



Long-Term Participant Development

Stroke by Stroke

The Swimming LTPD Programme of Swimming South Africa



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Acknowledgements

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Preface

Swimming South Africa is pleased to introduce the Long-Term Participant Development Strategy for Swimming. This document, which describes the ideal development strategy in detail, has been created as a guide for everyone involved with the South African swimming community, particularly the coaches, administrators and athletes' parents. Swimming is a dynamic sport, and although it will continue to change and develop, the basic principles behind the long-term development of athletes will not change.

List of acronyms used in this document

LTAD	Long-Term Athlete Development
LTPD	Long-Term Participant Development
PHV	Peak Height Velocity (the adolescent growth spurt)
SSA	Swimming South Africa

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Foreword by the President of SSA



The journey towards building world champions is a long and arduous road. We have been fortunate in swimming that we have been able to contribute significantly to South Africa being a winning nation. We have had many champions at Continental Championships, Commonwealth and World Championships as well as the Olympic and Paralympic Games.

However, it is important that we continue to build on these successes as we go forward and develop methods of identifying, nurturing and developing talent in a manner that considers the development state of the child and create an environment that youngsters can grow and enjoy the sport of swimming throughout their lives.

The Long Term Participant Development Strategy for Swimming that is presented in this document lays the basis for growing swimming in a sustainable manner. It will be critical for our coaches, parents, administrators, educators and athletes to understand the model that is presented here so that the depth and quality of our swimming will continue to grow from strength to strength.

I would like to thank the SSA Workgroup, the various individuals that have commented and contributed towards the development of this document and SASCOC for the ongoing support for the LTPD programme.

I look forward to seeing the fruits of success of this initiative in the years to come.

Jace Naidoo

A handwritten signature in black ink, appearing to read 'Jace Naidoo'. The signature is stylized and fluid, with a large initial 'J' and 'N'.

President
Swimming South Africa

Introduction

1. What is LTPD?

The origins and meaning of LTPD

LTPD stands for Long-Term Participant Development. It was first developed by Dr Istvan Balyi, a coaching educator, as the LTAD (Long-Term Athlete Development), in the late 1990s and early 2000s. His work was prompted by scientific research that shows it takes 8–12 years of training for a talented athlete to reach elite levels (Bloom 1985; Ericsson et al. 1993; Ericsson and Charness 1994.) It was meant mainly as a strategy for developing athletes to their fullest potential.

Many professional sports bodies throughout the world use variations of this strategy for their athletes. However, following the LTAD model has huge potential for enhancing any participant's enjoyment of sport and physical activity, so we refer to it as the **LTPD** model (replacing 'athletes' with 'participants').

The LTPD model is based on the idea that at any one time, each participant in a sport is at different stages of:

- physiological (bodily)
- cognitive (mental) and
- emotional development.

These factors of development together make up **developmental age** – the maturation level of an individual. It is developmental age, rather than chronological age, that we must identify and consider when developing a participant's optimal training, competition and recovery programs.

At the same time, the various stages of LTPD are still linked to the participant's approximate chronological age. The stages can be grouped as follows:

Childhood

- Active Start
- Fundamentals
- Learn to Train

Adolescence

- Train to Train
- Train to Compete

Adulthood

- Train to Win
- Active for Life

The stages of LTPD are based on the concept that sports can be classified as early or late specialisation sports. **Early specialisation** sports are defined as those sports where early specific training is essential to be successful, such as gymnastics, rhythmic gymnastics, diving, figure skating, swimming and table tennis.

Late specialisation sports are defined as those sports when early specialisation is not required to achieve excellence. These sports include cricket, athletics, soccer, rugby, volleyball, combative or racquet sports.

LTPD is an example of a shift in thinking, resulting in a fundamentally different approach to sport and physical activity. The basic LTPD principles apply equally to people of all ages and abilities, whether they are participating in elite professional sport, or purely recreational physical activity.

To better understand the LTPD model, and its role in helping participants to achieve their individual goals, we first need to discuss a number of key factors that make up the LTPD model and set it apart from other athlete development models.

Goals of LTPD

One of the goals of the LTPD model is **physical literacy**, which means mastering fundamental movement skills and fundamental sport skills.

A physically literate person moves with poise, economy and confidence in a wide variety of physically challenging situations [and] is perceptive in reading all aspects of the physical environment. He/ she anticipate[s] the movement needs or possibilities, and responds appropriately with intelligence and imagination. (Whitehead, 2001)

LTPD's first three stages (Active Start, Fundamentals and Learn to Train) enable physical literacy. The next three stages (Train to Train, Train to Compete and Train to Win) lead to excellence and enable transition at any age to the last, Active for Life stage, which is basically lifelong participation in physical activity or sport.

Another goal of the LTPD model is **full sport system alignment and integration**. Basically, this means recognising that physical education, school sports, competitive sports, and recreational activities should be mutually *interdependent*, that is, they should communicate with, support and rely on each other.

The LTPD system is easy to follow, and provides a framework that allows its principles to be applied. The more the national, provincial, district, school and club teams co-operate and work together, the stronger the framework will be, which will enable athletes to develop along optimal lines.

The implemented system will create a common development program that will ideally enable all athletes – including athletes with disabilities – the opportunity to achieve the best swimming experience possible. It will provide guidelines for athletes to attain the technical, physical, tactical and mental skills required for them to achieve excellence at the highest level.

2. Where are we now?

Athletes

Performance levels

While we have seen improved performances by some of our top athletes at events such as the Olympic Games, these performances came from only one or two athletes. Unfortunately, we have only a few athletes that are capable of achieving medals at the Olympics. However, there are a large

number of athletes who are capable of reaching FINA World Championships and Olympics semi-finals and finals. The development program presently in place at club and affiliate level caters mostly for these talented athletes.

Accessibility

SSA Provincial structures cater for the very young swimmers. This is a problem as we need to introduce a sustainable program that will assist and develop our younger boys and girls.

Coaches

At present there is a structure in place to encourage co-operation between coaches at various levels. There is a framework for coach education and an accreditation process of recognising coaches' education and development.

Officials

Currently there is no clear national system for the accreditation of Technical Officials. At this stage, most of the training and accreditation are done by affiliates. Officials for national events are handled and organized by the SSA with the assistance of the hosting affiliate body.

Parents

In general, parental support and understanding of LTPD is still extremely limited. Very little parent education has been carried out throughout the country. A few concerned coaches are trying to carry out a program to educate parents about LTPD. A major concern is that some parents seem to push their children to win at all costs (in order to bring home trophies), to the detriment of these young athletes. One option is to produce posters explaining the SSA LTPD concept in point form, and then to supply these to all swimming facilities, learn-to-swim coaches, clubs and schools.

3. *Where do we want to be?*

Athletes and participants

- All participants and potential athletes should be given the opportunity to learn to swim through our learn-to-swim programs. The activity programs are being offered and organised by SSA Affiliates and are available at clubs and swim schools.
- All athletes should be allowed equal opportunities to reach their personal goals in swimming.
- Swimming should be available to anyone in the quest for a healthy lifestyle.

All athletes, including athletes with disabilities, should be able to join SSA-accredited clubs that can offer an educated LTPD program to all their members. The clubs will be able to deliver a national co-ordinated program, giving athletes better opportunities and preparing them to compete successfully at international, national and affiliate championships.

Coaches

We aim to accredit non-qualified and non-accredited coaches through an RPL process based on coaches' educational background, experience and performance. The process will cover the learn-to-swim program and coaches through all the various levels.

We should hold regular education courses that will offer support, discuss new and progressive ideas, and supply basic training for new coaches. We must be able to offer top quality coaching programs on

par with the best coaching programs in other countries, to encourage talented athletes to remain in our training programs in South Africa.

Officials

All affiliates (provincial members or federations of SSA) must be responsible for educating and training technical officials, based on the national and international information available. All technical officials should make themselves available for national and regional competitions. This will encourage skill transference between officials and help them to interpret and apply rules uniformly (i.e. consistently).

Parents

Ideally, education programs would be held all around the country to familiarise parents with the benefits of the LTPD program. Parents' encouragement of young athletes, from the active start through all the various stages, helps ensure athletes' participation in sporting activities and promotes values, fun, inclusion and fairness.

Facilities

Our aim would be to have at least one indoor pool of international standard, as well as a number of heated pools, in each province.

4. *How are we going to get there?*

Athletes

If we want to encourage children in sport and lifelong activity, as well as create the potential for them to compete internationally, we need to build our sport programs around principles that respect the developmental needs of all children. LTPD is a progressive pathway of development that recognises the distinct stages of physical, mental (cognitive) and emotional development in child athletes. It addresses the needs of those who are able-bodied, and those who have a disability, and it also aids both early and late developers.

As stated earlier, LTPD assumes that it takes 8–12 years of training and practice for an athlete to reach elite levels, and that success comes from training, practising and competing well over the long term, rather than focusing on winning in the short term. There is no shortcut to success in an athlete's preparation!

The LTPD model not only provides grounds for enhancing our current system, but also helps us to identify and tackle some of the weaknesses in it. To develop talent we must look beyond the short-term and always plan for the future. These are immense challenges for our sport.

Additional support mechanisms must be built into the development program for athletes. These athletes will be included in additional squads according to their performance and talent. The different squads will train specifically for Olympic, Paralympics, World Championships and Commonwealth competitions. This will improve the ability of our qualifiers to make finals at these world class events, and at the same time strengthen our relay teams. The youth squad will supply these in the years to come.

Coaches

We have set up a coaches' framework and we have finalised the criteria for the four levels of all SSA accredited coaches. Educational and practical coaching courses are held, targeting previously disadvantaged coaches in order to attract new athletes in poorer areas such as townships.

We need to:

- recognise and reward coaches' performances
- encourage a friendly and co-operative association where coaches are willing to discuss successful methods with fellow coaches
- convey a sense of gratitude for the important job coaches are doing for their communities.

Technical officials and volunteers' education and development

We aim to:

- recognise the time and dedication of all technical officials and volunteers
- amend the existing officials' training and development programs
- set up a standard education program for volunteers throughout the country
- promote and develop an awareness program for volunteers
- design and deliver official and team manager development workshops
- monitor progress, evaluate success and review periodically
- develop an effective mentoring and monitoring scheme for officials
- supply all registered SSA technical officials (volunteers) with competence certificates
- assign duties to high ranking volunteers for all international and national events
- continually update rules and regulations as needed.

Parent education

It is important for parents to encourage sport and physical activities to help with the growth and development of their children. Medical and sport research shows that children are increasingly at risk for obesity and disease due to low levels of activity and poor nutritional habits.

Children play sport to:

- have fun
- experience thrills
- be with friends or make new friends
- do something they are good at
- feel good about themselves
- feel accepted
- improve skills and learn new ones.

Parents may have their own reasons for encouraging their children to play sports, and problems arise when their motives conflict with those of their sons or daughters. Some of the most common problems arise when parents:

- place too much emphasis on winning
- push their children to specialise in one sport too early
- try to live their own dreams through their children.

Ideally, a child should find intrinsic reward in an activity – in other words, the child should simply be having fun. This is the best basis for motivation. No child should be forced to participate in a sport they don't enjoy.

Clubs and club development

Clubs play an important part in delivering any new system. Their roles and responsibilities are as follows:

- Clubs that are part of the SSA setup will initially be used as the ‘front line’ in the development process. In conjunction with the affiliate clubs, they will be responsible for delivering the Fundamentals, Learn to Train and Train to Train phases of LTPD (from ages 6–15). As the system rolls out, we envision that additional clubs will be added to deliver the system once they gain accredited club status.
- As an increase in the number of hours of activity for talented athletes is expected, we propose that clubs and affiliates locate and provide additional local venues where athletes can be trained by experts.
- In the long term, tailored packages of benefits could be offered to these clubs. Benefits would include appropriate resources for the delivery of programs.
- District and affiliate bodies will need to work closely with local schools, to ensure effective delivery of the system.
- If the opportunity arises, additional outdoor and indoor practice facilities should be made available for affiliate and national bodies to use for squads as part of an extended high performance program.
- Club coaches attached to accredited clubs should be given access to LTPD training and support programs offered by SSA or its provincial affiliates or the Coach Education Department.
- Accredited clubs should display posters outlining what they can do for athletes, and their route map forward.

Facilities

We aim to:

- upgrade and/or build new facilities with the help of government, affiliate and district departments
- raise funds via the South African national lottery (the LOTTO) and private companies
- set targets and strategies to establish the first steps on a journey that could take some time.

Communication

We need to appoint a webmaster to keep the SSA website updated, reflecting all relevant information pertaining to swimming needs. The site should provide the following information:

- News and upcoming events
- The annual swimming calendar
- National event programs
- Results
- Rankings
- Qualifying times¹
- Records
- Drug information
- Athlete profiles
- FINA basic swimming rules

¹ The standards for assessing swimmers are based on a percentage of the Olympic Games qualifying times. Small adjustments to the qualifying times are made annually, but generally they are set every four years, at the start of the season (after the Olympic qualifying times are made available).

- Club information
- Coaches information
- Official (volunteers) information

The ten key factors influencing LTPD

1. *The fundamentals – developing physical literacy*

A foundation of physical literacy and fitness enables participants to enjoy a lifetime of physical activity and to achieve athletic excellence. Physical literacy is made up of fundamental movement skills (running, throwing, catching, hopping, bounding, etc.), and fundamental sport skills. Children should master the fundamental movement skills and fundamental sport skills, before learning more complicated sport-specific skills and strategies, and before the start of the growth spurt that occurs when they reach adolescence.

The physical and movement qualities which are developed as part of physical literacy are essential for participating in and enjoying sports. Athletics, gymnastics and swimming are three sports which are particularly useful for developing fundamental movement and sport skills.

Swimming (or being able to swim) is the foundation of all water sports. It also promotes water safety, and teaches balance in a buoyant environment, as well as coordination.

2. *Chronological age vs. development age*

A second factor influencing the LTPD is the recognition that chronological age differs from developmental age.

- *Chronological age* refers to the number of years and days that have elapsed since birth.
- *Developmental age* refers to the child's relative position on a continuum that begins at birth and ends in full physical maturity.

Developmental age

A participant's developmental age determines when various aspects of sport and physical activity should be introduced or emphasised. The LTPD model uses the broad categories 'early', 'average', or 'late' matures to identify an athlete's developmental age. Coaches and instructors can then design instructional, training and competition programs that are appropriate for the participant's level of development.

Monitoring development

Tracking maturation allows coaches to identify the critical or sensitive periods of physical development (endurance, strength, speed and flexibility) and skill development. As individuals mature, there are several time-sensitive periods when there is accelerated adaptation to training. The model identifies these periods and makes maximum use of them to introduce skill and fitness development.

Identifying an athlete's stage of maturation is not difficult. (For specific information, go to www.ltad.ca and refer to the section 'The role of monitoring growth in long-term athletic development'.)

The age of an athlete can be examined from seven different perspectives:

- Chronological age
- Biological age
- Development age
- Sport-specific training age
- Relative age
- Skeletal age
- Training age

For example, coaches and parents can use height measurements as a guide for tracking the development age of children.

How do you measure a growth spurt?

- The child should stand straight against a wall (without shoes on), with the heels touching the wall.
- Measure from the floor to the top of the head.
- Measurements should be taken at the same time of the day each time (a.m. or p.m.).

3. *Mental, cognitive and emotional development*

Individuals mature at different rates. The timetable for physical, mental, motor and emotional development varies from athlete to athlete. Therefore, instructors and coaches should take a **holistic** approach to teaching and training athletes. This means taking into account a wide variety of factors that influence the athlete day-to-day, such as psycho-social and emotional factors.

Cognitive (learning), intellectual (logical thinking) and emotional (affective) elements have a significant effect on participants' performance. Consider also that equipment and environmental factors can impact on sports participation, performance and safety.

That said, however, it is important to emphasise and teach **ethics** such as fair play, respect of self and others, and perseverance within all stages of LTPD.

4. *Specialisation*

Many successful athletes played a wide variety of sports and physical activities as children. The movement and sport skills they developed early on helped them to reach a high level of athletic achievement.

A child has much to gain from early participation in a variety of sports. Early exposure to a wide range of physical activities will develop many of the physical and movement attributes that are crucial to later success, including agility, balance, conditioning, core body strength, speed, stamina, suppleness, and eye-hand-foot coordination.

On the other hand, early specialisation in a late-specialisation sport can contribute to:

- overemphasis on sport-specific preparation, or one-sided (limited) preparation
- lack of development of basic movement and sport skills
- overuse injuries
- early burnout
- premature retirement from training and competition.

5. **Trainability**

There are five main aspects of training and performance known as the 5 S's (; Viru et al, 1998 and 1999; Rushall, 1998):

Stamina (endurance)

- The optimal window of trainability occurs at the start of Peak Height Velocity (the main growth spurt during adolescence).
- Aerobic capacity training is recommended before athletes reach PHV. Aerobic power should be introduced progressively after growth rate decreases.

Skill

- The window for optimal skill training is between the ages of 9 and 12 for boys, and 7 and 11 for girls.

Strength

- The optimal window of trainability for girls is immediately after PHV (or the onset of menarche), while for boys it is 12 to 18 months after PHV.

Speed

- For boys, the first speed training window is between the ages of 7 and 9, and the second window is between the ages of 13 and 16.
- For girls, the first speed training window is between the ages of 6 and 8, and the second window is between the ages of 11 and 13.

Suppleness (Flexibility)

- For both boys and girls, the optimal window for suppleness training is between the ages of 6 and 10.
- Special attention should be paid to flexibility during PHV.

Thus, biological markers – such as the onset of PHV (adolescent growth spurt) and the onset of menarche – can identify the ‘sensitive periods of accelerated adaptation to training’ for the factors stamina, strength and skills (Balyi, 2002). However, the trainability of the speed and suppleness factors is based on chronological age. (See further details on trainability in the section on 10 S's of training and performance.)

6. **Periodisation (annual training, competition and recovery plan)**

Success means achieving optimum performance at the required time (such as in a competitive environment). Periodisation improves the chances of success by organising training, competition and recovery into a logical and scientifically based schedule. The trainer should develop a periodised annual plan after taking into account growth, maturation and trainability principles for all stages of LTPD.

Simply put, designing a periodised yearly plan means time management, planning suitable activities with the appropriate level of difficulty and in the correct sequence.

The trainer should break the plan down into workable units and then, critically, sequence these units properly for the athlete to succeed, as follows:

- Develop the performance capacity of the athlete, including physical literacy and sport-specific skills, tactics/strategies, physical components and mental skills.
- Integrate the performance factors in a complex and harmonious blend.
- Prepare the athlete to perform at important competitions.

In order to design an annual plan, the trainer needs to know:

- how the sport-specific athletic form is developed
- the requirements (demands) of the sport during competition
- the demands of the sport during the preparation phase
- the competition calendar and the purpose or relative importance of each competition
- the actual training state of the athlete at the start of the yearly plan
- the contextual reality that the trainer and athlete have to cope with
- the principles of long-term athlete development.

7. *Calendar planning for competition*

Creating a blueprint for success involves accurate and effective planning for training, competition and recovery. The South African competitive swimming calendar is divided into 4 cycles: a winter season comprising mainly of short course events (May to July, and August to October) and a summer season comprising mainly of long course events (November to January, and February to April).

Ideally, the domestic competitive and events calendar should support and be aligned with LTPD. Athletes at different stages of development and different levels of participation have different requirements for the type, frequency and level of competition. At some stages of development, training and development should take precedence over competitions and short-term success. During the later stages, participants need to experience a variety of competitive situations and perform well at international and other high calibre events.

National and international competition and event calendars must be coordinated, and competitions selected according to the priorities of the specific stage of development of the participants.

8. *The ten year rule*

Scientific research in sport has concluded that a minimum of ten years (or 10 000 hours) of deliberate training is needed for a talented participant to reach elite levels (Ericsson et al, 1993). This translates into an average of three hours of training daily for ten years. There are no shortcuts; participant development is a long-term process (Gibbons, 2002). Short-term performance goals must never be allowed to undermine long-term participant development (Viru, 1995).

9. *System alignment and integration*

LTPD recognises that physical education, school sports, recreational activities and competitive sport are interdependent.

Stakeholders in LTPD include participants, instructors, coaches, parents, administrators, spectators, sponsors and supporting national and multi-sport organisations. All these stakeholders must work together to implement the right programs and to establish a system that produces optimal conditions

for training and competition. With so many partners across the country, and with different demographic compositions included, system integration and alignment is a major challenge.

The South African sport system should include the school system (physical education subjects and extracurricular school sports), government sports and recreation departments, competitive sport, sport facilities and coaching organisations. Each element in the system plays a crucial role in an athlete's development. All parts of the sport community must be integrated and aligned. The system must be clear, seamless, and based upon a consistent set of principles.

10. *Continuous improvement*

LTPD is a dynamic (active, changing) framework that allows for continuous adjustments based on key principles. Continuous improvement ensures the following:

- LTPD responds and reacts to new scientific and sport-specific innovations and observations. It is exposed to continuous research in all its aspects.
- LTPD, as a continuously evolving vehicle for change, reflects all emerging facets of physical education, sport and recreation to ensure systematic (organised) and logical delivery of programs to all ages.
- LTPD promotes ongoing education of all partners, and raising awareness about the interlocking relationships between physical education, school sport, community recreation, life-long physical activity and high performance sport.
- LTPD promotes integration between sport, physical education, recreation, health and education.

The 10 S's of training and performance

We have discussed the original five capacities or 5 basic S's of training and performance (as introduced in the Canadian Sport for Life LTAD document), focusing on physical development. Building on these, we can add an additional five capacities or S's (suppleness, structure, psychology, sustenance, and schooling) to create a complete (holistic) training, competition and recovery program and a proper lifestyle.

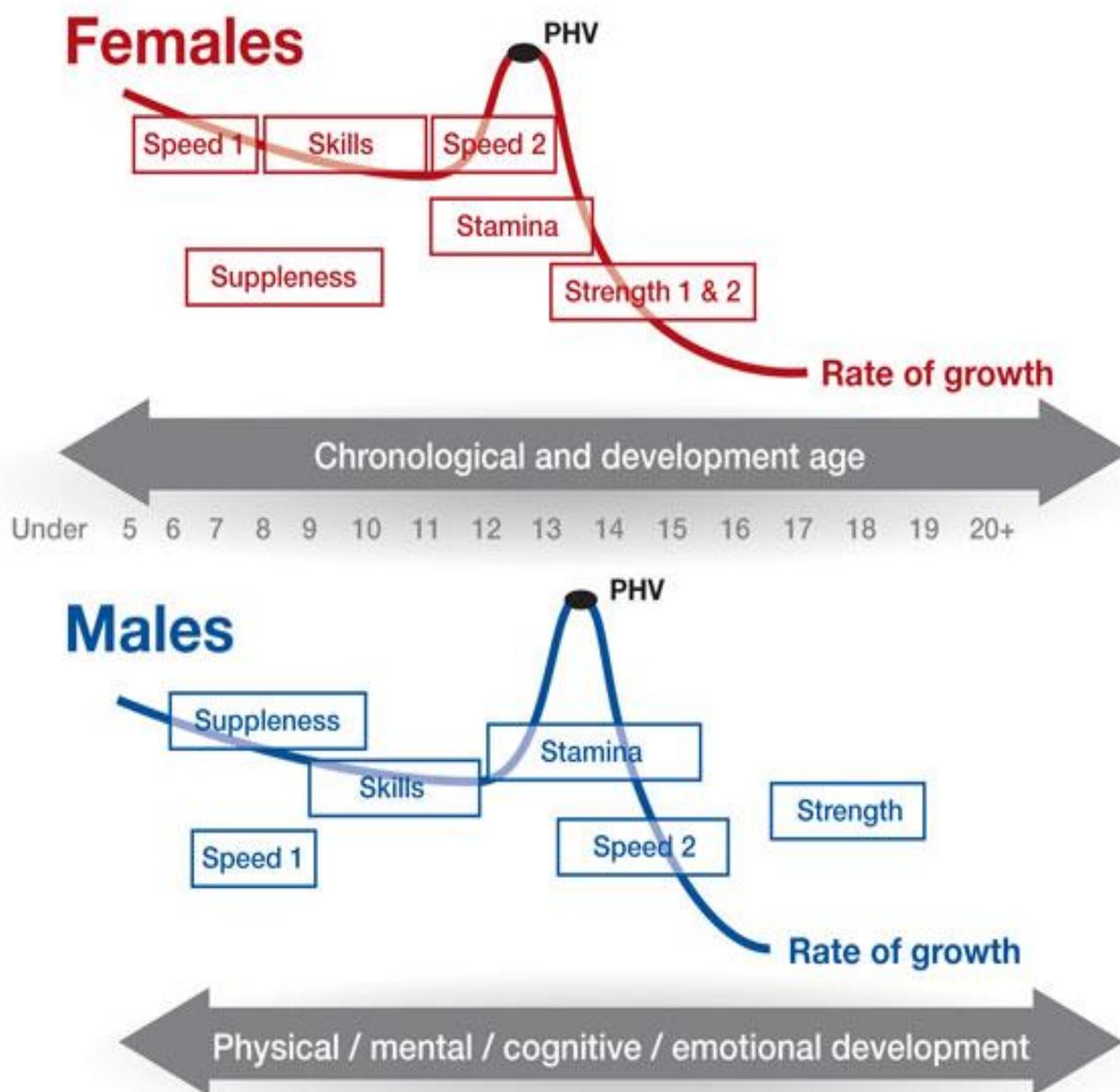
The trainer needs to integrate these Ten S's when developing annual training, competition and recovery plans. Each of these capacities is trainable throughout an athlete's lifetime, but there are clearly critical (sensitive) periods in the development of each capacity, during pre-puberty, puberty and early post-puberty, where training produces the greatest benefit.

The various stages of LTPD have identifiable windows of optimal trainability (periods of accelerated adaptation to training). The training 'windows' are fully open during the sensitive periods, and only partially open outside of these periods.

These sensitive periods vary between individuals, as each athlete is unique in their genetic makeup. While the sensitive periods follow general stages of human growth and maturation, scientific evidence shows that humans vary considerably in the magnitude and rate of their response to different training stimuli at all stages.

Some players may show potential for excellence by age 11, whereas others may not indicate their promise until age 15 or 16. Consequently, a long-term approach to athlete development is needed to ensure that athletes who respond slowly to training stimuli are not 'short-changed' in their development.





Male's and Female's rate of growth for the 5 S's according to developmental age

Stamina (Endurance)

The sensitive period for training stamina occurs at the onset of the growth spurt or Peak Height Velocity (PHV). Athletes need increased focus on aerobic capacity training (continuous or aerobic interval workloads) as they enter PHV, and they should be progressively introduced to aerobic power training (anaerobic interval workloads) as their growth rate decelerates. However, sport-specific needs will determine 'how much endurance is enough' in a particular sport, thus minor or major emphasis of training the aerobic system will be defined by sport-specific break point volume.

Strength

There are two critical windows of trainability for strength in girls: immediately after PHV and after the onset of menarche. Boys have one strength window, and it begins 12 to 18 months after PHV. Again, sport-specific needs will determine 'how much strength is enough' in a particular sport, thus minor or major emphasis of training strength will be defined by specific and individual needs.

Speed

There are two critical windows of trainability for speed. For girls, the first speed window occurs between the ages of 6 and 8 years, and the second window occurs between 11 and 13 years. For boys, the first speed window is between the ages of 7 and 9 years, and the second window is between 13 and 16 years.

During the first speed window, focus training on developing agility and quickness (where duration of the intervals is less than five seconds); during the second speed window, training should focus on developing the anaerobic alactic power energy system (where duration of the intervals is 10–15 seconds).

We recommend that speed should be trained on a regular and frequent basis, for example at every training session as part of the warm up. Towards the end of, or immediately after the warm up, there is no central nervous system or metabolic fatigue present in the organism, and so this is an optimal time to train speed. Keep the volume of training low and allow full recovery between exercises and sets.

Outside of the window of optimal trainability, train for short acceleration, with proper posture and arm and leg drive, take-off speed and segmental speed. In addition, allocate proper blocks of training to speed training during the periodised annual program according to seasonal and the sport-specific requirements.

Skill

Girls and boys both have one window for optimal skill training. For girls, the window is between the ages of 8 and 11 years, while for boys it is between 9 and 12 years. During this window, young athletes should be developing physical literacy. Physical literacy is the development of **fundamental movement skills** and **fundamental sports skills** that permit a child to move confidently and with control, in a wide range of physical activities and sport situations. It also includes the ability to 'read' what is going on around them in an activity setting and react appropriately to those events. Physical literacy is the foundation of life-long involvement in physical activity and also for high performance participation.

Suppleness

The critical window of trainability for suppleness occurs between the ages of 6 and 10 years in both girls and boys. However, remember to pay special attention to flexibility during the growth spurt as well.

A reminder: The windows are fully open during the sensitive periods of accelerated adaptation to training and partially open outside of the sensitive periods.

Structure / Stature

This component addresses the six stages of growth.

- Phase 1: Very rapid growth and very rapid deceleration
- Phase 2: Steady growth
- Phase 3: Rapid growth
- Phase 4: Rapid deceleration
- Phase 5: Slow deceleration
- Phase 6: Cessation of growth (and of links to the windows of optimal trainability)

It recognises stature (the height of a human) before, during and after maturation, with guidance on the measurements needed to track growth. Tracking height as a guide to developmental age allows you to plan for the **sensitive periods** of physical (endurance, strength, speed and flexibility) and skill development. Diagnostics to identify individually relevant sensitive periods of accelerated adaptation to training are essential, to design and implement optimal training, competition and recovery programs.

Psychology

Sport is a physical and mental challenge. Being able to maintain high levels of concentration, and to remain relaxed with the confidence to succeed, are skills that transcend from sport to everyday life. Developing the mental toughness for success at high levels requires training programs which are designed specific to the gender and LTPD stage of the athlete. Training programs should include key mental components identified by sport psychologists; concentration, confidence, motivation and handling pressure.

As an athlete progresses through LTPD stages, the mental training aspect will evolve from having fun and respecting opponents, to visualisation and self-awareness, goal setting, relaxation and positive self-talk. To master the mental challenge of sport, those basic skills are then tested in increasingly difficult competitive environments.

Ultimately the planning, implementing and refining of mental strategies for high level competition will determine podium performances. The mental training program is critical at any LTPD stage as dealing with success and failure will determine continuation in sport and physical activity, therefore dramatically affecting an individual's lifestyle.

Sustenance

Sustenance refers to a broad range of components, with the central theme of replenishing the body, to prepare the athlete for the volume and intensity required to optimise training, or to live life to the fullest. Areas addressed include nutrition, hydration, rest, sleep and regeneration, all of which need to be applied different to training (life) plans depending on the stage within the LTPD. Underlining sustenance is the need for optimal recovery management, moving the athlete to the 24/7 model, which places a high degree of importance on the individual's activities away from the field of play. For proper sustenance and recovery management, the instructor or parents need to be able to monitor recovery by identifying levels of fatigue. Fatigue can come in many forms, including metabolic,

neurological, psychological, environmental and travel. While overtraining or over-competition can lead to burn-out, improperly addressing sustenance can also lead to fatigue.

Schooling

Trainers, when designing a training program, always consider the demands of school. Besides the demands placed by school sports or physical education classes, this includes academic loads, learner duties, school related stresses, and timing of exams. When possible, training camps and competition tours should complement, not conflict with, the timing of major school academic events.

Monitor stress levels carefully. Overstress can occur from the everyday stresses of life, such as schooling, exams, peer groups, family, friends and romantic relationships, as well as increased training volume and intensities.

To minimise interference from other school sports, communicate with relevant coaches who are responsible for training and competition programs. Work with coaches and parents to establish a good balance between all factors.

Sport socialisation

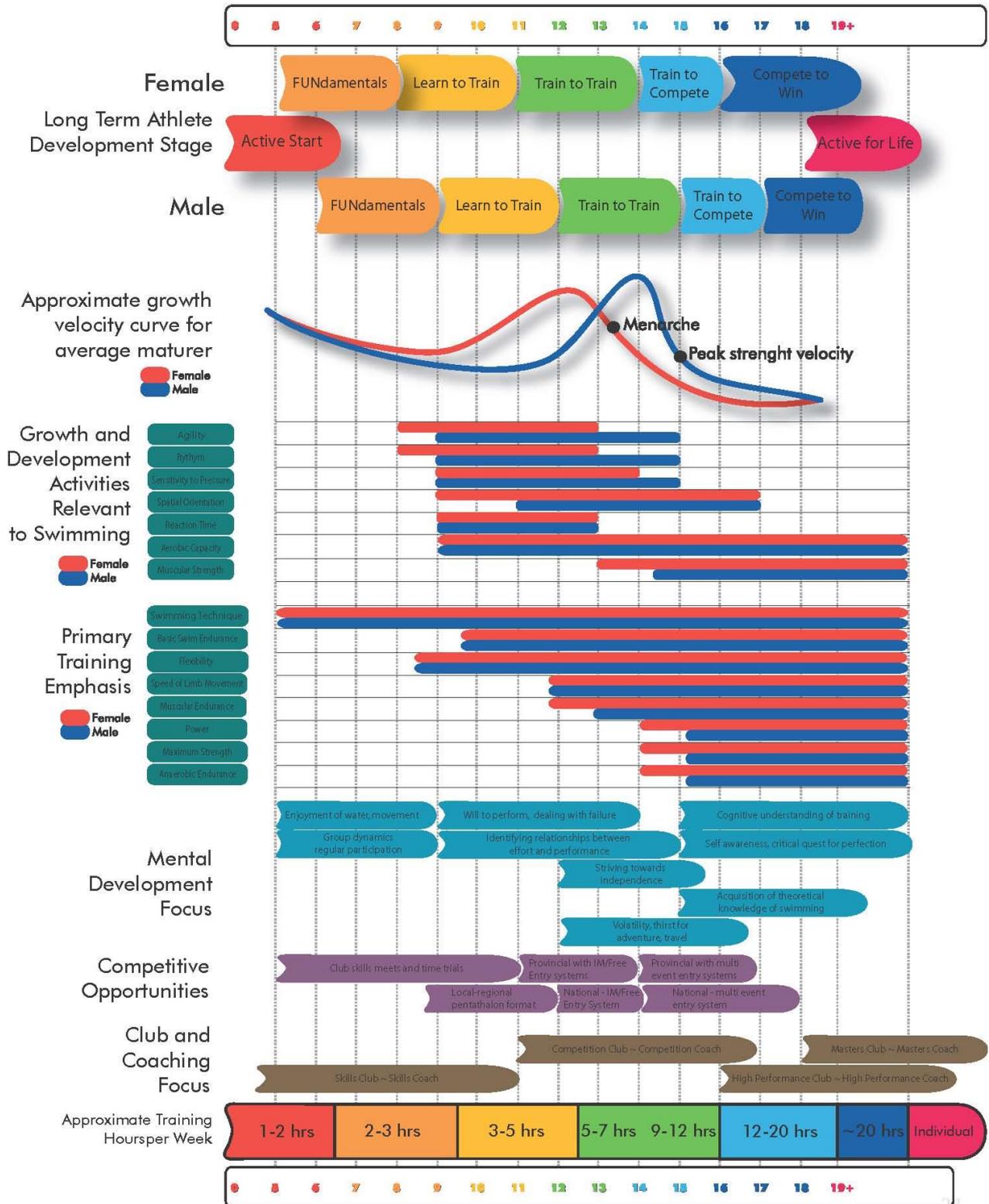
Pay attention also to managing and planning for the socio-cultural aspects of sport. Socialisation through sport participation helps participants to internalise general societal values and norms. This occurs from the community level and up through the LTPD stages, possibly all the way to international exposure. Socialisation broadens athletes' perspectives through their increasing awareness of ethnicity and national diversity. When travelling, schedule opportunities to learn about local history, geography, architecture, cuisine, literature, music and visual arts, perhaps during recovery periods. Your proper annual planning will allow athletes to experience much more from sports than simply commuting between hotel rooms and fields of play.

Sports socialisation also must address sport sub-culture. Coaches and parents must guard against group dynamics which create a culture of abuse or bullying. Integrate ethics training into sports training and competition plans at all stages of LTPD.

Overall socio-cultural activity is not negative distraction or interference with training and competition activities. It is a positive contribution to the development of the person and the athlete.

Children often choose to play a sport after the windows of optimal trainability for speed, skill, and suppleness have passed. These children are therefore dependent on schools, recreation programs, and other sports bodies to provide timely training in these capacities. LTPD advocates that coaches build relationships with these organisations (schools, recreation and other sports bodies which are not national sports federations) to promote and support appropriate training. If athletes miss these training periods entirely, coaches will need to design individualised programs to remedy any shortcomings.

LTPD Overview



Building a pathway – the seven stages of LTPD

Our LTPD model distinguishes seven stages of athlete development:

1. Active Start: 0–6 years of age
2. Fundamentals: Females 6–8 / Males 6–9
3. Learn to Train: Females 8–11 / Males 9–12
4. Train to Train: Females 11–15 / Males 12–16
5. Train to Compete: Females 14–16+, Males 16–18+
6. Train to Win: Females / Males
7. Active for Life: Enter any time

Physical activity should be fun and a natural part of a child's daily life. It is essential for healthy child development. Physical activity has many benefits.

- It enhances development of brain function, coordination, social skills, gross motor skills, emotions, leadership and imagination.
- It helps children to build confidence and positive self-esteem.
- It helps to build strong bones and muscles.
- It improves flexibility and develops good posture and balance.
- It improves fitness.
- It reduces stress and improves sleep patterns.
- It promotes healthy weight management.
- It helps children learn to move skilfully and to enjoy being active.

Organised physical activity and active play are particularly important for children with a disability to develop healthily and learn habits of lifelong activity.

Stage one: Active start

Ages: 0–6

Objectives: The objective of this stage is to learn fundamental movements and link them together into play.

Physical activity:

- This first phase requires approximately two half-hour sessions of learning to swim per week.
- Use any additional time available for other sports and physical free play.

Overall description

Ideally, parents or teachers should introduce children to the water as early as possible. Instructors should run an effective learn-to-swim program, to teach buoyancy, water confidence and water safety.

Implications for instructors

- Be prepared and enthusiastic.
- Aim for proven progression from class to class.
- Track children's progress from session to session (not starting from scratch each session).
- Provide an appropriate challenge for each individual.
- Keep a high ratio of activity to rest within class time.

- Teach every child to swim, to promote safety around water and as an effective motor skill.
- Provide organised physical activity for at least 30 minutes a day for toddlers and at least 60 minutes a day for pre-schoolers.
- Provide physical activity every day regardless of the weather.
- Starting at infancy, provide infants, toddlers and pre-schoolers with opportunities to participate in daily physical activity that improves fitness and movement skills.
- Provide parents and care-givers with appropriate information about their child's development relative to its age.
- Encourage basic movements skills – these skills do not just happen as a child grows older, but develop depending on each child's heredity, activity experiences and environment. For children with a disability, access to age and disability appropriate adapted equipment is an important contributor to success.
- Focus on improving basic movement skills such as running, jumping, twisting, wheeling, kicking, throwing and catching. These motor skills are the building blocks for more complex movement and they help lay the foundation for lifelong physical activity.
- Be determined to help children to feel competent and comfortable participating in a variety of fun and challenging sports and activities.
- Include games for young children that are non-competitive and focus on participation.
- Ensure that activities are gender-neutral and inclusive, so that active living is equally valued by and promoted for all children.



Stage two: Fundamentals

Ages: Females 6–8; Males 6–9

Physical activity:

- 2–3 sessions per week rising to 4–6 sessions
- 30–60 minute sessions
- High repetition, low intensity activity focus

Overall description

At the entry level or Fundamentals stage of LTPD, children start becoming involved in different types of sports.

If children have not been introduced to swimming, this can still happen through SSA instructors, or at homes, crèches and schools. The shortage of swimming pools is a problem in South Africa, especially at grassroots level and in rural areas. If this is a problem in your area, try to obtain a porta-pool.

During this phase, which lasts approximately 3–4 years, children can try out the sport and obtain a basic understanding of various swimming skills.

Early-maturing athletes are undoubtedly better athletes during childhood. However, research strongly suggests that late-maturing children may have greater potential to reach elite levels in the long term. They are likely to benefit from spending longer in the important early stages that form the patterns for future physical literacy.

Implications for instructors

- Emphasise fun and participation during this stage.
- Help children to have a positive early experience of swimming for them to develop a future love for the sport.
- Encourage a positive perception of the activities and of the children themselves.
- Create a non-judgmental and unthreatening atmosphere. Give equal praise for all forms of effort.
- Avoid obvious ‘school-associated’ learning.
- Basic swimming-related skills such as buoyancy, feeling for the water, arm and leg movements and correct breathing techniques are starting to be learnt. The child is patterning these skills into the sport during this phase.
- Aim to develop crucial physical capacities such as agility, balance, co-ordination and speed (ABC’S) alongside basic swimming-specific skills.
- Encourage children to participate in as many other sports as possible.
- Identify children who are particularly keen, or have a genetic disposition to swimming, and introduce them to a local SSA-accredited club that will provide the opportunity for more focused development.

Physical development

Characteristics and implications – Basic characteristics at this age

- The child’s larger muscle groups are more developed than smaller ones.
- The size of the heart is increasing in relation to the rest of the body. The cardiovascular system is still developing.
- Ligamentous structures are becoming stronger, but the ends of the bones are still cartilaginous and continue to ossify (i.e. turn into bone or bony tissue).

- Basic motor patterns become more refined towards the end of this phase. The balance mechanism in the inner ear is gradually maturing.
- Girls develop co-ordination skills faster than boys, but otherwise the developmental differences between boys and girls are negligible.

Performance capabilities and limitations

- Children are more skilful in gross movements involving large muscle groups, than in precisely co-ordinated movements involving the interaction of many smaller muscles.
- The endurance capacity of young players is more than adequate for most activities.
- The child's body is very susceptible to injury through excessive stress or heavy pressure.
- There is a great improvement in agility, balance, co-ordination and speed (ABC's) towards the end of this phase.
- Sex differences do not matter very much at this stage in development.

Implications for instructors

- Develop basic skills during this phase.
- Plan short duration anaerobic alactic activities (e.g. short, sharp sprint activities lasting 6–8 seconds, with 3 minutes rest in between).
- Use slow progressions in hopping and bounding, limiting strength training to body weight or an appropriate medicine ball (for neural recruitment, i.e. nervous system adaptation).
- Emphasise co-ordination and kinaesthetic sense with swimming-specific activities and games. Activities which incorporate gymnastic or athletics type movements are most appropriate.
- Introduce athletes to the other disciplines e.g. synchro fun, diving fun, splash polo—this could also be an introduction to teamwork.
- Training and playing in combination should be emphasised at these ages and during this phase.

Mental/cognitive development

Characteristics and implications – Basic characteristics

- Attention span is short and children are action orientated. Memory is developing progressively.
- Children in this phase have limited reasoning ability. Later on during the phase there is growing capacity for more abstract thought.
- The repetition of activities is greatly enjoyed. Young athletes improve their abilities through experience.
- Imagination is blossoming.

Performance capabilities and limitations

- Young athletes cannot sit and listen for long periods of time.
- Children are generally leader-orientated: they love to be led!
- Young athletes do not learn the skills correctly by trial and error.
- Experimentation and creativity should be encouraged.

Implications for instructors

- Use short, clear and simple instructions. Children want to move and participate. You will need excellent communication skills to work at this level.
- Adopt a 'follow me' or 'follow your leader' approach and ensure that all activities are fun and well-planned. Introduce fun items and drills into the warm up session and encourage children to carry out important skills in a fun manner.

- You must be able to provide a correct demonstration of basic swimming skills and have excellent technical modelling.
- While training and practising, encourage input (opinion) from the children. They will love to try things out! Create a non-judgmental environment.

Emotional development

Characteristics and implications – Basic characteristics

- The children's self-concept is developing through experience and comments from others.
- Children like to be the centre of focus and attention.
- The influence of peers becomes a very strong driving force behind all activities.
- The child begins to understand the needs for rules and structure, as well sport ethics.
- Basic racing opportunities and understanding of competition – recreational galas.

Performance capabilities and limitations

- Children perceive these experiences as a form of self-evaluation: 'I am a good person if I do well – I'm a bad person if I do poorly.'
- When a situation becomes threatening they quickly lose confidence.
- Their acceptance into a peer group often depends upon their abilities in physical skills and activities.
- Children can understand simple games with simple rules and will tend to question rules and expect thoughtful answers.

Implications for instructors

- Children need positive perceptions of themselves. Provide positive reinforcement on a regular basis, to motivate them to continue with the activity.
- Plan and structure technical and tactical activities so that success is virtually guaranteed. This means progressing from simple to more complex activities.
- You must be able to assess their basic skills and provide a varied program of practical opportunities for technical and tactical development and improvement.
- Children need equal praise for all forms of effort. Emphasise participation and fun over winning. Focus on the process, not on the outcome!

Stage three: Learn to train

Ages: Females 8–11; Males 9–12

Objectives: This phase is likely to map out a youngster's future attitude towards training and how fitness helps athletes achieve high performances and a healthier lifestyle. Towards the end of this phase children will probably be partaking in organised swim meets at school, club, regional and maybe even at a provincial level.

Physical activity:

Time spent training and the number of sessions increase further for athletes in this phase.

- 4–6 sessions per week
- 60–90 minute sessions
- Pool time: 4–7 hours
- Pool volume: 8–14 km

Physical development

Characteristics and implications – Basic characteristics

- The range of maturation is likely to be wide during this stage.

Performance capabilities and limitations

- Athletes should concentrate on building upon competencies learnt during the Fundamental stage, including motor skills and developing co-ordination, with an emphasis on all four swimming strokes.

Implications for instructors

- Determine their readiness to advance by skill competency and measured increase in PHV.
- Ensure that the athlete participates in many more training sessions than swimming events.
- Educate them regarding puberty changes.
- Introduce concepts of warm-up and stretching.
- Introduce basic flexibility exercises.
- Introduce basic practice skills – lane etiquette, pace clocks, etc.
- Continue developing speed and endurance through fun games in and out of the pool.
- Refine the starts and turns skills and develop underwater skills.
- Teach racing principles – to ensure that their skills become more proficient, e.g. pacing strategies, splitting goals.

Mental/cognitive development

Characteristics and implications – Basic characteristics

- Abstract thinking becomes more firmly established.
- Young athletes are eager to perfect their skills.

Performance capabilities and limitations

- Decision making through more complex technical training/practice should be introduced.
- Individual specific direction and structure in the learning process is required. A variety of methods to measure success are important to maintain motivation.

Implications for instructors

- While athletes are learning to become better and better athletes, make sure they are still having fun.
- Coaches need to be positive role models by helping shape and correct values and beliefs. Encourage positive attitudes when faced with challenges, and help athletes to form coping strategies for winning and losing.
- Emphasise the link between athletes' physical conditions and their performance in swimming. They must understand how important this is.

Emotional development

Characteristics and implications – Basic characteristics

- Young athletes develop a new form of egocentric thought. Much emphasis is placed on self-identity.

Performance capabilities and limitations

- This may result in a strong fear of failure.

Implications for instructors

- Introduce discipline and structure.
- Continue to promote the concepts of perseverance and self-confidence.
- Continue to develop concentration.
- Provide positive reinforcement for effort and achievement.

Stage four: Train to train

Ages: Females 11–15, Males 12–16

Objectives: This is a critical stage of LTAD. Many of the important physical attributes will be shaped over the next 4 or 5 years. This is the window of opportunity to train stamina, speed, and strength in addition to maintaining the ABC's and exploring further more specific swimming skills. This stage is about 'Building the Engine'.

Physical activity:

Time spent training and the number of sessions increase further for athletes in this phase.

- 6–12 sessions per week
- 60–120 minute sessions
- Pool time: 12–24 hours
- Pool volume: 24–30 km/week building to 40–50 km/week

Overall description

Athletes entering this phase should have mastered the skills of all four strokes and developed a training competence and have reached goal times set for the end of this swim skills phase. The most talented athletes are likely to be in school, regional or affiliate teams and will have achieved times set by SSA to compete at national age group competitions against the best athletes from other parts of the country. Towards the end of the phase they will likely take the important first steps into senior swimming competitions.

Remember that at this age, the most talented performers may only have limited opportunities to produce times that will impress selectors. Their swimming performances will be the main criteria for selectors to identify talented athletes for teams and squads.

Competitions take on greater significance as the athlete develops towards the end of this phase. All those associated with the athlete must ensure that he or she has a balanced ratio of training to rest intervals, allowing the athlete to perform to their peak each time they compete.

While it remains important that athletes continue to play other sports, for variety and cross-training, the priority during this phase should be swimming. It is critical to monitor the growth of athletes carefully using simple height and weight measurements and visual assessment, to ensure that appropriate training is introduced at the most appropriate time.

Implications for instructors

- During this period aim to progressively extend the volume of training, while maintaining an efficient and effective technique.

- Always include a speed component. By the end of this phase, athletes should be achieving the target guideline times set out for national competitions.
- Monitor the growth of athletes carefully using simple height and weight measurements and visual assessment.
- It is vital to monitor the ratio of competitions to training. To assist peak performance, aim for a ratio of 90% training to 10% competition swimming.
- Maintain effective communication between the different interested bodies to ensure that the system remains 'athlete-centred'.
- Avoid training athletes as if they were adults – first establish a sufficient training base.

Physical development

Characteristics and implications – Basic characteristics

- Significant proportional changes occur in bone, muscle and fat tissue.
- Girls begin their growth spurt from ages 12½ to 14, boys from 12½ to 15. Girls attain a maximum rate of growth at average age 12, boys at average age 14.
- Smaller muscle groups are becoming more developed.
- During this phase the various parts of the body do not grow at the same rate. The growth rate of legs and arms will peak before that of the trunk.
- A significant increase in red blood cells occurs – especially in boys due to the male hormone testosterone.
- The central nervous system is almost fully developed.

Performance capabilities and limitations

- During growth spurts, adaptation is influenced by sudden changes in body proportions.
- Early in this phase, girls are faster and stronger than boys. This situation is reversed later in the phase.
- Speed, agility and co-ordination are still improving rapidly.
- A change in the centre of gravity, length of limbs and core strength will determine the content of training.
- The oxygen transportation system is still developing and aerobic endurance is continuing to increase.
- Agility, balance and co-ordination are fully trainable.

Implications for instructors

- Monitor training carefully and individualise the content of training to ensure adaptation.
- The increase in body mass requires more structured aerobic training. Keep anaerobic activities short.
- Be aware that chronological age might not be the most appropriate way to group athletes.
- With the improvement of fine motor skills, all basic technical skills should be mastered.
- Athletes should learn how to train. Include physical, technical, and tactical training, and teach them important additional elements (e.g. warm-up, cool-down, diet, nutrition, hydration etc.).
- Some pre-learned skills may need to be relearned, if limb growth is affecting technique.

Mental/cognitive development

Characteristics and implications – Basic characteristics

- Abstract thinking becomes more firmly established.

- Young athletes develop a new form of egocentric thought. Much emphasis is placed on self-identity.
- Young athletes are eager to perfect their skills.

Performance capabilities and limitations

- The difference between physical and mental development can vary greatly.
- There may be a strong fear of failure.
- Positive reinforcement is imperative.
- Individual specific direction and structure in the learning process is required.

Implications for instructors

- Make decisions on tactical solutions based upon the skill level of the athlete.
- Introduce decision-making through more complex technical training/practice.
- Create the optimum learning environment, matching skill and drill levels. Focus on mastery.
- To maintain motivation, use a variety of methods to measure success.
- Introduce simple coping strategies for winning and losing, positive reaction to challenges.
- Provide a strong role model by having 'winning mind' values and beliefs.
- Take care not to pick the early developers and neglect or deselect the late-developers.
- Your ability to demonstrate specific skills is important.

Emotional development

Characteristics and implications – Basic characteristics

- Physical, mental and emotional maturity does not necessarily develop at the same rate.
- There is a tremendous influence on behaviour from peer groups.
- Values and attitudes are being created and reinforced by the group.
- During this phase players are capable of co-operating and accepting some responsibility.
- Tension generally exists between adults and adolescents.
- It is important at this developmental level that young athletes are able to display tenderness, admiration and appreciation.
- There is a desire to have friends of the opposite sex.
- Social activities are important events for this age group.

Performance capabilities and limitations

- Some athletes may be less responsible mainly due to a fear of failure.
- Communication channels should be kept open by adults as all teenagers need help even though they do not recognise the need or seem grateful for the help.
- Deprivation of these qualities often leads to exaggerated and/or unacceptable behaviour.
- Feelings of confusion or anxiety may exist as a result.
- Early matures often become leaders and excel in performance.

Implications for instructors

- Exercise strong direction and supervision. It is important for young athletes at this phase to have a respectable role model.
- Have open communication with athletes.
- Always attempt to foster two-way communication. Create an open environment and opportunities to make decisions, decide on methods, make judgments and make mistakes.

- Do not create ‘in and out’ groups as this can have negative effects on other athletes’ development.
- Avoid situations where sexual development could cause fear, guilt or anxiety.



Stage five: Train to compete

Ages: Females 14–16+, Males 16–18+

Physical activity:

Time spent training and the number of sessions increase further for athletes in this phase.

- 8–12 sessions per week
- 90–120 minute sessions
- Pool time: 16–24 hours
- Pool volume: 40–50+km/week

Objectives: The athlete should have successfully mastered the Train to Train phase and have attained the required times to move on. Transition from age group to open competitions takes place. Athletes will compete in top youth competition and vie for spots in the various SSA squads.

Overall description

Athletes focus on race tactics, and strategies play an important part. Coaches need to place a strong emphasis on autonomy and independence, and create the right environment for mastery of technique

and mental toughness. Individually tailored physical and mental development programs are an integral part of improving performance.

Good young athletes will be competing for their schools, representing their clubs at National Level 3 age group and at Youth Nationals. The elite will be swimming at Senior Nationals and will probably be in one of the select SSA squads. The progression into senior swimming creates satisfaction and additional opportunities that encourage promising athletes to stay in the sport. It is important for coaches to consider appropriate training programs to ensure that athletes retain a balanced lifestyle.

Physical development

Characteristics and implications – Basic characteristics

- The circulatory and respiratory systems reach maturity.
- Increases in height and weight, gradually slow down and stabilisation occurs in the muscular system.
- Skeletal maturation continues in males and females.
- By age 17, girls generally have reached adult proportions. Boys do not usually reach adult proportions until several years later.

Performance capabilities and limitations

- The circulatory and respiratory systems are generally capable of giving maximum output.
- Muscles have grown to their mature size, but muscular strength continues to increase, reaching its peak in the late twenties.
- Connective tissues are still strengthening.
- Proportionally, girls gain more weight than boys during this phase.

Implications for instructors

- Train aerobic and anaerobic systems for maximum output.
- Implement full swimming-specific energy system training.
- Strength training can be maximised to improve overall strength development. Optimise neuromuscular training during this phase.
- Continue with progressive overloading in training.
- Optimise aerobic training for girls. Be aware of how to deal with weight gain and its effect on figure.
- Athletes should learn how to compete including all technical, tactical and ancillary components.

Mental/cognitive development

Characteristics and implications – Basic characteristics

- Generally, by age 16, the brain has reached its adult size but continues to mature neurologically for several more years.
- Critical thinking is well developed during this phase.

Performance capabilities and limitations

- Athletes can cope with multiple strategies and tactics, particularly near the end of the phase.
- The capacity of self-analysis and correction is developing.

Implications for instructors

- Ensure the refinement of all technical and tactical skills.
- Decision making should be developed further through technical and tactical development.

- Promote autonomy and independence.
- Create an environment where athletes are encouraged to make decisions, decide on methods and make judgments.
- A structured environment is vital in order to maintain a strong competitive value base.

Emotional development

Characteristics and implications – Basic characteristics

- Peer group influence is still a powerful force.
- Athletes are searching for a stable, balanced self-image.
- Activities and interaction with the opposite sex are important during this phase.

Performance capabilities and limitations

- Independent decision-making and leadership skills are becoming more developed.
- Self-concept is still very much influenced by success and failure. Coping techniques are useful.

Implications for instructors

- Give athletes the opportunity to develop through participation in appropriate leadership or responsible roles (e.g. captaincy), but maintain strong direction and discipline.
- Positive evaluation of performances and positive reinforcement are imperative.

Stage six: Train to win

Ages: Females 16+, Males 18+

Physical activity:

Time spent training and the number of sessions increase further for athletes in this phase.

- 10–15 sessions per week
- 90–150 minute sessions
- Pool time: 20–24 hours
- Pool volume: 40–50+ km/week

Objectives: The Training to Win stage represents senior and open competition. It is the point at which improvements in performance as a result of an individual growth and development cease to be significant. The maintenance of physical attributes and further development of a specific stroke or strokes take place.

Overall description

‘Train to Win’ is the final professional LTPD stage and lasts until retirement from competitive swimming. The stage deals with the athletes who have most of the capacities in place to perform at the highest level. Athletes should have mastered the Train to Compete phase, and have met the relative target times required. Training should focus on the development of stamina, strength, speed, skill and suppleness. At this stage, training programs are designed to suit squads or individuals, and they target specific events and strokes at certain times of the year.

The number and frequency of training sessions depends on the level to be attained or retained.

A selected maximum number of competitions per year should be enough, but this depends on specialisation, i.e. if there is an event that requires alteration or modification to an athlete’s training program.

Implications for instructors

- Select a training facility that will be the most beneficial to the athlete.
- Set a clear performance target for all events that include a taper or rest from training.
- Use the most advanced physical training techniques available.
- Ensure that all muscle groups and body alignments are well balanced and complemented by optimal flexibility ranges.
- Use testing and monitoring programs to detect and avoid overtraining and overstress.
- Regular appropriate medical monitoring should be conducted.
- Athletes should be capable of self-analysis and work with the coach to correct and refine their skills. Working with state of the art camera equipment, will assist with any minor changes that may be needed.
- Definite goal setting should be emphasised to give direction and purpose to the athlete's overall program.
- They need to be treated as adults and assisted with professional guidance during the on and off season. This will include any educational pursuits.

Physical development

Characteristics and implications – Basic characteristics

- Physiologically the body reaches maturity during this phase.
- All systems are fully trainable. No longer does growth play a large part.
- Final skeletal maturation occurs at age 19–20 for females and approximately 3 years later for males.

Performance capabilities and limitations

All physiological systems are fully trainable.

Implications for instructors

- Use the most advanced physical training techniques and programs to ensure maximum adaptation and to minimise injuries.
- Insure that all muscle groups and body alignments are well balanced and complemented by optimum flexibility ranges.
- Use state of the art testing and monitoring programs.
- Overtraining and overstress should be carefully monitored.
- Recovery and regeneration is very important.
- Conduct regular appropriate medical monitoring, with additional blood tests for female athletes to prevent iron deficiency.

Mental/cognitive development

Characteristics and implications – Basic characteristics

- Neurologically the brain matures at about 19–20 years of age.
- There is a complete understanding and acceptance of the need for rules, regulations and structure.
- Athletes have to be goal-orientated and disciplined.
- Major decisions on career, lifestyle and education will come to the fore as well as major changes in interest, hobbies and interactions with the opposite sex.
- The athlete must be ready to assume responsibility and accept the consequences of their actions.

Performance capabilities and limitations

- Players are capable of self-analysing and correcting and refining skills. Athletes can analyse and conceptualise all facets of swimming.
- Well-developed information processing skills improve the player's ability to visualise verbal instructions.
- The young athlete must perceive the rules and structure as being clearly defined and fair.

Implications for instructors

- Provide positive feedback and encouragement
- Combat boredom in training programs
- Problem solving is essential
- Constant motivation is essential

Emotional development

Characteristics and implications – Basic characteristics

- There is a need to be self-directed and independent.
- Self-actualisation and self-expression are important.
- Major decisions on career, lifestyle and education are important at some point in this phase.
- Interactions with the opposite sex continue to be a strong priority with lasting relationships developing.

Performance capabilities and limitations

- The athletes are ready to assume responsibility and accept the consequences of their actions.
- Major changes in interests, hobbies and physical activities occur during this phase.

Implications for instructors

- Emphasise goal-setting to give definite direction and purpose to the athletes' overall programs.
- Treat athletes as adults – with respect, though direction and structure is still important.
- Make available professional guidance regarding off-season and educational pursuits.
- Allow athletes ample opportunities for independent social interaction.

Stage seven: Active for life

Age: This is when an individual makes the transition from competitive sport to life-long physical activity, and it may occur at any age.

Objectives:

- Continue to be physically active in swimming or in any other sport.
- Continue to be involved in the swimming community at different capacities.

Overall description

This stage describes the transition from competitive sport to lifelong physical activity. The sport system should encourage participants to move from one sport to another or from one aspect of sport to another with ease.

Active for life may also involve moving from competitive sport to:

- recreational activities such as running, swimming, hiking, cycling, etc.
- lifelong competitive sport through age group competition such as Masters

- sport-related careers, such as coaching, officiating, sport administration, small business enterprises, or media
- volunteer positions, as coaches, officials, or administrators.

Training, racing and recovery programs should fit the needs of the athletes for whom they are intended. Masters athletes need programs that take into account how aging affects strength, flexibility and endurance. A positive experience in sport is the key to retaining participants after they leave the competitive stream.



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Appendix

Skills

The initial learn-to-swim phase encompasses basic movements, balance, and coordination. The athlete progresses to the skills stage. This stage is crucial to their development. The phase starts at about the 7-to-8 year age and carries on to about 15 to 16 and sometime even beyond. Although it is never too late to perfect skills, the older the athlete, the harder it is to change bad habits, and the task of fine-tuning skills becomes more specific and individualistic.

During the skills stage, the athletes are educated to:

- maintain correct body position
- correct breathing for different speeds, strokes and distances
- use the most effective kicking methods for the various strokes
- develop a feel for the water, sculling and change of speed of the pulling and pushing phases of the arm stroke
- use the most efficient arm recovery
- apply the correct technique to gain the most economical distance per stroke
- develop techniques that minimise resistance
- use kicking and pulling drills to perfect stroke technique
- perfect various start and turn techniques.

The skill development stage ensures that a good technique produces high efficiency and there should be an awareness of the difference between style and technique. Complicated skills should be broken down into simple techniques. It is important to work through the three transition stages.

- Learning stage
- Performance with speed stage
- Speed under pressure stage.

The annual program and implementation guidelines

The following schedules and work program set down the amount of development work that should be done with individuals, when that work should take place, and what it should consist of. The programs and guidelines are designed to assist schools, community/recreation centres, private academies, clubs and affiliate/district associations to position themselves for full future implementation of the LTPD principles and to help plan development activities over the long-term. The following points should be noted:

- All children should have the opportunity to be part of the Fundamentals stage of LTPD.
- The priority should be on the long-term development of individuals as opposed to short-term team success.
- New revisions will ensure that LTPD principles are incorporated into all levels of coaching.
- A degree of flexibility may need to be applied to parts of the Annual Program where conflicts with educational requirements take place.
- The majority of athletes will not possess the necessary talent, desire or inclination to reach elite levels within the sport. For these athletes, programs should be designed around a 'Core' LTPD program which provides for basic LTPD principles to be applied. For those potential top athletes, an 'Extended' LTPD program will be provided as shown in the Annual Program and Implementation Guidelines.

Competition guidelines

Definitive guidelines on levels of competition for swimming have been set up, based on annual performance related to a percentage of the Olympic qualifying times, for Senior Nationals, Youth Nationals and the three age groups – Level 3, Level 2 and Level 1. The guidelines include the various National Squads quality standard target times.

Every athlete's situation and circumstances differ. Over-competing for the most talented young athletes is a problem, especially over-competing when combined with insufficient fitness levels, physiological imbalances and poor technique, as this leads to a higher risk of injury. It can also lead to early burn-out and exit from the sport. If a sports system is to be truly 'athlete-centred' then this weakness in our system needs to be addressed.

SSA's competition review will provide guidelines on appropriate competition training-to-rest ratios. The guidelines are of primary importance to the most talented athletes who are in greatest demand, but will also benefit the less able athlete. This sensitive ratio issue will require agreement, co-operation and consensus on calendar planning between SSA'S Swimming Technical Committee, different coaches, parents, athletes and others involved in a talented athlete's development. The Swimming Technical Committee is responsible for making the appropriate decisions in consultation with affiliate and district organisations. An unbalanced competition calendar and unbalanced competition-to-practice ratio will interfere with training opportunities, which in turn will affect an athlete's skill and ability levels in later years.

The role of Swimming South Africa

In its role as the National Governing Body for swimming, Swimming South Africa will take on the implementation of many of the structural and framework changes required. Policies will be decided at a national level. Specific roles and responsibilities of SSA will include the following:

- Ensuring that any relevant current and future programs and initiatives affecting the performer's development are consistent with the aims of the LTPD system for swimming.
- Making any changes needed to the current system of INSET courses, teacher training, the coach education system and coach development, through the Coach Education Department and the Development Department.
- Aligning and integrating existing ethics, equity, child welfare, facilities, disabilities, volunteer and other strategies into the new system.
- Ensuring that competition rules and guidelines are designed to be consistent with LTPD principles.
- Ensuring that appropriate funding levels support the LTPD sports system and are targeted towards the young performer's growth and development key stages at school, club, district and affiliate levels.
- Putting in place effective detection, identification, selection and development criteria for talent identification for use by schools, clubs, and district, affiliate and national boards using the minimum quality standards. This would include a system of objective measurement to monitor competencies achieved.
- Ensuring that new initiatives and programs from outside bodies and agencies are appropriately introduced into and are consistent with the LTPD sports system.
- Being responsible for setting up and overseeing an effective monitoring system to evaluate the LTPD process.

Affiliate Boards would be responsible for the local delivery of the LTPD sports system. Their roles and responsibilities would include the following:

- A dedicated performance officer is needed to work alongside the chief development officer, who is responsible for the long-term development of the key 6–15 age group of performers. The performance officer would set policies, plan programs, and liaise with other key personnel including the chief development officer, academy directors, clubs, schools, parents, and the SSA Performance and Development Departments.
- Responsibility for implementing a nationally consistent Fundamentals program for the 6–9 age group.
- Responsibility for delivering an effective district and affiliate program with appropriate levels of training and competition as set down by the ECB.
- Responsibility for mentoring, planning and developing the program for the most talented performers whose chosen sport is swimming.
- To ensure that adequate funding is targeted within development plans to develop the key 6–15 years of age performers. The minimum quality standards will provide guidance as to which areas of development should be prioritised.
- To ensure that a robust system of detecting new talent from primary school visits is in place and that those detected are introduced to appropriate local accredited clubs for focused on going development using club/school cluster groups.

Glossary of terms

Adaptation

This refers to responses to stimuli that induce functional and/or morphological changes in an organism. The level or degree of adaptation depends on the genetic endowment of an individual. However, the general trends or patterns of adaptation are identified by physiological research, and there are clear guidelines on the various adaptation processes, such as adaptation to muscular endurance or maximum strength.

Age

- Chronological age refers to the number of years and days since birth.
- Developmental age refers to the degree of physical, mental, cognitive, and emotional maturity.
- Physical developmental age can be determined by skeletal maturity or bone age, after which mental, cognitive, and emotional maturity is incorporated.
- Training age refers to the number of years in training, sampling different sports.
- Sport-specific training age refers to the number of years since an athlete decided to specialise in one particular sport.

Ancillary capacities

The knowledge and experience base of an athlete, including warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, regeneration, mental preparation, and taper and peak. The more knowledgeable athletes are about these training and performance factors, the more their training and performance levels will be enhanced.

Childhood

A time period from the end of infancy (the first birthday) to the onset of puberty that is characterised by relatively steady progress in growth and maturation and rapid progress in neuromuscular or motor development. This time period is often divided into early childhood (one to five years), and late childhood (six years through to the onset of puberty).

Competition

This is the period of time when all components of an athlete's training are successfully integrated to achieve excellence.

Development

The passage toward maturity of various traits, including social, emotional, intellectual, physical and motor qualities.

Growth and maturation

The terms 'growth' and 'maturation' are often used together and sometimes synonymously. However, each refers to specific biological activities. Growth refers to 'observable, step-by-step, measurable changes in body size such as height, weight, and percentage of body fat.' Maturation refers to 'qualitative system changes, both structural and functional in nature, in the organism's progress toward maturity; for example, the change of cartilage to bone in the skeleton.'

Participant

One can participate in recreation and/or physical activities and in sport as a recreational or competitive athlete.

Peak Height Velocity (PHV)

The maximum rate of growth in stature during growth spurt. The age of maximum velocity of growth is called the age at PHV.

Periodisation

The structuring of short and long-term training, competition and recovery periods to provide optimum performances at a given date.

- Single peak refers to one preparatory and one competition period within the year.
- Double peak refers to two preparatory and two competition periods within the year.
- Multiple peak refers to competing all year round while maintaining physical and technical skills.

Physical literacy

The mastery of fundamental movement skills and fundamental sport skills. 'A physically literate person moves with poise, economy and confidence in a wide variety of physically challenging situations, is perceptive in reading all aspects of the physical environment, anticipates movement needs or possibilities and responds appropriately with intelligence and imagination' (Whitehead, 2001).

Puberty

Also known as adolescence, this is the phase of growth that begins with onset of hormonal changes in the reproductive system and ends with sexual maturity.

Readiness

Readiness refers to the level of growth, maturity, and development that enables a child to perform tasks and meet demands through training and competition. The optimal periods of trainability during growth and development of young athletes are the correct times to program certain stimuli, for the best possible adaptation of motor skills, muscular and/or aerobic power.

Recovery

The term recovery is used in a number of situations.

- It could refer to a recovery set between daily intensive sets, or it could be at the end of a session.
- It could be a period in a cycle that allows sessions to be swum below training overload to help with recovery.
- It could also be a period of time between cycles that gives the athlete the opportunity to recover.
- A passive recovery is a rest or break from activities that cause either physical or psychological stress.
- Active rest entails a reduction in the training load.
- A successful program requires effective periodisation of training that will best balance and adjust the total stress training. This will allow some performance components the opportunity to recover and regenerate while other components are still subject to stress.

Regeneration

A number of physical therapies can help with the regeneration that will assist the athlete's recovery.

- The amount and type of recovery should be related to the various training sessions that may range from stressful endurance sets to stressful speed sets.
- Psychological recovery is just as important as physical recovery.
- Use contrasting temperature baths, spa and sauna treatments and hydro-massage. Even more sophisticated therapies can be used under the direction of specialists.
- Massage is the most commonly used recovery method. It quickens the removal of lactic acid from the muscle, and helps repair and regenerate muscle tissue following an injury. It has a psychological effect by helping the athlete relax, reduces muscle tension and helps warm up the muscle by stimulating blood flow.

Specialisation

Athletes limit their athletic participation to one sport which is practised, trained for, and competed in throughout the year.

Trainability

Refers to the genetic endowment of athletes as they respond individually to specific stimuli and adapt to it accordingly. Malina and Bouchard (1991) defined trainability as 'the responsiveness of developing individuals at different stages of growth and one of 10 key factors influencing LTPD'.