



Swimming New Zealand Long Term Athlete Development (LTAD) Guidelines

Purpose

To set developmental parameters to assist coaches with the training and retention of swimmers so that they achieve better results as mature athletes. For more detailed information see the 'Rationale' section of this document.

Key Objectives

Development of swimmers in specific areas:

1. Skills requirements – aquatic body awareness, streamline, under water proficiency, speed, technical development in all strokes, learning to adapt and change.
2. Physiological aspects – agility, balance, coordination, power, endurance.
3. Training ability – aerobic development, strength in all four strokes, understanding of stroke rate and stroke count, race pace skills, hard work and dedication.

Outcomes

To track the development of swimmers in New Zealand between the ages of 8 and 18 years, and to ensure their development in key areas (as above).

To ensure that our future champion swimmers are:

- Biomechanical, excellent, with world class race skills, so that when strength is added it assists speed and not drag.
- Physically well developed, both aerobically and anaerobically.
- Understanding of the training and discipline required for high performance athletes both in and out of the pool.
- Aligned with SNZ's team culture, values, and vision of 'Inspirational Swimmers exciting the Nation through Exceptional Results'.

Training Outline

8-10 years (+ or – 1 to 2 years)	11-12 years (+ or – 1-2 years)	13-14 years (+ or – 1-2 years)	15-18 years (+ or – 1-2 years)
<p>Building 'The Vehicle', Watersafe, and Loads of Fun:</p> <ul style="list-style-type: none"> - Multiple stroke development. - Enjoying, challenging and progressive experiences. - Multi - Sport Skill Development. - Introduction of short sprints, speed drills and skills, relays and swimming games. - Racing skills development (starts and turns etc.) - Water-safety exercises. 	<p>Building 'The Engine' to Train and Compete:</p> <ul style="list-style-type: none"> - Multiple stroke development. - Enjoying, challenging and progressive experiences. - Develop aerobic conditioning. - Develop anaerobic conditioning. - Continuation of speed work (relays, sprints, speed drills and skills etc.) and race skills. 	<p>Optimizing 'The Engine' to Train and Compete:</p> <ul style="list-style-type: none"> - Multiple stroke development. - Enjoying, challenging and progressive experiences. - Improve aerobic conditioning. - Step up anaerobic conditioning. - Incorporate more event specific individual training and race pace work. - Continuation of speed work and race skills. 	<p>Specificity of Training and Competition:</p> <ul style="list-style-type: none"> - Multiple stroke development. - Enjoying, challenging and progressive experiences. - Specialised individual training. - Testing and data analysis. - Enhanced performance goals. - Continuation of speed work and race skills.
<p>Learn to Train and Love to Swim:</p> <ul style="list-style-type: none"> - Development and consistent demonstration of all swimming skills. - Expert instruction on technical and physical skills. - Development of positive attitudes to self, others and sport. - Participation in other sports. - High repetition low intensity skill focus. - Develop agility, balance, coordination, own body exercises with correct posture for appropriate strength development. 	<p>Learning Skills:</p> <ul style="list-style-type: none"> - Develop under water fly kick (front, back and side) to the 10m mark. - Learn stroke count and technique. - Improve race skills (start, turn, finish). - Start to learn how to pace. - Demonstrate the ability to hold technique at race pace. 	<p>Developing Skills:</p> <ul style="list-style-type: none"> - Increase speed on under water fly kick (front, back and side) to the 15m mark. - Master stroke count, stroke rate and technique under pressure and at race pace. - Perfect race skills. - Develop pacing capabilities. - Demonstrate the ability to hold technique at race pace. 	<p>Enhancing Skills:</p> <ul style="list-style-type: none"> - World Class under water speed. - Master stroke count, stroke rate and demonstrate the ability to hold these and true technique during intensive training and at race pace. - Fine tune all race pace skills.
<p>Body Understanding:</p> <ul style="list-style-type: none"> - Develop coordination. - Simple calisthenics. - Own body weight routines with good posture. 	<p>Body Awareness:</p> <ul style="list-style-type: none"> - Develop agility. - Introduce core exercises. - Develop balance. - Include body weight exercises. - Introduction of basic dry land equipment (i.e. stretch-cords, Ab' wheels, Swiss and medicine balls). - All exercises should be swimming specific; include team games. 	<p>Body Strength and Control:</p> <ul style="list-style-type: none"> - Improve flexibility. - Develop core stability. - Improve balance. - Include cross training activities. - Continuation of swimming specific strength training exercises. 	<p>Fine Tune Postural Awareness:</p> <ul style="list-style-type: none"> - Develop specific individual weight training programmes. - Refine flexibility. - Enhance core stability. - Increase range of motion and muscular coordination.
<p>Competitions:</p> <ul style="list-style-type: none"> - Attend club, local, regional and national. - Compete in all four strokes. - Compete in distance up to 200m. 	<p>Competitions:</p> <ul style="list-style-type: none"> - Local, regional and national swim meets. - Compete in all four strokes. - Compete in all distances. 	<p>Competitions:</p> <ul style="list-style-type: none"> - Local, regional, national and international swim meets. - Compete in specific events; - In addition compete in other strokes and distances. 	<p>Competitions:</p> <ul style="list-style-type: none"> - Regional, national and international swim meets. - Compete in specific events; - In addition compete in other strokes and distances.

Training Guidelines and Recommendations

8-10 years (+ or – 1 to 2 years)	11-12 years (+ or – 1-2 years)	13-14 years (+ or – 1-2 years)	15-18 years (+ or – 1-2 years)
<p>Competencies:</p> <ul style="list-style-type: none"> - Lane swimming, discipline, direction. - Use of clock –starting, resting. - Use of equipment, personal, flags, goggles. - Learning of correct stroke technique. - Awareness of perceived effort, easy acceleration, fast finish. - Working in group exercises/stroke specific drills. - Correct starts, turns and under water fly kick. - Not breathing in and out of starts and turns. - Capable of 10 exercises with own body weight, holding correct posture and movement patterns. - Capable of 10 flexibility exercises. <p>IM based training.</p>	<p>Competencies:</p> <ul style="list-style-type: none"> - Use of clock – monitoring times, checking heart rates. - Development of stroke technique. - Stroke counting, increase pace, consistency of repetition in sets. - Proficient with good starts, turns and under water fly kick. - Not breathing in and out of starts and turns. - Capable of 15 exercises with own body weight, holding correct posture and movement patterns. - Capable of 15 flexibility exercises. - Awareness of competition pathway. <p>IM based training.</p>	<p>Competencies:</p> <ul style="list-style-type: none"> - Understanding how to do pace work. - Maintain efficient technique. <p>Increased volume.</p> <ul style="list-style-type: none"> - Racing skills. - Excellence in starts, turns and under water fly kick. - Some intense interval training. - Compete in various stroke events and distances. - Flexibility and body strength awareness. - Dry-land strength training with correct posture and movement patterns, adding progressive resistance over time. - Nutritional awareness. - IM based training. 	<p>Competencies:</p> <ul style="list-style-type: none"> - Fine tuning stroke technique. - Understand race pace training sets. - Transfer power into swimming. - Transfer of wall speed into swimming speed. - Specific strength training programme with correct posture and movement patterns, adding progressive resistance over time. - Maintain flexibility. - Nutritional awareness. - Rest and recovery awareness. - Knowledge of SNZ High Performance Pathways. - Stroke and event specific based training.
<p>Continuous Swim (Skill Based):</p> <ul style="list-style-type: none"> - Free 400-600m - 3 fly kicks off every wall. - 200m x 2 other strokes +200 IM - 4th stroke = 150m or 4 x 50 + R20 sec 	<p>Continuous Swim (Skill Based):</p> <ul style="list-style-type: none"> - Free 1000m – 4 fly kicks off every wall. - 400m x 2 other strokes + 400 IM - 4th stroke = 200m or 2 x 100 + R15 sec 	<p>Swim Test:</p> <ul style="list-style-type: none"> - 7 x 200m Step test on 6m - 6 x 100m max effort on 6m - 12 x 50m max effort on 2.30 	<p>Swim Test:</p> <ul style="list-style-type: none"> - 7 x 200m Step test on 6m - 6 x 100m max effort on 6m - 12 x 50m max effort on 2.30
<p>Swim Speed (Skill Based):</p> <ul style="list-style-type: none"> - 4 x 25m on 1:00 IM (8m under water off walls) 	<p>Swim Speed (Skill and Time Based):</p> <ul style="list-style-type: none"> - 4 x 25m on 1:00 IM (10m under water off walls) 	<p>Swim Speed (Skill and Time Based):</p> <ul style="list-style-type: none"> - 8 x 25 Max on 1:00 (12m under water off walls) 	<p>Swim Speed (Skill and Time Based):</p> <ul style="list-style-type: none"> - 12 x 25m Max on 1:00 (15m under water off walls)
<p>Kick Test:</p> <ul style="list-style-type: none"> - 4 x 25m timed with 10m under water fly kick on 60. - 8 x 50m max effort on 1:45. - 6 x 100m on 2:40/2:50 (make interval). - 200m max effort. 	<p>Kick Test:</p> <ul style="list-style-type: none"> - 8 x 25m timed with 15m under water fly kick on 60. - 8 x 50m max effort on 1.30. - 8 x 100m on 2:10 (make interval). - 3 x 200m max effort. 	<p>Kick Test:</p> <ul style="list-style-type: none"> - 16 x 25m timed with 20m under water fly kick on 1:00. - 10 x 50m max effort on 1:30. - 12 x 100m on 1:45 (make interval). - 5 x 200m max effort on 5m. - 100m, 200m & 400m max effort. 	<p>Kick Test:</p> <ul style="list-style-type: none"> - 16 x 25m under water fly kick on 1:00. - 12 x 50m max effort on 1:30. - 12 x 100m on 1:30 (make Interval). - 5 x 200m max effort on 5m. - 100m, 200m & 400m Max. <p>Event specific customized testing</p>

Approximate Training Volumes and Hours

Age	Sessions	Pool (<i>hours</i>)	Volume (<i>Kilometres</i>)	Dryland (<i>hours</i>)
7 – 8 years	1 - 3	1 - 2	NA	
9 – 10 years	3 - 4	3 - 4	NA	1
11 – 12 years	4 - 6	6 - 9	16 - 24	2
13 – 14 years	6 - 8	9 - 16	30 - 50	2 - 3
15 – 16 years	8 - 9	13 - 18	40 - 60	3 - 4
17 – 18 years	9 - 10	16 - 20	45 - 60+	4 - 5

Rationale

A coaching emphasis on Long Term Athlete Development (LTAD) is essential to ensuring that swimmers reach their peak swimming potential as physically and mentally mature adults.

As water is 800 times denser than air, the LTAD needs of swimmers are very specific compared to many other sports and a correct balance of age and maturity appropriate training should be carefully considered by the coach. An emphasis on repetitious technical training and skill development from an early age needs to be combined with the appropriate duration and intensities of training sets, weekly pool and dryland training sessions, competition, and above all challenge and enjoyment. If these factors are considered and well implemented in a systemic way by the coach, a swimmer will develop good technique and skills from a young age, and have a much greater chance to stay in the sport long enough to achieve their full potential.

When considering a LTAD pathway for a swimmer it is important to factor-in that most swimmers go through the same developmental stages, but at different ages and rates. This is especially true when considering the gender differences of maturation. It is very important that coaches create squad structures that group swimmers of similar ability, age and maturity. This alone will accelerate an individual swimmers development, while at the same time creating a socially interactive squad environment that is challenging, vibrant, and fun to be a part of.

Early success as a younger swimmer is not always an indication of long term success. In fact the competitive results of swimmers at a younger age are more often a reflection on earlier maturation of that athlete. Therefore it is critical that a coach has numerous strategies in place to foster a long term development model for each swimmer.

For adolescent swimmers a large proportion of swimming training must be devoted towards repetitiously recruiting neural motor skills in a biomechanically correct way so that preferred habits are well established in all four strokes. If too much repetition of movement is prescribed without correct technical patterning then poor habits are learnt and LTAD will be severely compromised. Acquisition of a new skill is generally associated with a decrease in the need for effortful control over performance, leading to the development of automaticity. Automaticity by definition has been achieved when performance

of a primary task is minimally affected by other ongoing tasks. Once correct technique (the vehicle) is soundly established a coach can increasingly put more emphasis on developing the swimmers aerobic and anaerobic capacity ('the engine'). This is built first through aerobic endurance, which can be improved rapidly during the puberty stage of growth, then by optimizing the engine by maintaining specific periods of higher volume workloads and increasing intensity. This must be achieved by the coach while maintaining a focus on correct skill development and biomechanical prowess. Like the three L's of real estate (location, location, location) the three T's in swimming are technique, technique, technique.

At all ages some speed development should be incorporated into training sessions. This is fun for the swimmers, it recruits fast twitch muscle activity, replicates and simulates racing and if done correctly can be used as a tool to develop desired motor-skill development of specific movements. A vigilant eye must be maintained by the coach to ensure that technique and skills remain true during repetitious speed, speed endurance or highly intensive swimming sets, as it is this type of training that most closely mimics the habits that a swimmer will revert to (automaticity) when under the high physical stress that occurs during racing.

With post adolescent swimmers the coach needs to set in place additional emphasis on physical conditioning and strength development. Strength performance depends not only on the quantity and quality of the involved muscles, but also upon the ability of the nervous system to appropriately activate the muscles. So it is imperative that a long term systematic approach to dryland strength and conditioning regimes are put in place with an emphasis on correct posture and the specificity of movements required for the four competitive swimming strokes and the duration of individual events.

Once the swimmer has progressed through these stages then it comes down to; a desire and work ethic, a specialised individual training and competition plan, ongoing performance goals and athlete support networks. With sound technical skills a swimmer should progressively get faster with increased strength and endurance. A steadily improving swimmer rarely loses their enjoyment of training and competition and will stay with the sport well into adulthood to see how fast they can eventually swim. When this is achieved the goal of LTAD has been reached by the coach.