and negotiating their level of involvement, roles and responsibilities should be clearly defined. This will clarify their expectations, to whom they are responsible, with whom they will communicate, and will imply a level of commitment, accountability and the need for their ongoing development and that of the athletes.

The program network, as illustrated in Figure 2.1, should engage anyone who can assist the coach and athletes to enjoy the coaching and playing experience and to develop their individual and collective performance levels. The program network may include:

- the coach, who takes responsibility for planning the program and coordinating the activities of any assistant coaches who may be available to add support
- specific support personnel, who can assist in the following areas:
  - first aid — it is strongly recommended that a person with first aid qualifications is available for all training and competition sessions
  - trainer, physical education support — this person may be able to assist with specific physical training advice and direction
  - manager — this person organises the off-field needs of the players. Their role may include communicating arrangements and forward plans to the athletes and parents (if applicable) and to clarify logistics for the use of training and competition facilities. They may also manage fluid and nutritional replacement
  - statistics — a person to record performance statistics in training and/or competition. They may also assist with video support, if available

– equipment support — a person to ensure that equipment is maintained, accounted for and available at training and competition, as required.

When resources permit, and at higher levels of competition, it may be possible to establish a more comprehensive specific support network. This network could provide a higher level of sophisticated and professional support for the athletes and the program. If such a network can be assembled, some of the following positions may be considered:

– technical experts — positional/specialist coach, video operator, skill analyst

– medical staff — doctor, physiotherapist, massage therapist, nutritionist

– sports science — exercise physiologist (fitness assessment), biomechanist (skill analysis), performance analyst (charting tactical trends, video analysis, etc.), sport psychologist

– physical preparation — strength and conditioning staff, gymnastics coach, Pilates instructor

– personal and professional development personnel to advise athletes on personal behaviour, presentation and career development

– communications personnel — technology specialists who will be able to provide electronic communication among athletes, coaches, officials and parents (if applicable), with links and updates to the media and other program partners

- influencing personnel, who are not a direct part of the coach's support team, but have a significant influence on the program. They may include:

– selectors — depending on the policies of the overall organisation, selectors may be responsible for choosing athletes to represent the club, team or organisation

– board/committee members — who are responsible for policy and the overall direction that the program must follow

– officials — including referees, judges and umpires who are responsible for the management of the competition environment

– media — it may be possible to identify a parent or interested person who will ensure that the media is well informed of results and potential story-lines. This can also help to integrate the program into the broader community

– significant others — while care must be taken not to introduce biased support, it is clear that those close to the athletes may have a genuine interest in the program and be willing to provide assistance. Such support can be productive, provided that responsibilities and expectations are clearly defined. Significant others may include:

> parents/family members

> spouse/partner

> friends

> teachers/employers.

Figure 2.1: The program network

Specific support personnel   **Influencing personnel**

First aid

Coach
and
assistant coaches

Selectors

Trainer, physical
education support

Board/committee

Manager

Officials

Athlete/s

Equipment

Media

Statistics

Significant others

Communications

The success of any coaching program can be enhanced by the quality of communication among all parties. With the rapid changes in the information and communications technology area, it is worth considering ways in which communication at all levels can be improved (for example, using text messaging, instant messaging, email and other online processes such as websites, blogs, wikis and online forums). Younger generations are usually familiar with these methods and will be very comfortable using them to communicate. Additionally, they will be in a position to make valuable recommendations on improved communication between coach and athlete, athlete and athlete, and throughout the club community. It may be valuable to establish a club communications plan to ensure that communication is optimised in the club, and that there is continuing engagement of new communications technology as it becomes available.

Working effectively with others

Working effectively with others calls for thorough planning, open communication of the plans, good listening skills to foster communication, and clear links to individuals and groups. The aim should be to keep everyone informed, and make sure that there are no secrets.

The coach should clarify the roles of those in the program network, and work hard to develop effective working relationships by engaging each person in the contribution that they can make to the program. Communication channels should be set up to encourage ongoing exchanges of information as a stimulus for positive discussion. In order to develop strong relationships, face-to-face communication is ideal and must always be encouraged, but this is not always possible. Electronic communication can provide prompt and broad distribution of information and should be used to complement face-to-face communication. With the prevalence of web-based communication, access to online methods can help to keep everyone informed and promote open communication.

Regular hardcopy and/or e-newsletters and updates are valuable ways to keep the program network and the community informed and engaged.

Working with athletes

Coaches should always encourage athletes to learn about development opportunities, and to contribute to the establishment and ongoing refinement of individual and squad training plans. An agreed level of commitment should be established so athletes are engaged in the process and accountable for outcomes. This can be achieved by obtaining information through face-to-face discussion and completion of individual surveys and self-appraisal forms on:

- goals and priorities (short and long term)
- individual strengths and weaknesses
- preferred activities at official training sessions
- activities that can be completed at other times (for example, at home).

If athletes are engaged in this process, it is essential that information is reviewed regularly by the coach and athlete in order to improve the individual athlete program.

Working with committees and boards

To manage a program successfully, the coach must work effectively with committees and boards regarding strategy, policy and procedures surrounding the athletes and the program in general. Communication is most important when dealing with committees and boards. As with most aspects of the coaching role — and in order to seek the best position for athletes, coaches, support personnel and the organisation — the key processes are to prepare, communicate, discuss and follow up in order to ensure that the outcomes of the discussion are actioned.

There are a number of areas where committees and boards set directions, strategies, policies and guidelines that apply to athletes, coaches, parents and other supporters. These include:

- behaviour — policies on behaviour, commitment, discipline, attire, alcohol, smoking, drugs, nutrition, training and competition
- medical management of athlete injuries — emergency procedures and routine care of individuals (who is responsible; access to an ambulance, club medical staff or the local clinic/hospital)
- training — attendance, expected attire and behaviour, availability of facilities and equipment, attendance of coaches and support personnel, and special arrangements for extreme conditions (for example, wet weather, heat, drought, transport disruption)
- selection — what is the selection policy of the club or organisation for choosing players to represent the club or association
- competition — behaviour and attire for competition when representing the club or in other selected teams/events, and policy on dealing with on-field discipline reports and unacceptable interaction with officials
- employment — any assistance with employment opportunities for athletes
- sponsors — expectations of sponsors and other support agencies, and the responsibilities of athletes, coaches and program support personnel, particularly when acknowledging sponsors. This includes state and national sporting organisation acknowledgments, as well as government support
- schools — relationships with schools in the area, particularly the way in which schools contribute to the athlete pathway, and promotion of the sport and the organisation
- community groups — the relationship with local government and community groups, and the organisation's forward strategy regarding community engagement.

Selection

Selection is a vital, and at times litigious, part of sport and, as such, must be thoroughly planned and well documented. The selection process must be clearly stated through a selection policy, with an appointed selection panel and recognised processes to follow.

In order to establish and maintain a successful selection system, the following questions should be addressed:

- What are the defined selection criteria?
- Who is eligible to be on the selection panel, to make decisions on selections, and whether exceptional circumstance can be considered?
- When does the selection panel meet?
- What performance information is expected to be available for the selection panel to consider?

The coach's role in selection

The coach can play a variety of roles in the selection process, including sole selector or part of the selection panel, or they may not be involved in the selection process.

Any selection role brings with it advantages and disadvantages. By being the sole selector the coach has total control, but also total responsibility for the outcome. It also brings the potential for greater conflict with individual players who have not been selected. When a coach is not involved in the selection process, they are unable to ensure the selection of players required to implement a particular style of play. But it may also bring an independent viewpoint to selection, as coaches can often become too close to the players to make tough decisions when needed.

When coaches are involved as part of a selection panel, it enables them to have a say regarding which players are selected, but also provides the opportunity for an independent viewpoint to be part of the process.

Selection policy

The selection policy should be fair, reasonable and internally consistent. It should be communicated to athletes, the program network and significant others well in advance of selection. The policy should specify:

• Eligibility for selection — Who is eligible for selection? Are athletes required to nominate for selection?

• Selection criteria — What are the specific criteria against which athletes will be considered? Include objective criteria where possible. Are extenuating factors, including illness and misadventure, to be considered should athletes fail to meet the criteria? If so, is an examination by a designated medical practitioner or consultant required?

• Selection panel — Who is eligible to select? Are coaches, players, parents and partners eligible to sit on the panel? When is the selection panel formed and when does it meet?

• Selection process — When and where does the selection panel meet, what is recorded, and does selection require ratification?

• Selection announcement — How, when and by whom is the selection outcome announced? Are successful and unsuccessful athletes advised prior to the announcement?

• Challenge to selection — Is there a process for protest or challenge to selections? If so, when and by whom will the challenge be heard?

CASE STUDY

A volleyball team with a keenly interested support group began to complain about team performance, and the selection of young developing players at certain times in the competition schedule instead of relying on more-experienced players. The selection policy had been agreed to by the club's board, with the involvement of the coach and key senior players; however, the selection policy had not been communicated more broadly. The coach engaged the players and the support group, and discussed the philosophy behind the club's selection policy and the long-term view that they were taking at this stage of the club's development to ensure future success. Once the parents and supporters understood the philosophy of the program and reasons for the selection process, a unified outlook was achieved, which was greatly appreciated by the players and the team.
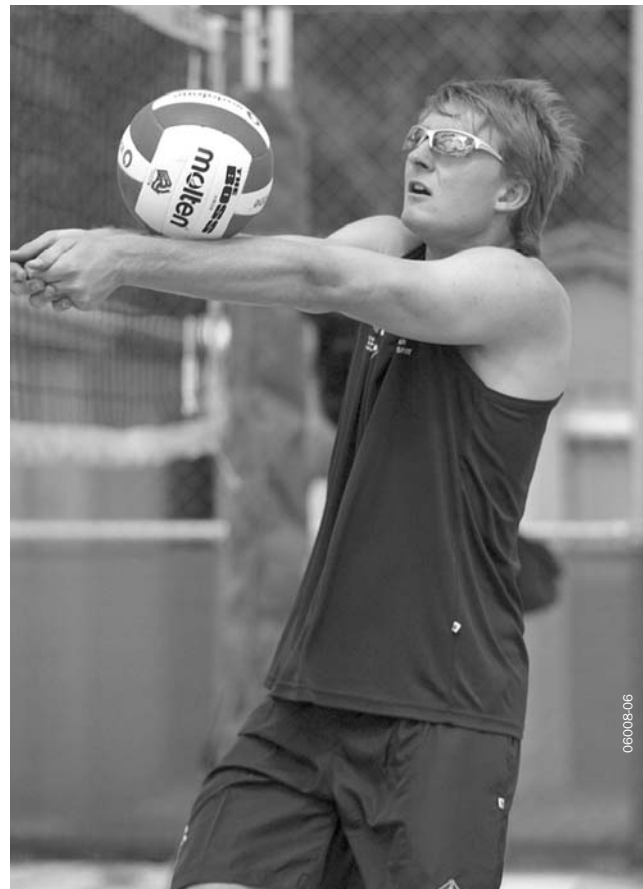
Conflict resolution

Conflicts are a normal part of the group development of any team or training squad and are more likely to occur when there are pressures associated with upcoming competition, school exams, etc. The 'in-fighting' stage, which follows the formation stage of any group, is believed to be an integral part of the evolution of the life cycle of a team.

The challenge is for the coach to recognise that this is likely to occur, to identify its onset, and to introduce team-building and focused-direction activities in order to minimise conflicts. By dealing promptly with conflict, the proactive coach will facilitate opportunities for the athletes or members of the coaching team to work through the conflict stage and progress to the 'settled team' stage.

In order to resolve conflicts, individuals should be made aware of the stages of development of groups, and then they should be brought together to address the issues in an open and positive fashion. This may involve the consideration of some broader issues:

- What is the background of the problem? Has there been any breach of the agreed program plans or rules?
- What are the overall goals and objectives that will enable these to be achieved?
- What are the alternatives that may enable the conflict to be resolved? Is there a win/win position?
- Will the conflict have any broader impact on the program?
- What can be learnt from this situation to improve the program and minimise future conflicts?

If the coach recognises that the conflict is escalating, it may be wise to seek professional advice from a counsellor or sport psychologist.

In all conflict resolution scenarios, remember to be 'hard' on the principle of the problem or dispute, but 'soft' on the people.

CASE STUDY

In a senior netball team, two of the prominent players became openly disruptive and exchanged hostile comments on court, particularly at training. The coach had a discussion with both players and reaffirmed their importance to the development of team morale and cohesion, and the overall performance of the team. She then had a post-training team meeting at which she stressed the core principle of the entire program, which was to give total support to each other and commitment to the team. She then asked players to nominate how they planned to provide support for team-mates, to which both players in question contributed comments and pledged commitment to the team and to each other. By doing this, the coach was 'hard' on the principle but 'soft' on the players.

Negotiation

Negotiation is a constant reality in the world of the coach (for example, negotiating with athletes, parents, officials of the club or organisation, opposition teams and facility managers). In entering into negotiations, it is important to be thoroughly briefed on all details and prepared to discuss the issues in an open and unemotional way. The following questions may be considered during preparation for productive negotiations:

- What are the expectations or preferences of both sides in the negotiation? What is in it for me? What is in it for them?

- Are the other parties aware of my circumstances? Do I understand their position?

- What are the key issues involved? What is the preferred position or outcome of the organisation? To what degree is the position negotiable? Are there any non-negotiable circumstances or expectations?

- Is there a win/win position?

CASE STUDY

Two junior swimmers from the same training squad were vying for state selection and were becoming distracted by each other. The coach discussed the situation with each swimmer individually and foreshadowed the meeting that he was to have with them together. At the subsequent meeting, the coach stressed the long-term objectives of each swimmer's training program and that they should aim to support each other. He pointed out that if each swimmer prepared in isolation, neither would be likely to prepare optimally to perform as well as possible at nationals. It was agreed that the swimmers would prepare together and compete in a number of component trials (starts, turns, shorter distance races, finishes, relays, etc.), before competing head-to-head in the final lead-up to the nationals. In this way, both swimmers recognised the role that each could play in support of the other and that, in this way, they could both be better prepared for future competitions, particularly in the years ahead.

Time management

Time management is vital for people in sport, many of whom are in part-time or honorary roles and all of whom tend to be 'time poor'. Clear foundations, systematic planning and well-developed negotiation skills are valuable prerequisites for good time management at any level.

Time management for athletes

By engaging the athlete in the planning process a good foundation is laid for good time-management practices. Key elements to this engagement are:

- developing individualised program plans for each athlete
- encouraging the athlete to engage in the planning process, ensuring that the program fits within their overall life, and that they make a personal commitment to the program, thereby establishing a level of accountability for the delivery of the program
- maintaining communication among the athlete, coach and support network to ensure that everyone is well informed about the program, the expectations and the progress achieved
- providing an electronic communication platform to back up face-to-face communication.

Time management for coaches

In order for the coach to manage their own time effectively and efficiently, it is important that all those involved in the program are aware of the foundations, policies, objectives and culture of the organisation and the style of program that is planned. If everyone is well informed, there should be less misunderstanding and fewer demands on the coach's time. In order to achieve this, it is wise to:

- continually remind all athletes, coaches, support network personnel, selectors and officials of the key elements of the program so that there is no misunderstanding
- systematically plan the program
- communicate the plan to each athlete, coach and all those engaged in the specific support network.

Closely associated with the planning process is the delegation of responsibility for aspects of the program planning and delivery. In determining the roles and responsibilities of other coaches and specific support personnel, it is important to clarify the expectations in the preparation and competition phases, with arrangements outlined for before, during and after competition. Unless everyone involved understands what is expected of them, there may be unnecessary reference to the coach.

For the coach to manage their own time, they must learn to delegate responsibility to appointed personnel, encourage them to develop their area in ways that are consistent with the agreed policies and culture of the organisation and program, then support them and give them the room to deliver on this delegated responsibility.

Leading and managing athletes during an event

The coach must accept the responsibility for educating the athletes and everyone involved in the support of the program. For the coach to deliver a stimulating and efficient program, it is essential that an open and challenging culture is established and maintained, with continuing communication.

Organising and managing athletes during competition

To organise and manage athletes effectively during competition, the coach must plan thoroughly. The coach needs to ensure that all athletes and support personnel know where and when they are required throughout the competition.

Communication is an essential part of successfully leading a team during a competition and needs to start in the lead-up to, and then throughout, the competition.

In the lead-up to the competition, engage the group in discussing the 'what ifs' in order to develop coping strategies to deal with expected and unexpected occurrences at competition. 'What if' discussion topics may include:

- What if transport is disrupted and the team arrives only ten minutes prior to competition?
- What if the referee cannot control the match?
- What if there is a serious injury during a match?
- What if there is disappointment with selection?
- What if the coach falls ill during competition?

CASE STUDY

Because of mechanical problems, the under-18 basketball team arrived only five minutes before the scheduled match. This scenario was the topic of one of the 'what ifs' that were discussed during the pre-season training program for the team. The coach was able to speak with the team in the bus prior to arrival at the venue, and to remind them of the steps to be taken. As a consequence, the players undertook some modified warm-up activities in the bus, changed on arrival at the venue, accepted responsibility for their own 'mini' warm-up, and engaged in some mental rehearsal and personal 'quiet time' prior to the coach confirming a simplified game plan immediately prior to the game.

Responsibilities when travelling with a group

The coach is responsible for the entire group and must be proactive. This is a great opportunity to engage athletes, key support personnel, parents and supporters who are travelling with the group. Responsibilities that may be delegated include:

- pre-tour arrangements, including parent/guardian permission forms (where applicable), travel details and contact points, bags and packing of belongings
- general equipment for the tour, including specific training and competition gear
- accommodation liaison
- meals and fluid replacement protocols for training and competition
- first aid and health supervision
- oversight of supervision of athletes during 'down time'.

It is wise to check the policy of the club or organisation regarding travel. It is usual to ensure that parent/guardian permission is obtained for young athletes (under 18 years). Furthermore, the parents/ guardians must be well informed about arrangements and contact points of the coach and other appointed personnel for the duration of the tour.

Additionally, ensure that the coach, manager or whoever has overall responsibility for the group, has a full copy of the details of the trip, schedule of events and next of kin contact points for all athletes, coaches and support personnel throughout the trip. Another copy of this information should be given to a responsible non-travelling official of the organisation for safe keeping. This is to facilitate prompt action in the event of injury, illness or some other accident to any or all of the touring party.

Dealing with behavioural issues during a competition

Many of the issues that may occur during a competition can be the subject of 'what if' scenarios during the lead-up to the event. In spite of the best-laid plans, unexpected occurrences may have to be addressed. It is wise to have nominated a disciplinary panel, which may comprise the coach, an assistant coach or manager, and a senior athlete or other support person, to adjudicate on any breach of discipline.

Other aspects of conflict, such as those relating to selection or personality clashes, should be handled by the coach and senior support personnel. Such action should be discussed prior to the trip to ensure that everyone concerned understands the processes that are to be followed.

It is wise to have an agreed attitude to 'down time' at events, with a clear policy on individual responsibility and an understanding of the importance of recovery and regeneration time. Experienced athletes may be better prepared to handle free time in a positive fashion, but for less-experienced groups, activities should be scheduled to make constructive use of down time. Some of these activities will be focused on recovery and regeneration, but others may be useful distractions to ensure that athletes are actively engaged and do not have time to get into trouble. While you do not want to fill up all down time with unnecessary activity, it is important to structure the athletes' time so that the risk of ill-disciplined behaviour is minimised.

Summary

Program management aims to ensure that coaching and support systems are integrated in order to satisfy the needs of each athlete. This entails systematic planning, well-developed time-management capacities, sensitive program delivery and fluent communication. Face-to-face communication is vital and can be supplemented by electronic communication.

Thorough planning and ongoing communication will enable the coach to manage relationships with other stakeholders, including regional, state and national sporting organisations, education authorities, community organisations and sponsors. The coach should communicate regularly with everyone in the program network — athletes, assistant coaches, specific support personnel and influencing personnel.

Clear policies and guidelines are required to ensure that selection, management of injured athletes, standards of behaviour, style of play and support at competition are successfully overseen.

The skills of negotiation and conflict resolution must be continually developed in order to ensure that problems can be managed and opportunities optimised.

Through astute program management, the coach will be able to manage their own time, delegate responsibility to appointed personnel, encourage them to work in ways that are consistent with the agreed policies and culture of the organisation and program, and then support them and give them room to deliver on this delegated responsibility.

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Chapter 3:
Planning

by Rebecca Layton

Coaching is often described as both an art and a science. The process of planning allows an effective coach to bring these two important elements together in a coherent and organised manner. When a coach takes the time to plan their teaching strategies, activities, sessions, seasons and even their athlete's longer-term career, they are able to develop their athlete on a day-to-day basis, with a longer-term outcome in mind. That outcome may be very performance oriented (that is, win a gold medal at the state championships), or it may be more developmentally oriented (that is, teach the technical skills of the sport while developing confidence, teamwork and a habit of physical activity in players). Either way, planning will help a coach to achieve their desired outcome.

Effective planning helps ensure that the coach:

• has the necessary resources available when they need them

• provides a safe environment

• makes effective use of the time available

• challenges the participant through progressive development

• includes all participants, regardless of their level of ability

• maximises enjoyment for themselves and their athletes.

Good planning involves the following steps:

Figure 3.1: The planning process

This cyclical process applies whether a coach is planning a session, a season or an athlete's career. This chapter will predominantly focus on season planning.

Depending on the nature of the sport, a season may run for a term, several months or a year. Essentially we are talking about planning for a phase of training that leads to a key competition, but in a non-competitive skills-based program, it may be more closely related to a phase of development (for example, in a swimming school it might be related to a level of skill development or a school term).

More advanced coaches who are concerned with the longer-term development of an athlete will also be considering a multiyear plan, such as a four-year plan, that looks at developing skills for an athletic career rather than for a single competition. All coaches, however, should always think of their session and season plans within the context of the overall development of the athlete. Asking the question, 'How will this activity or session contribute to the development of my athlete?' is always a good reminder that a coach and athlete are working towards a longer-term picture.

Issues to consider when planning

There are a number of issues that a coach must consider as they start to develop a season plan.

Age and physical/emotional development of the athlete

It is important for coaches to remember that people develop at different rates and that some athletes may be physically mature with good strength and body awareness, but their emotional and social development may not currently match their stage of physical maturity. Conversely, coaches will also be faced with athletes who are socially and emotionally very mature, but whose physical development is lagging. Being aware of the individual abilities of athletes will assist the coach to plan sessions that challenge their strengths, but also develop aspects that are currently lacking.

Balancing other non-sport commitments of athletes

It is very easy for coaches to forget the other aspects of athletes' lives. Keeping a balance is increasingly important in our hurried modern world. Coaches should consider the athletes' workloads at the office or school, work travel commitments, family activities and even just some 'down time' so the athletes can remain well balanced and fresh, and happy to come to training or a game. Students in particular may have peak study times that coaches should factor into their training schedule. Talking regularly with athletes about other aspects of their lives will help to ensure that sporting workloads do not create undue stress.

Involving the athlete/parents in the planning

Traditionally many coaches may have developed and even implemented a plan without any consultation with the athletes. This type of approach is often ineffective as it does not allow the coach to gather sufficient information about the athlete, such as their preferences or workloads. Nor does it promote commitment by the athlete to the plan. By involving athletes in the planning process, coaches can gain a better insight into the individual needs of the athlete. Athletes will also have a better understanding of the training they will be doing and why it has been scheduled that way.

When working with junior athletes, coaches should also consider what involvement their parents have in the planning process. This can be done in a number of ways. For instance, at a pre-season meeting the coach might gather information from parents and athletes about their experience in the sport, the athlete's strengths and weaknesses, and what their goals are for the season.

As the coach develops a plan, it is important to communicate it to both the athlete and the parents. In this way the parents also gain an understanding of the coach's expectations of their child and how the child's specific needs will be catered for. Involving the parents and the athlete in this process can also help the coach to understand whether they have similar goals for the athlete, or whether the coach might in fact be dealing with driven or 'pushy' parents and a less-motivated athlete. Involving the parents will also help to gain their commitment, which is very important as parents are often the ones who will be transporting the athlete to their sporting commitments. If the parents have greater 'buy in', they will be more likely to have the athlete at training on time, and they may even offer to assist in some way.

Meeting individual needs in a group training context

As coaches gather information about the current abilities of their athletes, they will realise just how different each athlete is. This can be quite daunting when developing a plan, as they will need to ensure that it caters for the individual needs of each athlete. Differences can include physical ability, emotional/social maturity, understanding of the techniques and tactics of the sport, learning preferences and motivation. By getting to know the athletes better, coaches will be able to better cater for these needs and adjust their coaching style to individual athletes to get the best performance from them.

In terms of planning, coaches need to develop an overall plan for their team or squad, but then they may need to make some adjustments or modifications for individual athletes. For example, a coach may have developed a plan where the focus of training for the coming month is the development of endurance, which includes some particularly long sessions that will be mentally tough for some athletes to cope with. Within the broader plan for this phase of training, the coach may decide to make some adjustments for an athlete who has an interstate school excursion and cannot make it to all the sessions, or they may choose to end a session early for a particular athlete who is not coping well mentally with the challenges of this phase of training. Keeping notes on these kinds of adjustments to the plan is important, as it will help in evaluating the effectiveness of it at the end of the season. It will also help in planning the next phase of training, as it provides information on how the athletes cope with the demands placed on them.

Understanding the physical, technical, tactical and psychological demands of the sport

Each sport has its own unique demands. Some sports are more physically oriented (for example, cycling or swimming), while others are more technical (for example, archery), tactical (for example, team sports) or psychologically demanding (for example, marathons or iron-man triathlons). The greater the coach's understanding of the unique demands of their sport, the better they will be able to prepare the athletes for these specific demands. Observing elite players, talking with experienced coaches, attending sport-specific coaching courses and reading sport-specific coaching manuals/ articles will all help the coach to gain a deeper understanding of what it takes for an athlete to perform well in their sport.

CASE STUDY

Mary is the coach of a group of young showjumpers. During a session she notices that one of her riders, Jake, is not performing well. He is not balancing his horse well and seems to be riding and jumping tentatively. Mary focuses her feedback on the technical aspects of Jake's jumping with very little success. Realising that something out of the ordinary is happening, she pulls Jake aside to try to reinforce her instructions, thinking that perhaps he does not understand them. Jake explains that he understands what she wants him to do, but that he had a nasty fall from his horse recently and no longer feels confident to be jumping at the level at which Mary has set the jumps. Mary realises that Jake does not have a technical problem with his jumping at all, rather, he has lost confidence in himself and his horse. She quickly sets up a smaller series of jumps at the far end of the arena and works with Jake and his horse to master a simpler activity, while still observing the riders at the other end of the arena. By recognising the significant psychological challenges involved in jumping, Mary is able to rebuild the confidence of Jake and his horse over the lower, simpler series of jumps. With some careful attention over the next few sessions Jake and his horse are soon jumping confidently.

Season planning

Planning for a season may seem quite daunting at first, but following the planning process just outlined will assist in tackling the process in an effective way.

The first step for a coach is to gather information about their sport and their athletes. The plan should have a direct link to the necessary attributes for the sport, so it is important for the coach to clearly identify what the relevant attributes are for the level of athlete being coached. This may differ depending on whether it is a junior talent identification squad or an adult social team being coached.

Some attributes of the sport for the coach to consider include:

- technical skills — catching and passing the ball, moving into space, starts and turns in swimming, racquet strokes and moving around the court in tennis, etc.

- tactical skills — decision-making, set plays or race tactics
- physical demands — speed, strength, power, endurance and flexibility
- mental skills — arousal, focus, relaxation, confidence, motivation, fear, etc.

The skills identification matrix at Appendix 2 is a useful tool to assist in identifying the attributes for each sport. Observing elite players, talking with experienced coaches, attending sport-specific coaching courses and reading coaching manuals/articles will help in identifying these attributes.

Coaches also need to gather information on each athlete's current capabilities. This can be done in a variety of ways depending on the nature of the sport, the level of athlete, and the resources and time available. It may be as simple as watching them at training for a few sessions and making some notes on their strengths and weaknesses, or it may involve some simple testing such as the 'beep test', which is a field test for aerobic endurance. If a coach has access to sports science support, this can be useful to do more formal testing on the athlete's current capabilities. Either way, it is useful for the coach to keep records of the results so that they can refer back to them throughout the season to help monitor progress.

The next step in the planning process is to set goals for the team/squad and the individual athletes. The coach's personal preferences will dictate how this is documented, but the goal-setting table at Appendix 3 might provide some guidance. Note that the table includes space for the coach to consider individual goals that relate to the athlete's communication skills, their attitudes to sport (for example, fair play, respect, responsibility, etc.), and their levels of physical, emotional and social maturity. All of these 'softer' skills also make a significant contribution to their performance and development.

Once the coach has developed a picture of where they are heading (that is, the end goal), the next step is to fill in the detail by programming the phases of training and then each session and activity that will lead to the end goal. As the plan unfolds through the season, the coach should regularly monitor the athletes' and team's progress and adjust the plans as necessary, perhaps adding more emphasis on a particular aspect of physical development or focusing more closely on the tactical aspects that have been shown to be weak in lead-up competitions.

The following diagram illustrates the relationship of these elements of planning.

Figure 3.2: The relationship between the elements of planning

Know your sport

Set individual and team goals

Review athlete progress and adjust your plans

Programming phases of training

Programming sessions

Programming activities

Evaluate planning processes
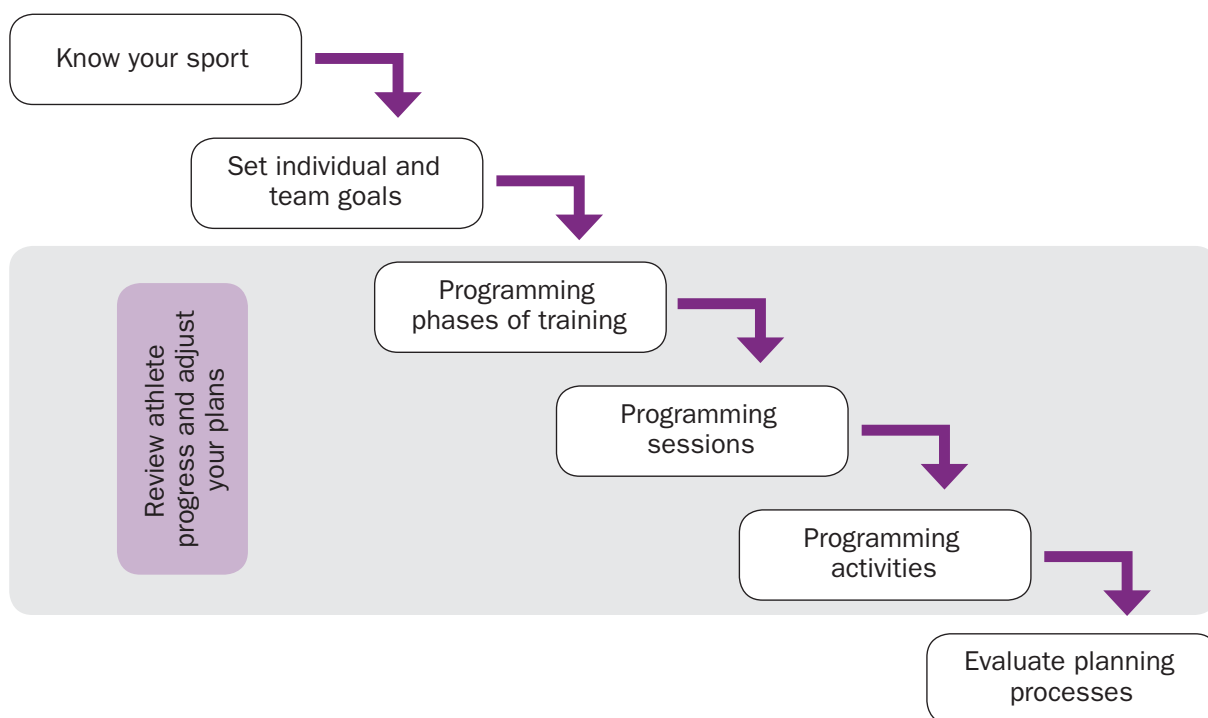
Phases of training

Most season plans are broken into three phases of training — the preparation phase, the competition phase and the transition phase.

Preparation phase

The beginning of the season needs to commence with a preparation phase, the purpose of which is to build the physical, technical and psychological skills and abilities that will be needed for competition. While this preparation phase may have some low-key competitions within it (for example, 'friendlies' for team sports, or club events for individual sports), the outcome of these competitions is normally not important as they are generally used as a marker to monitor athlete progress and to help the coach make necessary adjustments to their plan. It is important to allow sufficient time for this phase of training, as short cuts taken during this time may be exposed during the competition phase. By the end of this phase all physical capacities and technical elements should be developed to a high level.

Competition phase

Most sports' seasons will culminate in one peak event — either a competition (for example, regional championships), a grand final for a team sport, or in a more non-competitive sport, an event such as a games day or a 'come and try' day. This peak event will mark the end of the competition phase of the season. The focus of this phase of training is on producing the best possible results in the key competition event, and fitness work should be just sufficient to maintain the capacities developed in the preparation phase. The focus in this phase is usually on skills, and mental and tactical preparation.

This phase often includes some lead-up competitions where athletes can test their skill development and finetune their performance. Choosing these lead-up events can be critical to the success of the plan, ensuring that the athlete maximises both their preparation for the main competition and also their recovery between each competition. Going into each of these lead-up competitions with a clear goal will help athletes to stay focused on the aim of that specific competition. Goals for a lead-up competition may in fact be process goals (for example, move the ball quickly from defence to attack at each change of play), rather than outcome goals (for example, win the game by five points). Setting process goals during the lead-up competitions can help to keep athletes focused on the important elements of their performance. This will ultimately assist them to reach their final outcome goal at the peak competition. For team sports with weekly games that culminate in a grand final, athletes will need to perform well each week to ensure that the team makes it to the final series.

The challenge for the coach is to adjust the athlete's training load to allow them to peak (or reach maximum athletic performance) at the time of the key competition. Peaking has both a physical and mental component, as do all phases of training. Many sports rely on the technique of tapering to provide the athlete with the best possible performance at their peak event/s. Tapering involves a reduction in the volume and intensity of training to allow the body maximum capacity to recover and repair prior to competition. Timing the taper to allow for peak performance at the main competition without allowing physical capacities to decline is like walking a tightrope. Athletes must have sufficient stimulus to maintain their peak physical preparation without overdoing it and entering the competition in a fatigued state. Careful management of nutrition and rest are also important when tapering.

Transition phase

After the peak competition is over, athletes wanting to continue in the sport will normally move into a transition phase of training where they may take a brief break to recover both physically and mentally. They will then usually undertake some cross training or low-key games to maintain a level of fitness in preparation for the next season. Over a number of years this allows for progressive development of the athlete's physical capacities, with each season of training able to commence at a slightly higher volume and intensity than the previous year, as the athlete has maintained their fitness through the transition phase. This transition phase is also a good time for athletes to attend to any injury rehabilitation needs (for example, strengthening a weak shoulder).

Figure 3.3: The phases of training in a season

Preparation		Competition	Transition
F	F L L L M		

Key
F = friendly competition
L = lead-up competition
M = main competition of the season
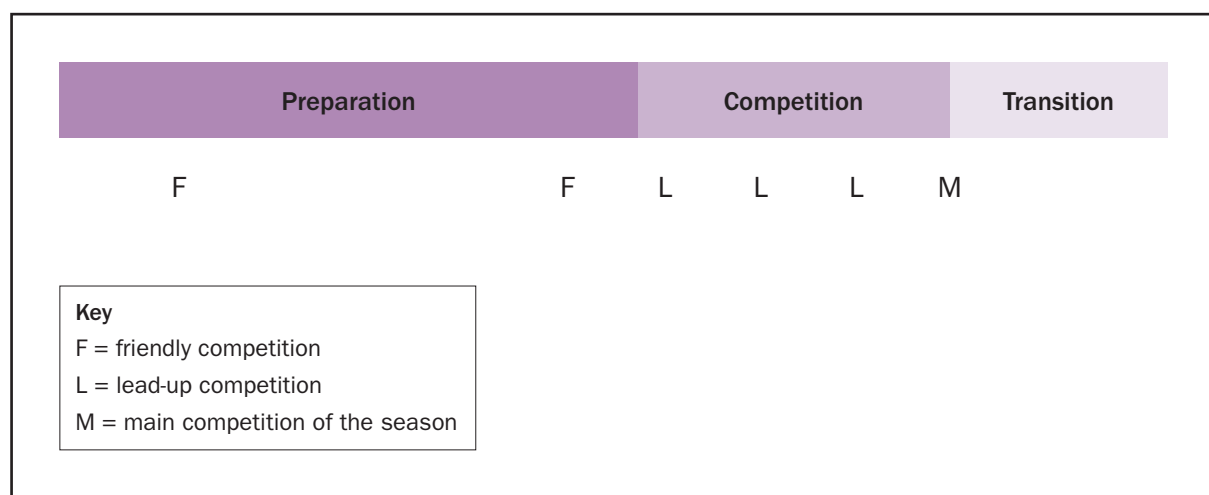
The duration, focus and intensity of each phase of training will vary for each sport and perhaps even for each individual in the squad/team, depending on their current level of physical, technical and psychological development. This is where it is critically important that the coach knows the athletes well — their individual physical abilities, strengths and weaknesses, likes and dislikes — as this will influence planning for them.

The training plans on the following pages provide examples of season plans for gymnastics, cycling and netball.

Gymnastics season plan

MONTH	JANUARY					FEBRUARY				MARCH				APRIL					MAY				JUNE			
MONDAY	1	8	15	22	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25
WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Competitions International																					Australian champs 24–27 May					
National and regional																	Regional champs 28–29 April		Senior state 11–13 May						State clubs 23–25 June	
Invitational																										
Intrasquads																										
Training camps and clinics																									State team camp	
Training phase																										
Basics																										
Skill development																										
Sequence development																										
Routine development																										
Full routines																										
Strength/power			GENERAL					STRENGTH				POWER					SPECIFIC									
Endurance																					SPECIFIC			ROUTINE		
Strength test																										
Skills test																										
School holidays	Start school 29 January													6–15 April											23	
Pupil-free days													16													

Cycling season plan

Phase overview (by week 1–52 and following week 1)

Month	Weeks	Training phase
January – February	1–8	General preparation phase
March – June	9–26	Specific preparation phase
July – September	27–39	Competition phase
October	40–45	Transition phase
November – December	46–52, 1	General preparation phase

Racing

Race level	Period
National racing	National club championships (weeks 37–39)
State racing	State championships (weeks 32–35)
Club racing	weeks 27–39 (1 per week)

Training sessions (Other than the 'Week' row, numbers refer to number of sessions of each type in each week)

Training sessions	General prep (1–8)	Specific prep (9–26)	Competition (27–39)	Transition (40–45)	General prep (46–52, 1)
Endurance	2	2	1		2
Strength	1*				1*
Strength/endurance		1**	1**		
Speed	1*	1*	1		1*
Power	1*	1*	1		1*
Speed/power		1^	1^		
Recovery	1	1#	1#	1	
Cross training				2	
Flexibility	(daily general flexibility throughout program)				
Psychology				1	1
Skill development/technique	1	(main focus)	(main focus)	1	1
Testing	1~ (monthly)	1~ (monthly)	1~ (monthly)	1~	1~
Tactics	Observation of elite-level race tactics on DVD or live where available	Discussion of tactics appropriate to level of racing being undertaken. Development of strategies for implementation and practice in club racing	Weekly review of race tactics and revision for ensuing races as appropriate	General review of previous season's tactics	Observation of elite-level race tactics on DVD or live where available
Diet	Slightly increased fuel intake with increased training volume. Also emphasis on maintaining hydration.	Focus on appropriate balance of food groups to support volume and intensity of training while maintaining appropriate weight for nature of cycling being undertaken. Maintain emphasis on good hydration.	Focus on fluid replacement during racing and consuming appropriate food before, during and after events.	Reduced fuel intake due to lower training intensity.	Slightly increased fuel intake with increased training volume. Also emphasis on maintaining hydration.

Colour code:

- Main focus of training phase
- Daily general flexibility sessions incorporated throughout program

Notes:

Other than 'Week' row, numbers refer to number of sessions of each type in each week

* Strength/speed/power combined into one session during this phase and carried out on bike or in gym

** Technique practice incorporated into these sessions

Specific flexibility included in these sessions in addition to daily general flexibility sessions

^ Tactics and skill development incorporated into these sessions

~ Simple testing program of timed rides over the same set of courses once a month; for example, one flat-time trial course, one hill climb and one 300-metre sprint. Can be undertaken in place of one endurance session. Comparison then undertaken from month to month

Cyclist background:

Cyclist is a male club-level road rider, aged in his mid-20s. He has good general fitness, poor climbing ability, but is a good sprinter. His skills and technique are average to poor. After many years of observing elite racing, he reads a race well, but often fails to respond to attacks in the bunch due to a lack of confidence in his own ability.

Netball annual training plan

Under–16s regional representative squad

Major competition for the year is the state championships in September

MONTH	JANUARY					FEBRUARY				MARCH				APRIL					MAY				JUNE				JULY					AUGUST				SEPTEMBER				OCTOBER					NOVEMBER				DECEMBER				
MONDAY	1	8	15	22	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1

School holidays: School hols (January); Hols (April); Hols (July); Hols (September); Hols (December)

Training phase: General preparation (January–early February); Specific preparation (February–March); Competition (April–September); Rest – Off season (October); General preparation (November–December)

Camps:
- General training begins 7 February
- Training camp 1 — 3–4 March
- Training camp 2 — 16–17 June
- Training camp 3 — 8–9 September

Major competitions:
- South coast carnival 22 April
- Northern region carnival 20 May
- Regional invitational carnival 28–29 July
- Schools carnival 26 August
- State champs 24–28 September

Selections:
- Squad selections 18 March
- Final team selections 13 May

PHYSICAL PREPARATION
- Cross training/other sports
- Endurance
- Strength and power
- Speed and agility
- Flexibility

SKILLS AND MATCH PREPARATION
- Basic passing and catching skills
- Basic attacking skills
- Basic defensive skills
- Advanced ball control and movement skills
- Team attacking skills
- Team defensive skills
- Goal shooting
- Tactics

CASE STUDY

Igor has been coaching a squad of talented junior middle-distance runners for several years. He has come to know the athletes well over the years and has recognised some very different preferences in the runners. Michelle is a talented 16-year-old who is also strong academically. She is an exceptional violinist and regularly competes in eisteddfods. Michelle is very good at balancing the various components of her life and always appears in control and focused, even at times when her workload is heavy. She plans her time well and has clear goals for herself in all aspects of her life.

Igor understands Michelle's need to be involved in planning her training. It is important to Michelle that Igor talks with her regularly about her progress and they discuss the training plan regularly to modify it around Michelle's workload.

Justin, on the other hand, is relatively new to the sport. He is a talented runner, but does not have much experience yet. Justin is always concerned with the times that he does in training, even when the focus of the activity is meant to be on skill, not speed. He gets very anxious about performance, to the point that if there is a tough training session coming up and he has not been happy with his times lately, he will find excuses not to attend the session.

Recognising that Justin is quite stressed about his training performance, Igor has decided to work quite differently with him. At the beginning of the season he spends some time with Justin discussing his goals, and they broadly map out the competitions he will do and the phases of training together. From then on, though, Igor does not discuss Justin's training plan with him in any great detail. Justin seems to prefer to deal with his training as it happens, rather than knowing in advance what he will be doing. He finds that he copes much better with the work if he does not have time to 'stew' over a difficult session or phase that is coming up in his program.

Some tips for building a plan

- Work backwards from the peak event
- Schedule in other lead-up events along the way to help track the athlete's progress
- Consider the timing, duration, volume and intensity of workload of each phase of training and set minor goals for each phase
- Build a series of session plans that will meet the minor goals for each training phase — once again it is often easiest to work backwards from the end goal for that phase

Building inclusive plans

When developing a plan, it is important to ensure that it meets the needs of all the athletes in the squad/team. This may require the coach to think about:

- physical barriers to access (for example, facilities, modifying equipment, planning for other needs such as travel to 'away games')
- social barriers to access (that is, team/squad dynamics and the coach's role in building these in a positive way).

The process of planning for an athlete with a disability is no different to the process for an able-bodied athlete. It is important to talk to the athlete about their abilities and any limitations they may have. Remember that they are the expert about their disability and will be the best resource for solutions to overcome it. In terms of planning, the coach may need to consider that progress for an athlete with a disability could be slower due to a physical or intellectual impairment and they may require additional support or modifications to equipment and activities. This can become increasingly difficult to manage in a more competitive environment with the added limitations of competition rules. Coaches need to think laterally and work with administrators and officials to break down unnecessary barriers. For example, in equestrian sports there are very strict rules about the riding equipment that can be used in competition. Riders with a disability, however, can be assessed and apply for an equipment exemption card that will allow them to use a special piece of modified equipment to allow them to compete, but will give them no unfair advantage in the competition.

Evaluating progress

Once the season plan is in place, it is important to think about how to evaluate the athlete's progress. Keeping records on athlete performance in both training and competition will help to monitor their progress over time and assist the coach to reflect on what modifications might need to be made to the training plan.

The coach's personal preferences will determine what system is used for keeping training records. For risk management reasons coaches should, as a minimum, keep a copy of the overall season plan and a copy of each session plan and any modifications made to a particular training session. Including a space at the bottom of each session plan to make notes on these changes is a good idea. It is also good to get in the habit of taking 5–10 minutes at the end of each session to evaluate its success. Keeping notes on what worked well, what did not, how specific athletes coped with the session, and ideas for what to include in the next session is a very useful exercise. For example:

Session evaluation

1. 'Knee high' drill was a disaster. My explanation was not clear enough and none of the kids got the point of the exercise. Need to spend time next session explaining this better and use Clayton as an example.

2. Paul was very sluggish today. Need to talk with him and check how he is feeling. Looked really slow and tired. Workload too heavy for him? May need more recovery time between these tough sessions.

3. Movement around the field was much better today. Need to look for a different activity to reinforce this next week.

Setting goals for the season and each phase of training that are specific and measurable will help the coach with evaluation. As a coach progresses through the season, having measurable goals for specific phases makes it much easier to check if the program is on track. It is important to remember that in most sports there will always be some 'gut feeling' from the coach about how an athlete is progressing — it is impossible to measure everything. It can also be useful to meet with an assistant coach at key points throughout the season to check their opinion of athlete progress.

Scheduling review periods into the planning process can also be helpful, both to measure performance and to actually make modifications to the plan before the key competition. Regular checks on performance are better than irregular ones, as they allow the coach to make smaller adjustments to the plan before things go too far off the rails.

There are many reasons why a plan may need to be modified:

- injury/illness
- initial goals were inappropriately set — too high or too low
- athlete development has not occurred according to plan
- non-sport factors have impacted on the plan (for example, school or work)
- the aims of the athlete have changed
- access to facilities or equipment has changed.

The process of modifying the plan should be based on:

- a re-evaluation of the athlete's goals
- a reassessment of the levels of fitness and technical skill of the athletes
- an evaluation of the competition they will be facing (for example, capitalising on weaknesses in the other team/competitors)
- adjustments should be discussed with the athletes and/or parents so they understand why the plan has changed.

Evaluating the planning processes

At the end of the season it is also important for a coach to review the effectiveness of their plan. This can be done by speaking with athletes, parents and other coaching staff to get their opinions on the season. Some questions a coach should consider include:

- Were the goals realistic?
- What did the athletes achieve by the end of the season? What were their strengths?
- What weaknesses remained?
- Did training sessions prepare the athletes physically and mentally for the level of competition in which they were competing?
- Was there adequate opportunity for recovery within and between sessions, or were the athletes becoming ill, injured and run down?
- Did the plan allow for the other elements of the athletes' lives (for example, school and social commitments)?
- What should I do differently next time?

A review of the season should also include the coach reflecting on their own coaching styles and methodologies. Some key questions a coach should ask themselves include:

- What aspects of my coaching did I plan to improve this season?
- What were some indications of improvement (try to think of some specific examples)?
- What areas did I have difficulty with (for example, modifying activities to suit the needs of a specific individual, or keeping communication focused on positive performances)?
- How can I avoid these difficulties next season?
- What specifically do I want to work on to improve my coaching (and thus the athletes' performance) next season?

Summary

For many coaches, planning the training season can seem quite a daunting task. Using the information-gathering, goal-setting, programming and reviewing model outlined in this chapter, coaches can take a logical, stepped approach to planning and, through open communication with the athletes, develop a plan that will meet their individual needs.

Remember, good planning will lead to better performance and more enjoyment for both the coach and the athletes.

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Chapter 4:
Sports safety

by Rebecca Layton

Many coaches come to a sport through their own child's participation or because they themselves are an athlete and have been asked to coach a junior team. While the coach may have a good grasp of the technical aspects of their sport and may attend coaching courses to broaden their knowledge of the sports sciences, the growing responsibilities expected of a coach in the 21st century can at times seem quite daunting. Issues such as injury prevention, child protection, insurance and the risk of legal action can, however, be managed very effectively with a little forethought and planning.

Sporting organisations and coaches must use reasonable care to ensure that people coming into or near their facility/program (for example, participants, spectators, tradespeople and visitors) are not injured in any way. With this level of responsibility, coaches must make safety a priority, and with good planning and documentation habits, it need not be an onerous task or take away all the fun.

Dealing with emergencies

Emergencies are by their nature unpredictable, and therefore very difficult to plan for. It is important, however, for every sporting organisation and coach to:

- give some thought as to what kinds of emergencies could potentially arise (identifying risks)
- consider the likelihood of them occurring and the types of damage that could result (analysing the risk)
- identify whether systems and procedures currently in place would be effective in such a situation (evaluating the risk)
- implement new systems, procedures or actions to reduce the risk of the emergency occurring or at least minimise the damage that results (treating the risk).

Due to the unpredictable nature of emergencies, a coach may not be able to foresee every potential danger, and therefore cannot always develop detailed action plans, so a broad set of principles that can guide a coach's actions in an emergency will also be helpful.

CASE STUDY

A Riding for the Disabled centre operates out of a 100-acre property on the outskirts of a city. Their facilities include about 70 acres of paddocks to accommodate their 20 specially trained horses. They also have a common room, stable block, hay shed and indoor arena.

Ever aware of the potential risk of fire, the centre developed a basic fire emergency plan. The plan focused on strategies to deal with a fire when it hit and mainly considered protecting the horses and buildings from a grassfire threat. However, when severe fires did hit the centre one summer, 20 horses had to be evacuated — something that had never been considered before and was a logistical nightmare, as the centre only owned a two-horse vehicle.

In the aftermath of the fires, the centre recognised the inadequacies of their original plan and acknowledged the need to develop a much broader emergency management plan that would guide them through a range of small and large-scale emergency situations. A small team of committee members, coaches and administrators were involved in the development of the new emergency plan. The local fire brigade and emergency services were also consulted on the centre's fire protection needs, and how to develop an effective emergency plan.

The end result was a new plan that focused on broad principles to be followed in the case of an emergency. The plan recognised that many of the riders had poor mobility, and introduced a policy that on total fire ban days, riders' transport must remain at the centre with them in case of the need to evacuate. The new plan paid greater attention to the range of emergencies that could potentially occur and assigned clear responsibilities to personnel in an emergency. Improvements to safety equipment were made and a new 140 000-litre water tank was installed as a dedicated source of water in case of fire.

A communication process was put in place to explain the plan to riders, parents, schools, coaches and volunteers. Aspects of the plan regularly featured in the centre's newsletter to ensure that new participants were aware of the safety and evacuation procedures and their responsibilities in an emergency situation. An annual check list of preparations for the bushfire season was implemented and the plan is regularly reviewed to ensure that it remains effective.

As a coach, it is important to be aware of the emergency management plans of your sport or organisation and to be involved in review processes (or the development of a plan if your sport does not have one). It is important that coaches understand the implications of the plan for their coaching program and understand how any safety and risk management policies impact on them.

Listed below are some questions coaches might like to consider in relation to emergency situations:

- Are you clear about your responsibilities in the case of an emergency?
- Are you able to access assistance?
- Can you care for the athletes effectively, including any injured athletes as well as the rest of your team/squad?
- Do you have access to athlete medical records in case emergency medical assistance is needed?
  Note: The athlete medical history form at Appendix 4 is a useful tool to collect this information. You will need to keep these records in an easily accessible place in case of emergencies, but also ensure that records are kept private.
- Can you contact the athletes' parents/guardians in a hurry?
- Do you know where emergency exits are located?
- Do you know the facility's evacuation procedures? Do you have athletes with poor mobility who will need assistance to evacuate?

- How will you account for all the athletes to know whether they are all safe or whether you need to report missing athletes to emergency services?

- Do the athletes know what to do in an emergency?

- Do you have an effective means to get the athletes' attention and bring them together when a threat arises?

- Do you have a process to document any injuries? **Note**: The injury report form at Appendix 5 may be useful for this.

Sports Medicine Australia's Victorian branch has developed a very useful brochure called *Emergency Planning for Sporting Clubs*, which you can find on the Smartplay website (www.smartplay.com.au/vic/doclib/pub/docliball.asp). This brochure outlines the types of things that should be included in a sport's emergency plan and also provides a sample plan that can be modified and adopted. Sports Medicine Australia's website (www.sma.org.au) also has links to other sports safety resources and their Smartplay program.

Remember that when working with junior athletes, a parent information meeting at the beginning of the season should include information about emergency plans. Parents need to know that their children will be cared for and they also need to be aware of any evacuation plans.

Travelling with teams

Developing risk management and emergency plans for the regular training or competition environment is important, but coaches also need to consider whether these plans would hold up just as well when travelling with an athlete or team. Prior to undertaking a sporting trip, it is important to consider the risks that could occur during the trip, how to manage these risks and what plans should be in place in case of an emergency while travelling.

The following table outlines some potential situations a coach might face when travelling with a team, and some suggested strategies to manage the situations effectively.

Table 4.1: Team travel situations and strategies

Situation	Strategies
Managing challenging behaviour from athletes when travelling	• Develop clear behaviour guidelines before travelling and ensure everyone understands the consequences of breaching the guidelines. • When travelling with junior athletes, make sure parents are also aware of these guidelines. • Act on any breaches of the guidelines promptly and fairly. • Communicate decisions and actions to the team when a breach has occurred. • Keep a record of any incidents and the actions taken. • Acknowledge good behaviour in your team.
Dealing with disharmony among team members	• Establish team goals and individual responsibilities before travelling so that everyone is clear about what they are working towards and their role in achieving the goals. • Acknowledge differences within the team and celebrate the contributions that everyone makes. • Provide avenues for individuals to 'blow off steam' and debrief in a supportive environment. This might mean removing someone from a situation until they have their emotions under control. • Keep listening to the athletes and encourage them to listen to each other with respect and support. • Take a problem-solving approach when faced with differing points of view — that is, do not focus on the problem, focus on the solution. • Encourage individuals to take responsibility for solving problems — do not leap in and solve it for them. • Provide team-building opportunities away from competition — for example, going to the movies or to a restaurant.
Managing multiple responsibilities while travelling (for example, team management, travel arrangements, meals, accommodation)	• Have a good plan for managing multiple responsibilities. • Before travelling, consider all the tasks that need to be managed and identify who can assist with these tasks. This may mean delegating some tasks to team members if there are no other support staff to call on. • When delegating, make sure the person has all the information and resources they need to do the job well. • Communicate regularly with the people to whom you have delegated and check they are on track to get the job done. • Once you get back home do not forget to thank the people who have helped.

CASE STUDY

Jacqui is the coach of a junior girls' hockey team. They have been invited to a weekend tournament at a costal town about 150 kilometres away. Jacqui has never travelled with a team before, and realises that aside from the logistics of getting the team there, she will have significant added responsibilities to look after the players for the weekend.

In order to ensure the trip will be a success, she meets with the players' parents, the captain of the team, her assistant coach and the club president to plan the trip and make sure that it will be safe and successful. At the meeting they plan many of the logistics, such as transport, accommodation and food, but they also consider the potential risks and strategies that can be put in place to manage these risks. Some of the issues they discuss include:

- obtaining consent (including consent for emergency medical treatment) from parents for the trip

- responsibilities for the players, coaching staff and accompanying parents while away

- rules for the trip to ensure the safe and effective management of the group while away

- appropriate supervision of the girls while away — this includes supervision at the tournament as well as during other activities and at the accommodation

- child protection issues, as one parent was concerned that the girls would be travelling with a young male assistant coach

- medical records for the girls and contact details for parents

- the need to have a qualified sports first aider with them and taking appropriately stocked first aid kits.

Jacqui kept notes of the discussion and the decisions made, and ensured that all parents and athletes received information notes about the trip, including risk management strategies, rules, consent forms and medical records, as well as information on the logistics for the trip.

The end result was a well-planned successful weekend away with the added bonus of a runners-up trophy at the competition.

Some of the keys to safe travelling with teams include:

- obtaining appropriate consents and medical information, and making this information available to team staff. It is also a good idea to leave a copy with someone at home just in case. Remember to keep private information confidential

- selecting appropriate staff/support, allocating responsibilities and reviewing the code of behaviour and rules with them

- ensuring there is appropriate gender balance of staff/support and appropriate strategies in place to deal with any child protection issues

- undertaking screening or checking processes on staff/support people. Note that some state and territory child protection legislation requires mandatory screening or checking processes for support staff travelling into their state/territory

- developing policies or team rules for travelling with athletes, parents and staff/support people. Ensure that these are documented and include disciplinary measures that will be enforced if rules are broken

- developing a strategy for dealing with any ill or injured athletes while away.

Dealing with ill and injured athletes

Coaches should place the safety and welfare of athletes above all else. The need for coaches to show concern and caution towards ill and injured athletes is paramount. Coaches should:

- encourage athletes to seek medical advice when required

- provide a modified training program where appropriate

- allow further participation in training and competition only when appropriate

- maintain the same interest and support towards ill and injured athletes.

It is the coach's responsibility to ensure first aid is accessible for ill and injured athletes, but it is not the coach's role to diagnose and prescribe treatment. Athletes should be referred to appropriate medical professionals if they have been injured. Coaches may have to make quick decisions (particularly during competition) regarding the severity of an injury and the ability of an athlete to continue participating. When it comes to an injury, it is always wise to err on the side of caution in making this decision. Coaches should remember, when an injury is suspected is it important to STOP.

- **S**top — the activity and the player

- **T**alk — to them to assess their response and get information

- **O**bserve — their body for obvious signs of injury

- **P**revent further injury:

  – by getting help for a severe injury

  – rest, ice, compression, elevation and referral for a less-severe injury

  – playing on in the case of a minor injury (remembering to manage any blood for infection reasons).

Coaches will often have to deal with minor injuries and could potentially have to deal with a major one. Obtaining first aid skills and qualifications will equip the coach to better handle an accident or injury to an athlete.

Once an ill or injured athlete has been assessed and treated by a health professional, the coach's role is to implement the recovery and rehabilitation program that has been set for the athlete. Communicating regularly with the athlete, parents and medical personnel will assist in this process. While the athlete is recovering, it is important that the coach continues to include them in the program, assigning them roles that are appropriate to their current level of ability. For example, can they help set up equipment and fill the water bottles, can they train alongside the team but with a lighter load/intensity, should they at least observe sessions that focus on tactical play even if they cannot participate?

Infectious diseases

People can be exposed to infection through participation in sport in a variety of ways:

- through blood-to-blood contact via broken skin and open wounds. Of most concern are the blood-borne viruses such as HIV and hepatitis C

- through contact between a person's broken skin, mouth, eyes and other mucous membranes with another person's infected body. A number of serious infections are possible such as hepatitis B, meningococcal disease and many of the sexually transmissible infections

- through exposure of the skin to another person's infected skin or body fluids. This may be via direct body-to-body contact or indirectly through the use of shared equipment (for example, wrestling mats), clothing (for example, jumpers, socks) and other surfaces that remain moist for a period of time (for example, shower floors, rub-down benches). These usually involve fungal skin infections such as tinea, viral infections such as warts, or parasites such as scabies

- through ingestion of contaminated food and drink. If people handling food do not wash their hands properly, hepatitis A or a number of other infectious diseases, such as those which cause gastroenteritis, can be passed on

- through direct contact (that is, touching something an infectious person has touched and transferring the germs to your mouth), or by breathing in airborne droplets of saliva or sputum when an infectious person coughs, sneezes or spits (a sneeze or cough can propel the virus up to two metres). The common cold and the flu are easily passed from person to person in these ways.

The risk of being infected with a blood-borne virus through participation in sport is very low; however, infection is possible. The risk can be minimised even further by following some simple guidelines as recommended by Sports Medicine Australia:

- Get immunised against influenza and hepatitis A and B — immunisation is an effective and inexpensive means of significantly reducing your risk of contracting influenza, hepatitis A and hepatitis B (strongly recommended for contact sports).

- Put blood rules into action — stop the blood, dress the wound and clean up the blood.

- Use gloves when handling blood or anything with blood on it — you should treat all blood and body fluids as though they are potentially infectious. When spills of blood or other body fluids happen, as far as is possible you should avoid direct contact with them, covering any cuts on your hands/body with an appropriate dressing and wearing latex gloves.

- Keep clean, use your own stuff — do not share clothing, razors, towels, face washers, nail clippers, drink bottles, mouth guards, medication inhalers or any other personal equipment that may have blood, saliva or other body fluids present. These fluids can be present in very minute quantities and not be visible to the human eye, but still harbour enough germs to spread infection from one person to another.

Remember that state and commonwealth anti-discrimination legislation makes it unlawful to discriminate against a person on the basis of their disability or impairment in many areas of public life, including sport and club membership. This includes discrimination due to the presence in the body of an organism (such as HIV or one of the strains of hepatitis) that may cause a disease.

While divulging HIV or hepatitis status is not required under law, there may be circumstances when a player might consider telling a coach or sports trainer about their condition. The player is legally entitled to have this information remain confidential and other people are not entitled to access such information without the consent of the player in question.

As a coach, this means it is very important to encourage all athletes to develop hygienic habits during training and competition, as it would be unlawful to discriminate against, or divulge information about, a player who you know to have an infectious disease.

Risk management for coaches

We all know the saying, 'prevention is better than cure'. Risk management is about taking a preventative approach to coaching, and helping to care for and protect all the people that become involved. Risk management involves analysing all situations involving participants and others in the coach's care. By identifying the potential risks, coaches can implement strategies to reduce the chances of the risk occurring and lessen the impact of the risk if it does occur.

Risk management involves the following five steps:

1 Establish the context — considering the environment in which you work as a coach.

2 Identifying risks — systematically considering and documenting the risks associated with your program.

3 Analysing the risks — considering the likelihood and consequences of a risk occurring.

4 Evaluating the risks — deciding whether the likelihood and consequences of the risk occurring are acceptable and considering whether the controls that are in place are sufficient.

5 Treating the risk — if the controls that are currently in place are not considered acceptable, taking steps to fix, transfer or remove the risk.

Risk management is a simple planning exercise, and thinking through some of the potential risk scenarios for a coaching program will help to provide a safer, smoother and more enjoyable program for the athletes.

The risk management planner at Appendix 6 is a useful tool for coaches to identify potential risks within their program and take steps to minimise the chance of the risk occurring. It is also important to assign responsibility (that is, allocate someone to implement the strategy) and a time frame for completion. Without these additional steps, important risk management strategies can easily fall by the wayside.

CASE STUDY

Adelle is the coach of a junior gymnastics program that runs out of the local school. A parent recently approached her about the possibility of their son, Ari, getting involved but Adelle wanted to be sure that she would have appropriate support, as Ari has a mild to moderate intellectual disability. After Ari's first session, Adelle was concerned that he had little understanding of the risks involved in the sport and was worried about his daredevil approach, having found him in a number of unsafe situations during the session.

Adelle decides to talk to Ari's parents as she does not want him to have an accident, but she also does not want to stop him from participating. During the discussion, she realises that Ari's parents feel strongly that he should not be 'wrapped up in cotton wool'. Adelle reflects on their attitude over the next few days and tries to weigh up the 'right to risk' against the need to provide a safe learning environment for all the children. She respects Ari's rights to fully participate and take similar risks to the other children, but she also knows that there are some risks that she is not willing to take with any of the children in the program.

Adelle explains her basic safety rules to Ari's parents and asks that Ari is equally expected to abide by these rules. Ari's parents explain that he may not necessarily understand the rules or the reasons for them. Together they come up with some strategies to ensure that he can participate fully, while still working within the safety rules of the program. They decide that:

- Ari's parents will discuss the safety rules with him and use pictures to help him understand the rules, and will regularly reinforce the rules in other play that he does
- Adelle's assistant coach will spend time working with Ari to show him how to safely use the equipment and the safety precautions that he must take
- Adelle develops safety tips for each activity along with some safety picture cards so Ari (and the other athletes) remember the safety precautions.

Coaching insurance

All coaches should ensure that they are covered by insurance. In terms of risk management, insurance is intended to provide a financial safety net only when other risk management strategies fail.

Insurance cover is no excuse for the coach to neglect their legal duty. Providing a safe environment and instruction is a legal duty. If the coach fails to undertake their duty, insurance cover can assist with a claim, but it will not be a defence.

The insurance industry is very dynamic and insurance brokers and underwriters from different companies will name their insurance schemes diversely. There are three main types of insurance that coaches should be covered by:

- personal accident
- public liability
- professional indemnity.

If the coach is expected to make decisions on behalf of club management and the business of the organisation in addition to their coaching duties, they should also consider directors and officers insurance.
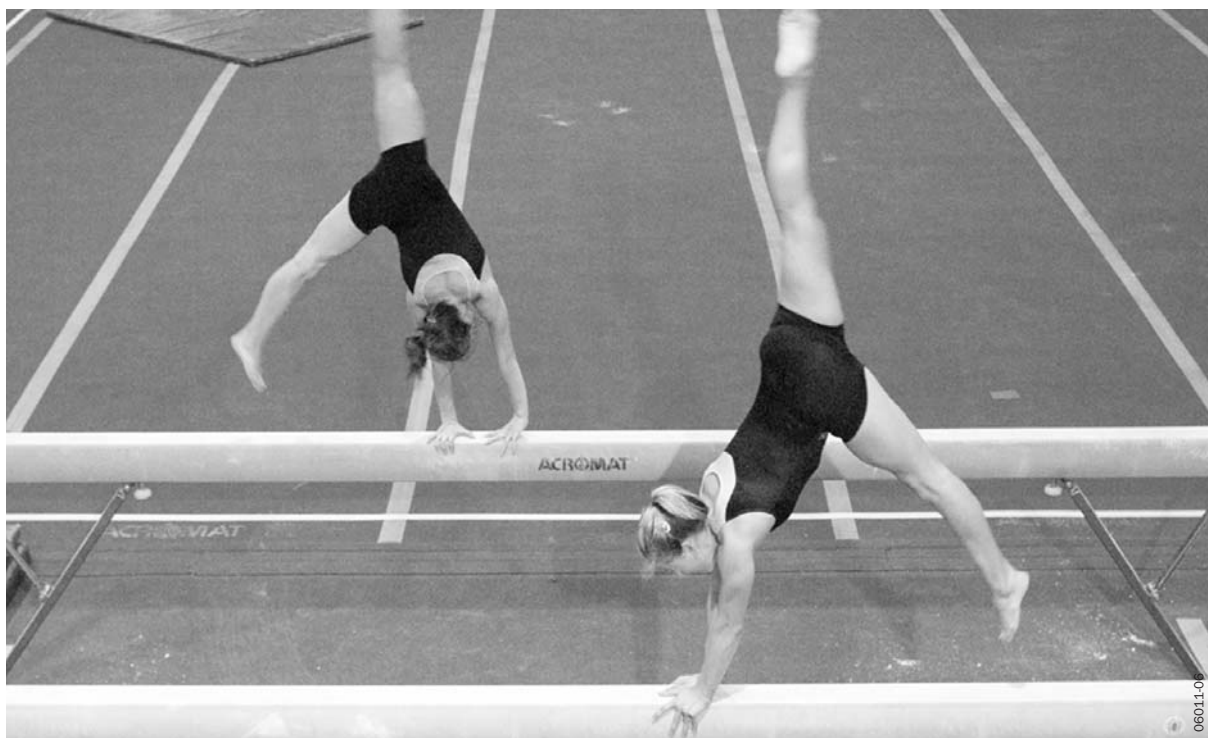
Personal accident insurance

Personal accident insurance is paid if the coach suffers injury and loss. It is not dependent on negligence or a breach of duty of care being proven. Personal accident insurance policies protect members while participating in their sport. For example, if the coach broke their arm while coaching, the policy will pay as per the premium guidelines. The coach would not have to investigate a legal claim to have the policy paid.

Different policies will have different definitions of the term 'member'.

Be aware that workers' compensation legislation exists and this can have an impact on personal accident insurance. If an accident occurs while a coach is undertaking 'employment duties', then personal accident insurance may not be called on.

Workers' compensation is legislated by the states and territories, and is known by different names in each state. 'Employment duties' are also defined differently in each state and coaches should obtain independent advice as to what conditions apply.

Public liability insurance

Public liability insurance covers liability resulting from the loss of or damage to property, or death or injury due to negligence. It does not include breach of professional duties.

Sporting organisations and coaches have a duty to use reasonable care and skill to ensure that people coming into or near their facility/program are not injured in any way. This duty extends to cover participants, spectators, tradespeople, visitors, etc. For example, a coach may have forgotten to secure access to an equipment storeroom and a participant's sibling enters the storeroom and is injured. The incident would be covered under a public liability policy.

Professional indemnity insurance

Professional indemnity insurance indemnifies the insured person against claims for compensation for breach of professional duty by reason of any negligence by way of act, advice, error or omission.

This insurance supports the coach if they have given an instruction that a participant acts on and is injured, or if the coach failed to give an instruction and a participant is injured. Coaches who ignore participants who are 'breaking the rules' are at risk of litigation if someone is hurt as a result of the breach of the rules and they failed to stop the activity. If the injured person lodges a legal claim some time after the original incident, the coach will need to still be insured at the time the claim is made against the professional indemnity policy, or have made individual arrangements with their insurer.

Often with professional indemnity insurance a 'claims made' rule applies. 'Claims made' policies mean that the coach has to be insured at the time the claim is made rather than at the time the incident occurred. This is a very important distinction. Therefore, it is important that coaches notify the insurer of any impending claim as soon as it becomes evident that an incident may lead to an insurance claim.

Insurance policy wording should be read very carefully, as often territorial or statute periods apply. For example, if a coach is travelling overseas with a participant, they should not assume that their personal accident insurance will cover them beyond Australia.

Every insurance contract is subject to the principle of good faith. Coaches are required to act with honourable intent. Failure to do so may permit the insurer to refuse to pay a claim or to cancel the policy. By acting appropriately and following good-practice guidelines, coaches can avoid being in this situation.

Summary

Athlete safety is an important issue for coaches to consider. All coaches need to be prepared for a range of situations that they might encounter when coaching. The use of emergency action plans is one important way to make sure that coaches are prepared. Coaches also need to consider the particular issues that might arise when they are involved in travelling with a team, as these may differ from the issues normally encountered.

Coaches need to know what to do when an athlete is injured. While the coach may not be the one providing first aid, they should have procedures in place to ensure that immediate injury care is available.

Coaches have an important role in dealing with and preventing the spread of infectious diseases and illness.

Risk management planning is an important tool that coaches can use to ensure that they are prepared for the risks of coaching. Identifying potential risks, and looking at ways to reduce these is one of the coach's many responsibilities. Coaches should also ensure that they themselves are protected.

Coaching insurance is essential for any coach. Insurance cover is not an excuse for the coach to neglect their duties; rather, it covers the coach in the event that something does go wrong.

The Australian Sports Commission would like to acknowledge the assistance of Sports Medicine Australia in providing information for this chapter.

References and further reading

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Pyke, F (ed.) 2001, *Better Coaching*, Australian Sports Commission, Canberra.

Smartplay website (www.smartplay.com.au) including:

- Emergency Planning for Sporting Clubs (www.smartplay.com.au/vic/DocLib/Pub/DocLibDetail. asp?lngDocLibID=39)
- How to become a Smartplay Club (www.smartplay.com.au/vic/DocLib/Pub/DocLibDetail. asp?lngDocLibID=60)
- Blood Rules (www.sma.org.au/information/blood_rules.asp)

VicSport website (www.vicsport.asn.au).

Chapter 5:
Coaching processes

by Brian Douge

Athletes acquire the ability to compete through their exposure to a variety of learning experiences. They learn by doing an activity at a more challenging level, by observing more accomplished athletes, by being guided through a well-structured development program, and by acquiring and applying knowledge about how to compete.

Coaches are responsible for delivering a program that best facilitates their athlete's ability to be competitive. How well this is achieved by the coach is greatly determined by the coach's command of the coaching process. Just as a chef produces a quality meal by cleverly contriving and integrating the ingredients of a recipe, a coach produces a quality athlete by cleverly contriving and integrating athlete learning experiences. This is the coaching process.

This chapter provides information about tried and true coaching processes that, if adopted, enhance the competitiveness of athletes.

Direct instruction

Types of direct instruction

Succinct and easy-to-follow written instructions are most useful when athletes have routines to follow and coaches want to avoid continually having to tell athletes what to do. This allows the coach to focus on other important duties. Some examples of written instructions in sport include the swimmers' training session written on a whiteboard beside the pool; exercise cards on the walls in weight-training facilities; written schedules for training camps; and team travel arrangements that include travel, meal and accommodation arrangements.

CASE STUDY

Aaron coaches an under-14 beginner rowing crew. Every rowing season he is frustrated by the amount of time wasted having to continually tell the rowers how to set up in the boat, which way the gate faces, who gets into the boat first, how to adjust the foot stretchers, which is the stroke side and which is the bow side of the boat, etc. One Saturday morning he purchased a wall unit kit from a furniture warehouse. He was amazed at how well the instructions guided him, a novice at manual skills, through the assembly process. Aaron decided to adopt the 'furniture kit' approach to guiding the crew through the process of setting up their boat. This involved numbering and colour coding the oars and boat, and developing a set of instructions for the designated team leader to follow. This relieved Aaron of the need to continually remind the athletes about how to set up their boat and left him free to attend to other important tasks prior to training and competition.

Oral direct instruction is the most common form of coach communication. It is used to give direction and impart knowledge. Quality oral instructions improve a coach's effectiveness. It is important to mentally prepare each instruction, limit the information to two or three key points, be succinct, and use voice and body language that ensures the delivery of an instruction is interesting and has high impact.

Once athletes become familiar with the detail of their coach's instructions, the coach can replace slabs of oral information with cues, for example, 'Okay team, let's warm up'. The 'warm-up' cue results in athletes performing a series of unprompted activities. Coaches can improve athlete self-management by including key words or cues in their communication.

CASE STUDY

The senior hockey team often lost possession of the ball when individual players tried to rush the ball from defence to offense. Geoff, their coach, devoted training sessions to practising a more controlled transfer of play from defence to offense, which encouraged players to set up the offense and provide support for each other prior to moving the ball downfield. Geoff used the oral cue 'Settle!' during games to mean 'Be controlled and set up the offensive play'. The players responded immediately when the coach or team-mates called out 'Settle!'

Direct instructions are a one-way form of communication, typically from the coach to the athlete. However, one of the most powerful forms of direct instruction is demonstration.

Content

The focus of oral instructions and demonstrations should be limited to two or three key pieces of information. Written instructions can have several pieces of information, provided the athlete is continually able to refer to them. All direct instructions must be succinct, worded to suit the audience, stated clearly and not overly repetitive.

The content of an instruction will at times need to include an explanation or brief rationale. This is usually when teaching a new skill, strategy or training routine, or when coaching a team that does not yet have complete confidence or belief in the coach.

CASE STUDY

Ian was bemused by his cricket team's excessive number of run-outs in each innings at the crease. He noticed that the striker of the ball was taking full responsibility for initiating the first and subsequent runs after the ball was hit. He instructed the players that from now on the strike batsman would make the 'run' call for balls hit in front of the batting crease, and the non-striking batsman would make the 'run' call for balls hit behind the crease. From then on, whichever batsman was facing the ball in the field would call for the next run. He explained that by doing this neither batsman would hesitate to run and both batsmen would be able to see and hear each other and the ball at all times. It took some time before the more dominant batsmen were able to relinquish total control of the running between wickets. Ian persisted with specific training drills and coach directions until the entire team became committed to the new running between wickets strategy. The number of run-outs was dramatically reduced over time.

Checking for understanding

One of the quickest ways to check that athletes have understood a coach's directions is to watch what happens. However, considerable time can be saved if coaches revise their instructions by asking athletes to either repeat them or predict what might be the outcome if they implement the instructions. For example, to check for understanding after explaining the new running between wickets strategy, the coach could ask the players, 'What is the benefit of the new calling strategy for the batsman at the striker's end of the wicket if the ball is hit behind the crease?' If the athletes answer this question correctly, the coach can be confident that they know what to do and why they are doing it.

Timing

Direct instruction can occur at any time in the athlete program; however, it should be immediately followed by an opportunity for the athlete to act on the instructions.

Facilitation

Rather than forcing athletes to be competitive and/or become more competitive, quality coaches create situations that facilitate an athlete's desire to be competitive. Ways to facilitate athlete learning include providing opportunities to respond, setting realistic expectations, giving athletes time to adjust to changing situations, building step-by-step progressions into the athlete program, and ensuring athletes experience the 'thrill of the skill'.

Opportunities to respond

Athletes acquire skills by 'doing'. It is essential that coaches organise training sessions and game structures so that athletes repeatedly practise new skills and/or modify previously learnt skills.

Realistic expectations

Setting standards and goals that the athlete can achieve not only encourages a better performance but also increases self-confidence and intrinsic motivation. For a team of seven netball players it is difficult to set challenging goals that each player can achieve, given the varying abilities of the players. However, effective coaches are able to impart flexible, individual expectations to each player in relation to a team goal.

CASE STUDY

One of the goals for Margaret's team of judo players was to increase their level of aerobic (endurance) fitness. Margaret did not set a goal for every player to score above ten on the beep test, rather she conducted a pre-test then asked every player to try to improve their score by a nominated percentage over a two-month training period. Margaret discussed and agreed with each player on a challenging and achievable per cent improvement target for the player. For some players the agreed target was 10 per cent, while for others it was 20 per cent.

Time to adjust

The amount of time an athlete takes to adjust to new competitive situations varies greatly depending on the type of activity, experience and ability of the athlete, the experience and ability of opposition players, and environmental conditions. Coaches should assume that their athletes are trying their hardest to adapt to new situations, and allow them several attempts at a new skill, strategy or playing position before deciding to intervene. This is an acceptable approach for coaches to take with all athletes.

Step-by-step progressions

The endurance pre-test of Margaret's judo team revealed that the team was lacking in fitness compared to opposition teams. Margaret decided to build the fitness of the team by integrating step-by-step endurance progressions with skills and strategy training. Gradually reducing the number of players in a drill, increasing the distances covered in strategy work, reducing the time expected to complete tasks, and increasing the presence of opposition in drills were step-by-step approaches that Margaret used to improve the fitness of her players.

'Thrill of the skill'

Coaches have the opportunity to provide every athlete with movement experiences that satisfy the sensory aspirations of the athlete — the 'thrill of the skill'. There are countless examples of movement thrills in sport — downhill skiing, forehand drive in squash, a perfectly timed deflection in football, forward one-and-a-half with full twist in diving, and a spiralling two-handed pass in rugby union. On the way to experiencing these more dynamic sporting thrills, coaches need to progressively provide opportunities for athletes to experience more easily attainable thrills. Careful planning and repetitive practice can allow athletes to experience the 'thrill of the skill' in their chosen sport.

Games-based approach

The major difference between a skills-based approach to athlete learning and a games-based approach is that the skills approach focuses on accelerating the ability to efficiently perform an essential component of a specific movement within the performance regime, and the games approach focuses on efficiently performing essential components of the performance regime under conditions that are typically experienced in the game.

CASE STUDY

Matthew enrolled his daughter Casey in a 'learn to play' golf program. Casey had a mild intellectual disability, enjoyed sports and was an admirer of Karrie Webb. Matthew hoped that Casey would enjoy playing golf and at the same time work to overcome her inability to concentrate and be patient.

Casey's golf coach, Lynda, was quick to recognise that Casey was not able to cope with the level of concentration and patience required in the skill training session devoted to correcting the grip, stance and swing of players as they hit 50 balls using a pitching wedge on the driving range. However, Casey coped very well if Lynda coached her using a games-based approach. Lynda asked Casey to chip eight balls onto the practice green from ten metres off the edge of the green and then try to putt the balls into any of the holes on the putting surface in three putts or less for each ball. If she could get all of the balls in the holes in less than four shots for each ball then she won the game, if not then the balls won the game. Lynda regularly checked on Casey to see if she was using the two 'Karrie Webb' grips of the club that she had taught her for chipping and putting.

Types of games

There are many variations of the games-based approach. Players could be exposed to the following situations:

- Competing against self — the softball coach set up a target resembling the strike zone with a point score allocated to various areas on the zone. A player was given 20 pitches to score as many points as possible. The coach then instructed the player to focus on trying to beat their score.

- Competing against a standard — the football coach asked his young players to complete a complex team drill involving a dribble through markers, passes to team-mates and a shot at goal from a designated area. The players were asked to aim to complete the drill with less than four errors. Errors included touching a marker when dribbling, not passing the ball to the advantage position for a team-mate, and missing the shot at goal.

- Competing against an opponent — the football coach in the previous example then introduced an opposition player, who was instructed to try to intercept and/or steal the ball at any time during the drill. When the players demonstrated composure and control, more and more opposing players were added to the drill to increase the competitive pressure.

- Cross training — activities and sports can often complement each other in fitness, skills and psychological areas. An obvious example of one sport complementing another would be touch football and rugby league. Rugby league players could cross train using touch football to finetune offensive passing skills and improve fitness. Track and field running programs for sprinters and middle distance runners are used by coaches of many sports as a cross training method for improving specific aspects of running fitness. Cross training can be used to add variety to an arduous program and/or to provide an intense focus on a particular aspect of athlete development. The Australian cricket team has employed the services of a US baseball fielding coach to enhance their cricket skills by adopting baseball fielding and throwing training methods.

- Simulation — repeating game situations at training enables players to correct errors in game play and develop new strategies. Tennis and cricket coaches have ball machines that deliver balls to the athlete as they are likely to receive them in a game. Being able to simulate a game situation over and over again with minimal time between trials greatly improves athlete performance. On occasions, coaches will simulate game situations at a higher intensity than would occur in a game. This approach is used by coaches to take the athlete to a higher level, thus making the real game situation relatively easier to manage.

CASE STUDY

Water polo coach Ben was frustrated by the team's lack of support play when moving from defence to offense. He set up a simulated game using a larger goal with no goalie and the rule that all players on the attacking team must be in the offensive half and have contacted the ball before a goal could be scored.

Purpose of the games-based approach

A games-based approach to training enables the coach to recreate game situations and focus on aspects of physical and mental skills, fitness, strategy development and opponent experience. Using small-sided games at training and rotating opponents can give a young player exposure to a range of opponents and accelerate their ability to cope with more-experienced athletes in real situations.

Problem-solving approach

Defining a problem

Requiring players to participate in solving problems they are having with their performance and/or the performance of the team, entrusts them with taking ownership of aspects of their program. Some athletes appreciate being responsible for their development, while others would rather be guided entirely by the coach.

There are simple and complex problems that confront coaches in all sports. A simple problem could be identifying the order in which sprinters run in a 4 x 400-metre relay race. The coach has two runners who run fastest when in front and two who run best when there is someone to chase. Three of the runners finish hard, while one tires quickly at the finish of the 400 metres. The coach arranges a meeting with the athletes and asks them to choose the running order based on their knowledge of each other's ability and their knowledge of the opposition runners.

A complex problem would be a team's lack of confidence in each other and themselves. This situation requires each team member to identify, in private meetings with the coach, personal areas of concern with their performance, as well as concerns they have with the performance of other members of the team. The coach then collates the views of the players and, as well as asking each player to develop a plan to confront their own lack of confidence, a leadership team is given responsibility to find a solution to team confidence issues.

Plan of attack

Once a problem has been recognised by the athlete/s it is essential that they work with the coach to develop an action plan. The plan should include a target outcome, the training activities to be undertaken, a time frame for completing the task, and who is responsible for implementing the program. Simple problems will often not require a sophisticated plan; however, a complex problem can place extensive demands on the planning process.

Problem situations

There are many elements of a competition that pose problems for coaches and athletes. Some examples include:

- environment — unusual weather conditions, different playing surfaces, poor preparation areas, extensive travel demands
- mental — poor motivation, lack of concentration, lack of confidence, misdirected aggression, excessively high or low anxiety
- strategic — lacking strategies to avoid exposing weaknesses, coping with fatigue, overcoming the loss of a quality player in the team, lack of variety in defensive and offensive plays
- technique — lack of skill routines to suit critical situations, lack of automation of basic skills, high skill error rate caused by poor technique, vulnerable performance areas caused by poor technique which limit skill options
- opposition — contending with high-quality players, coping with aggressive opponents, contending with inflated opposition reputations, overcoming physical differences (speed, size, endurance).

Problem situations are often managed effectively if the athlete is involved in the process of developing a solution.

Questioning

Asking athletes questions about their performance and training program is an effective method of encouraging them to become skilled at identifying and solving their own problems.

CASE STUDY

Tennis coach Brian was keen to encourage a young player, Erin, to make the connection between where the ball went, how hitting in different directions felt different, and what adjustments are made to the hitting action to hit in different directions. He asked Erin to serve to the left and right corners of the service box. Brian then asked Erin, 'What felt different between the two serves?' Erin was able to analyse the two serves, then compare these actions with her previous experiences in both tennis and other sports.

The questions that Brian was asking of Erin were higher-order questions requiring considerable thought. Lower-order questions are used by coaches to encourage athletes to remember concepts and ideas. A concept in Australian football would be the use of a zone defence when the opposition is kicking the ball into play. Players could be asked to remember their individual roles in the zone defence. In this situation, the coach would speak to individuals and ask them to describe their role and then observe their ability to remember it while playing the game.

Assessing athlete needs and capabilities

Formal assessment

Methods for assessing elite and professional athlete performance have become highly sophisticated and labour intensive. Often these methods are not viable for typical sporting teams and individuals. Most coaches do not have the time, equipment or specialist expertise to conduct laboratory-type assessments. There are, however, several more modest approaches to athlete assessment that can provide useful information for improving the competitiveness of athletes.

- Video analysis — video is a tool that is readily accessible to most coaches. It can be a powerful method for coaches to analyse athlete performance, as well as to show athletes specific aspects of their technique or tactical performance.

CASE STUDY

Michael was having difficulty explaining to Ian, a backstroke swimmer, that his hand entry was too far across his body. Ian's action was causing his body to sway from side to side and reduced the required lateral pressure early in the stroke. After several discussions, constant feedback and having a third party observe Ian, there was minimal change. Michael decided to video Ian and was amazed that after only one video analysis session Ian corrected the fault.

- Observation — an astute coach is capable of assessing a range of athlete abilities by watching, listening to and, in some sports, feeling the performance of their athlete. This is the most common form of ongoing assessment. It is important when using this technique to provide immediate feedback to the athlete and to keep a mental or written note of significant observations and assessments.
- Testing — the advantages of conducting standard tests are that athletes can make comparisons with their previous performance and with other athletes and team performances. 'Field' tests that are specific to the sport and easy to administer are often the most effective testing protocols. The beep test, an easy to administer fitness test, is used in the field by a number of sports to assess running endurance.

Player self-assessment

Using player self-assessment can increase a coach's understanding of each athlete.

One of the most intrinsically motivating experiences is when an athlete achieves a personal goal. Team players will often be disappointed after a competition even though their team has won the game. One reason for this is that, individually, they have not played according to their expectations. On the other hand, athletes who believe they played well can appear buoyant after a competition despite their team losing.

Athletes will say, 'That felt good', as a way of expressing the positive intrinsic sensations derived from their performance.

Team-mate assessment

A more difficult assessment tool to manage is team-mate assessment. Team-mate assessment is not holding a stop watch and recording the times of other athletes, but is an assessment of:

- a player's affect on other players
- what role in the team is most suited to a player's current abilities
- how well the player performs in pressure situations.

On the field, a player is able to assess the relative contribution of their team-mates in congested situations that are often remote from the coach.

It is important to respect the sensitivity of team-mate assessments. These assessments should be managed using either confidential written reports or private confidential meetings with the coach.

The types of areas to assess include physical strengths and weaknesses, technique, decision-making ability, and ability to work as part of a team. Just as a good scientist would use the most reliable and valid instruments to test a theory, coaches should use the most reliable and knowledgeable team-mates to provide assessments of players and the team.

Assessment process

The assessment process has three essential steps:

1 Establish the criteria for assessment (for example, a volleyball coach establishes a team criteria of less than five unforced errors in each set of play).

2 Collect data that is specific to the behaviour being assessed. The data must be accurate (for example, the volleyball coach counts the number of unforced errors and uses a list of pre-determined examples of unforced errors as the basis for scoring the behaviour).

3 Analyse the data by comparing them to other teams, comparing them to the team's previous performance, and by assessing whether there are more unforced errors by specific players or in specific game situations.

Coaching methods to suit learning styles

In most groups of athletes there will be different learning styles. Some athletes learn best by seeing someone else or themselves perform (visual learners). Others learn best by listening to an instruction or receiving feedback comments (auditory learners) and others learn best by feeling the sensations of a movement and making adjustments until the movement 'feels right' (bodily–kinesthetic learners).

When a coach has yet to determine the preferred learning style of an athlete, it is advisable to provide the opportunity for each learning style to be engaged.

CASE STUDY

Simon was about to teach his under-9 football team the 'inside of the foot' pass. He decided to show the team a brief video (visual learner) of a few 'inside of the foot' passes used by top international players from the football World Cup. By slowing down and pausing the video, the players could see the exact point of contact between the ball and the foot. Simon then took the players outside and explained (auditory learner) the three key elements of the pass:

- turn your kicking foot side on to the target
- pretend that your leg and foot are a broom and 'sweep' the foot at the ball
- hit the ball with your foot as if you were trying to knock over the pins at a tenpin bowling alley with a broom.

Finally, Simon placed the players into pairs and let them practise kicking with the inside of the foot for 10–15 minutes and said, 'See if you can feel the nice flat and solid contact between the ball and the inside of your foot, like it feels when you hit a balloon with the palm of your hand' (bodily–kinesthetic learner).

Various thinkers

People think in different ways. According to Gregoric (1982) there are four types of thinkers. Those who process information:

- in an ordered, sequential, linear (A–Z) way — a coach of this individual would provide highly structured programs and reality-based activities
- using trial and error — these individuals have a strong need to find alternatives and do things their own way. A coach of this individual would provide the athlete with a target and allow them to work out how to achieve the target through trial and error
- by absorbing ideas, information and impressions, and organising these through reflection — a coach of this individual would relate concepts to past experience and personalise the content using anecdotes. More personal anecdotes will be more effective
- by generating ideas and concepts then researching and analysing the ideas — a coach of this individual should provide data about performance and encourage the athlete to analyse the data and generate ideas for improvement.

Developing athlete independence and self-responsibility

Athlete independence and self-responsibility are nurtured when coaches allow the athletes to independently take responsibility for aspects of the competition program. Athletes are encouraged to develop a plan for an aspect of individual and/or team performance. They then implement the plan, self-evaluate and review the plan.

CASE STUDY

David is the tallest player in the basketball team, but is having problems penetrating the opposition's zone defence. His coach suggested he speak with his team-mates and devise ways to overcome the problem. After a lengthy discussion the players put in place a three-week training program. The program involved four different strategies for getting the ball to David and other players inside the 'key' (defence zone). David also devised a plan to develop his own shooting skills so that he had three or four avenues to the basket when he received the ball in the 'key'.

After each game the players evaluated their penetration strategies and David evaluated his choice of shooting options. Adjustments were made to the plans each week at training. At the end of the third week there was a significant improvement in both penetrating the opposition's zone defence and also in David's ability to score.

It is possible for highly talented and experienced athletes to take full responsibility for their performance; however, it is advisable in most situations, particularly in team sports, for athletes and coaches to share the responsibility for performance.

Observe, analyse and provide feedback to athletes

During practice and games, a coach should direct observations and feedback at the specific focus of the activity.

CASE STUDY

At rugby training, Grant devoted considerable time to practising hooker lineout calls with lineout lifting from in front and behind the lineout jumper. He then set up a competition drill combining hooker throws and calls with lineout jumping and lifting. Grant observed a range of errors, from players not bending their knees before lifting, to poor timing of the 'grip and lift' with the jumper take off. He gave immediate feedback using a mixture of positive comments such as, 'Nice quick turn around and grab on the hooker call!', negative comments such as, 'It is disappointing that most players remember to concentrate on the hooker calls, but one or two forget and make it difficult for everyone else' and neutral feedback such as, 'Lifters need to maintain a strong grip and upward pressure on the shorts of the jumper for as long as possible'.

What was effective about Grant's feedback was that it was immediate and he gave at least three positive or neutral feedbacks for every negative feedback.

During the drill Grant also noticed that the designated jumper was not positioning his thumbs behind the ball when catching, and some of the hooker passes were slipping through his hands or deflecting to the opposition. Rather than comment during the drill focusing on lifting, Grant delayed his feedback until after the training session. He then worked with the jumper, one on one, practising catching technique while being lifted.

Coaches who provide feedback (extrinsic feedback) facilitate an athlete's ability to generate their own feedback (intrinsic feedback) about their performance. Athletes do this by relating the outcome of a movement to technique criteria.

CASE STUDY

Squash player Julie knows that when her backhand drive loses power, falls short of rebounding the ball to the back corner of the court, and the ball hits high on the front wall, there is a strong possibility that she has forgotten to adjust to the backhand grip from the previous forehand stroke.

How to observe

As previously discussed, there are many ways to observe performance to be able to provide legitimate feedback. Coaches can watch a video of performance, refer to a score, or refer to the outcome of skill application or team strategy. No matter which method or combinations of observation techniques are used, it is advisable to conduct several observations of the focus behaviour before confirming that feedback is required or that there is a problem. Players who can intrinsically analyse performance may be capable of self-managing and overcoming a skill or team-play problem before the coach needs to intervene.

What to observe

The observation of athletes should be congruent with the task. Effective coaches avoid being distracted by aspects of performance that are not the behaviour being coached at the time.

More-experienced coaches develop the ability to observe a range of relevant associated performance areas at the same time. Athlete safety, mental attitude, physical abilities, and behaviours before and after a performance are all important components of being able to accurately analyse the performance of athletes using the observation method.

CASE STUDY

Peter instructed his squad of four vision-impaired distance runners and their guide runners that he would be basing their entry into the national cross country championships on their overall performance in the local community Bay to Bridge run. On the day of the Bay to Bridge run, Peter informed the athletes that their finishing time would be only one of the many factors that he would consider in assessing their ability to compete in the nationals in six months time. The other factors Peter would observe and assess would be:

- attention to safety issues, such as regular hydration, communication with the support runner about the terrain, levels of physical comfort and appropriate footwear
- pre-performance warm-up and briefing of the support runner, as well as a post-competition cool-down and debriefing
- the ability to develop a positive and focused attitude with unwavering commitment throughout the race
- the ability to run efficiently and according to the race plan.

Peter was able to record each runner's performance profile on the basis of observing the above performance criteria.

Amount of practice

The amount of practice an athlete needs to facilitate learning depends on the complexity of the task, and the natural ability and experience of the athlete. It is essential that:

- there is minimal delay between successive trials of a skill, strategy or team play

- the athlete is able to successfully complete the task for the majority of trials

- fatigue does not interfere with the ability to concentrate on the task, unless learning to cope with fatigue and frustration is the focus of the practice.

Communication skills and techniques

Presenting information

When presenting information to athletes, coaches will maintain interest and attention if their communications are:

- positive

- clear

- articulate

- precise

- relaxed

- confident

- based on familiar language.

Posture

The body language of a coach needs to depict the sincerity and importance of communications. This can be achieved by:

- maintaining an open stance

- leaning or tending towards the listener

- maintaining eye contact.

Interest

To be able to effectively use familiar and relevant language, a coach should have a grasp of the terminology of the sport. To be able to heighten athlete interest in what could become at times bland and repetitive communications, a coach should include related anecdotes and specific examples in the presentation of information.

Athletes do not require coaches to be formidable public speakers or highly entertaining orators. Most athletes are involved in sport to experience the thrill of participation. However, to facilitate learning and participation it is advisable that coaches include the communication skills and techniques outlined above when presenting information to athletes.

Listening skills

There are many situations where athletes may need to speak to their coach. Apart from formal interviews or debriefing sessions, athletes may speak to a coach to seek clarification in relation to an instruction or to increase their understanding about an aspect of competition. Basic listening skills such as eye contact, nodding the head when appropriate, keeping silent while the athlete is speaking, maintaining calm even if the athlete is testing your patience, and keeping relatively still, will encourage the athlete to be open and relaxed.

Other non-verbal coach behaviours that determine the impact a coach has on athletes include:

- facial expressions — smiling and concerned looks
- voice characteristics — change of volume
- mannerisms — forceful tone of voice
- touching — encouraging pats on the back
- relative position — up close and personal
- movement — bold hand gestures, pacing up and down.

Clever combinations of non-verbal coach behaviours are usually the domain of experienced coaches. Some coaches are highly skilled at depicting the mood of a situation and deploying the best combination of non-verbal behaviours to suit the situation and embellish a message.

Special needs

Athletes with a disability

For athletes with special needs, the facilitation of learning requires coaches to adopt specific methods to assist these athletes to cope with their particular limitations.

Special equipment and rules can assist amputees and athletes using a wheelchair. Touch, audio tapes, Braille instructions and meaningful sounds can assist athletes with vision impairments. Diagrams, video segments, manipulation and modelling can assist athletes with hearing impairment, autism, cerebral palsy and/or other neurological impairments.

Effective coaches seek out the appropriate support methods for their athletes with special needs.

CASE STUDY

Fourteen-year-old Raymond had atrophying muscles caused by a neural disorder in his spine. Raymond's prognosis was not good, and because of his increasing inactivity he became obese and his enthusiasm towards his favourite pastime, sport, waned. Raymond's parents took him to the local swimming club. The club had an indoor heated pool and a range of swimming programs from learn to swim, to high performance competition, to veterans' water aerobics.

Raymond was not a swimmer, but had always wanted to learn to swim. His coach, Elizabeth, recognised his lack of muscle tone, anxiety in the water and social maturity. It would not be appropriate to put 'floaties' on Raymond. Through Elizabeth, the swim club approached a buoyancy manufacturing company who made a special suit for Raymond. The buoyancy suit covered Raymond's torso, looked like a diver's wetsuit, provided excellent buoyancy, and in no way hindered movement. This, combined with modified activities and Elizabeth being able to discuss the program with Raymond, resulted in a highly successful relationship between the coach and athlete. Not only did Raymond lose excess weight and become a swimmer, but he also significantly delayed the progress of his muscle atrophy.

Language barriers

A combination of a multicultural society and a more mobile global population has resulted in many athletes with English as their second language. Coaching strategies for facilitating communication with these athletes include:

- Verbal instructions should use plain English and not be embellished using local slang or phrases and terminology that are unfamiliar to the athlete's dominant language.
- Use demonstrations more often and, if possible, have the English-speaking athletes demonstrate drills and techniques to those for whom English is a second or third language.
- Encourage athletes to learn to communicate in English by occasionally taking the time to communicate with them in their language, even if it is only in the form of a greeting.
- Become familiar with what motivates athletes from other cultures and develop empathy for their varying expectations.

Summary

Coaches play a vital role in helping athletes to learn. They can establish a positive environment for athletes to develop by using coaching methods and communication approaches that facilitate learning. Coaches need to ensure that they structure the training environment so that athletes can learn to think for themselves, and play a proactive role in their own development.

The skilled coach is not just a teacher, they are a facilitator of the learning process. Observation and effective feedback are important tools for the coach and play an important role in the coaching process. Coaches should also be able to mould the learning environment to suit athletes from a broad range of backgrounds and abilities. Through effective use of these skills, coaches can give athletes the best possible chance to develop and improve.

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Chapter 6:
Inclusive coaching

by Les Bee

Coaches at all levels need to be aware of their potential 'customer'. These customers can range from someone who is experiencing their first contact with a sport through to an elite athlete. They can also be from a range of ages, from the very young to mature age. To cater for all participants the coach is required to design and develop programs that meet individual needs.

This chapter is designed to assist practising coaches to ensure all participants experience quality activities. In simple terms, being inclusive in regard to participation in sport means that there are groups of people with differing levels of ability and access to sporting activities, and the role of the coach is to recognise, acknowledge and, wherever possible, adapt a coaching program to cater for all athletes.

Coaches are required to utilise a wide range of skills to provide quality experiences for all participants while also catering for individual needs. Skills encompass being able to plan, communicate and modify for a variety of population groups that might include (but not be limited to):

- Indigenous
- people with a disability
- culturally and linguistically diverse
- women.

What does it mean to be inclusive?

CASE STUDY

Bobbie is a bowls coach who is approached by Sam, a 25-year-old who has cerebral palsy and an intellectual disability. Sam is very interested in learning to play bowls but lives two kilometres away and has no means of getting to and from the club for pennant competitions. The club already has a large membership widely spread throughout the local community, and registration fees are reasonably cheap.

If you were Bobbie:
- What would your response be to this request?
- What would you need to consider?

Often the response to this type of scenario is to reject the opportunity because there appear to be too many barriers and the club does not need any more members. In this chapter there are a number of different approaches provided that a coach might use to be inclusive. Coaches can consider these approaches and use them to reflect on the scenarios and develop their own response.

Coaching has a much broader impact than just developing sport-specific skills; it is about developing the whole person (a holistic approach) not just their physical skills.

In terms of inclusion, holistic coaching requires the coach to find out more about each individual, their background (where they came from, what experiences they have had, what they can do), their family, their community, their interests and beliefs, and their customs. All these can impact on how each individual will respond to coaching. Often, individuals might use sport to become involved in the local

community, make friends, or just feel part of a group or team. There are benefits to both the individual and community, not the least of which might be an easier assimilation into that community.

Benefits of inclusive coaching to the individual and the community include:

- increasing social skills

- building self-esteem

- reducing antisocial behaviour

- developing skills, such as sport-specific, leadership and communication skills

- developing a more connected community.

How to be inclusive

Coaches can be inclusive by using the following skills and strategies:

Communication

- Develop rapport

- Use active listening

- Acknowledge differences

- Use questioning to gain a better insight into the individual's position and requirements

- Be prepared to negotiate in relation to these requirements so that the integrity of competition is maintained

- Be receptive to differing body-language approaches

Flexibility

- Adapt to meet the needs of participants without affecting the integrity of the sport/competition

- Use a flexible and responsive approach to thinking about all aspects of training and competition

Planning

- Develop individualised programs through discussion and research

- Engage individuals in the planning of their programs wherever possible (this will depend on the age and maturity of the athlete)

- Review the program regularly to ensure appropriate changes are made to future plans

Patience

- Allow time for current and new participants to adapt to any new approach

- Be receptive to different thinking and approaches

Safety

- Provide a welcoming environment that is physically safe (the welfare and health of athletes is paramount) and psychologically safe (no abuse, and it is okay for athletes to make mistakes)

- Remember, your sport may not be a familiar activity to new participants, so there is a need to outline inherent dangers and aspects of training and competition

CASE STUDY

Chris, an experienced rugby union coach, is planning to take a team of players on a pre-season training camp in the summer to prepare for their winter competition. A series of games has been arranged with local teams to fit into an extensive training program that is physically demanding.

Chris discovers that three players are Muslim and the scheduled camp coincides with Ramadan. The fast of Ramadan lasts the entire month. Muslims are not allowed to eat or drink during the daylight hours and must pray five times during the day.

The players are crucial to the team's performance and are well respected by their team-mates. The coach is concerned that lack of nutritional recovery might impact adversely on their performance and has concerns about potential health issues in relation to rehydration.

Chris arranges to discuss this with the boys' parents, with assistance from the boys in interpreting. After discussion, the parents agree that rehydration is important and decide that this will be acceptable, and Chris will organise for the players to access a quiet room close to the training facility to allow them to pray at negotiated times so that there are no clashes with important program components.

Chris also explains to the rest of the team why the boys will be missing from training at certain times and that the others need to respect this. Chris will also monitor the players' condition and response to training to ensure there are no ill effects.

This case study demonstrates **flexibility** in accommodating religious beliefs through the organisation of rooms and allowing time for prayer. **Communication** is modified as there is a need to raise issues and enter into discussion with parents, using the players as interpreters. This might also take the form of written communication.

The coach has developed a **plan** for the camp to ensure that the players do not miss any important parts of the program. By explaining the issues to the whole group and showing support for these players, the coach also plays an **advocacy** role.

Why be inclusive?

Coaches have a moral, social and legal responsibility to be inclusive.

- Moral — everybody in our society has the basic right to be treated fairly. It does not matter what age, race or gender they are, or what religious and political beliefs they hold. It does not matter if a person has a disability, is married or single — everyone has a fundamental right to be treated fairly.

- Social — everyone, not only the affluent and privileged, has access to the resources and opportunities to participate fully in the cultural and social life that is considered normal in our society.
- Legal — the Equal Opportunity Act makes it unlawful to discriminate against people on certain grounds and areas of public life (for example, religion, gender and age). This Act was established to give everyone 'a fair go' in the eyes of the law.

Referring to population groups in sport

There are a number of terms that are used to describe people from different backgrounds.

Indigenous

Australia has two Indigenous peoples — Aboriginal people and Torres Strait Islander people. Ethnically and culturally, Aboriginals and Torres Strait Islanders are two distinct peoples. Identifying as an Aboriginal or Torres Strait Islander may relate to:

- being of Aboriginal or Torres Strait Islander descent
- self-identifying as an Aboriginal or Torres Strait Islander
- being accepted as an Aboriginal or Torres Strait Islander by the community in which they live.

Culturally and linguistically diverse

This term refers to where the language spoken at home or by parent/s is a language other than English, and/or where the cultural and social customs are different from Australian cultural and social customs. This term excludes Aboriginal and Torres Strait Islander backgrounds.

People from overseas

These can be grouped in the following categories:

- migrant — someone who chooses to leave their country of their own free will
- refugee — someone who has suffered or fears suffering persecution for reasons of race, religion, social or political opinion, and as a result has fled their country
- asylum seeker — someone seeking asylum or protection in a country that is not their country of origin or nationality
- new arrival — someone who has arrived in the country in the last two years.

People with a disability

Some of the common disability groups include:

- sensory or speech
- intellectual
- physical
- psychological
- head injury, stroke or other brain damage.

In Australia we use 'person first' terminology (for example, athlete with a disability, person using a wheelchair, person with a vision impairment).

With all of the groups just listed, it is important to remember that there can be crossover between these groups of people (for example, culturally and linguistically diverse people with a disability).

Issues and strategies explored throughout this chapter are also relevant to low socioeconomic groups who may also be targeted as potential participants in sport.

Barriers to inclusion

Access barriers may take the form of:

- transport — perhaps due to location or cost of travel (for example, Indigenous groups may have difficulty travelling to and from training and games)
- time — activities are scheduled at times when potential participants cannot attend (for example, sole/primary carers may not be able to participate in the evenings due to lack of childcare options; religious events may prevent participation in regular competition)
- facility — the facilities might not be accessible to wheelchairs, prams/pushers/strollers, etc.
- cost — registration or equipment might be too expensive (for example, new arrivals may not have the current finances for full registration fees or be unable to afford expensive equipment required to participate).

Attitude barriers may take the form of:

- rules — inflexible regulations (for example, dress codes may have an impact on culturally and linguistically diverse women, or women with poor self-image or low self-esteem)

- exclusion — current participant attitudes (for example, we do not need or want these people because we are happy with the current arrangements and do not want to change)
- individual exclusion — individuals may exclude themselves on the basis that they do not know how to play a sport and perceive that they will not be accepted or well received
- stereotyping — where people are identified with one trait (usually a negative one) and this can establish expectations that are unfounded.

With all groups there is a need to consider a wide range of participation opportunities through flexible competition structures. Some groups will integrate fully into the current competition or with some slight modifications. However, there may also be a need for either a transition stage or, in some cases, a permanent competition structure for specific groups.

Some examples of this approach include:

- individual/s participate in a community competition (for example, a group of new arrivals register with a local club to participate in a basketball competition)
- individual/s participate in a community competition with slight rule/equipment adjustments and/or considerations (for example, a sailing club might allow some adapted equipment in a sailing class to include people with a disability; a netball competition may allow Muslim women to wear tracksuit pants to play)
- individual/s participate in an event/competition for a specific population group (for example, a swimming club organises an event specifically for Muslim women)
- individual/s participate in an open competition and their results are judged against their specific category group (for example, a marathon integrates a wheelchair race into the event).

There is a wide range of flexible options to be considered when organising inclusive events/ competitions to cater for everyone in the community.

CASE STUDY

Robin, a softball coach, is approached by a young girl who is one of a number of new arrivals to Australia who has recently moved into the suburb, and she asks to have a try at the sport. Robin sees the opportunity to recruit more players from this group and perhaps strengthen the club and establish another team to play in the competition. The girl attends training and, while unfamiliar with the rules and tactics, shows a good aptitude for the game.

On match day, the girl arrives wearing baggy tracksuit pants and when asked to change out of them and into a softball uniform, is very reluctant and chooses not to play. Robin has a discussion with the girl and her parents to identify what their concerns are and what can be done to accommodate both this girl and any other potential players. The parents are supportive of their daughter participating and explain that previous experiences in her country of birth are the cause of a body image issue and therefore her reluctance to remove her tracksuit pants.

Robin realises that there is a need to be more flexible if she wants to encourage more new players into the team. She has discussions with both the club and team members about the value of including new players. Robin chats to the new girl after the next training session and encourages her to invite her friends along next week. They decide that the best option would be to organise a fun social activity as an introduction to the team, where uniform and rules would be modified to introduce them to the basics of softball. Robin also arranges a meeting with her softball association to discuss a relaxation of uniform regulations to encourage more new arrivals to register.

Here Robin demonstrates her **flexibility** by allowing a change to dress regulations. She **negotiates** with the participants, their parents and team members. Robin also plays an **advocacy** role for change within the club and the association.

When organising team-building or sporting activities, coaches need to be aware that some current activities may not be appropriate with different groups. For example, activities where close physical contact is required may be threatening to some initially. This is where the coach needs to discuss this with players prior to the event.

CASE STUDY

Eric is a football coach and has a very talented Indigenous athlete, Joanne, in his squad. He asks Joanne to demonstrate a particular skill during one session and she is reluctant to do the demonstration. Eric decides to discuss this poor attitude with her after training. In discussions with Joanne, she indicates she is embarrassed to demonstrate in front of her peers and would prefer others to take on this role. She explains that in her culture a person can feel shame in being singled out, even when the intention is for a positive purpose. A sense of community and family is strong in Indigenous communities and there is a holistic approach to achievement. Eric recognises her reluctance and discusses with her that as a talented player, others will want to copy her skills and she may also benefit from observing others' demonstrations.

In the example above, Eric **observes** Joanne's body language and quickly recognises there is a problem that he needs to discuss with her in private. After carefully **listening** to Joanne and acknowledging and showing **empathy** for her position, he demonstrates a **patient** approach in allowing Joanne to further consider how she might overcome this barrier.

CASE STUDY

Ali is a football coach who has targeted new arrivals from Sudan to join his club. A group of about eight young men have been attending training sessions and games over the past few weeks. His current players have complained about a number of issues and feel the newcomers are getting special treatment.

The new players enjoy themselves at training, but are consistently late to sessions. They all arrive and leave together and often take a long time by themselves in the meeting room preparing before coming out to play, appearing to lack the required levels of commitment to which the current players are accustomed. The new players also claim that they are unable to afford registration fees, but dress in the latest fashion gear, carry expensive mobile phones and a couple even drive 'flashy' cars.

Ali discusses this with the new players and realises that they have focused on some of these luxury items because of their desire to fit into the local community. They discuss how this is perceived by the current players and they agree to negotiate a flexible registration fee payment and perhaps seek some funding to start the process.

They also discuss the issue of their late arrival and its effect on team cohesion, and building on their desire to fit into the community, discuss how this might occur within the team environment. Ali organises a team-building activity and has planned with one of the new players who has displayed leadership skills to conduct an activity familiar to the Sudanese that will contribute to the session.

In the example above, Ali **acknowledges** the different perceptions of all of his players and uses his **negotiation** skills to **plan** for a more cohesive team approach. He recognises the need for both groups to work together and **facilitates** this by organising the team-building activity.

CASE STUDY

Sara is a lacrosse coach who is trying to recruit more women for the local team, as numbers are declining. She has been successful in identifying a group of women who are interested in playing to keep fit. However, they raise concerns about the time of the games, as a number of them need child-minding support and they also say they would prefer to wear tracksuits to keep warm as the games are in the late afternoon. The other clubs in the competition are reluctant to change playing times, as the current arrangements have been in place for a while.

Sara discusses this with the group and they investigate the opportunity of establishing a simple roster to look after one another's children at the club. The ratio of children to adults is within the required numbers so they arrange their roster and commence playing. There is no issue with the uniform as the competition is already quite flexible in their approach. Sara investigates the possibility of seeking funding to support the women in buying resources for the child-minding activities.

In the example above, Sara recognises the issue of the women and **facilitates** a flexible approach to including them in the competition. She is receptive to their needs and **researches** options for them to gain funding, thus providing a welcoming and responsive environment for these new players.

CASE STUDY

Carla is a badminton coach and is taking on a coaching role with Rob, a player who uses a wheelchair. He has developed some basic skills and is keen to develop further so that he can play in the evening social competition, but is concerned about his movement around the court.

Carla and Rob develop a program that focuses on training games with a short, wide court on his side of the net allowing for his continual movement rather than stop–start, and a full court on his opponent's side of the net. Carla observes the game and sees that he is coping well with his movement, but his shot placement is poor. She provides some challenges for Rob by establishing areas where he can score double points if he lands the shuttlecock. After training, they discuss Rob's progress and he feels he can increase the size of the court on his side next training session while still retaining the double points areas to encourage better placement of his shots.

Through discussion, Carla demonstrates a **flexible** coaching approach by modifying the area Rob has to work in to meet his needs and setting challenges for him to be more precise with shot placement. They develop, review and progress the **plan** together based on Rob's feedback after the session. Carla will organise varying levels of opponents at training and Rob will decide when he feels ready to join the social competition.

Classification

Classification in disability sport is similar, in principle, to classifying age-level competitors, single-gender competitions and weight-classified competitions. Classification aims to place athletes into classes so that they compete against people who have impairments that have a similar impact on sports performance. In this way, classification provides the framework for competition and the class to which each athlete is assigned is their fundamental point of reference.

People with a disability who compete in sport but do not have a class have difficulty evaluating or extracting meaning from their performances. For example, without a class, a ten-year-old schoolgirl with cerebral palsy who throws the shot-put 4.5 metres at her school carnival cannot know whether her performance is outstanding or average and whether her prospects for participation at an interschool or zone carnival are good or poor. Without this knowledge, which is taken for granted by all people without a disability, the motivation to set goals, train and participate is greatly reduced.

This only applies to athletes wishing to compete in events for athletes with a disability. Not all athletes need to be classified if they choose to compete in mainstream competitions. A comparable example might be that a boxer who is classified in a weight range can compete against boxers of heavier weight range if they choose to.

Coaches, therefore, need to be aware of the implications of classification in their own sport to ensure athletes are placed on the correct pathway and enter into relevant and appropriate competitions.

CASE STUDY

Alex is a basketball coach and has taken on a new coaching role with a wheelchair basketball team. Sandy is a newly registered player with the team and has recently been playing tennis.

Sandy's mobility is good but her shooting is inconsistent, and after some traditional shooting coaching her performance does not improve. After spending some time observing her technique, Alex enters into a discussion with Sandy about some possible options for shooting and what feels most appropriate for her. Together they recognise that a two-handed shooting style might be more appropriate for her level of function. They develop a training plan and Sandy spends time practising this new technique.

Sandy's shooting improves and her feedback is that she feels she has more control over the shot due to a more stable base for throwing. Alex then further develops the training plan with Sandy to include a greater and more challenging range of shooting practices that will stand Sandy in good stead for the upcoming competition.

Through Alex's **communication** and **questioning**, both he and Sandy develop an approach that with **patience** will change and improve her technique. This requires a very **flexible** approach to Alex's coaching as he **adapts** his approach of current technique to a new approach based on the player's input. Alex and Sandy establish a **plan** together and are prepared to spend some time practising and developing this new approach.

CASE STUDY — BACK TO BOBBIE

At the start of this chapter, a case study about Bobbie the bowls coach and Sam, a 25-year-old with cerebral palsy and an intellectual disability, was introduced. A coach, having worked their way through this chapter, should now be equipped to answer the questions posed in that case study.

Some of the things a coach should have considered include:

- their moral, social and legal responsibilities
- discussing with Sam what he is able to do
- conducting an individual session to assess his ability
- identifying if anyone in the club can provide transport for Sam (for example, pick up/drop off)
- planning a program for Sam that includes clear guidelines for continued development
- considering the use of modified equipment if necessary (for example, a bowler's arm)
- discussing any concerns with club administrators regarding uniform/equipment requirements and perhaps the response of current members
- safety — initial introduction to sport and its inherent dangers (for example, driving)
- behaviour in relation to bowls etiquette
- approach — patience, flexibility, advocacy.

Summary

Coaches have social, moral and legal responsibilities. They need to provide inclusive opportunities and adapt to meet the needs and requirements of **all** participants.

Coaches should provide a safe and supportive environment for their athletes and be role models and advocates for inclusion through using a variety of skills that might include:

- communication — developing rapport, being supportive and empathic, involving individuals in planning and decision-making, questioning, actively listening, acknowledging and responding to differences/concerns, advocating inclusion to others
- planning — individualising programs, undertaking research, questioning, engaging individuals in program planning, evaluating
- flexibility — adapting to meet individual needs without affecting the integrity of the team, the sport and its competition
- safety — ensuring the physical and psychological wellbeing of all athletes
- patience — recognising that inclusion may take time for both current and new participants.

References and further reading

Australian Sports Commission 2005, *What is Disability Sport?* CD-ROM, Australian Sports Commission, Canberra.

Australian Sports Commission website (www.ausport.gov.au).

Centre for Multicultural Youth Issues website (www.cmyi.net.au/MulticulturalSport/ MulticulturalSportHome).

Chapter 7:
Skill acquisition

by Damian Farrow

One of the most alluring aspects of watching the best sportspeople in action is that they make the skills of their sport look easy — almost within reach. On occasions, the ease of the elite is enough motivation for the rest of us to get out on the court and give it a go. 'Geez, if the Australian netball shooter can average about 90 per cent shooting accuracy, I must be able to average at least 70 per cent!' Within minutes of making a few awkward shots at the local school courts the reality sets in, 'This is harder than it looked on telly. There is so much to think about. How did she hold the ball again? How do I shoot it over the defender's arm?' Skilful performance is about developing a sound technical action and then being able to apply it under the pressure of competition.

This chapter is divided in three sections:

- examination of what elements are required to make a skilled movement
- discussion of some of the key characteristics in developing a coaching approach to assist in skill learning
- the core principles of designing a successful practice environment.

Elements of a skilled sports movement

Perception and decision-making

Perception is the process of an athlete determining what is occurring both in relation to their environment (for example, 'Where are my opponents and team-mates?'), and what is happening in their own body (for example, 'How puffed am I?', or 'Where is my left arm relative to my right?').

Decision-making is closely linked to perception and is about using the information gathered from perception to determine what, if any, response is required. For example, an athlete may have noticed that there were two team-mates in front of goal and only one opposition player. Decision-making is then used to select the next course of action; in this case, deciding to pass the ball to one of the two free team-mates while they out-number the opposition. While the two processes are different, it is useful to consider them together when looking at the implications for coaching.

In order to develop perceptual skills, it is important for the coach to understand what parts of perception are vital to improved sports performance and what elements are not so important.

Sports or situations where an athlete has little time to respond and react provide an excellent example of the value of perception. For example, interceptive skills such as cricket batting or defending a penalty kick in football all require athletes to initiate their response under severe time stress and initiate their movement before the ball has been hit or kicked. This is called anticipation, or the capability to start their response to an opponent's action in advance.

In team sports, perceptual skill is shown by an athlete's ability to 'read the play'. In skill acquisition terminology this ability is called 'pattern recognition'. Watching a team sport such as netball is a good example of watching a continuously changing pattern. While the pattern may look meaningless to the untrained eye, that is, 14 athletes sprinting and dodging in all directions, to an expert player (or coach) it can all look completely logical and allows them to predict in advance where the ball is about to be passed and helps with decision-making. This ability to recognise an opposition team's attacking or defensive patterns is not because the elite athletes have a bigger memory capacity than less-skilled athletes. Rather, their memory of sport-specific attack and defence strategies is simply more detailed and can be recalled and used in a split second.

CASE STUDY

Madeline coaches an under-17 state netball team. She is keen to do some testing of the players' pattern recall ability, as some of the players in the team often make poor choices about who to pass the ball to. Madeline videotapes a national netball league game, which was broadcast on television, to show to the players. She also prints up some blank netball courts on pieces of paper for the players to use. Madeline plays back approximately ten seconds of play and then quickly stops the tape and asks the players to try and recall where each player was positioned at the instant the tape was stopped, by marking the position of each player on the blank netball courts. The team in possession of the ball was indicated with an 'O' and their opposition with an 'X'. To check the players' accuracy, she then replayed the video sequence, but this time paused the tape and asked the players to check if it matched their drawing. Madeline did this activity initially with a variety of set piece situations that occur in a netball match, such as a centre pass, or throw in from the defence end to the centre. She was aware that research has found national-level athletes can recall approximately 70 per cent of all the athletes seen. She found that there were some players who were unable to identify even 50 per cent of the players in the picture. This assisted her in developing some game-based training activities to try and work on the players' perceptual skills.

Training perceptual and decision-making skill

Coaches should start by developing a check list of any key movement pattern information sources that may help predict what an opponent is likely to do in their sport. For example, rugby union coaches often cite the importance of watching an opponent's hip movement when preparing to tackle them. Most importantly, athletes should be coached to understand the relationship between the various movement pattern characteristics and the likely resultant player movement or ball direction. The use of video footage shot from the player's perspective (for example, a tennis serve filmed from the perspective of the receiver) which is then paused at various points before contact, is a useful means of training an athlete's understanding of movement patterns.

Another good information source is probability information such as an opponent's favourite kicking side, dodging direction or service location. This source of anticipatory information is vital at the elite level and requires close examination of an opponent's behaviour in different situations in order to identify particular idiosyncrasies or tactics used for disguise. Video review of particular opponents is the most common means of sourcing this type of information.

From a team-sport perspective, while there will always be players who are more naturally talented than others, coaches can still improve an athlete's ability to read the play and make better decisions. The most important method is by using practice activities or drills that require athletes to continually make the decisions they will be required to make during competition. Too often coaches try to control practice by using drills that force the athletes to complete pre-programmed movements around a series of cones, with little or no decision-making required by the player. The more game situations that athletes get to experience, the more accustomed they will become to specific attacking and defensive strategies, and they will develop an understanding of where they should move to receive the ball or to whom they should pass the ball. This is why a game sense coaching approach is so valuable.

CASE STUDY

Danny is the coach of a developmental Australian football program in a regional area that has a high Indigenous population. His club has strong links with one of the major AFL clubs, which has recruited a number of young Indigenous players from his program. While Indigenous people make up only 2 per cent of the general population, they represent over 7 per cent of the athletes competing in the AFL competition. More impressive is that the 7 per cent within the AFL are generally considered part of the competition's elite athletes.

Danny is aware that there are a number of factors that contribute to this phenomenon, such as the Indigenous player's physiological qualities being ideally suited to the game. However, he has consulted with a number of experts regarding some of the skill acquisition reasons behind this. Research has found that the best decision-makers in Australian football generally share similar developmental backgrounds. In addition to playing Australian football, these athletes all played a significant number of other 'invasion' games such as basketball, football and rugby union. They also spent significantly more time playing unstructured invasion games or, put simply, neighbourhood or backyard games/scratch matches such as '2 on 2' basketball or touch football. These types of activities develop the perceptual and decision-making skills of these athletes, allowing them to 'get a jump' on others who invest less time in such activities, but still end up making it to the elite Australian football competition, most likely because of their physical capacities.

As a result of this information, Danny ensures that his coaching program for young players (both Indigenous and others) includes a wide variety of game-based activities, and also includes activities from other sports. For example, he uses a touch football game as part of the warm-up, and a netball activity as part of his training session.

Action: skilled movement

The most obvious element to spectators watching sport are the movements of the athletes. Producing a skilled sports action consists of a complex mix of muscle control and timing. When comparing highly skilled athletes to lesser-skilled athletes, a number of movement qualities become apparent. In particular:

- in sports where speed is important, the highly skilled are faster
- in sports where movement timing is important, the highly skilled have more consistent movement times
- in sports where reproducing the same skill repeatedly is critical to success (such as in golf or gymnastics), the highly skilled have greater consistency in both their movement and the timing of these movements
- skilled athletes' efficiency of movement (movement economy) is superior to the lesser skilled. In other words, the skilled athlete can achieve the same outcome with less energy expenditure than their unskilled counterparts
- as the basic skills of a sport become automatic to the highly skilled athlete, they are more capable of not only performing the basic skill (for example, dribbling the basketball) but can also give their attention to other aspects of the skill (for example, looking for a team-mate to pass the ball to).

Sometimes it is difficult for a coach to know how automatic an athlete's skills have become. It is valuable to have this information, as it can assist the coach to decide when to progress the difficulty of a drill or game. The more highly skilled an athlete becomes, the more likely it is that they can perform the basic skills of the game automatically and also complete a secondary task simultaneously. Based on this, coaches can make a quick assessment of an athlete's skill by using an activity that requires more than one task to be completed. For example, the coach may set up a course through which the player can dribble the ball as quickly as possible. At the same time the coach will flash up a series of coloured cards at the end of the course and ask the player to call out the colour of the card when presented. The more-skilled athletes will be able to maintain their dribbling speed and control while accurately identifying the colour of the cards flashed before them. Lesser-skilled athletes will have to compromise on one or both of these tasks.

Developing a coaching approach

Catering to the individual: using learning styles for communicating with athletes

In a coaching setting athletes generally gather information either visually, aurally, through reading/writing or feeling/doing, or a combination of all of these methods. Identification of an athlete's learning style allows a coach to understand their preferred way of gathering, organising and thinking about the information given to them. Each athlete has a different learning style that, if catered to, allows them to absorb information to their full potential and maximise learning. An athlete's learning style can be identified either simply, through questioning and observation of how the athlete tends to learn during training, or through a formal questionnaire that can be administered (for example, see the learning style questionnaire at www.vark-learn.com/english/index.asp). The following table contains a summary of the key characteristics of each learning style as defined in the VARK learning style approach. This is only one of many methods of defining a person's learning style. Irrespective of which approach a coach adopts, the aim is to try and cater more specifically to their athletes' learning needs.

Table 7.1: VARK learning styles

Visual learners	**Auditory learners**
Prefer information presented visually (Note: images that contain movement, such as video, are not part of the visual learning style)	Prefer information presented aurally, which is either through listening to others, or talking themselves. Interestingly, this would often be a coach's most dominant method of communicating with their athletes
High visual learners — prefer information presented through graphs, charts, mind maps/flow charts and images, and also through changes in colour, font style, font size, highlights and boldness	*High auditory learners* — like discussion groups, questions for coaches or other athletes, audio recordings to listen over key points, and also cue words they can say in competition
Low visual learners — find it difficult to get meaning from images or symbols (for example, whiteboarding of team patterns)	*Low auditory learners* — do not rely on what the coach says. They often forget important topics raised in team discussions, and miss highlighted points and lose concentration in long meetings
Read/write learners	**Kinesthetic learners**
Prefer information presented through written words	Prefer information presented within action and movement
High read/write learners — learn best through lists, headings, written cue words/phrases, others writing on same sport topic (that is, biographies)	*High kinesthetic learners* — learn best through demonstration through movement, doing the activity, hands on, learning by experiencing, video feedback and visualisation
Low read/write learners — do not use lists or place any emphasis on words. They lose or forget to bring any given sheets/papers to training or meetings and are reluctant to use training diaries	*Low kinesthetic learners* — distrust things learnt from experience and find that trial and error is not scientific enough

Many athletes do not have one learning style preference, but possess a combination of preferred styles. In these cases, a coach needs to provide the key information in more than one method before the athlete is likely to 'get it'.

Explicit and implicit learning approaches

How to convey technical information to an athlete most effectively is a major issue faced by coaches. While catering to the athletes' individual learning styles is one method for addressing this issue, another way is to consider the overall learning approach to take with the athletes. Traditionally, the use of instruction in conjunction with a demonstration has been a coach's main approach. However, a growing amount of research investigating instructional techniques suggests that the use of technical instruction in many cases may be unnecessary, and in some instances lead to poorer performance.

Explicit learning refers to traditional coaching approaches where verbal instruction is used to coach a learner about how to perform a skill. This process usually results in the learner evaluating each practice attempt. For example, 'I hit the ball in the air, I'd better adjust my grip' and so on. As a result the player is able to verbalise how to perform the skill — although it does not guarantee they can physically execute that skill.

In contrast, **implicit learning** methods contain little or no formal instruction about the skill mechanics, yet result in a learner being able to perform the skill despite being unable to verbally describe how they do it.

Interestingly, research has demonstrated that learners coached using an implicit learning approach learn equally as well as those instructed more traditionally. However, a number of additional advantages have been found for implicit learners, including being less susceptible to their skill breaking down in stressful situations, commonly referred to as 'choking'. Explicit learners are more likely to think too much about how they are executing the skill, which can be detrimental to performance and generally leads to 'paralysis by analysis'. Implicit learners who do not have any technical information to refer back to are not restricted by over-analytical thoughts. Interestingly, this is a characteristic possessed by elite athletes when 'in the zone' or playing at their best.

There are a number of implicit learning methods that can be used during practice. The aim of implicit practice is to develop activities that minimise or stop the learner from thinking too much about what they did or did not do correctly when performing the skill. Following are some approaches that have been developed that meet this aim:

- Explain the skill requirements by analogy or metaphor — this means that the need for explicit verbal information is minimised. Cricket coaching is littered with good examples of analogy learning. For example, asking athletes to shape their arms and bat to form the number '9' overcomes the need for a number of individual instructions when coaching the basic batting set-up position.

- Perform a secondary task while performing a primary skill — giving attention to a secondary task reduces the opportunity for learners to think too much about the primary task and over-think about how the skill is performed. For example, counting backwards in threes from 100 aloud while dribbling a hockey ball.

- Utilise errorless learning conditions — creating an environment where the learner is always successful prevents over-analytical behaviour because no errors are made (for example, goal-kicking in football from a distance and angle that always guarantees that the player will kick the goal). This approach may not suit every situation, but could be particularly useful for an athlete in a slump.

What goes through an athlete's mind as they prepare to execute a skill that has been practised many times before? When standing with the ball in hand, 40 metres out directly in front of goal, what does an Australian footballer think about — perhaps how they should swing their leg back to generate the required power, or perhaps they focus on the outcome of the kick?

Of interest to coaches is whether goal-kicking success rates are related to what athletes focus their attention on as they execute the kick. A flurry of sports science research over the last decade has tried to address this issue by examining what the optimal strategy is for focusing an athlete's attention as they practise and perform the skills of their sport.

Essentially, two types of attentional focus have been examined. An **internal focus** of attention occurs if the player's attention is directed to their body movements, such as focusing on guiding the ball onto the boot when kicking. Attention directed to the effect of the movement, such as the flight of the football, is called an **external focus**. Learning and subsequent performance of a skill is generally found to be superior if the player has adopted an external focus of attention. The logic behind using an external focus of attention approach relates to the old coaching chestnut 'paralysis by analysis'. Due to the amount of practice an elite athlete has devoted to their skills, they generally can perform the skill automatically without conscious effort. To use an internal focus of attention that forces the player to focus directly on the movement disrupts their normal unconscious skill processing. A similar explanation has been proposed as a reason for athletes choking under pressure — conscious thought about a movement turns the muscle memory of an elite performer into that of a novice.

Interestingly, when an athlete is kicking poorly, coaches generally try to improve performance through technical instruction, usually internal in focus. To convince athletes and coaches to make a change to an external focus of attention requires examples from other successful athletes, and the strongest support for such an approach is the performances of a famous English rugby union goal-kicker.

When the player was having problems with his kicking, it was decided to forget about technique (internal focus) and focus on 'Doris'. Basically, every time he prepared to kick, he externally focused his attention on an imaginary woman called Doris sitting in the stands behind the goalposts. Initially his focus was to hit her, and then as his skill level increased, he narrowed his target to kicking a newspaper out of her hands, and then a soft drink can. The results of this technique were significant.

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Teaching and learning sports skills

When designing a learning environment for the practise of skills there are a number of important features that need to be considered by the coach. Following are some of the more vital characteristics.

Learning and performance

One of the most critical distinctions a coach can make is whether the focus of practice is on performance or learning. Performance is a skill execution at a particular moment in time. It is highly variable and sensitive to other conditions (for example, fatigue, environmental conditions, instructions). In contrast, learning is a permanent improvement in skill that is achieved as a result of practice. It is not necessarily a change in performance, rather an improved capability to perform a skill. Coaches need to understand that certain practice approaches and instructions only have an impact on performance (short-term improvement that is not retained) whereas other approaches are more likely to lead to longer-term skill learning. While both performance and learning approaches have their place in coaching, it is important that the coach understands which one will be developed in a particular practice drill.

Practice volume

There is a strong link between the time spent practising a skill and improvement in the performance of that skill. Research into the effects of prolonged practice and the rate of learning typically show that rapid skill improvements are made during the initial periods of practice, and further improvement requires the athlete to invest in progressively more hours to accrue progressively smaller improvements. Put simply, we cannot practise our skills enough and generally the availability of time, and factors such as fatigue, reduce practice volume. Consequently it is important for coaches to structure practice volume so that athletes get maximum value for each repetition.

Practice variability and specificity

One way to organise practice is through the use of a random or blocked practice approach. Random practice involves changing between two or more skills or skill variations. For example, netball practice might involve an athlete completing a chest pass then a shot at goal, another chest pass and shot between goal, and so on. Neither the chest pass nor the shot at goal is practised repeatedly by itself.

Alternatively, blocked practice involves practising one skill continuously for a set of practice attempts before practising another skill. For example, 50 practice shots at goal are completed before performing any chest passes. Research has found that, compared to random practice, blocked practice leads to better performance of the skills in the short term. This would seem logical due to athletes being able to get into the 'groove' of a given skill during the practice session. However, when the skills are examined over the longer term and in the game setting (the ultimate test), random practice produces improved retention or learning of the skills practised.

So why does random practice cause poorer practice performance but lead to more effective game performance than blocked practice? It has been suggested that changing between two or more skills (for example, chest pass and shooting) results in the learner having to forget one skill to perform the other. Therefore when you attempt to perform the skill for a second time athletes have to try to remember what they did the first time and so on. Random practice requires greater mental effort on the part of the learner than blocked practice, whereby you repeatedly practise the same skill, not necessarily having to remember what you did previously. The key point is that the learner must not be allowed to go into 'auto-pilot mode' while learning a skill. As a famous football coach once said, 'I like my athletes to bring their brain to training'.

While random practice creates better learning than blocked practice, there are some exceptions. The skill level and experience of a learner has a major impact on the success of random or blocked practice. Beginners who have little or no experience in the skill to be practised initially benefit more from blocked practice than random practice, as they need the opportunity to get an idea of the movement and establish a basic movement pattern. This is logical if we consider the amount of mental effort a beginner uses when first learning a new skill. To increase that effort by introducing the learning of two new skills at the same time, as in random practice, would only cause an overload on a beginner's limited attention capacity. However, once the basics are mastered an athlete should attempt to practise more than one skill in a session so that mental effort is increased. Therefore intermediate and advanced-level athletes can benefit more from random practice than blocked practice.

It is also important to consider the type of skills being practised when using blocked or random practice. Open skills are performed in an unpredictable situation generally under time-stress from an opponent, whereas closed skills are performed in a stable and predictable environment with no time-stress from opponents (taking a shot at goal with defenders removed). When using a random practice approach with open skills, it should be remembered that performing an open skill is more complex than executing a closed skill due to the additional demands imposed on an athlete, such as decision-making and time-stress. Therefore, random practice may need to be introduced at a later stage of development for open skills compared with closed skills, as the learner will already be experiencing a high degree of mental effort.

It should also be remembered that team sports are made up of a collection of skills that are used in all manner of combinations. When thought of in this manner it is easy to see that random practice more closely resembles playing the actual game than blocked practice. Equally important is that the benefits of variability apply to closed skill activities such as gymnastics. While the athlete may wish to reproduce the same movement each time, there are always variations that need to be handled. As such, designing training activities that develop the athlete's capability to handle such variation is best achieved through random practice.

CASE STUDY

Lara is a tennis coach who works with several talented young players. One of the players that she coaches, Claire, is a skilled technical player, with a powerful serve and a lethal backhand. However, she has poor anticipation skills, which seem to stem from her inability to 'read' her opponent's movements. This is a particular problem when she is returning serve, as she is often unable to pick where the ball is going early enough to anticipate where best to move to receive it.

Lara decides to use several new practice activities to assist Claire in developing better anticipation skills. She focuses on game-based activities, including returning of serve and when to move to the net to volley, where Claire is forced to anticipate. By exposing Claire to these activities, which mimic a match situation, Lara sees an improvement in Claire's anticipation skills.

Practice strategies to simplify complex skills

A common challenge faced by coaches when designing practice is to make the activity achievable for all participant skill levels. This challenge can be particularly difficult when the complexity and organisation of the skills to be practised are considered.

Complexity relates to the number of components that make up a skill and its information processing demands. Skills such as a tennis serve, which has a large number of components and demands a large amount of attention, is a high complexity skill. In contrast, completing a bench press in the weights room is lower in complexity.

Organisation refers to how closely linked the temporal and spatial components of a skill are. Again using the tennis serve as an example, the link between the ball toss and subsequent racquet swing to contact are highly organised, whereas learning a variety of movements for a dance or aerobics routine may be less organised.

Following are some guidelines to assist coaches when deciding on how to simplify the presentation of a new skill to assist a learner.

- If a skill is low in complexity and high in organisation, practice of the whole skill is recommended.
- If the skill is high in complexity and low in organisation, breaking the skill into components or parts is appropriate. It is important to note that the parts of the skill should be put back into the whole as quickly as possible.

- Unfortunately many skills fall between the previous two general rules and require greater analysis of a skill's demands. In such cases it is preferable to refrain from breaking a skill into components if at all possible. Reducing a skill's difficulty through simplification can be of value. For example:

  - slowing down skill execution — many coaches get their athletes to slow down their execution of the skill in order to gain more control. Such an approach is appropriate as long as the action is not slowed so much that the dynamics of the skill are completely changed. It must be remembered that reflexes play an important role in skill execution and are not recruited correctly if the skill is practised too slowly

  - reducing the difficulty of the objects used to complete the skill — for example, using decompressed tennis balls for younger tennis athletes slows down the ball's flight and bounce height, making the task of preparing a return stroke a little easier than it would have otherwise been

  - reducing the attention demands of the skill without changing the actual goal — these approaches are successful because they reduce a skill's complexity. For example, teaching a learner how to bowl a cricket ball may require the coach to start with no run-up component within the delivery action.

Summary

Developing a coaching approach that allows athletes to apply their skills successfully in a competition setting requires an understanding of a variety of skill acquisition principles. This chapter was designed to increase coaches' understanding of the perception, decision-making and action elements required to make a skilled movement. Some of the key characteristics in developing a coaching approach to assist athletes in skill learning were discussed, with particular attention paid to the use of learning styles and a more implicit approach to conveying information to athletes. These communication strategies, used in conjunction with the core principles of practice, provide coaches with guidelines for developing a successful practice environment.

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Chapter 8:
Introduction to physiology

by Wayne Goldsmith

The study of the human body's structures, systems, tissues and cells is called physiology. The application and understanding of how the human body responds and adapts to exercise or sport is known as sports physiology.

Success in sport relies on the optimal development of the physical, mental, technical and tactical elements of performance. At the core of every performance is the physiological or physical preparation of the athlete.

Coaches are always looking for a performance edge through a new idea or innovative technique that might provide their athletes with an advantage over their opponents. Sports science is not a magic trick and there are no short cuts to the top. The methods and techniques of sports science are tools, and like the tools of any trade their effectiveness lies in the skills and knowledge of the user. The information contained in this chapter offers the coach simple but effective tools so they can systematically plan, implement, monitor and modify training programs for their athletes and so achieve their sporting goals.

Energy systems in sport

The human body is a complex machine comprising the following systems and structures working together to sustain life:

- cardiovascular system (the heart and blood vessels) — delivers blood carrying oxygen and vital nutrients to working muscles and tissues

- endocrine system (tissues and glands that secrete hormones) — sends chemical signals around the body that affect specific organs, tissues and cells

- musculoskeletal system (muscles, joints, ligaments, tendons and bones) — produces movement and structural stability for the body

- nervous system (brain and nerves) — regulates, integrates, stimulates and monitors internal and external information.

The energy to power sporting movements comes from a range of complex biochemical processes and chemical reactions occurring in different tissues and cells around the body.

Aerobic energy system

Some of these reactions occur using oxygen and these are known as aerobic (think AIR-obic). Characteristics of aerobic activities include:

• low intensity, around 65–75 per cent of maximum intensity

• long duration, either continuous or with limited rest periods

• usually programmed early in the season.

The aerobic system is used in sports that require a sustained and enduring expenditure of energy. Training activities that improve cardiovascular efficiency and aerobic energy production are called aerobic training. Jogging, cross country skiing, road cycling and long-distance swimming are all examples of aerobic training.

The body adapts to aerobic training by improving:

• the ability of cells to use oxygen

• the capacity of the blood vessels to deliver oxygen to working muscles

• oxygen transport mechanisms.

Anaerobic energy system

Other reactions and processes in the body are able to produce energy quickly in response to a need for speed, power or explosiveness, and this is known as anaerobic (think a-NO-AIR-obic). The anaerobic system has two components:

• the lactic acid system

• the alactic (meaning without lactic acid) system, also known as the phosphate system.

Anaerobic activities are typically high intensity and short duration. Anaerobic training activities are those that improve the functioning of anaerobic energy-producing systems and physical abilities such as power and strength, including:

• lactic anaerobic activities — those of sustained high intensity, such as the 400-metre run on the track and the 100-metre swim in the pool

• alactic anaerobic activities — those that are explosive, of short duration and high intensity, such as a single lift in a power lift or a high jump.

Alactic training is often used in the development of the neural system, also known as the nervous system, which is best stimulated in an environment without fatigue or significant lactic acid being present.

Systems working together: total energy demands and total energy production

It is a common misunderstanding that the body's energy-producing systems are separate systems operating independently of each other. In reality, both the aerobic and anaerobic systems work to produce energy in all sporting activities. It is the relative contribution of each system that changes with the intensity and duration of the activity.

Alactic anaerobic system

In a 100-metre sprint on the track, for example, the dominant energy supply comes from the alactic anaerobic system, which produces energy quickly and can use energy already present in the muscle cells. Other energy systems continue to operate; however, their relative contribution to total energy production is small, as shown below.

100m sprint = ALACTIC ANAEROBIC LACTIC ANAEROBIC AEROBIC

Lactic anaerobic system

In a sustained high intensity activity such as a 400-metre run on the track lasting 40 seconds or more and at near maximum intensity, the body relies more on energy production from the lactic anaerobic system and the relative contribution of the other systems is smaller, as shown below.

400m run = ALACTIC ANAEROBIC LACTIC ANAEROBIC

Aerobic system

In longer events such as distance running or long-distance cycling, where energy demands are lower but need to be sustained for longer, the aerobic system is the dominant energy-production system as shown below.

Distance events = ALACTIC ANAEROBIC LACTIC ANAEROBIC AEROBIC

Team sports

In team sports, the relative contribution of the energy-producing systems will vary over the course of the game, depending on position, tactics, strategies and game activity.

Figure 8.1: Energy systems

Energy systems

Total energy demand

Anaerobic (oxygen independent)   Aerobic (oxygen dependent)

(Alactic)   (Lactic)
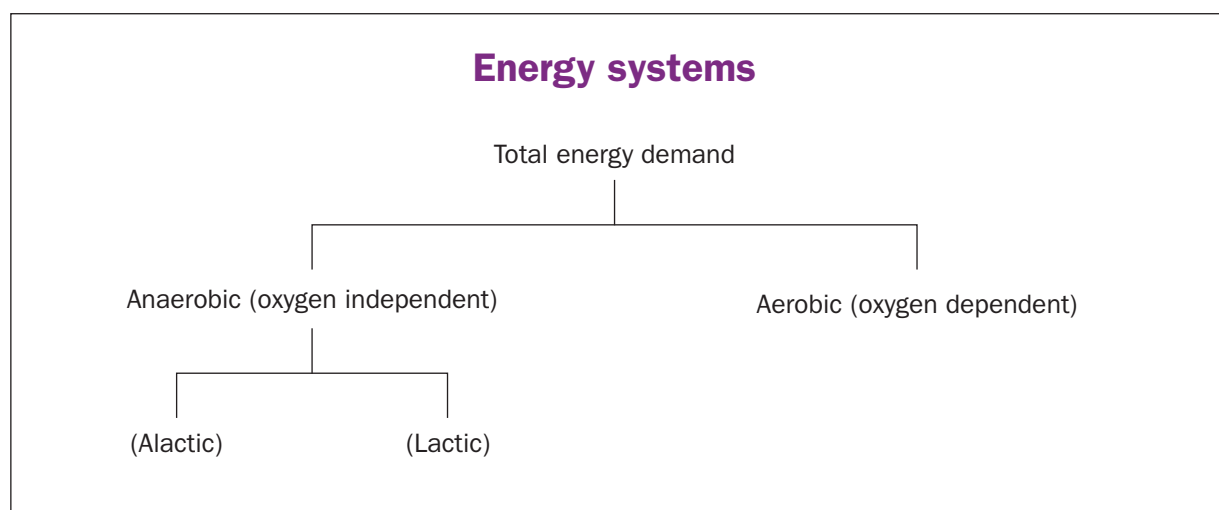
Anaerobic and aerobic energy systems contribute to energy production in all activities. Metabolic processes do not act independently but occur simultaneously and are fully integrated to provide the required energy. Relative contributions of energy systems are dependent on overall **intensity** and **duration** of exercise.

In the past, sports science has made general recommendations on training energy systems in specific sports. The trend for coaches now is to individualise training programs for each athlete and develop the athlete's energy systems based on the unique needs of each person, rather than apply broad, non-specific physiology principles.

Analysis of needs

Every coach needs to understand the performance demands of their athletes in a competition setting and from there they can develop appropriate and effective individual training programs. One way of doing this is to undertake a performance analysis of needs. This can be as simple as using a stop watch in a time-and-motion study and recording the time an athlete spends standing still, walking, striding, jogging, sprinting or jumping during a game. It could also include using a video camera to record and then analyse an athlete's performance or physiology testing.

Monitoring training intensity

The basic measurement and monitoring tools of sports physiology for coaches are:

• heart rate

• energy systems — training zones

• perceived exertion.

These are used to help determine how hard the athlete is working. This is a key training concept known as the exercise intensity. While the volume of training, or how much training an athlete does, is an important issue, it is the intensity of training that is the key to how the athlete responds and adapts to both the immediate and longer-term effects of the training program.

Training adaptations, fatigue, recovery and other fundamental physical changes are all directly affected by training intensity. To be successful, coaches must have a thorough understanding of training intensity, how to manipulate it to achieve performance goals and, very importantly, how to measure and monitor it.

Performance versus physiological measures of exercise intensity

It is important to distinguish between performance and physiological measures of intensity.

• Performance measures, or primary measures — are the more constant and controllable measures, such as running speed, court time, number of tackles or rebounds, free throws or kicks. These can be accurately and reliably measured and recorded.

- Physiological measures, or secondary measures — are those that assess or evaluate the physiological responses to an activity, such as heart rate and breathing rate. These cannot be measured as readily or with the same accuracy as the performance measures and are subject to the influence of other internal or external factors.

Analysis of the physical demands and fitness requirements of a sport requires the application and understanding of both performance and physiological measures.

Heart rate

In sports physiology, heart rate is commonly used to monitor exercise intensity and is described in terms of beats per minute. The heart contracts between 50 and 80 beats per minute in the average person at rest. As the person increases physical activity, the heart responds to the increasing need for oxygen and blood supply by increasing its rate of contracting; that is, the number of beats per minute increases in direct relation to the intensity of a physical activity. In this way, the heart is a type of 'speedometer' for the human body in action. While providing useful information, keep in mind that heart rate can vary due to other factors including caffeine, alcohol and stress, and so heart rate should be just one of the factors a coach uses to determine an athlete's training loads.

Energy systems and training zones

Coaches in the field need simple and reliable measures of exercise intensity. The following five training zones are one way of meeting this need. The coach and athlete can use training zones to prescribe individual training sessions, training sets and drills. For practical purposes the most readily identifiable and useable zones are:

- recovery level, relaxed, comfortable — very easy aerobic
- low intensity — easy aerobic
- high intensity, sustained pace work (also called threshold training) — anaerobic and aerobic
- specific pace work at the intensity of the targeted competition — anaerobic and aerobic
- speed development work (neuromuscular training) — alactic anaerobic.

In a laboratory setting with an individual athlete it is possible to identify other training zones; however, these five are easy to use and meet most training needs in most sports.

Perceived exertion

The concept of perceived exertion relies on the subjective judgment and 'feel' of the athlete. The athlete is asked to provide feedback on the intensity level of the training activity or how hard the training activity feels.

For example, an athlete may be asked to do a training activity at a specific intensity level. The coach may want to prescribe the intensity level not in terms of objective measurements such as speed or time, but in terms of how the athlete 'feels' the effort. To help with this process, coaches and athletes can develop simple scales that are practical and meaningful to them, such as the following one. In combination with other measurements it can give a relatively accurate understanding of the athlete's intensity level.

Intensity level	Feels like	Equates to
1	Very relaxed	Recovery
2	Easy	Easy aerobic
3	Tough	Threshold
4	Very hard — uncomfortable	Race pace/near maximal game intensity
5	Fast but not hard	Speed development/neural

When using perceived exertion levels, it is important to remember that each athlete's opinion about how things 'feel' applies to that individual only. A 'four' for one athlete, for example, may feel like a 'two' for another athlete. There may also be some day-to-day variation in feel as the athlete's level of fatigue, motivation, attitude and recovery status change.

So what is the best way for a coach to determine the intensity level of training activities? The coach must determine the most appropriate, relevant and meaningful way of monitoring training intensity in their athletes. As athletes become more experienced, it is important that the coach takes time to demonstrate and teach athletes to self-manage and self-monitor, so that the athletes themselves can determine accurate training loads. Ideally the best way to manage exercise intensity is to use a combination of two or more of the physiological measurement techniques.

CASE STUDY

Pauline and her coach Louise are working together to monitor training load and have a training session scheduled at the track. Louise has determined that today's run should be completed at a moderate pace. She gives this information to Pauline in three different ways, starting with telling her to run three kilometres at about a 12-minute pace. She goes on to suggest a six-out-of-ten pace, which she felt would be just steady running for Pauline (or in other words, a moderate effort). At the end of the run, Louise takes Pauline's heart rate to add to the other information about how hard her body is working at that pace. Louise and Pauline then discuss how the run felt and provide feedback to each other as follows:

Louise: 'It looked good. It looked comfortable. How did it feel?'

Pauline: 'It felt easy. About six out of ten. What was my time?'

Louise: 'The time was 11.57. Nice pacing.'

Pauline: 'What about heart rate?'

Louise: 'Pretty comfortable — about 140 beats per minute.'

As a result of this discussion, Louise has useful information from the training session to then determine whether training is going according to plan or whether changes need to be made in order to achieve the longer-term program goals.

It is important to educate athletes on how to monitor, measure and manage their own bodies and how they are responding and adapting to training loads. Information on performance, fatigue, sleep, mood and attitude, as well as general health and wellbeing, can provide valuable feedback to the coach and athlete on the progress of the training program.

Many sports are now investigating the use of online monitoring tools to assist their coaches, staff and athletes in the capture, recording and analysis of this important information.

Fitness for sport

Components of fitness

For the general public, fitness usually relates to weight management, good health and regular exercise. In a sports context, it is the capacity of an athlete to perform in their chosen sporting activity.

Some capacities are genetically determined and cannot be trained (for example, height). However, other capacities such as strength, flexibility and endurance can be trained, and it is on these changeable elements of an athlete's physical capacity that training programs are focused. Training these capacities is an ongoing coaching challenge, as attributes such as flexibility can show changes within a week, but strength and endurance, for example, can take significantly longer to show gains — sometimes weeks or even months.

Every sport is different and requires programs designed specifically for that sport and specifically for those athletes. Fitness for a long-distance runner, for example, will focus on endurance and speed. For an Australian football player it will be based on endurance, speed and agility. A hockey goalkeeper's fitness, on the other hand, may be measured in terms of power, flexibility and agility. A coach will use their knowledge of the components of fitness when prescribing a training program to include an appropriate balance of exercise intensity and volume (duration) as well as frequency and recovery.

The building blocks of performance

Speed is how fast an athlete moves from point A to point B.

The measurement and development of speed involves a number of different elements, including:

- reaction time — the time it takes for an athlete to react (move) in response to a stimulus
- acceleration — how fast an athlete increases speed
- maximum velocity or speed — the maximum speed an athlete can attain.

A 100-metre sprint on the track, 50-metre sprint in the pool and an all-out sprint down the court are all examples of speed.

Strength is the ability or capacity of muscles to apply force, such as in weightlifting, grappling with an opponent in wrestling or pushing in a rugby scrum. It is a key element of power and speed.

Power is the rate of force application or explosiveness. Put simply, it is how much force can be applied in the shortest possible time. The rate of performing work must have a force or load component as well as a speed or velocity component.

Power = force (strength) x velocity (speed)

Power in sport can be seen in jumping high to take a catch in handball, a mark in Australian football, starts in track and field or swimming, and throwing a shot-put.

Endurance is the capacity to perform an activity repeatedly, to go longer or to resist fatigue. A muscle's or muscle group's capacity to resist fatigue is called muscular endurance. Examples of endurance can be seen in marathon running, road cycling or Australian football. In team sports, repeated sprint ability is an important endurance adaptation. It allows players to repeat short bursts of high intensity, high-speed efforts. This ability is critical in team sports such as hockey when possession of the ball changes frequently in a short time, requiring players to sprint into attacking and defensive positions with limited rest between sprints.

Agility is the ability to change direction quickly. It is important, for example, in the football codes when side-stepping an opponent, as well as in floor routines in gymnastics. In court sports it is key when turning quickly and competing with opponents travelling in the opposite direction.

Baking the performance cake

Designing a training program with the right mix of performance elements such as speed and endurance is just like making a cake. With a cake, there is a recipe that explains how many eggs and how much flour, how long to beat it and how long to let it stand. Then there are details on how hot to have the oven and how long to bake it. If the cook is in a rush and adds too much butter, no eggs and then, in a moment of misguided enthusiasm, adds a few cups of flour more than the recipe needs (because they would like it a little larger than the one in the picture), then even if the temperature is right, the cooking time is not, and what you get is a brick, not a dessert!

Training is a mix of the right things done at the right time in the right quantities. It all starts with the training plan, which is the 'recipe' for success. The training plan includes lots of ingredients such as endurance, speed, power, technique training, skill training and gym work. It is mixing these training ingredients correctly that makes all the difference. If an athlete does too much endurance without mixing in some speed work, gym work and flexibility, they will not get the success they deserve. With not enough endurance training, athletes will fatigue in the latter stages of races and games. It is the balance of training 'ingredients' that makes a great performance 'cake'.

While it is convenient to categorise unique and separate training types such as speed or endurance, it is also popular to include cross training in effective training programs. Cross training is the incorporation of different training types or training for different sports within the same training cycle (for example, distance runners incorporating cycling into their training program, or football players including tennis to improve agility and fitness).

Types of training

Each type of physical ability or capacity can be changed, improved or developed based on the appropriate application of a training stimulus.

Endurance training examples

Type of training	Characteristics	Examples	Pros	Cons	Coaching issues
Distance	Long duration Continuous Rhythmic Low intensity — that is, less than 80 per cent of maximum. The primary goal is duration of exercise, rather than speed or intensity	Long-distance running, cycling, swimming	Efficient form of endurance development	Can be boring for athletes Can increase risk of overuse injury	Balancing the need for long, slow, continuous training with the practicality of keeping athletes motivated and stimulated by the training environment
Fartlek	Speed 'play' Changing movement speed with mood, terrain, recovery	Running around a golf course and surging up hills Swimming ten laps and sprinting the first five metres of each lap	Can be an interesting and stimulating training type with countless variations Based on the athlete's 'feel' rather than a pre-prescribed load that may be inappropriate	Athletes may do too much at an inappropriate intensity level, resulting in the need for significant changes to the training program	Measuring work actually completed
Interval training	Training activities of relatively short duration interspersed with rest/ recovery periods; that is, an 'interval' of work followed by an 'interval' of rest	Running 10 x 200-metre efforts holding a time of 35 seconds for each 200 with a one-minute rest between each	Easy to manage and measure workload Variety in workloads including distance, speed, terrain and recovery	Relatively higher intensity can lead to increased injury risk Too much focus on time and effort, rather than skills and technique	Great opportunity for feedback and coaching comments between work intervals

Strength training

Strength is the maximum force or tension generated by a single muscle or group of muscles. Strength or resistance training involves using weights or other external loads to overcome a fixed initial resistance to strengthen specific muscles. The muscle cells adapt to the extra workload by increasing in size and recruiting greater numbers of nerve cells to cause a muscle contraction.

Strength training can be a useful supplement to sport-specific training. Effective strength training programs use a wide range of techniques and skills to enhance the athlete's ability to perform in competition. The key question for every coach, however, must be whether the strength and conditioning activity the athletes are doing directly (through increased power or strength) or indirectly (through injury prevention or early season conditioning) contributes to improved competition performances.

When setting strength training programs, the following terms are used:

- repetition — a single complete movement of an exercise or activity. One push-up is one repetition; one chin-up is one repetition

- set of repetitions or simply a set — a series or group of repetitions performed continuously without rest. Ten push-ups completed without rest is known as a set of ten push-ups.

- repetition maximum — the maximum number of repetitions that can be completed in a single set with a given resistance.

Strength training examples

Type of training	Characteristics	Examples	Pros	Cons	Coaching issues
Body-weight resistance training	Lifting own body weight	Push-ups, chin-ups, dips, stair climbing, rope climbing	Easy to learn Inexpensive Practical — can be done anywhere and anytime Easy to measure improvement	Athletes can get bored and tired of the training environment	Transfer of increased strength to improved competition performance
Weight training	Lifting an external resistance; for example, weights	Gym work; that is, lifting free weights, using weights machines	Variety of the training environment Training load can be easily measured and manipulated	Importance of learning correct lifting techniques Need for partner to assist in safe lifting Cost of gym access	Need to control the weight-training environment to ensure safety, correct technique and sensible progression are adequate Transfer of gym strength to improved competition performance
Circuit training	Combination of movements, loads, equipment and exercises in a systematic programmed training activity. Circuit activities are usually rapid, moderate to high intensity performed in a sequence with short rest periods in between	Jumping followed by throwing followed by a short jog. Thirty seconds rest then ten push-ups, 20 step-ups and another short jog	Variety of the training environment Enjoyable group training environment Can be used to simulate competition environment	Difficult to quantify or measure exact training load	Transfer of circuit activities to game/competition environment

Flexibility training examples

Type of training	Characteristics	Examples	Pros	Cons	Coaching issues
Dynamic stretching	Stretching to the limits of the range of motion using fast, sport-specific movements	Arm or leg swinging movements to the limits of range of motion	Stretching through a range of movement at speeds close to those of the competition environment	Increased risk of soft tissue injury if athlete does not warm up appropriately	Care needs to be taken to ensure athletes are warmed up and prepared appropriately before attempting dynamic stretches
Static stretching	Holding a stretch in a single position near the point of maximum stretch for 30–60 seconds	Standing hamstring stretch with the leg parallel to the ground	Controlled movements mean minimal injury risk Range of motion can be increased, particularly if static stretches are held for 30–60 seconds post-exercise	Static nature of the stretching is not specific to the movements of most sporting activities	Athletes should be educated to hold the stretches while staying relaxed and controlling breathing
Partner stretching	Working with a partner in stretching exercises and flexibility routines	One athlete executing a shoulder stretch while their partner is supporting their shoulder	A partner can help an athlete achieve an increased level of stretch that the athlete could not achieve unassisted Can be motivating to work with a partner	Danger of overstretching if both partners do not communicate effectively	Need to educate athletes on how to work together and provide continuous feedback to each other

Speed training examples

Type of training	Characteristics	Examples	Pros	Cons	Coaching issues
Accelerations	Activities that increase athletes' ability to increase speed rapidly	5–10-metre timed sprints Accelerations from slower speeds Leg speed drills	The first 5–10 metres in many team-sport competitive situations are critical in order to overcome or escape an opponent	Injury risk with sudden increases in rate of speed if not adequately warmed up and prepared	Aim should be to train athletes to achieve their own maximum speed faster
Agility	Activities that teach athletes to change direction quickly	Rapid change of direction drills around cones and obstacles	Agility is a critical component of most team sports, especially football codes, netball, basketball, hockey and volleyball	Sudden deceleration/ acceleration and changes of direction pose a potential injury risk to joints and muscles	Importance of educating athletes to change direction quickly while maintaining technical skills, control, balance and coordination
Reaction exercises	Activities that improve athletes' ability to react or move in response to a stimulus Reaction consists of several components, including the receiving of the stimulus by the athlete, the processing of the stimulus by the athlete's brain and nervous system, and the initiation of movement in the athlete's muscles	Five-metre sprint in response to a sudden noise, trigger or stimulus Measuring athletes' response (first movement) to an external stimulus	Improving reaction is a critical competitive skill, and by training reaction athletes can develop an increased ability to compete against an opponent	Due to the short time involved, improvement in reaction time can be difficult to measure without electronic measuring equipment	Simulate the reaction stimulus in training that athletes will be reacting to in competition (for example, a starting signal for sprinters and swimmers or the movement of an opponent for a team-sport athlete)

Power training examples

Type of training	Characteristics	Examples	Pros	Cons	Coaching issues
Plyometrics	Explosive, powerful movements with minimal rest and contact with the ground	Jumping, hopping, bounding	Effective power development activities that closely simulate many explosive sporting movements	Potential injury risk for athletes who are not strong enough or adequately prepared	Importance of stressing good technique and explosiveness in all plyometric activities
Circuit training for power	Fast, explosive activities performed in a circuit or sequence with minimal rest. Generally few repetitions of each activity are performed to minimise the impact of fatigue	Jumping, hopping, bounding, throwing	Can simulate the repeated power demands of many field games such as football, hockey, and basketball. Can use interesting and stimulating equipment to bound, jump, hop, leap over and around	Difficult to measure load	Need to balance power and explosiveness development with fatigue from repeated exercises in the circuit
Weight training for power	Typically 2–4 sets 2–6 repetitions Load relatively light and movement fast and controlled	Most weight-training exercises	Variety Overload can be closely monitored and controlled	General gym safety issues Potential injury risk to joints and muscles at the end of the movements if not controlled	Important to ensure good weight-lifting technique with increasing speed of movement
Terrain power sprints	Short, powerful, explosive sprints with exaggerated running action (for example, high knee lift)	8 x 20-metre sprints up a 5 per cent grade hill with long rests in between each repetition	Very specific overload for running muscles	Changes to running technique if grade is excessive	Important to identify terrain that stimulates power development but does not compromise running technique

The principles of training

Overload

Improvements from training come from working the body and mind a little harder than previously to achieve a training effect. As an athlete develops training loads, the load needs to be increased gradually but progressively to ensure continuing adaptations.

Periodised training that is systematically planned and programmed over time allows for effective development of the appropriate body system. Each training session should have a clear objective and should be evaluated to ensure the appropriateness of the (over) loading.

Increasing an athlete's workload too quickly can lead to overtraining, which can result in excessive fatigue, injury and illness.

Overloading can be done through regular physical training and competition, introducing a new training stimulus or changing the frequency, intensity and volume balance. In the gym, for example, a coach may increase the amount of weight lifted. On the running track, a coach may increase the distance covered in a training session or training period.

RUFIT: are you fit?

A simple way to remember the fundamentals of overload is the RUFIT system:

- **R**ecovery — ensure adequate focus on recovery between training and competition
- **U**nique — overload each athlete based on their individual needs, abilities and capabilities
- **F**requency — how often athletes train
- **I**ntensity — how hard athletes train
- **T**ime (duration/volume) — how long they train for.

CASE STUDY

Sixteen-year-old Hannah is a good club-level volleyball player who has been involved in the sport for five years. She trains with her team three times each week and plays on Saturday afternoons. She has decided to make the commitment to improving her performance with a view to making the state team. Hannah discusses this with her coach, Irena, and together they plan a training program to achieve this goal. They identify that Hannah needs to improve her physical endurance in particular, and make this their first priority.

Irena uses the RUFIT system as a guide to help her plan the new program.

- **R**ecovery — an increased training load means Hannah will need to plan for more rest and recovery, so she decides to reduce the amount of television she watches at night and get some extra sleep.
- **U**nique — Irena prescribes a training load based on Hannah's individual needs. Hannah has a limited background in endurance training so she decides to balance her endurance training with swimming, cycling and a little jogging.
- **F**requency — Hannah is at school, but has some time free in the mornings. Irena includes an endurance training activity on Monday, Wednesday and Friday mornings.
- **I**ntensity — as the goal is to improve endurance performance, Irena sets the intensity level at 75 per cent of Hannah's maximum heart rate and shows Hannah how to take her heart rate accurately during exercise.
- **T**ime — Hannah and Irena decide that given Hannah's training background, 3 x 30-minute endurance training sessions will be sufficient training volume to achieve the training goals.
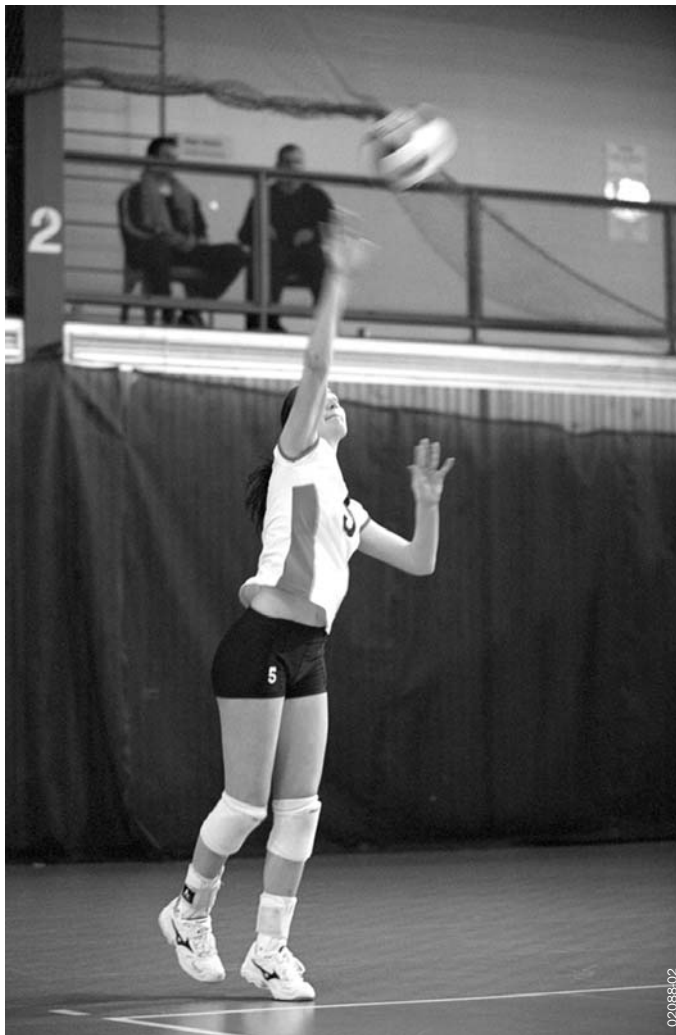
Progression

Progression is the gradual, systematic and planned increase in training and competition loads. An important aim of progression is to gradually increase the stress and load placed on the body, usually on a specific muscle or muscle group, so that its capacity to produce force or resist fatigue becomes greater. This can be done by gradually increasing the distance an athlete runs in training each week or gradually increasing the amount of weight an athlete lifts in the gym over the season.

The principle of progression underlies all planning decisions in the training program, as the program itself is designed to achieve the set goals systematically and strategically, or in other words, progressively.

Regular testing such as time trials, shuttle runs or speed tests are an important feedback mechanism for the coach and athlete on how the program is progressing.

Testing has four main goals:

- determining appropriate training zones for the individual athlete
- ensuring that athletes are coping and adapting to the training programs
- evaluating the effectiveness of the training programs
- providing motivation for athletes by demonstrating performance progress.

Regular, accurate and reliable feedback from the athlete can provide a valuable insight into the effectiveness of the training program and the application of the principle of progression.

CASE STUDY

Vladimir is an experienced coach who has recently moved to town and taken over a large squad of enthusiastic squash players. The season is about to start and the season plan is already in place; however, he needs to get to know his squad quickly so he can make sure their individual programs are working for them. Vladimir decides that introducing the athletes to self-monitoring is a way to get some of that information, and at the same time educate the athletes to listen to their bodies and learn to take care of themselves. Vladimir develops seven quick questions for the athletes to ask themselves every day that will give both the coach and athlete an insight into how they are adapting to training and how the training progression is working. The questions include:

- How do I feel today?
- How well did I sleep last night?
- How is my attitude?
- How is my appetite?
- Are my muscles sore and aching?
- Do I feel stressed or anxious?
- Is there anything happening away from the court that I cannot stop thinking about, such as exams or issues with family and friends?

The athletes are asked to answer using a simple scale of 1–5.

     1 = Poor

     2 = Fair

     3 = Average

     4 = Good

     5 = Excellent

Vladimir is particularly keen to identify any athletes whose scores are low for more than two or three days, as this can often be an early indication that the athlete is not adapting to the training program and may need more focus on rest, recovery and regeneration.

Recovery

Recovery in sports physiology has been an area of increasing importance and focus in recent years. It is essentially recovering from training and competition loads through resting and recuperating, which in turn regenerates the body and mind. Many sporting teams have a designated recovery program to support and complement their training and competition program.

Recovery can be approached in many ways, such as quarter-time or half-time breaks in team sports, easy days or sessions in a long-term training program, or off-season breaks after the end of one season and before the beginning of the next. On a day-to-day basis, coaches can support recovery by encouraging athletes to drink plenty of fluids straight after training or competition to replace what has been lost, suggesting a massage (either self-massage or by a massage therapist) and perhaps most importantly, recommending a good night's sleep.

Signs of fatigue

Feeling fatigued or tired after training is normal, but excessive and constant fatigue is not.

When the body is constantly tired, it more easily becomes ill or injured. The body's defence mechanism, known as the immune system, then breaks down leaving the athlete vulnerable to coughs, colds and infections. **More is not better**. An overtrained athlete is one who has done more work than they can physically and mentally tolerate. They will not improve and their performance may even go backwards.

There are several fatigue factors that if monitored regularly can help the athlete manage fatigue levels, maintain good health and achieve optimal training.

These include:

- sleep — what is the athlete's quality of sleep? Do they fall asleep easily and wake feeling refreshed or do they toss and turn and wake feeling even more tired than the day before? Athletes training hard sleep well. Athletes who are in a state of excessive fatigue will often complain that they have difficulty falling and staying asleep

- muscle soreness — do the athlete's muscles feel tired after training or are they still sore and aching 2–3 days later? It is normal for muscles to be tired, but it is not normal for muscles to be sore, aching and tight for more than 24–48 hours

- resting heart rate — as athletes get fitter, their resting heart rate (taken when they first wake) gets lower. If an athlete's heart rate is higher than normal by 10–15 beats per minute for 2–3 consecutive days it might be a sign their body is not adapting to training

- energy — fit people are high-energy people. Overtrained people feel slow, flat and lethargic, and lacking in energy

- weight loss — fit, healthy people tend to keep an energy balance where weight is neither gained nor lost. In an overtrained or tired state, body weight can fluctuate by 1–2 kilograms (or more) in 24 hours

- 'feel' — tired swimmers will often say, 'I can't feel my stroke'. Athletes in other sports will also talk about not 'feeling right'. This concept of 'feel' is related to neural (nervous system) fatigue and it is a good indicator of overtraining and excessive fatigue

- stress — athletes are subject to all the stresses and strains of life including those surrounding family, study, relationships, money and work. There is a strong relationship between life stress and fatigue levels. In young athletes it is essential to consider the planning of the training program in relation to school and exam loads, particularly for teenage students completing final high-school exams.

These fatigue factors are simple to monitor and measure and can be excellent indicators of training adaptation. It is essential that coaches manage the overall training loads that athletes experience individually and keep in mind the demands of all training and competition activities, as well as outside-of-sport demands when developing training and recovery programs.

CASE STUDY

Lars is a successful European handball coach who decides to introduce a strength training program for the first time. The club has given him a budget and he is able to purchase a range of suitable equipment and also to enlist the help of a strength expert recommended to him by another coach. Lars schedules the gym program opposite the running program. During training cycles where the athletes worked hard on the running program, the gym program was relatively light and easy, and when the gym program was hard then the running work was more relaxed. It seemed like a great plan, but the team's season ended up being one of their worst ever.

Work is work. The mistake Lars made was to swap one form of work (training) for another (strength training) without really providing the athletes with a chance to rest and recover.

Reversibility

If you don't use it, you lose it! If an athlete stops training a particular physical capacity by either reducing the training load or by stopping the activity altogether, the fitness levels they have gained will be lost. Although no one is really certain why, the body seems to remember how to move, train and compete even if it has not done a specific activity for some time. For example, if it takes five years for a gymnast to learn how to perform a complex routine and injury forces them out of training for six months, leading to a loss of strength, fitness and skill, it takes significantly less than six months for the athlete to return to pre-injury performance levels.

Aerobic endurance can be lost relatively quickly, and it is important that athletes maintain a base level of endurance during off-season periods or breaks in regular training due to injury. A football player, for example, might engage in regular cycling or swimming for fitness during the summer off-season period. A swimmer may take up open water or surf swimming during a break from pool training to maintain aerobic fitness.

Variety

As well as being effective, training and competition activities should be varied, interesting, stimulating and enjoyable. Coaches might consider changing training locations or training times and days, introducing new training equipment or changing the frequency, intensity and volume mix. Regularly introducing new exercises also serves to offer variety, which maintains interest and challenges muscles and systems, forcing them to adapt with increased size, strength and/or efficiency.

CASE STUDY

Karen is a dedicated hockey coach who has been coaching under-14 hockey players for ten years. She always spends a great deal of time carefully planning and preparing her sessions and is a regular at the professional development sessions at her club. Lately she has been concerned that, although the players work hard at training, they do not seem to really enjoy her sessions. Disappointingly, their match performance has not really been what she had hoped either. The fitness development sessions on Tuesdays seemed to be a particular problem.

Karen knows a good base of general fitness is important, but she also knows that what she is doing at present is not working. On reflection she decides that while she has included all the key elements needed in a fitness program, the sessions lack variety. Karen decides to include the team in preparing the Tuesday sessions. She outlines on the whiteboard four key elements for them to consider in their planning. The session should be 30 minutes long and must include 20 minutes of non-stop, continuous movement with limited rest at low intensity.

The session must also include 20 short (around 20 metre) all-out sprints and 50 body-weight resistance exercises such as push-ups, pull-ups, steps-ups and dips.

The response from the athletes is great. They love planning their own sessions and decide to run their fitness sessions down by the river, a short walk from where they usually train. The team also comes up with some great ideas about how to include the necessary elements in a series of fun sessions. They even allocate two different players each week to actually run the sessions and to ensure that everything is done.

They mixed things up in ways Karen had not even thought of. Not only did this approach offer variety in training, which is important for developing their physical attributes, but at this age the players were really keen to take some responsibility for their development and have stronger ownership of their team. Planning their own sessions offered them this opportunity and gave them a good sense of being part of the team as a whole.

Specificity

You get what you train for. Training activities and programs must be closely related to performance goals. To perform with increased strength, training loads need to emphasise increased strength development through gym work or resistance training. To perform with increased endurance, training loads need to emphasise increased endurance development through long-distance running, cycling, swimming or cross country skiing.

Remember, the most specific training of all is to simply play the sport.

Individuality

Each individual will adapt to training and competition loads differently based on genetic, behavioural, environmental and developmental variations. Swimmers competing in the same event may require different amounts of training and a different mix of training elements. Players playing in the same team may require different training loads and recovery activities even though they play in the same position.

Individualising training programs in team sports is one of the great challenges for team-sport coaches. In some sports, players are grouped together based on their on-field positions for tactical reasons and not necessarily based on their physical capacities or recovery abilities. Wherever possible, each athlete should be given an individualised training program to ensure optimal adaptation and performance potential. Each athlete's ability to adapt to training and competition loads depends on a variety of factors including:

- genetics
- training background and history
- gender
- outside-of-sport commitments such as school, family or work
- injury status.

CASE STUDY

Peter is a 34-year-old triathlete who has been involved in the sport for two years. He became involved in triathlon to keep fit and stay healthy after a long career in lacrosse. Peter regularly trains with a large group of triathletes, all around his age. Even though Peter does all his training with the group and completes the same training programs, he finds he is not competitive with many of the group when they race, particularly in the swimming and cycling legs. He decides to raise his concern with his coach, Theo.

Theo suggests that as Peter's sporting career has until now been largely based on running, he should focus on developing skill, technique and knowledge of swimming and cycling. They make a simple but important change to Peter's training program by decreasing the amount of running, adding an extra swimming session each week with a specialist swim coach and also an additional cycling time trial where Peter trains alone, focusing specifically on learning how to cycle more efficiently at high intensity.

Summary

Simplicity is the key. An educated athlete with a strong feel for training load and an understanding of how their body works, training together with an educated coach who has an understanding of, and empathy for, their athlete as well as an understanding of the principles of sports science, can achieve great things. While sports physiology can provide coaches and athletes with technology and tools to measure a wide range of responses and adaptations, often it comes down to what is practical, simple, affordable and immediately available.

Just as a smart investor does not put all their eggs in one basket, coaches and athletes should not place all their faith in one particular physiological measure or technique. The most effective training methodologies lie in a unique combination of both the art and science of coaching and an educated 'feel' for the individual athlete.

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Chapter 9:
Basic anatomy and biomechanics

by Wayne Spratford

Understanding the structure of the human body and how the body moves is important for coaches who are seeking to improve and develop their coaching. While coaches do not need to become experts on anatomy and biomechanics, developing an understanding of the principles involved in the structure and movement of the body will assist them in a number of ways, including:

- analysing athlete movements, and assisting the athlete to move more efficiently (for example, by changing a technique)
- understanding the effects of movement on the structure of the body, including prevention of sports injuries
- being able to communicate with sports medicine and sports science personnel regarding aspects of the athlete's body and movement (for example, treatment of injuries)
- selecting appropriate techniques and equipment for an individual athlete's size and level of development so that the best possible performance can be achieved.

What do we mean by anatomy and biomechanics?

Anatomy refers to the internal and external structures of the human body and their physical relationship with one another. This includes basic information on anatomical terminology, the skeletal system and the major skeletal muscles.

Biomechanics is the study of how and why the human body moves. Sports biomechanics help coaches to understand this body movement, how to identify and correct flaws in performance, and prepare athletes to learn new skills. It enables coaches to measure forces that come from inside the body (for example, muscles and tendons) or from outside the body (for example, gravity, water or friction).

Anatomical terminology

Coaches may initially be intimidated by some of the terminology associated with anatomy. Some anatomical terminology is used in everyday life, but other terms may be foreign to many coaches. Developing a basic level of knowledge of anatomical terminology will assist coaches in communicating with medical staff, in particular regarding their athletes.

Anatomical position

In order to describe body parts, a reference point is needed. This is called the anatomical position. It is from this position that all anatomical terminology relates, regardless of the body's actual position. The anatomical position refers to a person standing upright, arms by their side with palms facing forward and thumbs pointing away from the body.

Directional terms

This is an explanation of where one body part is in relation to another. The following table outlines some common directional terminology.

Table 9.1 Directional terms

Term	Definition	Example
Superior	Towards the head, above	The chest is superior to the pelvis
Inferior	Away from the head, below	The jaw is inferior to the eyes
Anterior	Towards or at the front of the body	The ribs are anterior to the shoulder blade
Posterior	Towards or at the back of the body	The spine is posterior to the ribs
Medial	Towards or at the midline of the body, on the inner side	The sternum is medial to the arm
Lateral	Away from the midline of the body, on the outer side	The thumb is lateral to the fingers
Proximal	Closer to the origin of the body part or the point of attachment of a limb	The wrist is proximal to the fingers
Distal	Further from the origin of the body part or the point of attachment of a limb	The elbow is distal to the shoulder
Superficial	Towards the surface	The skin is superficial to the skeletal bones
Deep	Away from the surface, more internal	The muscles are deep in relation to the skin

The skeletal system

The skeletal system is made up of 206 bones, as well as cartilages, ligaments and joints. It accounts for about 20 per cent of body mass.

The body's skeletal system performs five important functions:

- support — bones provide a framework, giving the body form and shape
- protection — bones provide protection for our vital organs, such as our central nervous system (the brain and spinal cord) which is completely enclosed in bone
- movement — articulating bones act as levers enabling us to move
- mineral storage — calcium is the most abundant mineral in the human body. A typical human body contains 1–2 kilograms of calcium, 98 per cent of which can be found within the skeleton
- blood cell formation — red blood cells, white blood cells and other blood elements are produced within red marrow that fills the internal cavities of many bones.

The major bones of the body are indicated on the following figure.

Figure 9.1: Anterior view of the skeleton

Skull

Mandible

Clavicle

Sternum

Scapula

Humerus

Ribs

Radius

Vertebra

Ulna

Illium

Pubis

Ischium

Pelvis

Carpals

Metacarpals

Phalanges

Sacrum

Femur

Patella

Fibula

Tibia

Tarsals

Metatarsals

Phalanges
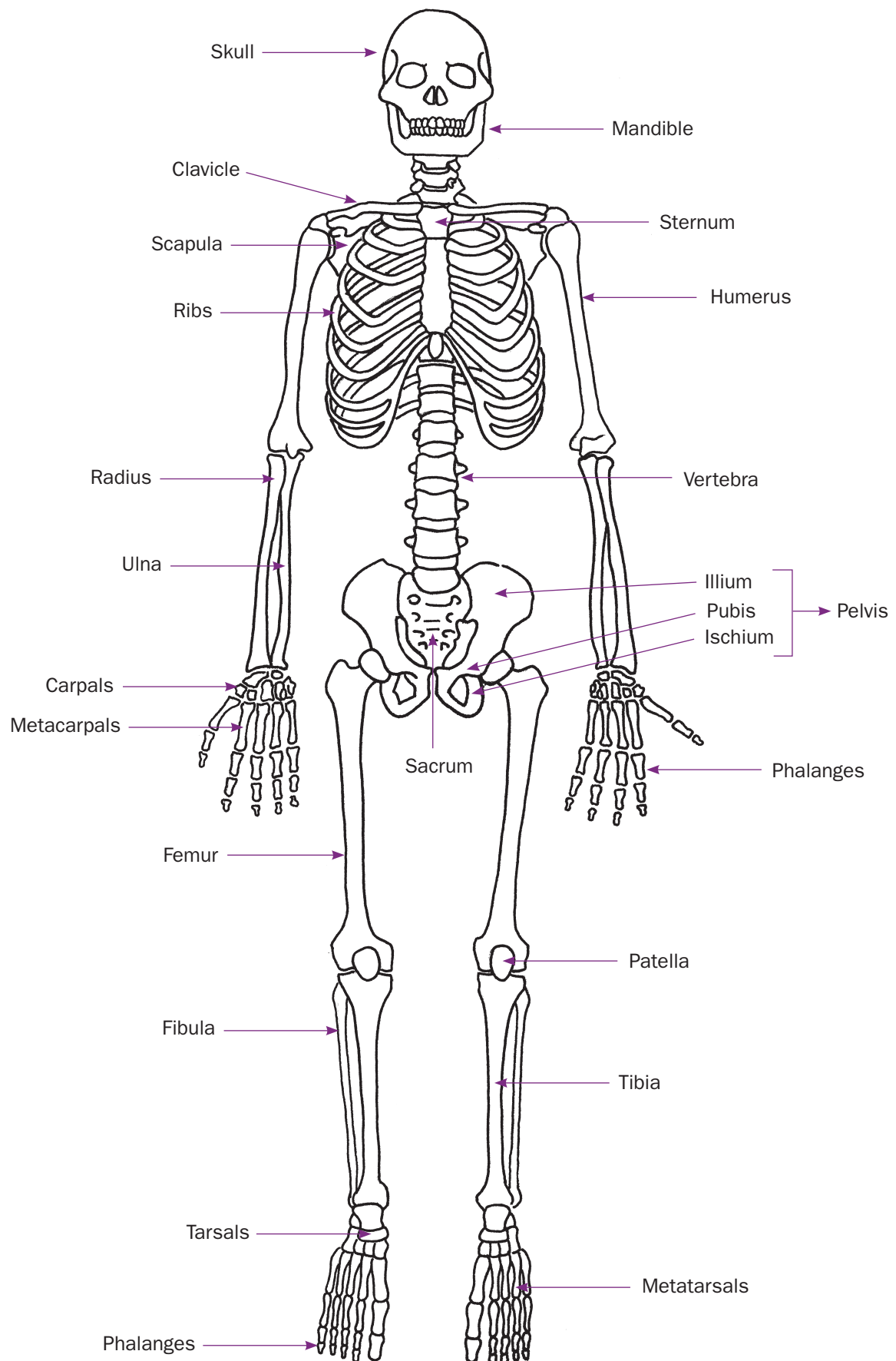
CASE STUDY

Joanne coaches a squad of young female gymnasts who train 3–4 times a week and are competing at regional level. One of the girls in the squad, Shauna, who is 12 years old, has been complaining of pain in her left shin when she lands. After a week of the pain continuing, Joanne spoke to Shauna's parents and recommended that they take her to a sports medicine physician. Joanne was concerned that it could be an overuse injury, such as a stress fracture. Joanne was keen to address the problem quickly, as Shauna is at a stage of intense bone growth where a small problem could turn into a big problem if not treated. Joanne will need to take advice from Shauna's physician in regard to changes needed to Shauna's training loads and types of training activities that are suitable during rehabilitation.

Joints
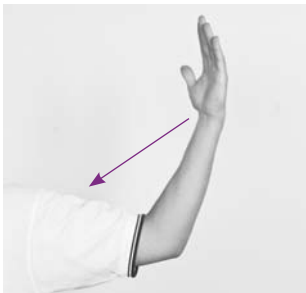
Joints exist wherever two bones, joined by ligaments, meet and are classified functionally as well as structurally into the following three categories:
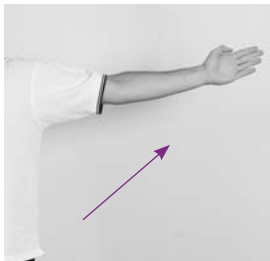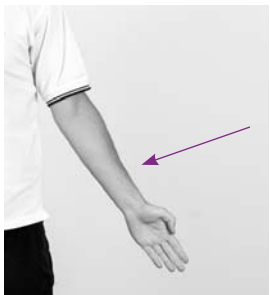
- fibrous — the ends of the bones are joined by fibrous tissue. No joint cavity is present and little or no movement exists. An example would be the joints of the skull and the joints of the teeth and jaw
- cartilaginous — mainly provide stability, with limited movement. Bones are connected by collagen fibres, cartilage or ligament. An example would be the discs of the vertebral column
- synovial — typically found at the end of long bones and permit a wide range of motion. An example would be the joints of the limbs such as shoulder, hip and knee.

Joint movements

All skeletal muscles are attached to bone, either directly or indirectly, by connective tissue at a minimum of two points. The following table describes the directional movements that take place at these joints.

Table 9.2: Movement terms

Terms	Definition	Image
Extension	Increasing the angle at a joint	
Flexion	Decreasing the angle at a joint. Flexion of the foot at the ankle is called dorsi flexion	
Hyperextension	Extension of a segment past the anatomical position	

Terms	Definition	Image
Abduction	Movement away from the body's midline	
Adduction	Movement towards the body's midline	
Dorsi flexion	Only occurs at the ankle and is the action of moving the toe towards the shin	
Plantar flexion	Only occurs at the ankle and is the action of moving the toe towards the ground	
Rotation	Movement about an axis, either medially (inward) or laterally (outward)	
Circumduction	Moving a limb so that the end of the limb draws a circle	
Supination	Moving the flexed forearm so that the palm of the hand is facing out	

Terms	Definition	Image
Pronation	Moving the flexed forearm so that the palm of the hand is facing down	
Eversion	Rotation of the foot to turn the sole outwards	
Inversion	Rotation of the foot to turn the sole inwards	
Elevation	Moving a body part upwards	
Depression	Moving a body part downwards	
Opposition	This only occurs between the thumb and the fingers of the hand. The action occurs when you touch your thumb to the tips of the other fingers on the same hand	

Muscles

Types of muscles

The three types of muscle tissue found within the human body are:

- smooth muscle tissue — found in the walls of many internal organs and is involuntary (that is, contracts without voluntary control)
- cardiac muscle tissue — found only in the heart and is also involuntary
- skeletal muscle cells — make up our muscles and attach directly or indirectly (via tendons) to the skeleton.

Functions of muscles

Skeletal muscles have five main functions:

- producing movement — contracting muscles pull on tendons to move the bones of the skeleton
- maintaining posture — tensions in our skeletal muscles maintain posture. Without this constant muscle activity, sitting or standing would be impossible

- supporting soft tissue — muscles support the weight of internal organs and protect them from injury. These muscles may be located within areas such as the abdominal wall and the floor of the pelvic cavity
- protection — openings such as orifices in the digestive and urinary tracks are encircled by skeletal muscles. These muscles provide voluntary control over swallowing, defecation and urination
- maintaining temperature — muscle contractions require energy and whenever energy is used in the body some is converted to heat. The heat lost by muscles contracting keeps body temperature in the range required for normal functioning.

Major muscles

There are over 600 muscles in the human body. Some of the main muscles involved in gross motor activities are:

- abdominal (for example, external and internal oblique, rectus and transversus abdominus)
- shoulder girdle (for example, trapezius, rhomboids and the rotator group, comprising infraspinatus, supraspinatus, teres minor and subscapularis)
- arm (for example, pectoralis major, deltoid, biceps and triceps)
- upper leg (for example, gluteal, hamstrings and quadriceps)
- lower leg (for example, gastrocnemius, soleus and tibialis).

CASE STUDY

Jake coaches the reserves team for a rugby union club that competes in a regional competition. The team has a range of players, including some young up-and-comers, as well as some older players who are on the verge of retiring from playing at competitive level. Two of the older players have ongoing injury issues. One has a problem with the medial ligament in his knee, which has never fully recovered from surgery some years ago. The other has ongoing issues with his right hamstring, with a long history of strains and muscle tears. Jake spends some time discussing with these two players how to manage these injury issues. This includes looking at what specialised conditioning and treatment they need to prevent further injury, what type of training and competition load their bodies can handle, and what type of recovery activities they need so that they pull up okay after each training session and match. Jake seeks specialist help with some aspects that are outside his expertise (for example, he consults with a physiotherapist and massage therapist who are linked with the club for treatment and recovery assistance). With careful management, Jake is able to keep the two players injury free in their final year of competition, and the two players retire at the end of the season on a positive note.

What is biomechanics?

Biomechanics is the study of the forces that produce human motion and the effects of those forces on and within the human body. Forces can be internal, including those created by muscles and tendons, or external, including forces created by gravity, air, water or friction. Once the movement of the body performing a given task is understood and measured, it may then be possible to make changes to technique or equipment to improve performance or reduce the possibility of injury.

By understanding some of the basic principles of movement and forces, coaches can gain a better understanding of why certain movements create particular outcomes. It can also assist them in their analysis of athlete movement and help them to identify and correct performance flaws to produce better performances in the future. An understanding of biomechanics in sport enables each athlete to be coached as an individual, using techniques and equipment that are determined by the coach to be the most suitable for the athlete's unique requirements.

Biomechanical analysis considers movement in two different ways:

- kinematics — concerned with the motion of a body (how far, how fast or how consistently it moves)
- kinetics — concerned with what causes that movement and includes an analysis of the forces acting, momentum, torque and power.

Biomechanical principles

There are a number of scientific principles on which sports biomechanics is based, which include laws of physics and mechanics. While coaches do not need to become experts in the science of these principles, it is valuable to have a grasp of the concepts. The principles that will be covered in this chapter include motion, forces, levers and balance.

Laws of motion

Sir Isaac Newton formulated three laws of motion to explain what causes a body to move and the motion that results. An understanding of these basic principles helps in the knowledge of movement or motion.

1   The law of inertia

A body will remain at rest or it will travel in a straight line at a constant velocity unless a force acts on it to change its state of rest or motion.

If something needs to be moved we must first overcome its inertia (an object's resistance to change). This resistance is directly proportional to the mass of the object. The heavier the object, the greater the resistance, and the harder the object is to move.

2   The law of acceleration

The acceleration of a body is directly proportional to the amount of force used.

The heavier an object, the more force is needed to move it. To move the same object faster, even more force is needed. For example, with a small light ball, such as a tennis ball, the larger the force applied to it, the greater the acceleration. If the force applied remained the same, but a bigger, heavier ball such as a basketball was used, it would experience less acceleration.

3   The law of action and reaction

For every action there is an equal and opposite reaction.

When a runner pushes down against the ground they exert a downwards and backwards force (action). In turn, the ground exerts the same force upwards and forwards against the runner's foot (reaction).

Body motion

Motion is the process of changing position. All physical activities involve motion of the human body. Motion can be:

- linear — where the body's centre of gravity moves along a straight line and all the body parts travel in the same direction, over the same distance and in the same time. An example of this is an ice-skating glide
- curvilinear — where an object or the body follows a curved line. This can be seen in the flight of a gymnast somersaulting through the air, or a ball after a kick
- angular or rotary — movement around a fixed point, as is seen in most of the joints in the skeleton. For example, when a ball is kicked the femur rotates around the hip joint and the tibia rotates around the knee joint, giving angular motion.

In general, angular motion occurs more often than linear but a combination of the two is the most common. For example, when walking, the body's centre of gravity may move in a linear direction or a straight line, but at the same time movement at the hips, knees, ankles and shoulders gives angular motion.

Motion terminology

- Velocity (or speed) measures how quickly an object or person moves over a distance (distance divided by time equals velocity). Velocity is measured as either the average speed over a distance or the top speed over that distance. For example, a tennis player might serve at 160 kilometres per hour, which is the highest speed reached over the distance. A swimmer, on the other hand, might swim a 100-metre butterfly in 90 seconds by averaging 0.9 metres per second over the race.
- Acceleration is a measure of the rate of change of velocity, or how quickly an athlete can change speed. An example of this is a cyclist accelerating at the beginning of a time trial from zero to 15 kilometres per hour in one second.

Projectile motion

Any object moving through space is called a projectile, including humans when they are diving or jumping, or balls when they are hit, kicked or thrown. For an object to become a projectile, a force must be applied to it.

All things being equal, the greater the force applied to the object, the further a projectile will travel (Newton's second law of motion). Opposing this force are air resistance (acting on horizontal motion) and gravitational force (acting on vertical motion).

The path a projectile follows through the air is called its trajectory. The trajectory of a projectile is predetermined at the moment of release by the:

- velocity (speed) of release — the greater the speed of release, the greater the range, flight time and height or distance obtained
- angle of release or take-off — the angle will depend on whether maximal height or distance is your goal. For example, 45 degrees is the optimal angle at which an object needs to be projected to obtain the maximum distance.

When we are looking at humans as the projectiles, it is impractical or unobtainable for an angle of release to reach 45 degrees. In reality, research shows that long jumpers leave the ground at between 19 and 25 degrees.

CASE STUDY

Angela is a young shot-putter who is keen to increase her throwing distance. Her coach, Kwasi, suggests they start by taking a video of her throwing. He positions the camera directly side on and records a few throws. Kwasi knows that the throw distance depends on factors determined at the exact moment that the shot leaves Angela's hand. These factors are:

- the release velocity, or the speed of release

- the angle of release

- the height of release, or how far above the ground the shot is released.

Kwasi looks carefully at Angela's throws and then estimates how high she reaches when she releases the shot. Kwasi then estimates the angle of release. He explains to Angela that the slower the speed of release, the shallower or smaller the release angle tends to be. He points out that as throwers become able to generate a higher release velocity, they also tend to be able to increase their release angle (world-class throwers release the shot at angles between 32 and 38 degrees). Kwasi tells Angela that he will focus her training specifically on further developing her strength and power, which in turn will increase her speed of release.

The second area that Kwasi knows they can work on is Angela's technique in moving across the circle. He uses what he knows about the summation of forces and the need for a smooth and efficient action to ensure that the forces generated by the thrower from the legs, hips and arms are then transferred to the shot-put leading to an increased speed of release.

Force

A force is a push or pull that alters the state of motion of a person or object. Force can cause a moving body to increase its speed, slow down, stop or change direction. It can also cause a body that is at rest to move (Newton's first law). The strength or size of the force required to change the state of motion of the body will depend on the:

- weight of the body
- point of application of the force
- direction of the force
- time over which the force is applied.

Forces that act on the body may originate internally or externally. Internal forces come from the actions of muscles or tendons, which act on bones with sufficient force to set them in motion. External forces that oppose motion include gravity, friction and fluid resistance, which are defined in the following table.

Table 9.3: External force definitions

External force	Definition	Example
Gravity	This refers to the earth's gravitational pull of 9.8 m/s^2	Runners who raise and lower their body excessively with each stride waste energy by continually trying to overcome the force of gravity
Friction	Resistance to motion caused by two surfaces touching each other	Friction may work for or against an athlete depending on their sport. For example, a gymnast tries to reduce friction by using chalk on their hands, while a table tennis player uses a bat with a special surface to increase friction to assist their grip
Fluid resistance	When a body moves through air or fluid, resistance to motion (drag) occurs. The faster you move, the more drag you encounter	Cyclists ride closely behind another rider to decrease air resistance (drag) and conserve energy

Summation of forces

Many sports involve an all-out effort, such as throwing a javelin, or jumping as high or far as possible. In order to achieve the optimum result, it is necessary for the athlete to combine the movement of different body parts into a coordinated sequence of movement. By also limiting the use of muscles that are not needed, less energy will be wasted.

When a maximal effort is required, summation of force (adding of forces together) is necessary. The summation of force can happen when everything happens at the same time or sequentially. When everything happens together, all the body parts move explosively at the same time, which results in the greatest possible force. This includes actions such as the high jump, gymnastic vault or judo kick.

In sequential body movements such as a tennis serve, the movement begins with the larger, heavier body parts with the greatest inertia (trunk and hips) and ends with the smaller, lighter body parts (lower arm and hand). In this type of action, the power generated in one body part is transferred to the next moving part. To get the greatest possible power, each part must contribute by developing its greatest velocity before the next part starts its action.

Momentum

Momentum is the product of the mass and velocity of an object (momentum = mass x velocity).

Linear momentum can be described as how difficult it is to stop an object or a body. All bodies have both mass and velocity, and when multiplied together they give a measure of linear momentum. Tenpin bowlers like to use heavier balls even if they are harder to control, as they have more chance of success because of the greater momentum at impact.

Angular momentum is the momentum of a rotating body such as a golf club or a figure skater and equals the body's moment of inertia multiplied by its angular velocity, or how fast it is turning.

Moment of inertia is a body's resistance to change when rotating about a specific axis. This varies not only with mass, but also with how this mass is spread from the axis of rotation. If the mass is spread a long way along the axis, the moment of inertia will be faster. For example, a figure skater who begins a spin with arms outstretched pulls in her arms and so reduces her moment of inertia, causing her to spin faster. A junior tennis player who grasps their racquet midway along the handle reduces the moment of inertia, causing their racquet to swing slower and so making it easier for them to control. This is why it is important for junior athletes to use shorter racquets or bats suitable for their size and strength.

Conservation of momentum

When two or more bodies collide with each other, momentum is conserved. In other words the total momentum of the bodies before impact is the same as their total momentum after impact.

For example, when a bat meets a ball, the total momentum is equal to the momentum of the bat and the momentum of the ball. After impact, the momentum of both objects may change (for example, the bat will usually slow down and the ball will travel much more quickly, but the total momentum still stays the same). This means that some momentum from the bat has in fact been transferred to the ball, or vice versa.

Levers

Mechanical lever systems are seen in many day-to-day tasks — wheelbarrows are used to carry heavy loads and bottle openers are used to open bottles. The human body is also made up of many levers (bones), which are pulled and moved by the forces of muscles acting via tendons. In sport, our arms and legs act as levers and in many cases we use a racquet, bat or stick, which adds an extra length to the body's lever.
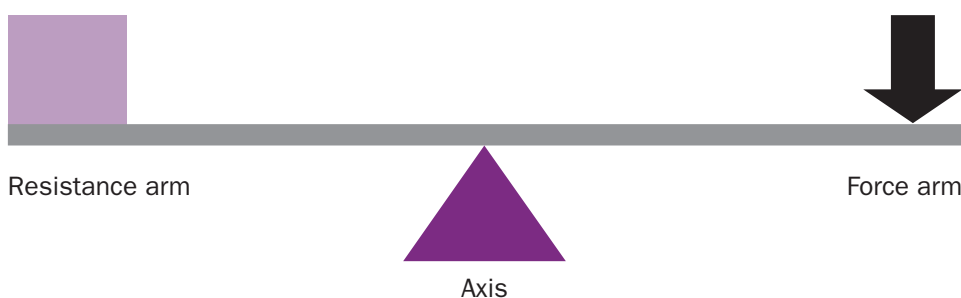
Levers have three main segments:

- a force arm (between the axis and where the force is applied)
- a resistance arm (between the axis and what is to be moved)
- an axis.

Levers have two main functions:

- to increase or magnify the force
- to increase the distance or speed with which the lever can be moved.

Figure 9.2: Basic lever system

Resistance arm   Force arm

Axis

Levers that increase force make it easier to do the work, as the lever carries out the function of force magnification. Its advantage comes when the axis is closer to the resistance than the force (the force arm is longer than the resistance arm).

Levers that increase speed operate at a mechanical disadvantage, meaning that more effort is required to move something, but the speed that it can be moved has increased. This occurs when the axis is closer to the force (the force arm is shorter than the resistance arm).

Figure 9.3: A force lever and a speed lever

Force lever   Speed lever
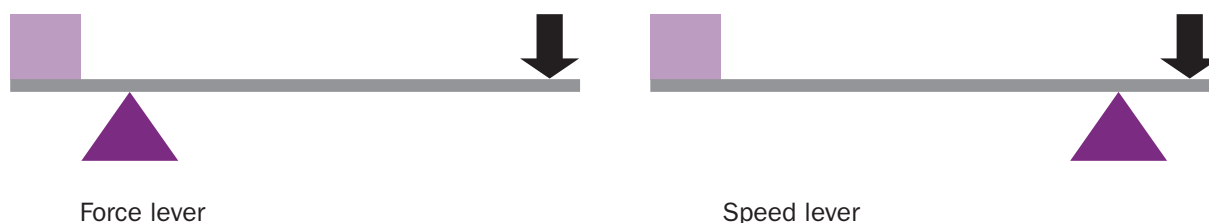
In many sports (such as tennis, squash, cricket and golf) technique has combined the use of both systems (speed and force). In the tennis serve, the arm and the racquet is the lever. The service action starts with the arm bent at the elbow and the racquet in the back scratch position, which gives a shorter lever and greater initial acceleration. The lever is extended to its maximum at the point of impact, as here the arm is fully extended and the racquet is at its highest point overhead. Thus, the head of the racquet will be moving faster than at any other point on the lever so that you can get the most powerful serve possible.

CASE STUDY

Jim is a weight-lifting coach who works with a young squad of lifters. The technique involved in lifting is one of the main areas that Jim is focusing on with his squad. Using the principles of levers, Jim works with his athletes to ensure that their technique for the clean and jerk lift maximises the force lever. Keeping the bar close to their body is important in improving their lifting capacity. Poor technique in some athletes results in them increasing the length of the resistance arm, which results in greater speed of movement but reduced lifting capacity. Jim is trying to ensure that their clean and jerk technique focuses on increasing the force arm, but with sufficient speed to successfully lift the weight.

Balance

Balance can be either static (standing still), or dynamic (moving).

- Static balance is required in sports where athletes stand still in a set position for a long time (for example archery, wrestling or shooting).
- Dynamic balance is required in sports where balance needs to be shifted easily (for example, fast-changing sports such as tennis or netball).

Stability

A key concept in stability is the centre of gravity of an object. This is an imaginary point where the weight of a body is balanced; that is, its balancing point. Due to the constant changing of the body's shape, the centre of gravity is also always changing. Usually it is located somewhere near the pelvic region. For females it is often slightly lower, but this depends on their body composition. Centre of gravity is directly related to a person's stability and balance.

A position with a high degree of stability requires a stronger force to be moved than a position with low stability. Not all sports require a high degree of stability — wrestling and gymnastics do, but others such as tennis and rugby union require stability to be shifted and varied.

The five basic principles to keep in mind regarding stability and balance are:

- weight — the greater the weight of an athlete the more stable they are, and in contact sports such as rugby union the more difficult they are to move. For example, in a rugby scrum, the weight and the techniques used affect the scrum's stability

- base of support — the base of support is comprised of the two feet and the area between them. For a body to remain balanced, the centre of gravity must be within the base of support. The wider the base of support or the further apart the feet are, the more stable a person is (for example, in surfing and archery)

- height — the lower the centre of gravity is above the base of support, the more stable the athlete is. The higher the centre of gravity, the less stable the body is and the easier it is to move or push off balance

- line of the centre of gravity — when a person's line of gravity is outside their base of support (see Figure 9.4), they are less stable. When the position of the centre of gravity is well centred over the base of support, it is difficult for wind or an opponent to move the body from its position. When quick movement is required athletes bend their knees slightly, which lowers their centre of gravity. They then position their centre of gravity close to the edge of the base of support area by leaning or tilting their body. A 100-metre sprinter in the 'set' position has their body positioned forwards over their hands ready for a quick start

- rotation — when something is rotating or turning around, such as a spinning ice skater or a bike with rotating wheels, stability is increased.

Figure 9.4: The line of gravity

Line of gravity

Base of support
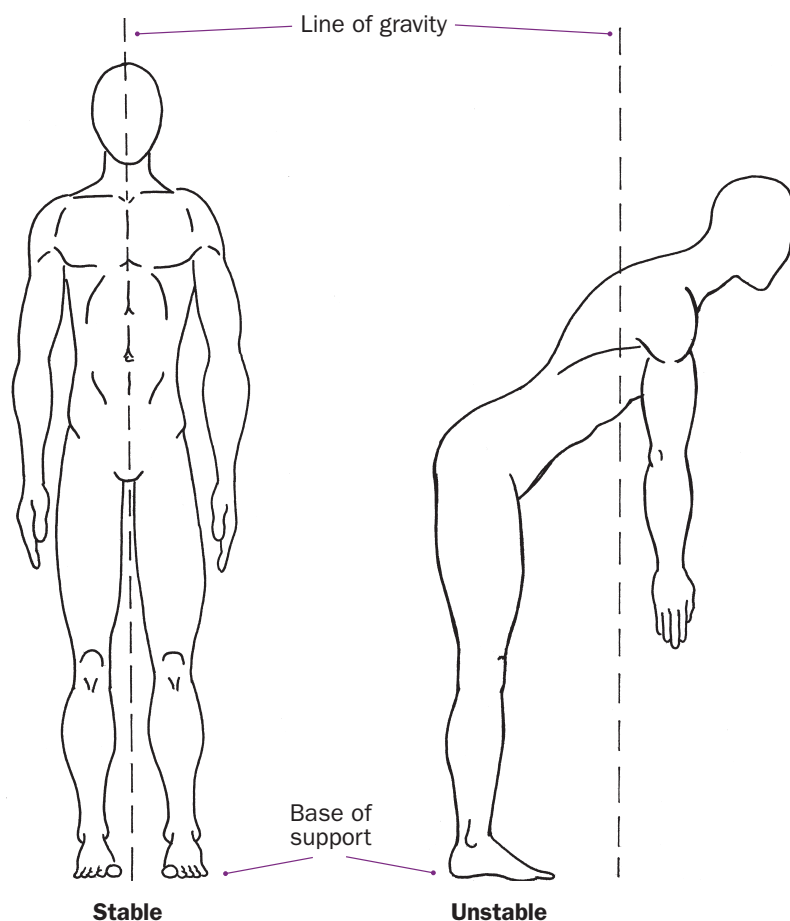
Stable   Unstable

CASE STUDY

Rosemary is a coach of an under-15 boys' basketball team and notices that Kamil, one of her taller players, seems quite unstable and is frequently being knocked over on court during defence. She decides to talk to Kamil at their next training session about maintaining a strong position on court, and to give him some key points to remember to help maintain his balance. Rosemary knows that stability depends on three factors:

- the base of support
- the height of the centre of gravity
- the line of the centre of gravity in relation to the base of support.

She explains to him that while it is good to be on his toes at times when he may want to move quickly in any direction, this also means that the line of his centre of gravity is close to the edge of the base of support, and it only takes a small knock or push from an opponent to then put him off balance. Rosemary suggests to Kamil that to stop him being pushed off his position he needs to increase his base of support by moving his feet further apart and lowering his centre of gravity by bending his knees. By keeping his weight in the centre of his feet (not on the heels or toes) he keeps the line of the centre of gravity well within his base of support.

Methods of analysing movement

A coach with an understanding of biomechanical principles, together with knowledge and experience of their own sport, can analyse an athlete's technique.

Movement analysis can be broken into two areas — qualitative and quantitative. Qualitative analysis can be as simple as a coach watching their athlete train or compete. While this assessment can be instantaneous it is subjective and non-numerical, meaning results or athletes are difficult to compare. This is the key difference with a quantitative style of analysis, which is numerical, and as such allows comparison to other athletes as well as comparisons to previous performances.

There are a number of tools that provide quantitative analysis to many different sports. The simplest is video analysis, which is accessible to most coaches. Through the use of freeze-frame techniques, coaches can analyse an athlete's body position and movements at critical moments in the execution of a technique. Other tools that are accessible to most coaches include 'radar guns' to measure speed.

At the higher end of quantitative analysis, there is a variety of laboratory and field-testing devices. These are generally only accessible to coaches working in higher-level programs such as state or national institutes or national team programs. Within the laboratory setting there are motion analysis systems that are used to measure kinematics, as well as force platforms that can measure kinetics. Some sport-specific field testing devices include instrumented force blocks (athletics), and force systems that mount on rowing and kayak paddles to give detailed kinetic feedback. High-speed cameras capable of capturing images at over 2000 pictures per second can enable access to detailed information on ballistic movements.

Using biomechanical analysis information to make changes

While there is a wealth of information that can be collected on athlete movement, coaches should carefully consider what they wish to do with this information, and how they will go about making changes to technique.

When considering making technique changes a coach should keep in mind the following:

- Consider whether the athlete is actually ready to change the technique. Sometimes anxiety or self-confidence can affect technique, and if this is the case it should be addressed first before any work on modifying technique begins.
- Consider whether the athlete understands the modifications that are needed and the reason for the change.
- Consider if the athlete has the physical capacity to do the required technique. Is the athlete strong or flexible enough to do what is required?
- Sometimes error in technique can be the result of a poor choice of technique or inappropriate response, rather than a problem with the technique itself.
- A technique flaw in the performance of gymnasts or ice skaters must be corrected because it relates directly to how their performance is judged. On the other hand, a basketballer with some technique variation that does not affect performance could be left alone. Natural flair may also lead to an athlete having an alternative technique, but this variation does not necessarily mean their technique should be changed.

Summary

By gaining a better knowledge of the structure of the human body, and how and why the body moves, coaches can undertake better analysis of their athletes, and use that information to improve athlete performance. Identifying and correcting errors in performance is part of the coach's role. Using scientific principles as the basis for obtaining information and recommending change is a valuable tool for coaches.

While coaches do not need to become experts on anatomy and biomechanics, by understanding and applying the principles involved with the structure and movement of the body they can become a better coach. Once a coach understands how a body works and performs a movement, they can:

- change technique to improve performance
- change technique to reduce the risk of injuries
- select the appropriate techniques and equipment to suit an athlete's individual needs
- communicate effectively with sports medicine and sports science personnel.

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Chapter 10:
Development and maturation

by Kym Guelfi and Grant Landers

Most coaches will encounter issues related to growth, development and maturation at some stage during their coaching career. Whether they are working with young children, adolescents, female athletes or masters athletes, coaches should be aware of the implications of growth and development on sporting performance. By being aware of these issues, coaches can individualise their coaching to suit the developmental needs of the athletes in their care.

Stages of growth and development

All children grow and mature at different rates, which in turn leads to varying rates of skill development. Childhood growth and development can be classified into three main phases — early childhood (0–6 years), late childhood (6–12 years) and adolescence (12+ years).

Early childhood

The early childhood years are characterised by moderate growth and rapid development of motor skills. As well as enjoying a wide variety of play during this time, children learn to:

- crawl, walk and run (body locomotion)
- hold and manipulate objects, throw and kick (object manipulation)
- balance, roll, twist and turn (body management).

Socially children at this stage are very focused on themselves. They tend to feel their ability matches their effort. They can also be very creative and imaginative, and thrive on opportunities to show their initiative as well as their steadily growing independence. Coaches need to maximise opportunities for gross-motor play that include a wide variety of activities for all the large muscle groups as well as for both sides of the body.

Late childhood

From the ages of 6–12 years, growth slows before the child reaches puberty and motor skills are consolidated. By the age of 12 years children are 80–90 per cent proficient in complex skills. This pre-adolescent period of late childhood is often described as the 'golden years' of skill development.

It is crucial that during this time children are able to develop fundamental movement skills through play, sport and physical activity.

Limited exposure to movement skills at these ages may not be reversible. Social and peer group pressures can also conspire to prevent motor development in adolescent years.

During these years it is vital that children have many opportunities to develop skills in their chosen sport, and are encouraged to participate in a variety of modified sports and activities. Physiological adaptations such as endurance and anaerobic threshold are not important at this stage and should be left until later in their development. Children who are physically active and enjoying their various activities will naturally improve their endurance capacity over time. The focus in training for the 6–12-years age group should be on teaching the skills well to all participants.

Children's social skills at this stage have improved from the early years and they are now generally happy to comply and participate well in small groups to begin with, moving to larger groups as they get older. They are now also more willing to share and have an increased awareness of rules and fair play.

Adolescence

Around the age of 9–13 years in girls and 11–15 years in boys, children undergo a growth spurt with a rapid increase in size. The timing and duration of this growth spurt varies greatly among individuals and between genders. Females typically begin this phase around two years before their male counterparts. This rapid growth also indicates the transition of a child through puberty to an adolescent. At this time hormones begin to run wild, and size and strength differences become more noticeable, as maturity levels can differ greatly among children.

During this time the focus shifts socially to the peer group and away from family and other adults. Adolescents also now become keenly aware that their effort may not match their ability, and this may increasingly affect their willingness to participate. During this time, competition may not be as important to many athletes, who may have joined in primarily to belong to a group and to have fun. Learning and mastering new skills can be a key motivator at this stage.

Coaches need to offer a balance between cooperation and competition, and be prepared to provide constructive feedback for individuals' contributions, keeping in mind the differing physical and social maturity levels of participants. It is also important during this time to consider matching heights and weights in some sports during training and drills. Social opportunities should be a primary focus during adolescence. Training should be fun and athletes should be offered some choices in what they do. For athletes who show interest, this can be extended to involvement in developing their program as a whole.

Long-term growth considerations versus early specialisation

How old a child is does not tell the coach a lot about their level of maturity. Consider the range of sizes in any under-14 basketball team — children at this age could be anywhere between 130 and 180 centimetres tall. Some children will have their growth spurt earlier than others of the same age. There could be as much as six years difference in age between the earliest maturing girl and the latest maturing boy. This wide variation poses a real challenge to coaches in junior sport. Throughout life different body parts also grow at different times. In the early part of life, for example, brain development is very rapid, then during adolescence the reproductive system starts to grow and develop more quickly.

As a coach of growing children it is very important to recognise that they are not simply little adults. Physical growth, mental development, hormonal changes, sexual maturation and social understanding vary immensely during the early years of life. Children differ greatly in strength, concentration and coordination, as well as in their body's ability to control their temperature compared to a mature adult.

As a coach it can be tempting to choose an athlete for certain positions based on their size. The short-term gains for the team can be significant, but in the long term the decision can lead to a real loss for the individual athlete. The early maturers are normally more successful at sport in the early years as they

tend to be bigger and stronger. Late developers, however, eventually catch up. It is the responsibility of the coach to challenge all athletes to continually develop their skills so that when they have reached maturity they will have the same skill sets as their friends, no matter what their size.

For children, skill development in all areas of a sport or activity is far more important than early specialisation. For example, if coaching Australian football to a group of 13-year-old boys it could be beneficial to the team to play the taller, stronger child in the ruck. However, specialising a 13-year-old as a ruckman will not allow for their development in other areas of the game, such as leading as a forward or learning to rove the packs. In five years time they may be just as tall and strong as their peers, but lack the necessary skills to enjoy different positions. Treat children as individuals and when looking for improvements, compare to their own previous results, not those of the group.

Impact of puberty

Perhaps the most challenging time in a young person's life occurs during the transformation from the body of a child into that of a young adult. This period follows the same growth rules just discussed. Specifically, it is a continuous process, with individuals growing at different times and rates. Until the age of nine, males and females are similar in physical size and mental development; however, from this age, gender differences start to become more obvious.

Both genders go through a growth spurt. In females this is usually from 9–13 years, with males following two years later at 11–15 years. This rapid growth period can create a number of issues for the child. At this time, for example, body proportions change dramatically, and arms and legs grow very quickly. This leads to periods of poor coordination and reduction in strength. In general the skeletal system (bones) grows first, followed by the growth of muscles (strength), and finally the nervous system (coordination) catches up.

During this time males and females begin to develop secondary sex characteristics such as:

- body hair
- deeper voice (male)
- growth of penis, testes and scrotum (male)
- development of breasts and uterus (female)
- commencement of menstruation (female).

Around this time gender differences become more noticeable as well. These differences are not limited to physical characteristics such as size, shape and strength, but include those related to social and psychological wellbeing, such as changes in body image.

Puberty in girls

As girls tend to reach puberty first they often become self-conscious about their new bodies. Girls start to notice that they are different to boys, particularly in the case of early female developers. The body composition of females begins to change with an increase in the percentage of body fat due to hormone changes. This change in body composition often leads to poorer physical performance due to a decreased power-to-weight ratio. These girls may be challenged when participating in activities against gravity, such as running and jumping; however, they may have an advantage in weight-supported sports such as swimming and water polo due to their increased buoyancy. In girls, late maturation can also be an advantage in sports such as gymnastics and distance running, where low body weight and narrow hips assist movement.

Puberty in boys

Late developing boys, on the other hand, tend to be more self-conscious about their lack of secondary sex characteristics, such as a deeper voice or a larger Adam's apple. Late developing boys will see all the girls change dramatically and their male friends get bigger and stronger while they are still in their childhood body. For some boys this can leave them embarrassed and discouraged, and if not supported through this phase they may drop out of sport altogether. To avoid this it is important to have a stronger focus on the social aspects of sport during this time. Late developers will then be encouraged to stay with their sport while their body matures. In males this phase can be very intense, and there can also be a plateau or drop off in performance due to a mismatch of body size when compared with earlier developing players, before strength catches up. Early developers, on the other hand, can experience significant early success due to their size and strength advantage, but may need to be reassured and encouraged to continue once others begin to catch up and competition again becomes more equal.

CASE STUDY

James coaches an under-13 football team. Toby is one of the players he has coached for a number of years, but recently things seem to have changed. Toby has started turning up late to training and games and seems slow to join in once he gets there. When he started watching him more closely, James noticed that Toby was often the odd one out when players paired up for drill practice.

James realises that Toby is a lot smaller than most of his team-mates and has not yet begun to mature. His body will mature when it is ready, but this is little comfort to Toby right now.

To draw him back into the team James considers some different options. As Toby is not as strong as the other members of his team he cannot kick the ball as far or as hard, so needs to continue to practise this to maintain his skill and confidence with the ball, but at the same time, because he is smaller he is quicker and more agile.

James knows that Toby is very good at weaving between cones due to his smaller size, so he invites Toby to demonstrate this skill to the rest of the team before they all practise it. In this case James is hoping to highlight Toby's strengths to the rest of the team. He also speaks privately to Derek, the team captain, who is a very skilful player. He asks Derek to have Toby as his partner for kicking drills during training sessions so Toby does not feel left out, and at the same time is able to work on his kicking skills along with the rest of the players. The other boys look up to Derek and so his pairing with Toby during skill work draws him back into the group again, making him feel both valued and included.

Overuse injuries in young athletes

Injuries can be classified into two categories: chronic, which are those caused by doing too much, or acute, which are short term and usually the result of an accident. Children can be affected by both forms of injuries; however, this text focuses on overuse injuries.

Overuse injuries are common in both children and adults but may be increased in children during rapid periods of growth. These types of injuries can occur as the result of not following the basic principles of training.

Problems of overuse can arise from:

- repeating an activity too often
- increasing the training load too quickly
- not having enough recovery time between training sessions.

It is very important as a coach to monitor younger athletes for signs of overtraining or overuse injuries, as the longer-term consequences can be far more serious than for adults.

One of the greatest concerns is for injuries to the growth plates. The growth plates are areas at the end of the long bones in the legs and arms of children that have not fully calcified. It is in this area that a bone becomes longer and a child will continue to grow until the growth plates close over. These growth plates can prematurely close through overtraining or training on hard surfaces. The result might be different leg lengths and stunted growth, so full height potential may not be reached.

As discussed previously, during growth a child's body proportions, size and composition can change dramatically and it may take time for muscle strength and coordination to catch up. With a change in body composition and size (for example, increased weight) there may be greater forces placed on the body without any increase in training load prescribed by the coach.

Training loads can be managed during growth periods by:

- reducing the training load and/or volume
- reducing the training session length
- reducing the amount of weight-bearing activity
- reducing the number of repetitions of an activity
- conducting an activity on softer surfaces (for example, grass rather than a netball court).

With rapid growth and changes in proportion, sufficient strength may not be available to continue to perform skills. In this case, technique may need to be altered to reduce the load placed on the muscles and joints, or equipment might need to be modified, such as increasing the seat height on a bicycle.

Overtraining

Overtraining is the result of not enough recovery time between sessions. Children and their parents frequently want to do many different sports and activities. In some cases children may swim before school then participate after school in football training, dance classes or basketball practice. Each coach or teacher tries to get the most out of every session they have with their athletes and may forget to take into account the energy that these children may be expending elsewhere. Coaches must try to communicate with both the children and the parents to identify what other activities and commitments the child has, to ensure that they do not become overtrained.

CASE STUDY

Sophie is an experienced coach of junior swimmers. The majority of her training program consists of technique development. She has been coaching 14-year-old Ben for nearly five years and is very pleased with his technique. Ben tells Sophie that he is getting a sore shoulder while swimming freestyle and is suffering quite a lot of discomfort during freestyle drills.

Sophie knows that Ben has grown about ten centimetres in the last two months. With her understanding of the process of growth and development in children and that the skeletal system is the first to grow, she knows that the soreness may be a result of the growth in arm length, without any corresponding increase in muscle strength around the shoulder. The longer arms place greater force on the joints without Ben having the necessary strength in the shoulders to propel him through the water.

Sophie talks to Ben about these changes and suggests he alters his freestyle technique by bending his arm a little more during the underwater phase of the stroke, thus reducing the force placed on the shoulder and easing the discomfort while swimming. Sophie then makes a note to continue to watch Ben's technique and monitor his growth and strength changes over the next few months.

Coaching junior athletes offers many opportunities and challenges. It is essential throughout these sometimes turbulent years to remember to manage every athlete as an individual, each with their own needs and aspirations as well as unique growth patterns and associated skill strengths.

Considerations for the female athlete

Although most principles of training apply to both males and females, the female athlete faces unique challenges, particularly due to the physiological changes associated with the menstrual cycle and other issues relating to reproduction, including pregnancy and menopause.

The menstrual cycle

A normal menstrual cycle involves a series of events occurring over a 28-day period in which the lining of the uterus (the womb) undergoes changes because of hormone levels in the body. This 28-day cycle is often divided into two phases: days 1–14 are called the follicular phase and start with approximately five days of menstrual bleeding, while days 14–28 are called the luteal phase. It is important to remember that cycle length can vary from person to person, and even from one cycle to the next within the same person. A normal cycle can be as short as 21 days or as long as 40 days.

The main hormones that change during the menstrual cycle are called oestrogen and progesterone. The levels of these hormones (and so the phase of the menstrual cycle) may affect certain types of athletic performance. However, it is important to remember that each woman's experience with the menstrual cycle will be different and while exercise performance may be impaired in some females, in others there may be little or no effect.

Volume of blood loss

One of the key factors that varies greatly between females is the amount of blood lost through menstruation and symptoms associated with this monthly bleeding. Firstly, the volume of blood lost during menstruation is approximately 40 millilitres (or two tablespoons); however, in some females this can exceed 200 millilitres (or more than ¾ of a cup). Regular heavy blood loss may lead to anaemia (low red blood cells) and decreased ability to carry oxygen around in the blood, which can affect endurance performance. If this is the case, the athlete's iron levels should be closely monitored and attention paid to getting enough iron in the diet.

Physical discomfort

Some athletes may experience painful abdominal cramps or a slight increase in body weight in the days just before menstruation, due to the body's tendency to store extra fluid at this time. Increased body weight may in turn affect performance in sports in which body weight plays an important role, such as those involving weight categories (for example, judo or rowing) or those involving jumping or moving the body weight against gravity (for example, high jump or gymnastics).

Mental state

For some females their mental state may be affected more than others by the phase of the menstrual cycle. Some women may experience more negative moods in the days just before and during menstruation.

Body temperature

Coaches also need to be aware that body temperature increases by 0.5°C after ovulation (about day 14 of the cycle). This rise in body temperature stays throughout the luteal phase. When the body temperature is higher, it means that the body may not start to sweat until it reaches a higher

temperature during exercise, which can place extra strain on the heart and blood vessels. As a result, endurance athletes competing in hot, humid environments may find it beneficial to coordinate the menstrual cycle to avoid important competitions in the luteal phase. On the other hand, there is some research that this same luteal phase may be better for longer (more than 90 minutes) endurance performance because high levels of the hormone called progesterone at this time can help to burn more fat during exercise and save carbohydrate (making carbohydrate stores in the body last longer, which may help performance).

Factors not affected

Generally, athletic performances involving muscular strength do not seem to be affected by the phases of the menstrual cycle. Similarly, maximal aerobic capacity (the maximum volume of oxygen that can be consumed by the muscles during exercise) does not seem to be better or worse at any time of the cycle. This means that females involved in strength-specific (for example, weightlifting) or intense aerobic events (for example, middle-distance track events) do not need to worry about coordinating the menstrual cycle with major competitions.

Using oral contraceptives to regulate the cycle

To prevent some of the possible negative effects of the menstrual cycle on performance, some athletes might decide to use oral contraceptives to regulate their cycle (that is, to coordinate their cycle with important competitions). Although this can be useful, there is some debate about using oral contraception and its affect on training and performance. One possible negative concern is that some women may experience weight gain.

CASE STUDY

Peter is an experienced coach of a group of endurance runners. In his squad he has both male and female athletes and a range of ability levels. His two best female runners, Olivia and Keira, are highly competitive at state level. He is currently preparing the women for the state marathon and is aware that the phase of the menstrual cycle may affect their performance in an endurance race such as this. Olivia experiences heavy menstrual bleeding and abdominal cramps, while Keira does not seem to be affected at all. Based on this, Peter suggests that Olivia visit her doctor (months before the race) to discuss the use of an oral contraceptive pill to help alleviate her severe symptoms, as well as to have the option to manage her menstrual cycle to avoid her period falling at the time of the race. In contrast, he and Keira agree that it is not an issue to worry about in preparing for her race, as her menstrual cycle appears to have little impact on her performance.

Effect of training on the menstrual cycle

As well as considering the effect of the menstrual cycle on athletic performance, it is important to consider the opposite effect of intense training itself on the normal menstrual cycle.

The average age of the onset of menstruation is 11–13 years. However, this age can often be delayed to around 15 years in girls training strenuously from a young age. Other factors that can increase the age of the first menstruation are low body weight and fat levels. If menstruation is delayed beyond 16 years of age, it is called primary amenorrhea.

It is also important to note that some athletes may not have a normal menstrual cycle **because** of their training. This common menstrual disturbance is called secondary amenorrhea. This is when the regular menstrual cycle has started as expected and then stopped and menstruation has been absent for a long period of time. Amenorrhea affects around 20 per cent of female athletes, but the risk is much higher in endurance runners. Although high training load (overall energy expenditure) is a common cause of amenorrhea in athletes, there are also other possible causes, including abnormal hormone

levels or emotional stress. If intense training is identified as a factor causing amenorrhea, normal menstruation can be restored by a reduction in training load (by approximately 10 per cent) and an increase in body fat (around two kilograms in weight).

Female athlete triad

The coach should also be aware that amenorrhea is commonly linked with two other conditions — disordered eating and osteoporosis. Together, these three conditions are called the 'female athlete triad' and are often found in females participating in sports where there is pressure to have a thin physique or low levels of body fat (that is, endurance sports, sports using weight categories, sports involving revealing clothing, or scoring based on athletic appearance). This pressure contributes to disordered eating, which includes a broad range between the extremes of anorexia (excessive restriction of food intake) and bulimia (repeated binge eating followed by purging by vomiting or use of laxatives). The prevalence of disordered eating may be as high as 60 per cent in some sports. This is of concern, as disordered eating and low levels of body fat can impair performance, increase the risk of injury, as well as lead to amenorrhea and reduced bone density, possibly causing osteoporosis (increasingly fragile bones) and fractures in later life.

For these reasons, coaches of sports at risk of the female athlete triad should be alert to possible signs such as tiredness related to an inadequate diet or anaemia, poor body self-image, a high heart rate or history of fainting (low blood pressure). Keep in mind that the affected female may not always be abnormally thin. In addition to seeking medical advice, the coach's role should be to help educate and encourage sensible nutritional intake through open discussion of food habits and weight, as well as to decrease exercise intensity and the frequency of competition as necessary to restore menstruation. Ensuring adequate calcium intake is also important and oral contraceptives may be useful in restoring menstruation and hormone levels to reduce loss of bone density.

Pregnancy, training and performance

Pregnancy is the most stressful physiological event in a healthy woman's life, with major changes occurring in several body systems and functions, including changes in the heart, blood flow, breathing, metabolism, and regulation of heat, hormones and the musculoskeletal system. Pregnant women in the past have been discouraged from participating in exercise due to concerns that it may harm the growing baby or increase the risk of early labour. These days, however, it is well known that the benefits of keeping physically active far outweigh any negative risks in healthy pregnancies.

Current recommendations are for all women with healthy pregnancies to continue with aerobic exercise and strength conditioning. The aim generally should be to maintain good fitness without trying to reach peak condition or train for athletic competition. This is because overall fitness levels will decline slightly in most pregnant athletes.

Considerations for pregnant athletes

- A 10–15 beats per minute **increase in heart rate** both at rest and during moderate exercise can occur. This will affect heart rate training zones, with less effort required to reach higher heart rates.
- **Decreased blood pressure** may occur, which can increase the risk of dizziness or fainting. For this reason, athletes must take care when stopping exercise suddenly, or any activities involving rapid changes in position/posture (that is, from upright to lying down).

- **Decreased joint stability** (due to changing hormone levels), increased body weight (by around 12 kilograms) and a change in the body's centre of gravity (moves forward and up) all mean that care should be taken with weight-bearing exercise (due to increased loading at joints) or sports involving frequent changes in direction, jumping or impact/contact (due to increased risk of injury and possible difficulties with balance).
- **Temperature regulation** should be given close attention, since high body temperatures (greater than 39°C) have been linked to problems in a baby's development. Athletes should avoid exercise in hot, humid environments, ensure adequate hydration by drinking plenty of fluids, and dress in cool clothing for exercise.
- Athletes should **avoid exercise** lying on the back after the first trimester of pregnancy, since the enlarged uterus can put pressure on major blood vessels.
- Athletes should ensure that **food intake** is enough to fuel both the exercise and the growing baby. After week 13 of pregnancy, an extra 1200 kilojoules (equivalent to roughly four slices of white bread) are needed for the growing baby. Low-carbohydrate diets should be avoided, since an increased amount of carbohydrate is burnt for energy during pregnancy. Adequate iron and calcium intake are also important.

Pregnancy and high intensity training

For women wanting to continue high intensity training, medical supervision is required since there is still debate about intense and prolonged exercise, with no set upper limit. Warning signs to immediately stop training and seek medical advice include:

- vaginal bleeding or leakage of amniotic fluid
- difficulty breathing before exercise
- dizziness or headache
- chest pain
- muscle weakness
- calf pain or swelling
- abdominal pain, especially in the back or pubic area (this includes painful uterine contractions)
- decreased movement of the baby.

Returning to training after birth

After birth, the return to training will depend on how the baby was delivered. Delivery by caesarean will necessitate a longer recovery period. For breastfeeding mothers, exercise does not seem to have any negative effects on the amount or quality of breast milk; however, maximal exercise may increase the concentration of lactic acid in the milk, making it less appealing to the newborn. To prevent this (plus the discomfort of exercising with heavy breasts), it may be desirable to either feed or express milk before training.

Menopause, training and performance

Menopause typically occurs at around 50 years of age, but can occur as early as 35 or as late as 59. At this time changes in hormone levels cause menstruation to stop permanently. Other effects of these hormonal changes (mainly decreased oestrogen) include decreased muscular strength and loss of muscle mass. There is also an increased risk of osteoporosis or bone fracture, so care should be taken with activities that are high impact or carry a high risk of falling.

Every woman's experience of menopause will be different and this can vary with the influences around her and her overall lifestyle. Some women may suffer from physical and emotional symptoms during menopause that should be treated. These symptoms may include hot flushes, loss of libido, mood changes, irritability, forgetfulness, fatigue and loss of strength.

Coaching tips for managing menopause

Coaches should:

- find out as much as they can about hormone changes and the impact it has on training and performance
- be sympathetic and supportive, as this phase of life can last between five and ten years
- recognise symptoms associated with hormonal changes as just outlined
- encourage the athlete to maintain a training diary so that changes can be made. Options could be to train less and at a lower intensity, add more frequent and longer recovery periods, remove the stress of competition and consider cross training as an alternative
- work as a team — athlete, coach and doctor.

(Source: Sports Medicine Australia, Women in Sport Fact Sheet No. 4)

CASE STUDY

Angus is the long-time coach of a masters triathlon squad. Most of his athletes joined the squad some time ago to participate in ironman events together and he knows them all very well. Lately, one of his stronger athletes, Lucy, has seemed unsettled and has become very upset with some of her fellow squad members over a matter that usually would not have bothered her. Angus knows this is out of character and watches Lucy more closely during training. He notes that she is struggling to maintain her usual efforts in the gym and also seems more tired than he would have expected at the end of sets in the pool.

Angus reviews Lucy's training diary, which is regularly maintained with information regarding diet and personal wellbeing, as well as specific details of her training in each discipline. Together they go through the last few weeks looking for anything that does not seem quite right. First Angus checks Lucy's food intake. This looks fine, as does her rest and sleep patterns. Lucy seems to be getting plenty of rest; if anything she seems to be sleeping more than Angus would have expected. Finally he looks at her training program and also her other commitments outside sport. Again all looked balanced, and on past performance should not result in overtraining. Angus does notice, however, that Lucy's feelings recorded with smiley faces along the bottom of the page were regularly frowning and some even show tears.

Having eliminated other possible problem areas, Angus concludes that at age 45 Lucy may be just beginning menopause. He raises this with Lucy. They decide to continue to maintain her diary to keep track of changes and her responses to them. Angus will also reduce her training loads in both volume and intensity. He knows that Lucy will benefit from more-frequent and longer rest periods both in training and in the program generally. He also suggests that she meet with her doctor and reassures her that symptoms of menopause can be treated and eased significantly. He offers to meet with Lucy's doctor as well, so together they can plan for and manage her training over what could be a 5–10-year phase.

The successful management of female athletes throughout their sporting careers is fundamental to their physical wellbeing, enjoyment and continued participation in sport. Coaches must take the time to listen and learn how to manage each athlete as an individual, remembering that every woman's experiences of menstruation, pregnancy and menopause are entirely unique. There are many resources available to assist coaches with the most up-to-date information on issues specific to women in sport and it is the coach's responsibility to locate and access these, as well as to seek further assistance from a doctor or nutritionist as required.

Summary

Coaches need to take into consideration the stage of growth and development of the athletes that they work with. Each athlete will have individual needs, and may experience various aspects of development and maturation differently. By taking these individual differences into account, coaches can ensure that they develop training programs that are appropriate for all the athletes. The coach can play an important role in supporting athletes at the various stages of development and maturation. For example, supporting an athlete going through an adolescent growth spurt who seems to lose their coordination and experiences a drop in skill level. Coaches should aim to understand the development and maturation process, and ensure that their program takes this into consideration.

References and further reading

Australian Sports Commission 2002, *Pregnancy in Sport: guidelines for the Australian sporting industry,* Australian Sports Commission, Canberra.

Sports Medicine Australia, *Women, Menopause and Sport,* Women in Sport Fact Sheet No. 4.

Chapter 11:
Nutrition for sport

by Gary Slater

It is important for a coach to recognise that what athletes eat and drink will have an impact on their sports performance. A coach has regular contact with athletes, and it is only natural that they look to their coach as a valuable source of information on a wide range of issues, including diet. Therefore, the coach should understand key sports nutrition principles and knows where to go if they want further information. It is also important to have an appreciation of factors that can influence the dietary intake of athletes, including their:

- cooking and shopping skills (or those of their parents)
- dietary practices and knowledge of significant others, including family, friends, team-mates and flatmates
- study and/or work commitments
- financial stability
- travel commitments.

The importance of nutrition for sports performance will vary depending on the sport, but it is fair to say that all athletes will benefit to some degree by considering their diet. Eating to optimise performance does not just happen; it takes a certain amount of knowledge, hands-on skill and commitment. However, it is not about athletes avoiding all of their favourite foods. There are no good and bad foods — all foods can be incorporated into an athlete's meal plan. It is a case of getting the proportions right for each individual. Sports nutrition focuses on providing an athlete with the fuel they need and uses their food preferences to achieve this. This chapter provides a general overview of the important ingredients in a well-planned diet for an athlete. It is not intended to be complete or replace the expert knowledge of a sports dietitian.

Nutritional demands of exercise: the training diet

No one, magic food exists with all of the nutrients the body needs in the correct proportions. Rather, athletes should select a wide variety of foods from each of the food types, such as vegetables, fruit, cereals and grains, legumes, meat, fish and dairy foods. Variety also means the range of foods within each of these types (for example, cereals could be wheat, oats or rice). A variety of foods are encouraged because the nutritional benefits can be very different between each food type. In fact, some nutrition authorities suggest we should eat at least 30 different foods each day. Eating a greater variety of foods each day ensures a greater variety of nutrients in your diet, including those we know about and those yet to be discovered.

Regular exercise increases demands on the body's energy supplies and fluid reserves. Meeting this increased demand is a high priority for hard-training athletes. High-energy expenditures during training dictate the need for higher-energy meal plans. While this might sound easy, an over-committed lifestyle with training, work, study and family commitments can limit opportunities to meet total energy requirements, demanding novel strategies to overcome such obstacles for each athlete. The following sections focus on the key energy-providing nutrients in an athlete's meal plan — carbohydrate, protein and fat.

Carbohydrate

As carbohydrate is the main fuel burnt during exercise, focusing on a carbohydrate-rich meal plan can help build fuel reserves, delay fatigue, enhance recovery between sessions and maintain immune function. The harder and longer an athlete trains, the higher their carbohydrate needs. As such, carbohydrate needs will vary from day to day according to the intensity, duration and frequency of training sessions. Carbohydrate intake should be highest on heavy loading days and lower on recovery days. Table 11.1 provides a guide to daily carbohydrate needs. However, these recommendations need to be balanced against total energy needs over the day and the requirement for other nutrients.

Table 11.1: Daily carbohydrate requirements

Exercise load per day	Carbohydrate intake (grams per kilogram per day)
Light (< 1 hour)	3–4
Light to moderate (1 hour)	4–5
Moderate (1–2 hours)	5–6
Moderate to heavy (2–4 hours)	7–10
Heavy (4–5 hours)	10–12+

Selecting nutritious carbohydrate-rich foods such as wholegrain bread and other flour-based products, cereals, pasta, rice, noodles, fruit in all its forms, legumes, starchy vegetables (for example, potato and corn), and low-fat dairy products, not only assists in achieving carbohydrate needs but also provides essential nutrients. As such, wholegrain and less-processed carbohydrate-rich foods are generally considered to be nutrient dense, contributing a large part to daily vitamin, mineral and fibre intake.

CASE STUDY

Julia coaches a group of high school female rowers who typically train three to four mornings a week during school term. During a mid-term break a training camp is held in preparation for a major regatta in two months. With two daily training sessions, several of the girls complain of fatigue and tiredness after the morning row on the third day. Recognising that training volumes have doubled those usually experienced during the school term, Julia quizzes the athletes about their dietary intake.

Despite the increase in training load, few athletes have increased their carbohydrate intake, indicating that the frequent training sessions often coincide with snack times, meaning the athletes are only eating three or four times a day. Julia instructs the girls to make use of sports drinks during training sessions and to bring compact carbohydrate-rich snacks with them (for example, cereal bars, fruit yoghurt, dried fruit and fruit bread) for recovery snacks immediately after getting off the water. Combined with a lighter afternoon training session, the boost in carbohydrate intake helped the girls get through the training camp and compete successfully at the regatta.

Many carbohydrate-rich foods are also a valuable source of protein. Consequently, carbohydrate-rich foods should form a significant part of each and every meal/snack. Having an appreciation of the carbohydrate content of foods can make it easier to compare daily carbohydrate intake against recommendations. Table 11.2 provides a list of carbohydrate-rich foods and the amount of each food required to obtain 30 grams of carbohydrate.

Table 11.2: Carbohydrate-rich foods

Food/fluid	Serve	Food/fluid	Serve
Nutritious carbohydrate foods		Dried fruit	½ cup
Rice	½ cup	Milk**	2½ cups
Noodles/pasta	⅔ cup	Yoghurt (fruit)**	200 grams
Bread/fruit loaf	2 slices	Fruit juice	1½ cups
Bread roll	1 medium	**Refined carbohydrate foods**	
Crumpet	1½	Jam/honey/syrup	2 tablespoons
Muffin (English)	1	Sugar	1½ tablespoons
Muffin (baked)	½ large	Chocolate*	50 grams
Rice cakes	3 slices	Ice cream*	6 scoops
Potato	2 medium	Potato chips*	1 cup
Corn	1 cup	Jubes/jelly beans	50 grams
Breakfast biscuit	3	Jelly	¾ cup
Flake and fruit cereal	1 cup	Soft drink	1 can (335 millilitres)
Oats (cooked)	1½ cups	Cordial	1½ cups
Kidney/baked beans	1 cup	Ice block	2
Cereal bar	1	**Sports nutrition supplements**	
Muesli bar*	1½	Sports drink	2 cups
Fruit salad	2 cups	Carbohydrate gel	1
Apple/pear	2 medium	High-carbohydrate drinks	⅔ cup
Orange/mandarin	2 large	Sports bar	⅔ bar
Banana	1 medium	Carbohydrate loader powder	1½ tablespoons

* Higher fat — not recommended as a first choice carbohydrate source

** Preference for low-fat varieties

Source: Australian Department of Community Services and Health, 1995

Tips for achieving a high-carbohydrate diet

- All meals and snacks should be based on nutritious carbohydrate-rich foods such as noodles, rice, pasta, bread and other flour-based foods, cereals, fruit in all its forms, legumes and starchy vegetables. These foods should take up half of the plate during heavy loading days.

- Vegetables are very nutritious, but only potato and corn contain significant amounts of carbohydrate. Thus, vegetable-based dishes should be accompanied by some carbohydrate-rich food (for example, rice, noodles and bread) at a meal.

- Carbohydrate-rich snacks should be included in the meal plan each day. It can be very difficult to achieve carbohydrate requirements from just three meals a day. Snacks such as sandwiches, fruit bread, cereal bars, fruit yoghurts, fresh and dried fruit, low-fat fruit smoothies, pancakes and scones are excellent choices.

- Including small serves of refined carbohydrate foods such as jam and honey can be an easy way of boosting carbohydrate intake for those with very high carbohydrate needs. As a very concentrated source of carbohydrate, these foods can increase total carbohydrate intake without adding to the bulk of a meal.

- Sports drinks should be used during intensive sessions lasting longer than 60–90 minutes, depending on the intensity of the session. They help to meet both fluid and carbohydrate needs simultaneously.

Note: The Australian Institute of Sport has investigated the relative benefits and potential concerns associated with the use of sports drinks. Visit the AIS Sports Nutrition website (www.ais.org.au/nutrition/documents/SupSportsDrink07.pdf) for further information.

Protein

It was previously a common belief that protein was the major fuel used during exercise. We now know that carbohydrate and fat are our main energy sources; however, protein still plays many essential roles in the body. Each protein is made up of differing combinations of amino acids. In fact, our dietary requirement for protein is actually a need for amino acids. Twenty amino acids make up all of the proteins in our diet. Nine of these are essential; the body cannot make them, so they must come from the diet. Protein from animal food contains all the essential amino acids, while plant protein does not. Choosing a wide variety of protein-containing food ensures both vegetarians and non-vegetarians obtain adequate amounts of essential amino acids. While meat, seafood, poultry and dairy foods are especially good sources of protein, many plant foods also contain moderate amounts of protein and can contribute significantly to total daily protein intake. Table 11.3 shows the dietary sources of protein, including both animal and plant foods. Each serve contains 10 grams of protein.

Table 11.3: Dietary sources of protein

Animal	Plant
30–35 grams beef/lamb/chicken/pork	2 cups rice (cooked)
50 grams fish	2 cups noodles/pasta (cooked)
2 medium eggs	120 grams tofu
Glass milk/soy milk	4 slices bread
2 slices of cheese	2 cups breakfast cereal
200 grams yoghurt	¾ cup baked beans/lentils
¼ cup cottage cheese	⅓ cup nuts
½ cup liquid meal supplement	2 slices fruit bread

Athletes obtaining their protein from purely plant sources should consume a variety of the foods listed in Table 11.3 each day to ensure that they obtain all necessary amino acids.

Muscle protein is constantly being made and broken down. Some of this protein is recycled in the body while the remainder must come from the diet. The recommended dietary intake for protein in the general population is 46 grams for females and 64 grams for males, or ~0.8–1 grams per kilogram of body weight daily. Both strength and endurance athletes have greater protein needs than inactive people (50–100 per cent more), depending on the training undertaken and training status of the athlete (see Table 11.4).

Table 11.4: Daily protein requirements of athletes

Population	Estimated protein needs for males (grams per kilogram per day)
Recreationally active	0.8–1.0
Resistance training (inexperienced athlete)	1.5–1.7
Resistance training (experienced athlete)	1.0–1.2
Endurance training	1.2–1.6
Adolescent athlete	1.5–2.0
Female athlete	15 per cent lower than males

Source: Burke, 2007

Fortunately, the high food intake of most athletes ensures a generous protein intake, usually well above requirements. As food intake is increased with the additional energy needs of training, the greater protein needs are easily achieved from a diet selected from a wide variety of foods without the need for expensive protein powders or bars.

While heavily training athletes have greater protein needs than inactive people, the very high protein intakes consumed by some athletes are unnecessary and unlikely to enhance athletic performance. In fact, they may potentially displace other important nutrients from the diet. Conversely, a minority of athletes may be at risk of eating too little protein. Athletes on low-energy diets, and fussy or restrictive eaters, risk eating inadequate amounts of protein, leaving little for muscle repair and growth. Not eating enough protein can compromise muscle size, slow recovery and have serious health problems, such as compromised immune function, if continued for an extended time.

Some individuals choose to follow a vegetarian meal plan, avoiding all animal flesh including red meat, seafood and poultry, but usually including eggs and dairy products. Such eating patterns can easily meet the requirements for protein and other nutrients as long as foods of similar nutritional value are used daily to replace the animal flesh, such as lentils, dried beans and peas. Ready-to-use products are also available, such as tofu, tempeh, textured vegetable (or soy) protein, and ready-made nut, soy or wheat-derived alternatives, eggs and dairy products. Vegetarian athletes should consult a sports dietitian to ensure they are selecting appropriate foods throughout the day to achieve protein and other essential nutrient needs (for example, iron and zinc).

Tips for pumping up the protein

- Including a small serve of protein-rich food at meals and snacks (including pre and post-training opportunities) is preferable compared to achieving daily protein needs from just one or two meals. For example:
  - milk on cereal at breakfast
  - a tub of yoghurt with fruit salad as a snack or easy dessert option
  - lean cold meat or cheese on a sandwich
  - lean meat, fish, chicken or vegetarian alternative with an evening meal.
- Athletes should be guided to choose meal combinations that match protein requirements with other nutrient needs. For example:
  - three or more serves of low-fat dairy foods daily for protein and calcium
  - one or two serves of lean meat, fish, chicken or vegetarian alternatives daily for protein, iron and zinc.
- Some athletes avoid important protein-rich foods such as meat and dairy foods in the belief that they are fattening. Low-fat varieties of these are readily available and remain excellent sources of protein and other essential nutrients.

Fat

Dietary fat is one of the most commonly discussed yet poorly understood nutrients. With approximately twice the energy of carbohydrate and protein per gram, fat is a very concentrated source of energy. It provides essential fatty acids and fat-soluble vitamins essential for maintaining health and can be an important source of energy. Fat also enhances the flavour and texture of many foods and simplifies the cooking process. In fact, fat is an essential component of a well-chosen diet — it is just a case of getting both the quality and quantity right.

Like most members of the public, many athletes eat too much fat. A high fat intake carries with it the potential to promote body-fat gains and lifestyle-related diseases such as cardiovascular disease. This is especially so for a diet rich in saturated fat, the fat primarily found in animal foods. Of more immediate concern to an athlete is that a diet high in fat can limit carbohydrate intake. Moderating fat intake will help ensure requirements for fat and associated fat-soluble vitamins can be met without compromising carbohydrate intake.

Tips for keeping a low-fat profile

- Choose low-fat methods of cooking such as grilling, dry or light frying, baking on a rack, microwaving, steaming or poaching. All these techniques require little or no added fat/oil.
- Use non-stick pans and make use of oil sprays, providing just the right amount of oil for cooking — a very fine film to stop the food from sticking.
- When oil is required during cooking, choose predominantly unsaturated vegetable oils such as sunflower, canola, corn, soya, olive and flaxseed, rather than artery-clogging animal fats, palm or coconut oil, or hydrogenated vegetable oils.
- Choose lean cuts of meat and chicken. Trim meat of all fat and remove the skin from chicken prior to cooking. When purchasing meat, look for the cuts without marbling (a fatty/streaky appearance). Limit intake of sausages, fatty mince, processed meats and 'luncheon' meats. Try to include fish in your diet.
- Be aware of the fat added to many foods — butter, margarine or mayonnaise on bread, oil-based dressings on salad, oil in tinned fish and meat, or cream (coconut or dairy) in sauces. Use these sparingly or try low-fat alternatives (for example, oil-free dressings, low-fat mayonnaise, evaporated skim milk with coconut essence, tinned fish in water or brine).

- Use low-fat varieties of foods now readily available (for example, dairy products).

- Do not be misled by labelling claims such as 'cholesterol free', 'reduced fat' or 'light'. Learn how to read food labels, avoiding products high in saturated fat.

- When dining out, choose lower-fat options. This will be especially important if a busy lifestyle results in an increased reliance on takeaway meals. Look for options that are based on noodles, rice or pasta, with a healthy serve of vegetables and some lean meat, fish or chicken. Avoid deep-fried choices, creamy or satay sauces, and options with lots of added oil. Alternatively, double up on ingredients when meals are prepared at home, ensuring leftovers are available for another night of the week.

- High-fat snacks such as potato or corn crisps, chocolate, biscuits and cakes should only be enjoyed in small quantities and not form the base of mid-meal snacks. A better option is using high-carbohydrate, low-fat snacks such as sandwiches, fruit bread, fruit, cereal bars, scones, low-fat muffins and low-fat fruit yoghurt.

Hydration

Even before sweat losses from exercise are considered, the average person requires about two litres of fluid per day. Sweating is the body's primary method of dissipating excess heat and is influenced by an array of factors, including exercise intensity and environmental conditions. Basically, the hotter it is and the harder an individual works, the more they sweat. Rates of one to two litres per hour are not uncommon among athletes training hard during summer. Failure to match fluid intake to sweat rates results in dehydration, which affects the body in many ways, including impairment to:

- endurance exercise performance

- thermoregulation, or the ability to regulate body temperature, increasing the risk of heat stress

- mental function and skill coordination, with perception of effort increasing

- gastrointestinal function, increasing the risk of nausea/vomiting and slowing the rate of fluid absorption, so as dehydration sets in, it becomes increasingly difficult to reverse the fluid deficit.

Even mild dehydration (2 per cent body weight reduction or 1.2 litres for a 60-kilogram athlete) can compromise exercise performance in warm environments. The impact on performance is proportional to the degree of dehydration — the more dehydrated an athlete becomes, the more their performance suffers. Furthermore, as the level of dehydration increases, so too does the risk of developing heat exhaustion and heat stroke. In short, each athlete should attempt to minimise dehydration by matching fluid intake with sweat losses as best they can. Replacing 80 per cent of losses is achievable for most athletes, or limiting weight loss during a session to less than 1 per cent (that is, 0.6 kilogram for a 60-kilogram athlete). Unfortunately, the voluntary fluid intake of many athletes replaces less than two-thirds of sweat losses. This is because most people rely on thirst, a very poor indicator of fluid requirements, to gauge their fluid needs.

Tips for remaining well hydrated

- Start each session well hydrated by making sure fluid losses from the previous session have been replaced. Drinking in and around training and meals is a great start, but there needs to be a conscious effort to drink throughout the day, especially in summer. Athletes should keep a drink bottle at their side, all day every day, filled with chilled tasty fluids. The type of fluid may be determined by individual energy needs; that is, water for those with lower-energy needs, while those with higher needs may benefit from nutritious drinks such as fresh fruit juice, low-fat milk shakes/smoothies, etc. This ensures ready access to fluid and is also a great reminder to drink.

- Experiment with a moderate volume (~250–500 millilitres) of fluid in the 15–30 minutes prior to exercise. This not only helps increase total fluid intake but also primes the stomach to maximise fluid uptake while exercising.

- Start to drink early and at regular intervals during exercise in an attempt to match fluid intake with sweat rates. Athletes should take advantage of all breaks in training/competition, both formal and informal, to access fluid. With a little training, athletes should be able to tolerate 600–1000 millilitres of fluid per hour or 150–250 millilitres every 15 minutes. Coaches should remember to schedule regular breaks in training to ensure ready access to fluid throughout a session.

- Water is an excellent choice for shorter-duration or low-intensity sessions, but athletes should consider making use of sports drinks during longer sessions (that is, lasting more than 60–90 minutes). They help to achieve both fluid and carbohydrate needs simultaneously, and most athletes find sports drinks more palatable. This ensures more fluid is consumed, reducing the potential for dehydration. The small amount of sodium in sports drinks further enhances palatability, maintains the drive to drink, and promotes retention of the fluid consumed. Keeping drinks chilled (~15°C) in a cooler is another excellent idea for maximising palatability of fluids. Athletes should be encouraged to drink water between sips of sports drink, further boosting fluid intake while also maintaining good oral hygiene.

- Monitor athletes' weight before and after exercise. Any weight loss during a session reflects an accumulated fluid deficit (for example, one kilogram of weight loss equates to a fluid deficit of one litre). The fluid deficit should always be kept to less than one kilogram. In recovery, any fluid deficit should be matched with an amount of fluid equivalent to 150 per cent of losses (for example, one kilogram loss during training demands 1.5 litres of fluid in the 2–4 hours of recovery after training).

- When fluid losses are high or rapid rehydration is required, sodium replacement may also be required. Sports drinks, oral rehydration solutions and/or salty foods (for example, bread, pretzels, cheese, Vegemite, soups, breakfast cereals, dishes with added sauce or salt) can all contribute to sodium replacement, enhancing the retention of ingested fluid by keeping body electrolyte levels in balance.

- A urine sample taken on waking provides a good index of hydration status over the previous day. While expensive equipment is available to assess urine concentration and thus hydration status, urine colour also offers valuable insight into hydration status. Well-hydrated urine is clear or light-straw coloured and should be copious throughout the day.

- Prepubescent children are at particular risk of heat illness when exercising in hot environments, making fluid replacement a high priority.

Consuming fluid in excess of requirements may cause gastrointestinal discomfort. In extreme cases, a potentially life threatening condition known as **hyponatremia** (low blood-sodium levels) can occur. It is not common but can occur in prolonged endurance events lasting two hours or more when large volumes of low-sodium drinks are consumed and sweat losses are small. Consuming sodium-containing fluids such as sports drinks and matching fluid intake to sweat losses (but not exceeding this level) lowers the risk of hyponatremia.

CASE STUDY

Tom coaches a local football team that is about to travel to Townsville for an important multi-day competition. Recognising that even in winter Townsville can be hot and steamy, Tom is keen to assess the fluid needs and drinking practices of his athletes. He starts by doing some fluid-balance studies (weighing the athletes and their drink bottles before and after the session) during training one Saturday in the warmer part of the day. With regular breaks in training and encouragement to drink more, Tom is able to keep weight loss (and thus the imbalance between fluid intake and sweat loss) during the session to less than one kilogram for the majority of the squad. This is repeated when the squad arrives in Townsville, recognising that sweat rates are higher in the warmer environment.

On their first night in Townsville, the squad is instructed to inspect their urine when they first go to the toilet before breakfast each day. The next day the colour tells the story — several athletes report that their urine was dark, a sure sign of dehydration. So while the athletes appear to be good at matching fluid intake to losses during training with the encouragement of Tom, their fluid intake falls off outside of training. It is decided the athletes must carry a drink bottle with them throughout the day for the duration of the competition. This not only acts as a regular reminder to drink but also ensures the athletes have ready access to suitable fluids throughout the day. A spot check two days later shows that all athletes are producing clear urine, indicating that body fluid levels have been topped up.

Competition nutrition strategies

Pre-event fuelling

Most athletes appreciate that what they eat and drink prior to exercise can have a real impact on performance, but few are aware that fuel and fluid reserves are a result of their eating and drinking behaviours over the previous one to two days. Focusing only on the pre-exercise meal will not fully prepare them for competition. One or two days of tapered training, together with a high-carbohydrate meal plan, will ensure muscle fuel stores are well stocked for most events. For endurance athletes competing in events lasting two hours or more, a more sustained period of fuelling up may be required. The support of a sports dietitian will help identify needs and formulate a suitable meal plan for this time.

The pre-event meal provides a final opportunity to top-up fuel and fluid-level stores while preventing hunger and maximising intestinal comfort. Emphasis should be placed on meal combinations that:

- are rich in carbohydrate
- are low in fat
- are low in fibre
- include plenty of fluid
- are based on familiar and enjoyable foods and fluids.

Larger meals are best consumed 3–4 hours before exercise, while smaller snacks can usually be tolerated 1–2 hours before warming up. If the pressure of competition results in stomach 'butterflies', liquid meal supplements or home-made shakes may be the best choice, as they are better tolerated. Examples of suitable pre-race meal and snack ideas are:

- breakfast cereal/porridge with low-fat milk and fruit
- bread/toast/muffins/crumpets with jam/honey/syrup and fruit juice
- pancakes with maple syrup/jam/lemon and honey, and fruit juice or smoothie
- baked beans*/tinned spaghetti on toast
- fruit smoothie based on low-fat milk/soy milk, fruit and low-fat yoghurt
- liquid meal supplement
- sandwiches or rolls with low-fat fillings (for example, banana/jam/honey)
- rice/noodle/pasta dish with low-fat sauce (for example, napolitana — tomato)
- cereal bar/sports bar and sports drink
- fresh fruit and low-fat fruit yoghurt.

* High-fibre choice

Nutrition during competition

Muscle glycogen (the storage form of carbohydrate in the body) stores can be depleted after just 90–120 minutes of high intensity exercise. Anyone who has 'hit the wall' will appreciate how bad it feels to deplete carbohydrate stores. The provision of additional carbohydrate while exercising is essential if the performance-sapping effects of fatigue are to be minimised. For endurance events lasting longer than 60–90 minutes, athletes should plan to ingest 30–60 grams of carbohydrate every hour.

While both solid and liquid options are suitable, sports drinks are particularly useful as they simultaneously meet both fluid and carbohydrate needs. Just 500–1000 millilitres of sports drink provides 30–60 grams of carbohydrate.

While solid food may increase the potential for intestinal discomfort, small amounts can help top up carbohydrate intake and stave off feelings of hunger during extended performance efforts. Solid forms of carbohydrate are also more compact and can be easily packed away in sports clothing or taped to equipment. If space is a limitation to the supply of carbohydrate, options such as cereal bars, sports bars and carbohydrate gels are an excellent idea.

Recovery strategies

Training or competing multiple times over a day or week brings with it a number of other challenges. Maximising recovery becomes critical. Refuelling and rehydrating must become priorities, especially when the next session is scheduled within a few hours. Consuming plenty of carbohydrate-rich foods and fluids soon after the completion of exercise will help start restoration of muscle fuel and fluid levels prior to the next session.

Rates of glycogen synthesis remain low until carbohydrate is consumed, so ingesting a snack rich in carbohydrate (perhaps also with some protein) as soon as possible on the completion of exercise should become a priority. Intense exercise can suppress the appetite of some individuals. Making use of compact, low-bulk carbohydrate-rich foods and drinks such as sports drinks, cordial, soft drinks, prepared liquid meal supplements, and cereal or sports bars, can be particularly valuable in this situation. The choice of fluid may vary with individual preferences, but sodium or salt-containing options such as sports drinks may be particularly useful in recovery, enhancing the retention of ingested fluid.

Training and competition venues are unlikely to provide food and fluid choices in line with recovery goals. Appropriate recovery snacks should be packed into a training bag to avoid disappointment. Foods that are usually consumed cold should be kept this way. A cooler with an ice brick can be particularly valuable for both chilled and easily perishable food. Alternatively, more robust recovery options include dried biscuits, powdered liquid meal supplements, rice cakes, tinned fruit, cereal bars, tins of creamed rice and bakery options such as fruit buns and scones.

Tips to help maximise recovery

- Maintain a high-carbohydrate intake throughout the day.
- Ingest carbohydrate-rich food and/or fluids as soon as possible after the completion of exercise. Aim to ingest one gram of carbohydrate per kilogram of body weight in the first 30 minutes following the completion of exercise, and repeat this every 1–2 hours until appetite returns and normal meal patterns resume.
- If the appetite is suppressed immediately after exercise, make use of compact, low-bulk carbohydrate-rich foods/fluids such as sports drinks, cordial, soft drinks, prepared liquid meal supplements, and cereal or sports bars.
- Do not rely on thirst. Calculate fluid deficits and match this with an amount of fluid equivalent to 150 per cent of losses.
- Make use of sodium-containing foods and/or drinks if dehydrated. While sports drinks contain small amounts of sodium, the salt does not have to come from the fluid. It may be derived from ingested food.
- Examples of recovery snacks with adequate carbohydrate, sodium and fluid include:
  - fruit, yoghurt and sports drinks
  - sandwiches with lean meat/low-fat cheese, plus soft drink or water
  - noodle/rice/pasta dish with vegetables, meat and sauce, plus cordial or juice.

Each of these options also contains a small amount of protein to further promote recovery and contribute to daily requirements.

If recovery times are short (less than 1–2 hours) during competitions involving multiple games or a series of heats and finals in the same day, small regular snacks may be better tolerated than one or two meals over the day. Suitable recovery choices when there is little time between events include:

- liquid meal supplements, milk shakes or fruit smoothies

- sports bars and cereal bars

- flavoured yoghurt and milk

- sports drinks, cordial or juice

- sports gels or lollies.

Athletes should be encouraged to experiment with their competition eating strategies in training to identify combinations and volumes of food and fluids they feel most comfortable with.

Weight loss and weight gain

Most athletes are required to modify body weight at some stage of their career. For some it may be an attempt to lose weight following injury or an off-season break. Others may need to gain weight and increase size, strength and power. Despite what is written about both weight loss and gain, the basic principles are simple. Weight loss/gain is a result of the balance between energy intake from food ingested and energy expended through daily activities. When intake is less than expenditure, body weight decreases. Conversely, if energy intake exceeds expenditure, body weight will increase.

Losing weight/body fat

The focus of any weight-loss plan should be an emphasis on body-fat reduction. This requires the balance of a suitably designed training program and cleverly designed meal plan that primarily focuses on food quality, rather than reducing the absolute amount of food ingested.

Tips for decreasing energy intake

- Keep fat intake in check to help reduce overall energy intake. As a very concentrated source of energy, just a small reduction in fat intake can cause a big drop in total energy intake without affecting the amount of food eaten. However, just eating low fat is rarely enough.

- Maintain a high intake of fresh fruit and vegetables. These should fill the majority of the plate at a meal. Both are rich sources of vitamins and fibre, but also help to fill out a meal while containing very few calories/kilojoules. Aim for more than 2–3 pieces of fruit and more than 2–3 cups of vegetables per day. For most athletes, that is two meals a day containing moderate amounts of vegetables. Ways to achieve this are to:

  – bulk sandwiches out with generous servings of salad

  – increase the proportion of vegetables in recipes

  – add vegetables to the plate first before serving the meats and carbohydrate choices

  – use fruit instead of heavy desserts to finish off a meal.

- Adjust carbohydrate intake according to daily needs — higher on heavy training days but lower on lighter or training-free days. High-fibre versions of carbohydrate-rich foods are preferred.

- Focus on water to meet fluid needs. Energy-containing drinks should be avoided wherever possible (for example, fruit juice, cordial, soft drinks, smoothies, milk and sports drinks). While all can be low fat or fat free, these drinks are easily over-consumed, providing a large number of calories/ kilojoules. Sports drinks may be required during prolonged training sessions. Water or low-calorie soft drinks and cordials should be used in small amounts at other times.

- Include a small amount of protein-rich food at each meal and snack to make it more filling (for example, add some ham or low-fat cheese to a salad sandwich, or have yoghurt and fruit as a between-meal snack).

- Do not include food as an automatic partner to social activities (for example, lollies at the movies, muffin or pastry with a coffee at the cafe).

- Limit alcohol consumption. Alcoholic drinks are high in energy but provide very few essential nutrients.

- Get organised. Plan the day's food intake so that suitable choices are readily available. Keep some fruit nearby and a low-fat flavoured yoghurt in the fridge.

- Aim for a weight loss of no greater than 0.5–1.0 kilogram per week. This ensures the greatest likelihood that weight loss is from body fat. Faster rates of loss are likely to come from reductions in both fat and muscle mass. Maintaining muscle mass is critical to performance and also ensures energy expenditure remains high because it is the muscles that are metabolically active, burning up calories throughout the day.

Body composition goals should be aligned with performance outcomes. Athletes should be reminded that it is not necessarily healthy or beneficial to performance to have the lowest level of body fat possible.

Gaining weight/muscle mass

Bulking up can play an important role in the development of many athletes. For most athletes, the intent to bulk up or increase weight is a desire to increase muscle mass and strength. Few athletes intentionally plan to increase body fat. To ensure gains in muscle mass are prioritised, the combination of a well-designed training program plus an energy-rich diet with adequate protein is essential.

Increasing dietary energy intake (that is, calories/kilojoules) is essential if significant gains in muscle mass are to be achieved. For some athletes this can be a real challenge. Frequent and/or prolonged training sessions can limit opportunities for meals and snacks, while intense training can curb appetites. Creative strategies such as greater use of energy-dense snacks and drinks may be required to overcome such obstacles.

Tips for increasing energy intake

- Increase meal/snack frequency. Intestinal comfort is higher when the frequency of meals is increased rather than increasing the size of existing meals and snacks. Eating frequently should become a priority, even during busy days. Including three main meals and two to three (or more) snacks each day should be the aim.

- Make use of energy-dense drinks (for example, smoothies, milk shakes, powdered liquid meal supplements, fruit juice, cordial and sports drinks) and other nutritious, energy-rich foods (cereal or sports bars, and dried fruit/trail mix). Skim milk powder can be added to homemade milk drinks for an extra protein and energy boost. These drinks can be particularly useful for athletes unable to tolerate solid food before or after exercise or those with smaller appetites.

- Low-energy fruit and vegetables, although a great source of nutrients, are best maintained at their current level in the meal plan. This will allow more room for energy-dense, nutrient-rich options. The inclusion of dried fruit is a great way of boosting both energy and nutrient intake.

- Plan the day's intake of food — what and when. This ensures suitable food and drink is on hand as required. Keeping a ready supply of non-perishable snacks in a training bag can be a great idea (for example, tetra packs of UHT flavoured milk/fruit juice, cereal/breakfast bars, dried fruit, powdered liquid meal supplements and sports drinks).

- While an increase in energy intake is essential to promote gains in muscle mass, eating for muscle gain should not be considered an excuse to indulge in high-fat nutrient-poor fast food. This may merely promote gains in body fat that will have to be reduced at a later stage.

Other muscle-building tips

- While the meal plan should be based on nutritious carbohydrate-rich foods, including a small serve of protein-rich food/fluid at each meal/snack may help to optimise training responses. This may be especially important for pre and post-training snacks.

- Only after training and diet have been optimised should consideration be given to the use of sports supplements. The professional support of a sports dietitian can help to negotiate the sports supplement market.

- Set realistic goals and monitor progress regularly. Do not expect miracles — gains of 0.25–0.5 kilogram per week are possible but will depend on an individual's genetic make-up and training history.

- If gains in muscle mass are a priority, a muscle-building phase should be incorporated into the yearly training program, emphasising consistent allocation of resistance training sessions and limiting additional fitness/conditioning sessions. The specialist skills of a strength coach may be particularly valuable.

- Be patient. Commitment and perseverance are necessary. Developing optimal levels of strength and muscle mass for sport may take years.

Monitoring progress

Regular feedback on progress (whether it be weight loss or gain) not only allows adjustments to dietary and/or training interventions, but also offers a valuable source of motivation for the athlete. Sports dietitians can be of assistance in this area. They have specialist training in monitoring body composition via the measurement of body weight and 'skinfolds'.

CASE STUDY

Jeremy is an aspiring discus thrower with cerebral palsy who is hoping to make it to the Paralympics with the support of his coach, Phil. While his technique has improved markedly under the support of Phil, Jeremy's results have started to plateau. With a greater focus on technical issues over the past 6–12 months, Jeremy has only been doing resistance training once or twice a week. With a new program in hand (emphasising regular resistance training sessions and less other conditioning), Jeremy approaches Phil about buying some protein powders and bars to assist with muscle building.

Recognising the small but real risk of purchasing a supplement contaminated with a banned substance, Phil decides to make an appointment for him and Jeremy to see a sports dietitian. After a closer look at Jeremy's meal plan, the sports dietitian suggests that Jeremy needs to boost his overall energy intake rather than just his protein intake. A meal plan is developed that includes three main meals and three snacks, including pre and post-training snacks.

The combination of an adjustment in Jeremy's training program, combined with a commitment to an energy-rich nutritious meal plan, ensures Jeremy is able to increase his body weight by five kilograms over the next four months. His strength is up in the gym and he is throwing personal bests in the field. Jeremy's Paralympic aspirations are becoming a reality.

Summary

It is valuable for coaches to be able to provide guidance to the athletes they coach regarding appropriate nutritional strategies for training and competition. Eating and hydrating well can positively impact on an athlete's sporting performance. Coaches can assist athletes to understand about good food choices to assist their performance. Hydration is another area where coaches can assist and advise the athletes. Adequate hydration is essential for sporting performance, especially in longer events. Even mild dehydration can affect sports performance, so this is an area for coaches to closely monitor. With a well-balanced diet that takes into account individual food preferences, an athlete's sporting performance can be maximised.

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Chapter 12:
Sport psychology

by Sandy Gordon

Psychological skills training is an important area for coaches and athletes to develop competence in. While much of the coach's time is spent in developing physical, technical and tactical components of an athlete's performance, psychological skills contribute greatly to overall athlete performance. Coaches need to ensure that they spend time with athletes to develop a range of mental skills to assist performance.

As well as providing information for coaches on mental skills training to bring out the best in athletes, this chapter illustrates the use of appreciative and solution-focused coaching language. Appreciative coaching increases an athlete's awareness of their existing strengths and abilities, and provides a positive starting point for the development of mental skills. Solution-focused coaching principles include:

- what you focus on grows, so focus on solutions, not problems
- because athletes are experts in their own lives, they can recognise best solutions for themselves
- there is always a better way
- never failure, only feedback
- all problems have exceptions
- do more of what works, do less of (or stop) what does not work.

Goal setting

Goal setting is the foundation of all coaching, and the following diagram (adapted from Greene and Grant 2003) provides an illustration of the basic goal-setting process.

Figure 12.1: Goal-setting process
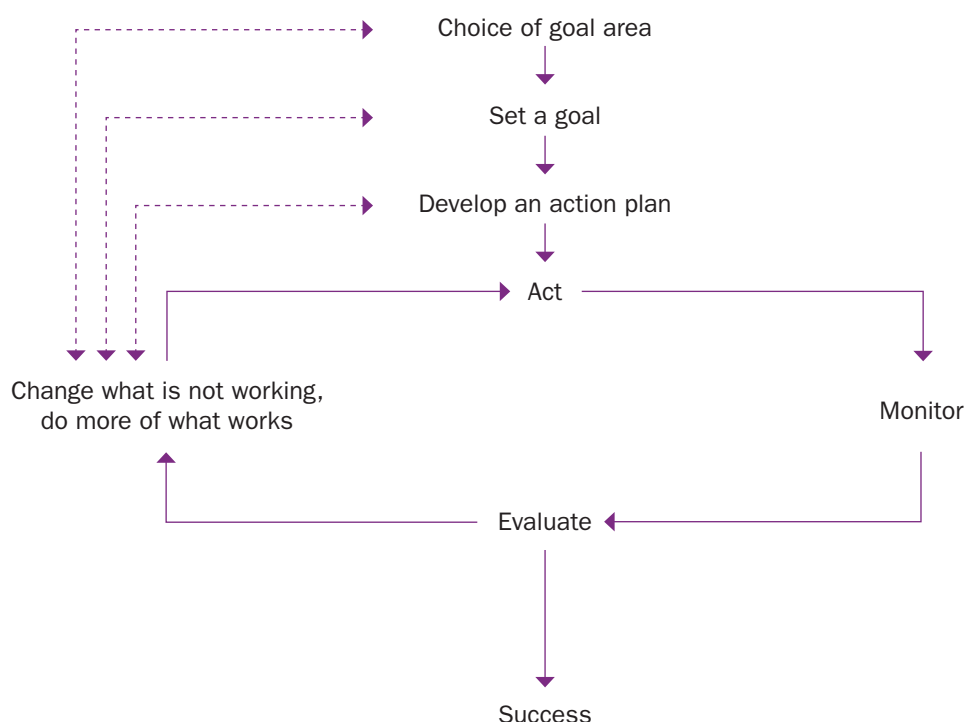
Coaches should first get acquainted with individual athletes and clarify what they want from their sporting experience. Questions that help this process include:

- What are the best things about your current involvement in sport?

  Responses will inform coaches of some of the things athletes really enjoy or value. Understanding the sources of an athlete's interest and energy provides ideas that coaches can craft later to link back to that source.

- Describe a high point in your sports experience up to now.

  Answers will reveal how athletes evaluate both their sports achievements and relationships. Knowing this, coaches can replicate aspects of previous peak experiences in current circumstances.

- What do you most value from your sports experience?

  By exploring values, coaches can create a positive context to frame challenges and issues athletes bring to sport, including how they perceive themselves and their interactions with others.

- What one or two things do you want more of from sport?

  Answers to this question begin to shape a picture of what a possible future may look like for each athlete.

Responses to all four questions accomplish two things. Firstly, they give athletes the opportunity to remember, reflect on and ponder what is important about their sports experience, and what is or has already been positive about that experience. Secondly, by beginning with positive questions coaches immediately move athletes away from 'problem outcomes' and towards creative and 'solution-focused' outcomes in which they become agents of their own change.

Once the goal area has been clarified, coaches can turn athletes to setting INSPIRED goals and developing an action plan. The acronym INSPIRED identifies a number of important goal-setting principles:

- **I**nternalised — it is important that athletes 'own' and commit to goals. Goals that are accepted and internalised provide a greater sense of self-determination when achieved.

- **N**urturing — in addition to achieving results or targets, goals should include a developmental and learning element so that athletes grow personally as well as improve their performance.

- **S**pecific — clear and unambiguous goals make it obvious when they are achieved. Goals do not have to be quantifiable. Such things as concentration and confidence are difficult to attach numbers to, but all goals need to be specific in the sense that certain thoughts and behaviours should be identified.

- **P**lanned — short and long-term goals lead to greater achievement and higher performance, rather than long-term goals alone. Goals that are time-framed also provide both immediate and long-term incentives, so it is important to build sub-goals into goal-achieving plans.

- **I**n your control — the achievement of goals should be attainable through the athlete's personal efforts. Effective goals should not be subject to external factors such as financial resources, facility availability and weather, which are uncontrollable.

- **R**eviewed regularly — regular reviews of progress towards long-term goals and a flexible attitude regarding setbacks and uncontrollable events should be part of the planning process. An image of a staircase with the ultimate goal at the top helps promote a focus on the present, as well as longer-term commitment and persistence.

- **E**nergising — goals should excite and energise athletes as well as produce a great sense of accomplishment when they are achieved.

- **D**ocumented — 'Ink it, don't just think it!' Documenting goals in some form and recording progress towards them in effect produces a written contract with oneself. Ideally goals should be constantly visible in a diary or log book, as well as on fridge doors or bedroom walls (adapted from Jones and Moorhouse 2007).

CASE STUDY

Barb decided that she would set goals to improve her swimming so that she could win her age group (over 40s) 100-metre breaststroke in the winter carnival in four months time. She knew, of course, that she was not completely in control of this outcome goal in that she had to beat seven other swimmers who were regarded by the coaches as 'rapid improvers', and also capable of swimming much faster than their present times. So she set a performance goal that she could totally control — she thought that a time of 1 minute 15 seconds or better would be good enough to win. Subsequently she geared all of her training and practice towards swimming this time and 'staircased' her progress in terms of various times and milestones that were required along the four-month journey.

These 'steps on the staircase' provided her with a sense of sustained motivation, self-belief and achievement as she monitored her progress towards her ultimate goal. To achieve the performance goal, however, she needed to set underlying process goals such as her reaction to the starting signal, her starting dive technique, her turn, and holding her technique during the last 20 metres of the race, which is when sprinters become fatigued and slow down as they lose their form. In addition to her overall breaststroke technique, these features of her race plan were practised over and over during training. As it turned out, coming into the last few metres of the race in fourth place, Barb finished with technique in tact and passed her three opponents to win narrowly.

When setting goals, coaches can focus on different skill areas. For example, athletes can set goals to improve technical, tactical, physical, mental, behavioural and environmental skills. Technical skills refer to the techniques required to play any sport; tactical skills are those associated with strategy and decision-making; physical skills relate to improving health and fitness (for example, strength, speed, power, agility and endurance); mental skills include concentration, imagery and confidence; behavioural skills include teamwork, leadership, time management, diet, attitude and enthusiasm; finally, environmental skills relate to sport–work—life balance, personal and spiritual growth, and physical (home) environment.

A key factor in setting goals in any of the above areas is making sure different types of goals are aligned towards the same ends. To ensure this happens, coaches need to teach athletes three types of goals — outcome, performance and process goals:

- Outcome goals relate to results and usually comparisons of some kind with others (for example, winning a 200-metre race).
- Performance goals refer to the numbers such as times, distances and points required to achieve the outcomes, independent of other performers (for example, running 200 metres in a specific time).
- Process goals are the controllable behaviours required to deliver performance goals, such as tactics and strategy, as well as attitude and thinking processes (for example, exploding out of the blocks, running the bend hard).

The following table provides an example of aligning outcome goals with performance and process goals.

Table 12.1: Examples of goal types

Goal type	Long jump	Swimming	Football
Outcome goal	Win age-group final	Make swim team	Voted most-improved player
Performance goal	Jump a personal best (for example, six metres)	Reduce times in all strokes by five seconds	Outperform opposition player in 70 per cent of matches
Process goal	Drive arms in run-up High knee lift Reach long in the jump phase	Improve my turns Hold technique when fatigued	Confident and focused under pressure Exploit my vision

Appreciative and solution-focused coaching questions

During discussions on goals, coaches can enhance their athletes' self-management and self-regulation skills using the following types of questions:

- **Goal clarification**

  Athlete: 'I want to improve my concentration skills.'

  Coach: 'Great, so what does good concentration mean to you?'

- **Dealing with resistance**

  Athlete: ' … but I couldn't do all that goal-setting stuff!'

  Coach: 'Okay, so which bits could you do?'

  Athlete: 'I really hate training and practising.'

  Coach: 'I hear that. Which parts of training and practising are less unpleasant for you?'

- **Language that moves athletes forward**

  Athlete: 'I just don't see the point in continuing. I don't feel I'm getting anywhere.'

  Coach: 'So, you'd like a better sense of purpose and direction? What would give you that?'

Arousal and anxiety control skills

Arousal can be described as a general physiological and mental state varying on a continuum from deep sleep to intense excitement. Low arousal is when we are bored or relaxed, high arousal is when we are excited or angry; so a state of high or low arousal is not in itself necessarily a pleasant or unpleasant experience. Anxiety, on the other hand, is by definition an unpleasant sensation. It is often described as a negative emotional state with feelings such as fear, worry and apprehension, and is basically an unpleasant state of high arousal. However, it should be pointed out that fear and anxiety are not all bad in sport. Some apprehension is good to combat complacency. Fearful thoughts or images produce a stress ('fight or flight') response, which is simply nature's way of preparing us to defend ourselves against potential harm and danger. However, the stress response (fear) need not be the end product every time. The term 'intensity' is recommended over both arousal and anxiety because all coaches and athletes recognise that intensity has positive associations with sport performances.

Intensity can range from very low (relaxed, calm) to extremely high (charged, pumped) and can be experienced positively, leading to improved confidence, motivation, stamina and strength, and negatively, leading to extreme nervousness, muscle tension and loss of confidence. It is important that coaches teach athletes how to maintain and control their intensity because it can dictate how they will perform in training and competition, and how they experience sport in general.

Over-intensity is usually caused by a belief that some upcoming event is stressful, when actually it is the athlete's interpretation of the event, not the event itself, that makes it threatening. Their belief triggers physical (extreme muscle tension, stomach butterflies, shaking muscles, difficulty breathing or excessive perspiration), mental (negative self-talk or narrowed attention) and emotional (fear, anger or frustration) symptoms associated with poor performance. Other causes of over-intensity among athletes include lack of confidence or belief in their ability, and both internal (negative thoughts about past failures and outcomes) and external (expectations of significant others such as parents and friends) distractions.

Under-intensity is also caused by an interaction of how athletes perceive themselves and how they will perform in certain situations. Typical causes include over-confidence (win easily), perceived lack of importance, low motivation (lack of interest) and physical symptoms (fatigue or sleep difficulties).

CASE STUDY

Andy is a 20-year-old cross country skier who has developed several approaches to dealing with his stress levels and symptoms. He reads books, does crosswords or listens to music in the lead-up to competition — all internal things to take his mind away from the upcoming game and to a 'different place'. He consciously moves away from nervous people and never hangs out with team-mates and coaches who cannot seem to cope. He picks symptoms in others that give away their stress levels, such as talking too quickly and yelling. When he cannot avoid seeing uptight coaches, he asks to see them at least 90 minutes ahead of the start and insists on making that time the only time they can meet.

Andy still finds the 30 minutes before races the hardest to deal with because everyone seems quite gladiatorial. He is aware of his breathing becoming quicker and his shoulder muscles tensing up. So he has learnt and practised ways of dealing with that (for example, breathing exercises, basic meditative and muscular relaxation techniques, and listening to music). He has also learnt to challenge the 'negative voice' in his head with humour, by imagining two men, one on either shoulder, and the positive one holding a huge megaphone drowning out the pessimistic and unhelpful suggestions of the other.

Coaches can teach athletes how to identify optimal intensity, which is personal for each athlete, by asking them to reflect on previous successful and unsuccessful experiences, as illustrated in the following table.

Table 12.2: Intensity identification

Indicate the physical, emotional, mental and behavioural responses related to your best (optimal intensity) and worst (over or under-intensity) experiences in sport. Discuss these findings with your coach.

Intensity factors	Best performance (optimal intensity). 'Do more of this … '	Worst performance (over or under-intensity). 'Do less of this … '
Physical feelings		
Emotions		
Thoughts		
Behaviours		

A common issue that arises is how to get athletes to maintain their optimal intensity and stay in the 'zone' when things are going well. Coaches can explain that some athletes snap themselves out of the zone simply because they lose their focus. By thinking 'I'm playing well — why?' or 'I should win' or 'When will I mess up?' the athlete's concentration shifts from the task at hand (for example, the next play) to, respectively, an evaluation of performance, or the expectation to continue it, or the negative consequences if it is not continued. Their focus, which was once on automatic and was absorbed in the moment, moves to a more evaluative one with demands placed on the future. 'Good thinking' in the zone and maintaining optimal intensity is about staying task-aware, enjoying each moment, being patient and trusting performance routines developed at practice.

Appreciative and solution-focused coaching questions

Coaches can use the following questions to discover what causes their athlete pressure and anxiety, and to encourage the athlete to talk about a time when they successfully turned that pressure and anxiety into performance:

- 'What was the situation? What did you do?'
- 'How did you feel as you did this?'
- 'What were the benefits to you and to others?'

Mental imagery

While all athletes imagine themselves performing in their sport — scoring a goal or serving an ace at match point — they may not know how to get the most benefit from using imagery. Mental imagery is a process of internalised (non-physical) rehearsal of an athletic experience involving multi-sensory representations. It can involve sight, sound, touch, movement, smell and taste, as well as emotions, thoughts and actions. The purpose is to reproduce an athlete's experience so accurately that they feel as if they are actually performing. The real value of this mental skill lies in its use of structured imagery scripts, which provide the 'stage' on which the imagery is acted out. Scripts are detailed training and competition scenarios that athletes prepare before imagery begins, and which they use to guide them in the actual settings where performance occurs.

Mental imagery influences sports performance on many levels. It can enhance physical skills (learning new skills, performance execution and error correction), perceptual skills (practising strategy and problem-solving), and mental skills (motivation, confidence, intensity, focus emotions, interpersonal and life skills, and injury rehabilitation). Mental imagery can be used to improve tactical and game skills, such as strategy development, strategy learning, strategy practice and problem-solving. Competition preparation skills, such as familiarisation with competition sites, mental warm-up and pre-performance routines, can also be enhanced through imagery. Imagery can improve coping skills when dealing with pain and injury, rehabilitation from injury, and recovering from heavy training loads. A useful framework for helping coaches maximise the application of mental imagery is termed PETTLEP:

- **P**hysical — athletes should closely mirror the physical movements of their activity, including use of relevant sport equipment.

- **E**nvironment — replication of actual performance settings is essential.

- **T**ask — skills that depend on 'form' would benefit from an external imagery perspective (seeing oneself as if on television), as opposed to an internal perspective (imagining being inside your own body and experiencing all sensations expected from actual activity), which would be more appropriate for skills involving 'feel'.

- **T**iming — real or actual performance time is associated with both enhanced performance and timing of performance.

- **L**earning — an external perspective may be more useful in early learning where visual perspective is helpful. However, later learning will benefit from an internal perspective emphasising kinesthetic feelings once the athlete has become familiar with the basic skills and movement sensations.

- **E**motion — similar emotional reactions as those experienced in actual performance are encouraged.

- **P**erspective — skills that are more cognitively based (for example, making decisions on club and shot selection in golf or passing options in Australian football) may benefit more from internal imagery, whereas more technically focused skills (for example, tennis serve or dismounts in gymnastics) may profit most from external imagery (Holmes and Collins 2001).

CASE STUDY

Mario talked with his coach about his strengths and weaknesses as an under-19 cricketer. He identified that his performance as a fast bowler was often negatively affected by anger. Inaccurate deliveries, no bowling and especially poor umpiring decisions frequently triggered his anger and a loss of focus during games. Mario was also aware that he became more emotional the longer he bowled off his long run-up and when he reached fatigue. So his coach helped him design a refocusing imagery program in which he saw himself dealing with each of the above scenarios in turn.

Several imagery scripts were developed incorporating imagery triggers so he could mentally practice emotional control and refocusing. His emotional control script for dealing with bad umpiring followed: 'That was an interesting call … deep breath … squeeze the ball … let the anger swell up from my toes to both legs, all the way through my trunk, then flowing down each arm until I feel the hot emotions burst out of my fingers … squeeze all that anger into the ball as I return to the top of my mark … deep breaths … relax my hands … pause … next delivery, see and feel what I have to do to bowl well … commit to that image … let's go!'

Mario was able to use his imagery scripts to practise emotional control and refocus skills and, although his anger never totally disappeared, he became much more consistent in dealing with these and other negative events during games.

The following table summarises critical moments to use imagery.

Table 12.3: Critical moments to use mental imagery

When	Critical moment	Purpose
Before, during and after practice	Performance rehearsal	To rehearse skill learning and performance
Before competition	Quick preview	To provide relaxing images, repetition of simple and advanced skills, competition strategies, past successes
During competition	Competition preview	To provide an example of actual skill execution, strategies and plays To rehearse action movement and events before they occur
	Instant imagery	To imagine the feeling of a movement or play after successful execution To commit to memory To identify or correct an error
After competition	Competition review	To evaluate good and bad aspects of performance after a competition To assist in planning training To reward good performance

Adapted from Taylor and Wilson 2005

The following table illustrates an example of an imagery script for an axel jump in figure skating.

Table 12.4: Mental imagery script for an axel jump

List basic skill components	Add details (for example, action or mood words)	Refine script using stimulating sentences
Begin by watching a skilled skater (live or on video) perform an axel several times	Close your eyes and put yourself in the skater's body	Imagine what the timing and movements **feel** like
Exhale and sit into the take-off in a proper take-off position	When setting up the jump, take a deep breath and exhale. Focus on feeling balanced	Imagine the **power** in the breath and how **balanced** you **feel**
Kick a goal! Explode the free leg through as in kicking a ball	As you enter the jump, concentrate on sitting into the entry and exploding on the take-off	Imagine how **strong** your take-off movements are as you **kick through** and **fly upwards**
Step up, land backwards. Shift weight to the free leg as if stepping up onto a step and landing on the step backwards	The jump happens quickly so try to re-create the imaged feeling and timing of performing the jump	**See and feel** yourself turning in the air **effortlessly**
'Soft and hold'. Landing motion should be soft and the landing position held	On the landing use the triggers 'soft' and 'hold' to achieve the proper landing position	Imagine how **lightly** and how **solidly balanced** you land

Adapted from Vealey and Greenleaf 2006

Motivational strategies

Motivation is the driving force behind athlete behaviour and involves the three central components of:

- direction — choosing to participate in particular sports
- intensity — the amount of effort athletes are willing to expend
- persistence — continual effort over time, especially in the face of obstacles.

However, what is most important for coaches to learn in terms of explaining athlete behaviour is the basic distinction between external and internal motivation.

External motivation refers to performing for incentives such as money, trophies and to please others. Internal motivation, on the other hand, refers to doing an activity for the inherent satisfaction of the activity itself, or simply because you enjoy it. A strong emphasis and focus on participating in sport to attain internal aspirations, such as personal growth and development, is associated with high self-esteem and lower depression and anxiety. Placing a strong emphasis and focus on external aspirations, such as wealth and approval of others, is associated with lower self-esteem and higher depression and anxiety. Most importantly, compared to externally motivated athletes, internally motivated athletes have more interest, excitement and confidence, which in turn leads to greater persistence, energy, creativity and wellbeing, as well as performance.

For internal motivation to be maintained and enhanced it is necessary to satisfy three basic psychological needs that are essential for athlete health and wellbeing:

- competence — a feeling of mastery and accomplishment
- autonomy — a sense of being in control so that behaviour and participation in sport is self-determined
- relatedness — a sense of belonging and security.

Consequently, threats to internal motivation that coaches and athletes need to be aware of include:

- perceptions of feedback that is negative and indicating a lack of competence

- overvaluing rewards (for example, trophies and medals) so that they become major drivers for participation

- being constantly driven by directions and goals imposed by others (for example, parents, coaches)

- being unable to establish a secure relational base or sense of attachment to others, the team and sport organisation generally.


Coaches therefore need to maintain and enhance internal motivation among athletes by finding ways of helping them feel competent in what they do, providing opportunities for athletes to exercise choice over their behaviour, and facilitating an inclusive, cooperative and supportive sporting environment.

Coaches can also optimise motivation by ensuring that the following characteristics of a positive sport environment are present:

- Since motivation is about what athletes want to do, not what they are trying to get away from, an approach rather than avoidance culture needs to be promoted.

- Athletes need to be encouraged to make things happen, not wait for things to happen — be active rather than passive.

- Athletes satisfying their own needs first before satisfying the needs of others is important — doing things for themselves first, then for others.

- Motivating experiences are always about enjoyment, not desperation, so events and opportunities need to be positive rather than negative.

- An internal focus on personal pride, enjoyment, interest and satisfaction derived from achievement is paramount, as opposed to external rewards received by simply being successful. Even where athletes are driven by external rewards they should look to achieve personal choice (autonomy) over their own behaviour as much as possible. This characteristic, self-determination, is also an aspect of effective goal setting.

There are some distractions that sabotage motivation, effort and commitment, and athletes should be made aware of them. They include:

- Impatience with improvement — probably the number-one form of sabotage. Some athletes want a quick fix, something that works immediately, and if it does not work fast, they are prone to throw it away and not try it again. This is why athletes sometimes jump from one coach to the next looking for the quick fix.

- Rationalisations that sabotage success — rationalisations are excuses people use to avoid doing something. Athletes sometimes rationalise or justify why they should not go to practice, take regular lessons, or work on their mental game. Some golfers, for example, think they will be ready to improve mentally when they are finished working on their swing. When are golfers ever finished working on their swing?

- Fear of trying and not succeeding — perhaps athletes are afraid of going after their dream and not succeeding? There are no guarantees that if they work harder and put all their energy into getting better, their game will improve. But some athletes cannot stomach the fear of not reaching their goals if they give it their all, so they do not.
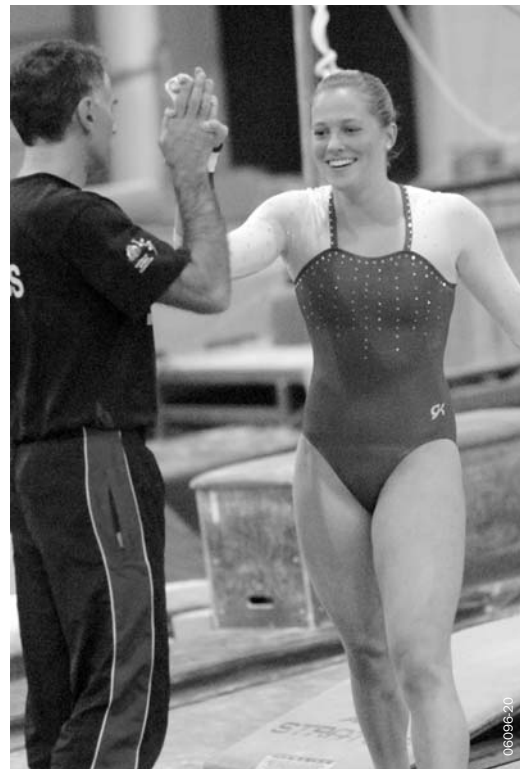
- Distractions by others — do others distract athletes from their mission? Do their friends ask them to party every night? Are others giving them advice that contradicts their coach's advice? If yes, then the athletes should consider a change in input/support network.

- Overload syndrome — some athletes actually sabotage their commitment to getting better by listening to every instructor and guru, and trying to integrate everything anyone has ever said about their sport. These athletes usually end up more confused, wondering why they are not playing better, and then give up trying.

- Overtraining syndrome — training too much can also cause athletes to spin their wheels because they are mentally and physically exhausted and are bothered by nagging injuries. The body needs rest and the mind needs a break occasionally.

- Know-it-all syndrome — if athletes are 'know it alls', then others, even experts, cannot help them with their commitment. 'Know it alls' are not teachable because they believe they already have the information to be successful.

When dealing with athletes who are negative thinkers, coaches can help them change their self-talk. The goal is to abolish negative, defeatist statements and use more positive, productive ones. Athletes do have a choice in this matter and have control over their self-talk or inner dialogue. Here are a few examples of a golfer's defeatist self-talk and a corresponding productive self-talk:

Defeatist self-talk	Productive self-talk
'Great front nine, now don't blow it.'	'Keep this round going strong.'
'Play it safe so you don't lose the lead.'	'Play your game and bury him.'
'Don't hook it left out of bounds.'	'My target is over there.'
'He's got me again, I always lose to this guy.'	'Three holes left, I'll recover.'
'I'm never going to break 80.'	'I can't wait until I break 80.'

The issue for some coaches is that they coach athletes who are over-motivated. Over-motivated athletes illustrate extremes of effort, determination and work ethic, are too goal-oriented and are perfectionist about performance. Because of this, they can easily become stale and burnt out, anxious in competition, can over-analyse and try too hard to play well, and because they generally work so hard they can become afraid of failure. Some advice coaches can provide to these athletes includes:

- stay in the present — focus more on the process of playing the game, not the final score

- set out to have more fun, not winning/achieving — focus on the joy of just playing sport

- time out — take breaks in practice/play to refresh and be aware of over-practice syndrome

- do not dwell on mistakes — perfectionist thinking does not let you enjoy anything

- give yourself permission to make mistakes — you will never play any game perfectly

- be patient with yourself (and others) and give improvements time to occur.

Dealing with winning and losing

Coaches can better comprehend how athletes deal with winning and losing by understanding the different ways both coaches and athletes approach and think about achievement situations. For example, consider Archie, a 16-year-old tennis player who has been competing for eight years. He approaches each tournament from the perspective of doing his best, having fun and learning. His focus appears to be on self-improvement and working hard as opposed to defeating opponents. On the other hand, Mary, a 16-year-old gymnast, also with eight years experience, is a highly competitive person and becomes distraught if she does not out-perform her competitors. Winning

appears to mean everything to her and she commented recently that as long as she wins she does not care how well she actually performs.

In terms of achievement, Archie would be described as having a **task goal orientation** because he seems more interested in mastery and getting better today at tasks than he was a week ago. Mary could be described as having an **ego goal orientation** because she seems more interested in outperforming others as opposed to self-improvement. Unlike Archie, who perceives himself to be high in ability if he gets better at tasks each day, Mary's perception of ability and self-confidence is tied to how she compares with others. While both athletes enjoy mastering tasks, Mary has become more aware of the consequences of social comparison and has developed a different goal orientation. Consequently, Mary is likely to be inconsolable if she does not win and oblivious to the lessons learnt about personal improvement when she does win.

When athletes fall short, and particularly those with ego-oriented dispositions, coaches should ask questions that help rebuild self-esteem. For example:

- Did you try your best to achieve your goals or try to stuff up?
- Was your goal realistic given your preparation, available support, focus and quality of opposition?
- Was the outcome within or outside your control?
- Is the outcome now within or outside your control?
- Are there lessons you can extract from the experience that might help you now or in the future?
- How best can you act on those lessons?

Coaches can also offer the following advice on finding emotional lifts when athletes feel emotionally down and out:

- Rest — go to bed early, sleep in, take naps
- Spend time in silence — silence relaxes
- Spend time in nature — nature heals
- Share time with positive-energy people
- Avoid stressful people and situations
- Do simple things that you enjoy
- Reflect on your own recent performance (and others) for forthcoming performances.

In addition, the following three techniques can assist both coaches and athletes to deal with winning and losing, particularly when circumstances seem both unexpected and uncontrollable. The key to these circumstances is to regain composure quickly and to continue with minimal disruption towards desired goals.
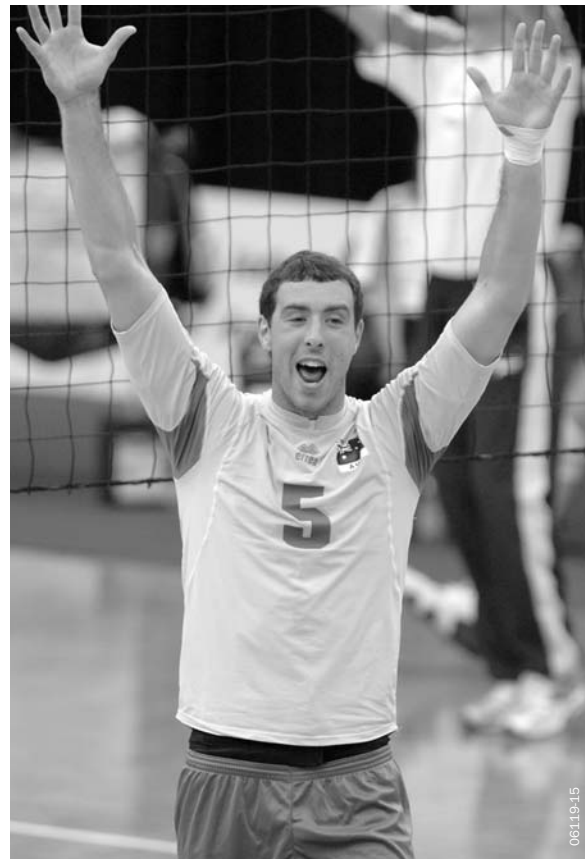
Technique 1: what ifs

The 'what if' technique primarily involves identifying those things that could go wrong, although planning for what could go right is also helpful. Coaches and athletes work out responses to each 'what if' before they encounter it. This is not negative thinking, it is thinking ahead — these 'what ifs' are going to happen sooner or later. By planning ahead about what they will say to themselves and how they will behave, athletes effectively remove the heat from the situation and reduce the pressure that can cause over-reactions and rash decision-making. For example:

- 'What if … I stuff up and lose today?'
- I will say to myself, 'That's disappointing, but it wasn't all bad. What can I learn from this for next time?', then briefly rehearse/shadow the skills required, congratulate the opponent, smile, and adopt the attitude of 'get over it, move on'.

Technique 2: simulations

Simulations are simply adverse circumstances built into normal practice conditions that oblige coaches and athletes to practise responses to 'what ifs'. By providing a safe environment to learn and practise constructive and helpful responses to adversity, coaches and athletes become more prepared to deal with the real thing.

Technique 3: mental rehearsal

Mental rehearsal involves the athlete imagining themselves dealing with errors, mistakes or peak performances. It also helps coaches and athletes re-focus when actual events occur. This technique is especially effective and convenient because it can be practised frequently and uses different types of circumstances.

Appreciative and solution-focused coaching questions

Sometimes unpredictable and uncontrollable adversity occurs and can either demoralise or discourage, or stimulate and challenge. Mentally tough and resilient athletes quickly regain energy and focus after setbacks, and seek out new directions for positive action. Sooner or later all athletes come to realise that setbacks can stimulate learning that sends them into the future even more capable than before. Athletes should think back on a time when they recovered rapidly from a disappointing setback.

- Who was involved? What happened?
- What internal and external factors enabled such a rapid recovery?
- What permanent, positive changes did they experience as a result of this experience?
- How can they apply what they learnt from that situation?
- What first steps can they take towards recovery from recent disappointments and setbacks?

Creating a positive environment for team selection

Perhaps even more important than knowing whether an individual athlete is task or ego oriented is the **motivational climate** in which individuals and teams are placed. Learning environments can also be task or ego oriented. An ego-oriented environment, with its emphasis on social comparison, can be particularly harmful to low-ability athletes. Coaches have the choice of creating two types of climates that have significant implications, both on how teams are selected, and the information conveyed by the selection or non-selection.

A task-oriented or **mastery** climate is one where athletes receive positive reinforcement from coaches when they work hard, demonstrate improvement, help others learn through cooperation and believe that each athlete's contribution is important. Team selection acknowledges achievement of all of these

values. In contrast, an ego-oriented or **competitive** climate is one where athletes perceive that beating the opposition (winning) is all important, poor performance is punished, only high-ability athletes deserve attention and recognition (for example, selection), and that competition among team members is not only healthy but is encouraged by the coach. Team selection processes merely reflect these expectations.

In the latter environment it would be quite natural for patterns of selection to emerge that reflect self-centred and self-interested approaches to sports participation. However, if coaches are aware of this, they can cater for it and can develop empathy and self-awareness among athletes, as well as improve their long-term performance.

All coaches should consider their own principles and processes of selection based around the following key questions:

- What are the core selection criteria that will promote a positive sports environment characterised by such things as personal satisfaction, strong team identity, team cohesion, mutual acceptance and effective communication? Some suggested criteria might include:
  - effort and commitment — evident in training as well as competition
  - skill development — increasing proficiency in the performance of skills
  - supportive behaviours such as attendance, punctuality and enthusiasm
  - interactions — promotion of positive relationships among team members.
- How can these criteria best be developed to make opportunity for selection as fair and equal as possible?
- Who else can provide information on selection that athletes would accept as being an appropriate source?
- Athletes have the right to personal feedback when they are de-selected, so how is this best achieved? Selection should be solely based on agreed criteria and exclude any personal feelings towards individuals.

Rather than treating selection as an uncontrollable issue, coaches should coach athletes to believe that selection is controllable, and help them focus more closely on how they can improve their performances (through process goals), which will enhance their selection potential. If performance is the key criterion for selection, then athletes must assume responsibility for selection. When athletes are de-selected, coaches can suggest that they consider the following:

- Through self-talk make your setbacks (de-selection) temporary, not permanent. 'I was dropped for this game, not the entire season.'
- Get specific feedback from the selectors about what is required to improve performance. Be assertive but not argumentative, and always thank selectors for their feedback.
- Focus on the controllables, such as your effort and attitude both to training and games.
- Prepare responses to (inevitable) questions from others who do not know what else to ask or say to you (for example, 'Why were you dropped?', 'How do you feel about being dropped?').
- Preserve relationships within the club and organisation. Be nice to everyone and become known for handling setbacks well. Everyone will appreciate that attitude.

Referral services for athletes who need sport psychology advice and support

Sport psychologists can be contacted through the Australian Psychological Society website (www.psychology.org.au) and Australian Psychological Society College of Sport Psychologists website (www.groups.psychology.org.au/csp/). The first point of contact can also be through respective state or territory institutes and academies of sport. In addition to recreational, elite and professional athletes, a range of people use sport psychology services:

- coaches, managers and administrators
- trainers, physiotherapists, physicians and others sports scientists
- umpires, referees and officials, and also performing artists (for example, musicians, dancers or actors)
- business personnel interested in optimal performance.

The types of athlete assistance sport psychologists typically offer include qualified advice on performance enhancement and individual mental skills such as goal setting, concentration, handling pressure, confidence, imagery, and creating the 'zone' or ideal performance state. Additional personal development skills can be provided, such as exercise and health behaviour changes (for example, weight management and smoking cessation), time-management skills (for example, balancing sport and study or employment or family life), career transitions, communication and travel skills. Issues related to the consequences of sport involvement can also be addressed, such as recovery from heavy training loads, staleness, overtraining and burnout, and rehabilitation from injury. Finally, organisations and teams can also benefit from leadership in conflict resolution, team building, teamwork, debriefing and program evaluation.

Many mental health problems have their first onset in mid to late adolescence or early adulthood — times when participation rates in sport are high. While some athletes may experience one-off episodes of uncontrollable fear, depression or anxiety, or feel that they are 'losing it', these brief periods of distress are not considered symptoms of mental illness. Each mental illness has its own symptoms, but there are some observable behavioural signs that occur over a prolonged period of time (at least two weeks) that might assist coaches in recognising that something is wrong. On witnessing any of the following behavioural signs coaches are advised to consult a sport psychologist who may, in turn, refer the athlete to a doctor and/or to specialists in mental health (for example, a clinical psychologist or psychiatrist).

Behavioural sign	Example
Withdrawal	Abnormal disinclination to speak up/get involved
Impaired focus	Inattentive, more easily distracted than usual
Irritability	More sensitive and easily frustrated than normal
Rapid weight change	Extremes of either weight gain or weight loss
Sadness and gloom	Increased tendency to appear very unhappy
Worry and agitation	Abnormally fretful and apprehensive
Aggression	Self-harm or excessively violent towards others
Erratic behaviour	Tendency towards mood swings
Disinterest	Cold, unconcerned, insensible, loss of enthusiasm
Delusional	Deceptive, prone to fantasy and false beliefs
Grandiose behaviour	Over-confidence, arrogance

Summary

Assisting athletes to develop the mental side of their performance is important in the overall development of an athlete. To perform at a competitive level in sport, positive mental skills are an essential component. Some of the areas where coaches can assist athletes include:

- goal setting
- arousal and anxiety control
- mental imagery
- motivation
- dealing with winning and losing.

Coaches should also consider how the environment that they create affects team selection processes. In competitive sport, the issue of selection or non-selection can be de-motivating for athletes and affect their ongoing participation and long-term performance. Coaches can assist in setting a positive environment for selection.

Coaches should also be aware of the limits of their role in relation to mental skills. Mental health problems are beyond the scope of the coaches' role, and they should be aware of referral services available for athletes who need specialist help.

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Chapter 13:
Anti-doping in sport

by Australian Sports Anti-Doping Authority

The use of substances and methods to enhance sporting performance, known as 'doping', is an issue coaches need to consider as part of their role. Eliminating doping in sport is paramount to protecting the integrity of sport, ensuring a level playing field, and maintaining the health and wellbeing of athletes.

The issue of doping in sport comes into play at both the elite and lower levels of sport. It is important that coaches are informed about the issue, and understand that they have a crucial role to play in shaping athletes' attitudes towards doping in sport at an early stage in their development. Like athletes, coaches are bound by their sporting organisation's anti-doping policy.

The role of the coach in anti-doping

The impact coaches have on athletes is significant with regard to anti-doping in sport. An effective coach can create an anti-doping culture that may help prevent athlete misuse of prohibited substances and methods, and assist athletes to deal with other issues related to anti-doping in sport.

To minimise doping in sport, there are a number of practical things a coach can do. These include:

- planning and implementing a training program that develops the athlete in all areas
- alleviating pressures on athletes where possible and caring for their wellbeing
- providing information about the health risks and other effects of prohibited substances and methods to athletes
- ensuring athletes understand the consequences of using prohibited methods and substances
- educating athletes about the various anti-doping resources that are available, and the procedures for checking medications and gaining approval for their use

- communicating to athletes the spirit of sport, health and fair play, by reinforcing that the use of prohibited substances and methods is cheating
- discouraging practices such as smoking, excessive drinking and the use of illicit drugs that are contrary to the idea of sport as a healthy pursuit
- being a good role model in relation to the use of alcohol and illicit drugs, and not smoking around athletes.

Coach responsibilities in anti-doping

Coaches should understand that athlete support personnel are subject to anti-doping rules in the same way that athletes are. Violation of these rules may result in a sanction.

Athlete support personnel include coaches, trainers, managers, agents, team staff, officials, and medical or paramedical personnel working with or treating athletes in, or preparing for, sports competition.

Anti-doping rule violations relevant to athlete support personnel include:

- tampering, or attempting to tamper, with any part of doping control
- possession of prohibited substances and prohibited methods
- trafficking in any prohibited substance or prohibited method
- administration or attempted administration of a prohibited substance or prohibited method to any athlete, or assisting, encouraging, aiding, abetting, covering up or any other type of complicity involving an anti-doping rule violation or any attempted violation.

According to the World Anti-Doping Code, athlete support personnel, including coaches, have the following roles and responsibilities with regard to anti-doping:

- to be knowledgeable of, and comply with, all anti-doping policies and rules adopted pursuant to the World Anti-Doping Code and which are applicable to them or the athletes who they support
- to cooperate with anti-doping organisations, such as the Australian Sports Anti-Doping Authority (ASADA), to conduct athlete testing
- to use their influence on athlete values and behaviour to foster anti-doping attitudes.

World Anti-Doping Agency

The World Anti-Doping Agency (WADA) is the international independent organisation created in 1999 to promote, coordinate and monitor the fight against doping in sport in all its forms.

Composed and funded equally by the sports movement and governments of the world, WADA coordinated the development and implementation of the World Anti-Doping Code, the document harmonising anti-doping policies in all sports and all countries.

WADA's activities focus on seven areas:

- World Anti-Doping Code — acceptance, implementation and compliance
- science and medicine
- out-of-competition testing
- anti-doping coordination
- athlete outreach
- anti-doping development
- education.

What is Australia doing in regard to anti-doping?

Australia is a world leader in the fight against doping in sport. The Australian Government established ASADA in 2006, replacing the Australian Sports Drug Agency. ASADA is a holistic anti-doping organisation that is responsible for implementing Australia's anti-doping program. This includes:

- doping control
- education
- investigation
- presentation of cases at hearings
- sanction recommendations
- assisting Australia's national sporting organisations in the development, approval and monitoring of their anti-doping policies.

ASADA has the power to investigate suspected anti-doping rule violations, make recommendations on its findings, and present cases against alleged offenders at the Court of Arbitration for Sport and other sports tribunals.

ASADA's clients include elite and sub-elite athletes, coaches, managers and medical officers who support athletes. ASADA also provides anti-doping services to:

- major Australian sporting events
- state, national and international organisations
- professional leagues

by carrying out doping control and education programs. ASADA's key roles and functions are listed at Appendix 7.

ASADA's anti-doping framework establishes clear and consistent arrangements for the hearing of doping matters and represents a tough response to eradicating doping in sport — a response that ensures Australian athletes are treated fairly and consistently.

Anti-doping rules

Each sporting organisation maintains an anti-doping policy. An anti-doping policy outlines the rules that govern anti-doping within that sport. Australian sporting organisations are required to have anti-doping policies that are set out in the ASADA National Anti-Doping Scheme.

The anti-doping rules for athletes and support persons are:

1   an athlete must not fail to comply with a request to inform ASADA of his or her location; and

2   an athlete must not fail to be able to be located for a sample after being requested to provide his or her location; and

3   an athlete must not evade, or attempt to evade, a request by ASADA for a sample; and

4   an athlete must not fail to comply with a request for a sample; and

5   an athlete or support person must not tamper, or attempt to tamper, with a sports drug matter; and

6   an athlete must not use, or attempt to use, a drug or doping method mentioned in the Prohibited List; and

7   an athlete or support person must not traffic in a drug or doping method mentioned in the prohibited list; and

8   an athlete or support person must not possess a drug or doping method mentioned in the prohibited list; and

9   an athlete or support person must not:

   a)   administer, or attempt to administer, a drug or doping method mentioned in the prohibited list; or

   b)   engage in conduct aiding and abetting any activity involving a violation of the anti-doping rules; and

10   an athlete must not have present, in their urine sample or blood sample, a drug or its metabolites or markers or doping method mentioned in the prohibited list.

CASE STUDY

Earl, a gymnastics coach, has one of his athletes approach him and allege that one of the girls she competes against from another state has been using prohibited substances.

While Earl has been put in a tough position, he realises how hard it was for his athlete to tell him this. Earl tells his athlete that he will have to phone ASADA's confidential Stamp Out Doping investigations hotline, 1800 645 700, and tell the organisation what he knows. He explains to his athlete that she needs to tell him as much as she knows, and that he will ensure her safety and reputation are not compromised. Earl also encourages his athlete to call the ASADA Stamp Out Doping hotline.

Earl phones the Stamp Out Doping hotline and tells the operator everything he knows, and expresses his concerns for his athlete.

The hotline operator assures Earl that his name will be kept confidential and that any information he provides will go directly to the ASADA investigations unit.

Prohibited substances and methods

Sporting organisations with compliant anti-doping policies prohibit the use of substances and methods listed in the World Anti-Doping Code's Prohibited List. Athletes must be aware of the substances and methods that are prohibited in their sport, and check the anti-doping rules of their sporting organisation/s. The World Anti-Doping Code's Prohibited List is subject to regular review and is updated on an annual basis. See the WADA website (www.wada-ama.org/en/) or ASADA website (www.asada.gov.au) for details.

A policy of strict liability exists in sport, whereby athletes must take full responsibility for the substances in their body regardless of how that substance came to be there.

The World Anti-Doping Code's Prohibited List includes substances and methods that are prohibited in and out of competition. The following classes of substances and methods are prohibited under the World Anti-Doping Code 2008 Prohibited List.

Substances prohibited at all times

- Anabolic agents
- Hormones and related substances
- Beta-2 agonists
- Agents with anti-estrogenic activity
- Diuretics and masking agents

Substances prohibited in-competition only

- Stimulants
- Narcotics
- Cannabinoids
- Glucocorticosteriods

Methods prohibited at all times

- Enhancement of oxygen transfer
- Chemical or physical manipulation (which now includes intravenous infusions)
- Gene doping

How to check the status of medications in sport

It is important that athletes check the status of any medications they are planning on taking prior to use to ensure they are permitted in sport. Checking of medications can occur through ASADA via the following avenues:

- The ASADA Anti-Doping Hotline on 1800 020 506 between 8.00am and 8.00pm Australian Eastern Standard Time, seven days a week. The ASADA Hotline provides sport-specific information regarding the status of medications and substances in sport.
- The ASADA *Anti-Doping Information Handbook* is a useful hardcopy anti-doping reference that includes details regarding the status of medications and substances in sport.
- The ASADA On-Line Medications List provides details of medications that are permitted, prohibited and subject to certain conditions. The ASADA On-Line Medications List is available on the ASADA website (www.asada.gov.au).

CASE STUDY

Shane has been coaching the state swimming squad for three years. In that time he has attended an education session delivered by ASADA, and watches the ASADA educational DVD, *Pure Performance in Sport*, annually with his squad.

Sally, one of Shane's athletes, approaches him before a training session, clearly embarrassed and in pain. She tells him she has been suffering from terrible period pain all day. She shows Shane some pain relievers that her mother gave her, and asks if she can take them.

Shane knows that the World Anti-Doping Code's Prohibited List is updated annually. Although he thinks he knows the answer, he reminds Sally that it is easy to find out. He tells her that she can call the ASADA Anti-Doping Hotline on 1800 020 506, and get the right answer from the people who know, and remain anonymous.

Shane uses his mobile to dial the Anti-Doping Hotline, and hands the phone to Sally so she can speak to an operator. After speaking with the operator, Sally tells Shane that her medication is not on the Prohibited List, so she can take it. She received a receipt number from the operator, which Shane advises her to keep on her records for future reference.

Shane reminds Sally she must always check the status of medications before she takes them.

The role of doping control in sport

Doping control (commonly know as drug testing) is designed to maximise the deterrence and detection of athletes engaging in prohibited doping practices. Internationally and in Australia, athletes may be targeted or randomly selected for testing.

Sample collection procedures for testing are listed at Appendix 8, and apply to those athletes who are subject to doping control.

Who is eligible/subject to testing?

Sample collection may occur **in competition**, where the athlete is selected for sample collection in connection with a specific competition, or **out of competition**.

In Australia, ASADA maintains a registered testing pool and a domestic testing pool. As a guideline, ASADA's testing pool includes:

- athletes who are part of senior national teams in Olympic and Paralympic sports and other recognised national sporting organisations (currently defined by ASADA primarily as national federations and programs in receipt of regular high performance Australian Government funding via the Australian Sports Commission)
- Australian athletes in international federations' testing pools
- athletes who are serving periods of ineligibility or provisional suspensions as a consequence of anti-doping rules violations
- other athletes who may be included in the national testing pools based on ASADA's doping control requirements.

Each athlete in ASADA's registered testing pool will be notified in writing of their inclusion, and specific athlete whereabouts information, requirements and consequences for non-compliance will be outlined.

An athlete's inclusion in the testing pool is based on a number of factors related to the athlete, level of competition, sport and ASADA's anti-doping program requirements. ASADA's testing pool is constantly reviewed and updated, and athletes can be notified of their inclusion or removal from the testing pool at any time.

Generally, in-competition testing is conducted at state, national or international-level events where athletes identified in ASADA's testing pool are competing. However, it should be noted that testing at these events may also involve athletes who are not part of ASADA's testing pool.

The random selection procedures used for in-competition testing may involve athletes being selected through a process involving final placing or through the drawing of competitor numbers.

The selection of athletes for out-of-competition testing can be determined by direct targeting, random draw, or weighted random selection.

Athletes under the age of 18

Athletes who satisfy the definition of 'athlete' under the ASADA National Anti-Doping Scheme and are under 18 years of age are subject to testing. It is strongly recommended athletes under 18 have a representative present during the testing. A representative may include the athlete's parent, guardian, coach, manager, representative of sporting body or an adult requested by the athlete. The representative as well as the athlete should be notified for testing.

If an athlete under 18 years of age is selected to provide a sample, the doping control officer may notify the athlete's representative of the athlete's selection and explain the athlete's rights and responsibilities to this person.

- During advance notice notifications over the phone, the doping control officer may notify the parent/ guardian in the first instance.

- An athlete who is under 18, or their representative, may request that the representative is present in the provision area, but they will not witness the passing of the sample. The athlete must approve the presence of the representative.

- The athlete's representative will be requested to sign the doping control form if present at the session. If the athlete or the athlete's representative has any concerns with the testing process, this should be documented on the doping control paperwork.

Athletes with a disability

The needs of an athlete with a disability are taken into account during the sample collection process. Assistance is provided as needed during the sample collection procedure and modification of the sample collection procedures can occur, on request of the athlete, where required.

An athlete with a disability is strongly advised to have a representative present during testing.

Therapeutic use of prohibited substances

The following information applies to athletes who are subject to doping control (drug testing) in their sport.

In some cases, athletes may require the use of a prohibited substance to treat a legitimate medical condition. If an athlete suffers a medical condition that can only be treated with a medication containing a prohibited substance, and there is no permitted alternative, there is a process available to allow for therapeutic use of prohibited substances. This is known as a therapeutic use exemption.

There are two types of therapeutic use exemptions:

- standard therapeutic use exemption
- abbreviated therapeutic use exemption.

The standard therapeutic use exemption must include a full clinical history and requires submission to the Australian Sports Drug Medical Advisory Committee for approval. The abbreviated therapeutic use exemption, for the use of inhaled beta-2 agonists (asthma medications) and some non-systemic use of glucocorticosteroids (anti-inflammatories), must be submitted to the athlete's national sporting organisation for approval. Athletes should not use a prohibited medication prior to receiving a therapeutic use exemption, unless it is an emergency medical situation.

More information regarding therapeutic use exemptions can be found on the ASADA website (www.asada.gov.au) or the Australian Sports Drug Medical Advisory Committee website (www.asdmac.org.au).

CASE STUDY

Amanda is the coach of an equestrian team. One of her paraplegic athletes, John, approaches her to ask about a narcotic medication he takes for pain management. John is concerned he will have to stop riding if he is unable to use the medication.

Amanda advises John to phone the ASADA Anti-Doping Hotline on 1800 020 506 to check if the substance is prohibited or permitted.

Under the Equestrian Federation of Australia's Anti-Doping Policy, the painkiller is a prohibited substance; however, the athlete is advised he can apply for a therapeutic use exemption.

Amanda reminds John to follow the correct processes for a therapeutic use exemption and that he must wait to be advised in writing of his application's approval before he can take the medication. If approval is granted, John can take his required medication and continue in his sport.

Prohibited substances in foods or supplements

Supplements are not comprehensively regulated in Australia. For this reason there can be problems with the use of supplements and sports foods. There is a risk that supplements may contain:

- ingredients not listed on the label that could cause a positive test
- impurities introduced at the manufacturing stage that could cause a positive test.

It is impossible to guarantee the safety of these products or that they do not contain substances that may result in a positive test. Under the World Anti-Doping Code's strict liability rule, athletes are responsible for any substance found in their body. It does not matter whether the athlete intentionally or inadvertently consumed or used the product. If an athlete tests positive to a prohibited substance the athlete is likely to receive a sanction.

While some manufacturers may guarantee the ingredients in their product, or that the use of the product will not result in a positive test, the athlete is still responsible if a prohibited substance or method is detected, even with the guarantee. Athletes must take seriously their personal responsibility for what they ingest.

Summary

Anti-doping in sport is an important issue for coaches, and one with which they need to be familiar. Coaches should be aware of the role that they can play in regard to anti-doping, as well as the impact of anti-doping rules on themselves and the athletes they coach.

It is important that coaches know where to go for information on anti-doping issues, and can assist athletes in understanding their responsibilities in regard to anti-doping. Coaches can encourage their athletes to ensure they are meeting their responsibilities by checking medications and abiding by their sport's anti-doping policy. For those athletes that are subject to doping control, coaches can assist athletes to understand the requirements of the doping control process, and provide support and assistance when required.

Coaches have a vital role to play in shaping the values of athletes towards anti-doping in sport. This is an important responsibility, which coaches should make efforts to act on.

References and further reading

Australian Sports Anti-Doping Authority 2007, *Anti-Doping Handbook*, Australian Sports Anti-Doping Authority, Canberra.

Australian Sports Anti-Doping Authority 2006, *Doping Control Guide*, Australian Sports Anti-Doping Authority, Canberra.

Australian Sports Anti-Doping Authority website (www.asada.gov.au).

Australian Sports Drug Medical Advisory Committee website (www.asdmac.org.au).

Australian Sports Commission website (www.ausport.gov.au/ethics/antidoping.asp).

World Anti-Doping Agency website (www.wada-ama.org/en/).

World Anti-Doping Code, 2008 Prohibited List.

Appendix 1:
Australian Sports Commission Code of Behaviour

This Code of Behaviour is intended to be the minimum standard for anyone involved in sport.

- Operate within the rules and spirit of your sport, promoting fair play over winning at any cost.

- Encourage and support opportunities for people to learn appropriate behaviours and skills.

- Support opportunities for participation in all aspects of the sport.

- Treat each person as an individual.

- Display control and courtesy to all involved with the sport.

- Respect the rights and worth of every person regardless of their gender, ability, cultural background or religion.

- Respect the decisions of officials, coaches and administrators in the conduct of the sport.

- Wherever practical, avoid unaccompanied and unobserved one-on-one activity (when in a supervisory capacity or where a power imbalance will exist) with people under the age of 18 years.

- Adopt appropriate and responsible behaviour in all interactions.

- Adopt responsible behaviour in relation to alcohol and other drugs.

- Act with integrity and objectivity, and accept responsibility for your decisions and actions.

- Ensure your decisions and actions contribute to a safe environment.

- Ensure your decisions and actions contribute to a harassment-free environment.

- Do not tolerate harmful or abusive behaviours.

Athletes

- Give your best at all times.

- Participate for your own enjoyment and benefit.

Coaches

- Place the safety and welfare of the athletes above all else.

- Help each person (athlete, official, etc.) reach their potential. Respect the talent, developmental stage and goals of each person and compliment and encourage with positive and supportive feedback.

- Any physical contact with a person should be appropriate to the situation and necessary for the person's skill development.

- Be honest and do not allow your qualifications to be misrepresented.

Officials

- Place the safety and welfare of the athletes above all else.

- Be consistent and impartial when making decisions.

- Address unsporting behaviour and promote respect for all people.

Administrators

- Act honestly, in good faith and in the best interests of the sport as a whole.
- Ensure that any information acquired or advantage gained from the position is not used improperly.
- Conduct your responsibilities with due care, competence and diligence.
- Do not allow prejudice, conflict of interest or bias to affect your objectivity.

Parents

- Encourage children to participate and have fun.
- Focus on the child's effort and performance rather than winning or losing.
- Never ridicule or yell at a child for making a mistake or losing a competition.

Spectators

- Respect the performances and efforts of all people.
- Reject the use of violence in any form, whether it is by spectators, coaches, officials or athletes.

Appendix 2:
Skills identification matrix

Use the first column of the table below to list the important skills of your sport. You may also like to give them a ranking for the order of their importance to good performance. Then use the 'Athlete' columns to note down the athletes' current ability level for each of these skills. A coding system (for example, 1 = strong at this skill, and 5 = weak at this skill) may help to summarise their abilities. You may prefer to modify this table to suit your individual needs and preferences.

Skills of the sport	Athlete's name:	Athlete's name:	Athlete's name:	Athlete's name:	Athlete's name:
Technical skills					
Skill 1:					
Skill 2:					
Skill 3:					
Skill 4:					
Skill 5:					
Skill 6:					
Tactical skills					
Skill 1:					
Skill 2:					
Skill 3:					
Skill 4:					
Skill 5:					
Skill 6:					
Physical skills					
Speed					
Strength					
Power					
Endurance					
Flexibility					
Balance					
Agility					
Other					

Skills of the sport	Athlete's name:	Athlete's name:	Athlete's name:	Athlete's name:	Athlete's name:
Mental skills					
Skill 1:					
Skill 2:					
Skill 3:					
Skill 4:					
Skill 5:					
Skill 6:					
Maturity and experience					
Physical maturity					
Emotional maturity					
Social maturity					
Playing experience					
Communication skills					
Other					

Appendix 3:
Athlete goals

Use the table below to record goals for the athletes. Do not forget to make them SMART — specific, measurable, achievable, realistic and time-bound (that is, set a date for their achievement).

Athlete name: _____ **Date:** _____

Technical skills
Tactical skills
Physical skills
Mental skills
Other

Appendix 4:
Athlete medical history form

PERSONAL DETAILS

Given name: _____ Family name: _____

Address: _____

Tel: (h) _____ (w) _____ Mobile: _____

Sex: M   F   (please circle)   Date of birth: _____

EMERGENCY CONTACT

Given name: _____ Family name: _____

Address: _____

Tel: (h) _____ (w) _____ Mobile: _____

Relationship: _____

HEALTH CARE DETAILS

Doctor's name: _____ Tel: _____

Dentist's name: _____ Tel: _____

Medicare number: _____

MEDICAL DETAILS

Blood group: _____ Do you object to transfusions?   Yes / No (please circle)

Have you received a medical clearance from your doctor?   Yes / No (please circle)

Do you have any allergies?   Yes / No (please circle)

If yes, please list: _____

_____

_____

Please list any medical conditions that you have (for example, asthma, diabetes, epilepsy):

_____

_____

_____

Please list any regular medications you require (include dosage):

_____

_____

_____

SPORTS INJURY DETAILS

Please list any current or recurring injuries:

_____

_____

_____

Do you suffer from recurring pain in any joint when playing sport?   Yes / No (please circle)

If yes, please provide details: _____

_____

_____

Do you wear protective equipment (for example, mouthguard, head gear)? Yes / No (please circle)

If yes, please provide details: _____

_____

_____

Do you require specific taping/padding for a previous injury?   Yes / No (please circle)

If yes, please provide details: _____

_____

_____

Have you ever had a head, neck or spinal injury?   Yes / No (please circle)

If yes, please provide details: _____

_____

_____
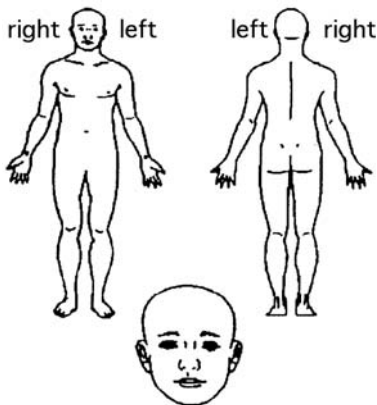
To the best of my knowledge, all information contained on this form is correct
(if under 18 please have a parent or guardian sign)

Signature: _____

Date: _____

Note: Users of this form are advised that medical information should be treated confidentially.
In some states, additional legislation affects the management of health records.
See the Australasian Legal Information Institute website (www.austlii.edu.au) for further information.

Appendix 5:
Injury report form

Injury details: This report reflects an accurate record of the injured person's reported symptoms of injury

Name of person injured:

DOB (Day/Month/Year):   /   /

Date when injury occurred: /   /

Date when injury is evident: /   /

Person injured: ☐ Athlete ☐ Coach ☐ Other:_____

Gender: ☐ M ☐ F

Supervising coach: _____
(Signature)

Witness: _____
(Signature)

First aid provided by: _____
(Signature)

Time of first aid: :

Initial treatment:
☐ No treatment required
☐ CPR ☐ RICER
☐ Crutches ☐ Sling/splint
☐ Dressing ☐ Strapping
☐ Massage ☐ Stretching

Nature of injury:
☐ New injury ☐ Aggravated injury
☐ Recurrent injury ☐ Other:_____

Did the injury occur during: ☐ Training ☐ Event ☐ Other:_____

Symptoms of injury:

☐ Blisters	☐ Inflammation/swelling	☐ Spinal injury
☐ Bleeding nose	☐ Cramp	☐ Cardiac problem
☐ Bruising/contusion	☐ Suspected bone fracture/break	☐ Electrical shock
☐ Cut	☐ Dislocation	☐ Burn
☐ Graze/abrasion	☐ Concussion/head injury	☐ Insect bite/sting
☐ Sprain	☐ Loss of consciousness	☐ Poisoning
☐ Strain	☐ Respiratory problem	☐ Other:_____

Body part injured:

right left   left right

How did the injury occur?
☐ Collision with a fixed object   ☐ Overbalance
☐ Collision/contact with another person   ☐ Overstretch
☐ Fall from height/awkward landing   ☐ Slip/trip
☐ Fall/stumble on same level   ☐ Other:_____

Extra detail regarding how the injury occurred:

Was protective equipment worn on the injured body part? ☐ Yes ☐ No

Follow up action:
☐ None ☐ Medical practitioner/physiotherapist ☐ Hospital
☐ Ambulance ☐ Other:_____

Signature of person completing form:

Date: /   /

Note: Coaches without medical training should refer all medical decisions to appropriately qualified persons. Do not attempt to 'diagnose' an injury. Users of this form are advised that medical information should be treated confidentially. In some states, additional legislation affects the management of health records. See the Australasian Legal Information Institute website (www.austlii.edu.au) for further information.

Appendix 6:
Risk management planner

Risk identification	Strategies to minimise risk	Timeline	Responsibility
Program			
1			
2			
3			
Environment			
1			
2			
3			

Risk identification	Strategies to minimise risk	Timeline	Responsibility
Personnel			
1			
2			
3			
Other			
1			
2			
3			

Appendix 7: Key roles and functions of the Australian Sports Anti-Doping Authority

The Australian Sports Anti-Doping Authority's (ASADA's) key roles and functions are:

- to advise the Australian Sports Commission about sports drug and safety matters that should be included in any agreement under which the Commission gives money to a sporting organisation

- to advise the Australian Sports Commission about recognising a sporting organisation as being responsible for administering the affairs of a sport, or of a substantial part or section of a sport, in Australia

- to support, encourage, develop and implement initiatives that increase the skills and knowledge of people involved in sporting activities about sports drug and safety matters

- to support and encourage the sporting community to develop and implement comprehensive programs and education initiatives about sports drug and safety matters

- to support, encourage and conduct research about sports drug and safety matters

- to collect, analyse, interpret and disseminate information about sports drug and safety matters

- to encourage the development of ways for the states and territories, and sporting organisations, to carry out initiatives about sports drug and safety matters

- to cooperate with the states and territories, and with sporting organisations, to carry out initiatives about sports drug and safety matters

- to provide the following services under contract on behalf of the Commonwealth:

  – anti-doping testing services

  – safety checking services

  – other services (including information technology services) relating to sports drug and safety matters

- to make resources and facilities (including secretariat services and clerical assistance) available to the Australian Sports Drug Medical Advisory Committee for the purposes of enabling it to perform its functions

- such other functions as are conferred on ASADA by the *Australian Sports Anti-Doping Authority Act 2006* or any other law of the Commonwealth

- to advise the Minister about matters relating to any of the above functions

- to do anything incidental, or conducive to, the performance of any of the above functions.

Appendix 8: Australian Sports Anti-Doping Authority sample collection procedures

Notification and athlete response

Athletes can be notified of their selection for sample collection anywhere, anytime.

The main personnel involved in conducting sample collection sessions are:

- doping control officer — the person who runs the testing session. They will answer questions that coaches or athletes may have regarding the test
- chaperone — the person who will notify the athlete that they will be tested. The athlete is to remain with the chaperone from notification until the test is complete. The chaperone will be the same gender as the athlete. The doping control officer may also perform any of the chaperone's tasks
- blood collection official — if a blood sample is being taken, this is the qualified person who will physically collect the blood.

An Australian Sports Anti-Doping Authority (ASADA) doping control officer or chaperone will notify an athlete of their selection for sample collection. In rare circumstances, an athlete may be notified by telephone or via a third party.

At the time the athlete is notified by an ASADA official, the official will record the relevant details on a Doping Control Notification Form. The athlete is required to sign the form, and will be given a copy for their records.

For no advance notice, out-of-competition and in-competition testing, the athlete is required to report to the Doping Control Station as soon as practical or within 60 minutes, whichever is sooner. Athletes can request a delay in reporting to the Doping Control Station, or leave the Doping Control Station once they have reported, with the consent of a doping control officer and at all times in full view of the chaperone, for valid reasons, including to:

- attend a victory ceremony
- compete in further events
- finish a training session
- receive necessary medical attention
- fulfil media commitments
- cool down
- undertake other activities considered reasonable and approved by the doping control officer.

The athlete must remain in full view of an ASADA official until the doping control officer is satisfied that the sample collection procedure is complete.

Urine sample collection

The chaperone will notify the athlete they have been selected for doping control. The chaperone will escort the athlete through the doping control process. It is the responsibility of the athlete to remain in sight of the chaperone at all times until the doping control session is complete.

In the Doping Control Station, the athlete must roll their sleeves up to their elbows, have their shirt pulled up to their ribs, and have their pants down to their knees. The chaperone will directly observe the provision of a sample from the athlete's body into the collection vessel. This is to ensure that the sample has not been tampered with in any way, and that the integrity of the sample is maintained.

The World Anti-Doping Code's International Standard for Testing requires that a doping control officer or chaperone witness the sample leaving the athlete's body and record the witnessing of that sample in writing.

Athlete rights

Athletes have the right to:

- nominate a representative of their choice to accompany them to the Doping Control Station
- request information regarding the sample collection procedure
- request a delay in reporting to the Doping Control Station, or leave the Doping Control Station once they have reported, with the consent of a doping control officer and at all times in full view of the chaperone, for valid reasons including to:
  - attend a victory ceremony
  - compete in further events
  - finish a training session
  - receive necessary medical attention
  - fulfil media commitments
  - cool down
  - undertake other activities considered reasonable and approved by the doping control officer
- request modifications to standard sample collection procedures — this will be recorded on the Doping Control Test Form and only applies to athletes with a disability
- request an interpreter.

Athlete responsibilities

Athletes have a responsibility to ensure:

- they are aware of, and comply with, their sport's anti-doping policy (including the provision of accurate whereabouts information)
- they are available for, and comply with, sample collection procedures[*]
- they remain in sight of the chaperone at all times
- they control the sample until it is sealed in the sample collection equipment
- the sealed sample collection kit is secure and identified
- all appropriate documentation is accurate, complete and signed
- they take responsibility for what they ingest and use
- they inform medical personnel they are subject to doping control and of their obligation not to use prohibited substances and prohibited methods
- any medical treatment does not violate anti-doping rules.

* The relevant sporting federation may apply sanctions if an athlete does not comply with a request to provide a sample or otherwise interferes with the doping control process.