A SHORTER GUIDE TO LONG TERM ATHLETE DEVELOPMENT (LTAD)

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INTRODUCTION

Scientific research has identified that it takes at least 10 years, or 10,000 hours for talented athletes to achieve sporting excellence. There are no short cuts!

There are two ways in which young swimmers can improve their performance:

- Training;
- Growth and development.

Long Term Athlete Development (LTAD) is about achieving optimal training, competition and recovery throughout an athlete's career, particularly in relation to the important growth and development years of young people. If a long term approach to training is not adopted there is likely to be a plateau in performance, when growth and development slows significantly. Which for some swimmers may result in their performances getting worse. At this point the short-term training approach cannot be reversed. This often leads to drop out before a swimmer has achieved close to their potential.

REASONS FOR LTAD

There are five clear reasons for introducing a Long term athlete development approach:

- To establish a clear swimmer development pathway;
- To identify gaps in the current swimmer development pathway;
- To realign and integrate the programmes for developing swimmers and swimming in Britain;
- To provide a planning tool, based on scientific research, for coaches and administrators.
- To guide planning for optimal performance.

It is anticipated that the principles of LTAD will be used to review existing swimming initiatives led by the governing body and inform any future initiatives. It is hoped that all swimming providers will use LTAD in a similar way. This will enable the swimming community to pull in one direction towards achieving Swimming's goals and targets.

CURRENT SPORT SYSTEM ISSUES

The following are some general observations of sporting systems from around the world (including Britain):

- Young athletes under-train, over-compete;
- Low training to competition ratios in early years;
- Adult competition superimposed on young athletes;
- Adult training programmes superimposed on young athletes;
- Male programmes superimposed on females;
- Training in early years focuses on outcomes (winning) rather than processes (optimal training);
- Chronological age influences coaching rather than biological age;
- The "critical" periods of accelerated adaptation are not fully utilised;

- Poor training between 6-16 years of age cannot be fully corrected (athletes will never reach genetic potential);
- The best coaches are encouraged to work at elite level;
- Coach education tends to skim the growth, development and maturation of young people;
- Coaches, Swimmers and Parents need to be educated in LTAD principles;
- Administrators and officials need to be educated in LTAD principles.

Bill Sweetenham (British Swimming National Performance Director) summed up the current position with the development of British Swimming thus:

> "Right now we have too many clubs in Great Britain offering too little training time and in most cases too much competition. This leaves many athletes in a twilight zone of training less than 14 hours a week, hoping for international results and expecting overseas tours and camps and national level success. For an athlete training 8 hours a week the benefits are social, fun, participation, team building and health benefits. For those athletes wishing for an international career and who are serious about optimum performance at the national level then swimming in a programme with a high performance objective of 18-25 hours is approximately what it will take to achieve these objectives. However, in most countries and in most clubs, the vast majority of athletes train between 8 and 14 hours per week. This is the twilight zone, too much volume to be fun and achieve the social and happy benefits of the participation level (8 hours and under) and not enough to achieve the competitive results or optimum performance that an athlete expects. In other words it is too much for participation and too little to be considered really serious in terms of the competitive nature of the sport. Changing this twilight zone should be the major focus of every club and national programme."
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> (Bill Sweetenham, Wavelength 2002)

LTAD FRAMEWORK

Long Term Athlete Development (LTAD) is a sports development framework that is based on human growth and development. In short, it is about adopting an athlete centred approach to swimming development.

All young people follow the same pattern of growth from infancy through adolescence, but there are significant individual differences in both the timing and magnitude of the changes that take place. It is however important to stress that human growth and development happens without training, however swimming training can enhance all of the changes that take place.

A number of scientists have reported that there are critical periods in the life of a young person in which the effects of training can be maximised. This has led to the notion that young people should be exposed to specific types of training during periods of rapid growth and that the types of training should change with the patterns of growth. These have been used by Dr Istvan Balyi to devise a five stage LTAD framework that has been be adapted to swimming:

- FUNdamental – basic movement literacy;
- SwimSkills – building technique;
- Training to Train – building the engine;
- Training to Compete – optimising the engine;
- Training to Win – maximising the engine.

Stage 1 – FUNdamental

AGE: Female 5 to 8 years;
Male 6 to 9 years.

The FUNdamental stage should be structured and fun! The emphasis is on developing basic movement literacy and fundamental movement skills. The skills to be developed are the ABCs (**A**gility, **B**alance, **C**oordination, **S**peed), RJT (**R**unning, **J**umping, **T**hrowing), KGBs (Kinesthetics, **G**liding, **B**uoyancy, **S**triking with the body) and CKs (**C**atching, **K**icking, **S**triking with an implement). In order to develop basic movement literacy successfully participation in as many sports as possible should be encouraged.

Speed, power and endurance should be developed using FUN and games. In addition, children should be introduced to the simple rules and ethics of sports. No Periodisation should take place, but there should be well-structured programmes with proper progressions that are monitored regularly.

Stage 2 – SwimSkills: Building technique!

AGE: Female: 8 to 11 years;
Male: 9 to 12 years.

During this stage young swimmers should learn how to train and develop the skills of a specific sport. There may be participation in complementary sports i.e. those sports, which use similar energy systems and movement patters. They should also learn the basic technical/tactical skills, and ancillary capacities, including:

- Warm up and cool down;
- Stretching;
- Hydration and nutrition;
- Recovery;
- Relaxation and focusing.

This stage co-incides with peak motor co-ordination, therefore there should be an emphasis on skill development. Training should also include the use of 'own body weight' exercises; medicine ball and Swiss ball exercises as well as developing suppleness.

Although the focus is on training, competition should be used to test and refine skills. The recommended training to competition ratio is 75% to 25%. There should be single periodisation.

If a young swimmer misses this stage of development then he/she will never reach their full potential. One of the main reasons athletes plateau during the later stages of their careers is because of an over emphasis on competition instead of optimising training during this very important stage.

Stage 3 – Training To Train: Building the engine!

AGE: Female: 11 to 14 years;
Male: 12 to 15 years.

During the Training to Compete stage, there should be an emphasis on aerobic conditioning. This is the stage where there is greater individualisation of fitness and technical training. The focus should still be on training rather than competition and the training should be predominantly of high volume, low intensity workloads. It is important to emphasise that high volume, low intensity training cannot be achieved in a limited time period, and therefore the time commitment to training should increase significantly. As the volume of training increases there is likely to be a reduction in the number of competitions undertaken. However, there should now be specific targets for each

competition undertaken with a view to learning basic tactics and mental preparation. There should be either single or double periodisation of the training year.

During this stage, training should continue to develop suppleness and to include the use of 'own body weight' exercises; medicine ball and Swiss ball exercises. However towards the end of this stage, preparations should be made for the development of strength, which for girls occurs at the end of this stage and for boys at the beginning of the next stage. This should include learning correct weight lifting techniques. The ancillary capacities (the knowledge base of how to warm up and warm down; how to stretch and when to stretch; how to optimise nutrition and hydration; mental preparation; regeneration; how and when to taper and peak; pre-competition, competition and post competition routines) should be established.

Similar to the previous stage, if insufficient time is devoted to this stage or it is missed, then the young swimmer will never reach their full potential.

Stage 4 – Training To Compete: Optimising the engine!

AGE: Female: 14 to 16 years;
Male: 15 to 18 years.

During the training to compete stage there should be a continued emphasis on physical conditioning with the focus on maintaining high volume workloads but with increasing intensity. The number of competitions should be similar to the end of the previous stage but the emphasis should be on developing individual strengths and weaknesses through modelling and nurturing technical and tactical skills based around specific strokes or distances, but not both. As a result, there should be either double or triple periodisation of the training year. In addition, the ancillary capacities should be refined so they are more specific to the individual's needs.

During this stage, training should also focus on developing maximum strength gain through the use of weights. This should be coupled with continued work on core body strength and maintaining suppleness.

Stage 5 – Training To Win: Maximising the engine!

AGE: Female: 16+ years;
Male: 18+ years.

This is the final stage of athletic preparation. The emphasis should be on specialisation and performance enhancement. All of the athletes' physical, technical, tactical, mental, and ancillary capacities should now be fully established with the focus shifting to the optimisation of performance. Athletes should be trained to peak for specific competitions and major events. Therefore, all aspects of training should be individualised for specific events. There should be either double, triple or multiple periodisation, depending on the events being trained for. During this stage, training should continue to develop strength, develop core body strength and maintain suppleness.

LTAD FRAMEWORK FOR BRITISH SWIMMING

Full details of The Swimmer Pathway can be obtained from ASA Merchandise Ltd, Unit 2 Kingfisher Enterprise Park, 50 Arthur Street, Redditch B98 8LG. Phone: (01527) 514288; Fax: (01527) 514277; Website: www.asa-awards.co.uk. However, the following table contains a summary of the LTAD framework for British Swimming.

LTAD FRAMEWORK FOR SWIMMING

	FUNDAMENTAL	SWIMSKILLS	TRAINING TO TRAIN	TRAINING TO COMPETE	TRAINING TO WIN
Chronological / Biological Age	Chronological/Biological Age: Male 6-9 years Female 5-8 years	Biological Age: Male 9-12 years Female 8-11 years	Biological Age: Male 12-15 years Female 11-14 years	Chronological Age: Male 15-18 years Female 14-16 years	Chronological Age: Male 18+ years Female 16+ years
Development Phases	Movement Literacy	Skill Development	Skill / Aerobic Development	Competitive / Physical Development	Specialisation and Performance Development
Progression	• FUN and participation. • General, overall development. • ABCS: Agility, Balance, Co-ordination and Speed. • RJTs: Running, Jumping and Throwing. • KGBs: Kinesthetics, Gliding, Buoyancy and Striking. • CKS: Catching, Kicking and Striking. • Speed power and endurance through FUN and games. • Introduction to simple rules and ethics of sport.	• Peak motor development. • Shoulder, elbow, core, spine and ankle stability. • Participation in complementary sports (similar energy system and movement patterns). • FUNdamental technical skills progressively more specific skills towards the end of the stage. • Medicine ball, Swiss ball and own body exercises for strength. • FUNdamentals of ancillary capacities (knowledge and experience).	• Emphasis on aerobic conditioning. • 2nd Speed window • Individualisation of fitness and technical training. • Shoulder, elbow, core, spine and ankle stability. • Participation in complementary sports (similar energy system and movement patterns). • Refinement of specific technical skills • FUNdamentals of tactical preparation. • Introduction to mental preparation. • Moral learning.	• Sport and individual specific physical conditioning. • Shoulder, elbow, core, spine and ankle stability. • Basic tactical preparation. • Individualisation of technical/tactical skills. • Basic mental preparation. • Sport and individual specific “ancillary capacities” (knowledge and experience).	• Improvement of physical capacities. • Shoulder, elbow, core, spine and ankle stability. • Modelling all possible aspects of training and performance. • Frequent prophylactic breaks. • Advanced tactical preparation • Advanced mental preparation • All aspects of training individualised. • Develop further “ancillary capacities” (knowledge and experience - there is no “ceiling limit”).
Growth and Development Considerations	Emphasis on development of skills. 1st Speed (agility/quickness) Window (PSpV1); girls 6-8 yrs, boys 7-9 yrs.	Peak motor co-ordination (PMCV), emphasis on skill development before age 11 yrs for girls, age 12 yrs for boys.	Growth spurt (PHV), emphasis on aerobic development; girls 12-13 yrs, boys 13-15 yrs. 2nd Speed (alactic) Window (PSpV2); girls 12-13 yrs, boys 13-15 yrs 1st Strength Window (PSV); girls at end of PHV	Peak Strength development (PSV), emphasis on strength development; girls 2nd strength window at onset of menarche, boys 12-18 months after PHV	Development of stamina, strength, speed, skill and suppleness.
Swimming Specific Skills	Development of all 4 strokes	Improvement of all 4 strokes Sculling and “feel for water” Development of Starts & Turns	Development of aerobic base, plus all 4 strokes (200m IM).	Start to compete in a wider range of events based on strokes or distance, but not both.	Specialise in an event(s).
Periodisation	No periodisation, but well structured programmes with proper progression.	Single Periodisation (1 x 48 weeks)	Single or Double Periodisation. Double (2 x 24 week macro-cycles)	Double or Triple Periodisation. Double (2 x 24 week macro-cycles) Triple (3 x 15 week macro-cycles)	Double, Triple or Multiple Periodisation. Double (distance) Triple (middle distance) Multiple (sprinters)
Session Numbers	General sport participation 5-6 times per week. This should include land work and multi sport activity.	Sport specific training 4-6 times per week, plus participation in other sports.	Sport specific training 6-12 times per week including land work.	Sport specific technical, tactical and fitness training 8-12 times per week, including land work.	Sport specific technical, tactical and fitness training 10-15 times per week, including land work.
Session Length	30-45 minutes	60-90 minutes	2 hours	2 hours	2+ hours
Training Hours	Sessional.	4-7 hours per week in water; 1-2 hours per week land work.	12-24 hours per week in water; 2-3 hours per week land work.	16-24 hours per week in water; 3-4 hours per week land work.	20-24 hours per week in water; 3-6 hours per week land work.
Training Volume	Skill acquisition	8,000m – 16,000m/week	At beginning of Training to Train: 24,000m – 32,000m/week. Working towards breakpoint volumes (2,100–2,500+ km/year or 44km–52+ km/week over 48 weeks) at maturation (13/14/15 years).		Depends on specialisms, but breakpoint volume maintained. Distance swimmers cover more.

	FUNDAMENTAL	SWIMSKILLS	TRAINING TO TRAIN	TRAINING TO COMPETE	TRAINING TO WIN
Number of Competitions		75% training to 25% competition ratio	As a swimmer moves towards breakpoint volumes, the number of competitions is likely to reduce significantly towards a maximum of 12 per year. (A competition is defined as an event that requires alteration or modification to a swimmers training programme. All events that include a taper or rest from training should have clear performance targets set by the coach.)	Maximum of 12 competitions per year. (A competition is defined as an event that requires alteration or modification to a swimmers training programme. All events that include a taper or rest from training should have clear performance targets set by the coach.)	Maximum of 12 competitions per year but depends on specialisms. (A competition is defined as an event that requires alteration or modification to a swimmers training programme. All events that include a taper or rest from training should have clear performance targets set by the coach.)
Competition profiles			Sequence of 3 competitions below current level, 2 competitions at current level, 1 competition above current level.	2 x (3 competitions below current level, 2 competitions at current level, 1 competition above current level)	2 x (3 competitions below current level, 2 competitions at current level, 1 competition above current level)
Competition Targets			Full Training: Heat - 3% of PB/Goal time Semi Final - 2% of PB/Goal time Final - 1% of PB/Goal time Tapered: Heat – 2% of PB Semi Final – 1% of PB Final - -1% of PB	Full Training: Heat - 3% of PB/Goal time Semi Final - 2% of PB/Goal time Final - 1% of PB/Goal time Tapered: Heat – 2% of PB Semi Final – 1% of PB Final - -1% of PB	Full Training: Heat - 3% of PB/Goal time Semi Final - 2% of PB/Goal time Final - 1% of PB/Goal time Tapered: Heat – 2% of PB Semi Final – 1% of PB Final - -1% of PB Between Trials and Major International Championships, 1-2% improvement.
Competition Events	25m all strokes; 4/8/16 x 25m relays all strokes. Active Sport Festival events or based on skills for Active Sport Local Development Camps.	BAGcat events	BAGcat events at lower end of Training to Train moving towards: 100/200m BF, BK, BR; 200/400m IM; 100/200/400/800/1500m FS; 4 x 100m FS & Medley relays.	100/200m BF, BK, BR; 200/400m IM; 50/100/200/400/800/1500m FS; 4 x 100m FS & Medley relays; 4 x 200m FS relay.	100/200m BF, BK, BR; 200/400m IM; 50/100/200/400/800/1500m FS; 4 x 100m FS & Medley relays; 4 x 200m FS relay.
Competition Types	Club championships Intra club competitions. Local/mini leagues.	Club Championships Speedo Leagues Open meets (Local/County) County Championships (Age-group)	Open meets (District/National) County Championships (Junior, Senior). District Championships (Age-group)	District Championships (Youth, Senior). National Championships (Age group, Youth).	National Championships (Senior). International Championships (Youth, Senior).
Swim 21	Teaching	Skill Development	Competitive Development	Competitive Development	Performance
Coach Education	Level 1	Level 2	Level 3	Level 4	Level 5
ASA / British Swimming Programmes	National Teaching Plan ASA Awards Active Sport (Stage1)	Active Sport (Stages 2, 3 & 4).	Active Sport Talent Camps World Class Start – 200 IM World Class Start – Age group	District Camps – Age group World Class Potential – Age group World Class Potential – Youth	World Class Performance