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# Long-term Athlete Development

## the system and solutions

***(Much of this article is based on one previously written by Istvan Balyi entitled 'Sport system building and long-term athlete development in Canada – The Situation and the Solutions' which first appeared in the Coaches Report Vol 8, summer 2001. It is reproduced here with permission from the editor of Coaches Report.)***

***In September 1998 the very first issue of FHS included an article by a Dr Istvan Balyi on long-term planning. This was the first of three articles in which Istvan described his Long-term Athlete Development (LTAD) model based around three phases – Training to Train; Training to Compete; Training to Win. Since then Istvan's work has gathered pace and credence, not only in this country (where he has recently finished a hectic flying visit working with Sport England, sportscotland, the Sports Council for Wales, sports coach UK and the Lawn Tennis Association amongst others) but also world wide.***

***Now, however, he admits that for most sports his original model was not correct, and that it was missing a key, vital component – the initial FUNdamental phase on which the others are built.***

***In the summer of 2001, Istvan wrote an article for the Canadian publication Coaches Report, in which he explained his LTAD model (now adopted by British Columbia) and highlighted the key problems and issues with the existing sports systems there. I make no apologies for reproducing the article here, with Istvan's permission. In fact he suggested we should. Once you have read the article I hope that you will be able to see why I agree that many, if not all the gaps he identifies in the British Colombian system also exist in this country.***

### The System and the Solutions

***'It takes 10 years of extensive training to excel in anything'***

The objective of this article is to shed light on some of the key issues facing the sport systems in British Columbia and Canada. To achieve this objective, this article will briefly:

- describe British Columbia's athlete development model, which has been accepted worldwide and endorsed by the Coaching Association of Canada (Istvan's LTAD model)
- identify some of the major gaps in the current sport systems
- briefly explain SportMap, a tool developed by British Columbia's System Integration Group.

Scientific research has concluded that it takes eight to twelve years of training for a talented athlete to reach elite levels (Bloom 1985; Ericsson et al. 1993; Ericsson and Charness 1994). This is called the ten-year or 10,000 hour rule. For athletes, coaches and parents, this translates as slightly more than three hours of practice daily for ten years (Salmela 1998). Unfortunately, parents and coaches in many sports still approach training with an attitude best characterised as the 'peaking by Friday' approach (Balyi and Hamilton 1999) ie as soon as many coaches start to train athletes, they train them to win. We now know that a long-term commitment to training is required to produce elite athletes in all sports, something that needs to be communicated to and understood by parents, coaches, sport administrators etc.

A specific and well-planned training, competition, and recovery regime will ensure optimum development throughout an athlete's career. Ultimately, success comes from training and performing well over the long-term rather than winning in the short-term. There is no shortcut to success in athletic preparation. Rushing competition will always result in shortcomings in physical, technical, tactical and mental abilities.

## Models of Long-term Athlete Development and Training Requirements of Different Sports

In principle, sports can be classified as either 'early specialisation' or 'late specialization' (Balyi and Hamilton 1999). Early specialisation refers to the fact that some sports, such as gymnastics, rhythmic gymnastics, figure skating, diving and table tennis require early sport-specific specialisation in training.

Late specialisation sports, such as athletics, combative sports, rowing and all team sports, require a generalised approach to early training. In these sports, the emphasis of training should be on the development of general, fundamental motor and technical/tactical skills. Reviewing the existing literature helped us to conclude that early specialisation sports require a four-stage model, while late specialisation sports require a five-stage model:

**Early Specialisation Model**

1 Training to Train
2 Training to Compete
3 Training to Win
4 Retirement/Retaining

**Late Specialisation Model**

1 FUNdamental
2 Training to Train
3 Training to Compete
4 Training to Win
5 Retirement/Retaining

Since only a few sports can be categorised as early specialisation sports, this article will focus on late specialisation sports. Each early specialisation sport needs to develop a sport-specific model; a generic model would lead to serious oversimplifications. The challenge for early specialisation sports is either to combine the FUNdamental and Training to Train stages or to amalgamate them into a single stage, such as Training to Train stage. For late specialisation sports, specialisation before age ten is not recommended since it contributes to early burnout, dropout and retirement from training and competition (Harsanyi 1985).

One of the most important periods of motor development for children is between the ages of nine and 12 (Balyi and Hamilton 1995; Rushall 1998; Viru et al. 1998). During this time, children are developmentally ready to acquire the fundamental movement skills that are the cornerstones of all athletic development. These fundamental skills include running, throwing, jumping, hopping and bounding – the ABCs of athletics. The introduction of the ABCs of athleticism (agility, balance, coordination, speed) and the KGBs of skills (kinaesthesia, gliding, buoyancy and striking) during this period will lay the foundation of athletic excellence for later years.

Fundamental movement skills should be practised and mastered before sport-specific skills are introduced. The development of these skills, using a positive and fun approach, will contribute significantly to future athletic achievements. Participation in a wide range of sports is also encouraged. This emphasis on motor development will produce athletes who have better trainability for long-term sport-specific development. If the fundamental motor skill training is not developed between the ages of nine and 12, skills cannot be recaptured at a later time (although carefully planned and implemented remedial programmes can contribute to limited success).

## The Five Stage Model for Late Specialisation Sports

### Stage 1 – The FUNdamental Stage – (males and females 6 to 10 years old.[1])

The FUNdamental stage is well structured and fun! The emphasis is on the overall development of the athlete's physical capacities, fundamental movement skills and the ABCs of athleticism. Participation in as many sports as possible is encouraged. Speed, power and endurance are developed by using FUN games. Correct running, jumping and throwing techniques are taught using the ABCs of athletics.

Strength training during this stage should include exercises using the athlete's own body weight, medicine ball and Swiss ball exercises. Athletes should be introduced to the simple rules and ethics of sports. No periodisation takes place but all programmes are structured and monitored. Activities revolve around the school year and during summer and winter holidays multi-sport camps are recommended. If athletes and parents have a preferred sport, participation once or twice per week is recommended but participation in other sports three or four times per week is essential for future excellence. If the athletes later decide to leave the competitive stream, the skills they have acquired during the FUNdamental stage will still benefit them when they engage in recreational activities, which will enhance their quality of life and health.

### Stage 2 – The Training to Train Stage – (males 10 to 14 years old / females 10 to 13 years old.)

During the Training to Train stage, young athletes learn how to train and they also learn the basic skills of a specific sport. As well, they are introduced to the basic technical/tactical skills and ancillary capacities including warm-up and cool-down, stretching, hydration and nutrition, recovery and regeneration, mental preparation, taper and peak, integrated precompetition routines and post-competition recovery.

During competitions, athletes play to win and to do their best, but the major focus of training is on learning the basics as opposed to competing. Training and

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competition ratios are optimised because too many competitions waste valuable training time and conversely, not enough competition inhibits the practice of technical skills and learning how to cope with the physical and mental challenges presented during competition.

A 75 per cent training to 25 per cent competition ratio is recommended by experts during the Training to Train stage; however, these percentages vary according to sport and individual specific needs. Athletes undertaking this type of preparation will be better prepared for competition in both the short- and long-term than athletes who focus solely on winning. During this phase, athletes train in competitive situations daily in the form of practice matches or competitive games and drills.

The Training to Train stage addresses the critical or sensitive periods of physical and skill development. Athletes who miss this stage of training will never reach their full potential, regardless of remedial programs they may participate in. The reason why so many athletes plateau during the later stage of their careers is primarily because of an overemphasis on competition instead of on training during this important period in their athletic development.

## Stage 3 – The Training to Compete Stage – (males 14 to 18 years old/females 13 to 17 years old.)

This phase of development is introduced after the goals and objectives of the Training to Train stage have been achieved. The training to competition and competition-specific training ratio now changes to 50:50. Fifty per cent of training is devoted to the development of technical and tactical skills and fitness improvements and fifty per cent is devoted to competition-specific training and to competitions.

During the Training to Compete stage, high intensity individual and sport-specific training is provided to athletes all year round. Athletes, who are now proficient at performing both basic and sport-specific skills, learn to perform these skills under a variety of competitive conditions during training. Special emphasis is placed on optimum preparation by modelling training and competition. Fitness programmes, recovery programmes, psychological preparation, and technical development are now individually tailored to a greater degree. This emphasis on individual preparation addresses each athlete's individual strengths and weaknesses.

## Stage 4 – The Training to Win Stage (males 18 years and older/females 17 years and older.)

This is the final stage of athletic preparation. All of the athlete's physical, technical, tactical, mental and ancillary capacities are now fully established and the focus of the training has shifted to the optimisation of performance. Athletes are trained to peak for major competitions. Training is characterised by high intensity and relatively high volume. Frequent 'prophylactic' breaks help to prevent physical and mental burnouts. Training and competition-specific training/ competition ratios are 25:75.

## Stage 5 – The Retirement/Retraining Stage

This stage refers to the activities performed after an athlete has retired from competition permanently. During this final stage, ex athletes move into sport-related careers that may include coaching, officiating, sport administration, small business enterprises, masters competition and the media.

## Gaps in the Sport Systems

Analysing the sport systems from the point of view of performance delivery, it seems that the following gaps are inhibiting the system:

- The system of competition, or the non-existence of a system of competition, often inhibits optimal training and performance. Competitive calendar planning is not based on technical knowledge, but on traditions and improvisations.
- Administration and coaching practice focuses on training and competition. Talent identification and recruitment are largely neglected although retirement/retaining has received more attention recently.
- The best coaches work at the elite level. Volunteers or Level 1 coaches coach the FUNdamental and Training to Train stages. However, this is ironic because it is the FUNdamental and Training to Train stages that are the most critical to long-term athlete development. Coaching at these levels requires knowledgeable and experienced coaches who can correctly perform and demonstrate skills for the children.
- Individuals coaching at these levels should also be well acquainted with the physiological, cognitive and emotional development patterns of

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children and adolescents. The damage done due to incompetent coaching during the FUNdamental and Training to Train stages cannot be fully repaired during the Training to Compete and Training to Win stages.

- The higher the performance level of the athlete, the better the support programmes are. Unfortunately, this means that there is very little or no support at all for the developmental athlete.
- Due to the shortcomings of athlete development during the FUNdamental, Training to Train and Training to Compete stages, many athletes will never reach their optimal performance levels or genetic ceilings/potential. Regardless of the sophistication of the support programmes at the elite level, they do not compensate for the shortcomings in the systems. Thus, the national sport centres will not be able to fulfil their roles unless changes are made to the sport system to encourage preparation at early training ages.
- Although Canada is considered to be a world leader in coach education, women in sport development, ethics and anti harassment issues, doping control and athlete assistance, the country's technical short- and long-term periodization programmes lack sophistication and integration.
- Canada is the only developed country without a centralised sport science programme. In fact, it is the only developed country without any sports scientists working full-time in the sport system.
- The existing sport science and sport medicine programs are not fully integrated and sequenced with sport-specific technical/tactical activities.
- A high ratio of competition to training activities inhibits optimal athletic development, especially in team sports.
- The basic components of athletic preparation are not being implemented in a systemic manner (for example, the ABCs of athleticism and the ABCs of athletics).
- Male training programmes are superimposed on female athletes. This is inappropriate in light of the physiological and developmental differences between the genders.
- Adult training programmes are superimposed on young athletes. This is detrimental because it means that coaching is conducted without regard for the principles of childhood development.
- Adult competition schedules are superimposed on young athletes. As a result, too much time is spent competing and not enough time is spent learning and mastering basic and sport-specific skills.
- Optimal trainability is disregarded during the 'critical' or 'sensitive' periods of athlete development – about two per cent of coaches use anthropometrical measurements to identify Peak Height Velocity or fitness training to optimise the periods of accelerated adaptation to training. Therefore, young athletes are not introduced to skills at the time when they are developmentally ready to learn them.
- A focus on winning rather than development characterises the preparation of the developmental athlete.

Other identified general sport system gaps include:

- A lack of horizontal and vertical integration of the competition systems, mainly at beginner and intermediate levels.
- Training at beginner and intermediate levels is too strongly focused on the outcome (winning) and not the processes (optimal training).
- Training and competition designs are dominated by chronological, not biological, age for young athletes between 12–16 years.
- The 'critical' or 'sensitive' periods of accelerated adaptation are not fully utilised by coaches during the Training to Train stage.
- Coach education barely covers the basic issues of growth and development and maturation.
- Parent's education is neglected in terms of LTAD and associated parameters (maturation, nutrition etc).

The recent Sport England review of the World Class Programmes concluded that Australia and France are 15 to 20 years ahead in sport system development. That Canada is at least ten years behind the UK is little consolation.

In coming up with the solution for British Columbia, something called the SportMap was designed to align and integrate the provincial and federal system elements from the grassroots to senior elite levels and eliminate the gaps in the BC sport system. SportMap is also a comprehensive curriculum of sport education for athletes, coaches and parents that provides a holistic and scientific approach to integrating athlete development. The numerous organisations who have signed up to its implemention all advocate the importance of:

- sport education and skill-building within the sport system in BC
- athlete development models as planning maps for sport organisations
- information-sharing among athletes, coaches and other adults (most notably parents) on sport values and principles of athlete development
- coordination and shared leadership among the recognised multi-sport organisations in BC.

## Summary

The long-term athlete development model, consisting of the FUNdamental, Training to Train, Training to Compete and Training to Win stages, has become the foundation for British Columbia's sport system. Hopefully the national sport policy will ensure horizontal and vertical integration of the Canadian sport system and will provide leadership and financing for the new system in the near future.

How does this, however, impact on the British sporting system? In order to better illustrate how the LTAD model can be used by sports in this country we spoke to a number of organisations who are integrating the principles into their own developmental model. These are illustrated in the other articles in this issue.

1 *It must be noted that the ages described are general guidelines. The individual tempo of development/maturation will influence how athletes will reach the various stages of long-term development. However, they all will go through the same stages. Some early maturing athletes may have as much as a four-year physiological advantage over their late maturing peers (Ross et al. 1977).*

***A bibliography is available on request from Coaches Report at www.coach.ca/a-test/crep.htm***

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