Squash CANADA

BEYOND THE NICK

Long-Term Player Development

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FOREWORD

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President of Squash Canada (1997-2001)

The publication of *Beyond the Nick: Long-Term Player Development* (LTPD) represents an important milestone in the development of Canadian squash. The LTPD model describes a rational framework for optimal player development with special reference to growth, maturation and development, appropriate training, and suitable competition. In addition, *Beyond the Nick* discusses the importance of an integrated and aligned system of qualified instruction and coaching at all levels of participation within the Canadian squash system that focuses on the needs of the player first and foremost.

Squash Canada is looking to provide our players with the necessary skills to reach their maximum potential in the game and to support healthy physical activity throughout their lifetimes. With *Beyond the Nick*, we are looking further into the future than simply teaching skills to win games or tournaments today or tomorrow; we are promoting a lifelong love of the sport and building the skills and capacities that will serve our players whether they pursue medals in high performance or simply choose squash for recreation as part of an active lifestyle.

This document should inspire all those involved in Canadian squash to question and challenge conventional thought in all areas from technical execution to facility design, from equipment selection to competition structure, and from coaching education to rules and etiquette. I invite you to read the information presented in this document and reflect on the importance of your role in helping to make LTPD the gold standard in squash.

Sincerely,

Jim McAuliffe

Jonathon Power

1998 World Champion, Squash World Open
2002 Gold Medalist, Commonwealth Games

I am happy to see squash adopting the LTPD model, as it mirrors my own development in the game. One of the things that is especially clear from my own experience in squash is the importance of being exposed to a lot of different types of movement and different sports from the time I was small. I was fortunate to have access to great sports facilities and plenty of opportunity to play different sports from a young age, including squash. Not every child has these sorts of opportunities. By the time I was 12 years old and made the decision to specialize in squash, I had already logged thousands of hours playing different sports, and probably over a thousand hours in squash alone.

LTPD presents a formal understanding of the type of sequential development that made me successful as a squash player and active in sport in general. With LTPD, the idea is that we can plan for success for more people instead of leaving things more or less to random chance. There is a lot of opportunity to grow the sport of squash in Canada, and LTPD can provide the guidance necessary at all levels of the game.

Yours in sport,

Jonathon Power

Linda MacPhail

Executive Director, Squash Canada (1997-2010)

The LTPD model presented in *Beyond the Nick* has been developed from the leading global research in athlete science, observed best coaching practices in worldwide sport, and consultation with stakeholders in the Canadian squash system from the club level to the national stage. Many of the discussion points have been shaped from the input of club head coaches, technical leads at provincial and territorial associations, and others associated with the delivery of squash programs across Canada. By representing a broad base of squash expertise, *Beyond the Nick* aims to guarantee the future growth and success of the Canadian game by ensuring excellence in development.

Best regards,

Linda MacPhail

Board of Directors, Squash Canada

The Squash Canada Board of Directors is pleased to announce the publication of *Beyond the Nick*, our very own squash-specific Long-Term Player Development model. With this initiative, we see a bright future for Canadian squash. For some of our athletes, it offers an avenue to achieve excellence and podium performances in the game they love. For many more, it provides a fun recreational pursuit that promotes physical, mental and emotional health. With the logical and systematic approach of LTPD, we will see more success in developing high-performance players, and we will also promote physical literacy among our children and youth, helping more Canadians to acquire the sport skills and capacities they need to pursue a lifetime of physical activity. Whether their goals pertain to high performance or community recreation, LTPD provides the framework that will serve the needs and aims of all of our squash players.

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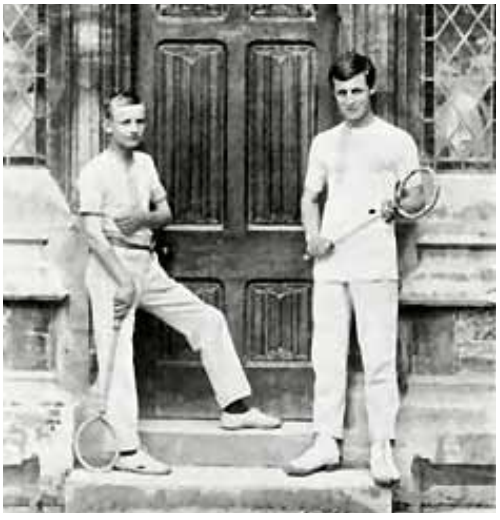
INTRODUCTION

A Brief History of Canadian Squash

The sport of squash started in the early 19th century in England as a game called “rackets”. It was played against a wall and developed largely at Harrow School, but rackets itself is believed to have had its origins in a game invented by English prison inmates to amuse themselves. In 1893, the name “squash” was first mentioned in a book together with a basic set of rules. The game migrated to North America, and the first Canadian squash court was constructed in Quebec City in the 1800s.



Over the last 100 years, the game of squash has grown steadily worldwide. In addition to being a popular sport for many thousands of Canadians, there are now 150 member nations who belong to the World Squash Federation (WSF) and the game is played on all five continents. Squash Canada, the national governing body of the Canadian game, has its origins as the former Canadian Squash Racquets Association (CSRA). Formed in 1913, the CSRA originally represented only a handful of squash clubs in Montreal, Toronto and Hamilton. As the sport grew in popularity through the last century, the organization evolved to become Squash Canada and now encompasses 12 provincial and territorial squash associations with over 400 clubs.

Today, more than 400,000 Canadians play squash competitively and recreationally, and there are more than 15 million squash players globally. In Canada and worldwide, the most popular version of squash is the softball game. The hardball doubles version is growing in popularity in Canada.

Canadian players have gained distinction on the international stage. In recent decades, Canadians have achieved podium finishes at the Commonwealth Games and Pan American Games since the sport was added to both in the 1990s. In 1993, Gary Waite followed his distinguished youth career by attaining a number one ranking in hardball singles, number two ranking in hardball doubles, and number 12 ranking in softball singles. Heather Wallace won gold medals in the individual and team events at the 1995 Pan American Games, and she was the number one ranked women’s player in Canada for 10 years between 1986 and 1996. In 1998, Canadian Jonathon Power won the World Men’s Open and subsequently became the World number one ranked player by the Professional Squash Association (PSA). All of these results testify to the capacity of Canadian players to compete at the highest levels of our game.

Squash on the International Stage

Squash is played in two major international games:

Commonwealth Games

Squash has been part of the Commonwealth Games since 1998. Jonathon Power of Canada won the silver medal at the 1998 games, and then took the gold medal in 2002 when he defeated Peter Nicol (representing England) in a spectacular final between the world's top male players.

Pan American Games

Squash has been part of the Pan American Games since 1995. In both 1995 and 1999, Canadian squash athletes won all contested gold medals.

Squash Today – and Tomorrow

Today, Canadian squash is clearly thriving, with tens of thousands of recreational players participating across the country and dozens of high-performance athletes competing with success in the international arena. But what about tomorrow? This document is about securing our place in the game long into the future, both at the recreational level and in the high-performance ranks.

Canadian squash is currently very strong at the recreational level at virtually all ages. Squash programs across the country permit entry into the sport at any age and level of ability, from the grassroots and junior stages to the Masters level spanning ages 30 to 80 years. Facilities are widespread and accessible even in some of the most geographically remote parts of Canada, and a broad range of graded competitive events exist for players to challenge themselves according to their age, experience and ability level.

The main challenge for Canadian squash lies in high performance. As standards in athlete training and development continue to rise around the world, Canadian high-performance athletes in all sports are struggling to remain competitive at the international level, and squash athletes are no exception. There are at least two reasons for this. Squash has not completely developed the potential of the children's recreation market in Canada, and this limits the numbers of athletes entering our high-performance stream. By developing more programming opportunities for children, we can expect to see greater numbers entering the high-performance pathway during adolescence with improved skill sets and stronger physical and mental capacities. As well, in our current high-performance programs, there is a tendency for many athletes to set their expectations relatively low within the international arena; we can aim to be much more ambitious in our goals by following a systematic process of player development.

Other challenges are more universal in nature to all sports and physical activities. First, in Canada as elsewhere, trends towards increased rates of obesity and inactivity among our children and youth threaten to reduce the number of newcomers to squash and thereby our long-term participation numbers. Second, as all sports move towards becoming more inclusive of participants with all levels of physical, cognitive and sensory abilities, the awareness grows that we need to make efforts to provide increased playing opportunities for persons of all ability levels.

Developing Our Sport

Squash Canada has a mandate to select and develop squash athletes for international competition, but there is also a need to promote and support the development of Canadian squash starting at the grassroots level. To this end, Squash Canada sets and maintains standards for the training and certification of coaches and officials in Canada, including the selection and development of high-performance coaches. Squash Canada also helps recommend standards for training and competition to promote the best development of all Canadian players, from child to senior and recreational to competitive, including players of all physical, cognitive and sensory abilities. To give shape to all of these efforts to promote and develop our sport, Squash Canada is adopting a Long-Term Player Development pathway (LTPD).

LTPD is the squash-specific adaptation of the Long-Term Athlete Development model (LTAD) that was developed through the Canadian Sport for Life initiative following the introduction of the Canadian Sport Policy. In 2002, the Canadian Sport Policy was established to make Canadian sport more inclusive and increase the quality of our athlete training in general. Canadian Sport Centres responded in 2005 by publishing Canadian Sport for Life (CS4L), a framework and philosophy for promoting lifelong participation in sport and physical activity for all Canadians while also revitalizing Canada as a competitive force internationally. LTAD, a cornerstone of Canadian Sport for Life, has been developed from a comprehensive review of coaching literature, sport science research, and observations and experiences gleaned from effective sports programs in Canada and worldwide over the past 30 years.

LTAD outlines principles and guidelines for optimal athlete training, competition and recovery based on proven sport science and best practices in coaching. LTAD also recognizes that optimal athlete development happens when recreation, education and health authorities cooperate as partners within an integrated 'sport system' that promotes increased participation and greater achievement. Since 2005, dozens of Canadian national sports organizations have created their own sport-specific LTAD guidelines, and LTAD has even been adopted by many national associations in other countries.

Similarly, the LTPD model for Canadian squash is intended to secure a solid future for our sport at both the recreational and high-performance levels. LTPD provides guidance on best practices for developing champion squash players at the national and international level, and it promotes the wider growth of our sport recreationally across Canada. Notwithstanding, LTPD should be viewed as a basic guide or framework, not a permanently fixed structure. LTPD recognizes that sport research and expert opinion are constantly evolving, consequently new advances in coaching and athlete training should be reviewed and incorporated into the LTPD pathway where appropriate.

At the governance level, LTPD will also help to unify and harness the energies of all stakeholders in the squash sport system in Canada. Historically, our Canadian system of training, development and competition has been fractured along the lines of regional, provincial and national representation. We now understand that how we govern squash is a critical piece in how we develop squash, and divisions in the Canadian squash community present obstacles to the smooth development and progress of our athletes. Accordingly, LTPD identifies all levels and stakeholders under a common goal and reduces the overlap and areas for 'friction' between various agencies that have sometimes existed within Canadian squash.

To serve the best interests of our athletes and our sport, we have to work with each other and not against each other. As we move forward with LTPD, our wish is to see all clubs, recreational groups and administrative bodies in Canadian squash working together in collaborative decision-making based on player-centered principles at all levels of the game.

1. BACKGROUND ON LTPD

Excellence and Lifelong Wellness

Long-Term Player Development (LTPD) is built on the idea that a functional sport system will achieve two purposes frequently believed to be divorced from one another: excellence for those who pursue high performance, and wellness and participation for all. In short, LTPD says an effective squash system will encourage the greatest possible number of participants at all ages of recreational play, yet it will also provide opportunities and structured pathways in elite development and competition for those who choose to pursue excellence. Integral to this approach is the principle that LTPD remains player-centered; all training, competition and recovery is designed with the best interests of both the developing and the elite players at heart. Coaches, parents, administrators and other external parties operate solely in supporting roles.

At the highest levels of competitive squash, the player-centered philosophy is augmented by an emphasis on performance. Owing to the large amount of coaching and administrative resources required to nurture and develop elite squash players, these athletes must be prepared to reciprocate with an equal commitment to improve their performance. Put simply, it is not sufficient at the high performance stage to be satisfied with being the best in Canada – the goal is to be the best in the world.

Why is it important that LTPD be player-centered? In many Canadian sports, the needs of our athletes are often given second billing to the desires and goals of coaches, parents and sport administrators. In this scenario, athletes and players are frequently driven to over-compete and under-train, particularly during pivotal developmental periods in childhood and early adolescence. They spend too many hours playing competitive matches and too few hours practicing skills and developing the physical, mental and emotional capacities needed for long term success. Sadly, over-competing frequently results in technical, physical, tactical, psychological and emotional shortcomings that hinder the player's performance in the long term.

LTPD presents a balanced and scientific approach to training, competition and recovery to produce both higher achievement and sustained participation among squash players. This balance is created by respecting the physical, mental, and emotional maturation of players through the player-centered approach.

"The health and well-being of the nation and the medals won at major Games are simple by-products of an effective sport system."

- Istvan Balyi, athlete scientist

7 Stages of LTPD

LTPD identifies seven basic stages in the optimal development of a player essentially from childhood to adulthood based on the physical, mental, emotional and social maturation of the individual. Training and competition guidelines for each stage stipulate appropriate formats for game play, preferred training methods, optimal ratios of training to competition hours, and targets for development of technical, tactical, physical, psychological and ancillary capacities in the player. Through a thoughtful and systematic approach, LTPD optimizes player development at each stage of maturation and avoids the hazards associated with arbitrarily imposing adult training regimens and competition formats on children. In simplified terms, the seven stages are described as follows:

Active Start
(0-6 years)

Children are introduced to basic physical movement and activity in play settings. The emphasis is on fun and engagement in daily physical activity, not competition. Healthy activity and play stimulate development of their physical coordination and gross motor skills along with brain function, social skills, emotions, imagination, confidence and positive self-esteem.

FUNdamentals
(6-9 males, 6-8 females)

Through a variety of physical activities, children are introduced to fundamental movement skills such as running, jumping, throwing, hitting and kicking – activities that will later form the basis for most sports skills. Like the Active Start stage, the emphasis is on FUN.

Learning to Train
(9-12 males, 8-11 females)

Children transform their FUNdamental skills into sport-specific skills within structured training settings, though the emphasis is on learning a variety of sports and avoiding early specialization.

Training to Train
(12-16 males, 11-15 females)

Pre-adolescents and adolescents consolidate their basic sport-specific skills and may begin moving towards specialization in one sport, especially if they are identified as possessing special talent and choose to pursue high performance in their sport. However, they are still encouraged to participate in at least one other sport or activity.



Training to Compete

(16-23 +/- males, 15-21 +/- females)

Athletes have specialized in their sport and now work to optimize all of their athletic capacities – technical, tactical, physical, mental, emotional, and more. Training regimens are intense, and the aim is to prepare the athlete for elite competition and podium performances.

Training to Win

(19 +/- males, 18 +/- females)

The athlete's physical, technical, tactical, mental, and lifestyle capacities are fully established. The focus of training shifts to the maximization of performance in order to win national and international competitions.

Active for Life

(any age males and females)

Athletes transition from a competitive focus to lifelong participation in recreational sport and/or physical activity. This transition may occur at any time during the previous stages, though ideally no earlier than the Learning to Train stage, when the athlete has mastered basic 'physical literacy' (see 'FUNdamentals' on page 14).

My LTPD Story: Alana Miller

Alana Miller won four Canadian National Championship titles in senior women's competition from 2004 to 2008. She has played professionally in Europe, Asia and North America and represented Canada at the Pan American Games.

I was introduced to racquet sports when I started playing tennis at age 6 at a private club in Winnipeg. My dad and mom were both tennis players, and they had me in tennis camps from the time I was 6 or 7 years old.

I caught a taste for badminton and squash when it rained and the tennis courts were wet, because we would go inside and play badminton and squash. I really enjoyed them because there was a carry-over from the skills I had learned in tennis, so I started taking lessons in badminton and squash during the winter months.

Badminton was my main sport until I turned 18 or 19. I was always at the top of the Canadian national rankings. I won the Canadian Junior badminton singles at the Under-16 level, and I also won the Canadian Junior squash singles.

At the time, I was playing badminton 4 times a week and squash only once or twice.

I played the full provincial schedule in tennis every May to August, and I won a few provincial titles and some prize money. I was the Manitoba women's single champion, and I was also a doubles and mixed-doubles champion.

I shifted my emphasis to squash when I was 19. I had some tremendous role models at the time – Melanie Jans and Marnie Baizley – so I kept a close eye on them. I kept track of their results and what they were doing, and that really motivated me.

The transition from Junior to Senior squash was tricky. I was used to winning, and all of sudden I was losing in the first round at the Senior tournaments. And even though I was improving, I wasn't having the results to show it. I got a little bit discouraged. I kept playing while I was going to university, but I didn't make a big push in international competition. Then in 2004, I started to focus on squash again, and I won my first Senior Women's national title that same year.

- Alana Miller

The 10 Key Factors of LTPD

The 7 stages of LTPD have been defined according to 10 broad key factors that athlete scientists have identified for successful athlete and player development. The 10 key factors relate to processes of human maturation and how these processes interact with training, competition and recovery program design through an athlete's lifetime. These key factors have been gleaned from the most current global research in athlete science, together with observed best practices in training, competition and sports system management around the world.

1. The 10-Year Rule

Research suggests that it takes at least 10 years and 10,000 hours of training for talented athletes to reach top performance levels. This translates to slightly more than three hours of daily training and competition for 10 years (Balyi & Hamilton, 2003).

LTPD has been developed with the 10-year rule firmly in mind. Athletes who choose high performance and finish the first 6 stages of LTPD will complete 10,000 hours of balanced training and competition together with appropriate recovery periods, optimizing their athletic development by the time they reach their early twenties. The 10-year rule underscores a key concept of LTPD: the pursuit of excellence requires a significant time investment over several years, with a progressively greater degree of commitment to training and competition on the part of the athlete.

2. The FUNdamentals

All sports are based on fundamental movement skills and sports skills. Fundamental movement skills are often referred to as the ABCs – Agility, Balance, Coordination and Speed. Fundamental sports skills include activities such as running, jumping, throwing, hitting and catching. Research has demonstrated that children will experience more success and achievement in a sport if they are trained to be physically 'literate' in these skills prior to their adolescent growth spurt. They will also be more likely to pursue lifelong recreational physical activity and maintain greater levels of wellness. 'Physical literacy' is the phrase used to describe basic competency in the movement and sport skills considered essential to every individual's participation in sport and physical activity.

3. Specialization

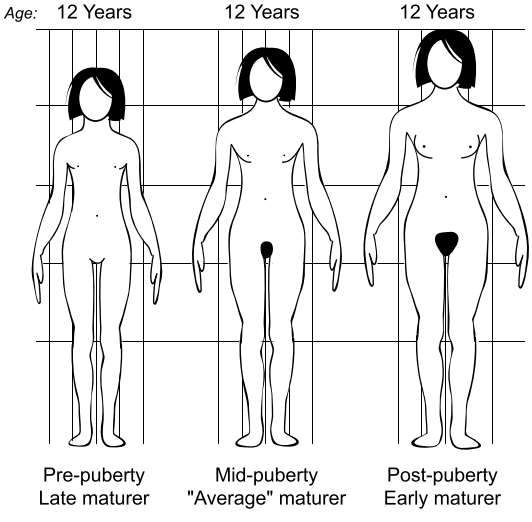
Some sports require 'early specialization' to obtain elite performance levels, such as gymnastics and figure skating, while other sports see better athlete performance in 'late specialization,' such as basketball, soccer, tennis and squash. As a late specialization sport, squash relies on the overall sport system (pre-schools, schools, recreation centres, other sports) to assist future players in developing physical literacy during the Active Start and FUNdamental stages. This holds true for speed and suppleness training as well. The science behind LTPD

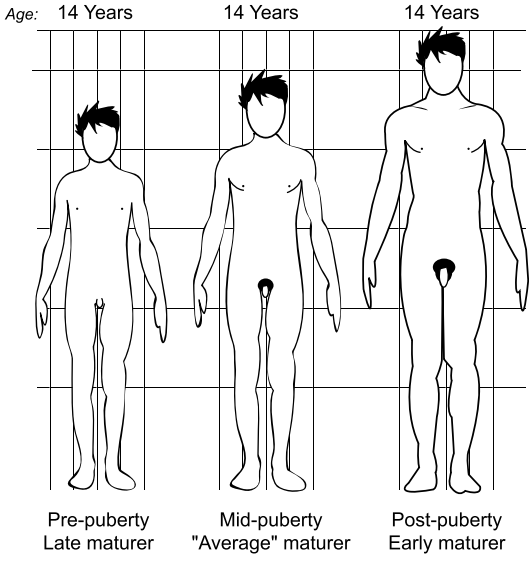
actively discourages early specialization in squash (prior to the age of 14 or 15 years) since premature specialization contributes to imbalanced physical development, overuse injuries, early burnout, and inadequate development of fundamental movement and sports skills.

4. Developmental Age

Everyone passes through the same stages of development from early childhood through adolescence, but the timing and rate of development vary. This is described as the difference between chronological age and developmental age. Two children may be the same chronological age, but they may be four to five years apart in developmental age. According to LTPD, coaches and administrators need to take developmental age into account when they design programs for players.

Maturation in Girls and Boys (Adapted from Growing Up by J.M. Tanner, *Scientific American,* 1973)



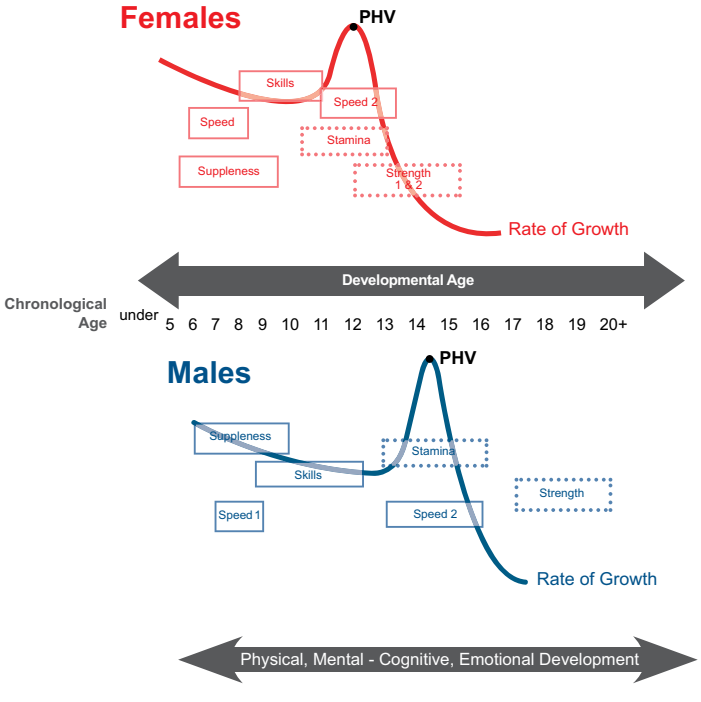


5. Trainability

Trainability refers to the body's responsiveness to training stimuli at different stages of growth and maturation. The physiological systems of every player can be trained at any age, but there are sensitive periods during their growth and maturation when athletes are especially responsive to specific types of training (e.g., stamina, strength, speed, skill and suppleness). Accordingly, to reach their full genetic potential, players need to receive the right type of training at the correct stage of development. If these sensitive periods are missed, players may grow to be fast, strong, and reasonably skilled, but they may never be as fast, strong, and skilled as they might have been if their training had been timed to coincide with the suggested sensitive periods of trainability.

Note: Trainability is often confused with adaptation. Adaptation refers to actual functional and/or morphological changes that occur in an athlete's body as a result of training (e.g., stronger muscles, better aerobic endurance).

Sensitive Periods for Trainability (Balyi and Way, 2005)



Peak Height Velocity (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 growth spurt, occurring after PHV is achieved. The sequence of developmental events may normally occur 2 or even more years earlier or later than average.

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.

6. Physical, Mental, Cognitive, and Emotional Development

As players grow from childhood through adolescence, they experience significant changes in their physical, mental, cognitive, and emotional capacities. Coaches and administrators need to consider these changes carefully when they plan training programs and design competition formats. Failure to account for these changes may result in mental or emotional burnout, undue mental stress, anxiety, diminished confidence, and early exit from the sport.

7. Periodization

Periodization refers to creating logical and scientific-based schedules for player training, competition, and recovery. In practical application, periodization sequences training components into years, months, weeks, days and sessions to optimize the athlete's development and performance. Periodization plans should be adjusted at each stage of development to account for player growth, maturation, and trainability.

8. Calendar Planning for Competition

Player development is strongly impacted by the competition calendar. Different stages of development and maturation have different requirements for the type, frequency, and level of competition. For example, in the early LTPD stages, an emphasis on training and practice is far more beneficial to the long-term performance of athletes than formal competition. At these early stages, training should be given greater emphasis, and short-term success in competition should not be a major goal. As players progress through the LTPD stages, training-to-competition ratios are adjusted to serve their level of maturation and their long-term needs, whether competitive or purely recreational. Calendar considerations become especially important for our top junior players as they start to encounter the strain of being involved in both domestic and international competitions.

9. System Alignment and Integration

LTPD recognizes that each athlete's development is affected by the variety of different training environments they experience – such as club programs, recreational sports, physical education programs, and school and university teams – as well as the activities of their local, regional, provincial, territorial and national associations. They are also impacted by the availability of facilities and support from sport health professionals. To optimize player development, LTPD asks that these different groups and institutions work cooperatively to serve the best interests of the athletes, ensuring that they are mutually supportive, clear in their roles and responsibilities, and aware of how they contribute to athlete development. Players will best develop in a coordinated sport system that is clearly defined, logically structured, and based upon consistent principles. In addition, LTPD will allow players to identify the opportunities available to them and to understand the pathway they need to follow, whether their aim is long-term excellence or simply remaining active for life.

10. Continuous Improvement

LTPD is based on the best available research in sports science and the best practices in athlete training around the world, but sport science is always being refined. Consequently, LTPD programming should respond to new scientific research to ensure the latest advances are incorporated into training, competition and recovery regimens and formats. LTPD can also initiate new research based on identified needs or issues. In the larger sport community, LTPD should support education, promotion and advocacy for player development with government, media, educators, parents, coaches, administrators and sport scientists.

These sensitive periods of trainability vary between individuals

Trainability and the 10 S's

When considering the key factor of Trainability, LTPD looks at 10 S's of training which must be integrated into training and competition plans. The 10 S's include five physical capacities: stamina (endurance), strength, speed, skill and suppleness (flexibility). Beyond these five physical capacities, there are five general S's that complete a holistic training program: (p)sychology, structure/stature, sustenance, schooling and socio-cultural. Each of these capacities is trainable throughout a player's lifetime, but there are clearly sensitive periods when each capacity benefits most from training.

These sensitive periods of trainability vary between individuals according to their unique genetic makeup. While the sensitive periods follow the general stages of human growth and maturation (see diagram, Sensitive Periods of Trainability, page 16), scientific evidence shows that humans vary considerably in the magnitude and rate of their response to different training stimuli at all stages. For example, some athletes may show potential for excellence by age 11, whereas others may not indicate their promise until age 15 or 16.

Consequently, a long-term approach to athlete development is needed to ensure that players who respond slowly to training stimuli are not deprived of opportunities. If players are to reach their genetic potential, correct training must be provided during these sensitive periods of trainability.

Again, all of the S's can be developed at any stage or age, but the sensitive periods provide the best opportunities for the greatest gains in the long-term development of the athlete.

1. Stamina (Endurance)

The sensitive period for training stamina occurs at the onset of Peak Height Velocity (PHV)[1], commonly known as the adolescent growth spurt. Athletes need increased focus on aerobic capacity training as they enter PHV, and they should be progressively introduced to aerobic power as their growth rate decelerates.

2. Strength

There are two sensitive periods of trainability for strength in girls: immediately after PHV and during the onset of menarche. Boys have one sensitive period beginning 12 to 18 months after PHV.

3. Speed

In both boys and girls, there are two sensitive periods of trainability for speed. For girls, the first sensitive period occurs between ages 6-8 years, and the second period occurs between 11-13 years. For boys, the first sensitive period occurs between ages 7-9 years, and the second period occurs between 13-16 years. During the first sensitive period, training should focus on developing agility and quickness; during the second period, training should focus on developing the anaerobic alactic energy system.

[1] *Peak Height Velocity (PHV) is the maximum rate of growth during the adolescent growth spurt.*

4. Skill

Girls and boys both have one sensitive period for skill training. For girls, the period is between ages 8-11 years, while in boys it is 9-12 years (Learning to Train stage). During this period, young athletes should be developing physical literacy – that is, competence in the fundamental movement and sport skills that form the foundation of all sports.

5. Suppleness (Flexibility)

The sensitive period of trainability for suppleness occurs between ages 6-10 years in both girls and boys. However, special attention should also be paid to flexibility during PHV.

6. (P)sychology

Sport is a physical and mental challenge. Maintaining high levels of concentration while remaining relaxed with the confidence to succeed is a skill essential to long-term performance in any sport. Possessing 'mental toughness' while training and competing under extreme pressure and duress is especially important to success at the high performance level. At the same time, these mental skills also enhance everyday life.

7. Structure / Stature

This component describes the six stages of growth in the human body and links them to the sensitive periods of accelerated adaptation to training. Stature (individual height) is measured before, during, and after maturation to track the developmental age of the athlete. By tracking developmental age, coaches can identify the sensitive periods of skill acquisition and physical development (endurance, strength, speed and flexibility) and adjust training programs accordingly.

These girls are 12 years old and born within 2 months of each other, but they are likely 1-2 years apart in developmental age.

8. Sustenance

Sustenance recognizes a broad range of components that serve the central purpose of replenishing the body, thereby preparing the athlete for the volume and intensity required for optimal training. Sustenance addresses several areas: nutrition, hydration, rest, sleep, and regeneration. As with problems in overtraining or over-competition, failure to address sustenance can lead to player burnout.

9. Schooling

Each player's school needs must be considered in the design of training and competition programs. Not only should school sports and physical education classes be taken into account, but also academic loads and timing of exams. When possible, training camps and competition tours should complement, not conflict with, the timing of major academic events at school. Coaches should monitor potential overstress in their athletes resulting from schooling, exams, peer groups, family, and boyfriend or girlfriend relationships, as well as increased training volume and intensities. A good balance needs to be established between all factors.

10. Socio-Cultural

Sport activities expose players to various forms of social interaction and stress, beginning with their participation at the community level. Eventually, their participation may also lead them to international travel and multicultural experiences if they pursue high-performance competition. For example, squash is played on five continents and the game is becoming increasingly popular in Latin America and Asia. Even at the Under 19 level, Canadian players need to be comfortable with travel and competition in foreign countries.

At the same time, their socio-cultural experiences are valuable in broadening their social perspective and understanding, including ethnicity awareness and national diversity. Accordingly, socio-cultural activities may be integrated within competition travel schedules, where recovery periods might include education about the competition location, such as history, geography, architecture, cuisine, literature, music, and visual arts. With planning and foresight, squash can offer much more than a simple commute between hotel room and field of play – it can develop socio-cultural awareness and enrich the lives of our players.

Other Considerations in Trainability

Children, youth and adults may begin playing squash after the sensitive periods of trainability for speed, skill, and suppleness have past. These individuals are therefore dependent on schools, recreation programs, and other sports to stimulate development of these capacities. LTPD recommends that squash groups build relationships with these institutions and organizations to promote and support appropriate training. If squash players have missed these sensitive periods of trainability, coaches will need to design individualized programs to remedy any shortcomings.


HEAD

2. SQUASH LTPD STAGES

Rationale

The Long-Term Player Development (LTPD) model for squash presents a systematic approach to the delivery of all key facets of the game. It is designed to maximize each participant's potential and involvement in the sport by providing an overarching vision and a guide to programming content. The LTPD framework aims to help our squash players reach their full potential by defining optimal training, competition and recovery throughout their careers. At the same time, it supports their development in athletics in general, and it helps them to pursue lifelong participation in overall healthy activity.

For young squash players prior to the Training to Train stage, the emphasis will be on physical literacy. "Training" will focus on learning the ABC's of athleticism (Agility, Balance, Coordination and Speed) to teach players how to control their bodies. For this reason, children may take part in exercises that do not look relevant to squash but are supporting their development. Games and other sports will teach them to throw the ball (basic hitting actions), catch it (hand-eye coordination), and run properly. At each subsequent stage, children will be trained in the optimal systems and programs to maximize their potential as squash players and as long-term participants in sport.

Starting at the Training to Train stage, young players will begin to specialize in squash and the ancillary capacities required for competition at the highest levels of the game. Because squash is a late specialization sport, LTPD discourages early specialization (i.e., prior to the age of 14-15 years) since premature specialization contributes to imbalanced physical development, overuse injuries, early burnout, and inadequate development of movement and sports skills.

Celebrity athletes in many sports have attributed part of their success to having participated in different sports and activities at a young age, saying that the variety of activity gave them a wider base of athleticism and sports skills. LTPD encourages our squash players to reach their maximum potential by training and enhancing all the athletic skills and capacities that contribute to their success. At the same time, we are also trying to provide our players with the range of skills and capacities needed to take part in physical activity throughout their lifetimes. We are looking further into the future than teaching the skills to win games or tournaments tomorrow, especially when an over-emphasis on competing may have a detrimental effect on them taking part at a later age.

My LTPD Story: Jonathon Power

Canadian player Jonathon Power won the 1998 Squash World Open and the gold medal at the 2002 Commonwealth Games in men's singles. His rise to number one world ranking was a classic example of LTPD in action:

Sport was a big part of my life from the time I was born. My dad was big into sports, and he was in charge of administering all of the sports at a military base. So I grew up with access to all sorts of facilities, plus a father who wanted to play sports with me.

I was running and jumping and throwing from the time I was 2 years old, and I was playing tennis, hockey and baseball from the time I was age 5 or 6. I was involved in basically anything and everything that was going on.

I was introduced to squash at about age 8. My dad discovered squash, and he started taking me to play as well. I played a provincial championship in the Under 12 division, and then I took my first trip to the Nationals. I was playing a lot of tennis, basketball and everything else at that stage.

When I was 12 my dad sat me down and told me to choose the sport that I liked the best because I was going to commit to one sport. I chose squash. I started training before and after school and playing a lot competitively. I committed about 15 hours a week to squash from about age 12 to 14 and I pretty much dropped all other sports.

I turned professional at age 15 and I was soon travelling around the world in the PSA, playing in leagues in Europe and professional games at home. I was a top 50 player in the world by age 17, and then I sort of languished there from age 18-21.

I got together with my coach Mike Way at age 21 and tried to put in the same kind of commitment I had at age 12. My body was maturing, so once I started doing the right training I started getting results. I was number one in the world by age 24 when I won the 1998 World Championship.

- Jonathon Power

Guiding Principles

LTPD has been developed according to guiding principles that respect a player-centered approach and Canadian realities, as well as a clear focus on long-term performance:

- A 'Made in Canada' approach that recognizes international best practices and research but clearly understands the cultural, social and political factors that make the Canadian sporting landscape unique.
- Supporting the four goals of the Canadian Sport Policy – Enhanced Participation, Enhanced Excellence, Enhanced Capacity, and Enhanced Interaction.
- Contributing to and promoting a healthy, physically literate nation whose citizens participate in lifelong physical activity.
- Ensuring that optimal training, competition, and recovery programs are developed, provided, and accessible throughout a squash player's career.
- Respecting the physical, mental, emotional, and cognitive development of children and adolescents.
- Establishing physical literacy among participants, upon which specialized sport excellence can be developed through community recreation and sport/club programs.
- Recognizing the need to involve all Canadians in the LTPD process, including athletes with a disability.
- Recommending an optimal competition structure that is appropriate for the various stages of a squash player's development.
- Optimizing the involvement of all members of the sport, including participants, parents, coaches, officials, specialist consultants, schools, squash clubs, community recreation programs, provincial squash organizations, Squash Canada, municipalities, and all levels of government. The role of international-level stakeholders should also be recognized, such as the World Squash Federation, Professional Squash Player's Association, and the Women's International Squash Players Association.

Stage Descriptions

The LTPD model is split into sequential stages in which players move from simple to more complex skills and from general sport to squash-related skills. The following pages set out recommended training sequences and skills development for participants from the Active Start stage (6 and under) to the Active for Life stage (adult participation and recreational competitive streams). Each LTPD stage description addresses the physical, mental, emotional and technical needs of the athlete as they pass through each stage of development.

The first three stages of LTPD encourage physical literacy for all players, regardless of their abilities or disabilities, and correspond to the ages prior to the adolescent growth spurt (PHV). Stages four, five, and six focus on developing excellence and correspond to PHV's onset and aftermath. Stage seven encourages lifelong physical activity, and players may choose to enter this stage at any time in their life (though ideally after the Learning to Train stage has been completed, so physical literacy has been established).

Stage 1: Active Start

Ages 0-6 males and females

Key Objectives

Fun and participation with emphasis on the development of fundamental movement skills and the ABCs.

Where

Home, playground, daycare, preschool and kindergarten.

Who

Parents, care givers and teachers.

Total Hours Training & Competition

Provide 30-60 minutes a day of organized physical activity. Provide at least 60 minutes a day up to several hours of unstructured physical activity or active play. Children this age should not be sedentary for more than 60 minutes a day (unless sleeping).

Training to Competition Ratio

- There is no specific training to competition ratio for this stage, as there is no formal competition, only fun play. Instead, children should be engaged in play for a length of time suitable to their age and amount of other physical activities. Provide 30-60 minutes per day of organized physical activity.

Periodization

- No formal periodization.

Technical

- Introduce children to the squash environment.
- Encourage unstructured play on the squash court.
- Focus on developing the fundamental movement skills (e.g., running, jumping, hitting).
- Emphasis on fundamental movement skills linked together into active play.
- Players should participate in a variety of additional physical activities.
- Swimming and well-structured gymnastics programs are recommended to enhance the full range of basic movement skills and physical literacy.

Tactical

There are no tactical requirements at this stage.

Physiological/Physical

- The Active Start stage is marked by the child's initial high growth rate, as well as rapid nervous system and brain development.
- General locomotion skills are being established (walking and running), and there is obvious improvement in hand-eye coordination and overall movement sequence as children near the end of this stage.
- Physical activity will enhance bone and muscle growth, promote a healthy weight, improve posture and maintain an overall fitness level.
- Parents and care givers should provide opportunities for children to engage in a wide range of movements and physical play involving movement.
- Gymnastics is an ideal Active Start activity.
- Four key environments for movement should be introduced during this stage – on the ground, in the water, on snow and ice, and in the air.
- Agility, balance, coordination and "quickness" are cornerstones of physical literacy at this stage.

Psychological

- Introduce basic mental skills with fun, simple activities such as focusing (e.g., focus on objects and try to remember things about them) and relaxation (e.g., try to tense and relax specific parts of the body).
- Initiate imagery use with simple games involving the imagination (e.g., imaginary squash rallies on the squash court).
- Also introduce modeling with games like follow the leader (e.g., swing mechanics and court movement).

Ancillary Skills

- Ancillary skills are not taught to children at this stage, as they generally include instruction in nutrition, time management, career planning and relationship skills. Instead, parents and care givers should concentrate on providing sound nutritious foods and adequate water intake.

Competition

- There is no formal competition at this stage.
- Simple play is structured through fun programs such as 'Big Hand.'

Stage 2: FUNdamentals

Ages 6-9 males, 6-8 females

Key Objectives

Fun and participation with emphasis on the development of fundamental movement skills and fundamental sport skills.

Where

Clubs, schools and community recreation programs.

Who

Club coaches/professionals, teachers and community recreation instructors.

Total Hours Training & Competition

Participate in daily unstructured physical activity. Participate once for twice a week in preferred sport (if one exists) but also participate in many other sports 3 to 4 times a week.

Training to Competition Ratio

- No specific ratio. Children should be encouraged to compete with themselves (e.g., how many in row? Keep a rally going for a specified time period, hit targets for points, etc.). Children should also participate in a number of sports to help develop all fundamental movement skills, and they should also have daily unstructured physical activity.

Periodization

- No formal periodization. Activities should be planned around the school year to include camps during summer and winter holidays.

Technical

- Develop the fundamental movement skills through a variety of activities.
- Emphasize fun and the ABCs (Agility, Balance, Coordination, Suppleness).
- Develop striking skills.
- Introduce sport numeracy through a scoring system (e.g., points for hitting targets).
- Focus on developing physical literacy by emphasizing fundamental movement skills and fundamental sport skills.

Tactical

- Introduce the main tactic in squash – take away time and space.

Physiological/Physical

- Physical growth is relatively constant, but noticeably slower than the Active Start stage.
- Coordination improves steadily and the nervous system continues to develop rapidly (slowing towards the end of this stage).
- Although aerobic metabolism is primary, low endurance is prevalent in the early part of this stage (but improves noticeably).

- Anaerobic capacity is very limited, and heart rates are significantly higher than adults at all levels, including rest.
- Thermoregulatory control is poorly developed and children are not equipped to deal with hot or cold environments well.
- Skeletal system continues to be fragile with poor loading tolerance.
- Measurable 'reaction time' performance is below that of adults, although coordinated movement speed improves.
- Strength and strength endurance capability rise largely due to nervous system development and coordination improvements.
- There is little potential for hypertrophy (muscle mass increase), so there is no need for formal resistance training programs.

Psychological

- Present young players with the idea of the mind/body connection.
- Introduce the concept of mental skills and their importance in sport.
- Utilize simple, fun activities that focus on controlling anxiety, increasing relaxation, and energizing oneself.
- Use questioning strategies that encourage athletes to use imagery to develop an answer (e.g. what is likely to happen when you hit specific shots from specific parts of the court?).
- Parents and coaches should act as role models to support the learning and use of mental skills.

Ancillary Skills

- Parents and caregivers should concentrate on providing sound nutritious foods and adequate water intake.
- Age-appropriate (practical and fun) nutrition education should be encouraged.
- Players should be introduced to warm-up and cool-down, as well as the need for recovery (sleep).

Competition

- Children play modified game formats that are fun and relevant to their stage of physical development such as Big Hand and Mini Squash (balls, half court, and racquets, with modified scoring). Skill awards can be used to reward player performance.

Stage 3: Learning to Train

Ages 9-12 males, 8-11 females

Key Objectives

Further develop overall sport skills including core squash skills.

Where

Clubs, schools and community recreation programs.

Who

Club coaches/professionals, teachers and community recreation instructors.

Total Hours Training & Competition

2-3 hours per week.

Training to Competition Ratio

- 80% training and 20% competition (including competitive games and competitive drills).
- Tournament play should be introduced, but the focus should be on skill development.
- Consider rule modifications to emphasize skill acquisition.
- Encourage participation in at least 3 different sports to assist in developing a broad range of fundamental sports skills.

Periodization

- Single periodization that features a semester-by-semester evaluation and progression.

Technical

- Squash-specific skill development.
- Power under control (reduce emphasis on power to emphasize control).
- Basic efficiency (energy flow).
- Consistent grip (within a range).
- Hit the ball varying height, direction, distance, and spin.
- Continue to develop balance and pivot for efficient court movement.
- Continue to learn overall sports skills in addition to squash-specific skills.

Tactical

- Learn positions of playing: areas of the court and movement patterns.
- Introduce the ‘T’ prior to concepts of offence and defence.
- Introduce the concept of offence and defence.
- The goal of offence is to create space, thus providing the capacity to attack.
- The goal of defence is to restrict space, thus reducing your opponent’s capacity to attack.

Physiological/Physical

- Females will enter their major growth spurt (Peak Height Velocity, or PHV) towards the end of this stage (plus the possibility of menarche, their first period).
- The male growth spurt typically straddles this stage and the next.
- Overall development of the nervous system is usually approaching the adult stage.
- Although reaction time remains slow, players develop improved motor control.
- Hand-eye coordination allows for better catching and throwing performance.
- Strength and strength endurance capability rises largely due to nervous system development and coordination improvements.
- There is little potential for hypertrophy (muscle mass increase) so formal resistance training is not necessary.
- Performance gains are possible as a result of training, but most gains are simply due to growth.

Psychological

- Parents and coaches should be supportive of the use of psychological skills for both competition and practice.
- Players develop a thorough understanding of the importance of practicing and utilizing mental skills.
- Players are shown how mental states can affect squash performance.
- Players learn about positive self-talk, cue words, and re-focusing thoughts to help build and maintain confidence.
- Structured practice sessions are introduced for imagery use as well as other mental skills (e.g., anxiety/arousal control).
- Basic goal setting is introduced with short term goals for practices.
- Initially, players should focus goals on process rather than outcome (e.g., develop better length and tightness on drives).

Ancillary Skills

- Sport and activity programs should be providing an age-appropriate and progressive nutrition education program based upon both the needs of the sport/activity and early adolescence.
- Warm-up, cool-down and recovery activities should be well-defined and integrated into the overall program.

Competition

- Introduce formal game play, applying the correct rules of service and return of service.
- Play with scoring to 15 or 11, or play timed games.
- Introduce players to organized results and playing formats such as ladders, round robins and box leagues.
- Introduce players to tournament play within their age groups and genders: multiple games with match results.
- Tournaments could be one-day events.
- Focus on Novice events (first year participants).
- Participation could be within a club, or there could be community championships for different age groups.

Stage 4: Training to Train

Ages 12-16 males, 11-15 females

Key Objectives

Develop squash-specific skills. Start to build the performance 'engine': work on athlete speed and introduce strength training.

Where

Clubs and Provincial programs; schools and community recreation programs.

Who

Provincial coaches and club coaches/ professionals; community recreation instructors.

Total Hours Training & Competition

4-6 hours per week.

Training to Competition Ratio

- 60% training and 40% competition (tournament participation increases). Although players may select squash as their main sport, it is important for them to maintain participation in one other sport. Introduction to national competition may occur at this stage depending on the developmental age of the player.

Periodization

- Single periodization that features a semester-by-semester evaluation and progression.

Technical

- Focus on developing squash-specific skills.
- Increased emphasis on court movement.
- Continue to acquire and perfect the ball striking fundamentals of Height, Speed, Distance, Direction and Spin.
- Continue to work on error correction.
- Skill award programs.

Tactical

- Introduce the concept of open and closed strategies based on opponent's court movement (e.g., open court strategy for slower opponents and closed court strategy for faster opponents).
- Begin to recognize strengths and weaknesses of yourself and your opponent.
- Begin to develop pattern recognition skills.
- Identification and correction of tactical and strategic errors in play.

Physiological/Physical

- This stage presents the maximal growth rate for both females and males.
- Females typically experience increased body fat levels in response to hormonal changes.

- Menarche usually occurs about 12 months after peak height velocity (PHV), the greatest rate of change in height.
- PHV usually occurs between 11.5 - 12.5 years of age in females and around 14.5 years in males.
- During PHV (the 'growth spurt'), the typical growth sequence begins with feet and hands, then moves to legs and arms.
- As with earlier stages, the skeletal system remains fragile, particularly the long bones.
- Performance is likely to be compromised by the affects of rapid growth on coordination, relative and absolute strength, and speed and endurance. However, this stage is sensitive to developing aerobic capabilities and suppleness (flexibility). Also, towards the end of the stage, gains can be made in strength and speed-endurance by emphasizing those capacities in training.

Psychological

- Athletes should have structured, planned psychological skills training sessions in their training schedule.
- Encourage regular personal use of psychological skills.
- Optimize quality of play during training sessions by building players' awareness of their best mental performance states.
- Use positive imagery to help refine skills (e.g., imagine how a drop shot will look and feel when executed successfully) and for motivation (e.g., imagine making a comeback when behind in a game).
- Use both short term and long term goals extensively.
- Introduce outcome goals (e.g., placing top 3 at a competition).
- Initiate performance planning and development of pre-competition plans.

Ancillary Skills

- Players continue to learn about nutrition through a progressive educational program that provides practical suggestions for the player's daily lifestyle.
- Warm-up, cool-down and recovery activities should be well-defined and integrated into overall training programs.

Competition

- Club programs include junior interclub league play
- School squash
- Travel to other provincial clubs and cities
- Exposure to team play and mixed team competitions
- Provincial and National Squads (near end of stage)
- Provincial Games and Canada Games (near end of stage)
- Provincial/National/Club camps
- Mentoring Program (with an adult member)

Stage 5: Training to Compete

Ages 16-23 +/- males, 15-21 +/- females

Key Objectives

Optimize squash-specific preparation. Focus on specializing in squash.

Where

Provincial and National Training Programs.

Who

Club coaches/professionals, NCCP level 3 coaches and Provincial coaches.

Total Hours Training & Competition

11-15 hours per week.

Training to Competition Ratio

- About 35% training - 65% competition (40% tournament play, 25% practice matches and competitive drills). Players are introduced to international competition (depending on their developmental age).

Periodization

- Year-round periodization to include national and international competition schedules, tours and training camps.

Technical

- Maintenance and continuation of squash-specific skills.
- Maximize strengths: develop based on skill set the athlete has developed to this stage.
- Increased emphasis on performing technique under pressure.
- Optimize squash-specific skills while learning to compete.

Tactical

- Further develop pattern recognition skills and situation analysis.

Physiological/Physical

- Growth in height typically ends in this stage (females 17-18 years, males 19-20 years).
- The presence of testosterone increases the potential for increases in muscle mass (particularly in males), as well as the positive response to speed and power training.
- All of the athlete's major physiological systems have been established during the early part of this stage, so adult training regimens can be introduced at levels appropriate to the individual's training history and level of development.
- The skeletal system responds favourably to appropriate training loads and direction.

Psychological

- Continue specific structured and planned mental skills practice sessions (e.g., goal setting, positive self-talk and imagery).
- Players should be self-evaluating their psychological states and performance strategies.
- Enhance mental toughness by improving specific psychological skills (e.g., focusing, relaxing or arousing oneself) to help athletes manage distractions, increase concentration, and optimize their optimal mental performance state.
- Athletes should use imagery at an advanced level and for all its possible functions (skills, strategies, arousal, coping with challenges, winning).

Ancillary Skills

- Players have adopted clear nutritional strategies.
- Specific elements deal with training camps, travel, foreign countries and recovery.
- Warm-up, cool-down and recovery activities are well-defined and integrated into the overall program.

Competition

- Club squash program
- School squash
- Provincial and National Teams
- Canada Games
- Competitive tour
- Provincial/National/Club camps
- Adult Mentoring Program
- Espoir Squad
- World University Championships
- World Junior Championships
- Pan American Junior Championships
- Pan American Championships

Stage 6: Training to Win

Ages 19 +/- males, 18 +/- females

Key Objectives

Maximize sport specific preparation.
Finish on the podium!

Where

National and Provincial Training Programs.

Who

NCCP level 4 Coaches.

Total Hours Training & Competition

25 hours (including video sessions, warm-up and cool down).

Training to Competition Ratio

- 25% training and 75% competition (25% tournament play, 25% practice matches, 25% competitive drills). International competition is the major component of the athlete's calendar planning for competition. The athlete must schedule training and recovery around the international calendar.

Periodization

- Multiple periodization taking into account international competition schedule and world championships.

Technical

- Refine all skills
- Execute technique under pressure
- Stay current by watching other top players
- Borrow technique
- Maximize squash-specific skills while pursuing podium finishes

Tactical

- Raise the base: increase performance when operating at 75% of peak performance.

Physiological/Physical

- The player's physical systems and structures continue to mature.
- Training is likely to move to highly individualistic and high performance squash-specific preparation.
- Multi-year and single-year planning will be required to ensure optimal management of the player's training-competition-recovery schedule.
- Regardless of the stage in the training-competition-recovery schedule, an underlying 'base' of physical capacities will be maintained at all times.

Psychological

- Players should be aiming for complete mental toughness and full psychological awareness.
- Focus on performing under pressure.
- Players demonstrate full self-control over emotions and an ability to deal with distractions or difficult/unforeseen situations (e.g., playing with minor injuries, breaking a racquet).
- Players show an ability to control self confidence and keep it at optimal level (i.e., confident but not over-confident).
- Players continue to have both short- and long-term goals that are specific and attainable.
- Unforced errors should be at an absolute minimum.
- Players use advanced imagery for all settings and purposes.
- Players completely focus on their squash performance and winning.

Ancillary Skills

- Clear nutritional strategies are in place.
- Specific elements deal with training camps, travel, foreign countries and recovery.
- Warm-up, cool-down and recovery activities are well-defined and integrated into the player's overall program.

Competition

- National Senior squad
- National Senior team
- Pan American Championships
- Pan American Games
- Commonwealth Games
- PSA and WISPA
- World Championships (Senior)

Canadians versus the World

For Squash Canada, one Training to Win objective is to see our Canadian players make similar progress in the World rankings as their international peers from year to year. To date, Canadians have tended to lag behind their international counterparts after the first two years of competition, with progress in the rankings being inconsistent and slightly erratic. Through LTPD, we hope to see Canadian players match the progress of their World competitors more closely.

For a comparison graph of Canadians in the World professional rankings of the PSA and WISPA, please see Appendix E.

Stage 7: Active for Life

Any age males and females

Key Objectives

Healthy lifestyle for life, Active involvement in squash (retention and adult onset or initiation).

Where

Clubs and community recreation programs.

Who

Club coaches/professionals and community recreation instructors.

Training to Competition Ratio

- Specific to each individual. The ratio is dependent on individual goals.
- Masters level competition is an integral part of squash in Canada.
- Many age group athletes will follow training to competition ratios similar to competitive athletes as they prepare for National and International age group competition.
- A significant number of players will not adopt a specific ratio and continue to participate in the sport of squash as part of their commitment to healthy active living.

Periodization

- None specified for this stage.

Technical

- Technical development will be dependent on the athlete's past experience, current desire and goals.

Tactical

- Tactical considerations depend on the goals of each player.

Physiological/Physical

- Largely an issue of keeping active for life.
- Different players may have specific objectives (competitive or not).

Psychological

- Encourage an awareness of the mind/body connection.
- Avoid negative self-talk.
- Encourage regular participation through goal setting.
- Develop focusing and relaxation techniques to help maintain concentration and control arousal levels in match play.
- Use imagery to reinforce physical skill acquisition, enhance strategic play, and to help motivate.
- Goal setting will be dependent on the individual squash player's level of competition.

- Players competing in Masters squash tournaments should follow the same steps as the younger competitive players.

Ancillary Skills

- Players maintain general habits and practices aimed at maintaining a healthy lifestyle.
- Specific interventions may be taken depending upon level of play and other individual requirements.

Competition

- World Masters Games
- Provincial and National age groups
- Interclub
- NSO, PSO and Regional
- Coaching, officiating and volunteering
- Doubles

My LTPD Story: John Furlong

John Furlong was the CEO of the Vancouver 2010 organizing committee, but few people know he has also been an amateur squash champion. After discovering the sport at age 29, he began training and competing intensely until he became Canadian champion in the Men's 35 division in 1986. Together with his experience as a player with the Irish national basketball and handball teams, coach of the Irish national women's basketball team, and past CEO of the Arbutus Club in Vancouver, he exemplifies someone who has stayed *Active for Life* and used his experience to give back to sport in different roles.

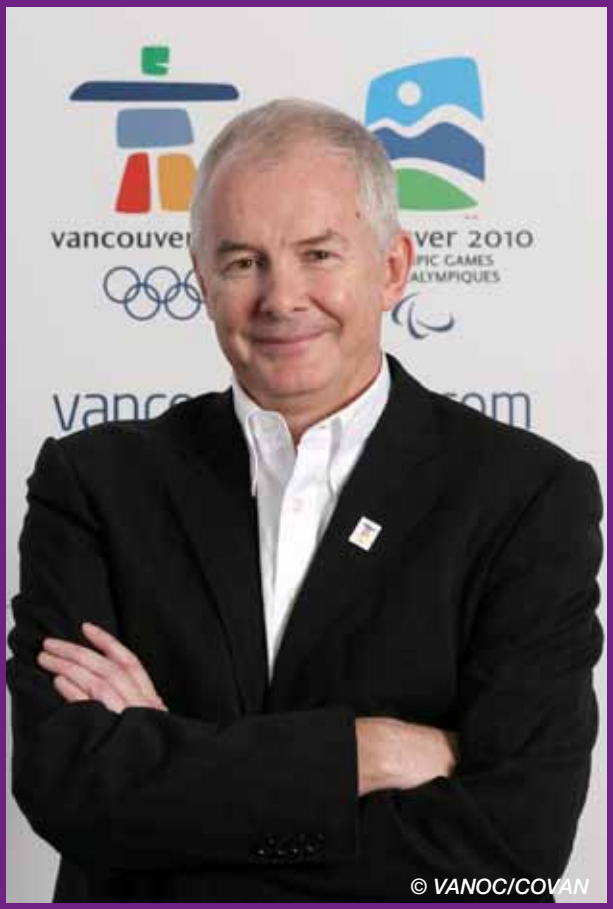
I started playing squash when I was 29 and living in Prince George. There was a court nearby and I had some friends who were playing, so I started playing on a dare and I got hooked.

I had already played team sports at a high level, so I simply took my competitive instinct and applied it to squash. I was what you would call "driven," but not nearly as talented as many of the other players around me. I got fit quickly and I reached A class within about two years. I won the Canadian Championship in 1986 for Men's 35, and then I found myself competing in the Men's 35 at the World Championship in 1987.

I liked the fact that it was a game where the reward was a direct result of your effort. You could either be super talented, or you could do it the way I did – get super fit and succeed. I thought squash played flat out was a pretty good metaphor for life. If you make the sacrifice and effort, you reap the reward. You won't get the result from a random turn of fate or a coin toss.

There are so many benefits to squash. It's relatively easy to play, and it's fantastic exercise, physically and mentally. For anyone who really wants to get the maximum out of their time, it's the right sport. It's good value and it keeps you healthy.

You can also play it your whole life, and you can play at any level – it doesn't matter how good or bad you are.



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In my case, I liked the fact that no matter how old I got, the quality of the competition was still good. There's nothing worse than playing a sport and feeling like you're not getting a whole lot from the exercise so you wander off and do something else. Not so in squash.

I think sport organizations in general could do a better job of instilling the idea in their athletes that they need to give back when they are finished competing. They shouldn't be taking all the benefits and then leaving without giving anything back. They need to be filled with a spirit of contribution. Simply put, sport needs to do a better job of connecting with these athletes so they will want to come back and contribute through coaching, officiating, or other means.

But the sport has to organize itself to do that, plan for it – it surely won't happen on its own.

- John Furlong

3. SQUASH LTPD SUPPORT PROGRAMS

LTPD relies on the support of our coaches, officials, clubs and associations throughout the integrated sport system of squash. It requires the understanding and support of parents, caregivers, teachers, health practitioners and sponsoring agencies who form part of this overarching squash system. LTPD requires that we align the activities and influence of all of these stakeholders with the needs of the player at each stage of LTPD.

Long-Term Development for Coaches

First and foremost, to help our players develop to their maximum potential, we need to provide them with quality coaching. Accordingly, as we align our training programs with LTPD principles and best practices, we need to ensure that our coaching development programs incorporate LTPD concepts and practices. From the community grassroots level to the national level, we need to align the training of our squash coaches with appropriate levels within NCCP so that our players receive the correct guidance at each stage of their development in the sport.

LTPD Stage	Player Pathways	Coaching Certification
Active Start	One pathway for all participants – playful activity	PSO Community Coach workshop
FUNdamentals	One pathway for all participants – FUN play	NCCP Introduction to Squash
Learning to Train	One pathway for all players – skills acquisition with emphasis still on fun	NCCP Introduction to Squash NCCP Intermediate Coaching Course
Training to Train	Players in this stage are moving towards specialization in squash. Other players have moved to the Active for Life stream.	NCCP Intermediate Coaching Course NCCP Introduction to Competition
Training to Compete	Players in this stage have specialized in squash. Some players may move to the Active for Life stream.	NCCP Introduction to Competition NCCP Competition Development
Training to Win	Players in this stage are highly specialized in squash and aim for podium finishes.	NCCP Competition Development
Active for Life	Players have a range of goals in playing squash – some purely recreational, some competitive.	NCCP Introduction to Squash NCCP Intermediate Coaching Course

Long-Term Development for Officials

To develop a correct understanding of the game, our players need to have quality officiating at those LTPD stages where competition becomes integral to their development in the sport. Accordingly, as with our coaching development programs, we need to align the training of our officials with the needs of LTPD competition. We want to ensure that our players learn the game with correct officiating, we want to safeguard the capacities of our officials at all levels of the game as new officials enter the system and others exit, and we want to safeguard the international presence of Canadian officials in squash.

LTPD Stage	Role of Match Officials	Certification Required
Active Start	No formal matches.	Adult with PSO Community Coach workshop.
FUNdamentals	No formal matches.	Adult with PSO Community Coach workshop or NCCP Introduction to Squash.
Learning to Train	Officials regulate match play. No instruction to players.	Squash Canada Provincial or National Examiners through rules clinics. Most matches will be refereed by peers or adults.
Training to Train	Officials regulate match play. No instruction to players. Continued instruction in rules and officiating.	Some matches will be refereed by peers, adults, or Squash Canada D4 or higher level referees. Key matches refereed by Squash Canada C3 or higher level referees. Minimum B1, Provincial or National Examiners through specially organized official training and/or individual tutoring.
Training to Compete	Officials regulate match play. No instruction to players. Advanced instruction in rules and officiating.	Early tournament round matches will be refereed by peers or Squash Canada D4 or higher level referees. Later tournament round matches refereed by Squash Canada B2 or higher level referees, Regional, or International Referees.
Training to Win	Officials regulate match play. No instruction to players.	Matches refereed by Squash Canada B2 or higher level referees, Regional, or International Referees.
Active for Life	Officials regulate match play and may instruct players in correct rules.	Matches will be refereed by peers or Squash Canada D4 or higher level referees

Leadership and Succession

To ensure the successful implementation of LTPD and its continuation in years to come, Squash Canada and Provincial/Territorial squash organizations need to work together to exercise leadership in LTPD initiatives. LTPD requires coordinated efforts at the national, provincial, territorial and regional levels to implement LTPD guidelines in coaching, officiating, competition, and ongoing development of facilities and programming. This work cannot be achieved without cooperation between squash leaders, organizations and clubs at all levels of the game in Canada.

A number of opportunities and challenges might be addressed:

- Creating a strategic organizational structure of squash across Canada.
- Planning for succession in squash leadership and LTPD implementation at all levels.
- Promoting squash domestically and internationally (e.g., Olympic initiative for squash).

To encourage greater cooperation and effective action between all squash stakeholders, it may be beneficial to perform a review of the governance structure for squash in Canada.

LTPD Resources for PSOs and Clubs

LTPD demands a certain amount of sophisticated understanding among players, coaches, parents and administrators to appreciate the principles of physical maturation and best practices in training. To promote this level of understanding and an appreciation of LTPD's purpose and importance, quality resources and information materials need to be readily available for players, coaches, parents and administrators from the provincial level to the club and community level. Part of the implementation plan for LTPD requires that a variety of suitable information materials and resources are developed for provincial squash organizations and clubs to be distributed and made accessible to coaches, administrators, parents and players.


NWT


Black Knight

4. COMPETITION

Competition plays a critical role in the development of our players. How we define the role of competition and the specific formats at each stage of LTPD will dramatically impact the development of their skills, tactics and mental capacities in the sport. It will also affect their enthusiasm for the game, as well as their relative success and longevity in the sport at all ages regardless of whether they choose high performance or simply activity for life. There are several key considerations when scheduling and designing competition at each LTPD stage.

a) Factors in Competition Planning

Training-to-Competition Ratios

The ratio of time spent in training to the amount of time spent competing should be adjusted according to the age of the player, their stage of maturation, and the number of years they have been playing squash (i.e., training age). For example, younger players and players with less experience should spend more hours in training to develop skills and physical capacities and much less time in formal competition. As players progress towards the end of the competitive pathway, at stages such as Training to Compete and Training to Win, they should be competing more in order to maximize the adaptation of their skills and other capacities to actual competition settings.

Periodization

Player training, competition and recovery should be guided by periodized plans at each LTPD stage. Periodization allows for cyclical peaking and tapering in training and competition so players do not burn out physically or mentally. Periodized plans will look different at each stage, according to the physical and mental maturation of the players.

Appropriateness of Competition

Competition formats should also respect the physical and mental maturation of players at each stage. Traditionally, most sports have imposed adult competition formats and schedules on child and youth players without considering the vast differences in maturation. Simply put, it may not be appropriate to have 8 year-old players competing in the same type of league or tournament formats as 18 year-old players. As well, it may be more appropriate to host regional competitions at certain ages and stages over national or provincial/territorial events, as travel and accommodation costs quickly become a barrier for many developing players or recreational participants.

Competition Scheduling

In the team setting, squash competition schedules can pose challenges for players and coaches who set out with the best intentions to follow logical periodized training plans, then find

that the timing of important competition events conflicts with those plans. In individual competition, it may be easier for players and coaches to select competitions according to the player's periodized training plan, maturation, training age, and unique developmental needs as a player. For example, it might not be useful or appropriate for a player to attend a particular competition simply because she is 'good enough' or qualified; it is conceivable that other factors in her development or training stage may dictate that it would be better to skip the competition or attend another.

Some Considerations:

- There is currently a gap between the end of the Canadian domestic season (April) and the start of the international season (mid-July). This gap represents a misalignment in periodization of training and competition, meaning that our high-performance players are not 'peaking' at the right time.
- There is potential to create more regional events to develop our junior players within Canada. More regional events would decrease travel and accommodation expenses in younger age groups and help to promote competitive development while sustaining player participation in squash.
- Different competitions may or may not be appropriate for talent identification and National Team selections.

b) Competition Review

To ensure that squash competitions are serving the best interests of our players, Squash Canada is committed to reviewing the timing and format of the various competition events across the country and assessing them according to their appropriateness to LTPD.

Competition Schedule

- The domestic season in Canada currently runs from September to April each year.
- The Canadian Junior Championship is traditionally held the 3rd week in April.
- The Canadian Championships (seniors and masters) are traditionally held in the 4th week of April. (Club coaches are averse to hosting either of these events earlier in the season.)
- Major International Junior events are held in the summer and December. The December events are a concern because there are 4 major events in 5 weeks, during a period when players should be resting. (These events include the Canadian Junior Open, the US Junior Open, the Scottish Junior Open, and the British Junior Open.)

Competition Formats

- Currently, the standard tournament format for all domestic and international events is the same: a match is best 3 of 5, scoring PAR 11.
- Junior age divisions are currently U13 / U15 / U17 / U19. (Until 1998, these were U12 / U14 / U16 / U19, then the age divisions were adjusted by one year due to issues with the 3 year gap between U16 & U19.)
- U10 events were considered and rejected by Squash Canada in 1993.

Some Considerations:

- Consideration should be given to skill-based events for the younger juniors in-addition-to or in-place-of standard competitions.
- Consideration should be given to creating a U23 event to support the Espoir squad (and the age group transitioning to senior level play).

Figure: Competition at the National Level

Squad	Events	Considerations
Junior	• Pan American Junior Championships (annual) • World Junior Championships (bi-annual)	• Selection events: 1 east, 1 west, nationals and 2 other.
Espoir - Training	• Potential for World University & Pan American Championships	• Created to maintain relationship with athletes at universities (especially US)
Espoir - Competitive	• Potential for World University & Pan American Championships	• Created to provide continuum of high-performance programming from junior to senior
Senior	• Pan American Championships (annual) • World Teams (bi-annual) • Pan American Games • Commonwealth Games	• Engage all senior squad in some national team events • Some athletes may be on the team for a long time; we need to be cognizant of succession planning

Competition at the Active for Life Stage

- Canadian squash has a well developed Active for Life competition component, as does the sport of squash in general.
- Players of all ages and abilities can choose to compete from several graded squash events, including leagues, tournaments, and club ladders and box play.
- Open, A, B, C, D, and E/Novice are hosted by most provincial-level competitions, supporting LTPD principles of fulfilling individual potential and lifelong participation.
- The Canadian Squash Championships have several events at the Masters level: Open, A and Masters. Masters events range from +30 to +75 (increments of 5 years).
- Most masters and seniors players participate in leagues, as well as club ladders and box play.
- Universities and colleges support the competitive development of players, as well as late entry into squash as a sport. A significant percentage of recreational players are exposed to squash in university and enter the LTPD pathway as adults. Squash Canada maintains a list of squash courts in 50 universities and colleges in 10 provinces and territories, and invitations are sent each year to invite these players to annual Canadian University and College Championships.

c) Achieving Podium Performances

LTPD aims to produce excellence even as it promotes lifelong activity and wellness for all Canadians. Accordingly, alongside the Active for Life player stream, LTPD supports high performance in squash through national and international competition. In the high-performance stream, our players aim to achieve podium performances and win medals at the national and international level. Currently, the target competitions in high performance are:

- Canada Games (every 4 years)
- Canadian National Championships – Juniors (annual)
- Canadian National Championships – Seniors (annual)
- World University Championships (every 2 years)
- Pan American Championship – Juniors (annual)
- Pan American Championship – Seniors (year 1-3 of quadrennial)
- World Junior Team Championships (every 2 years)
- World Team Championship – Seniors (every 2 years)
- Commonwealth Games (every 4 years)
- Pan American Games (4th year of quadrennial).

To prepare our high-performance players for these competitions, we need to engage in two more important activities: player monitoring and talent identification.

International Squash Competitions

Squash has been featured in the Pan American Games since 1995 but it is still not a core sport. Squash has lobbied to include squash in all Pan American Games (with the exceptions of Winnipeg 1999 and Toronto 2015, where squash was already included in the bids to host the Games).

Squash has featured in the Commonwealth Games since 1998, and the Commonwealth Games Federation (CGF) added squash as a core Commonwealth sport in 2006.

Squash is not an Olympic sport at present, though it was one of 5 sports shortlisted for addition to the Olympic program in 2005 (for 2010) and 2009 (for 2016). Squash will continue to work towards inclusion in the Olympic Games.

d) Player Monitoring

The training regimens of our squash athletes are designed to foster long-term development of many different player capacities. As our players progress through the LTPD model, they are engaged in training and lifestyle practices that affect their fitness, technical skills, tactical awareness, mental capacities and nutrition, to name only the obvious areas. To maximize the efficacy of training, the affects and outcomes of their training need to be evaluated on a regular basis through rational player monitoring protocols.

Evaluation provides coaches and athletes with feedback that can be used to adjust training regimens as necessary. Without this feedback, a player may continue training ineffectively and fail to develop the fitness, skills, tactical awareness and other capacities needed for competitive success. The Squash Canada *Technical and Fitness Testing Protocol Manual* has been developed with the intention of helping club, provincial and national coaches monitor the development of their athletes for this purpose, and it is available to club administrators and coaches from Squash Canada.

The *Manual* is also useful as a means to establish Canada-wide norms and performance measures which Squash Canada can use in its talent identification program. As these norms are published and made accessible to players, coaches and administrators, it becomes possible to compare athletes at the same LTPD stage and identify talent according to individual performance relative to these norms.

Talent Identification

Talent identification is a critical part of the LTPD high-performance pathway. Players are generally identified for high performance during the Learning to Train and Training to Train stages, though some may emerge at the ages we associate with the Training to Compete and Training to Win stages.

It is important that we base our talent identification on player talent and skill and not necessarily competitive results. For example, a junior player who has experienced early physical maturation may win competitions because he or she is physically bigger and more powerful than other competitors of the same chronological age, but this player may or may not have the skills to compete well at the senior level when the other players catch up in size and maturation. LTPD attempts to avoid missing the 'late bloomers': those players who might appear less strong at the Junior level but have the potential to emerge as top competitors at the Senior level once they mature.

Currently, Canadian player talent is identified in 3 ways:

1. Player rankings
2. Results at National Championships
3. Talent identification camps

Coaches and evaluators can collect additional player data for talent identification using a Player Evaluation Form (see Appendix D, page 75). When combined with player rankings and competitive results at Nationals, the data from Player Evaluation Forms can provide valuable information for making final selections for Junior and Senior National squads.

Coaches may conduct Player Evaluations while attending junior tournaments or during talent identification camps. While observing players compete, most coaches can recognize whether they are ahead or behind the curve for their stage, whether they have a great drop shot or a poor volley. It is important to record these observations in writing so Squash Canada can continue to monitor player progress and identify talent as it emerges. When National squads are selected, coaches should be able to review Player Evaluation data over a span of 2 to 3 years and see how each player has progressed.

In the interests of feeding our high-performance stream for international competition, Canadian junior players should be monitored and evaluated at regular intervals to identify potential talent. We are primarily concerned with two age groups:

- 17-18 year-old players in National competitions.
- 14-16 year old players in Provincial and Territorial competitions.

In making team selections, coaches and administrators should consider which competitive events are appropriate for identifying talent and evaluating players. They should also consider alternate venues that may exist or be developed for this purpose, as well as the criteria used in selecting players for Provincial and National Squads.

5. IMPLEMENTING LTPD

LTPD provides a rational and complete approach to achieving squash goals ranging from high performance to lifelong wellness through participation in recreational play. However, it is clear that implementing LTPD will have significant implications for every facet of the squash 'sport system' in Canada.

Implementing LTPD will require adjustments at every level of Canadian squash, and squash stakeholders will need to make concerted efforts to educate parents, coaches, and administrators in LTPD principles. Clubs and leagues may need to change competition formats for some age levels, coaches may need to adjust their training regimens and philosophies regarding competition, and administrators will need to demonstrate accountability in their roles. Support for LTPD implementation will need to come from diverse stakeholders who may have to set aside personal interests for the greater success of Canadian squash as a whole. All the while, implementation must also follow logical planning that accounts for the financial, social and geographical realities of our sport in Canada.

For these reasons and many more, LTPD implementation must be approached with patience, understanding, resolve, and a firm sight on the goal of strengthening our Canadian game.

Roles, Responsibilities and Action Plans

LTPD implementation will follow a series of structured Action Plans that detail the strategic objectives of squash for each LTPD stage, the actions required to attain them, timelines for taking these actions, and the people and groups responsible for each action. These Action Plans will be developed through discussion with all stakeholders in Canadian squash, periodically reviewed, and published as they are developed.

The successful implementation of LTPD will require clear definitions of stakeholder roles and responsibilities. Without clear definitions, there is potential for confusion, conflict and inaction between stakeholders during implementation. Definition of roles will ensure accountability for each of the strategic objectives; consequently there should be discussion and joint agreement on precisely who is responsible for completing each task.

SUMMARY

The introduction of LTPD represents an important leap forward in the development of Canadian squash. By using rational and sequential guidelines for training, competition and recovery based on the science of human maturation and proven best practices in coaching, LTPD is positioned to promote physical literacy and the growth of squash in Canada. It will help our sport to thrive in clubs and recreation programs across the country by encouraging growing participation by Canadians of all levels of intellectual, physical and sensory ability. In the span of the coming decades, it will also help Canadian players reach the podium at international competition on a consistent basis.

With *Beyond the Nick*, we are recognizing the importance of having a long-term vision for our sport. In squash clubs and recreation centres across Canada, we want to do more than simply help our players win games today or tomorrow; we want to promote a lifelong love of the sport and build the skills and capacities that will serve our athletes at all levels of the game for years to come. Some of our players may choose to pursue medals at the national and international level, while others may simply play squash as part of an active lifestyle. LTPD is designed to serve the needs of both.

Two principle characteristics of LTPD make this possible: it is systematic, and it is player-centered. Too often in sport, training is random and produces unpredictable results, while an over-emphasis on the goals and desires of coaches, club administrators and parents often sees both the immediate needs and long-term goals of athletes ignored. LTPD puts the focus on the needs of the player both in the short term and the long term, and it provides a logical framework in training, competition and recovery to serve their optimal development in the game.

LTPD will guide all those involved in Canadian squash in a regular re-examination of our practices in training, competition and recovery and how they affect the ongoing development of our players. As we move forward, LTPD will provide both a yardstick and a road map to ensure we are serving the best interests of our squash athletes and ultimately our sport – because we can always get better. We all play a role in ensuring that LTPD is a success whether we are coaches, administrators, parents or players. This document is an invitation to everyone to help make LTPD the gold standard in Canadian squash.

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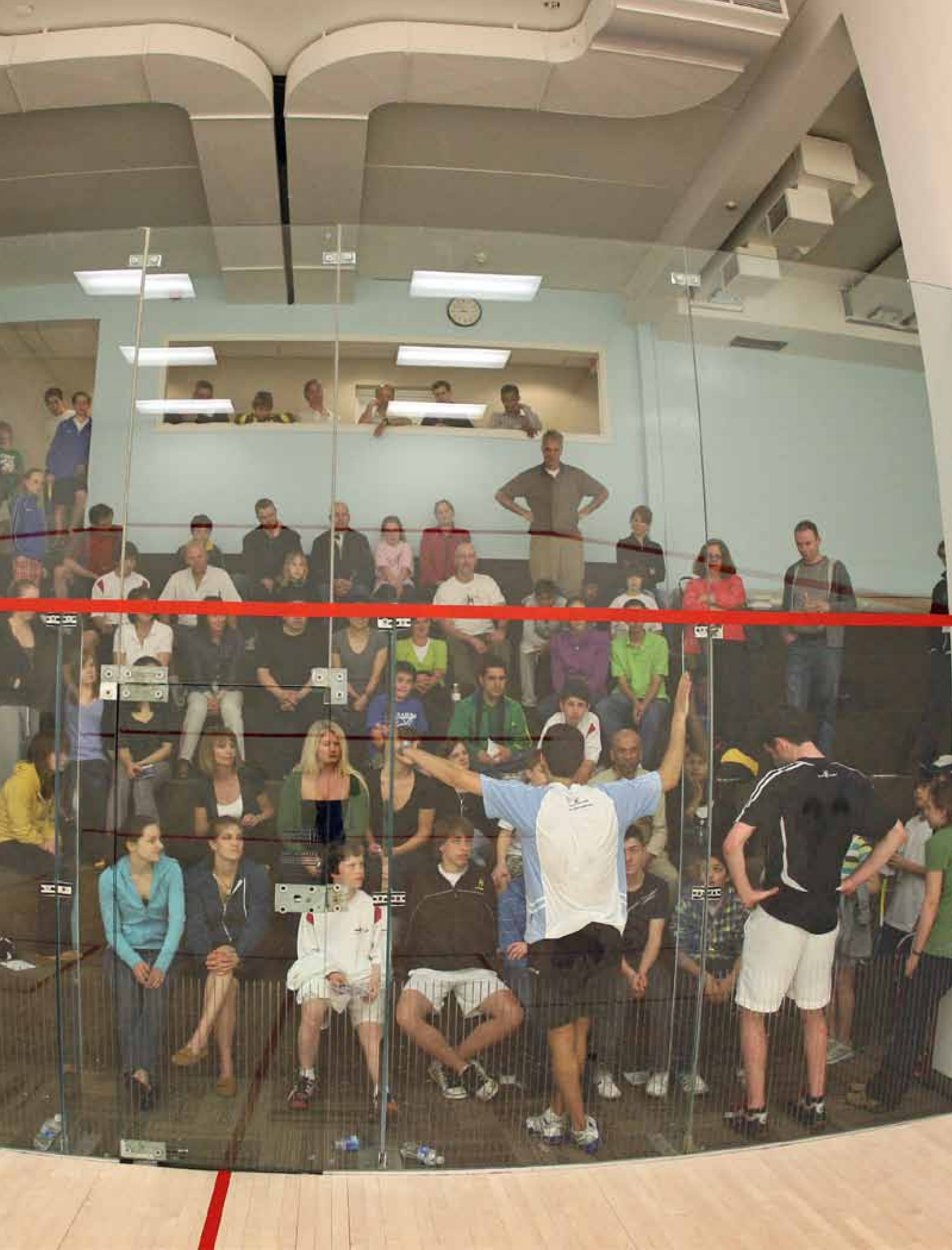


Appendix A: Glossary of Terms

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 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.

Adolescence is a difficult period to define in terms of the time of its onset termination. During this period, most bodily systems become adult both structurally and functionally. Structurally, adolescence begins with an acceleration in the rate of growth in stature, which marks the onset of the adolescent growth spurt. The rate of statural growth reaches a peak, begins a slower or decelerative phase, and finally terminates with the attainment of adult stature. Functionally, adolescence is usually viewed in terms of sexual maturation, which begins with changes in the neuroendocrine system prior to overt physical changes and terminates with the attainment of mature reproductive function.

Ancillary Capacities refer to the knowledge and experience base of a player and includes warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, regeneration, mental preparation, and taper and peak.

The more knowledgeable players are about these training and performance factors, the more they can enhance their training and performance levels. When athletes reach their genetic potential and physiologically cannot improve anymore, performance can be improved by using the ancillary capacities to full advantage.

Childhood ordinarily spans the end of infancy – the first birthday – to the start of adolescence and is characterized by relatively steady progress in growth and maturation and rapid progress in neuromuscular or motor development. It is often divided into early childhood, which includes preschool children aged 1 to 5 years, and late childhood, which includes elementary school-age children, aged 6 through to the onset of adolescence.

Chronological age refers to "the number of years and days elapsed since birth." Growth, development, and maturation operate in a time framework; that is, the child's chronological age. Children of the same chronological age can differ by several years in their level of biological maturation. The integrated nature of growth and maturation is achieved by the interaction of genes, hormones, nutrients, and the physical and psychosocial environments in which the individual lives. This complex interaction regulates the child's growth, neuromuscular maturation, sexual maturation, and general physical metamorphosis during the first 2 decades of life.

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

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

Maturation refers to qualitative system changes, both structural and functional, in the child's progress toward maturity. One example would be the change of cartilage to bone in the skeleton.

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

Physical literacy refers to the mastering of fundamental motor skills and fundamental sport skills.

Post-natal growth is commonly, although sometimes arbitrarily, divided into 3 or 4 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 refers to the child's level of growth, maturity, and development that enables him/her to perform tasks and meet demands through training and competition. Readiness and critical periods of trainability during growth and development of young athletes are also referred to as the correct time for the programming of certain stimuli to achieve optimum adaptation with regard to motor skills, muscular and/or aerobic power.

Sensitive period of accelerated adaptation to training refers to a point in the development of a specific capacity (e.g., stamina, strength, speed, skill, suppleness) when experience or training has a marked effect on its development.

Skeletal age refers to the maturity of the skeleton determined by the degree of ossification of the bone structure. It is a measure of age that takes into consideration how far given bones have progressed toward maturity, not in size, but with respect to shape and position to one another.

Trainability refers to the genetic endowment of athletes as they respond individually to specific stimuli and adapt to it accordingly. Malina and Bouchard (1991) defined trainability as "the responsiveness of developing individuals at different stages of growth and maturation to the training stimulus."

Appendix B: Training Matrices

Training Matrix: Skills

very high emphasis

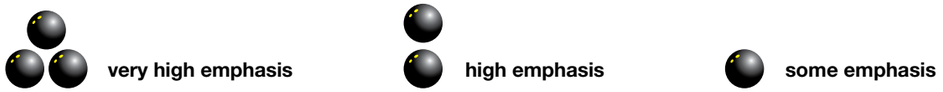
high emphasis

some emphasis

	Forehand Length	Backhand Length	Serve	Boast	Drop	Lob	Volley	Movement	Anticipation	Deception
Active Start 0-6 Males & Females										
FUNdamentals 6-9 Males, 6-8 Females	●●●	●●●	●●●	●	●		●	●	●	
Learning to Train 9-12 Males, 8-11 Females Training age: 1-3 yrs	●●●	●●●	●●●	●●	●		●●	●	●	●
Training to Train 12-16 males, 11-15 females Training age: 4-6 yrs	●●●	●●●	●●	●●●	●●		●	●●	●●	●●
Training to Compete 16-23 +/- males, 15-21 +/- females Training age: 7-10 yrs	●●●	●●●	●	●	●●●	●●	●●●	●●●	●●	●●●
Training to Win 19 +/- males, 18 +/- females Training age: 10+ yrs	●●●	●●●	●	●	●●●	●	●●●	●●●	●	●●●
Active for Life any age males & females Training age: any age										

Training Matrix: Physical Capacities 1

- A wide variety of physical skills and capacities are required to play squash. In high performance competition, the development of these capacities becomes even more critical.
- The following table presents the target physical capacities to be developed or emphasized at each LTPD stage.
- NOTE: During the Active for Life stage, the training emphasis on physical capacities will vary according to the interests and goals of each player.



	Agility	Balance	Coordination & Rhythm	Spatial Awareness	Reaction Time/Speed	Suppleness/ Flexibility		Speed	Anaerobic Capacity & Power	Aerobic Power	Aerobic Capacity/ Endurance	Specific Muscular Power	Specific Muscular Endurance	Speed/ Strength	Maximal Strength	Hypertrophy	General Strength Endurance
Active Start 0-6 Males & Females	2	2	2	2	2						1						1
FUNdamentals 6-9 Males, 6-8 Females	3	3	3	3	3	1		2		1	2						1
Learning to Train 9-12 Males, 8-11 Females Training age: 1-3 yrs	3	3	3	3	3	3		2		1	3			1	1		2
Training to Train 12-16 males, 11-15 females Training age: 4-6 yrs	2	2	2	2	2	3		3	1	3	3	1	1	2	2	1	3
Training to Compete 16-23 +/- males, 15-21 +/- females Training age: 7-10 yrs	2	2	2	2	2	3		3	2	3	3	3	3	3	3	3	1
Training to Win 19 +/- males, 18 +/- females Training age: 10+ yrs	1	1	1	1	2	3		3	2	3	3	3	3	2	1	1	1
Active for Life any age males & females Training age: any age	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1

Training Matrix: Physical Capacities 2

- A wide variety of physical skills and capacities are required to play squash. In high performance competition, the development of these capacities becomes even more critical.
- The following table presents special considerations that should be respected in the physical maturation of athletes at each LTPD stage.
- NOTE: During the Active for Life stage, the training emphasis on physical capacities will vary according to the interests and goals of each player.

Active Start
0-6 Males & Females

The child's initial high growth rate slows and body proportions align performance highly related to physical senses such as pressure General locomotion skills are clearly established (i.e., walking and towards the end of this period. Rapid development of the nervous system and brain weight/size. Motor control and sensitivity and touch. Hand-eye coordination and overall movement sequences visibly and steadily improve. running). The skeletal system (including the head/skull) is very fragile and high loading forces cannot be tolerated.

FUNdamentals
6-9 Males, 6-8 Females

Physical growth is relatively constant but slower than Active Start steadily. Although aerobic metabolism is primary, low endurance is significantly higher at all levels than in adults, including rest. well. Skeletal system continues to be fragile with poor loading capabilities increase due largely to nervous system development phase. Nervous system development continues rapidly but slows towards end of stage. Coordination improves prevalent in early part of stage but improves noticeably. Anaerobic capacity is very limited, and heart rates are Thermoregulatory control is poorly developed and children are not equipped to deal with hot or cold environments tolerance. Reaction time is slow, although coordinated movement speed improves. Strength and strength endurance and coordination improvements. There is little potential for hypertrophy (muscle mass increase).

Learning to Train
9-12 Males, 8-11 Females
Training age: 1-3 yrs

Females will enter their major growth spurt period towards the end stage and the next. Overall development of the nervous system coordination permits better catching and throwing performance. improvements. There is little potential for hypertrophy (muscle of this stage (plus the possibility of menarche - first menstruation), while the male growth spurt typically straddles this generally approaches the adult state. Although reaction time remains slow, improved motor control and hand-eye Strength and strength endurance capabilities increase due to nervous system development and coordination mass increase). Performance gains are possible as a result of training, but growth is the largest contributor.

Training to Train
12-16 males, 11-15 females
Training age: 4-6 yrs

Maximal growth rate for both females and males occurs in this occurs about 12 months after peak height velocity (PHV - greatest During the growth spurt, a typical sequence of growth is feet and Performance will likely be impacted by the affects of rapid growth developing aerobic capabilities and suppleness (flexibility). Also, period. Females typically experience increased body fat levels in response to hormonal changes. Menarche likely rate of change in height). PHV in females is usually between 11.5 - 12.5 years of age and in males around 14.5 years. hands, then legs and arms. As with earlier stages, the skeletal system remains fragile, particularly the 'long' bones. on coordination, relative and absolute strength, and speed and endurance. However, the stage is sensitive to towards the end of the stage, strength and speed-endurance training can be emphasized.

Training to Compete
16-23 +/- males, 15-21 +/- females
Training age: 7-10 yrs

During this period height changes typically end (females 17-18 (particularly in males), as well as the positive response to speed and therefore 'adult' and advanced forms of training may be undertaken favourably to appropriate training loads and direction. years and males 19-20 years). The presence of testosterone increase the potential for increases in muscle mass power training. All major physiological systems have been established during the early part of this period and at levels appropriate to the individual's training history and level of development. The skeletal system responds

Training to Win
19 +/- males, 18 +/- females
Training age: 10+ yrs

The physical systems and structure of the athlete continue to addition, multi-year and single-year planning will be required to an underlying 'base' set of physical aptitudes will be maintained mature. Training is likely to move to highly individualistic and high performance squash-specific preparation. In ensure optimal time management of the training-competition-recovery schedule. Furthermore, it is expected that at all times.

Active for Life
any age males & females
Training age: any age

Largely an issue of keeping 'fit for life,' but athletes may also have specific objectives at the individual level, whether competitive or recreational.

Training Matrix: Preparation & Recovery

- Training and competition put stress on the physical structures of the bodies of athletes. To prevent athlete burn out and ensure healthy, sustainable development of all physical structures and capacities, careful attention must be given to correct preparation and recovery during training and competition cycles.
- The following table presents the types of preparation and recovery activities that should take place at each LTPD stage.

	Physical conditioning and match preparation:	Suppleness (Flexibility):	Nutrition, Hydration, and other Regeneration factors:
 **Active Start** 0-6 Males & Females	No squash-specific requirements. Parents and caregivers should provide children with opportunities to engage in a wide range of movements, physical tasks/challenges, and 'play' involving movement. Gymnastics is an ideal Active Start activity and Gymnastics Canada has specialized programming at this age. The 4 key environments for movement should be introduced during the Active Start stage (on the ground, in the water, on snow and ice, and in the air).	Physical actiity will support the development of natural flexibility.	Parents and caregivers should provide sound nutritious foods and adequate water intake.
 **FUNdamentals** 6-9 Males, 6-8 Females	No squash-specific requirements. This is a critical stage for the development of Physical Literacy. As well, the foundations for many dvanced skills are also being established. The physical training aspects of warm-up and cool-down and the need for recovery (i.e. sleep) should be incorporated into activities and education.	Suppleness training should be built into warm-up/cool-down and recovery initiatives, as well as through other activities (e.g., gymnastics, dance, swimming, martial arts, etc). Daily flexibility should be a goal.	Parents and caregivers should provide sound nutritious foods and adequate water intake. Age-appropriate nutrition education (practical and fun) should be encouraged. The physical training aspects of warm-up and cool-down and the need for recovery (i.e., sleep) should be incorporated into activities and education.
 **Learning to Train** 9-12 Males, 8-11 Females Training age: 1-3 yrs	Although the overall physical conditioning program and direction will not be squash-specific, 'match preparation' should see the young player put into practice the key aspects being taught/rehearsed/practiced in training (both on and off-court components). These aspects will include warm-ups, cool-downs and recovery elements before matches, between matches (tournaments) and after matches, as well as overall recovery initiatives.	Suppleness training should be built into warm-up/cool-down and recovery initiatives, as well as through other activities (e.g., gymnastics, dance, swimming, martial arts, etc). Daily flexibility should be a goal.	Sport and activity programs should be providing an age-appropriate and progressive nutrition education program based on the needs of the sport/activity and the growing adolescent. Warm-up, cool-down and recovery activities should be well-defined and integrated into the overall program.
 **Training to Train** 12-16 males, 11-15 females Training age: 4-6 yrs	Physical conditioning through this phase will gradually become more 'squash specific.' although there will be a large multi-activity/multi-sport components even at the older/higher levels. All match preparation activities will be highly specific and will reflect those strategies being practiced within the training environment. Be aware of early vs. late maturers.	Suppleness training assumes a prominent place as part of the overall program, with more advanced elements incorporated (PNS and partner work).	Progressive nutritional educational program continues with clear expectations on practical aspects and the implementation of recommendations into the young player's lifestyle. Warm-up, cool-down and recovery activities should be well-defined and integrated into the overall program.
 **Training to Compete** 16-23 +/- males, 15-21 +/- females Training age: 7-10 yrs	Physical conditioning becomes specific to high performance squash, but elements still persist concerning overall athletic development and the particular strengths and weaknesses of individual athletes. All match preparation activities will be highly specific and reflect those strategies being practiced within the training environment. A progressive athlete monitoring program is required throughout this phase. Be aware of early vs. late maturers.	Suppleness training is part of the regular training and recovery program.	Clear and implemented nutritional strategies are in place. Specific elements deal with training camps, travel, foreign countries and recovery. Warm-up, cool-down and recovery activities are well-defined and integrated into the overall program.
 **Training to Win** 19 +/- males, 18 +/- females Training age: 10+ yrs	All aspects of preparation and recovery are specific to the lifestyle of a high-performance athlete and the goals of each individual. The format of training, preparation, competition, and recovery leads to establishing targeted behaviours and programs designed, implemented and monitored to ensure optimal competitive performance.	Suppleness training is individualized based on the application of sport science and elite athlete monitoring.	Clear and implemented nutritional strategies are in place. Specific elements deal with training camps, travel, foreign countries and recovery. Warm-up, cool-down and recovery activities are well-defined and integrated into the overall program.
 **Active for Life** any age males & females Training age: any age	Largely general pratices aimed at maintaining a healthy lifestyle, but with specific interventions as required depending upon level of play and other individual requirements.	Largely general pratices aimed at maintaining a healthy lifestyle, but with specific interventions as required depending upon level of play and other individual requirements.	Largely general practices aimed at maintaining a healthy lifestyle, but with specific interventions as required depending upon level of play and other individual requirements.

Training Matrix: Psychological Skills

- Sport is as much a mental and emotional challenge as it is a physical challenge. The ability to maintain high levels of concentration while remaining relaxed with the confidence to succeed is essential to long-term performance in any sport.
- The following table presents the psychological target skills to be developed at each LTPD stage.

Active Start
0-6 Males & Females

Introduce basic mental skills with fun, simple activities such as specific parts of the body). Initiate imagery use with low modeling with games like follow the leader (e.g., swing mechanics focusing (e.g., focus on objects and try to remember things about them) and relaxation (e.g., try to tense and relax organizational games involving the imagination (e.g., imaginary squash rallies on the squash court). Also, introduce and court movement).

FUNdamentals
6-9 Males, 6-8 Females

Present athletes with the idea of the mind/body connection. controlling anxiety, increasing relaxation, and the ability to energize is likely to happen when you hit specific shots from specific parts of

Introduce the concept of mental skills and their importance in sport. Utilize simple, fun-filled activities that focus on oneself. Use questioning strategies that encourage the use of imagery to help athletes develop an answer (e.g., what the court?). Parents and coaches should act as role models to support the learning and use of mental skills.

Learning to Train
9-12 Males, 8-11 Females
Training age: 1-3 yrs

Develop a thorough understanding of the importance of practicing of positive self-talk, cue words, and re-focusing thoughts to help (e.g., anxiety/arousal control). Introduce basic goal setting by length and tightness on drives). Parents and coaches should be

and utilizing mental skills. Create an awareness of how mental states can affect squash performance. Present ideas build and maintain confidence. Introduce structured practice sessions for imagery use as well as other mental skills developing short-term goals for practices. Initially, focus goals on process rather than outcome (e.g., develop better supportive of the use of psychological skills for both competition and practice.

Training to Train
12-16 males, 11-15 females
Training age: 4-6 yrs

Encourage regular personal use of psychological skills. Have play during training sessions, squash players need to be aware of imagine how a drop shot will look and feel when executed long-term goals extensively. Introduce outcome goals (e.g., placing

structured, planned psychological skills training sessions as part of athlete's schedule. In order to optimize quality of their best possible mental performance states. Athletes should be using positive imagery to help refine skills (e.g., successfully) and for motivation (e.g., imagine making a comeback when behind in a game). Use both short-term and top 3 at a competition). Initiate performance planning and development of pre-competition plans.

Training to Compete
16-23 +/- males, 15-21 +/- females
Training age: 7-10 yrs

Continue specific structured and planned mental skills practice performance strategies. Enhance mental toughness by improving concentration, and enable athlete to be in their optimal mental strategies, arousal, coping with challenges, winning). Continue use

sessions (e.g., goal setting and imagery). Players should be self-evaluating their psychological states and specific psychological skills (e.g., focusing, relaxing or arousing oneself) to help manage distractions, increase performance state. Athletes should be using imagery at an advanced level and for all possible functions (e.g., skills, of goal setting and positive self-talk.

Training to Win
19 +/- males, 18 +/- females
Training age: 10+ yrs

Players should be aiming for complete mental toughness and full control over emotions and ability to deal with distractions or self confidence and keep it at optimal level (i.e., confident but not errors. Use advanced imagery for all relevant functions. Total focus

psychological awareness. Focus should be on performing under pressure, with an ability to demonstrate full self difficult/unforeseen situations (e.g., playing with minor injuries, breaking a racquet). Demonstrate ability to control over-confident). Continued use of both short and long-term goals that are specific and attainable. Minimize unforced on squash performance and winning.

Active for Life
any age males & females
Training age: any age

Encourage an awareness of the mind/body connection. Avoid to help maintain concentration and control arousal levels during setting will be dependent on the individual squash player's level of competitive players.

negative self-talk. Encourage regular participation through goal setting. Develop focusing and relaxation techniques match play. Use imagery to reinforce physical skill acquisition, enhance strategic play, and to help motivate. Goal competition. Those competing in masters level squash tournaments should follow the same steps as the younger

Appendix C: Player Development Model

LTPD Stage	Level of Athlete	Responsibilities *primary (1), secondary (2) and tertiary (3)*
Active Start	Children in active play	1. Clubs and recreation programs provide support to schools and early childhood centres with visiting programs.
Fundamentals Learning to Train	Club Athlete - Age 7-18	1. Club - Club to provide coach (likely certified, L1-L4/5) and clinics 2. PSO - To provide support for novice events to encourage grass roots development
Learning to Train Training to Train Training to Compete	Competitive Junior - Age U13/U15/U17/U19 (competitive age-groups at national events)	1. Club - Club to provide (personal) coach and program 2. PSO - To provide support for competitive events - To provide assistance for recognized junior athletes: junior provincial squad 3. Squash Canada - To identify junior athletes (U13/U15) for future National Squads
Training to Train Training to Compete	Canada Games - Age U17/U19	1. PSO - To provide team coach (min. L3) - To provide camps in preparation for Games 2. Squash Canada - Provide event for identification of U17/U19 athletes
Training to Train Training to Compete	National Junior Squad - Age U19	1. Squash Canada - To provide National Coach (L4) , administrative support, camps, tours 2. PSO - To provide assistance where possible (e.g., funding for travel to competitive events)
Training to Compete	National Junior Team - Age U19	1. Squash Canada - To provide National Coach (L4) and logistics
Training to Compete Training to Win	Espoir - Age 18 ~26 - Ranked top 25	1. Squash Canada - To provide National Coach, camps, tours
Training to Win	National Senior Squad - Age 18 - Ranked top 10	1. Squash Canada - To provide National Coach (L4) , administrative support, camps, tours
Training to Win	National Senior Team	1. Squash Canada - To provide National Coach (L4) and logistics
Active for Life	All ages and levels of ability	1. Recreation programs provide instruction for late entry players. 2. Clubs provide personal coaching and programming for all interest levels. 3. PSOs provide competition opportunities.

Appendix D: Player Evaluation Form

Player Name	
Event	
Evaluator Name	
Date	

Please rank the athlete on each of the areas below using the following 5-point scale.
Please write any additional observations in the Comments section at the bottom of the form.

Legend:

1	Very Weak (Beginner)	**4**	Strong
2	Weak	**5**	Very Strong (Junior Squad Member)
3	Adequate	**N/A**	Not Applicable

Area 1: Technical

Forehand Drive	/5	Forehand Volley	/5	Serve	/5
Backhand Drive	/5	Backhand Volley	/5	Return of Serve	/5
Forehand Cross Court	/5	Forehand Boast	/5	Touch	/5
Backhand Cross Court	/5	Backhand Boast	/5		
Forehand Drop	/5	Lob	/5		
Backhand Drop	/5	Footwork	/5		

Area 2: Fitness

Hitting Power	/5
Agility	/5
Speed	/5
Endurance	/5
Leg Power	/5

Area 3: Mental

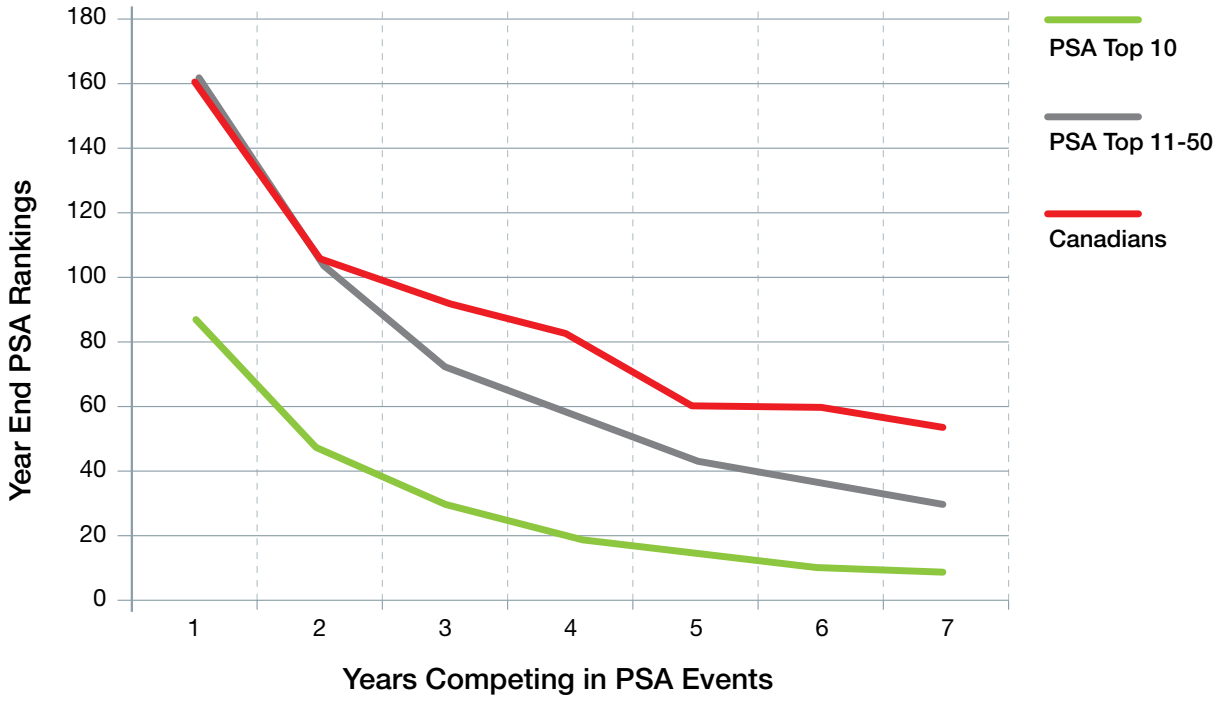
Focus	/5	Ability to Adapt to Opponent	/5
On-Court Temperament	/5	Competitiveness	/5
Off-Court Temperament	/5	Creativity	/5
Court Awareness	/5		

Area 4: Comments

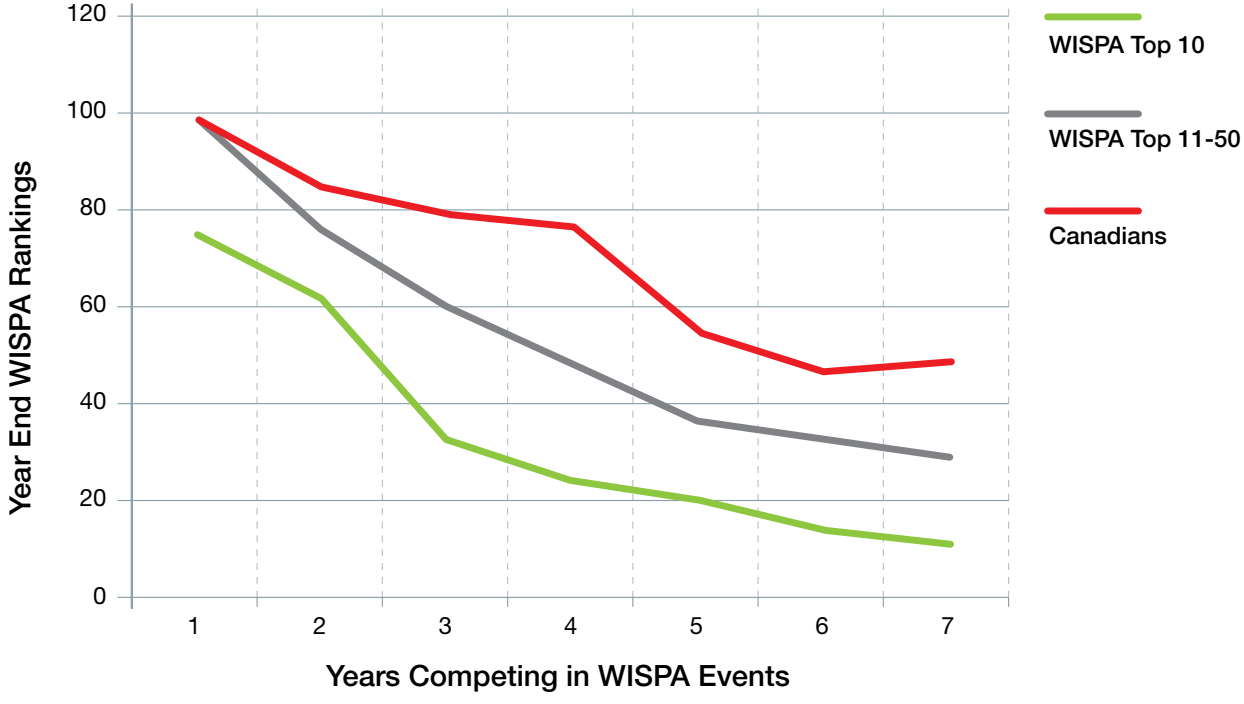
Please use the space provided below to provide any other feedback you have on this athlete.
You may also use the back of this sheet.

Appendix E:
Canadians Versus World – PSA and WISPA Rankings

PSA Rankings: World vs. Canada



WISPA Rankings: World vs. Canada



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