

# BADMINTON FOR LIFE



**Badminton Long-term Athlete Development**

BADMINTON FOR LIFE

1

■ BADMINTON LTAD

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# ▲ ACKNOWLEDGEMENTS ▲

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### Notes on this Document

The term “badminton” includes participants in all categories within the competence of Badminton Canada, be they athletes, coaches or volunteers.

Although the term “athlete” is often used, this model covers all participants and competitors in the sport of badminton who are called upon to demonstrate athletic attributes and skills.



# ▲ Foreword

Dear Reader,

The development of Badminton's Long-Term Athlete Development (LTAD) model within Canada came together with the help of two separate entities; firstly, from Badminton Canada, the governing body for Badminton within Canada and by Sport Canada, with the support of the Federal, Provincial and Territorial councils of Sport Ministries.

Due to the result of the Canadian Sport Policy, in 2005, Canada as a nation began a major shift in sport development philosophy. This initiative has re-invigorated the national sport scene. This new approach to athlete development was undertaken due to:

- ▶ Concerns over Canada's lack of physical activity.
- ▶ Growing percentage of obese children within our country.
- ▶ The perceived poor performance for many sports on the international stage.

This new outlook on life has the full endorsement and support of the Federal, Provincial and Territorial Sport Councils. Under the direction of Sport Canada, the Canadian Sport Centre Pacific, a select group, was given the huge responsibility of transforming the Canadian sport system and they took an innovative approach to this challenge. A six person Expert Group was established under the guidance of Istvan Balyi and they're approach was to create:

- ▶ A new generic LTAD model for able bodied athletes

- ▶ A supplement to the LTAD model that would address additional needs of athletes with intellectual or physical disabilities
- ▶ A relationship with the individual National Sport Organizations in order to adapt the generic model to meet with their sport-specific needs

The competitive nature of sport implies that only a few athletes will advance to elite ranks and international success. But LTAD is not just a model for the elite athlete; it provides a solid foundation for badminton players at all ages and levels, encouraging long-term participation, enjoyment and achievement.

The ever changing face of badminton within Canada has three distinct training contexts. There is a strong private club stream, with professional coaches and high membership fees associated within this reality. There exists an equally strong school and community based system within certain parts of the country. The third training stream is an ever growing privately owned, public badminton specific facilities. These facilities are often a pay as you play structure. This third option has seen growth in the Richmond/Vancouver area as well as the Toronto area. In regards to trainability, and the frequency of on-court training, they are greatly affected by the various training streams that exist.

**Marc Leger**

Badminton Canada LTAD Project Leader

# Foreword

by Andrew Dabeka, Olympian- Beijing 2008



Dear Reader,

My badminton beginnings could be classified as fairly inconspicuous, starting the game quite late, as I was entering high school in grade nine. Although I was very athletic, I had never participated in any organized sports, with the exception of gym class and fooling around at lunch and after school with my friends on the football field. Perhaps it was this organization that I was seeking, because on that first day of walking onto the badminton courts at the RA Badminton Club in Ottawa, a flame inside me was ignited and it has fuelled me to improve to this day.

Within 4 years of my introduction to the game, I won my first national title, the U18 Boys Singles. After that, my next big title was winning the men's national title, 2 years after that, in 1999, at the age of 20. Since that point, I have won 4 more national singles titles, and have had an international career

that I am proud of, representing Canada at several major events like the World Championships, Pan Am Games, Commonwealth Games and just recently, the 2008 Olympic Games.

Looking back on those past 16 years of my career, I can now see clearly what made me successful, as what held me back at various points along the way (The wonderful clarity of hindsight!). Our outcomes are mostly determined by our choices, and I will be the first one to admit that like most people, at certain times I have made poor choices, whether it was over-training or focusing on the wrong things at the wrong times. Having been introduced to the concepts of the Long Term Athlete Development model about a year ago, I have had my eyes opened to a bigger picture than I have ever seen before.

With the development of the LTAD model, there is now a tool which will help to produce an even better level of badminton player in Canada than we have seen before. With the theories of the LTAD model applied across the country, from our most basic grassroots programs to our most competitive teams, there is no doubt in my mind that we will see future generations of badminton players who will be ready to lead Canada into a new age of success on the international badminton scene.



**Andrew Dabeka**

Canadian Olympian - Beijing 2008



# ▲ Introduction

# 2

In Canada, badminton is a popular recreational sport played at all levels, from the elementary school to private clubs. There are hundreds of thousands of Canadians who are playing badminton in one form or another; however, despite the large participant base, there is a lack of competitive athletes training and playing the sport which has translated into a lack any significant results on the international stage. In the singles and doubles competitive events, we have achieved limited success with a Top 16 result showing as our best finish at the 2008 Beijing Olympic Games. Badminton in Canada only has a few athletes that maintain a top 50 world ranking.

Badminton, however, is not unique in its inability to achieve consistent, international success. There are many other sports in Canada that are also struggling. This reality has prompted Sport Canada to undertake a thorough review of the Canadian sports system in order to determine what must be done in order to achieve our objectives as a sporting Nation. The bottom-line is, if we want to achieve different results, we need to change the way we develop our athletes.

The LTAD model has been developed based on research of the Canadian Sport Centre's LTAD Expert Group. The principles of this research have been adopted by Badminton Canada as the framework to properly manage the youth and adolescent growth and development processes, and identified the sensitive periods of accelerated adaptation to training.



The Federal, Provincial and Territorial Ministers of Sport identified LTAD as the framework for sport development in Canada. Ministers have agreed to proceed with the implementation of this new approach to sport and physical activity in consultation with National, Provincial and Territorial Sport Organizations.

Through the improvement of physical literacy (fundamental skills such as throwing, running and jumping), the LTAD model will help develop a lifelong involvement of Canadians in physical activity and sport participation as well as producing future badminton athletes.

BADMINTON FOR LIFE





## Why we need a Long-Term Athlete Development Model ?

# 3

The current system of developing badminton players in Canada is extremely varied amongst the provinces and the multitude of clubs/practice groups. Coaches and parents have a variety of philosophies when it comes to the optimum way to develop athletes. It is quite common for the emphasis to be on outcome (winning) as opposed to process (skill development). Our success on the international scene has been limited at best. There are many problems that can arise from not having a development plan that does not consider child or adolescent development. Some of these are as follows:

- ▶ Under-training and over-competing.
- ▶ Imposing adult training programs on children.
- ▶ Imposing adult competition structures on children that are based on historical traditions and not a child's needs.
- ▶ Many training programs focus on the outcome such as winning rather than the process such as training.
- ▶ Physical, Technical, Tactical and Mental skills are not being introduced in a timely or systematic manner.
- ▶ No clear guidelines for parents, as to the nature, level and number of sports a child should take part in.



*Numerous sport organizations in Canada and many other countries around the world have adopted a LTAD model. Participants in sport will be the beneficiaries of more and more organizations operating under a similar philosophy.*



## The Long-Term Athlete Development Framework

The LTAD Framework is a sport development framework that is built on the basis of human growth and development. It is a system of training, competition and recovery based on developmental age or maturity level rather than the chronological age of an individual.

The implementation of sport programs that follow an LTAD model will enable coaches to develop individualized programs and take advantage of the sensitive periods of accelerated adaptation to training and maximize optimum periods of trainability. It will also ensure that athletes develop to their full potential. The LTAD framework is athlete-centered, coach-driven and supported by administration, sport science and sponsors.

In general, the Canadian LTAD model suggests that athletes move through 7 stages of development on their way to optimal elite performance. For Badminton in Canada, the LTAD model is an eight-stage process taking into account one additional stage based on historical data for producing international caliber players as well as what is acceptable in Canada based on the potential of earning a living in badminton, popularity of badminton and cost of travel. The additional stage is a 'Learning to Win' stage. The Learning to Win stage is defined as the stage of development for athletes looking to become fulltime competitive athletes on the international stage. This stage will be essential in the development process while enabling a smoother transition into the Training to Win stage of training.

It is important to note that the Active for Life stage can be entered at any time. The Active for Life stage provides sports with a guide to ensure that opportunities for continued participation are provided for those who do not wish/are unable to progress through all the stages.

One can start playing badminton as early as 5 or 6 years of age or at any later age. It is considered a 'late specialization' sport; however, early involvement in the FUNDamentals stage is essential no matter what age badminton is started.



## The Eight stages of LTAD are:

**1 Active Start**  
Males and Females 0-6

**2 FUNdamentals**  
Males 6-9 and Females 6-8

**3 Learning to Train**  
Males 9-12 and Females 8-11

**4 Training to Train**  
Males 12-16 and Females 11-15

**5 Training to Compete**  
Males 16-19 and Females 15-18

**6 Learning to Win**  
Males 19-23 and Females 18-21

**7 Training to Win**  
Males 23+ and Females 21+



**8 Active for life**  
Enter at any Age



## The 10 Key Factors Influencing LTAD as it Applies to Badminton



The following factors are the research, principles, and tools upon which LTAD is built.

1

### THE 10 YEAR RULE

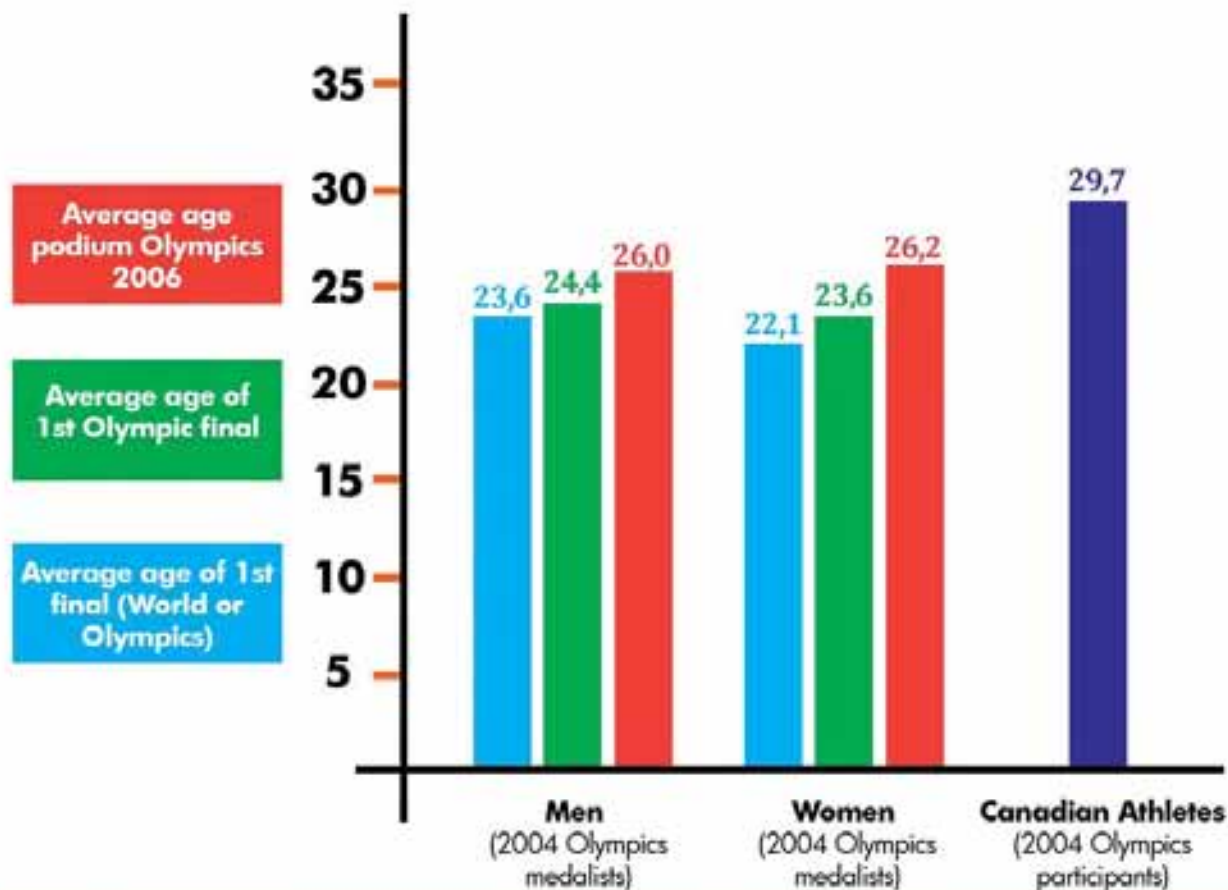
Scientific research has concluded that it takes a minimum of ten years and 10,000 hours of training for a talented athlete to reach elite levels for any sport. On average, for athletes and coaches, this translates into slightly more than three hours of training or competition daily for ten years.

This factor is supported by “The Path to Excellence”, which provides a comprehensive view of the development of U.S. Olympians who competed between 1984 and 1998. The results of that study reveal that:

- ▶ U.S. Olympians begin their sport participation at the average age of 12.0 for males and 11.5 for females.
- ▶ Most Olympians reported a 12- to 13-year period of talent development from their sport introduction to making an Olympic team.
- ▶ Olympic medalists were younger — 1.3 to 3.6 years — during the first 5 stages of development than non-medalists, suggesting that medalists were receiving motor skill development and training at an earlier age. However, caution must be taken not to fall into the trap of early specialization in late specialization sports.

## Olympic athlete learn to turn profile

### Badminton - Athens Medalists (2004)



Badminton within Canada is late in reaching international caliber (25+) because we are lacking in serious training hours. Most would only be training the required 3 hours a day from about 18 years of age and older. All however need 2 hours a day (physical activity) from 12 onwards (Learning To Train).



# 2

## FUNDAMENTALS

FUNDamental movements and skills should be introduced through fun and games for all sports, including badminton. FUNdamental sports skills should follow and include basic overall sports skills.

- ▶ FUNDamental movements skills and FUNdamental sports skills = **physical literacy**.
- ▶ Physical literacy refers to competency in movement and sports skills.
- ▶ Physical literacy should be developed before the onset of the adolescent growth spurt.

Table 1 lists the wide variety of fundamental movements and skills that underpin physical literacy. They include 4 different environments: Earth, water, air, and ice.



### (Table 1:)

#### → Travelling Skills such as:

- Climbing
- Hopping
- Jumping
- Leaping
- Running
- Skipping

#### → Object Control Skills such as:

##### **Sending**

- Strike (ball, puck, shuttle)
- Throwing

##### **Receiving**

- Catching
- Stopping
- Trapping

##### **Travelling with:**

- Dribbling (feet)
- Dribbling (hands)
- Dribbling (stick)

##### **Receiving and Sending**

- Striking (shuttle)
- Volleying

*\*from Jess 1999, adapted by Balyi and Way, 2005*

## Balance movement such as: ←

- Body Rolling
- Dodging
- Landing
- Ready position
- Spinning
- Stopping
- Balancing / Centering
- Stretching / Curling
- Twisting / Turning

*\*from Jess 1999, adapted by Balyi and Way, 2005*

The basic movement skills of two activities provide the base for all other sports.

- ▶ Athletics: run, wheel, jump or throw.
- ▶ Gymnastics: ABC's of athleticism — agility, balance, coordination, and speed.

Without the basic movement skills, a child will have difficulty participating in badminton. For example, to enjoy baseball, basketball, cricket, football, netball, handball, rugby, and softball, the simple skill of catching must be mastered.

It is critically important that children with a disability have the opportunity to develop their fundamental movement and sport skills. Failure to do so severely limits their lifelong opportunities for recreational and athletic success. Despite this great need, children with a disability face difficulty gaining the fundamentals because:

- ▲ Overly protective parents, teachers, and coaches shield them from the bumps and bruises of childhood play.
- ▲ Adapted physical education is not well developed in all school systems.
- ▲ Some coaches do not welcome children with a disability to their activities because of a lack of knowledge about how to integrate them.
- ▲ It takes creativity to integrate a child with a disability into group activities where fundamental skills are practiced and physical literacy developed.



# 3

## SPECIALIZATION

Sports can be classified as either early or late specialization sports. Early specialization sports include artistic and acrobatic sports such as gymnastics, diving, and figure skating. These differ from late specialization sports in that very complex skills are learned before maturation since they cannot be fully mastered if taught after maturation.

Most other sports are late specialization sports and badminton falls within this classification. However, all sports should be individually analyzed using international and national normative data to decide whether they are early or late specialization. If physical literacy is acquired before maturation, athletes can select a late specialization sport when they are between the ages of 12 and 15 and have the potential to rise to international stardom in that sport.

However learning to strike the badminton shuttle with correct technique before the onset of the growth spurt is optimal for maximizing long-term success.

Specializing before the age of 10 in late specialization sports, such as badminton contributes to:

- ▶ One-sided, sport-specific preparation
- ▶ Lack of ABC's, the basic movement and sports skills
- ▶ Overuse injuries
- ▶ Early burnout
- ▶ Early retirement from training and competition

Early involvement in the FUNdamentals stage is essential in late specialization sports. Many sports resort to remedial programs to try to correct shortcomings.

# 4

## DEVELOPMENTAL AGE

The terms "**growth**" and "**maturation**" are often used together and sometimes synonymously.

However, each refers to specific biological activities. Growth refers to observable step-by-step changes in quantity and measurable changes in body size such as height, weight, and fat percentage. Maturation refers to qualitative system changes, both structural and functional, in the body's progress toward maturity such as the change of cartilage to bone in the skeleton.

**Development** refers to "the interrelationship



**Development** refers to "the interrelationship between growth and maturation in relation to the passage of time. The concept of development also includes the social, emotional, intellectual, and motor realms of the child."

**Chronological age** refers to the number of years and days elapsed since birth. Children of the same chronological age can differ by several years in their level of biological maturation.

**Developmental age** refers to the degree of physical, mental, cognitive, and emotional maturity. Physical developmental age can be determined by skeletal maturity or bone age after which mental, cognitive, and emotional maturity is incorporated.

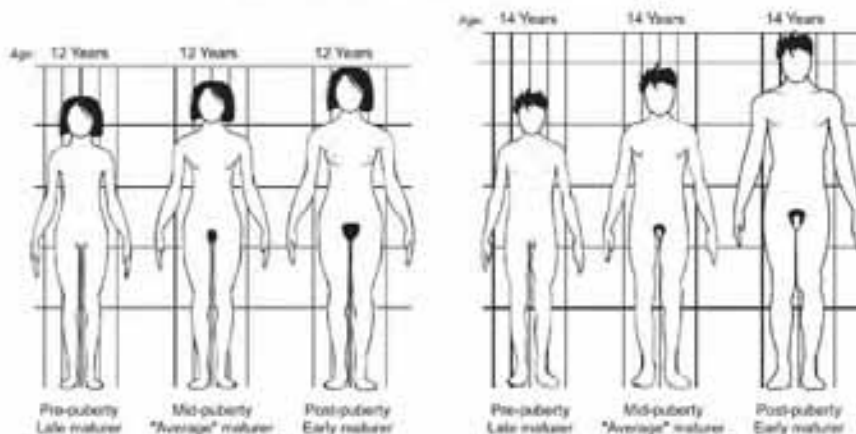
LTAD requires badminton in Canada to identify

early, average, and late maturers in order to help to programs in relation to optimal trainability and readiness. For badminton the beginning of the growth spurt and the peak of the growth spurt are very significant in regards to applications towards training and competition design.

Specific disabilities may dramatically change the timing and sequence of childhood and adolescent development.

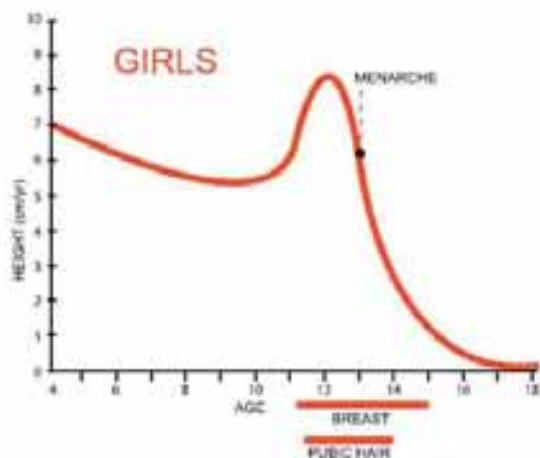
PHV in girls occurs at about 12 years of age. Usually the first physical sign of adolescence is breast budding, which occurs slightly after the onset of the growth spurt. Shortly thereafter, pubic hair begins to grow. Menarche, or the onset of menstruation, comes rather late in the growthspurt, occurring after PHV is achieved. The sequence of developmental events may normally occur 2 or even more years earlier or later than average.

## Maturation in Girls and Boys

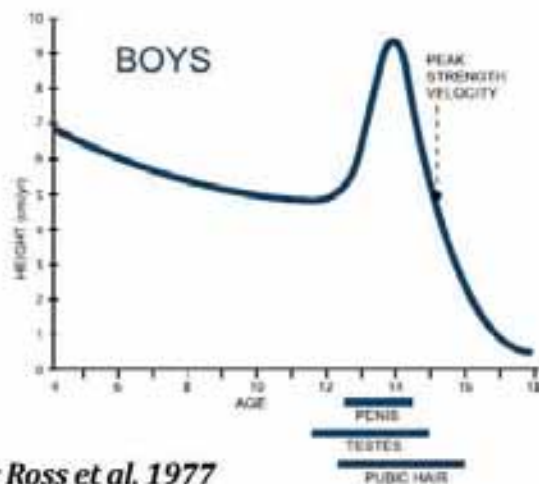


*\*Adapted from "Growing Up" by J.M. Tanner Scientific American 1973*

## Maturity Events in Girls



## Maturity Events in Boys



*\*Modified after Ross et al. 1977*

PHV in boys is more intense than in girls and on average occurs about 2 years later. Growth of the testes, pubic hair, and penis are related to the maturation process. Peak Strength Velocity (PSV) comes a year or so after PHV. Thus, there is pronounced late gain in strength characteristics of the male athlete. As with girls, the developmental sequence for male athletes may occur 2 or more years earlier or later than average. Early maturing boys may have as much as a 4-year physiological advantage over their late-maturing peers. Eventually, the late maturers will catch up when they experience their growth spurt.

Currently, most athletic training and competition programs are based on chronological age. However, athletes of the same age between ages 10 and 16 can be 4 to 5 years apart developmentally. Thus, chronological age is a poor guide to segregate adolescents for competitions.

**Training age** refers to the age where athletes begin planned, regular, serious involvement in training. The tempo of a child's growth has significant implications for athletic training because children who mature at an early age have a major advantage during the Training to Train stage compared to average or late maturers.





## TRAINABILITY

The terms “adaptation” and “trainability” are often used interchangeably in coaching.

However, the difference between them is significant.

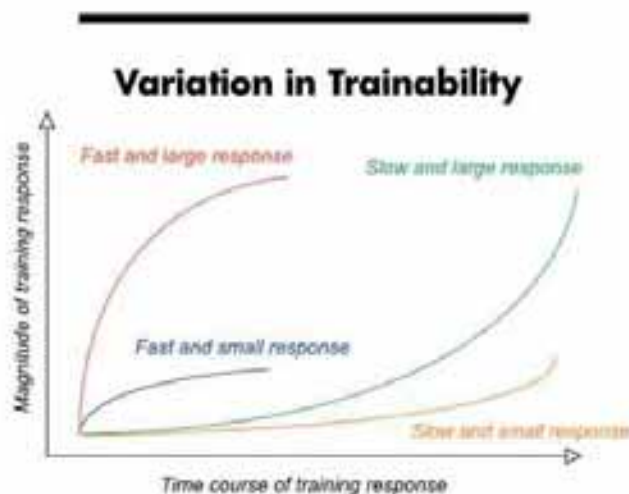
**Adaptation** refers to changes in the body as a result of a stimulus that induces functional and/or morphological changes in the organism. The degree of adaptation is dependent on the genetic endowment of an individual. However, the general trends or patterns of adaptation are identified by physiological research, and guidelines are clearly delineated of the various adaptation processes, such as adaptation to muscular endurance or maximum strength.

**Trainability** refers to the faster adaptation to stimuli and the genetic endowment of athletes as they respond individually to specific stimuli and adapt to it accordingly. Trainability has been defined as the responsiveness of developing individuals to the training stimulus at different stages of growth and maturation.

**A sensitive period of development** refers to the point in the development of a specific capacity when training has an optimal effect. Other factors are readiness and sensitive periods of trainability during growth and development of young

athletes, where the stimulus must be timed to achieve optimum adaptation with regard to motor skills, muscular, and/or aerobic power.

**Variation in Trainability** (bottom figure) illustrates the evidence to date that supports the fact that there is a high degree of variation in the trainability of humans (athletes), both from the standpoint of the magnitude of change and the time course of response to a given stimulus. This probably reflects the ‘elasticity’ of response to various stimuli and human diversity (as largely dictated by the underlying genetic matrix and supported by the environment in which Individual is immersed) (Norris & Smith, 2002).



*\*Adapted from work by Bouchard et. Al, 1997*



# 6

## PHYSICAL, MENTAL, COGNITIVE & EMOTIONAL DEVELOPMENT

"Eventually all top athletes have the same skill levels and fitness levels. The athletes that can handle the physical and mental stresses the best during competition will win. Therefore it is important to practice like you compete. Put yourself in situations in practice that you would encounter in competition to make sure you are physical and mental prepared to properly deal with these situations during a competitive match."

*Fiona McKee*

Training and competitive and recovery programs should consider the mental, cognitive, and emotional development of each badminton athlete.

Beyond the physical, technical, and tactical development — including decision-making skills — the

mental, cognitive, and emotional development should be enhanced for the sport of badminton.

A major objective of LTAD is a holistic approach to athlete development. This includes emphasis on ethics, fair play, and character building throughout the various stages, an objective that reflects Canadian values. Badminton programming should be designed considering athletes' cognitive ability to address these concepts.

# 7

## PERIODIZATION

Simply put, periodization is time management. As a planning technique, it provides the framework for arranging the complex array of training processes into a logical and scientifically-based schedule to bring about optimal improvements in performance.

Periodization sequences the training components into weeks, days, and sessions. Periodization is situation specific depending upon priorities and the time available to bring about the required training and competition improvement. In the LTAD context, periodization connects the stage the badminton athlete is in to the requirements of that stage.

Periodization organizes and manipulates the aspects of modality, volume, intensity, and frequency of training through long-term (multi-year) and short-term (annual) training, competition, and recovery programs to achieve peak performances when required.



Periodization, far from being a single fixed process or methodology, is in fact a highly flexible tool. When used appropriately in conjunction with sound methodology and ongoing monitoring and evaluation, it is an essential component in optimal sports programming and athlete development at all levels.

LTAD addresses this requirement by developing periodization models for all stages, taking into consideration the growth, maturation, and trainability principles that are unique to the primary development stages — the first two decades of life — yet seamlessly integrate with the subsequent stages of athletic performance and life.

LTAD is typically a 10 to 12 year procedure that optimizes physical, technical, tactical — including decision making — and mental preparation, as well as the supporting ancillary capacities. Within

LTAD is quadrennial planning, which refers to the 4-year Olympic cycle for elite athletes, and their annual plan, which is based upon identified periods of athletic preparation, competition, and the transition into the next calendar plan.

Current examples of periodization models identified in the sport performance literature are designed for the sub-elite and elite senior/mature performers. There is very little information on periodization for children or adolescents or for athletes with disability.

Single, double, triple, and multiple periodization formats follow the same principles with frequently introduced prophylactic breaks; that is, programmed and prioritized recovery and regeneration elements.

The terminology that describes the smaller subsets of time — organized blocks of training or competition — is macro, meso, and micro cycles. Macro cycles are the largest blocks within a phase of training and are usually 8 to 16 weeks in length. Meso cycles are smaller blocks of time, usually about a month. The smallest training block is often organized as a micro cycle and by convention is usually 7 days. The introduction of a recovery micro cycle determines the length of a meso cycle after 1 (1:1), 2 (2:1), 3 (3:1) or 4 (4:1) loading micro cycles.

*The table (next page) illustrates the phases of an annual plan for a single or double periodization.*



## FIVE PHASES of a Single Periodized Annual Plan

General Preparation Phase (GPP)

Specific Preparation Phase (SPP)

Pre-Competition Phase (PCP)

Competition Phase Peak (CP)

Transition Phase (TP)

ONE YEAR PERIOD

## EIGHT PHASES of a Double Periodized Annual Plan

General Preparation Phase (GPP)

Specific Preparation Phase (SPP) 1

Pre-Competition Phase (PCP) 1

Competition Phase (CP) 1 **Peak One**

Specific Preparation Phase (SPP) 2

Pre-Competition Phase (PCP) 2

Competition Phase (CP) 2 **Peak Two**

Transition Phase (TP)

## Horizontal and Vertical Intergration - 9 Expanded S's

Figure illustrates the 'art and science' required by the coach when planning the horizontal and vertical integration of the 10 Expanded S's of training and performance. The horizontal arrows represent the progress of an athlete that is quantifiable and based on scientific guidelines; the vertical integration is based on the interrelationship of each aspect of training and performance, which is often based on the 'art' of coaching.



*\*The Art and Science of Coaching (Balyi, 2004 and Norris, 2000)*



## CALENDAR PLANNING FOR COMPETITION

Optimal competition calendar planning at all stages is critical to a badminton athlete's development. At certain stages, developing the physical capacities take precedence over competition. At later stages, the ability to compete well becomes the focus.

The table below outlines general recommendations for the ratio of training to competition and competition specific training. Consider how the quantity and quality of the training and competition program changes as long-term plans progress. Improvements in performance.



## TRAINING TO COMPETITION RATIO

### Stages

### Recommended ratio

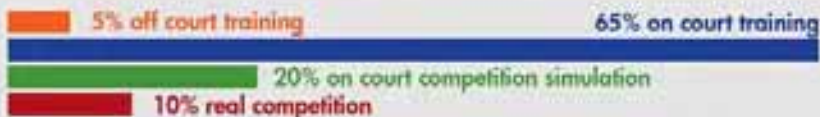
#### Active Start

*No specific ratios*

#### FUNDamentals

*All activity FUN based*

#### Learning to Train

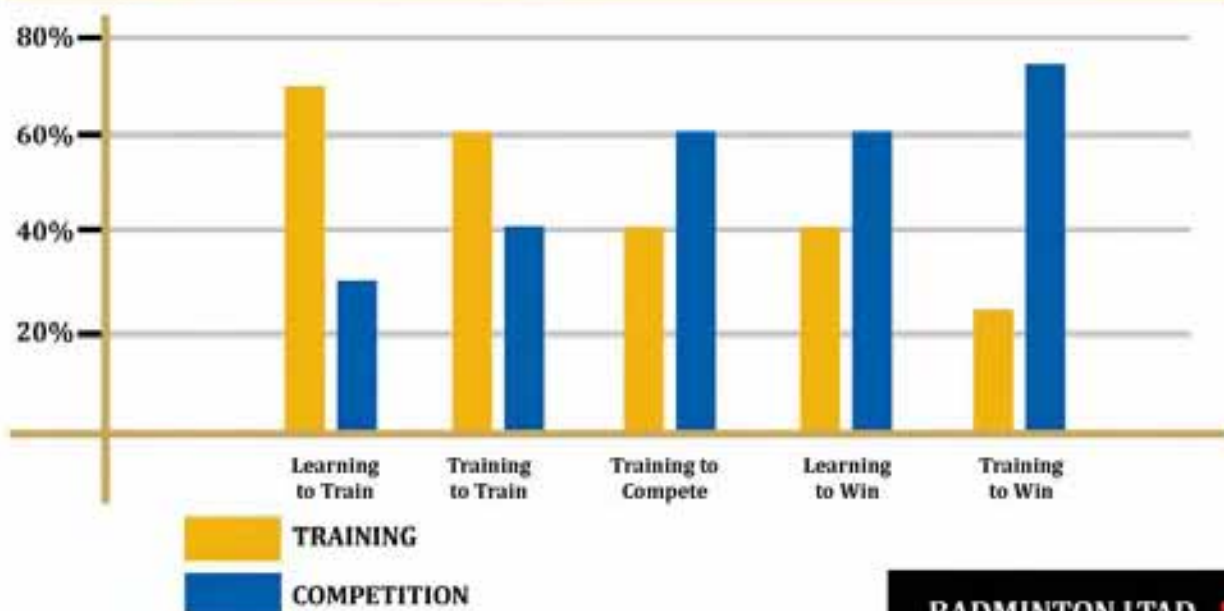


#### Training to Train



Stages	Recommended ratio
Training to Compete	 <p>15% off court training 25% on court training 40% on court competition simulation 20% real competition</p>
Learning to Win	 <p>25% off court training 15% on court training 40% on court competition simulation 20% real competition</p>
Training to Win	 <p>20% off court training 5% on court training 40% on court competition simulation 35% real competition</p>
Active for Life	Based on individual's desire

## TRAINING TO COMPETITION RATIO



- ▲ Optimal badminton competition ratios are required for all stages of LTAD.
- ▲ Level and length of badminton's competitive season in Canada should be aligned with the changing needs of the developmental athlete progressing through LTAD.
- ▲ Over-competition and under-training at the Learn to Train and Train to Train stages result in a lack of basic skills and fitness.
- ▲ The appropriate level of competition is critical to the technical, tactical, and mental development at any and all stages.
- ▲ Schedules are often 'set' for team sports by leagues and organizations and not by the coach and athlete, making optimal training based on periodization difficult. For individual sports, individual competition schedules can be selected by the coach and athlete based on the athlete's developmental needs.
- ▲ The current system of competition for badminton is based on tradition. It should be planned to enhance optimal training and performance of the athlete depending upon their LTAD stage.
- ▲ Badminton competitions in Canada must be created and scheduled considering strategic planning and with due regard for the optimal performance of an athlete and the tapering and peaking requirements.
- ▲ Optimal training to competition ratios for individual sports varies greatly and must be determined on a sport specific basis.
- ▲ While international and national calendars are usually well integrated, a systematic competition review needs to be undertaken. This is one of the biggest challenges for team sports and a significant challenge for individual sports in LTAD design and implementation.

*The system of competition makes or breaks athletes!*

# 9

## SYSTEM ALIGNMENT AND INTEGRATION

- LTAD is the core business of national, provincial / territorial, and local sport organizations.
- LTAD is a tool for change towards full system alignment and integration.
- A seamless, sport-specific LTAD should be based on national and international normative data, both sport specific and sport science.
- LTAD plans for athletes with a disability need to be developed on a sport-by-sport basis taking into account the specific needs of individuals with a congenital or acquired disability.
- After the LTAD design is completed, a sport-specific system of competition will be established that matches the competitive needs of developmental athletes during Active Start, FUNDamentals, Learning to Train, and Training to Train stages.
- The content of training, competition, and recovery during the FUNDamentals, Learning to Train, and Training to Train stages are defined, taking into consideration the developmental levels of the athletes as these relate to the physical, technical, tactical — including decision making — and mental requirements of the sport, rather than being based on chronological age.
- LTAD is an athlete-centered approach designed around the needs of athletes and institutionalized

by rationalization of the system by sport governing bodies.

- The process of designing and implementing LTAD programs is athlete centered, coach driven, and administration, sport science, and sponsor supported.
- LTAD has a strong impact on the coaching education curriculum. Developmental readiness will replace ad hoc decision-making about programming preparation.
- Activities of schools, communities, clubs, PSOs, and NSOs should be fully integrated through LTAD.



Bottom figure illustrates the various performance priorities that LTAD addresses and the system development it effects.

## System Alignment and Integration



*\*Way et. al 2005*

## Sport Canada: Strategic Leadership for Sport



*\*Sport England, 2004 - Modified by Higgs & Way 2005*

# 10

## CONTINUOUS IMPROVEMENT

The concept of continuous improvement, which permeates LTAD, is drawn from the respected Japanese industrial philosophy known as Kaizen.

"While many people have only seen the world's top athletes perform on court, I have had the privilege as an international player to see a different side. Over my 10 year career, I have learned from the best how hard an athlete needs to work in order to maintain and improve on the highest levels of skill. Whether, psychologically, physically, or technically, constant improvement and an ability to continually learn seems to be the common denominator for their high performance results."

*William Milroy - Athlete*

- ▶ 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 education, sport, and recreation to ensure systematic and logical delivery of programs to all ages.
- ▶ LTAD promotes ongoing education and sensitization of federal, provincial/territorial, and municipal governments, the mass media, sport and recreation administrators, coaches, sport scientists, parents, and educators about the interlocking relationship between physical education, school sport, community recreation, life-long physical activity, and high performance sport.



**BADMINTON FOR LIFE**





## ▲ The 10 S's of Training and Performance

The original five basic S's of training and performance were introduced in the Canadian Sport for Life: Long-term Athlete Development document. The five S's are: Stamina (endurance), strength, speed, skill, and suppleness (flexibility), (Dick, 1985). Building on a badminton athlete's physical development, an additional five S's create a complete, holistic, training, competition and recovery program and a proper lifestyle.

Thus, there are 10 S's of training which need to be integrated when developing a badminton athlete's annual training, competition and recovery plans. Each of these capacities is trainable throughout an athlete's lifetime, but there are clearly 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. In all former LTAD documents the windows of trainability have been referred to as the "sensitive periods" of accelerated training. 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.

For badminton in Canada, 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 badminton players may show potential for excellence by age 13, whereas others may not indicate their promise until age 17 or 18. Consequently, a long-term approach to badminton development is needed to ensure that players who respond slowly to training stimuli are not "short-changed" in their development.

## **S** **TAMINA** (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

*"The sensitive periods in trainability are referred to the windows of accelerated adaptation to training."*

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.

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

## **S** **TRENGTH**

There are two windows of trainability for strength in girls: The first is immediately after PHV. The second is after the onset of menarche. Boys have one strength window, and it begins 12 to 18

months after PHV. Again, sport-specific needs will determine "how much strength is enough" in a particular sport, thus minor or major emphasis of training strength will be defined by sport-specific and individual specific needs.

## **S** **PEED**

There are two sensitive 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. For boys, the first speed window occurs between the ages of seven and nine years, and the second window occurs between 13 and 16 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. In addition, proper blocks of training should be

speed. The volume of training should be low and allow full recovery between exercises and sets. 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.



## S KILL

Girls and boys both have one window for optimal skill training. For girls, the window is between the ages of eight and 11 years, while in boys it is between nine and 12 years. During this window, young athletes should be developing physical literacy. Physical literacy is the development of **fundamental movement skills and fundamental sports skills** that permit a child to move confidently and with control, in a wide range of physical activity and 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.

## S SUPPLENESS

The 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. 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.

## S 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 physi-



cal (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.



## PSYCHOLOGY

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.



## 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 include nutrition, hydration, rest, sleep and regeneration; all of which need to be applied different to training (life) plans depending on the stage within the LTAD. 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 and the sport-specific requirements.



## SCHOOLING

In a training program design for badminton the demands of school must be considered. This includes integrating school academic loads, duties, school related stresses, and timing of exams. When possible, badminton training camps and competition tours should compliment, not conflict, with the timing of major schools academic events.

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.



## 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.



## ▲ Stages of LTAD for badminton

### The Learning Continuum

The tables and notes in this document describe a sequential process for badminton teaching skills that includes the Introduction, Development, Refinement, Perfecting, and Maintenance of those skills over specific timelines. Coaches and administrators need to incorporate this “learning continuum” into the design of their badminton programs as the recommended sequences reflect the natural progression of learning.

The eight stages of the learning continuum are dictated by a player’s developmental age, not chronological age. In the ideal coaching scenario, players will begin learning and playing badminton during pre-adolescence, and coaches will thereby be able to apply the enclosed coaching, monitoring, and testing guidelines according to the “optimal” training timeline for producing long-term player excellence.

In some cases, some players will begin to learn and train in badminton at a much later developmental age (e.g. post-adolescence). In these instances, coaches must be prepared to customize portions of their training programs to accommodate these latecomers.

Throughout the learning continuum, coaches should understand that the learning and training of these skills and capacities is an integrated process, where techniques and tactics are learned and developed in combination with each other. For



the sake of simplicity and clarity, this document presents skills and tactics separately in a “matrix” format, but this should not be construed to mean that different training capacities and elements of game knowledge are intended to be learned in isolation from one another. Words and tables do not capture the integrated nature of the game – in this sense, the matrixes are a “best effort” to highlight the components required in an integrated training program.

### 1 Skill introduction

The purpose of skill Introduction is to ensure that players correctly understand the fundamental

movements needed to execute a particular skill; development and mastery of that skill will follow in later stages of the learning continuum. Under ideal circumstances where badminton learning and training begins with pre-adolescent youth, different badminton skills are introduced to players at different developmental ages according to a sequential plan. That is, fundamental skills will be introduced first, followed by progressively more sophisticated skills that represent the combining or refining of the fundamental skills. More sophisticated skills generally require greater subtlety of movement and decision making, so physiological and cognitive development play a large role in determining when they are introduced.

## 2 Skill Development

After players have been introduced to a skill and clearly understand the elements of its correct execution, they must be engaged in repeated practice of the skill so its basic execution becomes reliable. Many hours of formal training will be required, along with opportunities to apply the skill in practices and competitive settings. Qualified coaches must lead technical sessions so players can receive appropriate feedback and correction of the skill. Skills are then incorporated into game situations, forging the link between "theory and practice".

## 3 Skill Refinement

Following basic development of each skill, players refine their execution of the skill by combining it with other skills and tactics under conditions of







game pressure and pace. Players will also adapt the skill to their own unique physiology. As with all stages of skill development, many hours of practice are required in a variety of training and competitive settings to refine skills. The significant difference is that players refine their skills under increasing pressure as the speed of the game increases.

## **4 Skill Perfecting**

Players begin perfecting skills once they have completely adapted the skills to suit their particular physiology and they have reached their highest level of competition. Now begins the process of improving the most subtle aspects of their skills – such as speed, suppleness, and power – under the greatest conditions of pressure and performance. Players need to train and apply their skill sets regularly at the greatest level of competitive difficulty in order to challenge their skills at their optimal limits. Also note: improvements in performance may be partially contingent on training elements that are not visible on the badminton court, such as diet and nutritional programming, weight training, and suppleness and flexibility regimens.

## **5 Skill Maintenance**

When playing careers shift from high performance competition to competitive recreational badminton, players no longer seek to refine and perfect new badminton skills. However, it is beneficial that they maintain their existing skills so they can remain active in the sport in a variety of playing, coaching, and officiating roles.

## BADMINTON CANADA'S LONG-TERM ATHLETE DEVELOPMENT MODEL



## The Eight Stage Guide

This model recognizes the three distinct training contexts. There is a strong private club stream, with professional coaches and high membership fees associated with this reality. There exists an equally strong school and community based system within certain parts of the country. The third training stream is an ever growing privately owned/public warehouse option. These facilities are often a pay as you play structure. This third option has seen growth in the Richmond/Vancouver area as well as the Toronto area. In regards to trainability, and the frequency of on-court training or court availability greatly varies depending on the context a person finds themselves in.

# ACTIVE START

Chronological age:  
Males and Females 0-6



## Objectives:

- To learn fundamental movements while making physical activity fun and a part of a child's daily life.



## Focus:

- On physical literacy, kinesthetic awareness.

Parents and caregivers are primarily responsible for encouraging physical activity in this stage. It is important that they are well informed with age-appropriate information. Kindergarten and community programs have a significant impact as well.

Children should be continually active without being sedentary for more than 60 minutes at a time except when sleeping. Growth and development should be enhanced through playful exploration of risks and limits within safe environments.

Ideally, children begin to be exposed and focus on proper basic fundamental skills such as running, jumping, wheeling (for children in wheelchairs), twisting, kicking, throwing and catching.

There is no introduction to coaching in this stage. Children can be introduced to badminton by bouncing a balloon on a racquet, balancing a shuttle on the racquet and perhaps hitting a balloon or shuttle hanging from a string.

Some organized physical activity is desirable to help provide an active movement environment combined with an introduction to well-structured gymnastics and swimming programs.



## Recommended Training Framework:

- Daily physical activity
- Sessions of 30-60 minutes in duration
- Fun-based activities
- Unlimited activities outside of structured program
- A low volume program

# FUNdamentals

Chronological age:  
Males 6-9 and Females 6-8

The fundamentals stage also refers to a badminton player's first two to three years within the sport.

- Objectives:**
- To begin teaching agility, balance, co-ordination and speed (ABC'S)
  - Overall skill development should be emphasized including badminton-specific skills

- Focus:**
- General movement skills, agility, balance, shuffling, coordination, speed, running, throwing, jumping, skipping, catching, strength through own body weight and multiple sporting experiences.

This is the age when children are introduced to the sport of badminton on an actual court.

The first window of accelerated adaptation to speed occurs. This can be trained through linear, lateral, and multi-directional movements with the duration of repetitions less than five seconds. Strength training exercises can be implemented using the child's own body weight as well as medicine ball and Swiss ball exercises.

Technical instruction covers basic skills and movement. Badminton Canada's Skills and Badge program is a perfect tool within this stage of development.

The basic rules of play and etiquette can be taught. Participation and fun should be emphasized in any game play.

***Regular participation in formal competitions should not be stressed in this stage.***

Children should continue to participate in a variety of other activities geared towards fun such as Chess, strategy games, that focus on a child's decision making ability.

**Recommended Training and Competition Framework:**

- 1-2 sessions a week
- Sessions of 30-60 minutes duration
- 3-4 non-badminton activity sessions of 30-60 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 in regards to intensity of training

## General Descriptions:

### Technical Skills

At this stage of development, athletes should be introduced to a few basic technical skills of badminton.

- To introduce the Grip- Forehand and Backhand grips
- To introduce the Serve- Long Singles
- To introduce Feeding- hand feeding
- To introduce the ready position

### Physical

#### Stamina (endurance)

#### Strength

- Limited priority
- Develop strength using body weight exercises, medicine balls and Swiss balls

#### Speed:

- Window of trainability (males 7-9/females 6-8)
- Agility, quickness, change of direction 0-5 seconds
- Fast cadence movement-Optimal training age for both males and females.
- Use variety of exercises that involve the whole body and stimulate running speed and movement time for both arms and legs.
- Play games and relays should be the major elements.

### Physical

#### Flexibility:

*Flexibility is very important*

- Introduce flexibility exercises that mimic movements required for badminton
- Increase and maintain range of motion around major joints (shoulders, trunk, hips, knees)

### Psychological

Motor learning issues adopted in coaching practices. During this stage, the aim should be to get the children to notice and label their thoughts and feelings (I feel scared, I feel happy...). Children at this stage of development often know how they feel, but have difficulty expressing them.

#### Mental capacities

- Positive attitude towards sport, confidence, concentration, achieve success and receive positive reinforcement.

#### Lifestyle

- Take part in multiple sports, learn safety

# LEARNING TO TRAIN

Chronological age:  
Males 9-12 and Females 8-11



## Objectives:

- Develop fundamental badminton skills and physical literacy.
- To continue to enhance agility, balance, co-ordination and speed (ABC'S).
- Introduce more badminton specific skills and movements such as net play while developing endurance through fun activities.



## Focus:

- Motor skill learning, endurance, flexibility, strength using own body weight, light plyometrics.ance through fun activities.

Participation in regular training sessions may occur during this stage. It is crucial that all fundamental movement skills and overall sport skills are emphasized versus badminton-specific ones. Otherwise, a significant window of opportunity is lost, compromising the ability of the young player/athlete to reach full potential.

Strength training exercises using the child's own body weight as well as medicine ball and Swiss ball exercises should be continued as well as introducing light plyometric/jumping exercises. Flexibility, endurance, and speed can all be worked on during the warm-up by using fun games and relays.

Simple tactics for singles, doubles and mixed doubles should be introduced. Due to possible gender differences, there may be no difference between doubles and mixed doubles. Players should be encouraged to participate in all three disciplines. It is still important to participate in other sports but the focus should be narrowing down to 3 sports by the end of this stage.



## Recommended Training and Competition Framework:

### Training to competition ratio



- One to three sessions a week
- Sessions of 30-90 minutes duration
- Three other activity sessions of 30-90 minutes per week
- Participation in other sports camps and activities during the off-season
- **Type of competition:** single periodization, schools, clubs
- **Volume/Intensity of training:** according to growth could be high volume with increasing intensity

# General Descriptions:

## Technical Skills

At this stage of development, athletes should be introduced and work on developing additional technical skills of badminton such as:

**Serves:** Short Singles; backhand and doubles short serve. Also focus on developing the Long Singles serve.

**Clear:** Overhead attacking; overhead defensive; forehand underhand; backhand underhand.

**Return of Serve:** Singles long serve; singles short serve; doubles short serve.

**Drops:** Slow drop straight; slow drop cross court; fast drop straight; fast drop cross court.

**Smash / Return of Smash:**

Backhand block; forehand block

**Net Play:** Forehand straight; forehand crosscourt; backhand straight and

backhand crosscourt; introduce forehand net kill and backhand net kill.

**Movement:** Develop the ready position; introduce the shuffle; chaise; lunge; to forehand net; to backhand net; to deep forehand; to deep backhand; to around the head; to forehand sideline; to backhand sideline; to forehand sideline; out of forehand net; out of backhand net; out of deep forehand; out of deep backhand; out of around the head; out of forehand sideline; out of backhand sideline.

Feeding- racquet feeding; continue to develop the hand feeding.

**Drives:** Front court; mid court offensive; mid court defensive.

ore joints (trunk-spine), shoulders, elbows, wrists, fingers, hips, knees and ankles.

## Tactical Skills

At this stage of development, athletes should be introduced and work on developing tactical skills of badminton such as:

**Singles:** Introducing concepts in regards to the opponents movements.

Introducing the broken line concept in regards to the opponent's movements; introduce the concept of playing over, in front and to the side.

**Doubles:** Develop side by side positioning and their respective roles; introduce various permutations on front-back and side by side positioning.

## Physical

### Speed:

- Training decisions based on chronological age of the athlete
- Organize exercises to improve reaction time
- Children can progressively increase to the maximum intensity (speed) and power exercises.
- Children can follow the same trend for the number of repetitions
- Integrate speed and quickness in warm-ups

### Strength

- Limited priority
- Use body weight exercises as well as medicine balls, Swiss balls

### Flexibility:

- Further develop flexibility through structured training
- Begin to increase flexibility around more joints (trunk-spine), shoulders, elbows, wrists, fingers, hips, knees and ankles.

## Psychological

Motor learning skills adopted in coaching practices

### Mental training skills

- Introduce goal setting
- Set process and outcome goals
- Daily realistic goals

## Psychological

### Mental capacities

- Introduction to mental preparation
- Understanding the role of practice
- Perseverance, confidence, concentration
- Achieve success and receive positive reinforcement

## Lifestyle

- Involvement in multiple sports
- Inclusions of sport in lifestyle
- Participation in complementary sports

# TRAINING TO TRAIN

Chronological age:  
Males 12-16 and Females 11-15



## Objectives:

- Major fitness development phase with emphasis on aerobic development at onset of PHV.



## Focus:

- Aerobic conditioning, speed, strength at end of stage, flexibility, badminton skills, tactical preparation, other sports (be aware of growth spurt issues).

Optimal aerobic trainability begins with the onset of Peak Height Velocity (PHV), more commonly known as the growth spurt. Aerobic training becomes a fitness priority then while skill, speed, and strength should be maintained. Flexibility should be emphasized given the rapid growth of bones, tendons, ligaments, and muscles. Coaches may have to design personalized training programs taking into consideration the growth spurt in order to avoid injury.

There are two windows of accelerated adaptation to strength training for females: The first occurs immediately after PHV and the second begins with the onset of menarche. For males, there is one window and it begins 12 to 18 months after PHV.

Technical badminton instruction introduces advanced shots such as deception and a shortened stroke. Players are required to perform basic strokes under pressure either through drills or competition type situations. They should continue to play all three disciplines even if an aptitude to one or two events is becoming apparent.



## Tactical emphasis should be on anticipation, scouting, and competition plans:

Badminton is now the number one sport for the athlete but complimentary sports are encouraged.

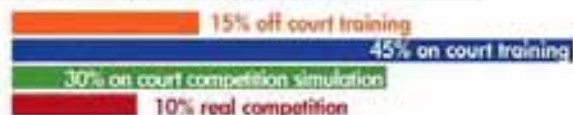
Mental training involves goal setting, pre-competition plan, relaxation techniques, and coping strategies. Nutrition, injury prevention and the importance of rest and recovery are presented as athletes begin to show an interest in these areas.

*Talented players must be challenged in order to improve their skills rather than simply worry about winning.*



## Recommended Training and Competition Framework:

### Training to train ratio



- Four to six sessions a week; five to seven hours of training with two to three hours of match play
- Sessions up to 120 minutes in duration
- Two to three complementary sports such as volleyball, soccer, handball or other racquet sports
- Type of Competition: double periodization; schools, clubs, provincials and Nationals
- Volume/Intensity of training: according to growth, could be lower volume with increasing intensity



# General Descriptions:

## Technical Skills

At this stage of development, athletes should be introduced and work on developing additional technical skills of badminton such as:

**Serve:** doubles flick

**Clear:** backhand overhead; around the head clear

**Grip:** grip for control; grip for power; grip for variations

**Return of serve:** doubles flick serve

**Drops:** backhand straight drop; backhand cross court drop.

**Slice:** straight from the deep forehand; cross court from the deep forehand; straight from the around the head corner; cross court from the around the head corner.

**Return of smash:** backhand lift; forehand lift.

**Net Plays:** inside out forehand spin; outside in forehand spin; inside out backhand spin; outside in backhand spin; forehand brush net kill; backhand brush net kill.

**Movement:** hover

**Deception:** racket swing; angle of contact.

**Feeding:** multi feeding

At this stage of development, athletes should be continuing to refine various technical skills of badminton such as:

**Serve:** Long singles, backhand, doubles short serve.

**Clear:** overhead attacking; overhead defensive; forehand underhand; backhand underhand

**Return of serve:** singles long serve; singles short serve; doubles short serve; doubles flick serve.

**Drops:** slow drop straight; slow drop cross court; fast drop straight; fast drop cross court.

**Smash/Return of smash:** backhand block; forehand block

**Net Play:** Forehand straight; forehand cross court; backhand straight; backhand cross court.

**Movement:** ready position; shuffle; chase; lunge; to forehand net; to backhand net; to deep backhand; to around the head; to forehand sideline; to backhand sideline; out of deep forehand net; out of backhand net; out of deep backhand; out of around the head; out of forehand sideline; out of backhand sideline.

**Feeding:** hand feeding (work on perfecting);

## Tactical Skills

**Singles:** Introduce the notions of intensity, angle and trajectory.

Develop the notion of playing over; in front and to the side.

**Doubles/Mixed:** Introduce the notions of variations of angle, and trajectory as it relates to the front-back positions; side to side and service and receiving serve.

Develop the various permutations on the front/back positions and side to side.

Develop the different attacks of the front/back positions.

Develop how to use the various side to side defensive positions and go from defense to offense by using the front-back positions.

Develop the roles of both the male and female relating to front court and the back of the court play.

## Physical

### Speed:

- Second window of trainability for males after PHV (13-16 yrs old); girls window of trainability (11-13 yrs old)

Boys/ Girls window of trainability-Energy system training 10-20 second intervals. Prioritize speed and decrease movement time by overcoming low levels of external resistance using correct technique.

### Strength

- IMPORTANT LATER IN STAGE; monitor height to determine optimal window of trainability for strength; use caution when using resistance exercises when large increases in body height are demonstrated; introduce resistance training exercises.

### Flexibility:

Important to continue flexibility training as athletes go through growth spurt; structured flexibility exercises should be integrated into practice.

## Psychological

Motor Learning issues adopted in coaching practices; decision making abilities, further develop mental preparation and an appropriate attitude towards competition.

### Mental training skills

Filling out and increasing detail of goals-set process and outcome goals;

## Psychological

Imagine technical corrections; apply basic activation & relaxation exercises and a basic understanding of mental training aspects (i.e.- parking, refocusing...)

### Mental capacities

Goal setting (short & medium term); imagery (practicing & improving technique and self confidence)

## Lifestyle

Rest and recovery; nutrition/hydration; training and performance diary/log; introduction to planning and periodization; introduce individual management and career planning.

# TRAINING TO COMPETE

Chronological age:  
Males 16-19 and Females 15-18

## Objectives:

- Developing performance, optimizing fitness and recovery tailored to individual.
- Concentrate on speed, strength, power, plyometrics, endurance, badminton skills and more tactical training depending on what discipline the athlete competes in, such as singles, doubles or mixed categories.

## Focus:

- Speed, Strength, power, plyometric training, endurance, badminton skills, more tactical concepts.

Athletes who are now proficient at performing basic and badminton-specific skills are working to gain more game maturity as they learn to perform these skills under a variety of competitive conditions.

In order to continue to improve, they must be exposed to quality playing and training environments which extend their mental, physical, tactical and technical capabilities to their limit. There is an emphasis on bridging the gap between junior and senior.

Physical training needs to be individually tailored to a greater degree.

Technical training emphasizes the refinement of core skills and advanced techniques and skills are introduced as appropriate. Possible specialization for singles or doubles play.

**Tactical instruction teaches game analysis.**

Mental training works to increase player concentration, responsibility, discipline, accountability, goal setting, self-confidence, self-motivation, will to win, mental toughness, and a competitive mentality in practice and games.

U19 or first year U23 provincial, national tournaments and a very select few international competitions.

## Recommended Training and Competition Framework:

### Training to competition ratio



- Six to eight sessions a week lasting 60-120 minutes
- **Type of Competition:** single, double or triple periodization depending on competition year- school, clubs, provincials, nationals
- **Volume/Intensity of Training:** High volume, increasing intensity

# General Descriptions:

## Technical Skills

At this stage of development, athletes should be introduced and work on developing additional technical skills of badminton such as:

- Serve:** Short singles; doubles flick serve.
- Clear:** overhead attacking; backhand overhead; around the head clear.
- Grip:** grip for control; grip for power; grip for variations.
- Return of serve:** doubles flick serve
- Drops:** backhand straight drop; backhand cross court drop
- Smash/Return of Smash:** backhand lift; forehand lift
- Net Play:** inside out forehand spin; outside in forehand play; inside out backhand spin; outside in backhand spin; forehand net kill; backhand net kill; forehand brush net kill; backhand brush net kill.
- Movement:** hover
- Drives:** front court; mid court offensive; mid court defensive.

At this stage of development, athletes should be continuing to perfect various technical skills of badminton such as:

**Serve:** Long Singles; backhand; doubles short serve.

**Clear:** overhead attacking; overhead defensive; forehand underhand; backhand underhand

**Return of serve:** singles long serve; singles short serve; doubles short serve

**Drops:** slow drop straight; slow drop cross court; fast drop straight; fast drop cross court

**Return of smash:** backhand block; forehand block

**Net Play:** forehand straight; forehand cross court; backhand straight; backhand cross court;

**Movement:** ready position; shuffle; chase; lunge; to forehand net; to backhand net; to deep forehand; to deep backhand; to around the head; to forehand sideline; to backhand sideline; out of the forehand net; out of backhand net; out of deep forehand; out of deep backhand; out of around the head; out of forehand sideline; out of backhand sideline.

**Feeding:** Racquet feeding

## Tactical Skills

**Singles:** Consolidate the notion of angle, intensity and trajectory  
Consolidate game plans as they relate to the opponent's strengths and weaknesses

**Doubles and Mixed:** Focus on refining the various permutations of positions relating to front-back and side by side.

Focus on refining the different attacks from the front-back position and the movements associated with it.

Focus on refining the different defensive positions in regards to side-by-side and how to go to gain the attack.

Refine the notion of angle, intensity and trajectory.

Consolidate then refine the role of both the male and female in regards to serve and receive.

Refine the role of the male and female in regards to net play, defense and back court.

## Physical

### Speed:

- Integrate speed and quickness exercises into warm-up routines
- Integrate speed training sessions into training program (x times/week)
- Plyometric training can be increased.

### Strength

- Periodized strength program is required over an annual plan
- Specific strength training programs based on anthropometric screening (monitoring growth) and event requirements.

### Flexibility:

- Flexibility training integrated into all aspects of training and practice; specific flexibility and range of motion should be

encouraged based on anthropometric and functional assessments by a qualified practitioner; Flexibility used to overcome imbalances in body structure due to injury or chronic conditions over time; Training program may be highly individualized.

## Psychological

Decision making and develop further mental preparation, media training and distraction management; social psychology and team dynamics.

### Mental training skills

- Set process and outcome goals
- Combine tactical and technical moves to imagery; refine individual refocusing skills
- Implement advanced skills in activation &

## Psychological

relaxation in competition

- Apply exercises and strategies consistently in practice and refine competition situations

### Mental capacities

- Focus & thought control, self talk/verbal cues (dealing with distractions & negative thoughts)

## Lifestyle

- Individualization of ancillary supports; refined self monitoring and plan career/sport options; Increased knowledge on hydration & nutrition.

# LEARNING TO WIN

Chronological age:  
Males 19-23 and Females 18-21



## Objectives:

- To refine previously developed capacities and to gain experience and confidence in national and international competitions



## Focus:

- Speed, strength, endurance, shot consistency, tactical development (i.e. - patterns of play for self & opponents) body weight,

The athlete is learning to become a full-time athlete. Participation in appropriate competitions is important in order to learn how to win and to build confidence in winning at the international level. Developing the ability to handle the numerous external factors that come with competing on the international scene is crucial (travel, food, climate, varying venues). The Canada Games multi-sport experience can be an invaluable tool in regards to the handling of numerous external factors. It is important to ensure the athletes do not get caught up in chasing points/ranking on international scene.

Competition evaluations will determine the majority of refinements to the physical, technical, tactical and mental training programs. Athletes are taught how to peak for major competitions.

A support group is established in regards to the following:

- Aiming to medal at low level international tournaments or Senior national events
- U23 and Open National Championships
- Canada Games
- Specialization for singles or doubles.
- National Team Squads for specific events



## Recommended Training and Competition Framework:

### Training to competition ratio



- Eight to twelve sessions a week lasting 60-120 minutes
- **Type of Competition:** double, triple or occasionally multiple periodization, depending on competition year; provincials, nationals and international events.
- **Volume/intensity of training:** high volume and high intensity

## General Descriptions:

### Technical Skills

*At this stage of development, athletes should be continuing to perfect the various technical skills of badminton.*

### Tactical Skills

**Singles:** Refine and perfect the notions of angle, intensity and trajectory as it relates to net play and back court play. (how to put your opponent off-balance)

Refine and perfect the match plans as it relates to the opponents strengths and weaknesses.

**Doubles and Mixed:** Perfect the notions of angles, intensity and trajectory

Perfect match plans in regards to the opponent's strengths and weaknesses.

Perfect the various permutations on front-back and side-by-side positioning.

Perfect the different attack from the front-back positions and the various movements that accompany it.

Perfect the roles of the male and female in regards to serve and receive.

Perfect the role of the female and male in regards to net, defensive and back court play.

### Physical

#### Speed:

- Highly individualized programs dependant on event specialization

#### Strenght

- Highly individualized training program dependant on event specialization

#### Flexibility:

- Flexibility training integrated into all aspects of training and practice

- Specific flexibility and range of motion should be encouraged based on anthropometric and functional assessments by a qualified practitioner

- Flexibility used to overcome imbalances in body structure due to injury or chronic conditions over time

- Training program may be highly individualized

### Psychological

Decision making and advanced mental preparation, media training and distraction management; social, psychological and team dynamics.

### Psychological

#### Mental training skills

Set process and outcome goals; Consistently apply imagery to competition situations; Consistently apply refocusing strategy at major events; IPS (ideal performance state)- target IPS during training and competition situations

### Lifestyle

Increased knowledge on all areas such as rest and relaxation; frequent breaks, well developed self monitoring and integrated support network; career/sport planning sustainedions of sport in lifestyle

# TRAINING TO WIN

Chronological age:  
Males 23+ and Females 21+



## Objectives:

- To maximize all previously established capacities thereby maximizing performance.



## Focus:

- Fine tuning all capacities until mastered.

By this stage, the athlete's physical, technical, tactical, decision making, psychological and lifestyle capacities are fully established and the focus of training has shifted to the maximization of performance. Access to a professional support group of coaches, trainers, nutritionists, physical therapists and psychologists is very important.

A well monitored individualized fitness program is crucial now to ensure successful and healthy athletes.

At some point in this stage the athlete needs to prepare for life after full time badminton.

- U23 National
- National Team Squads



## Recommended Training and Competition Framework:

### Training to competition ratio:



- Eight to twelve sessions a week lasting 6-120 minutes
- **Type of Competition:** per iodization designed around major competitions
- **Volume/Intensity of training:** High volume and high intensity

## General Descriptions:

### Technical Skills

*Athletes that are within this stage of competition should have mastered most if not all skills and should be focused on maximizing their performance while maintaining the technical skills previously acquired.*

### Tactical Skills

*Athletes have mastered the tactical skills and are focused on maximizing their performance on the international stage.*



### Physical

#### Speed:

- Highly individualized programs dependant on event specialization

#### Strenght

- Highly individualized training program dependant on event specialization

#### Flexibility:

- Flexibility training integrated into all aspects of training and practice

- Specific flexibility and range of motion should be encouraged based on anthropometric and functional assessments by a qualified practitioner

- Flexibility used to overcome imbalances in body structure due to injury or chronic conditions over time

- Training program may be highly individualized

### Psychological

Decision making and advanced mental preparation, media training and distraction management; social, psychological and team dynamics.

### Psychological

#### Mental training skills

Set process and outcome goals; Consistently apply imagery to competition situations; Consistently apply refocusing strategy at major events; IPS (ideal performance state)- target IPS during training and competition situations

### Lifestyle

Increased knowledge on all areas such as rest and relaxation; frequent breaks, well developed self monitoring and integrated support network.

A close-up, low-angle photograph of a badminton racket head. The strings are dark and form a grid pattern, receding into the background. The frame is black and appears to be made of a composite material. The lighting is soft, highlighting the texture of the strings and the frame.

**BADMINTON FOR LIFE**



## ACTIVE FOR LIFE

Chronological age: Males  
and Females at any ages



### Objectives:

- A smooth transition from an athlete's competitive career to lifelong physical activity and participation in badminton as a recreational player, a coach or an official. A stage that allows for adult beginners that may have never held a racquet in the past or athletes leaving other competitive sports.



### Focus:

- Pursuing individual goals

At any stage in the LTAD model, athletes may decide to drop out of competitive badminton for a variety of reasons. It is important that athletes have a positive experience in badminton so they remain active within the sport and sport in general.

Badminton is a sport that can be played for a lifetime. There are numerous places to play across the country and for those looking to compete, there is a healthy Masters program starting at age 35. Coaching, officiating, volunteering or working in administration are all possible options to stay involved in the sport.

Badminton players often drop out to pursue careers or start a family. It is quite common for them to look to become more physically active again once things settle down into a familiar routine. It is important that quality programs and facilities are available to them at this time.

Special attention needs to be given to the elite full-time athlete who is transitioning out of competitive badminton. It is often a difficult adjustment after years of dedication to training and competitions and experiencing the accolades that come with success. Traditionally, this has not been an area where coaches have been trained to provide guidance.



### Recommended Training Framework:

- Fun, social, maintenance of fitness
- Competition based on individual's desire
- Two to three 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

BADMINTON FOR LIFE





## Badminton in Canada Strategic Initiatives

# 8

**OBJECTIVES:** One of Badminton Canada's objectives as the LTAD model was being developed for was to identify gaps and shortcomings within the sport in Canada.

**FOCUS:** From these gaps and shortcomings, strategic initiatives were identified and prioritized.

In no particular order, listed below is a brief description of the top 10 strategic initiatives identified for badminton in Canada:

▶ **Create and develop a link with the school system and PSOs/TSOs** - In several provinces and territories there is a disconnect between the school system and the provincial bodies that manage the sport. Badminton Canada will assist provinces and territories to increase communication; thus, removing the disconnect.

▶ **Develop partnerships with various media outlets to help promote the sport** - Badminton Canada will focus on creating strategic media partnerships throughout the country. Through these partnerships, Badminton Canada will focus on promoting badminton to a regional and provincial based population in order to grow the sport's awareness within the Canadian community.



▶ **Create a database of resources in regards to player training and development** - There is currently no central database in place that allows coaches and athletes to access information. The creation of a database accessible through Badminton Canada's website will allow for information to be readily available to everyone within the badminton community. The steps will be undertaken by the development of an online coaching program with access to all interested coaches and athletes.

▶ **Develop a Mentorship program for High Performance coaches (Level 4+) with internationally recognized coaches** - Create partnerships with other countries to allow Cana-

dian High Performance coaches with international success to mentor and exchange ideas and strategies with Canada's Level 4/5 coaches. Badminton Canada will communicate with 3-4 specific countries in order to establish dialogue and partnerships. The focus will be on certain Asian countries, as they are leading in player development.

▶ **Develop and strongly recommend a proper competition schedule** - In order to maximize trainability of badminton athletes within Canada, the competition schedule will be reviewed to determine if various national championships and Junior/Senior Elite series are properly scheduled within the calendar year.

▶ **Have all provinces/territories buy into the same LTAD program** - The successful implementation of an LTAD model for Badminton in Canada will be determined by all partners involved in the process.

▶ **Include LTAD principals within the new NCCP courses to be developed** - The Community Sport Initiation stream has been launched in both official languages and the Competition Introduction stream is under way.

▶ **Develop a communication strategy to assist/support provinces and rural communities trying to increase their number of facilities** - Work with provinces/territories and local partners to developing a communication strategy, with the goal of increasing the awareness of the benefits of Badminton within a community structure, for a healthier, more productive population.



▶ **Re-define National Team structure** - A High Performance committee will be put together in order to review the entire National Team structure. This committee will look at the elements that need to be changed in order to focus on 2012, 2016 and beyond. The committee will develop a clear pathway in order to define the calibre of athlete that will be selected for various competitions and what needs to be developed to better support our athletes as they excel towards the Olympic Games.

▶ **Develop a mentorship program between new competitive coaches and High Performance coaches** - Develop a domestic program which will allow grass roots coaches to be partnered with nationally recognized High Performance coaches in order to allow a mentorship-like relationship to develop. This will cultivate an exchange of information/knowledge and facilitate and motivate grass roots coaches to continue with their certification.

## ▲ Glossary of terms

**Adaptation:** Refers to a response to a stimulus or a series of stimuli that induces functional and/or morphological changes in the organism. Naturally, the level or degree of adaptation is dependent upon the generic endowment of an individual. However the general trends or patterns of adaptation are identified by physiological research, and guidelines are clearly delineated of the various adaptation processes, such as adaptation to muscular endurance or maximum strength.

**Chronological Age:** Refers to the number of years and days elapsed since birth. Growth development and maturation operate in a time framework; that is a child's chronological age.

**Development:** Refers to the interrelationship between growth and maturation in relation to the passage of time. The concept of development also includes the social, emotional, intellectual, and motor realms of the child.

**Developmental Age:** The age determined by the physiological factors of maturation in conjunction with the training age (years of participation in sport).

**Growth:** Refers to observable step-by-step, measurable changes in body size such as

height, weight and percentage of body fat.

**Maturation:** Progress towards the biologically mature state. Maturation differs from growth in that although biological system matures at different rates, all individuals reach the same endpoint and become fully mature.

**Periodization:** The structure of short and long term training, competition and recovery periods to provide optimum performances at the required time or time series:

- Single Periodization: one preparatory and one competitive period within the year
- Double Periodization: two preparatory and two competitive periods within the year
- Triple Periodization: three preparatory and three competitive periods within the year
- Multiple Periodization: competing all year round while maintaining physical and technical skills.

**Phase:** Generally, "general" preparation phase, "specific" preparation phase, "pre competition" phase, "competition" phase and "transition" phase comprising of 4-6 mesocycles whereby a mesocycle is usually comprised of 2-4 microcycles and whereby a microcycle is usually a week.

**Physical literacy:** Is the ability to perform fundamental and specialized movement skills and the knowledge, understanding and ability to analyze sport and physical activity.

**Power:** Is the ability to generate the highest possible force in the shortest possible time.

**PHV:** Is the maximum rate of growth (growth spurt) in height, which tends to last between 2.5 and 3 years in most adolescents. PHV usually happens between the ages of 12 to 15 for males and 11 to 14 for females. Early or late maturers might differ from the ages above.

**Skill:** Is the ability to carry out a task with maximum certainty and minimum expenditure of energy and time.

**Speed:** Is the ability to react to a stimulus or signal in the shortest possible time (speed of reaction), and/or to perform a movement at the highest tempo (speed of movement).

**Strength:** Is the ability to generate force through a single maximum voluntary contraction.

**Trainability:** Trainability refers to the genetic endowment of athletes as they respond individually to specific stimuli and adapt to it accordingly.

**Canadian Sport for Life (CS4L)** is a movement which promotes healthy growth and development through sport, so people can enjoy a lifetime of physical activity and excel in sport.

**Long-Term Athlete Development (LTAD)** Model is a framework that recognizes the distinct stages of physical, mental, cognitive and emotional development in participants in sport.

**Physical literacy** is when fundamental movement skills and fundamental sport skills that permit a child to move confidently and with control, in a wide range of physical activity, rhythmic (dance) and sport situations are developed.

**Active for Life** is the lifelong enjoyment of sport and physical activity.

**Active Start** stage is when young children develop movement skills through active play.

**FUNDamental** stage is when children learn a wide variety of fundamental movements and build motor skills as they participate in a number of different sports and activities.

**Learning to Train** stage is when pre teens learn fundamental sport and decision making skills as they participate in a variety of sports.

**Training to Train** stage when youth, during their growth spurt, develop the physical, technical, tactical and mental capacities to compete at higher levels of sports.

**Training to Compete** stage ranges from athletes representing their province at nationals to representing their country in international competitions.

**Training to Win** stage is when athletes are competing and winning in senior international competition.

## ▶ AGE

**Chronological age** refers to the number of years and days elapsed since birth.

**Skeletal age** refers to the maturity of the skeleton determined by the degree of ossification of the bone structure.

**Relative age** refers to differences in age among children born in the same calendar year (Barnsley and Thompson, 1985)

**Developmental age** refers to the degree of physical, mental, cognitive, and emotional maturity.

**General training age** refers to the number of years in training, sampling different sports.



**Sport-specific training age** refers to the number of years since an athlete decided to specialize in one particular sport.

**Adaptation** means the changes in a person's body due to various external stimuli.

**Adolescence** is the child's rapid period of growth when a child's matures physically and sexually.

**Ancillary Capacities** are the training and performance factors an athlete has learnt about taking care of their mind and body while playing sport.

**Childhood runs** from the 1st birthday to adolescence.

**Development** includes social, emotional, intellectual and motor growth and maturation over time.

**Early specialization** sports (e.g. gymnastics and diving) refer to sports that recommend specialization before the age of ten.

**Growth** refers to “observable, step-by-step, measurable changes in body size such as height, weight, and percentage of body fat.”

**Ideal Performance State (IPS)** also known as “The Zone,” is that state in which you are able to hit the shuttle where you want, how you want, when you want. When players enter the IPS, their confidence soars. They become players, thinking tactically on the other side of the net, rather than hitters, who think technically on this side of the net. Even when they are down in a game, or trailing in a set to an opponent who is playing well, they love the battle.

**Late specialization** sports (e.g. athletics, tennis and all team sports) refer to sports that do not recommend specialization before the age of ten.

**Maturation** refers to “qualitative system changes, whether structural or functional, in the child’s progress toward maturity; for example, the change of cartilage to bone in the skeleton.”

**Peak height velocity (PHV)** is the maximum rate of growth in stature during growth spurt. The age of maximum velocity of growth is called the age at PHV.

**Peak strength velocity (PSV)** is the maximum rate of increase in strength during growth spurt. The age of maximum increase in strength

is called the age at PSV.

**Peak weight velocity (PWV)** is the maximum rate of increase in weight during growth spurt. The age of maximum increase in weight is called the age at PWV.

**Periodization** is time management (scheduling) of the volume, intensity and frequency of train

**Post-natal growth** is often divided into three or four age periods, including infancy, childhood, adolescence, and puberty.

**Puberty** refers to the point at which an individual is sexually mature and able to reproduce.

**Readiness** is the correct time when a child is ready to learn and perform tasks to meet the demands of training and competition.

**Sensitive periods of trainability** refer to the period when a child can most easily learn physical skills.

**Trainability** is how individuals respond to training at different stages of growth and maturation.



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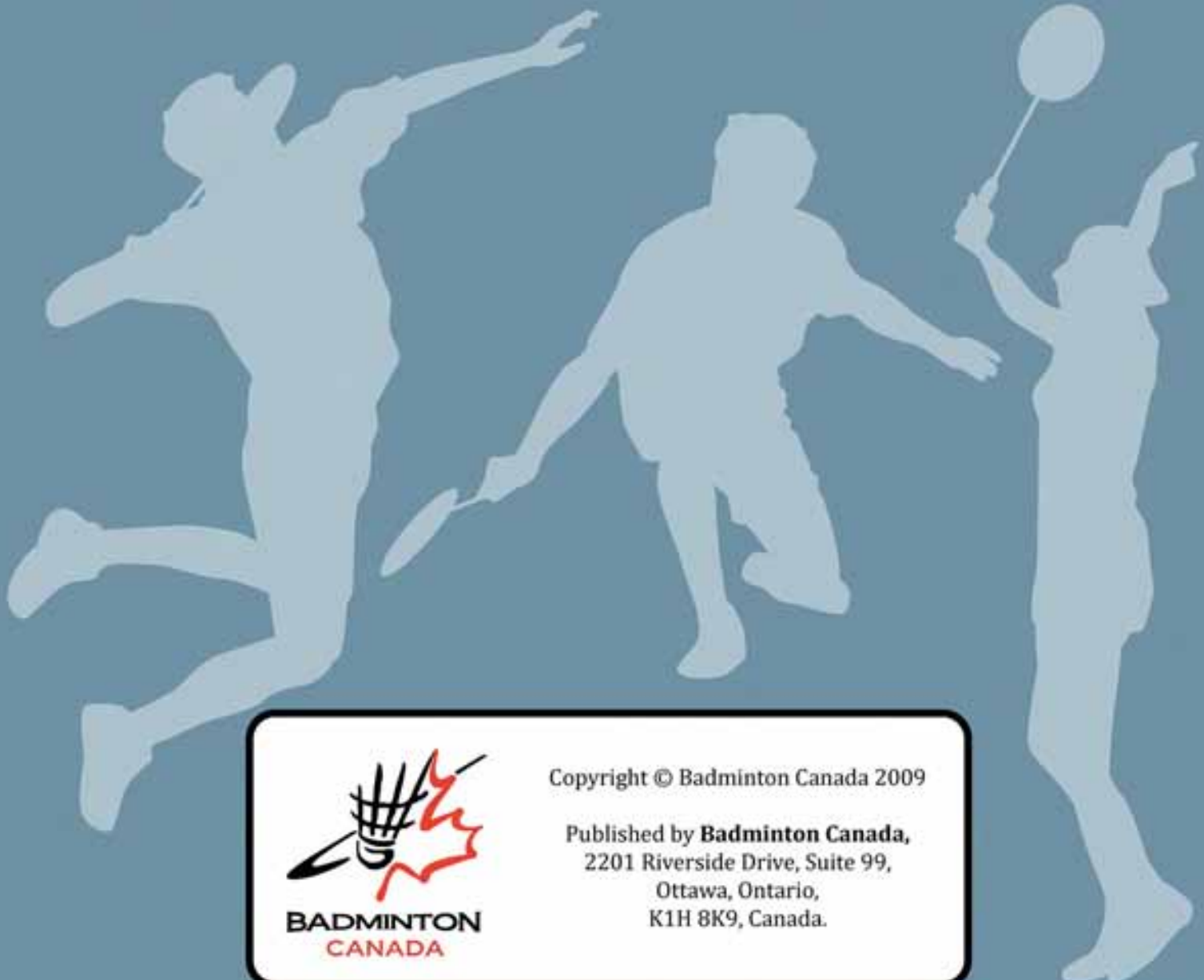
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