Boxing CANADA

LONG-TERM ATHLETE DEVELOPMENT

BOXING CANADA

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Table of Contents

ACKNOWLEDGEMENTS..... 02

FOREWORD..... 04

GLOSSARY OF TERMS..... 05

1 - INTRODUCTION AND GENERAL OVERVIEW..... 06
- Long-Term Athlete Development (LTAD): What Does This Mean?..... 06
- LTAD Goals..... 06
- Importance Of Reflecting On LTAD In The Sport Of Boxing..... 06
- Anticipated Benefits Of The LTAD Model In Boxing..... 07

2 - VISION OF THE CANADIAN AMATEUR BOXING ASSOCIATION..... 08
- What Do We Want To Accomplish?..... 08
- How Will We Get There?..... 08

3 - THE 10 FACTORS GOVERNING LONG TERM ATHLETE DEVELOPMENT..... 09
1. Time: LTAD Is A Process That Requires 10 Years..... 09
2. Early Acquisition Of The Fundamental Aspects Of Movement..... 09
3. Stages Of Development..... 11
4. Trainability..... 15
5. A Global Approach..... 16
6. Specialization At The Right Time..... 16
7. Periodization, Or The Training, Competition, And Recovery Plan..... 18
8. Competition Networks And Calendars That Are Well-Integrated And Consistent With LTAD Principles..... 20
9. System Alignment And Integration..... 21
10. Continuous Improvement..... 21

4 - THE 10 KEY PERFORMANCE FACTORS IN SPORT.. 22
- Aspect 1: Stamina, Or Aerobic Power And Endurance..... 23
- Aspect 2: Strength..... 23
- Aspect 3: Speed..... 24
- Aspect 4: Motor And General Sport Skills..... 25
- Aspect 5: Flexibility Or Suppleness..... 25
- Aspect 6: Structure / Stature..... 27
- Aspect 7: Psychology..... 27
- Aspect 8: Recovery..... 28
- Aspect 9: Education..... 29
- Aspect 10: Socio-Cultural Factors..... 29

5 - THE 7 STAGES OF LTAD IN BOXING..... 33
- STAGE 1: Active Start..... 34
- STAGE 2: FUNdamentals..... 36
- STAGE 3: Learn to Box..... 38
- STAGE 4: Train to Box..... 40
- STAGE 5: Train to Compete..... 44
- STAGE 6: Train for Peak Performance..... 46
- STAGE 7: Active for Life..... 48

6 - IMPLEMENTATION STRATEGIES FOR BOXING's LTAD MODEL..... 51

7 - BOXING CANADA's LTAD MODEL AND THE NEW NCCP..... 52

8 - BOXING CANADA'S LTAD MODEL AND THE DEVELOPMENT OF REFEREES..... 54

9 - SUMMARY AND CONCLUSION..... 55

SELECTED REFERENCES..... 56

Foreword

I am delighted to provide the forward for this important piece of work. I am a major proponent of all the principles of the Long Term Athletes Development model outlined in the present document, and have consistently spoken out against the culture of over-competing that engulfs many of our best clubs. Young people need to develop a wide range of technical expertise in a nurturing and fun-filled environment. The importance of keeping it enjoyable for young athletes cannot be overstated.

The boxing season is long. It can be difficult to keep it interesting for 11 months of the year with a varied and wide ranging programme. LTAD planning in boxing is about taking a progressive, developmentally-appropriate, and balanced approach to foster athleticism and technical excellence. This is an important concept for the successful development of our young athletes. We also need to ensure our coaches are highly trained and have the necessary support and means to deliver the type of high-quality developmental programs our sport needs.

The LTAD model is based on proven scientific principles of human growth and development and allows us to support our young athletes throughout a clearly defined pathway to achieve success on the world stage. It is a framework that allows boxing to work to achieve three aims:

START - To give more people the opportunity to enjoy the sport

STAY - To keep more athletes actively involved in the sport

SUCEED - To achieve medal success on the world stage

The highly competitive nature of Boxing implies that only a few athletes will remain in the elite programme by the time they reach senior level. However, it should be remembered that LTAD is not just an elite model – it is also a comprehensive series of guidelines that provide a clearly delineated path for the sound athletic development of boxers of all ages and performance levels, allowing long-term participation and enjoyment.

For CABA, the implementation of LTAD provides a clear direction for athletes and program development throughout the country. It reflects the unique nature of athlete's development in boxing and it identifies the most appropriate methodologies and structures to support both excellence in performance and life-long benefit to individuals who are involved in our sport.

In all sports, there is a tendency to take a special talent and try to make it shine too bright too early – ultimately burning it out before the realisation of full potential. We need to think about a future CABA in which special talents – and all Athletes for that matter – are carefully nurtured and slowly moved through the ranks, with the right balance of technical input, conditioning, and competition.

This document provides an excellent framework for doing so, and for building success and enjoyment in our future athletes.

John O'shea
President
Canadian Amateur Boxing Association

Glossary
OF TERMS

The purpose of this section is to provide a short definition of certain key terms that are used repeatedly throughout this document.

Adaptation refers to a response to a stimulus or to a series of stimuli that induces functional and/or morphological changes in the body. The level or degree of adaptation is dependent upon the genetic endowment of an individual.

Adolescence is generally 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. During this period, most bodily systems become adult, both structurally and functionally. The beginning and the end of adolescence are not easily determined. Adolescence begins with an acceleration in the rate of growth, which marks the onset of the adolescent growth spurt. The rate of growth reaches a peak, begins a slower or decelerative phase, and finally terminates with the attainment of adult stature.

Ancillary Capacities refer to performance aspects such as warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, regeneration, metal preparation, and taper and peak. The more knowledgeable athletes are about these training and performance factors, the more they can enhance their training and performance levels. When athletes reach their genetic potential and cannot improve anymore from a physiological point of view, performance can still 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 pre-school 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 changes during the first 2 decades of life.

Critical period of development refers to a point in the development of a specific behaviour or ability when experience or training has an optimal effect on adaptation, learning, and/or improvement. The same experience or training stimulus, introduced at an earlier or later time, may not be as effective, may have no effect, or may even retard the acquisition of particular abilities.

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

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 nature, as the body progresses toward maturity; for example, the change of cartilage to bone in the skeleton.

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

Peak strength velocity (PSV) is the maximum rate of increase in strength around the growth spurt. The age of maximum increase in strength is called the age at PSV.

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

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

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

Readiness refers to the child's level of growth, maturity, and development that enables him/her to perform tasks and meet specific sport 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 and endurance.

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

Trainability refers to the magnitude of the adaptations that occur in the athlete's body after he or she has been exposed to specific training stimuli, and to the time course in which they happen. Trainability can vary considerably amongst individuals, and is largely determined by heredity.

Training age refers to the number of years and months elapsed since the athlete began a systematic sport training program.

1 - Introduction
AND GENERAL OVERVIEW

Long-Term Athlete Development (LTAD): What Does This Mean?

Long Term Athletes Development (LTAD) is about achieving optimal training, competition and recovery throughout an athlete's career, particularly in relation to the important maturation years of young people. It is an athlete-centered approach to achieving optimal development so that the athletes can reach their full potential throughout all stages of their career.

Pioneered by Istvan Balyi, the model represents a seven stage progression, with each stage having a specific relationship to the important biological, psychological and social development periods in a person's life.

The process emphasises the role of quality preparation and delivery mechanisms, matched to key criteria based on individual development, and focused upon episodes and performance over the long-term rather than focusing on winning as a short-term objective (i.e. "peaking for the weekend").

An LTAD approach is about encouraging all athletes, whatever their talents and motivation, to achieve their full athletic potential. It is not only about improving performance and achieving top results, but also about encouraging lifelong participation in Boxing. This can only be achieved if the appropriate and effective environments can be created within our club system.

LTAD Goals

The main aim of the LTAD plan is to outline to coaches, parents, administrators and the Boxing community in Canada what a long term approach to training and preparation means. The plan gives detailed training and competition guidance that will be of assistance to Boxing leaders in planning their programmes. A key feature of the LTAD model is the recognition that not all children develop at the same rate. Programs and activities must therefore be developed accordingly.

Importance Of Reflecting On LTAD In The Sport Of Boxing

Currently, the training and competition programmes employed by CABA are based on chronological age. This means that, although athletes can be 3–5 years apart in their maturation levels, we train them in the same way. This is not the most logical thing to do… For instance, at the age of 13 one athlete could have the developmental status of an eleven-year-old child, while another may display the maturation level of an adolescent of 15, which represents a considerable difference from a physical development point of view.

This is vitally important in Boxing, as we traditionally select the more physically mature athletes. As a result, we consistently focus on short-term outcomes and results, and very often neglect developing those who mature more slowly, yet have the potential to be successful senior athletes in the future.

In order to achieve the intended LTAD goals in the long run, the implementation of the model must account for both the recreational and competitive streams of our sport. Programmes must also be developed specifically for boxers who fall outside the currently specified age ranges, and also for those who wish to progress but not

necessarily to the elite level or in a highly competitive environment. Therefore, the aim is to create an *integrated system* that will enable:

- More opportunities for young people to participate in Boxing.
- More boxers retained in the sport.
- More boxers achieving their aspirations through a higher standard of performance.

The LTAD model is designed to support athletes from the first day they step at the gym until they choose to hang up their gloves after many enjoyable, challenging, and rewarding years of boxing. It provides a logical progression of programme planning and skill development that will support the athletic development of all boxers.

Anticipated Benefits Of The LTAD Model In Boxing

The development and implementation of the LTAD model will enable CABA to positively effect the development of all boxers. The LTAD approach is also expected to contribute to the growth of our domestic scene by providing a sound framework for the development of effective and enjoyable programmes for all participants, attracting more participants to Boxing, and retaining them into the sport. The LTAD principles will also guide us in analyzing the current Canadian Boxing system, highlighting its gaps and shortcomings, and aid in developing creative and adapted solutions to the issues identified.

The LTAD model recognizes that training the right athletic abilities at the right stage of development is crucial for the success of all athletes, from beginning boxer to Olympic champion. These "windows of trainability" must be exploited strategically in order for athletes to reach their full potential, and should be viewed as central to the improvement of boxing performance in the future.

In addition to the above, other anticipated benefits of implementing the LTAD approach include:

- All stakeholders of the Boxing system will see where they fit and what their role is in the process of developing athletes.
- Coaches will have a clear set of guidelines for the design of annual plans and programmes.
- The sport as a whole will be able to understand what needs to be done to achieve success.
- Decision-makers will have solid points of reference in the process of designing specific programmes aimed at supporting the development of boxers.

Like CABA, numerous sport organizations in Canada are now showing a great interest in LTAD models. Investment in the implementation of LTAD will be a key factor in ensuring the future success of Boxing as a sport in our country. Indeed, LTAD is not just an elite model—it also provides a solid foundation for boxers at all ages and levels, outlining the necessary ingredients for long-term participation, enjoyment, and achievement.

2 - Vision of the
CANADIAN AMATEUR BOXING ASSOCIATION

What Do We Want To Accomplish?

For the next few years, CABA has the following goals and ambitions:

- To provide boxers with opportunities that will promote self-expression and personal development in the pursuit of excellence.
- To offer programmes and support services to all levels of boxers, consistent with LTAD principles.
- To maintain its commitment towards high performance and excellence in World Championship, Pan American Games, Commonwealth Games, Francophone Games and Olympic summer Games competitions.

How Will We Get There?

We can achieve the goals of our LTAD model if we take into account the following aspects, and integrate them appropriately into our own system and programmes:

The 10 Factors Governing Long-Term Athlete Development

1. Time: LTAD is a process that requires 10 years
2. Early acquisition of the fundamental aspects of movement
3. Stages of development
4. Trainability
5. Global approach
6. Specialization at the right time
7. Periodization, or the annual training and recovery plan
8. Competition networks and calendars that are well-integrated and consistent with LTAD principles
9. System alignment and integration
10. Continuous improvement

The 10 Key Performance Factors in Sport

1. Stamina (endurance)
2. Strength
3. Speed
4. Skills: motor and sport-specific
5. Suppleness (flexibility)
6. Structure and stature
7. Psychology
8. Recovery
9. Schooling and education
10. Socio-cultural aspects

The 7 Stages of LTAD in Boxing

1. Active start
2. FUNdamentals
3. Learn to box
4. Train to box
5. Train to compete
6. Train for peak performance
7. Active life

3 - The 10 Factors Governing
LONG-TERM ATHLETE DEVELOPMENT

1. Time: LTAD Is A Process That Requires 10 Years

Scientific research has shown that it takes a minimum of 10 years and 10,000 hours of training for a talented athlete to reach elite levels. For athletes and coaches, this translates into slightly more than 3 hours of training or competition daily for 10 years.

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

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

2. Early Acquisition Of The Fundamental Aspects Of Movement

Fundamental movements and skills must be introduced early in the child's life, through fun activities and games. The acquisition of sport-specific skills should follow a more general approach that emphasizes motor development, and includes basic overall sports skills.

- Physical literacy refers to competency in performing fundamental movements and sports skills.
- Physical literacy should be developed before the onset of the growth spurt which occurs during adolescence.

Table 1 lists a wide variety of fundamental movements and sport skills that support physical literacy. These motor abilities occur in four different environments: land, water, air, and ice.

The basic movement skills of three activities provide the foundation for the vast majority of other sports:

- Athletics: running, jumping, and throwing.
- Gymnastics: ABC's of athleticism — agility, balance, coordination, and speed.
- Swimming: for water safety reasons, for balance in a buoyant environment, and as a prerequisite for all water-based sports.

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

Table 1 – Fundamental movements and sport skills that support physical literacy.

Travelling Skills	Object Control Skills	Balance Movements
• Boosting • Climbing • Eggbeater • Galloping • Gliding • Hopping • Ice Picking • Jumping • Leaping • Poling • Running • Sculling • Skating • Skipping • Sliding • Swimming • Swinging • Wheeling	**Sending:** • Kicking • Punting • Rolling (ball) • Strike (ball, puck, ring) • Throwing **Receiving:** • Catching • Stopping • Trapping **Travelling with:** • Dribbling (feet) • Dribbling (hands) • Dribbling (stick) **Receiving and Sending:** • Striking (bat) • Striking (stick) • Volleying	• Balancing/Centering • Body Rolling • Dodging • Eggbeater • Floating • Landing • Ready position • Sinking/Falling • Spinning • Stopping • Stretching/Curling • Swinging • Twisting/Turning Jess 1999, adapted Balyi and Way 2004

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

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

3. Stages Of Development

A crucial component of the LTAD model is the recognition that the athlete's developmental status should determine the type of training and competition activities he or she is involved in. Sport programs must therefore be adapted to the participants' physical, motor, mental, and emotional development, and capitalize on particular periods of life during which specific athletic abilities can be improved optimally.

The terms "growth" and "maturation" are often used together and sometimes synonymously. However, each refers to specific biological activities. *Growth* refers to observable and measurable changes in body size such as height, weight, and percentage of body fat. *Maturation* refers to qualitative system changes, both structural and functional, as the body progresses toward maturity, such as the change of cartilage to bone in the skeleton. *Development* is therefore the interrelationship between growth and maturation in relation to the passage of time. In addition to the anatomical and physiological aspects, the concept of development also includes the social, emotional, intellectual, and motor realms of the child.

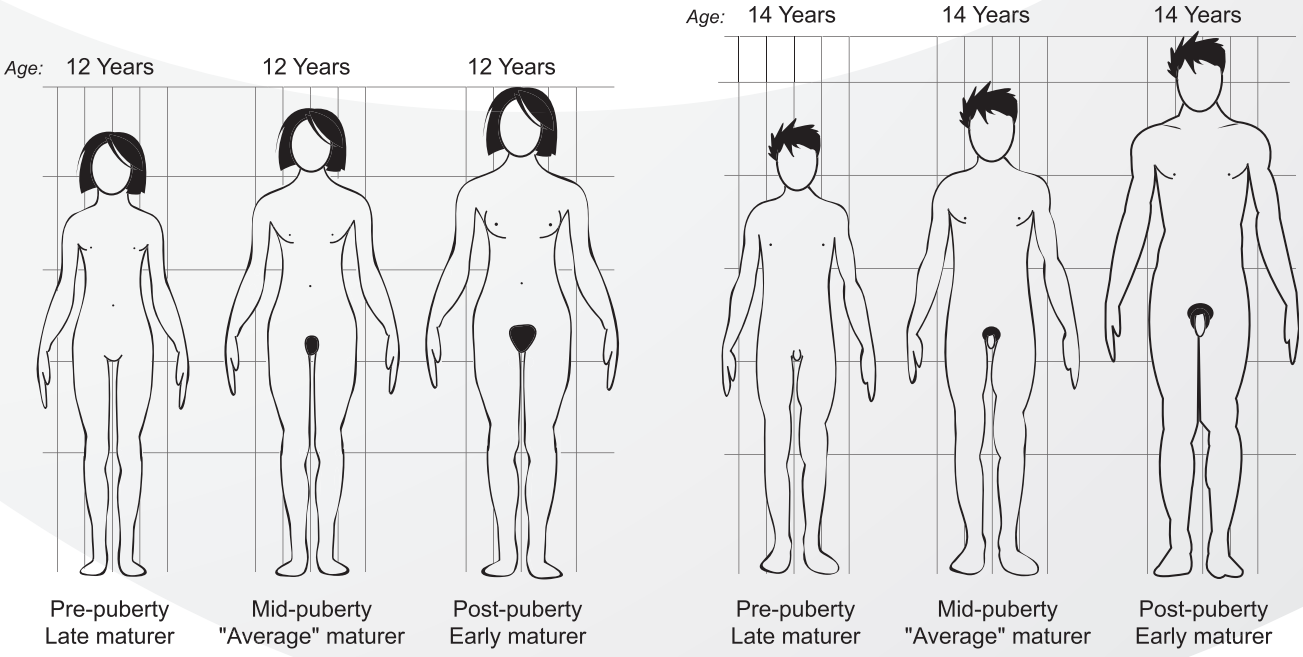
Chronological age refers to the number of years and days elapsed since birth. As shown in **Figure 1**, children of the same chronological age can differ by several years in their level of biological maturation.

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

LTAD requires the identification of the child's maturation rate (early, average, or late), in order to (1) design training and competition programmes and activities that are adapted, and (2) take into account particular periods during which specific athletic abilities can be developed optimally.

In the LTAD model, the two main points of reference for designing adapted sport programmes are (1) the beginning of the growth spurt during adolescence, and (2) the period when growth rate is maximal (Peak Height Velocity, or PHV).

Figure 1 – Possible levels of biological maturation in girls and boys of the same chronological age. Large variations can be observed between individuals.

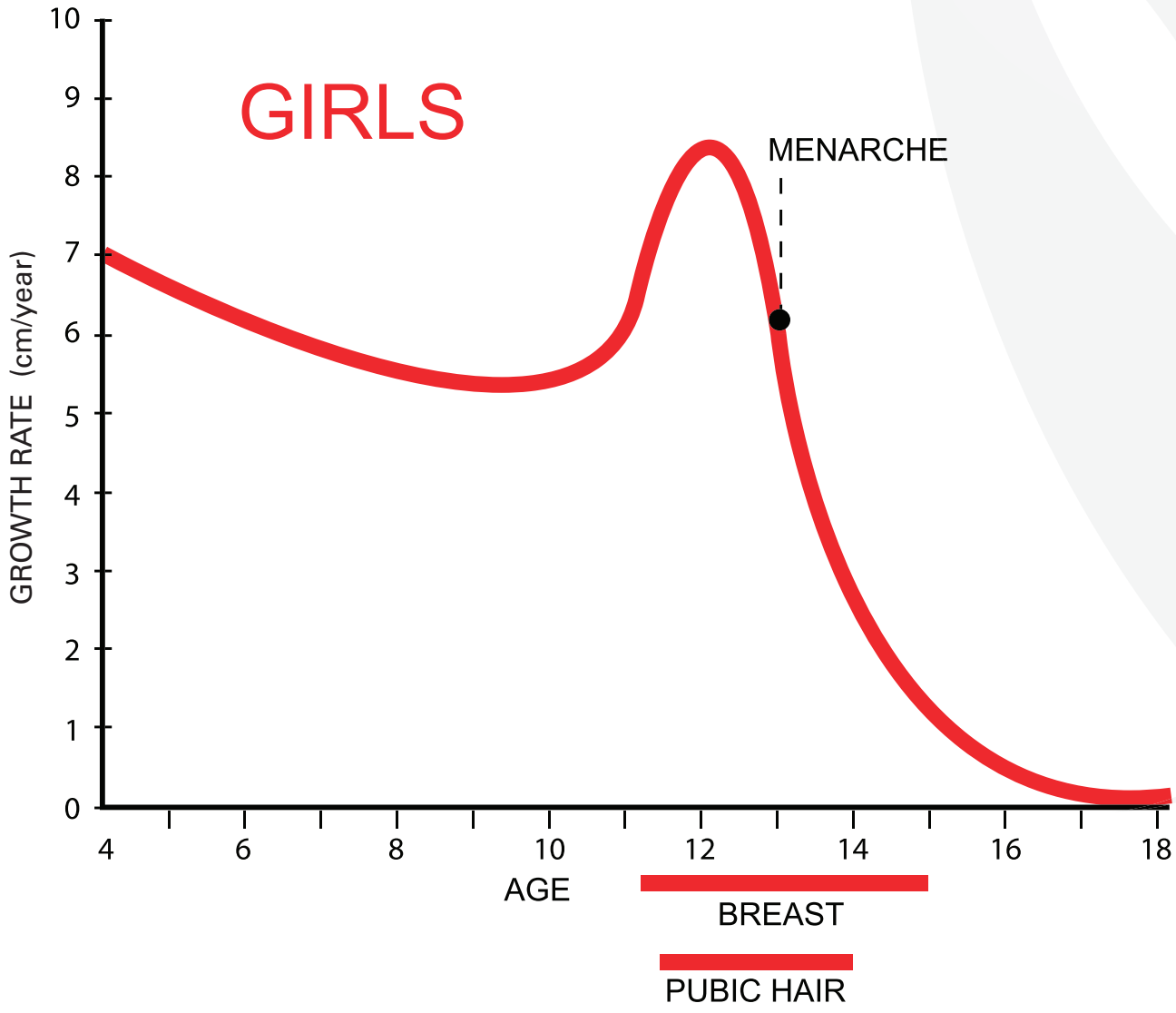


Adapted from "Growing Up" by J.M. Tanner. Scientific American 1973

In both girls and boys, growth rate is an important point of reference in the physical maturation process that occurs during the adolescence. *Peak height velocity (PHV)* is the maximum rate of increase in stature that is observed during the growth spurt.

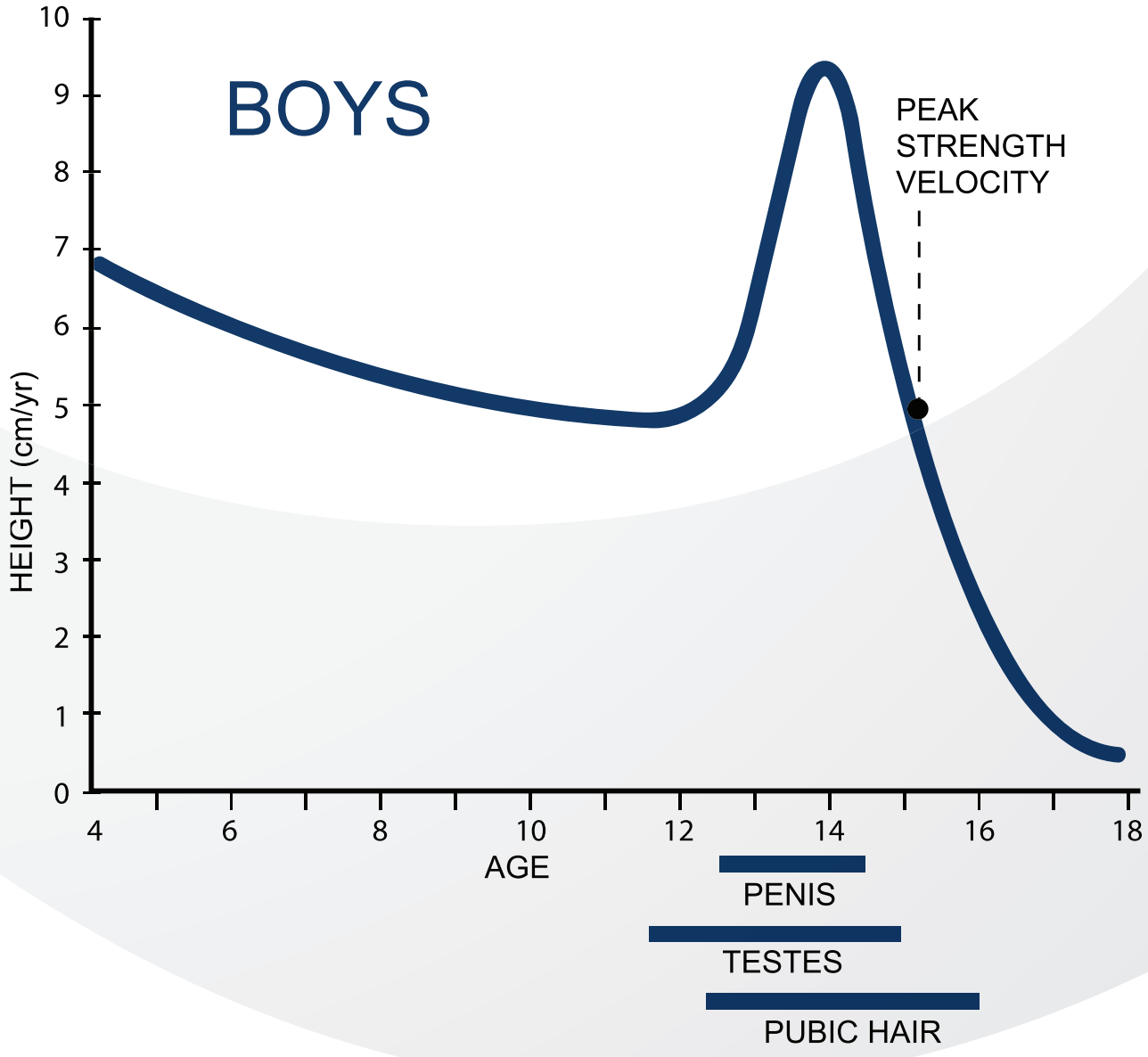
In girls, PHV occurs at about 12 years of age (Figure 2). Usually, the first physical sign of adolescence is breast budding, which occurs slightly after the onset of the growth spurt. Shortly thereafter, pubic hair begins to grow. Menarche, or the onset of menstruation, comes rather late in the growth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

Figure 2 – Maturity events in girls (modified after Ross et al., 1977). Ages shown are based on average values, and important variations may exist amongst individuals.



In boys, PHV is more intense than in girls, and occurs on average about 2 years later, i.e. around the age of 14 (Figure 3). Growth of the testes, pubic hair, and penis are related to the maturation process. The period when the greatest strength gains take place, or Peak Strength Velocity (PSV), comes a year or so after PHV, i.e. around the age of 15 or even later. Thus, on average, the optimal period for the development of strength occurs later in boys compared to girls. As with girls, the developmental sequence for male athletes may occur 2 or more years earlier or later than the average. Boys who mature early may have as much as a 4-year physiological advantage over their late-maturing peers. Of course, the late maturers will eventually catch up when they experience their growth spurt.

Figure 3 – Maturity events in boys (modified after Ross et al., 1977). Ages shown are based on average values, and important variations may exist amongst individuals.



Currently, most athletic training and competition programmes are based on the athletes' chronological age.

During adolescence, chronological age is a poor guide to select athletes for competitions.

Currently, most athletic training and competition programmes are based on the participants' chronological age. However, from a developmental point of view, between the ages of 10 and 16, athletes of the same chronological age can be as far as 4 to 5 years apart.

The rate of a child's growth has significant implications for athletic training because children who mature at an early age have a major advantage over average or late maturers of the same age group. However, after all children have gone through their growth spurt, it is often those who mature at a later age who have a greater potential to become top athletes, provided they experienced quality coaching and sport experiences throughout this period.

CABA ha developed detailed posters that outline simple yet accurate methods to determine when ***Peak Height Velocity*** occurs in adolescents. This information makes it possible to estimate the level of physical maturation in young athletes, and it is available to Clubs and to Provincial Associations. Coaches and parents should use these tools to draw individual charts of the young boxer's development. With this information, training and competition activities can be tailored to individual needs and capabilities, and promote athletic development more effectively.

4. Trainability

The terms "adaptation" and "trainability" are often used interchangeably in coaching. However, the difference between them is significant.

Adaptation refers to functional and/or morphological changes that take place in the body as a result of a stimulus. The various types of physical and sport-specific training an athlete can go through represent powerful stimuli and, as a result, they can lead to significant adaptations. Research in exercise physiology has provided important information about the *factors* that govern adaptation to specific training stimuli (e.g., training for strength, speed, aerobic endurance, etc.), as well as the general *trends and patterns* of the adaptive response that follows each type of training.

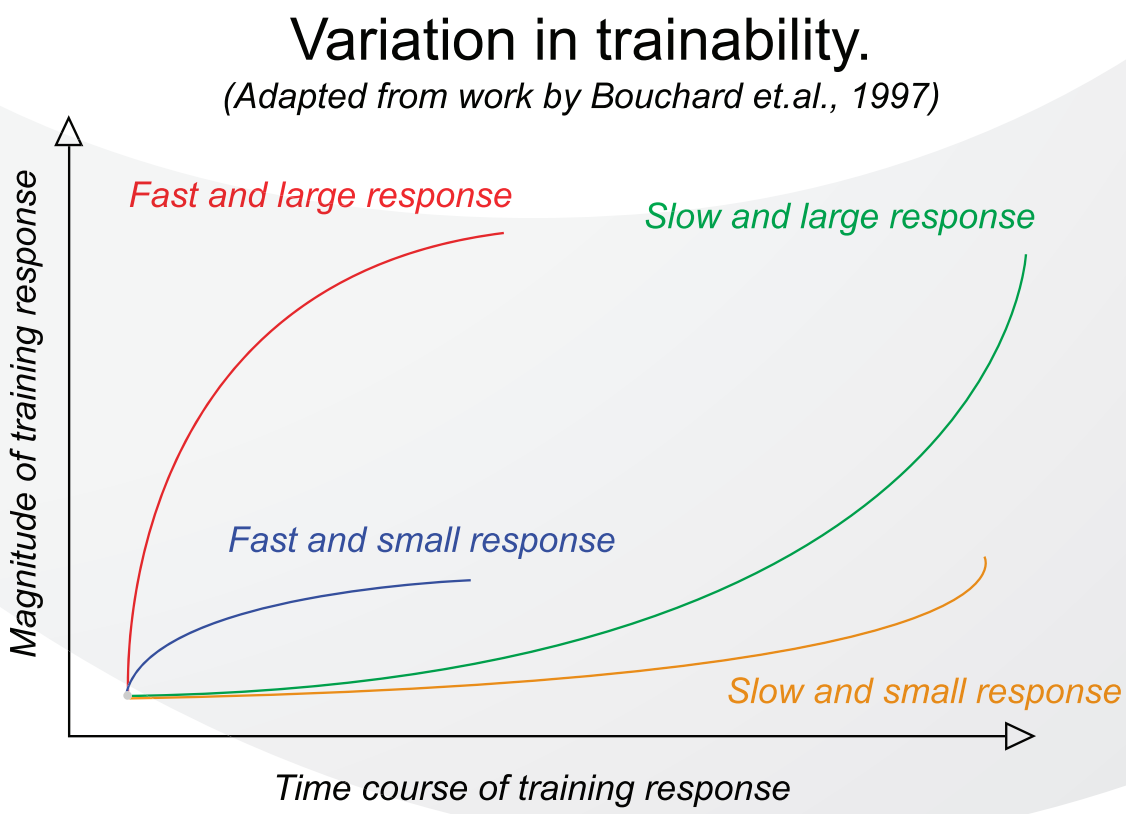
Trainability refers to the *magnitude* of the adaptations that occur in the athlete's body after he or she has been exposed to specific training stimuli, and to the *time course* in which they happen.

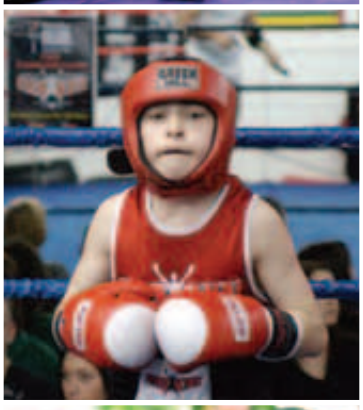
The degree of adaptation observed as a result of training, or trainability, is dependent on the genetic endowment of each individual.

Some athletes show a quick and marked response to a given stimulus, whereas in others the response may be slower or smaller.

Figure 4 illustrates recent findings pertaining to the variations that can be observed in the response to a particular training stimulus. These variations can be noted in both the magnitude of the training adaptations and their time course: some athletes show a fast and large response, while in others the magnitude of the adaptations or the time interval in which they occur may differ largely. Similar trends also exist with regard to recovery: some athletes recover more quickly and more completely than others after completing the same training or competition tasks.

Figure 4 – Variation in the training response (Adapted from Bouchard et al., 1997).





Such a high degree of variation in the training response may be explained by the great diversity that exists between individuals. Such diversity may itself be the result of both genetic factors and the environment in which the athlete has developed (Norris and Smith, 2002).

Later in this document the critical periods for the optimal development of athletic abilities such as motor skills, sport-specific techniques, speed, strength, endurance, flexibility, etc. will be outlined. Differences between boys and girls will also be discussed.

There exist **critical periods** of the developmental process during which the young athlete's body can adapt and respond optimally to specific training stimuli. In other words, large training responses can be obtained when focusing on certain athletic abilities at the right time.

5. A Global Approach

As mentioned previously, the time course of the various facets of human development can vary greatly amongst children. It is therefore important to take into consideration *all* the variables of a child's development, not only the technical or the physical demands of our sport. Therefore, above and beyond the training, competitive, and recovery programmes, an effective LTAD approach should also considers the mental, cognitive, and emotional development of each athlete. In addition, coaches must be aware of certain equipment or environmental factors that can have an impact on performance or on the safety of their athletes, and account for these variables in their programmes and activities.

Consistent with Canadian values, a holistic approach to athlete development should also include an appropriate emphasis on ethics, fairplay, character building, and perseverance as key success factors in both the athletic and human development processes. Of course, the athletes' cognitive ability must be carefully considered when presenting these concepts.

6. Specialization At The Right Time

Sports can be classified as either *early* or *late* specialization.

Early specialization sports include artistic and acrobatic sports such as gymnastics, diving, and figure skating. These differ from late specialization sports in that very complex skills must be learned *before* maturation. These complex skills are considerably more difficult to develop and to refine if taught after maturation. Most other sports, including Boxing, can be considered late specialization sports.

Training age refers to the number of years and months elapsed since the athlete began a systematic sport training program. Specialization should not occur until the athlete has a training age of several years, and has had the opportunity to experiment with a variety of different sports.

As a rule, boys join Boxing clubs around the age of 13. Ideally, they should have been involved in a variety of other sports beforehand, and have developed good all-around athletic abilities such as agility, balance, and coordination. For boys, specialization in the sport of Boxing is not desirable until the ages of 15 or 16, in particular if their general sport background is fairly limited. Indeed, specializing too early could lead to:

- deficiencies in certain fundamental motor and sports skills
- overuse injuries resulting from too many repetitions of the same movements at a young age
- early burnout
- early retirement from training and competition

Boxing is a late specialization sport. Specialization should not occur until the young boxer has had the opportunity to experiment with a variety of different sports, and has developed sound motor and athletic abilities.

In the case of female boxers the situation is often quite different. Indeed, most girls and young women usually take the decision to join a Boxing club much later, i.e. between the ages of 16 and 19 for most of them. At this stage of their life, physical maturation is fairly advanced, and sometimes even completed. In addition, they already have a fairly precise idea of what their goals in Boxing are, i.e.: (1) to follow a rigorous training process in order to achieve performances in competition, or (2) to embark into a predominantly recreational Boxing programme, and to use our sport as a means of personal development that will help them achieve certain individual objectives. Even though they are no longer children, these young women must nonetheless go through all the basic stages of athletic development in a progressive and carefully planned manner, in order to acquire and/or develop the various technical, tactical, physical, and mental abilities required in Boxing. The priorities of their programmes must therefore always be based on their actual sport background, skills, and capabilities, which may not always correspond to the LTAD stage at which they should be given their chronological age or physical maturation level.

Regardless of their age or physical maturation level, young women who get involved in Boxing must go through the various stages necessary for the proper development of the technical, tactical, physical, and mental abilities required in Boxing.

Admittedly, very few athletes or participants with a disability ever get involved into Boxing. For those who do, Boxing will most likely be a late specialization sport. It will therefore be very important that participants with either a congenital disability or a disability acquired at an early age be exposed to a wide range of activities aimed at developing their motor and physical athletic abilities *before* being involved in any Boxing programme, either recreational or competitive.

In addition to the Boxing-specific preparation and training, it is therefore possible that coaches may have to design special remedial programmes aimed at addressing certain physical or motor shortcomings in some participants. This may be necessary regardless of gender, and whether athletes are able bodied or athletes with a disability.

Success in sport is largely determined by the quality and thoroughness of the planning process in three key areas: training, recovery, and competition.

7. Periodization, Or The Training, Competition, And Recovery Plan

Periodization is a planning technique that provides the framework for arranging the complex array of training processes into a logical and scientifically-based schedule in order to bring about optimal adaptations and improvements in performance. Simply put, it is the sound management of the available time in the process of designing a seasonal, annual, or even multi-year sport programmes. Periodization implies that appropriate training and competition activities must be selected and organized. These activities must:

1. Be adapted to the athletes, and represent a suitable challenge for them.
2. Support the achievement of specific training and competition objectives.
3. Be introduced in a timely manner, and be sequenced adequately relative to each other throughout the programme.
4. Be of a sufficient duration and intensity, and happen frequently enough, in order to promote the development of specific athletic abilities and lead to the desired adaptations.

In the LTAD model, periodization connects the developmental stage the athlete is at to the optimal training and competition activities and experiences he or she should be exposed to at that particular stage.

LTAD addresses this requirement by providing models and templates for all stages of athletic development. These models take into consideration the growth, maturation, and trainability principles that are unique to each stage, and build a seamless progression from one stage to the other over a 10- to 12-year period, thus optimizing physical, technical, tactical, and mental preparation as the athlete gets older, consistent with the specific demands of the sport. To design effective annual or seasonal programmes, Boxing coaches should be familiar with the following aspects:

- How to determine an athlete's level of physical development and maturation, no matter what his or her chronological age is.
- The LTAD model in Boxing.
- The best methods and approaches for improving specific performance factors and athletic abilities.
- The competitive requirements of the sport of Boxing.
- The competition calendar and the relative importance of each competition.
- The actual training status of the athlete at the beginning and throughout the program.
- The unique context in which the athlete finds himself or herself.

BOXING ANNUAL TRAINING PLAN

| | | |

Competition calendars must be well planned and integrated at the regional, provincial, and national levels. In addition, participation in tournaments must always be governed by the priorities associated with the stage of development the athlete is at.

8. Competition Networks And Calendars That Are Well-Integrated And Consistent With LTAD Principles

The competition structure of a sport has many implications. Among other things, it impacts aspects such as athlete selection, talent identification, safety, the costs associated with participation in sport, and the periodization of programmes.

At each stage of the LTAD, optimal competition calendar planning is critical to athlete development. However, in many sports including Boxing, the system of competition is largely based on tradition. As part of the LTAD implementation process, it will be important to look critically at our current structure and format of competition, in order to determine if they contribute *optimally* to the development of the athletes.

At the regional, provincial, and national levels, competition calendars in Boxing should be set according to the key LTAD principles. The number, frequency, type, and level of competition athletes need to progress vary largely depending on the LTAD stage they are at, and the performance objectives they have. This is particularly important during adolescence, at which time taking into consideration the actual maturation level of the athlete - not only his or her chronological age - is essential for a quality sport experience.

During the early LTAD stages, developing the physical capacities should take precedence over competition and over performance. At later stages, however, the competitive experience will play an increasingly important role: competitions will have to be positioned adequately with the boxers' programmes, and be of an appropriate level to enable them to progress towards the high performance stream.

9. System Alignment And Integration

The key partners and stakeholders of the Boxing sport system include: athletes, coaches, parents, officials and referees, Club administrators, spectators, sponsors, provincial and national sport organizations, governments, and multisport organizations. With so many individuals, groups, and organizations involved, creating a seamless, harmonious, and effective system can be quite a challenge, particularly if we factor in the size of our country, its demographics, and the diversity of our population.

LTAD recognizes that physical education, sport schools, recreational programs, and competitive sport are all interdependent. It also recognizes that enjoying a lifetime of physical activity and achieving athletic excellence are both built on a foundation of physical literacy and fitness. Hence, it can be said that *"The health and well-being of a nation and the medals won at major Games reflect the effectiveness of its sport system".*

Each partner of the sport system has an important role to play with regard to athlete development and participation within programmes. There must be a better cooperation between sport organizations and other stakeholders of the system in order to better support the physical and motor development of children.

To achieve these goals, all the elements of the Boxing sport system should be integrated and aligned. Similarly, the entire Canadian sport community must have a common vision and work collaboratively to achieve it. The system must also be clear, seamless, and based upon a consistent set of principles.

Children often choose to get involved in a sport *after* the optimal windows of trainability for speed, skill, and suppleness have past. These children are therefore highly dependent on schools, recreation programmes, and other sports to provide timely training in these fundamental abilities. The LTAD model in Boxing advocates strong relationships with these organizations in order to promote and support appropriate physical and motor development in children. If young participants do not get access to quality sport and training opportunities, coaches will need to design individualized programmes to remedy certain shortcomings. Unfortunately, despite such initiatives, many athletes may never achieve their full potential, as such programmes may come too late in the children's developmental process.

10. Continuous Improvement

The LTAD model is a dynamic framework that should be updated periodically, while remaining consistent with the fundamental underlying principles on which it is based. Continuous improvement will help ensure that:

- LTAD responds and reacts to new scientific and sport-specific innovations and observations, and is the object of ongoing research in all its aspects.
- LTAD, as a continuously evolving vehicle for change, reflects all emerging facets of physical education, sport, and recreation to ensure systematic and logical delivery of programs to participants of all ages.
- LTAD promotes ongoing education and sensitization of federal, provincial/territorial, and municipal governments, the mass media, sport and recreation administrators, coaches, sport scientists, parents, and educators about the interlocking relationship between physical education, school sport, community recreation, life-long physical activity, and high performance sport.

4 - The 10 Key
PERFORMANCE FACTORS IN SPORT

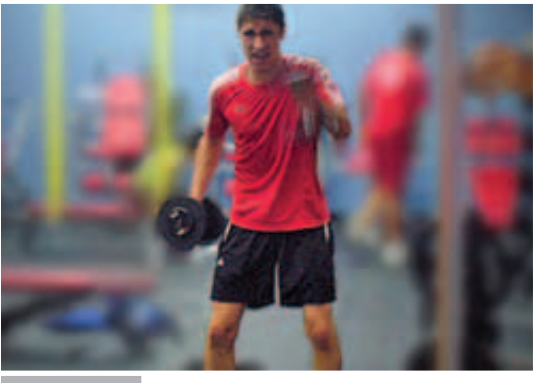
Sport performance can be improved at any age through training. However, there are certain periods in the growth and development process during which adaptations and training responses can be larger.

In 1985, a British Track and Field Coach by the name of Frank Dick proposed a model for athletic development based on five fundamental components: **stamina, speed, strength, skills, and suppleness.** The LTAD model in Boxing builds upon these "5 S's of performance", and adds five other elements in order to draw an even more complete picture of all the key factors that should be taken into account in a comprehensive and holistic training, competition, and recovery programme.

Each factor outlined in this section should be factored in throughout the athlete's sport experience, as improvements can occur at all ages as a result of training. However, as was mentioned previously, there are certain periods in life that are particularly conducive to inducing substantial adaptations and large training responses in specific athletic abilities. It is therefore crucial to expose young athletes to appropriate training stimuli during these "critical windows of trainability" in order to give them all opportunities they need and deserve to fully develop their athletic potential. Depending on the athletic ability, the "optimal windows of trainability" will occur either before, during, or after puberty.

To achieve their full athletic potential, young athletes must be exposed to appropriate training stimuli during the "optimal windows of trainability". Depending on the athletic ability, such "windows" occur either before, during, or after puberty.

Solid scientific data are available to support the general trends outlined in the present document. However, it is important to emphasize that there can always be significant variation from one person to another due mainly to heredity. While the "critical windows of trainability" are linked to specific stages of growth and maturation, the actual *magnitude* or *time course* of the training response may therefore vary greatly from athlete to athlete regardless of chronological age or LTAD stage. Also, it must be pointed out that some athletes may reveal a strong potential to perform at a high level as early as the ages of 11 or 12, while in others the aptitudes towards high-performance sport may not be evident before 15 or 16. Consequently, Boxing *must* have a long-term vision and approach for athletic development, otherwise athletes who grow and mature at a slower rate, or who need more time to respond to particular training stimuli, may be systematically penalized - and even excluded.



Aspect 1: Stamina, Or Aerobic Power And Endurance

Stamina, or aerobic power and endurance, determine the capacity of performing prolonged and somewhat intense efforts lasting from a few minutes to several hours. At a given exercise intensity, the longer the athlete can work, the better his or her aerobic endurance is. On the other hand, the higher the workload or the intensity the athlete can work at during a prolonged effort, the higher his or her aerobic power is.

The sensitive period for training stamina begins at the *onset* of the growth spurt that occurs during the adolescence. During the early stage of the growth spurt, athletes should emphasize the development of aerobic endurance through continuous training. Activities such as running, cycling, swimming etc. should be used, and the intensity should be moderate in order that the effort can be sustained without interruption over an extended period. After the age of Peak Height Velocity, when the growth rate begins to slow down, activities aimed at developing maximum aerobic power should be introduced progressively. At this point, interval training at higher intensity workloads can be used.

Even though Boxing is not an endurance sport such as Cross Country Skiing, Marathon Running, or Road Cycling, aerobic power and endurance must be adequately developed to support performance, for instance to help the athlete accomplish high volumes of training, sustain a high intensity level throughout a match, or recover more quickly from training and competition.

The sensitive period for training stamina begins at the onset of the growth spurt. Initially, aerobic endurance should be emphasized. After PHV, training for aerobic power can be introduced.

Aspect 2: Strength

There are different types of strength, and each one is important in Boxing. *Maximum strength* refers to the highest level of tension that can be generated by a muscle or muscle group, e.g., when the athlete tries to lift the highest possible weight.

The optimal period for strength development is not the same in girls and in boys. It occurs later in boys.

Strength-endurance (or muscle endurance) is the ability to perform repeated muscle contractions at intensities below maximum strength (normally, 15 to 30 repetitions or more). Lastly, *speed-strength* refers to the ability of performing a muscle contraction or overcoming a resistance as fast as possible (i.e. very brief effort such as a punch).

There are two critical windows of trainability for strength in girls: immediately after PHV and after the onset of menarche. Boys have only one optimal strength development window, and it begins 12 to 18 months after PHV. The period that is most conducive for obtaining major strength gains therefore occurs later in boys than in girls.

In a sport such as Boxing, it is recommended that strength development follows a carefully planned progression in order not to overstress muscle fibres and articulations during training. A mid- to long-term approach must therefore be used in the choice of methods. Strength-endurance should be emphasized initially; when the athlete has some background and experience in resistance training, methods for developing maximal strength can be used. Although very specific to Boxing, speed-strength should only be emphasized once the athlete has a solid strength training foundation.

The first few years of elementary school, and the period of the growth spurt during the adolescence, are the two most sensitive periods for the development of speed.

Aspect 3: Speed

Speed refers to the ability to move rapidly the body or a part of the body, or to execute a series of movements. Speed usually involves all-out efforts of very short duration. In Boxing, a punch or a quick lateral defensive movement are examples of situations where speed comes into play.

There are two critical windows of trainability for speed, and those vary according to gender. For girls, the first window of trainability occurs between the ages of six and eight years, and the second window occurs between 11 and 13 years, i.e. throughout the growth spurt of the adolescence, and until the first menstruations. For boys, the first window for optimal speed development occurs between the ages of seven and nine years, and the second one generally takes place between 13 and 16 years, i.e. also during the growth spurt of the adolescence.

During the first speed window, training should focus on developing agility and quickness and the duration of the efforts should be very short, i.e. less than five seconds. During the second speed window, high-intensity efforts for speed development can be extended somewhat, and last 10 to 15 seconds or so.

It is highly recommended that speed should be trained on a regular and frequent basis, for example, at every training session. The best time to train speed in a session is early on, after a thorough warm up. The reason for this is that there is usually no significant central nervous system or metabolic fatigue present in the body at the beginning of a session, so this is the most effective time for training speed. The amount (or volume) of work done overall should be low when training for speed, and the recovery between exercises and sets should be complete. This allows the athlete to maintain a high quality in the execution of the movements, and makes it possible to work at maximal intensity, which is necessary for the development of speed.

In Boxing, speed is an athletic ability that should always be included as part of the athlete's training process, even outside the critical windows for development. Short accelerations with proper posture and elbow and knee drive, take-off speed, and segmental speed should all be trained regularly. Proper blocks of training should also be allocated to speed as part of the periodized annual training, competition and recovery programme of the boxers.

Aspect 4: Motor And General Sport Skills

The development of sound motor and technical skills, or physical literacy, is the foundation of life-long involvement in physical activity, and a prerequisite to any high performance aspiration.

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

During this period, it is also important that children develop the ability to "read" what is going on around them while performing an activity, and learn how to react appropriately to those events.

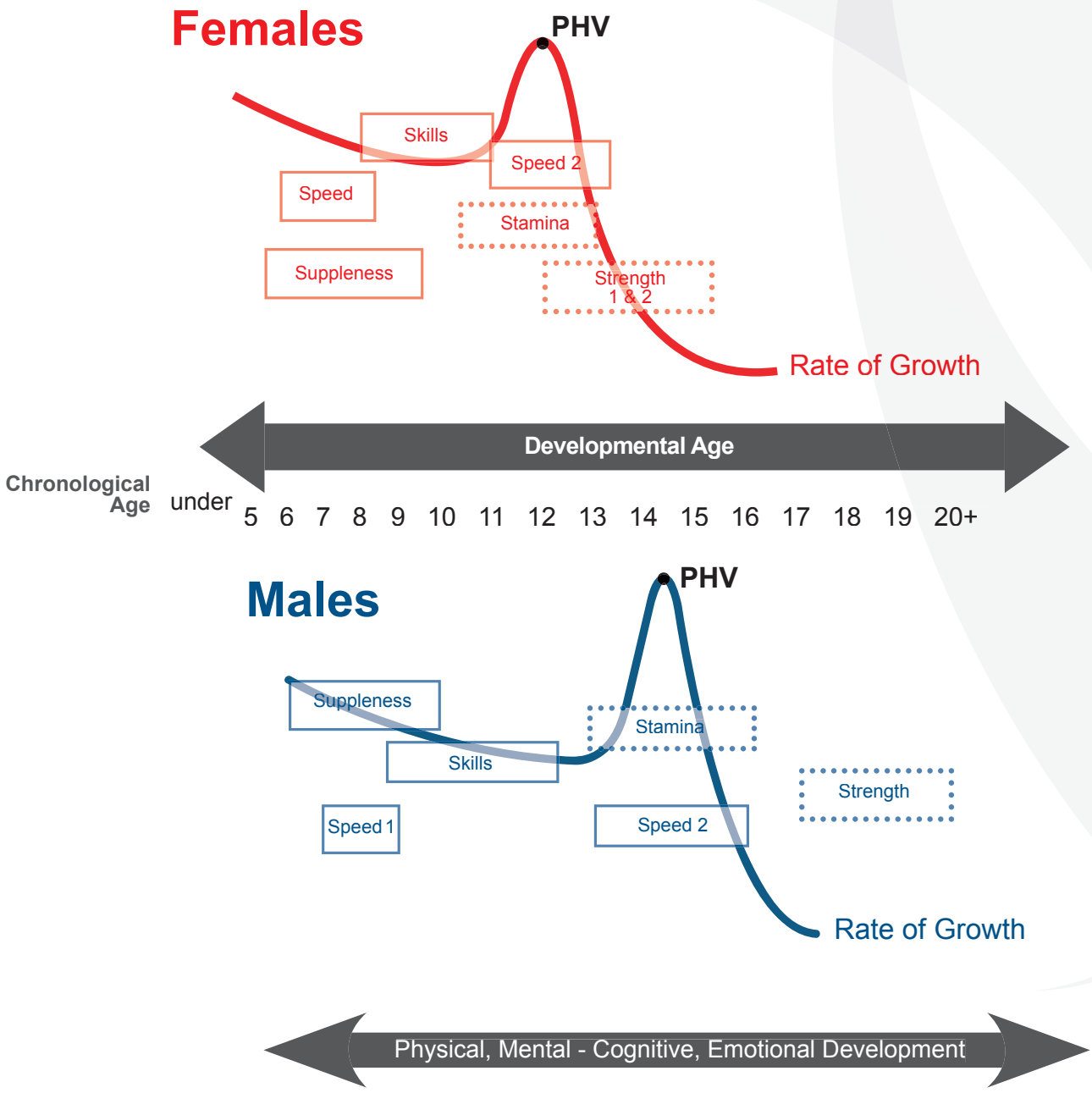
Aspect 5: Flexibility Or Suppleness

In both girls and boys, the optimal window of trainability for flexibility or suppleness occurs between the ages of six and 10 years.

However, because of the rapid growth of tissues during adolescence, special attention should also be paid to flexibility throughout the growth spurt.

Figure 5 shows the optimal windows of trainability for key performance factors in girls and in boys. In the case of aerobic stamina and strength, the growth spurt that occurs during adolescence is the key point of reference for determining when specific and systematic training should be introduced. For the other athletic abilities, i.e. speed, skills, and flexibility, the child's chronological age should be used by parents and coaches when programming activities.

Figure 5 – Optimal windows of trainability for specific athletic abilities throughout the developmental process in males and females (Balyi and Way, 2005). Ages shown are based on average values, and some variation may exist amongst individuals. PHV: Peak height velocity.



All Systems Are Always Trainable!

Aspect 6: Structure / Stature

This aspect refers to the increase in height. There are seven phases of growth in the human body:

Phase 1: very rapid growth
Phase 2: very rapid deceleration of the growth rate
Phase 3: steady growth
Phase 4: rapid growth, culminating with PHV
Phase 5: rapid deceleration of the growth rate
Phase 6: slow deceleration of the growth rate
Phase 7: cessation of growth

As mentioned before, some phases of growth can be linked to "windows of trainability" for specific athletic abilities.

During childhood and adolescence, the tracking of height as a guide to developmental age allows parents and coaches to (1) identify the *critical* or *sensitive* periods of physical and skill development, and (2) expose young athletes to the right type of training, at the right time. This is a critical strategy for designing and implementing optimal sport programmes, and for developing the full athletic potential of the child through individualized training, competition, and recovery activities.

The tracking of height provides an indication of the athlete's rate of physical development.

Boxing Canada has produced simple tools and guidelines to help coaches and parents monitor growth rate.

Aspect 7: Psychology

Sport is both a physical and psychological challenge. The ability to maintain high levels of concentration and to remain relaxed with the confidence to succeed are skills that transcend sport to everyday life. To develop the attitude and the mental toughness for success at high levels, the athlete requires psychological training programs that are adapted to his or her LTAD stage, as well as gender. These programs should include key mental components identified by sport psychologists such as: concentration, confidence, motivation, and handling pressure.

As the athlete progresses through the LTAD stages, the mental training aspect will evolve. During the early stages of sport participation, having fun and respecting opponents should of course be emphasized. Then, mental skills such as visualization, self-awareness, goal setting, relaxation, and positive self-talk should be progressively introduced.

To master the mental challenge of sport, those skills will have to be applied in increasingly difficult competitive situations. Ultimately, the planning, implementing, and refining of mental strategies for high level competition will be critical factors determining podium performances.

Mental training programs are critical at all LTAD stages, as dealing with success and failure will determine continuation in sport and physical activity, therefore affecting directly the individual's lifestyle.

The specific adaptations and responses that are sought from the training and competition program can take place only if the athlete's body can recover adequately from the fatigue that results from the efforts produced.

Aspect 8: Recovery

Training and competition can lead to significant levels of fatigue in the athletes. Recovery is the process whereby the athlete's body gets rid of fatigue, and regains its capacity to produce the type of efforts required in training and in competition.

To achieve success, competitive boxers must perform a large volume of work at high intensity. To be able to do this day in and day out while also dealing with a variety of other life tasks and responsibilities outside of the sport, the athlete and his or her support team must pay a particular attention to the sound management of the recovery process. Indeed, without proper recovery, adaptations and training effects cannot occur.

A variety of methods and modalities can be used to facilitate the recovery process and help the athlete regain his or her capability to sustain the repeated demands of training and competition. Among other things, those include: nutrition, hydration, rest, sleep and the use of techniques such as massages, contrast baths, warm water jets, etc. The need for and the use of specific recovery strategies, as well as the frequency at which they should be employed, will of course vary according to the stage of LTAD, and the actual level of competition the athlete is at.

The optimal management of the recovery process also requires that careful attention be given to the other life activities of the athlete outside of sport, as those can also be fairly demanding and represent significant sources of both fatigue and stress.

Poor planning, excessive training, or participation in too many competitions can all induce severe fatigue levels in the athlete, and lead to overtraining. The same detrimental outcome can come from the improper management of the boxer's recovery process.

Aspect 9: Education

When training and competition programmes are designed for young athletes, the demands of school should always be considered. Such demands include not only those placed by school sports or physical education classes, but also – and perhaps more importantly – by aspects such as academic loads and duties, school related stresses, the scheduling of classes, and the timing of exams. Whenever possible, training camps and competition tours should compliment, not conflict with, the timing of major academic events.

At all times, the priority of coaches and parents should be a good balance between the athletic and academic demands of the young athlete's life.

Overstress should be monitored carefully. Attention should therefore be given to the various possible sources of stress that the student athlete can be subjected to in his or her daily life, such as schooling, exams, peer groups, family, boyfriend or girlfriend relationships as well as increased training volume and intensity.

Interference from participation in other school sports should also be minimized, and an ongoing communication between the coaches who are responsible to deliver the various training and competition programs is essential.

Aspect 10 : Socio-Cultural Factors

The socio-cultural aspects of sport in general and of Boxing in particular are significant, and they must be properly planned and managed.

The socio-cultural possibilities offered through sport should not be viewed as potential distractions or interferences to the training and competition activities. Rather, they can play a key role in the holistic development of the athlete.

Indeed, throughout the athlete's developmental process, it is important to ensure that general societal values and norms are adequately reflected as part of the sport experience. Participation in sport activities can also be a powerful vehicle for broadening a young person's perspectives of the world in a variety of domains, including ethnicity awareness, cultural differences, and national diversity. Travels within Canada and in foreign countries offer exceptional opportunities for young athletes to learn and to live unique experiences in spheres such as history, geography, architecture, cuisine, literature, music, and the arts. Proper planning can allow sport to offer much more than simply commuting between hotel room and the gymnasium.

A reflection about the socio-cultural aspects of LTAD must also address the "sub-cultures" that can be found in a sport such as Boxing. In particular, coaches and parents must guard against group dynamics that lead to abuse or bullying. Notions of both ethics and respect should therefore be integrated into training and competition activities at all stages of LTAD. Those in charge of programmes must also be vigilant and ensure that quality leadership is always present, thus allowing each and every participant to develop within a healthy sport environment.

Another, very important, aspect that the present document must address is female boxing. Undeniably, female boxing has grown a lot during the past few years. As outlined previously in the section dealing with sport specialization, young women usually choose to join a Boxing club between the ages of 16 and 19, i.e. during late adolescence and early adulthood.

To continue to improve and achieve success on the world stage, CABA must first acknowledge the growing profile of female boxing in Canada, and provide greater opportunities for the development of this segment of its membership.

Currently, CABA runs national level programs for female boxers. However, and even though the recent growth of female boxing has been synonymous with Canadian success at the international level, aspects such as administration, programme funding, marketing, coach development, as well as equitable programming and opportunities for females have not followed on the domestic scene and at club level.

The following table outlines some of the current issues in Canadian female boxing, and the progresses CABA wishes to accomplish in the years to come.

Current Situation in Female Boxing	Desired Situation for CABA
• In general, late introduction to the sport. • For most females, Boxing is seen as an interesting sport alternative, rather than a first choice for sport participation. • Club system lacks specific structures/programs for females. • National programs have very high demands, and require a commitment that only few women can afford. • Few athletes are adequately prepared physically to compete at the elite level. • Few coaches are experienced in working with female boxers. • The athletes' developmental pathway to the elite levels of Boxing is not clear. • Few female boxers are adequately prepared to market themselves, and for their retirement from competitive sport. • Important mental training aspects are not given enough emphasis. • On the national scene, training and periodization regimes have important shortcomings. • There is insufficient emphasis on coach development and recruitment for female boxing, and inadequate delivery of certification programs for coaches working with higher level female boxers.	• Female boxers are introduced to the sport at a younger age. • Sufficient resources are available to support successful women who are boxing at the national level (financial, structural, coaching). • Higher profile for women's Boxing in both Canadian and sport cultures. • Adequate infrastructures and administration are in place to service all levels of female boxing. • Increased quality and quantity of coaches, administrators, officials of both genders committed to female boxing. • A clear pathway for female boxers' development is available, from entry to elite levels. • Coaching methods are inclusive of female learning models, support independent critical thinking, and are open to creative solutions. • A national vision is in place for female athletes at age group levels. • Effective communication networks between national, provincial, and inter-branch coaches are in place.

Within the LTAD model, several key outcomes advocating for an investment in change have been identified, in order to (1) elevate the profile of women's boxing in Canada, (2) increase participation, and (3) promote the retention of female boxers. In order that the "current status" evolves towards the "desired situation", all partners and stakeholders of the Canadian Boxing system must work together to support the following initiatives:

- At all levels of participation, appropriate infrastructures are in place for female boxing.
- Realistic opportunities for success are made available to female boxers.
- Critical aspects associated with the involvement of females in Boxing are addressed as part of coach training and certification programs (e.g. mental, emotional, physical, communication aspects).
- Females are seen as athletes first, females second; administrators and coaches use appropriate language and behaviour to enable female boxers to succeed.
- The specific conditions allowing females to become successful in Boxing must be analyzed and better understood, as well as the particular incentives allowing female athletes to perform at optimal levels.

As the organization leading the development of female boxing in Canada, CABA is therefore committed to the following initiatives:

- Building an infrastructure to support the growth of female in Boxing.
- Developing coach education material and resources to account for the differences between genders in areas such as communication and cooperation.
- Delivering national workshops on coaching female boxers.
- Developing a national coach mentorship program in Boxing to recruit more females into coaching, and provide enhanced development opportunities to female coaches.

Including more females in the decision-making processes.

Providing increased opportunities for an earlier introduction of females to Boxing.

Improving its Website to include more information about female boxing in areas such as: getting involved, types of programs offered, opportunities, athlete development pathway, etc.

Championships

GREEN HILL

5 - The 7 Stages OF LTAD IN BOXING

STAGE 1 – Active Start Boys and girls: 0 to 6 years old

Parents should ensure that their child has frequent opportunities to be physically active. The emphasis must always be on fun and on mastering new movements and skills. Although Boxing is not an activity children will be involved in at this stage of their development, it is important that our sport support the groups and organizations that promote physical activity in young children.

STAGE 2 – FUNdamentals Boys: 6 to 9 years old Girls: 6 to 8 years old

This stage is important for general athletic development. The focus must be on fundamental motor skills (agility, balance, coordination, quickness) as well as on developing basic sport skills (running, throwing, catching, gliding, and swimming) that can later be transferred to a variety of activities. Exposing the child to a wide range of sports, as well as ensuring he or she experiences success and enjoyment throughout these activities, are critical.

STAGE 3 – Learn to Box Boys: 9 to 12 years old Girls: 8 to 11 years old

In boys, this is usually the youngest age group involved in organized Boxing programmes. The emphasis should be on developing basic Boxing skills. Specialization must be avoided at this stage, and participants must be encouraged to get involved in a variety of sports to carry on with their general physical and motor development.

STAGE 4 – Train to Box Boys: 12 to 16 years old Girls: 11 to 15 years old

At this stage, the focus must be on introducing the participants to the various aspects of physical preparation for Boxing and on developing Boxing-specific skills. Increasingly challenging yet carefully selected competitive experiences must also be provided to the young athletes. The volume and the intensity of training should be increased progressively throughout this period, and it is the ideal time to instil a passion for the sport. For many athletes, this will also be the time when the growth spurt of the adolescence occurs. Some girls of this age group may show an interest towards Boxing. Talent identification and some form of specialization may be done at this stage.

STAGE 5 – Train to Compete Boys and young men: 16 to ~22 years old
Girls and young women: 15 to ~22 years old

At this stage, the focus must be on optimizing physical preparation and Boxing-specific skills, while at the same time developing the competitive attitude and the mental skills that are required to perform at a higher level. For the athletes who have the necessary training background, training becomes highly specialized in order to support a progression towards the high-performance level. The volume and the intensity of training are high, and fluctuate according to the schedule and the importance of the matches. For many athletes, significant strength gains can be achieved during the first few years of this stage. The majority of young women who join a Boxing club for the first time belong to this age group.

STAGE 6 – Train for Peak Performance Men and Women ~22 years old or more

At this stage, athletes have reached physical maturity. All the physical, technical, tactical, and psychological performance factors should be developed to an optimal level, highly specific to Boxing. The athletes who have the necessary training background and demonstrate the potential to perform at the highest level begin a transition from the national to the international scene. Career management, as well as the appropriate selection of matches throughout the preparation process, are key factors determining success.

STAGE 7 – Active for Life Male and Female participants of all ages

At this stage, participants engage in a transition from competitive Boxing to a life-long participation in sport and physical activity. Boxing must retain these individuals within its system through programmes and activities that are rewarding and adapted to both their needs and interests. Experienced boxers may also share their passion for the sport, their knowledge, and their skills with the up and coming generation through coaching, officiating, or as leaders of clubs and Boxing organizations, thus contributing to the growth of the sport.

STAGE 1 – Active Start

Boys and girls, 0 to 6 years old

Priorities The emphasis must be on fun. Physical activity must be enjoyed through a variety of games and experiences that support motor development. While Boxing does not have a direct role to play during the Active Start stage, our sport must support organizations that promote physical activity and motor development in young children.	Physical activity is essential for the development of a healthy child; it is very important to promote and guide the acquisition of basic movement skills. Indeed, motor skill development does not simply happen "naturally" as the child grows older, and some skills may be more difficult to acquire later if they are not introduced early and performed on a regular basis. Starting in infancy, parents need to provide infants, toddlers, and preschoolers with opportunities to participate in daily activities that promote movement. Building a well structured environment combining the fours pillars of physical literacy (athletics, swimming, gymnastics, and skiing) will enable the child to progress smoothly into the Fundamentals stage. **Why:** To allow children to learn and to experiment with basic movement and motor skills in a fun and encouraging environment. **Where:** Home, playground, daycare centres, elementary school programs, community clubs, structured programs, and free play. **Who:** Parents, immediate family, teachers, day care providers, instructors and coaches in sports other than Boxing.
Physical Aspects Regular participation in structured and non-structured activities that contribute to motor development.	• Fundamental elements of movement (Agility, Balance, Coordination and Speed) • Running • Jumping • Throwing
Mental Aspects Promote fun, discovery, participation, and reinforce the child's efforts.	• Fun through play • Participation and fairplay • Positive interactions with others • Confidence and self esteem
Health Promote healthy life habits.	**Nutrition** – Parents should: • Promote healthy eating through a variety of low fat, high in nutritional content meals. • Allow children to eat as needed, letting them use natural ability to learn how to monitor and control food intake. • Allow children to eat frequently throughout the day, but in small amounts each time; promote hydration. **Sleep** – As much sleep as the child wants and needs.
Role Of The Coach De-emphasize outcome and encourage participation and fun.	• Promote participation and enjoyment. • Provide positive reinforcement for efforts. • Select activities and drills in which success is almost always guaranteed. • Progress from simple to complex activities in a gradual fashion.
Recommendations Pertaining To Training And Competition No formal competitive structure.	• Participation in as many physical activities and sports as possible. • Provide organized physical activity for at least 30minutes a day for toddlers and at least 60 minutes a day for preschoolers. • Provide unstructured activity – active play – for at least 60 minutes a day, and up to several hours per day for toddlers and preschoolers. Toddlers and preschoolers should not be inactive physically for more than 60 minutes at a time, except while sleeping.

I'M BLOWIN UP

STAGE 2 – FUNdamentals

Boys: 6 to 9 years old Girls: 6 to 8 years old

Priorities

Creating conditions and experiences that lay the foundation for a life-long interest in sport and in physical activity.

Exposing the child to a wide variety of sports. Making sure he or she has fun and experiences success in all aspects of sport participation.

Well-structured programmes with proper progression are critical; such programmes should be monitored regularly by trained educators, coaches, and parents.

Very few children of this age group actually get involved in Boxing programs. For those who do, the emphasis should be on the development of motor skills in a fun and non-competitive environment, and Boxing should be only one of many sports participants are involved in.

Throughout this stage, the focus should be on enhancing basic movement abilities such as agility, balance, speed, and coordination, and on acquiring and improving fundamental sport skills such as running, jumping, throwing, punching, and swimming.

At this stage motor patterns become more refined, and balance improves as the inner ear gradually matures. No significant gender differences are apparent, and physical activity should still be done through games and sport play.

The child should have the opportunity to be involved in a variety of physical activity sessions at least 4 times a week. If a child has a favourite sport, participation up to twice per week in that activity is suggested; however, participation in several other sports or activities must continue to promote all-around athletic development.

Where: Elementary school physical education classes, community sport programmes, boxing clubs.

Why: To introduce children to fundamental motor skills, including some basic Boxing skills.

Who: Physical education teachers, instructors, club coaches.

Physical Aspects

Fun fitness activities and games to enhance motor skills and speed. General training for aerobic endurance and flexibility can be initiated, as well as muscular strength and endurance using the participant's own body weight.

The focus must be on developing physical literacy, i.e. basic movement skills:

- Running
- Jumping
- Hitting
- Throwing and catching
- General motor skills (agility, balance, coordination, speed)

The first "window of opportunity" for training speed (accelerated adaptation to training) occurs at the ages of 6-8 in girls and 7-9 in boys.

Technical And Tactical Aspects

Initiation to some motor skills that will be useful in the sport of Boxing, i.e. coordination between the movements of the arms, hands, and legs; balance; awareness of body position; etc.

At all times emphasize and reinforce good movement patterns.

Technical – Introduction to :

- The three fundamental principles of Boxing: offence, defence, footwork.
- Basic straight punches; basic body position; basic block technique against straight punches.

Tactical

- Focus on fun games and exploration of spatial awareness.
- Provide children with the opportunity to experience the outcomes of some competitions.
- Introduce basic rules of Boxing and ethical principles in sport.
- Introduce basic decision-making abilities.

Mental Aspects Developing self-esteem within participants through the reinforcement of effort, as opposed to outcomes.	Activity leaders must emphasize and model sportsmanship, and encourage open communication with the coach/leader and the other children. The following aspects should also be promoted: • The experience and the enjoyment of some forms of competition. • Positive reinforcement of strengths. • Effort based goals (trying hard) as opposed to outcome goals (winning). • Basic self awareness allowing the child to understand what he or she thinks and how he or she feels about certain things or situations. • Basic imagery with little structure (promote creativity). • Sportsmanship and ethical play. • A "no excuse" attitude. In addition, children should be introduced to basic decision-making skills and simple rules and ethics of sport.
Health And Injury Prevention Promote healthy life habits, and teach children to know and to listen to their body.	**Nutrition** – Parents should ensure that their children: • Have healthy eating habits and a balanced diet. • Do not eat excessively. • Are well hydrated. **Sleep** – As much sleep as the child wants and needs. **Strength** – No maximal or near-maximal strength activities should be performed, in order to avoid potential damage to the growth plates. **Equipment** – The equipment must be adapted to the size, strength, and skill level of the child.
Role Of The Coach Be a positive model at all times, and focus on the process (efforts) as opposed to the outcome (result, or winning).	With participants of this age group, coaches should: • Promote play and spontaneity in children. • Provide lots of positive reinforcement to build self-esteem in the participants. • Teach young athletes that mistakes or poor performance are not "bad", and provide learning opportunities. • Introduce Boxing etiquette, rules and concept of fair play. • Model fairplay and ethical behaviours, and encourage open communication.
Recommendations Pertaining To Training And Competition Participation to a variety of other sports and activities above and beyond Boxing. Focus on training as opposed to competition.	• Participation to 4 to 6 sport or general physical activities each week. • If possible, participation to 1 or 2 "introduction to Boxing" sessions of 45 to 75 minutes on a weekly basis. • No formal competitive structure.

STAGE 3 – Learn to Box (Building Technique) Boys: 9 to 12 Girls: 8 to 11

Priorities

This stage is one of the most important periods for the development of young athletes because it coincides with the optimal window of trainability for skills.

At all times, good movement patterns must be emphasized and reinforced.

In boys, this is usually the youngest age group involved in organized Boxing programmes. Very few girls get involved into Boxing at this stage.

At this stage, children are developmentally ready to acquire the general sports skills that are the cornerstones of all athletic development. Boxing fundamentals such as straight punches, blocking, and proper body position should be developed, with a constant emphasis on proper technique.

Specialization must be avoided at this stage, as it can be detrimental to later stages of skill development and to the refinement of fundamental motor skills. Inter Club competitions should be introduced for fun and to provide new experiences, but should not be the main focus. It is at this stage that the competitive spirit of future athletes is instilled, and this attitude must be carefully managed and nurtured.

At the end of this stage, athletes will typically choose one of the two streams: elite development or recreational participation. It is important to note that the technical, physical, mental and cognitive aspects of each programming stream are similar at this stage. The primary difference resides in the volume of training performed by the athlete. General talent identification also begins during this stage.

Where: Boxing clubs, community programs / clubs, elementary school physical education classes (for physical and motor development).

Why: To acquire and develop fundamental boxing skills, expand the athlete's exposure to the sport, and instil passion for Boxing.

Who: Club coaches, teachers, instructors.

Physical Aspects

Throughout this stage, the emphasis must be on (1) the acquisition of basic skills specific to Boxing, and (2) continuing to refine general motor abilities.

- The emphasis of the training process must be placed on learning Boxing-specific movements. This should contribute to improving the child's stamina, quickness, and muscular endurance.
- The development and refinement of basic motor abilities should be continued (agility, balance, coordination).
- Strength training can be initiated, using the athlete's own body weight as well as equipment such as stability balls and medicine balls.
- Endurance and speed should be trained through fun games.
- Some coach-lead training activities such as simulated bouts, condition sparring, or shadow boxing can be introduced progressively.

Technical And Tactical Aspects

Since this stage is main window of opportunity for the acquisition and development of skills. The emphasis must be placed on the following fundamental aspects of Boxing:

1. Offensive actions
2. Defensive actions
3. Footwork

Athletes should also be progressively exposed to competition.

Techniques

- The focus should be on the following Boxing skills :
  - Develop straight punches.
  - Introduction to hook and uppercut punches.
  - Introduction to straight punches combination.
  - Introduction to straight punches counter punch technique.
  - Develop blocking technique against straight punches.
  - Introduce blocking technique against hooks and uppercuts, as well as the parry technique.
  - Develop body position.
- Technical perfection must be stressed at all times when the above skills are being taught.
- All skills must be trained in both stationary and dynamic positions.

Tactics

- Focus on fun games and exploration of spatial awareness.
- Provide children with the opportunity to experience the outcomes of some competitions.
- Introduce basic rules of Boxing and ethical principles in sport.
- Introduce basic decision-making abilities.

Mental Aspects Self-esteem and confidence. Initiation to the fundamental aspects of mental preparation, and integration of mental skills within the training process and the competitive experience.	• Confidence and self-esteem, including knowledge of own strengths. • Progressive introduction to the following basic notions of mental preparation: - Relaxation: deep breathing, ratio breathing. - Goal-setting: long-term and short term goals. - Basic focus strategies and thought stopping. - Imagery, in order to promote skill development, control and confidence. - Self-awareness: self-talk and feeling states. - Confidence building, including the ability to identify strengths. • Comprehension and application of the competition rules and of the fairplay principles.
Health And Injury Prevention Children are not miniature adults. The choice of exercises, the equipment used, and the training loads must be adapted to their actual capabilities. A balanced development (i.e. each side of the body, and all major muscle groups) is critical in areas such as strength and flexibility.	**Choice of activities** • Balance one-sided skills with a variety of play activities that require opposite movement patterns. **Growth** • The period of rapid growth may begin for girls. **Nutrition** • Ensure adequate nutrition. • Discourage over-eating. • Ensure optimal hydration. **Strength and flexibility** - the following should be introduced progressively: • Low impact plyometric exercises through common games (hopscotch, jump rope). • Exercises for the development of the shoulders and the torso. • Correct lifting techniques with free weights; however, no maximal or near-maximal. strength activities should be performed, in order to avoid injuries to the growth plates. **Injury prevention** • There is an increased risk of injury during growth spurt, as the rapidly growing body adapts. • Training programs should be adapted during periods of rapid growth (i.e. imbalances in muscle flexibility and strength should be addressed, and the volume and intensity of training should be decreased). • Athletes should always wear properly fitting shoes.
Role Of The Coach Coaches must consistently act as positive role models.	• Basic training principles should be applied, and explained to both the athletes and their parents. • Introduction of boxers to basic mental skills, and integration of these skills into the regular training and pre-competition activities. • Basic information about sport nutrition and the importance of hydration should be provided to both the athletes and their parents.
Recommendations Pertaining To Training And Competition The emphasis must be on training, and competitions should provide a positive experience.	• Weekly participation in 4-6 general sport and physical activity sessions. • Weekly participation in 2-3 boxing specific sessions which should last between 45 – 75 minutes. • Athletes may start competing at the age of 11. At this stage, they should participate to no more than 2 to 4 Club events per year, against opponents of the same size and calibre and in well-structured events. The competitive experience should be positive and enjoyable, and represent an opportunity for learning, and for the expression of the various physical, motor, and technical abilities.

STAGE 4 – Train to Box (Building The Engine) Boys: 12 to <16 Girls: 11 to <15

Priorities Optimize physical preparation as well as the development of Boxing-specific skills.	The main objective of this stage is to optimize fitness preparation, and Boxing-specific skills. Training volume should remain high, while intensity should increase with the importance of competitions. Some girls of this age group may start showing an interest for Boxing. If their sport background is limited, the emphasis must be placed on the basic aspects of Boxing and on general athletic development; consequently, some of the recommendations outlined in this table may not be relevant for them. In many athletes, the latter part of this stage is also the time at witch peak strength velocity and peak weight velocity coincide with the period of opportunity for greatest strength gain. For this reason, the emphasis should be on developing the athlete's strong points and minimizing his or her weaker performance areas by adapting the physical, technical and tactical preparation around specific events. At this stage, the possibility of pursuing a career in High-Performance Boxing can be considered. **Where:** Boxing clubs and provincial programs, regional training centres, physical education classes at school (to support physical and motor development). **Why:** To develop a passion for Boxing and to pursue focused training. Athlete identification begins at this stage. **Who:** Club coaches, provincial coaches, physical education t teachers.
Physical Aspects For many athletes, this stage coincides with the growth spurt of the adolescence.	During this stage, the focus must be on the following physical performance factors: • Development of aerobic endurance with the onset of the growth spurt. • Development of speed, and introduction of specific training methods for the anaerobic energy systems towards the end of the stage; the second window of optimal trainability for speed generally occurs between the ages of 11-15 in girls, and 13-16 in boys. • Strength training: the use of exercises using the athlete's own body weight should be continued, and core strength should be emphasized; the systematic use of free weights for resistance training should be introduced during this stage, and proper movement execution must be emphasized at all times; for girls, the optimal strength development window during which free weights should be used occurs immediately after PHV or with the onset of menarche, and 12-18 month after PHV for boys. • Flexibility training should be emphasized throughout this stage. • Educating the athletes about the importance of optimal recovery and regeneration, hydration and nutrition; to a large extent, this role must be assumed by the coaches who should provide detailed information and specific strategies regarding these aspects of performance during training sessions. • Pre- and –post competition strategies should be developed to properly manage the athletes' efforts (i.e. no excessive fatigue leading to competitions, and adequate recovery following competitions). In the area of programme design, either a single or a double periodization can be applied. In the latter case, the programme features two competitive seasons, which are separated by a transition period sufficiently long to allow the athlete to recover fully.

Technical And Tactical Aspects The focus must be on consolidating and refining fundamental Boxing skills, developing more advanced techniques, and enhance the competitive experience.	**Techniques** • Basic Boxing skills should be consolidated. The boxer's strengths and weaknesses should be identified, and specifically addressed as part of the technical preparation process. • The focus should be on the same skills as those outlined in the in the FUNdamentals stage, plus the following: - Optimizing straight punches technique. - Developing hook and uppercut punches technique. - Introducing and developing straight punches combination with hook and uppercut. - Introducing and developing hook and uppercut combination. - Optimizing straight punches combination. - Developing counter punch technique against straight punches. - Introducing and developing counter punch technique against hook and uppercut. - Optimizing block technique against straight punches. - Developing block technique against hook and uppercut. - Developing parry technique and slip technique. - Optimizing body positionComprehension and application of the competition rules and of the fairplay principles. **Tactics** • The focus should be on the following Boxing tactics: - Understanding and application of the philosophy of Boxing relative to winning and losing. - Acquiring and developing appropriate tactical and strategic abilities against different styles of opponents. - Working on consistency of performance in a variety of situations. - Recognition of match situation and fostering aof appropriate decision-making. - Appropriate selection of skills in specific competitive situations.
Mental Aspects Mental skills should be integrated to the technical and physical preparation process. Boxers must learn how to cope with the challenges of competition through the correct application of specific mental skills.	The focus must be on developing or refining the following mental skills : • Progressive muscular relaxation. • Focus plans and competition strategies. • Self-talk – awareness of thoughts and application of methods and strategies for replacing unproductive self-dialogue. • Motivation – more advanced goals, and systematic use of the SMARTER principle of goal-setting: *Specific, Measurable, Achievable, Realistic, Time-based, Evaluated, and Recorded.* • Confidence – highlighting strengths and effective use of imagery. • Correct application of pre-competition strategies adapted to specific opponents and environments. • Improved self-awareness. • Distraction control strategies. • Competitive attitude consistent with the principles of sportsmanship and fairplay. • Teamwork and communication skills.

Health And Injury Prevention	**Growth** • For most athletes, this stage coincides with the growth spurt of the adolescence. **Nutrition** • Adequate caloric intake to account for energy expenditure associated with training and growth (average of 2200 Calories for females and 2800 Calories for males) • Balanced diet containing plenty of nutrient-rich foods, with particular attention given to calcium and iron intake. Optimal hydration. **Sleep** • Sleep needs increase during the period of rapid growth. **Strength and flexibility** • The systematic use of free weights for strength development should be introduced, with an emphasis on proper movement techniques; however, no maximal or near-maximal strength activities should be performed to avoid injuries to the growth plates. • Flexibility training should be emphasized during the growth spurt. **Injury prevention** • Injury prevention programs for shoulder and low back should be introduced, due to the increased risk of overuse injuries. • A pre-season, general conditioning program of at least 6 to 8 weeks should precede any intense Boxing-specific preparation. • Training programs should be modified as necessary during periods of rapid growth (i.e. coaches should ensure adequate muscle flexibility, guard against strength imbalances, decrease volume and intensity of training to allow for more recovery, etc.).
Recommendations Pertaining To Training And Competition	• Weekly participation in 5-7 general sport and physical activity sessions. • Weekly participation in 3-5 Boxing-specific sessions which should last between 45 – 90 minutes. • 4 to 10 bouts per year in club events and junior tournament.

BOeS

STAGE 5 – Training to Compete (Potential Stage)

Boys and young men: ~16 to <22 Girls and young women: ~15 to <22

Priorities The main objectives of this stage are to (1) optimize fitness preparation, and Boxing-specific skills; (2) refine and enhance competitive attitude and experience; and (3) nurture the potential for performance of those athletes with the talent and ambition to achieve high levels of performance.	As was the case during Stage 4, the main objective of this LTAD stage is to optimize fitness preparation, and Boxing-specific skills. Training volume remains high while intensity increases with the importance of competition. Training should become increasingly specialized to Boxing. The emphasis should be on developing individual strengths to the fullest, while addressing physical, technical, and tactical areas that are weaker through the use of adequate training methods and loads, while also taking into consideration the specific events in which the boxer will participate. **Where:** Clubs, provincial programs, universities, National Training Centres and National Team programs. **Why:** Continue to monitor the development of identified talent. Begin to prepare the elite athletes for high performance competition. **Who:** Personal coaches, provincial coaches and national coaches.
Physical Aspects All the athletic abilities are fully trainable towards the end of this stage. Fitness testing should be used on a regular basis to determine the priorities of physical preparation programs.	• For most male athletes, major strength gains can take place throughout this period due to the physical maturation process. • Given the specific demands of competitive Boxing, athletic abilities such as aerobic power and endurance, anaerobic power and endurance, speed, strength, strength-endurance, and speed-strength should all be trained. Athletes should also continue to improve their agility and footwork. • Strength development must be optimally integrated into the overall fitness and conditioning program of the boxer. • Regular use of recovery and regeneration strategies, and refinement in the application of such practices; assessment of individual nutrition needs. • Recovery and Regenation techniques should be refined, and individual nutrition needs should be assessed. • Injury prevention and care should be emphasized through adequate levels of core and upper body strength, as well as flexibility; all training activities must be carefully planned to allow appropriate recovery and avoid excessive fatigue and overtraining. • Single, double or triple periodization approaches can be used, depending on the athlete's competitive opportunities.
Technical And Tactical Aspects The boxer's technical and tactical skills must be tested, and performance capabilities must remain consistent under pressure and in a variety of situations. Condition sparring is important with emphasis on using specific skills with the element of competition.	**Optimization and refinement of the following Boxing-specific techniques:** • Straight punches. • Hook and uppercut punches. • Combination punches. • Counter punch against straight punches, hooks and uppercuts. • Block. • Parry and slip. • Body position, footwork, and agility. **Optimization and refinement of the following Boxing-specific tactics:** • Decision-making in boxing competition, i.e., focus on ability to read the opponent strategies. • Transition between attack and defence. • Defensive and offensive positioning in the ring. • Development of specific tactics against different styles of opponents. • Originality and innovation when responding to the opponent's actions.

Mental Aspects The boxer must continue to develop a competitive attitude, as well as the mental skills needed to (1) manage anxiety and (2) perform consistently. Personal accountability for performance excellence must also be emphasized.	**Optimization and refinement of the following aspects of mental preparation:** • Commitment to the demands of high-performance Boxing. • Ability to manage activation/ arousal level. • Goal-setting. • Self-awareness - high level of awareness of factors that maximize and minimize performance. • Knowledge and use of planning skills. • Critical evaluation of training and competition. • Competitor's mindset – confidence, focus, determination. • Personal responsibility and involvement in decision-making. • Sport-life-balance skills. • Independent attitude.
Health And Injury Prevention Implement specific injury prevention programmes to decrease the risk of injuries resulting from high-intensity, repetitive movements and efforts. Ensure adequate nutrition and hydration at all times.	**Self management** • Introduction to weight control practices, and development of individual strategies to achieve the correct weight. • Application of adequate strategies to minimize the negative effects of long-distance travels on performance. **Growth** • Some athletes may continue to gain height until they reach the age of 20-21. **Nutrition** • Adequate caloric intake to account for energy expenditure associated with training and competition activities. • Balanced diet containing plenty of nutrient-rich foods, with particular attention given to calcium and iron intake. Optimal hydration. **Strength and flexibility** • Ensure strength and flexibility levels meet the specific requirements of Boxing at a high level. • Continue to address any muscle strength and flexibility imbalances that may be present in the boxer. **Injury prevention** • A preseason, general conditioning program of at least 6 to 8 weeks should precede any intense Boxing-specific preparation. • Continue at least 6-8 weeks of pre-season conditioning prior to intense sport participation. • Introduce 2-3 aerobic cross training sessions per week to decrease the overload on the muscle groups highly stressed in Boxing.
Recommendations Pertaining To Training And Competition	• 4-5 fitness conditioning sessions, depending on the training phase and individual needs. • 5-6 Boxing specific sessions which should last between 60 and 120 minutes, depending on the training phase and individual needs. • 8 to 12 bouts per year in club, provincial, national and international youth and elite events.

STAGE 6 – Train for Peak Performance (Performance Stage)

Men: ~22 and up Women: ~22 and up

Priorities Optimizing physical preparation and advanced Boxing-specific skills through a highly individualized and specific preparation, in order to achieve peak performances in high level competitions.	This is the final stage of athletic preparation: athletes who have the required potential and motivation begin the transition between national and international levels. Maturation is complete, and all the performance factors should be developed at a level that will optimize performance on the international circuit. The athletes should be exposed to international competition on a regular basis, and special consideration should be given to developing the mental abilities necessary to cope with the unique demands of international competition. With regard to the athletic preparation process, the emphasis should be on both specialization and performance enhancement. **Where:** Boxing gym and National Training Centre. **Why:** Develop all performance factors at a level that is optimal for Boxing, in order to perform at the highest levels of competition. **Who:** Personal coaches and National Team coaches.
Physical Aspects	**With regard to physical preparation, special attention should be given to the following:** • Core strength / stability, and upper body strength. • Aerobic power and endurance. • Improving any individual weakness which can have a negative impact on performance. • Optimal functioning / fine tuning of all physical athletic abilities (tapering, peaking, pushing the limits). • Recognizing and preventing overtraining.
Technical And Tactical Aspects The boxer's repertoire of skills must continue to be perfected. Performance is expected to remain consistent under pressure and in a variety of situations. Condition sparring is important, with emphasis on using specific skills with the element of competition.	**Optimization, refinement and maintenance of the following Boxing-specific techniques:** • Straight punches. • Hook and uppercut punches. • Combination punches. • Counter punch against straight punches. • Counter punch against hook and uppercut. • Straight hook and uppercut counter punch. • Block, parry, and slip. • Body position. **Tactics:** • Refinement of competitive strategies against particular opponents and styles of boxing. • Advanced tactics are applied in a variety of conditions during training, to simulate situations encountered in international competition. • Advanced knowledge of international scoring systems, and adequate application of such knowledge in actual competitive situations. • Use of video to analyze performance and to develop specific competition strategies. • Originality and innovation when responding to the opponent's actions.

Mental Aspects Previously, all the training efforts have focused on *"getting there"*. At this stage, the emphasis is on *"staying there"*.	**Optimization, refinement, and maintenance of the following mental skills:** • Self-confidence, motivation and competitiveness. • Independence and autonomy. • Willingness to learn new ways of doing things, and relentless commitment to improve. • Creativity and innovation. • Strong work ethics, mental toughness, and resilience. • Focusing on the "big picture". • Demonstrating preparedness for the unexpected.
Health And Injury Prevention	**The following aspects of performance must be emphasized at all times:** • Optimal nutrition and hydration. • Adequate recovery and regeneration. • Minimizing the negative effects of long travels on performance. • Appropriate warm up and cool down practices and procedures. • Using adequate stretching techniques at the right times.
Recommendations Pertaining To Training And Competition	• Weekly participation in 5 or 6 fitness conditioning sessions, depending on the training phase and individual needs. • 5-7 Boxing-specific sessions that should last between 60 and 120 minutes, depending on the training phase and individual needs. • 8 to 12 bouts per year in national and international elite events. • Peaking and tapering for major championships and selection events, as necessary.

STAGE 7 – Active For Life (Enriched for Life)

Male and female participants may enter at any age

Priorities To retain participants through motivating programs and activities adapted to their interests and needs.	At this stage, the participant moves from competitive sport to lifelong physical activity and sport participation. In Boxing, this can be achieved through age group competition, or simply recreational enjoyment of the sport. **Where:** Boxing gyms and fitness centres. **Why:** For the love and enjoyment of the sport at any level. **Who:** Club coaches.
Physical Aspects To maintain an adequate fitness level to enjoy life to the fullest.	• Maintain aerobic fitness by walking or jogging at least 3-4 times a week for a minimum of 30 minutes each time. • Maintain an adequate level of strength through resistance training and other forms of conditioning exercises. • Maintain an adequate level of flexibility through various approaches, e.g. stretching, yoga or Pilates.
Technical And Tactical Aspects To continue to learn, and to share Boxing knowledge and experience with the others.	**Technical – Participants can:** • Perfect existing skills and learn new ones. • Engage in new aspects of the sport through volunteering of time (e.g., as a coach, referee, or club administrator). • Provide mentorship and developmental opportunities to young coaches and athletes. • Contribute to the ongoing development of Boxing through their involvement in community clubs. **Tactical – Participants can:** • Share their tactical knowledge and experience with others (athletes, coaches, parents) for incorporation into competitive situations or athlete development. • Provide knowledge, ideas and experience to promote the sport, or contribute to its continued growth.
Mental Aspects To have quality relationships with the others.	• Motivation to remain active and involved in the sport. • Desire to learn and to improve skills. • Development and maintenance of social contacts. • Fun; promotion and enjoyment of the sport.
Health And Injury Prevention To maintain a good health through a balanced and active lifestyle.	**Activities – Participants should:** • Do at least 60 minutes of activity per day (moderate and vigorous intensities). • Practice a variety of sports and recreational activities. **Nutrition – Participants should:** • Decrease their caloric intake due to less demanding training and competitive activities. • Maintain a balanced diet; eat foods that are low in fats, low in salt, high in whole grains, and high in complex carbohydrate. • Ensure adequate intakes of calcium. • Ensure adequate nutrition, but avoid over-eating. • Hydration should always be optimal.

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6 - Implementation

STRATEGIES FOR BOXINGS LTAD MODEL

In order for Boxing's LTAD model to be implemented successfully and achieve the desired outcomes, significant time, effort, and resources will be necessary. In addition, it will be crucial to ensure the model is well promoted throughout the Canadian Boxing system, and acknowledged as *"the way to do things"* by all the stakeholders in our sport. The following individuals and groups will therefore have a key role to play in years to come to support the implementation of LTAD strategies:

Groups and Organizations	Individuals
• Canadian Amateur Boxing Association • Provincial Boxing Associations • Boxing Clubs • National Training Centre • Regional and national Training Centres • Schools • Local authorities	• Athletes • Coaches • Parents • Volunteers • Administrators • Event organisers

This document is the first step in taking a long-term athlete development approach in the sport of Boxing. It provides general principles and guidelines to be used by parents, coaches, and providers of Boxing programmes. It defines the principles of LTAD, and outlines the framework for developing our sport in terms of participants' ages, stages of development, training emphases, and exposure to competition.

Further projects that the Canadian Amateur Boxing Association intends to undertake in the area of LTAD include:

- To develop and describe in detail sample training, competition, and recovery programmes for the *Learn to Box, Train to Box, Train to Compete,* and *Train for Peak Performance* stages. Such examples will be available for downloading from CABA's web site.
- To provide further information on the principles of LTAD to assist and update coaches, athletes, parents, and clubs.
- To incorporate the principles of LTAD into Boxing's coach education and certification system.
- To examine the domestic competition calendar to align it with the principles of LTAD.

CABA wishes to develop a realistic and practical LTAD plan that is based on the best information available. For this reason, the current LTAD document and strategies must be viewed as a dynamic project which will be subject to periodic reviews and adjustments. Throughout the LTAD implementation phase, the Canadian Amateur Boxing Association therefore welcomes the feedback and the suggestions from coaches, athletes, clubs, parents, administrators, volunteers and others with an interest in the sport and LTAD.

7 - Boxing Canada's LTAD MODEL AND THE NEW NCCP

As part of the transition of the National Coaching Certification Program (NCCP) to a competency-based approach, the Canadian Amateur Boxing Association will establish clear linkages between its coaching development system and the various groups of athletes and participants of its LTAD model. Coach training as well as certification requirements will therefore be based on the specific needs athletes have at each stage of their development.

The Boxing coaching system will feature two streams: *Instruction* and *Competition*. The Instruction stream will develop coaches who will work with participants of various age groups and ability levels involved in non-competitive programmes. The main goals of such programmes will be to teach basic Boxing skills, and to promote health and fitness through Boxing-specific training activities. The Competition stream will develop coaches working with athletes who aspire to achieve performances in competition. The training of coaches involved in this stream will emphasize aspects such as sport pedagogy, skill development, conditioning, tactics, mental preparation, as well as programme development and management. The tables below summarize the linkages between Boxing's new coaching system and the seven stages of LTAD.

Instruction stream: Non-competitive programmes focusing on a healthy lifestyle, as well as skill and fitness development through Boxing-specific activities.

Type Of Coach	LTAD Stage Most Participants Are At	Age Groups Most Athletes Are At
Instructor (beginner and intermediate level participants) - *Apprentice Coach*	Stage 1 - Active start	• Boys and girls aged 6 years or less
	Stage 2 - FUNdamentals	• Boys: 6 to 9 • Girls: 6 to less than 8
	Stage 3 - Learn to Box	• Boys: 9 to 12 • Girls: 8 to 11
	Stage 7 - Active for life	• Men and Women – late adolescence and adulthood

Competition stream: Development of athletes of various age groups and skill levels who aspire to achieve performances in competition

Type Of Coach	LTAD Stage Most Athletes Are At	Age Groups Most Athletes Are At
Introduction to competition - *Club coach*	Stage 3 - Learn to Box	• Boys: 9 to 12 • Girls: 8 to 11
	Stage 4 - Train to Box	• Boys: 12 to less than 16 • Girls: 11 to less than 15
	Stage 7 - Active for life	• Men and Women – late adolescence and adulthood
Competition and Development Coach	Stage 5 - Train to Compete	• Boys and young men: 16 to 21 • Girls and young women: 15 to 21
High Performance Coach	Stage 6 - Train for Peak Performance	• Men and Women aged 22 and up

8 - Boxing Canada's LTAD
MODEL AND THE DEVELOPMENT OF REFEREES

Referees can play an important role in the learning process young athletes go through during their first few years of competition.

Unfortunately, this role is often undervalued, or even completely neglected. However, to help young boxers progress more quickly, referees should not hesitate to make "pedagogical interventions" in certain circumstances. For instance, they can explain to young competitors the rules that support certain decisions, or take a few moments to explain the specific reasons why particular decisions were made.

As part of its future training and accreditation programmes for referees, the Canadian Amateur Boxing Association will emphasize the importance of making this type of interventions with young athletes and their coaches.

In addition, selected information pertaining to growth and development will be provided to referees, with the hope that this additional knowledge will assist them in their work.

9 - Summary
AND CONCLUSION

LTAD is a concept based on a systematic and clearly defined long-term approach. Its main purpose is to ensure the specific developmental needs of athletes of all age groups and competitive levels are adequately supported. Through the implementation of the LTAD model, male and female boxers will benefit from adapted training programmes, appropriate competitive experiences, as well as quality support at each stage of their athletic development. This will allow them to progressively acquire and develop the skills as well as the physical and mental abilities that are necessary to fully develop their potential, and will lay the foundation for a rewarding and enjoyable life-long involvement in physical activity and sport.

Undeniably, a well-planned and comprehensive preparation is crucial to achieve success in our sport. This is precisely what the LTAD model is about: making sure that training, competition, and recovery programmes are adapted to each stage of the young boxer's athletic development.

The LTAD model outlines fundamental principles and notions that will help shape a more systematic and better integrated athlete development process in Boxing. CABA therefore encourages its partners to take the LTAD principles into account when making decisions related to programmes, and to ensure such initiatives are properly implemented. Ultimately, this should result in increased participation, athletes with superior skills who enjoy boxing, better, more consistent performances at the highest levels of competition, and lifelong involvement in the sport.

In working hard together to make the LTAD vision a reality, we will become leaders in the world of Boxing. More importantly, we will contribute to the balanced development and individual success of those who choose to get involved in our sport.

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