LONG TERM PARTICIPANT DEVELOPMENT

SYNCHRONISED SWIMMING

for synchronized swimming

www.swimsa.co.za
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Mission Statement

Synchronized Swimming South Africa wants to train champions. We consider the following objectives important to attaining this goal:

1. Adopt a clear philosophy and a realistic pathway for the development of synchronized swimmers and champions for life.
2. Create sustainable, high-quality programs that respect and address the windows of trainability.
3. Increase the quality and quantity of coaches, officials, and administrators through improved education, commitment to innovation, and provision of support and resources.
4. Increase participation levels and the talent pool.
5. Create a formal talent identification system.
6. Improve the sport’s profile within South Africa and worldwide.
7. Achieve and sustain international success.
8. Ensure synchronized swimmers remain active for life after retiring from competition.
9. Establish synchro in South Africa as an athlete-centered, coach-driven and administration- and sport science-supported organization.
10. Bring sponsors into the sport to ensure essential finance available for development.
11. Ensure better facilities are made available.
12. Develop historically disadvantaged groups.
1. Introduction

1.1. What is LTAD?

The LTAD model is predicated on the idea that each participant’s stage of physiological, mental/cognitive, and emotional development must be identified and taken into account when developing his/her optimal training, competition and recovery program. Here it is important to understand the difference between the developmental age (the maturation level of an individual) and the chronological age (actual age in years) when progressing through the various stages.

The LTAD program is athlete-centered, coach-driven, and administration, sport science, and sponsor supported. Athletes who progress through LTAD experience training and competition in programs that consider their biological and training ages in creating periodized plans specific to their development needs.

The principles which underpin the LTAD are equally applicable to people of all ages and abilities whether they are participating in elite sport or recreational physical activity.

One of the goals of the LTAD model is Physical Literacy, as well as full sport system alignment and integration. Physical literacy is defined as 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. He/she anticipate the movement needs or possibilities, and responds appropriately with intelligence and imagination." (Whitehead, 2001)

1.2. Where are we now?

At the moment there is an over emphasis on competition and not enough on acquiring and refining basic skills. Children are pressurized into advanced levels too early and lose the fun element. This causes them to retire before they reach their true potential.

In order to assess where we are currently, we need to examine the five pillars of the sport and assess the current situation for synchronized swimming in South Africa.

Athletes

Our athletes currently have no standard development path as each coach adopts a different way forward. The athletes experience very little international competition due to our geographic situation and associated travel costs. They have no set goals to work towards and no long term plan. Because of this many athletes retire before reaching their maximum potential. We have a relatively small number of athletes. We need to grow the number of athletes involved in order to broaden our base. This will allow more talent to emerge.

Coaches

There are very few coaches in South Africa and this is a big problem in growing the sport. These coaches are capable at basics but need assistance in training strength and flexibility, as well as advanced techniques. Because South Africa seldom competes in international meets the coaches are not up to date with global trends though the advent of internet has helped here. It is also difficult to train coaches without a plan for the coach to follow.

Officials

South Africa currently has no judges at FINA A or B level. This can only be achieved by the officials attending more international meets where they get assessments. Any judge needs 3 assessments in order to apply for a regrade. This will also have results for the athletes and coaches as the judges will then give more accurate assessments at local competitions.

Parents

Parents need education on the sport as synchronized swimming is not a sport many have experienced. Fathers are particularly ignorant
and tend to regard it as water ballet and not a "real" sport. They need to realize that the sport requires maturity and strength and is a long term commitment. Many parents are impatient for results and unfairly pressurize the child.

Facilities
Ideally synchronized swimming requires heated water and 25 meter square pools of at least 3 meters depth. While there are water polo pools available these are not quite deep enough and may not be heated. Currently there is only one pool in South Africa (Kings Park, Durban) which can host an international meet. The lack of facilities is a major problem for developing the sport in smaller areas where pools are very shallow.

1.3. Where do we want to be?
Looking to the future the targets should be as follows:

Athletes
Athletes should train at the same level throughout South Africa. We plan to achieve this by adopting the British system of skills levels, which is the program approved by SASCOC. This will ensure that athletes only move to more advanced techniques once they have mastered the skills in the previous level. We will to use assessors to check the skills levels of the athlete. The assessors will themselves need to qualify in order to standardize the pass criteria. We want to introduce synchronized swimming to more school children in order to grow our base. We will do this by making it easier for school coaches to understand basic synchronized swimming. With the support of SSA, we are busy developing a DVD of the British skills as a simple coaching tool that anyone can understand, even with no synchronized swimming background. The plan is to make this available to schools to use.

Coaches
Again by using the British Skills Levels, coaches will work to a uniform plan. As stated above we will distribute a coaching DVD for use by school swimming coaches in conjunction with the Skills levels program. This should make it easier for school coaches to understand the basics and give pupils a simple introduction to the sport. Interested pupils can then join a club.

Officials
It is not easy for local judges to progress through the FINA grades as each assessment is only valid for 4 years and currently South Africa does not compete internationally very often. It is easier for a judge based in Europe as travel costs are so much less.

Malaysia have adopted a plan to assist one judge to obtain her A level and then to progress to become a FINA Assessor. This means that she is qualified to assess the other local judges in Malaysia. Egypt followed a similar route and now have several graded judges. However this can take a while to achieve.

Parents
Once the Skills Level program is in place the parents will have more information as to what is expected of their child over the time she participates in synchronized swimming. Hopefully we can educate them to understand that each child develops at a different rate.

Facilities
We need a suitable pool in each of the larger centers. To do this we need to ensure that municipalities building pools consider all the aquatic disciplines. We need to ensure there is an awareness of the synchro needs at all levels.

1.4. How to get there?
The philosophy behind LONG TERM PARTICIPANT Development is that it takes 8-12 years of training and practice for a player to reach elite levels (Bloom, 1985; Ericsson et al., 1993; Ericsson and Charness 1994), and that success comes from training, practicing and competing well over the long term rather than focusing on winning in the short term. There is no short cut to success in player preparation!

The LTAD Model not only provides the rational justification for enhancing our current system but also provides some of the solutions as
to the way forward in starting to tackle some of the weaknesses identified. Development of talent must look beyond the short-term and plan for the future. These are great challenges for our sport.

With LTAD we hope to cover the following:

- Implement a new communication pathway plan
- Improve current structures
- Ensure goals are stated in SMART format (reference?)
  - S – Specific
  - M – Measurable
  - A – Attainable
  - R – Realistic
  - T - Timely

2. The ten key factors influencing LTAD

To better understand the LTAD model, and its role in helping participants to achieve these goals, we have identified ten key factors which influence the model and set it apart from other long-term development models. These factors are outlined in the following section.

2.1. The FUNdamentals - Developing physical literacy

Fundamental movement skills (running, throwing, catching, hopping, bounding, etc.) and fundamental sport skills equals Physical Literacy. The literature on growth and development indicates that children should master the fundamental movement skills and fundamental sport skills before learning more complicated sport-specific skills and strategies. These fundamental skills should be acquired prior to the onset of the growth spurt which occurs in adolescence.

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

Athletics: Develops many of the fundamental movement skills which are components of all other sports, including running, jumping, throwing and for wheelchair participants, wheeling.

Gymnastics: Encourages the development of agility, balance, coordination, and speed, along with the fundamental movement patterns of landing, statics, locomotion, rotation, swings, springs and object manipulation.

Swimming: is the foundation for all water sports. It is also important for water safety reasons, and teaches balance in a buoyant environment as well as coordination. During the Learn to Swim program used by SSA, there is an opportunity to introduce a synchro fun component. British Skills Level 1 does not require deep water and is the ideal start to learning synchronized swimming.

2.2. Chronological age vs Developmental age

A second factor influencing the LTAD has been touched upon earlier. It is the recognition that chronological age differs from developmental age. Chronological age refers to the number of years and days elapsed since birth. Developmental age refers to the child’s relative position on a continuum that begins at birth and culminates in full physical maturity.

A participant’s developmental age determines when various aspects of sport and physical activity should be introduced or emphasized. The LTAD model uses the categories “early”, “average”, or “late” matures to identify an athlete’s developmental age. These designations help coaches and instructors to design instructional, training and competition programs that are appropriate for the participant’s level of development. Identifying an athlete’s stage of maturation is not difficult. For specific information on “how to”, go to www.ltad.ca. and read the article on ”monitoring growth."
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.

### 2.3. Mental, cognitive and emotional development

Instructors and coaches should recognize that individuals mature at different rates and that the timetable for physical, mental, motor and emotional development varies from athlete to athlete. Instructors and coaches are encouraged to take a holistic approach to teaching and training athletes. This means taking into account a wide variety of psycho-social and emotional factors that influence the athlete day-to-day.

Cognitive, mental and emotional (affective) elements have a significant effect on participants’ performance, and must be prioritized in long-term participant development. Beyond these elements, instructors and coaches should also consider equipment and environmental factors that impact participation, performance and safety. Ethics, including fair play, respect of self and others, and perseverance should be developed within all stages of long term participant development.

### 2.4. Specialization

Many of the world’s most successful athletes participated as children in a wide variety of sports and physical activities. The movement and sport skills they developed as a result have helped them to attain a high level of athletic achievement.

There is much to be gained from a child’s early participation in a variety of sports. Early exposure to a wide variety of sport and physical activities will develop some of the physical and movement attributes that are crucial to later success in participation including: agility, balance, conditioning, speed, core body strength, stamina, suppleness, and eye-hand-foot coordination.

Early specialization in a late specialization sport can contribute to:
- Overemphasis on sport specific preparation/ one-sided preparation
- Lack of development of basic movement and sport skills
- Overuse injuries
- Early burnout
- Premature retirement from training and competition.

### 2.5. Trainability

The trainability of the 5 S’s
- Stamina (Endurance)
- Strength
- Speed
- Skill
- Suppleness (Flexibility)

is well documented in the literature. Brohms, 1985; Viru et al, 1998 and 1999; Rushall, 2000. Biological markers (Balyi, 2002), such as
synchronized swimming

the on-set of PHV (adolescent growth spurt), PHV and the on-set of menarche can identify the "sensitive periods of accelerated adaptation to training" for Stamina, Strength and Skills. The trainability of Speed and Suppleness is based on chronological age. Thus, the biological markers will identify the "windows of optimal trainability for accelerated adaptation to training. (See further details on trainability in the 10S’s of training and performance section).

2.6. Periodization (annual training, competition and recovery plan)

Periodization provides the framework for organizing training, competition and recovery into a logical and scientifically based schedule to achieve optimum performance at the required time. A periodized annual plan that takes into account growth, maturation and trainability principles should be developed for all stages of LTAD.

Simply put, designing a periodized yearly plan is time management. This involves planning the right activities with the correct level of difficulty, in the correct sequence to reach the desired training and competition objectives.

The plan can be broken down into workable units. The proper sequencing of these units is critical for success. To reach optimum performance in a competitive environment, the training units should be sequenced in the following manner:

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

In order to design an annual plan, the coach 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 relative importance or purpose of each competition;
- The actual training state of the athlete at the start of the yearly plan;
- The contextual reality that the coach and athlete have to cope with;
- The principles of LONG TERM PARTICIPANT development.

Creating a blueprint for success involves accurate and effective planning of training, competition and recovery.

2.7. Calendar planning for competition

The domestic competitive and event calendar must support and be aligned with LTAD. 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 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 level 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.

2.8. 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. This translates into an average of more than three hours of training daily for 10 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)

2.9. System alignment and integration

LTAD recognizes that physical education, school sports, recreational activities and competitive sport are interdependent. Enjoying a lifetime of physical activity and achieving athletic excellence are both built on a foundation of physical literacy and fitness.
Stakeholders in LTAD include participants, instructors, coaches, parents, administrators, spectators, sponsors and supporting national and multi-sport organizations. With so many partners included, system integration and alignment is a major challenge.

It is important that all components of the community – athletes, coaches, parents, officials, spectators, sponsors, and supporting national, provincial, territorial and multi sport organizations work together to implement the right programs and establish a system that produces optimal condition for training and competition. The sport system must include the school system (physical education and school sports), recreation departments, competitive sport, sport facilities and coaching organization. All parts of the sport community must be integrated and aligned. With so many partners across so vast a country and with different demographic compositions, system integration and alignment are major challenges. Each element in the system plays a crucial role in player development. The system must be clear, seamless, and based upon a consistent set of principles.

2.10. Continuous improvement (KAIZEN)

LTAD is a dynamic framework that utilizes continuous adjustments based on key principles. Continuous improvement ensures that:

- LTAD responds and reacts to new scientific and sport-specific innovations and observations and is subject to continuous research in all its aspects.
- LTAD, as a continuously evolving vehicle for change, reflects all emerging facets of physical activity and high performance sport.
- LTAD promotes integration between sport, physical education, recreation, health and education.

3. The 10 s’s of training and performance

The original 5 Basic S’s of training and performance was introduced in the Canadian Sport for Life: Long-term Athlete Development document. Building on the physical development, an additional Five S’s create a complete, holistic, training, competition and recovery program and a proper lifestyle.

Thus, there are Ten S’s of training which need to be integrated when developing annual training, competition and recovery plans. Each of these capacities is trainable throughout a player’s lifetime, but there are clearly critical periods (or sensitive periods) in the development of each capacity during which training produces the greatest benefit to each athlete/player’s improvements.

The CS4L document also describes the various stages of LTAD and identifies the windows of optimal trainability related to the critical or sensitive periods of the maturation process.

“The sensitive periods in trainability are referred to the windows of accelerated adaptation to training.”

In all former LTAD documents the windows of trainability have been referred to as the “critical periods” of accelerated training; however, scientist now believes that critical periods should be referred to as sensitive periods. (1). Thus, windows of trainability refer to periods of accelerated adaptation to training during the sensitive periods of pre-puberty, puberty and early post-puberty. The windows are fully open during the sensitive periods of accelerated adaptation to training and partially open outside of the sensitive periods.

These sensitive periods vary between individuals as each athlete/player 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/player development is needed to ensure that players who respond slowly to training stimuli are not “short-changed” in their development.
3.1. Stamina (Endurance)

The sensitive period for training stamina occurs at the onset of the growth spurt or Peak Height Velocity (PHV), commonly known as the adolescent growth spurt. Athletes/players 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 and individual specific needs.

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

3.2. Strength

There are two critical windows of trainability for strength in girls: immediately after PHV and after the onset of menarche. 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 sport-specific and individual specific needs.

3.3. Speed

There are two critical windows of trainability for speed. For girls, the first speed window occurs between the ages of six and eight years, and the second window occurs between 11 and 13 years. During the first speed window, training should focus on developing agility and quickness (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 (duration of the intervals is 10-15 seconds).

It is highly recommended 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 the warm up or immediately after the warm there is no Central Nervous System or metabolic fatigue present in the organism, and so this is an optimal time to train speed. The volume of training should be low and allow full recovery between exercises and sets. Short acceleration with proper posture and elbow and knee drive, take-off speed and segmental speed should be trained regularly outside of the window of optimal trainability for speed. In addition, proper blocks of training should be allocated to speed training during the periodized annual training, competition and recovery program according to seasonal and the sport-specific requirements.

3.4. Skill

Girls and boys both have one window for optimal skill training. For girls, the window is between the ages of eight and 11 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 activity and
synchronized swimming

... sport situation. 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.

3.5. Suppleness

The critical window of trainability for suppleness occurs between the ages of six and 10 years in both girls and boys. However, because of the rapid growth special attention should also be paid to flexibility during the growth spurt.

3.6. 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) in the human body linking them to the windows of optimal trainability. It recognizes stature (the height of a human) before during and after maturation guiding a coach or parent to the measurements needed to track growth. The tracking of stature as a guide to developmental age allows planning to address 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 is essential to design and implement optimal training, competition and recovery programs.

3.7. (p)Sychology

Sport is a physical and mental challenge. The ability to maintain high levels of concentration, remain relaxed with the confidence to succeed are skills that transcend sport to everyday life. To develop the mental toughness for success at high levels requires training programs which are designed specific to the gender and LTAD stage of the athlete. The training programs should include key mental components identified by sport psychologists; concentration, confidence, motivation and handling pressure. As an athlete progresses through LTAD stages the mental training aspect will evolve from; having fun and respecting opponents; to visualization and self-awareness; to 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 LTAD stage as dealing with success and failure will determine continuation in sport and physical activity, therefore dramatically affecting an individual lifestyle.

3.8. Sustenance

Sustenance recognizes a broad range of components with the central theme of replenishing the body. This is to prepare the athlete for the volume and intensity required to optimize training or living life to the fullest. Areas addressed are: nutrition, hydration, rest, sleep and regeneration, all of which need to be applied different to training (life) plans depending on the stage within the LTAD. 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 there is a need to monitor recovery by the coach or parent through the identification 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 lead to the same result.

3.9. Schooling

In training program design the demands of school must be considered. This is only limited to the demands placed by school sports or physical education classes. This includes integrating school academic loads, duties, school related stresses, and timing of exams. When possible, training camps and competition tours should compliment, not conflict, with the timing of major schools academic events.

Overstress should be monitored carefully. Overstress refers to the everyday stresses of life, like schooling, exams, peer groups, family, boyfriend or girlfriend relationships as well as increased training volume and intensities. Interference from other school sports should be minimized, communication between coaches who are responsible to deliver the training and competition programs are essential. A good balance should be established between all factors and the coach and the parents should be working on this together.
3.10. Socio-Cultural

The socio-cultural aspects of sport are significant and must be managed through proper planning. Socialization via sport will ensure that general societal values and norms will be internalized via sport participation. This occurs at the community level and as an athlete progresses through the LTAD stages can lead to International exposure. This socialization can be broadening of perspective including: ethnicity awareness, national diversity. Within the travel schedule recovery can include education of competition location including; history, geography, architecture, cuisine, literature, music and visual arts. Proper annual planning can allow sport to offer much more than simply commuting between hotel room and field of play.

Sport socialization also must address sport sub-culture. As well, coaches and parents must guard against group dynamics which create a culture of abuse or bullying. Ethics training should be integrated into training and competition plans at all stages of LTAD. 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 optimal of trainability for speed, skill, and suppleness have past. These children are therefore dependent on schools, recreation programs, and other sports to provide timely training in these capacities. LTAD advocates that sports build relationships with these organizations to promote and support appropriate training. If athletes miss these training periods entirely, coaches will need to design individualized programs to remedy any shortcomings.

In South Africa the vast majority of the population has been historically denied access to sporting facilities and coaching. This has led to a huge backlog in the development of appropriate sporting skills in these population groups. Sports administrators are now left with the challenge of how best to fast track skills to these groups in order for teams to better represent the demographics of the country. Synchronized swimming requires that the athlete is a competent swimmer before entering the sport. This is a skill that many still do not have. Unlike running, swimming is an acquired skill that needs special facilities as well as teachers. This makes it a greater challenge to introduce synchronized swimming in historically disadvantaged areas.
4. BUILDING A PATHWAY: The Seven Stages of LTAD

The stages of LTAD are based on the concept that sports can be classified as early or late specialization sports. Early specialization 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. Synchronized swimming falls in this category as well.

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

The South African Sport for Life, Long-term Athlete Development distinguishes seven stages of athlete development:

1. Active Start: 0 - 6 years of age
2. FUNdamentals Females: 6 - 8 years
3. Learn to Train Females: 8 – 11 years
4. Train to Train Females: 11 – 15 years
5. Train to Compete Females: 15 – 17 years
6. Train to Win Females: 17+ years
7. Active for Life - Enter any time

4.1. Active Start (0 to 6 years)

The young child needs to develop a variety of life skills such as crawling, walking and running. All exposure to these skills should be in a relaxed fun environment. Synchro specific the child needs exposure to water and introduction to basic swimming skills. Teach an appreciation of music (clapping in time, etc.). Learn proper movement skills (running, twisting, etc.). Encourage everyday activity to promote physical development.

At this stage programs will:
- emphasize comfort in the water.
- introduce basic strokes, breathing patterns, and floating.
- expose the child to music and dance.
- introduce basic creative movement through fun, games, and make-believe in the water and on land.
- emphasize water safety.
- introduce natural acrobatic movements like jumping, somersaults, headstands, running, and skipping.
- introduce balance and stretching.
- encourage sharing and learning from others.
- teach fair play and cooperation.
- cultivate positive body image, self-confidence, and self-esteem.
- introduce healthy and fun food choices and the concept of hydration.
- provide the opportunity for children to observe and/or participate in water shows.
- start the child on the path of an active

Recommended Training Framework:
- 1 session a week (includes both water and land training)
- sessions of 30-45 minutes in duration
- fun-based activities
- unlimited activity outside of structured program
- a low volume program

4.2. FUNdamentals (5 to 8 years)

This phase is appropriate for girls aged 5 to 8. The main objective should be the overall development of the athlete’s physical capacities and fundamental movement skills. The key points of this phase are:
- Participation in as many sports as possible
- Speed, power and endurance are developed using FUN games
• Appropriate and correct running, jumping and throwing techniques are taught using the ABC’s of athletics
• Introduction to the simple rules and ethics of sports
• Strength training with exercises which use the child’s own body weight; medicine ball and Swiss ball exercises
• Training programs, based on the school year, are structured and monitored but not periodised
• Develop the athlete’s:
  o ABC’s (Agility, Balance, Coordination and Speed)
  o RJT (Running, Jumping, Throwing)
  o KGBs (Kinesthetics, Gliding, Buoyancy, Striking with a body part)
  o CKs (Catching, Kicking, Striking with an implement)

The first ‘critical period of speed development’ will occur during this phase, age 6-8 for girls and 7-9 for boys respectively. Linear, lateral and multi-directional speed should be developed and the duration of the repetitions should be less than 5 seconds. Fun and games should be used for speed training and the volume of training should be lower.

Synchro specific skills to include here are gymnastics, ballet or modern dancing, and swimming. Here teach basic sculling propulsion techniques. Use bottles to practice verticals and basic positions and transitions. Use music when swimming.

At this stage programs will:
• focus on the development of basic movement skills and motor skills (the ABC’s of Agility, Balance, Coordination, and Speed) prior to introducing Synchro-specific skills).
• develop self-esteem and self-confidence.
• introduce and develop basic sculling, positions, strokes, transitions, propulsion, patterns, and entries.
• introduce intermediate level sculls, positions, and patterns.
• begin shaping the leaders of tomorrow through the introduction of leadership skills.
• maximize the window of trainability for suppleness and speed through fun and games.
• promote innovation through creating shapes in water.
• encourage learning through role playing.
• introduce simple acrobatic movements.
• introduce principles of good posture.
• develop upper body and core strength using the child’s own body weight, Swiss balls, medicine balls, and light resistance.
• encourage healthy teamwork principles.
• introduce the ethics and rules of Synchro and sport in general.
• foster a healthy body image.
• introduce relaxation techniques and healthy nutrition principles.
• encourage positive self-talk and self-assessment.
• provide the opportunity for children to participate in skill-based fun competitions and water shows.

Recommended Training Framework:
• 1-3 sessions a week (includes both water and land training)
• sessions of 30-90 minutes duration
• 2-3 non-Synchro activity sessions of 40-60 minutes per week. These may be family activities.
• no periodization but a well-structured program to ensure variety and enjoyment
• low volume and intensity program

4.3. Learning to train (8 to 11 years)

This phase is appropriate for girls aged 8 to 11. The main objective should be to learn all fundamental sports skills. The key points of this phase are:
• Further develop fundamental movement skills
• Learn general overall sports skills
• Continue to develop strength with medicine ball, Swiss ball and own body-weight exercises as well as hopping-bounding exercises
• Continue to develop endurance with games and relays
• Introduce basic flexibility exercises
• Continue to develop speed with specific activities during the warm-up, such as agility, quickness and change of direction
• Develop knowledge of warm up, cool down, stretching, hydration, nutrition, recovery, relaxation and focusing
• Training programs are structured and based on a single periodisation
• Competition is structured and a 70:30 training/practice to competition-ratio is recommended

Continue to focus and consolidate on synchro specific skills like basic positions and movements. Continue with different sports but focus on core disciplines like swimming, dance and gymnastics. Work on stamina, strength and control. Stay aware of different levels of mental and emotional development. Introduce fun competitions but keep main focus on skills training.

At this stage programs will:
• improve agility, balance, motor coordination and core strength.
• introduce and develop advanced sculling techniques, basic entries, transitions, patterns, pattern awareness, land drill techniques, basic boost techniques and body positions.
• consolidate basic sculling techniques, propulsion techniques, and patterns transitions.
• integrate basic FINA2 positions, figures, transitions and sculls into routines.
• teach the rules and ethics of Synchro and sport in general.
• develop a healthy body image and foster self-esteem and confidence.
• address the windows of trainability for suppleness, stamina and skill.
• encourage self-awareness.
• enhance self-assessment, goal setting and decision making.
• develop mental rehearsal and relaxation techniques and consolidate positive self-talk.
• encourage exposure to and involvement in all forms of art and culture.
• advance a sense of rhythm through creative play in water and on land.
• consolidate knee and foot extensions.
• develop principles of optimal hydration.
• develop fundamental acrobatic movements and introduce Synchro-specific acrobatic movements.
• introduce age appropriate aerobic endurance through games.
• develop quick upper and lower body movements.
• advance core strength using own body weight, Swiss balls and medicine balls.

**Recommended Training/Competition Framework:**
• 1-4 sessions a week (includes both water and land training)
• sessions of 90-120 minutes duration
• 2 other activity sessions of 60-90 minutes per week
• participation in other sports/music camps and activities during the off-season
• no periodization but well-structured programs with appropriate skill progressions, level of activity and learning opportunities in a well-planned, positive environment
• low-medium volume/low-medium intensity
• maximum of 3 skill-based competitions

**4.4. Training to train (11 to 15 years)**

This phase is appropriate for girls aged 11 to 15. The main objective should be the overall development of the athlete’s physical capacities (focus on aerobic conditioning) and fundamental movement skills. The key points of this phase are:

- Further develop speed and sport-specific skills
- Develop the aerobic base - after the onset of PHV
- Learn correct weight lifting techniques
- Develop knowledge of how and when to stretch, how to optimize nutrition and hydration, mental preparation, how and when to taper and peak
- Establish pre-competition, competition and post competition routines
- The strength training window for boys begins 12 to 18 months after PHV
- There are two windows of opportunity to strength training for girls
  - Window one is immediately after PHV
  - Window two begins with the onset of menarche (the first menstrual period)
- Special emphasis is also required for flexibility training due to the sudden growth of bones, tendons, ligaments and muscles
- A 60% training to 40% competition ratio (includes competition and competition-specific training) is recommended
This phase is appropriate for girls aged 11 to 15. The main objective should be the overall development of the athlete's physical

4.4. Training to train (11 to 15 years)

- monitor the onset of PHV*, the major growth spurt during maturation in order to take advantage of optimal aerobic, strength, and speed trainability.
- make aerobic training a priority after the onset of PHV while maintaining or further developing levels of skill, speed, strength, and suppleness.
- address the windows of accelerated adaptation to speed and strength training.
- introduce Ideal Performance State (IPS).
- emphasize passive and active flexibility training given the rapid growth of bones, tendons, ligaments, and muscles. Caution should be exercised when performing dynamic flexibility to avoid injuries related to loose ligaments and tendons.
- consolidate the skills athletes need to cope with the physical and mental challenges of competition.
- train athletes in daily competitive situations in the form of simulated competitions or competitive games and drills.
- consolidate FINA figures, body positions, sculling variations and sculling combinations of increasing difficulty.
- refine basic sculling, transitions, patterns, body positions, strokes and propulsive skills.
- develop core strength and stability through use of own body weight, Swiss balls and medicine balls. Light weights can be incorporated from the age of 12.
- develop the ability to use the water for force.
- introduce routine transitions of increasing difficulty (complicated angles).
- consolidate boosting techniques, entries, land drill techniques, pattern awareness, and pattern formations.
- refine the ability to perform basic routine skills at fast speeds with high quality.
- introduce anaerobic development toward the end of this stage by increasing breath-holding in practice sets.
- introduce specific routine endurance toward the end of this phase once a fitness base has been established.
- consolidate “sharp” movements with extension in all basic team routine skills and transitions.
- refine feet and knee extensions.
- encourage individual creative expression and consolidate manner of presentation.
- introduce doping control.
- consolidate and increase variety in all areas of movement and rhythm.
- consolidate fundamental acrobatic movements and develop specific acrobatic movements.
- develop imagery, competition preparation, stress management, and relaxation skills.
- continue to encourage exposure to and involvement in all forms of art and culture.
- introduce pre-competition and competition planning.
- teach focus and concentration skills.
- consolidate communication and team-building skills.
- teach a nutrition plan for training.
- inform athletes about label reading while grocery shopping and healthy choices for dining out.
- introduce basic kitchen skills.
- educate about key nutrients for adolescent females in general such as calcium and iron.
- introduce disordered eating awareness education.
- develop leadership skills.
- continue to foster positive body image, high self-esteem, and confidence.
- introduce the benefits of massage as well as warm-up and cool-down protocols.
- develop the concept of nutrition as a recovery tool.
- Provide information about appropriate prevention and treatment of injuries.

Recommended Training and Competition Framework:

- 4-6 sessions a week (water training)
- sessions of 120-180 minutes duration
- 2-3 cross training sessions of 45-90 minutes per week
- single periodization focusing on athlete development
- high volume, low-medium intensity
- 4-6 competitions per year
- team emphasis, with introduction of solo, duet and combo routines
4.5. Training to compete (15 to 17 years)

This phase is appropriate for girls aged 15 to 17. The main objective should be to optimize fitness preparation, sport/event specific skills and performance. The key points of this phase are:

- 50% of available time is devoted to the development of technical and tactical skills and fitness improvements
- 50% of available time is devoted to competition and competition-specific training
- Learn to perform these sport specific skills under a variety of competitive conditions during training
- Special emphasis is placed on optimum preparation by modeling training and competition
- Fitness programs, recovery programs, psychological preparation and technical development are now individually tailored to the athlete’s needs
- Double and multiple periodisation is the optimal framework of preparation

Here we look to optimize fitness and synchronized swimming specific skills. Compete nationally and internationally. Continue to monitor performance under competition conditions. Continue to assess physical and emotional development. Use videos to improve skills. Identify potential senior squad members. Hold regular training camps. Use sports psychologist to teach team interaction.

At this stage programs will:
- provide opportunities for athletes to pursue either a national or international stream of competition based on talent predisposition and commitment level.
- place special emphasis on optimum preparation by ‘modeling’ competitions in training.
- individually tailor, when possible, fitness programs, recovery programs, psychological preparation, and technical development.
- refine the ability to perform all basic positions and FINA figures* at a “good to perfect” standard.
- maintain all techniques, transitions, sculls and positions.
- refine ability to perform all routine skills, including required technical team, solo and duet FINA elements at a “good to near perfect” standard.
- refine overall impression*, including synchronization* and total command of performance* at a “good to perfect” standard.
- refine the ability to perform basic team routine skills with sharpness* and extension.
- refine the ability to perform a variety of advanced transitions, complicated patterns changes, and innovative highlights within a routine at a “good to near perfect” standard.
- refine fundamental acrobatic movements and consolidate “highlight**” acrobatic movements.
- improve creative movement through use of diverse choreography activities.
- encourage exposure to various forms of art and culture.
- develop and consolidate IPS*.
- optimize ancillary capacities*.
- consolidate PLB* and core strength.
- develop general strength training through use of weights.
- consolidate speed of movement in synchro-specific skills.
- develop speed strength* and endurance of speed strength.
- develop anaerobic endurance, aerobic power and routine-specific endurance.
- refine aerobic endurance.
- develop maximum suppleness.
- refine total body extension in the water and on land.
- refine communication and team-building skills.
- foster positive body image, self-confidence, and high self-esteem.
- provide tools to help athletes identify, understand, and deal with emotions.
- refine the ability to self-assess and make decisions.
- consolidate pre-competition and competition planning.
- develop a nutrition plan for competition and a nutrition related recovery protocol.
- monitor the fatigue recovery cycle.
- implement and manage appropriate prevention and treatment of injuries.

Recommended Training and Competition Framework — International Stream:
- 6-8 sessions a week (water training)
- sessions of 120-240 minutes duration
• 2-3 cross training sessions of 30-90 minutes per week
• single or double periodization depending on competition year, events, and qualification standards
• variable volume, medium-high intensity (high quality)
• 5-8 FINA*-style competitions per year
• talent identification procedures
• team emphasis, with solo and duet routines for talent identified athletes

Recommended Training and Competition Framework — National Stream:
• 3-5 sessions a week (water training)
• sessions of 120-240 minutes duration
• athletes encouraged to pursue other activities that promote strength and conditioning and overall well-being
• single periodization
• variable volume, low to medium intensity
• 4-5 FINA-style competitions per year
• team emphasis

4.6. Training to win (17 years plus)

This phase is appropriate for girls aged 17+. The main objective should be to maximize fitness preparation and sport/event specific skills as well as performance. The key points of this phase are:

- All of the athlete’s physical, technical, tactical, mental, personal and lifestyle capacities are now fully established and the focus of training has shifted to the maximization of performance.
- Athletes train to peak for major competitions.
- Training is characterized by high intensity and relatively high volume with appropriate breaks to prevent over training.
- Training to competition ratio in this phase is 25:75, with the competition percentage including competition-specific training activities.

Focus on high performance. Maintain & improve core strengths and continue to further develop skills. Compete internationally and nationally. Fine tune all aspects of training and performance.

At this stage programs will:

- refine the ability to perform the execution of all sculling techniques and basic body positions at a “near perfect to perfect” standard.
- refine IPS*.
- refine the ability to perform all routine skills, including the required team, duet and solo FINA elements* at a “near perfect to perfect” standard.
- perform all overall impression* skills, including total command of performance* and music interpretation at a “near perfect to perfect” standard.
- refine diver’s style of acrobatic moves (for use in routine highlights* and entries).
- continue to develop innovative acrobatic moves.
- cultivate a positive body image.
- nurture self-confidence and high self-esteem.
- utilize decision-making skills.
- record individualized nutrition portfolios.
- follow a foreign travel nutrition plan.
- develop personal strategies to ensure recovery and regeneration.
- refine the concept of nutrition as a recovery tool.
- prepare to peak for major competitions.
- communicate clear program expectations and directions to athletes.
- refine strength endurance and power.
- generate speed of movement in synchro-specific skills.
- refine speed strength* and endurance of speed strength.
- maintain core strength and maximal strength.
- maintain “sharp” movements with extension in all team routine skills and transitions.
• maintain a high level of anaerobic endurance, aerobic power, aerobic endurance, and routine-specific endurance.
• maintain maximum suppleness, including dynamic* suppleness.
• encourage life balance through outside interests.
• foster team values and team cohesion.
• perfect competition and pre-competition planning.
• utilize mental imagery skills, IPS*, concentration skills, and emotion management.

Recommended Training and Competition Framework:
• 8-12 sessions a week (water training)
• sessions of 120-240 minutes duration
• 3-4 cross training sessions of 45-90 minutes per week
• double, triple or occasionally multiple periodisation, depending on competition year and events
• relatively high volume and high intensity (high quality)
• Olympic event emphasis, with specialization in solo and duet for talent-identified athletes
• FINA-style competitions

4.7. Retirement - Active for Life

The main objective here should be to retain athletes for coaching, officiating, sport administration etc. We look to encourage a smooth transition from a competitive career to masters (still competitive), administrative (coach, judge, manager) or recreational. The LTAD program must make options clearly available. The objective is to encourage involvement in any sport for healthy life style.

At this stage programs will:
• educate retiring athletes about transferability of their artistic skills to other endeavors like Cirque du Soleil and coaching.
• encourage athletes to maintain motor skills, basic strength, basic flexibility.
• engage alumni in the synchro community.
• promote life balance.
• potentially re-direct athletes to sports where they are pre-disposed to train and perform well.
• align with off-season sports.
• direct retiring high performance athletes to organizations that specialize in athlete transition.
• provide opportunities for social interaction.
• promote the maintenance of healthy nutrition habits.
• support retiring athletes.
• provide opportunities to move into volunteering, coaching, judging, and administration roles.
• advise athletes on how to deal with aging and prevention of injuries.
• introduce Synchro skills to newcomers to the sport.
• launch athletes on the path of an active and healthy life.

Recommended Training/Competition Framework:
• 2-3 activity sessions per week
• 45-90 minutes per session
• unlimited activity outside of structured programs
• no periodization but well structured programs with appropriate skill progressions, level of activity, and learning opportunities in a well-planned positive environment
• fun, social, maintenance of fitness.
5. OTHER AREAS

5.1. Clubs and Club Development

Clubs will play an important part in delivering any new system. It is proposed that the roles and responsibilities are as follows:

- Clubs must be initially used as the “front line” in the development process. In conjunction with all provincial affiliates, clubs are responsible for delivering the Fundamentals, Learning to Train and Training to Train phases of LTAD (from ages 6-15).
- Clubs must also support a close working relationship with schools to ensure effective delivery of the system.
- Club coaches must be given access to LTAD training and support programs. They need to work closely with the appointed assessors to ensure they are training the correct skills.

SSA needs to support club development by:

- developing and communicating a clear and concise athlete development pathway through the 7 stages of LTAD, providing an overview of the training requirements at each stage.
- establishing working groups to research and examine existing club structures and to make recommendations that foster quality community club development.
- maintaining an up-to-date ‘Club Development’ page on the national website
- building a communication structure that will service the needs of the clubs, and affiliates.
- rewarding best results at the club and affiliate levels.

5.2. Coach education and development

The role of the coach will be central to any successful introduction of a new sports system. The coach has the ability to motivate performers and either unlock and nurture or stifle future potential.

- SSA must ensure all coaches are trained in the new LTAD skills levels training process.
- SSA must keep coaches up to date on any amendments.
- Coaches must promote and develop an awareness program for the introduction of LTAD principles.
- SSA need to design and deliver Coach Development Workshops on LTAD with special emphasis on the delivery of the Fundamentals, Learning to Train and Training to Train stages. These workshops must use the Skills Levels System.
- SSA need to introduce a system to monitor progress, evaluate success and review coaches periodically - an effective Coach Mentoring scheme.

SSA must endeavour to provide coaches with:

- opportunity to be involved as leaders in LTAD program development.
- educational and learning opportunities to enhance professional and leadership development.
- facilitation of communication between coaches in order to build a strong network and encourage peer to peer learning.
- facilitation of communication between coaches and officials to ensure a seamless program.
- coordination of mentorship relationships for coaches to ensure a strong support system and encourage continual growth and development.
- services to ensure a smooth transition from club-level coaching to national team-level coaching.
- up-to-date coaching resources.
- opportunity to provide input into the organization’s strategic decisions at all levels of participation.
- competitive salaries and benefit packages for coaches working with national teams.

5.3. Officials education and development

The development of officials is of equal importance to that of the coach. Synchronized swimming is a subjective sport. The judges determine the winner rather than the athlete having absolute control. Judges need training in assessing correctly the performance in the water so that the athletes are ranked in the correct order. To do this bias needs to be eliminated and the judges need to examine the performance in the water with an objective and critical approach. There is already a system in place to train judges from SA Level 1 to SA Level 3. Once at SA Level 3 the judge can be appointed as a FINA G judge. SSA must encourage regular assessment of these judges by FINA appointed assessors.
SSA must endeavour to provide officials with:
• opportunity to be involved in LTAD program development.
• an officials’ Education Program.
• additional training and learning opportunities.
• facilitation of communication between officials and officials.
• facilitation of communication between officials and coaches.
• mentorship opportunities.
• funding for travel to national and international competitions.
• services and education to ensure a smooth transition from provincial-level judges to national-level judges.
• services and education to ensure a smooth transition from national-level judges to international-level judges.

5.4. Parents education

All parents want to ensure that their daughter has every opportunity to succeed in life. Synchronized swimming is the perfect activity to set a young girl on the path to becoming a champion for life. Our sport nurtures self-esteem, provides an abundance of successful female role models, and offers the perfect mix of technical, artistic, social, and psychological skill development. Parents need to work closely with the coaches to achieve the best balance. They can identify fatigue and stress in the home environment more quickly than the coach at the swimming pool. They can also ensure the correct nutrition is followed. However there needs to be a definite split in the roles with the parents operating more in a supportive position.

For further information on the role parents play in developing future champions there is the Parents Guide to LTAD. It is not sport specific as the parent’s role is necessary no matter what the sport.

5.5 Competition Structure

Synchro’s LTAD model recognizes that the competition structure for each stage must meet the needs of athletes in that stage. In many sports, young children are required to participate in competitions that are unsuitable for their developmental age. A competition structure designed to address the objectives of each of the 7 stages will allow children to discover the fun and joy of competition and encourage coaches and clubs to create developmentally appropriate programming.

Competition Recommendations per stage:

**Active Start**
• observation of performances, competitions, and water shows.

**FUNdamentals**
• Synchro decathlons, a series of events that reflect the guiding principles, motor skills, windows of trainability, and skills that are emphasized at this stage.

**Learning to Train**
• competitions based on a variety of skills that need to be acquired during this stage.

**Training to Train**
• competitions based on measurable basic skills while ensuring that adequate training time is devoted to maximizing the windows of trainability that are so critical at this stage.

**Training to Compete**
• international travel incentives for club and provincial teams.
• two streams of competition: international and national.
• FINA-style competition for solo, duet, team, and combo.
• bi-annual, inter-provincial competitions to complement the Canada Games cycle.

**Training for Performance**
• FINA-style competitions for solo, duet, team, and combo.

**Active for Life**
• university-level competitions.
• masters-level competitions.
• Synchro alumni incorporated into competitions in the roles that may include award giving and acting as special guests.