



Long Term **Athlete** Development

Target Shooting: a lifetime sport



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Acknowledgements

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The SFC acknowledges the contribution of the following individuals in the preparation of this document:

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We also wish to thank the Federation of Canadian Archers, Biathlon Canada and the Canadian Fencing Federation for being role models with their Long Term Athlete Development framework documents, and for allowing us the use of some of their materials and ideas.

Foreword

The SFC has created this Long Term Athlete Development framework as a model for the development of athletes in the Target Shooting sports. Through our efforts, we acknowledge the support of our funding partners, Canadian Sport Centres and Sport Canada, as we are part of a national LTAD initiative involving every sport in Canada.

This LTAD document sets out a framework to maintain alignment with all groups in Canada that are involved in Target Shooting sports. While the focus is on the Olympic and Paralympic disciplines, this framework is equally applicable to athletes in any of the other disciplines in the sport of Target Shooting. Regardless of the discipline, age, gender, ability or disability of the individual, there is a place for everyone in the Target Shooting sports. The responsibility of the SFC is to offer and coordinate the delivery of safe, developmentally appropriate programs of consistently high quality across the country.

The details of how LTAD will be implemented will be developed in the second phase of LTAD. The successful implementation of the LTAD framework will lead to an increased number of target shooters at the club level, more competent target shooters at the provincial level, more expert shooters at the national level and more successful target shooters at the international level. Ultimately, Target Shooting will be recognized as a progressive, respected sport fully supported by competent coaches, officials and committed volunteers at all levels.



We acknowledge the financial support of the Government of Canada through Sport Canada, a branch of the Department of Canadian Heritage

Canada 

Target Shooting is unique



Target Shooting is a well-established and highly respected international sport. It was one of the sports in the first modern Olympics in 1896 and has been part of every Summer Olympic Games since. Women's disciplines were first included in the 1984 Olympic Games in Los Angeles. World Championships were held for the first time in 1897 in Lyon, France, and in 1966 shooting events were included, for the first time, in the Commonwealth Games at Kingston, Jamaica. The Beijing Olympics included 15 different Target Shooting events for men and women.

Target Shooting is a contest of skill and precision. While physical conditioning plays a large role in success on the shooting range, mental preparation is the deciding factor for successful target shooters. Mental skills are of paramount importance if target shooters are to excel when faced with the enormous pressure of competition, whether at the local club level or the international podium.

Target Shooting is a late specialization sport. This means that in relation to many other sports, participants tend to enter the sport in the teenage years and, for those who advance to become competitive level athletes, attain peak performances as adults. One of the major advantages of Target Shooting sports is that a

competitive athlete can reach and maintain peak performance for many years. At the highest international level, many athletes have participated in several Olympic Games, and several of these competitors have been over the age of 60. As an example, Canadian Susan Nattrass has had one of the longest and most distinguished international careers of any athlete, in any sport. Not only was she first female Olympic shooter from any country in 1976, but the Beijing Olympics in 2008 was her 6th Games.

Many opportunities exist for target shooters to pursue high level competitive goals, even though they may only begin Target Shooting at an age that would be considered late in many other sports. In Canada, target shooters participate in both Olympic and non-Olympic disciplines. Some of the non-Olympic disciplines have a competitive circuit, including World Championships, while others are primarily recreational. Each discipline is distinguished by a specific type of firearm, target and distance.

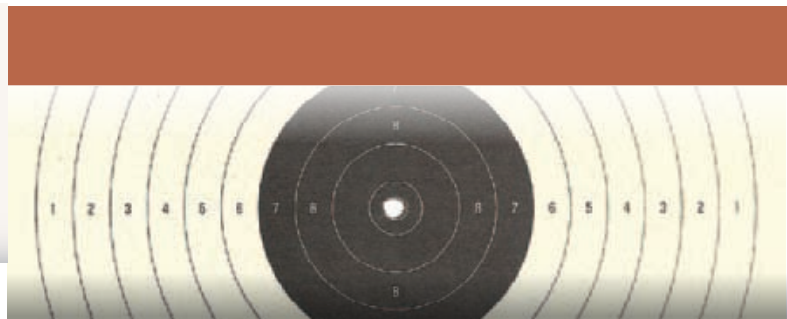
This document focuses on Long Term Athlete Development (LTAD) for participants in the Target Shooting sports, particularly in the Olympic and Paralympic disciplines. By respecting the factors of LTAD, our programs and structure will meet the needs of all athletes in Target Shooting, regardless of age, interest or ability.

Becoming involved in Target Shooting

Young participants in Target Shooting are usually introduced through the influence or guidance of family members, where the family has a strong history of participation. Once introduced, an individual can remain active in Target Shooting for many years, either as a recreational participant or as a competitive athlete. Target Shooting is considered a life-long sport.

In Canada, the majority of participants in Target Shooting commence their careers as recreational athletes at the local club level. Pony clubs, Biathlon, Tetrathlon and Modern Pentathlon are other sports that include Target Shooting, and athletes may compete in these sports as well as in the Target Shooting disciplines. Other organizations such as the Amateur Trap Shooting Association (ATA) and the National Skeet Shooting Association (NSSA) serve to introduce many people to trap and skeet shooting, and later provide opportunities for retired international athletes to remain active in the sport for life.

A number of initiatives could help introduce Target Shooting to a wider population, by providing opportunities for positive exposure to the sport:



- Disseminate information to educate the public that Target Shooting is a safe, fun sport that develops many desirable physical, motor and cognitive qualities;
- Create opportunities that encourage young people to try Target Shooting sports for both recreational and competitive goals;
- Synchronize recruitment and establish suitable competition opportunities for cross-over athletes (e.g. for retiring athletes from biathlon, pony clubs and modern pentathlon, as well as participants in cadet and other programs with air-rifle training);
- Provide more opportunities for adults to enter and pursue high levels of performance within the sport;
- Develop and promote opportunities for people with physical disabilities to participate in Target Shooting.

The disciplines of Olympic Target Shooting



Target Shooting disciplines are distinguished by the type of firearm or airgun, the type of target (moving or stationary), the distance of the shooter from the target, and the time limit. In pistol and rifle shooting, a score from one to 10 is possible for each shot, depending on its accuracy. In the shotgun events, the targets are either marked hit or lost, with a single point awarded for any hit target.

Men's Olympic events

EVENT	DISCIPLINE	SHOTS	DISTANCE (m)	TIME (hr)
50 m 3 Positions	Rifle	40 prone	50	1:00
		40 standing	50	1:30
		40 kneeling	50	1:15
50 m Prone	Rifle	60 shots (prone)	50	1:30
10 m Air	Rifle	60 shots (standing)	10	1:45
50 m	Pistol	60 shots	50	2:00
25 m Rapid Fire	Pistol	60 shots	25	
10 m Air	Pistol	60 shots	10	1:45
Trap Men	Shotgun	125 targets	70	
Double Trap Men	Shotgun	150 targets	70	
Skeet Men	Shotgun	125 targets	70	

Women's Olympic events

EVENT	DISCIPLINE	SHOTS	DISTANCE (m)	TIME (hr)
50 m 3 Positions	Rifle	20 prone	50	
		20 standing	50	
		20 kneeling	50	2:30 total
10 m Air	Rifle	40 shots (standing)	10	1:15
25 m	Pistol	30 precision	25	
		30 rapid		
10 m Air	Pistol	40 shots	10	1:15
Trap	Shotgun	75 targets	70	
Skeet	Shotgun	75 targets	70	

Target Shooting for athletes with a physical disability



Target Shooting has been part of the Paralympic Games since 1976. Paralympic Target Shooting competitions are divided into two major events—Rifle and Pistol—with competitions at three distances: 10, 25 and 50m. The rules depend on the gun, the distance, the target, the shooting position, the number of shots and the time limit. Competitors accumulate points for the value of their shots.

Target Shooting is one of the few sports in which an athlete with a disability can compete side-by-side with an able-bodied athlete. Competitions are organized according to a class system that varies according to athlete performance. Standards are set that allow a shooter to progressively develop toward higher classes, and to achieve a personal best score.

Target Shooting for athletes with disabilities is governed and coordinated by the International Paralympic Committee (IPC) following the modified rules of the International Shooting Sport Federation (ISSF). These rules take into account the differences that exist between Target Shooting for the able-bodied and Target Shooting for persons with disabilities.

The IPC utilizes a functional classification system which is open to any athlete with a physical disability, provided that he or she meets the minimum disability requirements for shooting. Depending on the existing limitations (degree of body trunk functionality, balance while seated, muscle strength, mobility of both upper and lower limbs), and on the skills that are necessary in Target Shooting, athletes are divided into three classes: SH1, SH2 and SH3 (Paralympic competition includes only classes SH1 and SH2).

SH1: Rifle and pistol athletes who do not require adaptive equipment. They are permitted to use a chair and, for rifle, a table for prone and kneeling positions.

SH2: Rifle athletes who have limited or no ability to support the weight of the rifle due to disabilities such as balance or arm/hand impairment.

Within these two main classes there are several subgroups:

SH1a, SH1b, SH1c

SH2a, SH2b, SH2c

Each subgroup identifies modifications that are permitted to the assisting devices that are used to compensate for different functional abilities between athletes of a particular class.

SH3: Athletes with visual impairment

International Paralympic Committee (IPC) Events

Event	Description (gender)	Class	Shots	Distance (m)	Time (hr)
R1	Air Rifle Standing (men)	SH1	60	10	1:45
R2	Air Rifle Standing (women)	SH1	40	10	1:15
R3	Air Rifle Prone (mixed)	SH1	60	10	1:30
R4	Air Rifle Standing (mixed)	SH2	60	10	1:45
R5	Air Rifle Prone (mixed)	SH2	60	10	1:30
R6	English Match .22 (mixed)	SH1	60	50	1:30
R7	Free Rifle .22 (men)	SH1	40P	50	1:00
			40S	50	1:30
			40K	50	1:15
R8	Sport Rifle .22 (women)	SH1	20P	50	2:30
			20S	50	2:30
			20K	50	2:30
R9*	English Match .22 (mixed)	SH2	60	50	1:30
R10*	Air Rifle Standing (mixed)	SH3	60	10	1:45
R11*	Air Rifle Prone (mixed)	SH3	60	10	1:30
P1	Air Pistol (men)	SH1	60	10	1:45
P2	Air Pistol (women)	SH1	40	10	1:15
P3	Sport Pistol .22 (mixed)	SH1	60	25	**
P4	Free Pistol .22 (mixed)	SH1	60	50	2:00
P5	Air Pistol Standard (mixed)	SH1	40	10	***

P = Prone S = Standing K = Kneeling

* *Not a Paralympic event*

** *Shot according to times listed in ISSF rules for 25m Ladies event*

*** *Shot according to times listed in ISSF rules for Air Pistol Standard event*

Use of Firearms



Canadian law closely regulates who can possess and transport firearms, including the manner in which the transport takes place. The Target Shooting sports place a very high priority on safety: on the range, while handling firearms, and while working with athletes of all ages and abilities, whether in training or in competition.

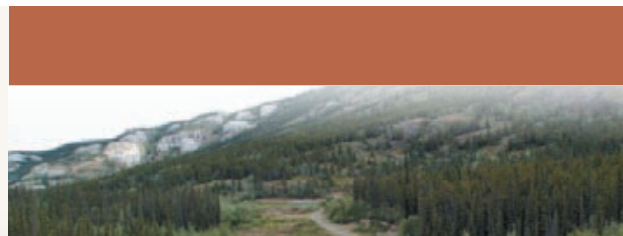
Competitive Target Shooting usually begins during the teenage years. Junior-aged athletes often train and compete with lightweight sporting equipment: .177 calibre airguns, small bore firearms and shotguns. Canada has strict regulations requiring adult supervision of junior athletes while using and transporting air guns and firearms. Training and practice should take place on a proper range, under adult supervision, however the requirements for transport of firearms mean that junior-aged athletes need an adult to accompany them to training locations. This adds a level of complexity for parents, and therefore to scheduling and establishing accessible locations for training.

Older or more experienced athletes have the option of using larger calibre firearms which are classified by type and are also under a strict set of federal regulations. Some of these firearms

are classified as restricted/prohibited and can only be transported by a licensed adult who possesses an "Authorization to Transport" (ATT) permit, which is issued by the Chief Provincial Firearms Officer. Each time the athlete wishes to train or compete, he or she is required to possess this document, or another person with the appropriate documents must accompany them. These regulations add complexity to training logistics, and create challenges that must be overcome by the athlete and his/her parents to participate in Target Shooting sports.

Traveling to a competition with a firearm also presents special challenges. Air travel, in particular, presents a unique challenge for athletes competing in major world games and other national or international events. All required permits, documents and legal forms must be complete before transit, and be readily presentable. Routing must be scheduled to avoid traveling through certain countries, and team members must be well-prepared for the variety of situations that may arise when going through security clearance at airports and customs.

Environmental Concerns



For both indoor and outdoor ranges, noise and related pollution issues are concerns that must be carefully managed. The collateral noise inherent in outdoor shooting sports has a direct impact on the location of such facilities. As well, specialized site preparation may be required to eliminate contamination of groundwater. These considerations can contribute greatly to the costs of building and maintaining facilities. In order to avoid relative proximity to residential areas, outdoor shooting ranges are often found in remote or rural locations. In these circumstances, cost factors exist relative to travel and time commitment of coaches, officials, athletes and family members.

Why is LTAD important for Target Shooting?



In the area of Athlete Development, LTAD provides:

- A framework for the optimal development of athletes of all ages, interests and abilities.
- A structure for program design and organization at all levels.
- A system that ensures that all participants will be more successful in sport, and healthier through life if they develop physical literacy at an early age.
- A framework which identifies specific athlete needs and therefore influences coaching education and officials training programs.
- An assurance that all participants have the opportunity to reach their full potential and that Canada is continually represented on World and Olympic Podiums.

In the area of Organizational Development, LTAD provides:

- A vehicle for organizational change.
- A formal framework to make sound decisions about the future directions of Target Shooting sports in Canada.
- A mechanism to assist in setting organizational goals that are clear and attainable and which support the values of our organization.
- A framework to identify and address gaps in our system.
- A mechanism for the development and implementation of programs that support the achievement of our organizational goals.

Anyone who participates in Target Shooting in Canada is a partner in LTAD:

Athletes	benefit from excellence in programming and coaching, at all stages of development and for all levels of interest and ability
Coaches	work as professionals to design and implement participation and training programs that respect the factors of LTAD
Parents and family members	become supportive partners in participant progression, training and competition as they come to understand and support the factors of LTAD and their importance in sport development
Target Shooting ranges and clubs	provide programs that reflect the factors of LTAD and support and value their coaches through ongoing professional coaching development appropriate to each stage of athlete development
Provincial/Territorial (P/T) Target Shooting associations	provide encouragement and resources for clubs, and ensure that provincial development programs, competitive structure and major events respect and support the factors of LTAD. They work as partners with the SFC to integrate and align their programs according to the factors of LTAD.
Shooting Federation of Canada	provides national leadership and assists P/T associations to integrate and align all programming to respect the factors of LTAD
Officials, sport leaders and volunteers	work within the national, provincial and club level structure as they support and respect the factors of LTAD in all decisions
Integrated performance teams	work with competitive athletes and their coaches to ensure fit, healthy and successful athletes
Sponsors and partners	work with the SFC to support programs and events

LTAD supports the four goals of the Canadian Sport Policy:

- Enhanced Participation
- Enhanced Excellence
- Enhanced Capacity
- Enhanced Interaction

LTAD reflects a commitment to contribute to the achievement of these goals. Our program is participant centered, coach driven, and administration-, sport science- and sponsor-supported. Athletes who progress through the stages of LTAD experience instruction, training, competition and recovery in structured programs that have been developed in consideration of their specific biological and developmental needs.

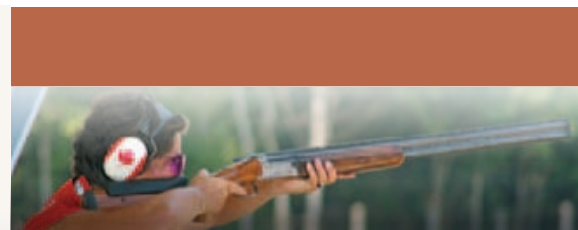
The LTAD process is appropriate for all athletes, including those with physical disabilities. The SFC has made a commitment to the ongoing development and delivery of programs for athletes with physical disabilities. Athletes with an intellectual disability do not generally participate in International Shooting Sport Federation (ISSF) Target Shooting programs.

All the factors of LTAD are applicable to athletes with physical disabilities, whether the disabilities are acquired or congenital. The rate of progress through the stages of LTAD, and the age at which these athletes enter each stage will vary according to the individual and the nature of the disability. LTAD is a starting point for ALL athletes.

Long Term Athlete Development:

- Reflects a “made in Canada” program that recognizes international best practice, research and normative data
- Is based on the physical, mental, emotional and cognitive development of children and adolescents. Each of the stages of LTAD reflects a different point in athlete development
- Ensures physical literacy upon which excellence can be built
- Builds physical literacy in all children, from early childhood to late adolescence by promoting quality daily physical activity in the schools and a common approach to developing physical abilities through community recreation and competitive sport programs
- Recognizes the need to involve all Canadians in LTAD, including participants with disabilities
- Promotes a healthy, physically literate nation whose citizens participate in life-long physical activity
- Provides a matrix for optimal training, competition and recovery programs throughout an athlete’s career
- Provides an optimal competition structure for each stage of athlete development
- Integrates elite sport, community sport and recreation, scholastic sport and physical education in schools
- Affects the entire sport continuum, including participants, parents, coaches, schools, clubs, community recreation programs, provincial and national sport organizations, sport science specialists, municipalities and several government ministries and departments (including health and education) at the local, provincial/territorial and national levels.

Current status of Target Shooting sports in Canada



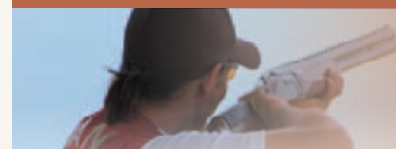
Target Shooting sports require a high level of technical, physical and mental preparation. As well, they offer safe participation, competition and enjoyment for a lifetime.

In Europe, Target Shooting sports enjoy a high profile, positive image, supported by professional, state-of-the-art facilities, public athlete recognition and many competitive opportunities. In Canada, however, Target Shooting sports often face challenges resulting from poor public image and restricted public access to facilities. Many of the Canadian attitudes toward Target Shooting sports are associated with the illegal use of firearms, lack of public knowledge about Target Shooting sports, and a declining number of Target Shooting ranges and competitive events.

The SFC, its provincial/territorial affiliates and all member clubs can develop a progressive and positive image for Target Shooting sports by working together. There are many components to creating and promoting this image, including educating and informing the public, being professional in our actions and strategies, being clear and coherent in our communication, and implementing well-structured sport governance models.

Working cooperatively, regardless of the sport discipline, residency in a particular region of Canada, or participation at a particular level within the Target Shooting sports, will allow our athletes, our programs and our sport to grow and flourish in Canada.

The factors influencing LTAD



1. The FUNdamentals

Fundamental movement skills (running, jumping, throwing, catching etc.) plus fundamental motor skills (agility, balance, and coordination) and fundamental sport skills (e.g. skating, skiing, swimming) are the basis for all sports and are known collectively as physical literacy. Physical literacy also includes the ability to “read” what is going on around you in an activity setting, and to react appropriately to these events. The qualities that are developed through physical literacy are very strong assets to participation in and the enjoyment of Target Shooting.

Children should develop physical literacy before the onset of the growth spurt. Three activities are extremely important to the development of physical literacy:

- Athletics:** run, jump, throw and wheel (for participants who use a wheelchair)
- Gymnastics:** ABCs of athleticism (agility, balance, coordination and speed) as well as the fundamental movement patterns of landings, statics, locomotions, rotations, swings, springs and object manipulation
- Swimming:** for water safety reasons, for balance in a buoyant environment and as the foundation for all water based sports

Other activities such as cycling, skiing, skating and wheeling (for participants who use a wheelchair) develop balance while in movement.

These basic movement skills provide many opportunities for future athletic success and lifelong enjoyment of physical activity.

2. Chronological age vs. Developmental age

Chronological age refers to the number of years and days elapsed since birth. *Developmental age* refers to the child's relative position on a continuum that begins at birth and culminates in full physical maturity. *Sport development age* refers to the number of years that the individual has been participating in the sport and is independent of both chronological and developmental age.

LTAD is based on developmental age, rather than chronological age, and is also related to sport development age. While we all follow the same stages to maturity, the timing, rate and magnitude of maturity differs greatly between individuals. As a result, a group of children with the same chronological age may differ by several years in their developmental age and the maturity of physical, motor, cognitive and emotional qualities. Early maturing adolescents may have as much as a 4-year physiological advantage over their late-maturing peers. Eventually, the late maturers will catch up when they experience their growth spurt.

All target shooters begin at the same sport development age, no matter what the age of entry into the sport. Participants will all progress through the LTAD stages in the same order, but the rate of progress and the amount of time spent at each stage will vary with the individual. Participants who enter at an older age can eventually catch up to earlier entry target shooters.

3. A holistic approach

Physical, mental, motor and emotional traits all mature at different rates. The coach must consider the whole athlete, and not focus only on the technical and physical aspects of Target Shooting.

Cognitive, mental and emotional (affective) elements are critical for athlete performance and must be prioritized in long-term athlete development. Beyond these elements coaches should also consider equipment and environmental factors that impact performance and safety. Ethical behaviour, fair play, respect and perseverance are qualities that are important within all stages of long-term athlete development.

4. Specialization

Many of Canada's most successful athletes participated as children in a wide variety of sports and physical activities. The movement, motor and sport skills they developed have helped them reach the top levels of their sport.

Target Shooting is a late specialization sport. Generally participants enter Target Shooting during the teenage years and may not reach their top performance levels until well into adulthood. Top international shooters can have a long sport career, with some Olympic target shooters being in their 50s and 60s.

There is much to be gained from a child's early participation in a variety of sports. Early exposure to a wide variety of sports and physical activities will develop some of the physical and motor attributes that are crucial to later success in Target Shooting: core body strength, stamina, suppleness, balance and eye-hand coordination.

Early specialization in a late specialization sport can contribute to:

- One-sided, sport specific preparation
- Lack of development of basic movement and sport skills
- Overuse injuries
- Early burnout
- Premature retirement from training and competition

5. Trainability

Trainability is the responsiveness of individuals to a training stimulus at different stages of growth and maturation.

All physiological systems are always trainable, but there are sensitive periods in development when the body is more responsive to specific training. Coaches must be aware and make best use of these sensitive periods of trainability when planning programs. LTAD addresses these key periods in the growth and development of young athletes where training must be carefully planned to achieve optimal adaptation.

Endurance	A sensitive period of trainability for endurance occurs at the onset of Peak Height Velocity (PHV). Aerobic capacity training is recommended before athletes reach PHV and is determined by developmental age. Aerobic power should be introduced progressively after growth rate decelerates.
Strength	The sensitive period of trainability for strength is determined by developmental age. For girls, this sensitive period is immediately after PHV or at the onset of menarche, while for boys it is 12-18 months after PHV. Speed strength and endurance strength can be developed prior to puberty using body weight, medicine balls and Swiss balls.
Speed	Speed is always trainable, regardless of the age of the participant.
Skill	Skill is always trainable. However, there is a period of particular trainability for skill training for boys between the age of 9-12 years, and for girls between the ages of 8 and 11 years—until the onset of the growth spurt. This assumes that a strong foundation of physical literacy skills has been developed prior to the onset of the growth spurt, which will help to increase the trainability of new sport skills.
Suppleness (Flexibility)	Flexibility is always trainable, but is more easily increased in younger participants. Enjoyable activities for flexibility development should be included in programs beginning at the earliest ages. During the adolescent growth spurt, there may be a decrease in the level of flexibility. In these situations, special attention is needed to design programs that maintain flexibility and reduce the risk of injury. Flexibility is important not only for injury prevention, but also for skill performance.
Motor Abilities	Motor abilities (agility, balance and coordination) can be developed at any age. Well developed motor abilities enhance skill learning and athletic performance. Games and other fun activities can be used to develop these qualities in all participants.

Other factors that affect overall athlete development:

Fatigue	Unexplained underperformance.
Growth	The rate and extent of growth is highly individual and difficult to predict. Regular monitoring of height and body length measurements will provide important information for planning training, competition and recovery programs.
Mental Skills	Target Shooting presents both a physical and a mental challenge. Even at the earliest stages of LTAD, participants can begin to develop the mental skills that support physical and technical preparation. Mental skills are developed progressively, through well-planned training programs and through careful selection of competitive opportunities.
Maintaining the Ideal Performance State	Optimal recovery management allows participants to maintain a state of performance that is appropriate for the level of participation and which places a high degree of importance on the individual's activities outside of formal training and competition. Areas addressed include nutrition, hydration, rest, sleep, and regeneration.
Schooling	The demands of school are important considerations when planning development programs. This can include balancing academic loads with other responsibilities, timing of exams and other stresses. When possible, training camps and competitions should complement, not conflict with, the timing of important school events.
Socio-Cultural	Through sport participation, athletes can develop a broader perspective of the world, an appreciation of ethnic and cultural diversity and a sense of national pride. As athletes begin to travel to competitions, activities that provide an exposure to local history, geography, architecture, cuisine, literature, music, and visual arts can be incorporated into the training plan.

6. Periodization (Annual training, competition and recovery plan)

Periodization provides the framework for organizing training, competition and recovery to achieve optimum performance at the required time. A periodized yearly plan can be developed toward the end of the Introduction to Target Shooting stage.

7. Calendar planning for competition

The domestic competitive and event calendar will be aligned with LTAD. Different stages of development and different levels of participation have different requirements for the type, frequency and level of competition. At some stages of development, training and development take precedence over competitions and short-term success. During the later stages, athletes need to experience a variety of competitive situations to learn to perform well at international and other high level events.

Optimal competition structure in all stages will favour individual athlete development. The structure of competition in Target Shooting has implications for selection, talent identification, safety, cost, and athlete periodization. For this reason, it is important that regional, provincial and national competition and event calendars are coordinated, and that competitions are selected according to the priorities of the specific stage of development of the participant.

8. The Ten Year Rule

Scientific research in sport has concluded that a minimum of ten years, or 10,000 hours of deliberate practice is needed for a talented athlete to reach elite levels. This translates into an average of more than three hours of training daily for 10 years. There are no shortcuts; athlete development is a long term process. Short term performance goals should always support long term athlete development.

9. System alignment and integration

LTAD recognizes that physical education, school sports, recreational activities and competitive sport are interdependent. Enjoying a lifetime of physical activity and achieving athletic excellence are both built on a foundation of physical literacy and fitness.

Stakeholders in Target Shooting include participants/athletes, parents, coaches, officials, administrators, spectators, sponsors and supporting national, provincial and multi-sport organizations. With so many partners, across so vast a country, with different demographic composition, system integration and alignment is very important to the ongoing growth and success of Target Shooting in Canada.

Since each element in the system plays a crucial role in athlete development, it is important that the system is clear, seamless and based upon a consistent set of principles.

10. Continuous Improvement

LTAD is a dynamic framework that utilizes continuous adjustments based on key principles.

Continuous improvement ensures that:

- LTAD responds and reacts to new scientific and sport-specific innovations and observations and is subject to continuous research in all its aspects.
- LTAD, as a continuously evolving vehicle for implementing change, reflects all emerging facets of physical education, sport and recreation to ensure systematic and logical delivery of programs to all ages.
- LTAD promotes ongoing education and sensitization of all partners about the interlocking relationship between physical education, school sport, community recreation, life-long physical activity and high performance sport.

11. Additional factors for athletes with a physical disability

While many similarities exist between athletes with a physical disability and able-bodied athletes, some differences make it necessary to modify and adapt the LTAD process.

- An athlete may have been born with a disability (congenital disability) or may have acquired a disability later in life.
- A child with a congenital disability may not have the same opportunity to learn fundamental movement skills because he/she does not always have the same opportunities for vigorous, physical play during the early years. This is sometimes due to long periods of hospitalization and the lack of suitable physical education programs, but may also be due to parents or caregivers being overly protective. This situation can also occur when an individual has an acquired disability.
- An athlete with a disability may require that the basic Target Shooting position be modified; for example, the standing position for a wheelchair athlete means that he/she cannot be supported above a measured distance on the back, and the arms must be free of all support from the chair or table.
- An individual can enter Target Shooting programs at any age. He or she will progress through the LTAD stages in order, but the age at which he/she enters or moves on from a stage will depend on individual progress.
- An athlete with a disability may require support personnel that are not found in able-bodied sport.

Development of an athlete with a physical disability requires two additional LTAD stages, compared to the able-bodied framework. These stages are called **Awareness** and **First Contact**, and they are particularly important for an individual with an acquired disability who, prior to injury or illness, may have had no contact with, and no knowledge of sport for athletes with disabilities.

The period following acquisition of a disability is one of transition and great change for most individuals. Many may not be aware that Target Shooting exists as a competitive and recreational opportunity, and as a Paralympic sport. The purpose of the Awareness and First Contact stages, therefore, is to inform individuals of this opportunity and to provide ways in which they can experience the activity. A positive first experience can go a long way to encouraging participation in both recreational and competitive sport activities.

The Stages of Long Term Athlete Development for Target Shooting



! "Years in the sport" are guidelines and will vary according to the individual training and competitive situation of each athlete.

Active Start

Chronological Age: 0 – 6 years

Participants with a physical disability may enter at any age, with or without a support person



During the Active Start stage, young children learn some of the fundamentals of movement. Daily physical activity and active play are very important in the early years. Among its other benefits, physical activity in this stage:

- Helps enhance development of brain function, coordination, gross motor skills, social skills, emotions, leadership and imagination
- Helps build confidence and positive self-esteem
- Helps build strong bones and muscles, improves flexibility, develops good posture and balance, improves fitness, reduces stress and improves sleeps
- Helps promote healthy weight
- Helps children learn to move skillfully and enjoy being active.

Physical activity should be fun and a part of daily life. Children in the active start stage should not be sedentary for more than 60 minutes at a time, except while sleeping. The best way for children to be physically active is through active play and organized physical activity. Be sure to provide opportunities for daily participation in physical activity that promotes fitness and movement skills.

- For toddlers, provide loosely structured physical activity for at least 30 minutes per day, and unstructured physical activity—active play—for at least 60 minutes (and up to several hours) per day.
- For preschoolers, provide 60 minutes per day of organized physical activity, and 60 minutes to several hours of active play.

Activities should focus on the development of fundamental movement skills such as running, jumping, twisting, rolling, gliding, kicking, throwing and catching and wheeling (for athletes using a wheelchair). These skills are the building blocks for more complex movement.

As well, encourage participation in activities that develop the motor qualities of agility, balance, coordination and speed (ABCs). These activities should allow the child to feel confident, competent and comfortable in a variety of fun and challenging sport situations. They should also be non-competitive and focused on participation.

While most physical activity should be in the form of active play, children in this stage should also be exposed to movement-based gymnastics and swimming programs as these sports develop the qualities that allow future participation in any other sport.

Introducing Target Shooting to children in this stage is not necessary; ensuring that the child develops sound physical literacy skills is far more important.

Additional factors for participants with a disability

People with a congenital disability often tend to be less active than their peers. To promote successful participation and an enjoyment of active living, ensure that activities are gender neutral and inclusive, and that access to age and developmentally-appropriate adapted equipment is promoted. Specific disabilities may advance or slow development for any given chronological age.

People with an acquired disability will enter the Active Start stage as they are learning to adapt to the specific nature of the disability. Learning how to walk or wheel, how to use adapted equipment or developing new technique in basic skill performance may be required. The length of time spent in this stage is a function of the individual and the type of disability.

The period following acquisition of a disability is one of transition and great change for most individuals. They may not be aware of the sport and recreation opportunities that are available to them, therefore this stage is also one of building awareness.

Informing individuals of the range of activities in which they can participate, and providing ways for them to experience and enjoy these activities is important. A positive first experience will go a long way toward engaging people with a disability in both recreational and competitive sporting activities.

FUNdamentals

Chronological Age: 6 – 10+ years

Participants with a disability may enter at any age, with or without a support person



During the Active Start stage, participants learn how to move their bodies in a variety of ways. Now in the FUNdamentals stage, this basis of movement leads to the development of skills with universal application to all sports.

Children in this stage should **sample** a wide range of sport activities. These activities should be well-structured, positive and fun! Through these activities, the child will further develop fundamental movement skills, and, by the end of the stage, will begin to develop fundamental sport skills. Bypassing basic skill development in this stage is detrimental to the child's future engagement in physical activity and sport.

- Ensure that fundamental movement skills are mastered before introducing sport-specific skills
- Emphasize the overall development of physical capacities, and the ABCs (agility, balance, coordination and speed)
- Introduce developmentally-appropriate and correct running, jumping, rolling and throwing technique and wheeling (for participants who use a wheelchair)
- Utilize active games to develop the qualities of flexibility, strength, power and endurance
- Develop linear, lateral and multi-directional speed through games and activities that require repetitions of less than 5 seconds duration
- Use the participant's own body weight as well as Swiss balls and medicine balls to develop strength
- Adapt all equipment to the size, weight and ability of the participant, and provide sufficient adapted equipment so that all participants are constantly active
- Introduce simple rules and ethics of sport
- Provide the opportunity for 60 minutes of daily physical activity, and include weekly participation in 3-4 different sports or activities
- Introduce (during the later part of this stage) Target Shooting as one of the sports that are being sampled.

Additional factors for participants with a disability

Participants with a disability should also have the opportunity to sample a wide range of sports and activities. These activities should be fun, easily accessible and employ equipment that is adapted appropriately to the individual. As in the active start stage, the age and rate of progress in this stage will vary with the individual.

The FUNdamentals stage is also the **FIRST CONTACT** and **RECRUITMENT** stage for participants with a physical disability. The participant may be considering trying Target Shooting for the first time, or the participant may need to re-learn basic techniques that were originally learned before acquiring the disability. In either case, the first experience should be enjoyable and the participant should gain an understanding of the competitive and recreational opportunities that target sports offer.

The information contained in the remaining LTAD stages for Target Shooting is equally applicable to able-bodied athletes and athletes with a disability.

Introduction to Target Shooting

Years in the sport: 1 – 3+ years

General objectives for this stage:

- To ensure that activities are fun and holistic in nature, providing a wide focus
- To introduce participants to Target Shooting sports
- To provide a safe, positive and fun Target Shooting environment that keeps participants motivated to remain in the sport
- To develop excellent basic technique
- To continue to develop and maintain the components of physical fitness through ongoing participation in a variety of sports and physical activities



Benchmarks:

Equipment:

Modified firearms according to the size, stage of physical development and level of ability/disability of the participant

Targets and distances:

Ensure early success by varying the distance to the target, allowing the athlete to make the link between success on the target and the physical act of Target Shooting

Dry firing:

Equivalent to one competition per training session

Training frequency:

1 – 3 times per week

Training duration:

1 – 1.5 hours per session

Training location:

Safe location at home (basement or garage); at an established range or appropriate building.

Length of training year:

36 – 44 weeks of the year (optimal)

Additional activities:

Participation in a variety of other sports/activities for ongoing development of strength, flexibility and endurance, as well as agility, balance and coordination.

Daily unstructured play and participation on school sport teams for continued development of movement skills, coordination and strength.

Competition:

1-2 club or local competitions per year; competitions to be experienced as an extension of training; focus on measuring performance factors, achieving a personal best, no focus on rankings or results.

Type of coach:

Minimum certified NCCP Instructor-Beginner coach or (preferable) Competition-Introduction coach. The best coaches are important for developing young or beginner athletes.

Implications for Coaching and Program Design:

- Teach safety first, demonstrate and enforce proper range safety procedures at all times
- Encourage participants to try a variety of Target Shooting disciplines
- Instruct excellent basic technique
- Monitor for onset of growth spurt in pre-pubertal participants and ensure that equipment is of appropriate size and weight for the level of development and ability
- Utilize high intensity games and relays to vary the program and add fun
- Provide developmentally-appropriate physical exercises to develop strength and endurance
- Guide the athlete in setting performance factor based individual goals that are challenging, yet attainable and which will build confidence
- Introduce mental skills preparation in such areas as visualization, arousal control and problem solving
- Encourage participants to self-reflect on their own performance and to begin keeping a basic training diary

Train to Train

Years in the sport: 2 – 5+ years

General objectives for this stage:

- To further develop and consolidate technical skills in 1 or 2 disciplines
- To build an aerobic base and develop speed and strength
- To introduce competition
- To develop a love for the sport, and a desire to remain in the sport
- To continue the “fun” component of Target Shooting, but focusing the concept of fun in the direction of achieving excellence



Benchmarks:

Equipment:

As appropriate for the individual athlete and level of ability

Targets and distances:

Full distance and number of competition shots

Dry firing:

Equivalent to one competition per training session

Training frequency:

2 – 5 times per week, combination of live and dry firing

Training duration:

1.5 – 2 hours per session

Training Camps:

Athletes may be selected to attend provincial or national training camps during the year

Training location:

In a safe location at home (basement or garage); at an established range or appropriate building.

Length of training year:

36 – 44 weeks of the year

Additional activities:

Maintain 2-3 times per week participation in 1-2 other sports/activities plus 2-3 hours of fitness training per week

Competition:

4-6 club, regional or provincial competitions per year; introduce 1-2 national level competitions toward the end of the stage; Canada Games; continue to treat competitions as an extension of training, no focus on rankings or results; focus on improving performance factors, focus on achieving a personal best.

Type of coach:

Certified NCCP Competition-Development coach.

Implications for Coaching and Program Design:

- Create an environment that is motivating, stimulating and enjoyable, while also challenging the athlete to reach beyond his or her own limits.
- Provide individualized training approaches to accommodate the range of physical, emotional and cognitive abilities within a group of athletes.
- Monitor for onset of growth spurt in pre-pubertal athletes and ensure that equipment is of appropriate size and weight for their level of development and ability.
- Build a single peak periodized program for the training year.
- Select competitions carefully to support and enhance the long term development of the athlete.
- Identify athletes with elite potential toward the end of this stage, and after athletes have finished the growth spurt.
- Instruct the athletes in their responsibilities, educate them about “Performance Factors” and promote their active role in goal setting.
- Integrate the further development of visualization and arousal control skills into technical training.
- Encourage athletes to participate in team sports to provide a balance to the individual nature of Target Shooting.
- Encourage athletes to maintain a balance between sport, school, work, family and social life. Athletes will need to be aware of and avoid sports and hobbies that could have a negative impact on Target Shooting. For example, athletes should wear protective gloves while working with metal and avoid contact sports and other sports where the hand or fingers could be injured prior to important competitions.

A survey conducted with target shooters at the 2007 Canada Winter Games indicated that a large proportion of these athletes participated in individual sports, or in music. Many continued this participation even while competing at a high level in Target Shooting. Further research is needed to determine if participation in these activities enhances Target Shooting training.

Train to Compete

Years in the sport: 4 – 9+ years

General objectives for this stage:

- To refine technical skills and specialize in one Target Shooting discipline
- To optimize physical preparation
- To learn to compete under a wide variety of conditions and circumstances
- To introduce an integrated support team to enhance athlete performance
- To develop a single-minded focus on achieving perfection in performance



Benchmarks:

Equipment:

International style equipment and facility are a benefit. Athlete should invest in electronic target systems

Targets and distances:

Full distance and number of competition shots

Dry firing:

1 match daily

Training frequency:

4 – 6 days per week

Training duration:

Equivalent to 1+ matches, plus time for evaluation of results

Training location:

In a safe location at home (basement or garage); at an established range or appropriate building.

Training Camps:

Participation in national level training camps during the year

Length of training year:

48 weeks

Additional activities:

Maintenance of fitness (agility, manipulation, strength, endurance); focus is away from sports or hobbies with side effects that could hinder shooting sport capacities

Competition:

National Championships and international competitions such as: Canada Games, Commonwealth Youth Games, Youth Olympic Games, World Cups, other National Team events. Focus on improving performance factors on demand

Type of coach:

Certified NCCP Competition-High Performance coach.

Implications for Coaching and Program Design:

Focus on training programs that are characterized by year-round, high intensity training for elite performance; athletes will be specialized in one discipline and will be integrated into the National Team program.

- Direct athletes to decrease participation in alternate sports in order to focus on Target Shooting.
- Customize training programs to be single or double peak periodization, according to individual athlete needs, and the specific schedule of the competition year.
- Ensure that as training volume and intensity increase, the periodized program focuses on optimizing physical fitness, preventing or overcoming imbalances and ensuring appropriate recovery and regeneration.
- Customize the training program to include fitness, recovery, mental preparation and technical development to address the specific strengths and weaknesses of the individual athlete.
- Emphasize optimum preparation by “modelling” high level competitions in training.
- Train the athletes to perform under a variety of competitive conditions.
- Assist the athletes to further develop “performance on demand” skills, as competition results become of increased importance.
- Select competitions carefully to support the athlete’s long term training program.
- Develop strategies that help athletes prepare for the demands of international travel as they begin to compete in international events.
- Assist the athletes in becoming independent and assuming greater responsibility for training, performance, equipment and behaviour.
- Select developmental strategies to help the athlete take an increasingly greater role in decision-making in regard to their own training and performance.

Train to Win

Years in the sport: 8 – 10+ years

General objectives for this stage:

- To demonstrate consistent “performance on demand” and to attain podium performances
- To optimize physical preparation, competition and performance skills
- To maximize the use of integrated support teams to help the athlete attain podium performances



Benchmarks:

Equipment:

Top international quality equipment and facilities, including electronic scoring, are required

Targets and distances:

Full distance and number of competition shots

Dry firing:

1 match daily

Training frequency:

6 days per week

Training duration:

Equivalent to 1+ matches plus time for evaluation of results

Training location:

On range, athlete may move to the vicinity of an international level facility to train or for national team/international training camps

Length of training year:

48 weeks

Additional activities:

Optimize fitness and motor qualities

Avoid contact sports, high impact sports and excess in personal life

Competition:

World Championships, Olympic Games, Paralympic Games, Pan Am Games, Commonwealth Games, Seniors and Masters Games, World Cup events

Type of coach:

Certified NCCP Competition-High Performance coach

Implications for Coaching and Program Design:

- Provide guidance for year-round, high intensity training in top level ranges and training centres.
- Develop training programs that will be multiple-peak periodization; the program must focus on preparing the athlete to peak for the most important international competitions.
- Focus on training as high volume and high intensity in accordance with periodization and peaking formula developed by coach.
- Develop a personalized, periodized training program that focuses on optimizing physical fitness, preventing or overcoming imbalances and ensuring appropriate recovery and regeneration to maximize performance.
- Support the athlete in developing full mental preparation skills and assist the athlete in applying these in any competitive situation.
- Provide the athlete with learning opportunities on how to manage the demands of media events and interviews.
- Offer athletes opportunities to become role models in the sport, which leads to being mentors for younger, up-and-coming athletes.
- Support the athletes (who may remain in this stage for many years) and provide opportunities to assist them in learning to manage the multiple demands of training, work and family responsibilities.
- Provide the athlete with learning opportunities to assist them in preparing for retirement from competition and the transition to other aspects of the sport.
- Seed the idea of giving back to the sport after retirement from competitive shooting; the retired athlete has much to offer the sport.

Active for Life: Target Shooting is a lifetime sport

Years in the sport: no specified lengths given that Target Shooting sports are late entry sports

General objectives for this stage:

- To provide opportunities for lifetime participation in any of the Target Shooting disciplines
- To provide opportunities for participants to try a new Target Shooting discipline
- To provide opportunities for retiring competitive athletes to remain active in the sport as coaches, officials and volunteers
- To provide opportunities for social interaction and to encourage participants to work with others within the sport
- To maintain established fitness levels and proper lifestyle

Benchmarks:

Equipment:

Appropriate to the activity

Targets and distances:

Use correct target and correct distance, or modify to maintain interest and stability of performance

Dry firing:

As needed to enhance desired level of performance

Training frequency:

Will vary with individual needs and motivations

Training duration:

As needed to reflect individual commitment to Target Shooting

Training location:

Local club or range

Length of training year:

As needed to reflect individual commitment to Target Shooting; also to coordinate with participation in other sports

Additional activities:

Appropriate to level of involvement of the individual and to ensure well-rounded access to healthy life-style; take part in another target sport such as golf or curling

Competition:

Club and informal competitions, provincial championships, national open championships, Masters events

Type of coach:

According to the level of participation of the athlete

Implications for Coaching and Program Design:

- Understand and be able to relate to motivations for remaining in the sport.
- Encourage the athlete to include physical fitness activities in their life-style.
- Recognize that athletes in this stage bring a greater maturity and are often open to creative challenges and new experiences.
- Organize social activities as part of the sport program.
- Promote safety as a high priority and integral part of all shooting programs.
- Encourage former elite athletes to become role models and spokespersons for the sport and to offer their expertise to support the development of the next generation of athletes.



Appendix 1: Glossary of Terms

Adaptation

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

Adapted Equipment

Factory produced equipment is adapted, or modified to fit the athlete's body. A Target Shooting athlete requires that their individual equipment be adjusted to various nuances of their own body.

Childhood

A time period ordinarily spanning the end of infancy — the first birthday — to the onset of puberty, characterized by relatively steady progress in growth and maturation and rapid progress in neuromuscular or motor development. This time period is often divided into early childhood, which includes preschool children aged 1 to 5 years, and late childhood, which includes elementary school-age children, aged 6 through to the onset of puberty.

Chronological Age

The number of years and days elapsed since birth. Growth, development, and maturation operate in a time framework known as 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 governed by the interaction of genes, hormones, nutrients, and the physical and psychosocial environments in which the individual lives. This complex interaction regulates the child's growth, neuromuscular maturation, sexual maturation, and general physical metamorphosis during the first 2 decades of life.

Competition

The time period that has been identified for the athlete to bring all the facets of their training together to achieve excellence.

Development

The passage toward, or percentage of maturity achieved, of various traits including social, emotional, intellectual, physical and motor qualities.

Dry firing

The action of an athlete where all the basic physical movements and intellectual commitments are brought together to complete the action of delivering a shot without actually causing the firearm to fire. The action may take place in any location where the athlete deems acceptable and rules permit, such as during an actual competition, a practice session or visualizing during a normal daily activity unrelated to shooting. Dry firing may be done with or without target systems, however normal personal equipment must be worn.

Growth and Maturation

The terms "growth" and "maturation" are often used together and sometimes synonymously. However, each refers to specific biological activities. Growth refers to "observable, step-by-step, 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, in the organism's progress toward maturity; for example, the change of cartilage to bone in the skeleton".

Laterality

A component of body awareness by which a person perceives and develops two distinct sides capable of independent movement.

National Training Centre

A physical facility where elite athletes can attend and receive sport-specific training, services and advice from appropriate experts in high performance Target Shooting. The centre allows athletes to have access to integrated support team members such as sport psychologists, nutritionists, and fitness specialists. A national training centre for Target Shooting would require an indoor shooting range with access to outdoor venues.

Peak Height Velocity (PHV)

The maximum rate of growth in stature during growth spurt. The age of maximum velocity of growth is called the age at PHV.

Periodization

The structuring of short and long term training, competition and recovery periods to provide optimum performances at a given date.

- Single peak = one preparatory and one competition period within the year
- Double peak = two preparatory and two competition periods within the year
- Multiple peak = competing all year round while maintaining physical and technical skills

Physical Literacy

The mastering of fundamental movement skills and fundamental sport skills. "A physically literate person moves with poise, economy and confidence in a wide variety of physically challenging situations, is perceptive in reading all aspects of the physical environment, anticipates movement needs or possibilities and responds appropriately with intelligence and imagination." (Margaret Whitehead, 2001)

Puberty

The phase of growth that begins with onset of hormonal changes in the reproductive system and ends with sexual maturity.

Readiness

The level of growth, maturity, and development that enables a child to perform tasks and meet demands through training and competition. Readiness and optimal 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.

Trainability

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

Training and Performance Factors

The knowledge and experience base of an athlete, including warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, regeneration, mental 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.

Appendix 2: Development of Mental Skills

This section describes the order of mental skills that should be developed for an athlete to progress in any of the Target Shooting disciplines.

The stress of a competition can cause an athlete to react physically and mentally in ways that can negatively influence performance. The symptoms of stress can include increased tenseness, increased heart rate, problems with digestion, worry about the outcome of the competition and inability to concentrate on each portion of the perfect shot.

Since Target Shooting can be a late entry sport, this section is described in a chronology of “years in the sport”. The scores in each box represent increasing abilities as time passes. The highlighted blocks show time periods where the individual skills are perfected and then regularly applied.

Many of the skills indicated can be learned at an early age, but they need to be trained and reviewed as the athlete progresses. Late-developing skills such as patience, commitment and ideal performance state are the product of learning, competition experience and life experience, as well as maturing mental abilities.

The SFC would like to thank Biathlon Canada for allowing us to modify materials from the Biathlon Canada Long Term Athlete Development Model Volume 1 (2006).

Development of mental skills vs years in the sport

LTAD STAGE	Introduction to Target Shooting		Train to Train		Train to Compete		Train to Win
YEARS IN THE SPORT	0-2	1-3	2-4	3-5	4-6	7-9	8-10
MENTAL SKILL							
Changing focus	1	2	3	4			
Becoming a team	1	2	3	4			
Time management	1	2	3	4			
Goal setting for practice	1	2	3	4			
Pre-match planning	1	2	3	4			
Self accountability	1	2	2	3	4		
Training diary	1	2	2	3	4		
Goal setting for training	1	1	2	3	4		
Practice analysis	1	2	2	3	4		
Coping with problems	1	1	2	3	4		
Communication proficiency	1	2	2	3	4		
Coping with technical problems		1	2	3	4		
Developing focus	1	2	2	3	4	4	
Ability to change		1	2	3	3	4	
Building self confidence	1	2	2	3	3	4	
Coping with emotions	1	2	2	3	3	4	
Mental visualization	1	1	2	2	3	4	
Anxiety control	1	1	2	2	3	4	
Motivation	1	1	2	2	3	3	4
Personal identity	1	1	2	2	2	3	4
Arousal control	1	1	2	2	2	3	4
Ideal performance state			1	2	2	3	4
Goal setting for life			1	2	2	3	4
Mental skills on demand				1	2	3	4
Performance on demand				1	2	3	4

1 = introduce skill

2 = basic performance of skill

3 = skill well developed

4 = elite level performance on demand

MENTAL TRAINING GLOSSARY

(Adapted from Biathlon Canada LTAD Framework, 2006)

Ability to change

The athlete must become aware if there is a need for change, then gain the ability to implement the required skills and behaviour to effect the change. After that the athlete needs reinforcement to sustain the changes made and celebrate success. Some examples of the kinds of changes may be physical (motor skills), methods (analytical), or interactions (changes in behaviour for dealing with others).

Arousal control

Each of the Target Shooting disciplines have an optimum arousal level, a 'zone', where performance is highest. To reach this an athlete must find out where their optimum arousal level is during practice and early competitions, then develop relaxation and warm-up skills to adjust their level as required.

Anxiety control

Anxiety can be a general feeling of worry, a sudden attack of panicky feelings, or a fear of a certain situation such as a competition. To control anxiety the athlete should learn methods to relax such as yoga, relaxation breathing or progressive muscle relaxation. If the athlete becomes anxious over an upcoming event, use one of the above techniques to relax and change focus to the job needed during the match.

Becoming a team

Skills needed to become part of a team and to help others become part of a team. This is a critical skill in sports where athletes compete as individuals but train and travel as a team.

Building self-confidence

This is a learned skill that comes from setting and achieving goals and then celebrating those successes. Evaluate goals, identify the skills needed to achieve them, and then determine how to acquire these skills confidently. Use strong mental images, positive thinking, and keep celebrating and enjoying success.

Changing focus

The ability to switch from one kind of focus to another as requirements change, e.g. from External-Broad; External-Narrow; Internal-Broad; Internal-Narrow.

Communication proficiency

An athlete must develop positive verbal, non-verbal (e.g., body language), and written communication abilities. An athlete must be able to listen to and understand what others are saying and communicate clearly to others in a way that they can understand.

Coping with problems

Planning for and learning strategies to handle problems in practice and during competitions. These could include items such as dealing with other athletes, equipment problems, weather or range conditions, nutrition, personal health etc.

Coping with emotions

This involves recognizing emotions in ourselves and others, and how emotions influence behaviour. Negative emotions can take away confidence and prevent rational thinking behaviour. The athlete must develop the ability to recognize these emotions and put in place methods to control them (e.g. relaxation breathing, positive self talk, talking to a coach or a friend, etc.).

Coping with technical problems

Specific, learned and practiced responses to common technical problems, e.g. target problems, range problems, or misfires and other related equipment issues. During practice the athlete should consider the many different things that can happen and build knowledge on how to handle them.

Developing focus

Athletes are constantly influenced with an endless array of internal and external stimuli, thoughts, and emotions during a practice or competition. They must develop the ability to focus or refocus on the present, attending to what is immediately important and blocking out any past and future concerns. Techniques such as relaxation breathing and mental visualization need to be well learned to handle this essential task.

Goal setting, for life

Goal setting encourages athletes to look at themselves more clearly to see where they are now and what they want for their life. Creating positive long term goals will help develop the inner skills they need in order to fulfill their dreams.

Goal setting, for practice

Set clear, measurable objectives before a practice for post-practice review. These objectives frame, define, and focus the work to be done during practices, gauge progress and measure success.

Goal setting, for training

Set long term goals, using clear, measurable objectives on a training plan. The goals will help when planning individual training cycles used during this plan.

Ideal Performance State (IPS)

A description of the physical, mental, and emotional feelings under which peak performances are most likely to occur for an individual. It is also known as “The Zone”, where the athlete is in a state in which they are able to hit the target where they want, how they want, when they want. Some typical parts of the IPS include a trance-like state of consciousness, similar to hypnosis; selective or even total amnesia; more intensive concentration on relevant stimuli; and a general inattentiveness to irrelevant items around them.

Mental skills on demand

To win at any sport takes a combination of natural ability and mental skill. All of the mental training done by the athlete will result in the eventual ability of being able to use these skills at any time in their chosen sport or in general life situations.

Mental visualization

Mental rehearsal involves imagining a situation or scenario and its ideal outcome. It can be used to reduce anxiety about an upcoming situation such as a competition. Athletes form a mental image of themselves going through each step of the anxiety-producing event and then successfully completing it. It is usually done by getting into a very relaxed state then rehearsing the event to its ideal outcome.

Motivation

In order to be successful at any endeavour, the athlete must have a good reason for taking part. The athlete must find the “Why” in relation to the level they are at in their sport. The reasons underlying will change as they progress (I want to have fun with my friends, I want to win the provincial title, or I want to win at the Olympics). Each of these desires or goals will spur them on as an athlete and provide the necessary motivation. The desires driving motivation will evolve as they proceed through life.

Performance on demand

The ability to perform as visualized regardless of the conditions. An athlete must be able to reach into their mind and pull out the necessary tools and skills to perform at their peak when required. It is a culmination of learning all the mental, technical, and physical skills required to take part at an elite level in any sport.

Personal identity

The athlete must begin to understand why they feel what they feel and why they behave as they do. They then have the opportunity and freedom to change those things they would like to change.

Practice analysis

What did the athlete learn? They should ask themselves how the practice made them feel and what they can do differently during the next practice

Pre-match planning

The ability to plan task sequences into a cohesive action plan and execute the plan; for example, a plan showing time to wake up, eat, travel and set up before a match.

Self accountability

Self accountability is who the athlete is and what they do when no one is watching. Honesty and responsibility are key factors of this concept. The athlete is then able to assume ownership of their own development.

Time management

The ability to successfully allocate appropriate amounts of personal time to required tasks and to follow these plans. This ability is integral to goal setting.

Training diary

Training diaries are excellent and important tools to help achieve short and long term goals and maintain motivation. The training diary may contain an exhaustive amount of information and is personal in nature. A training diary consists of such items as a record of daily events and equipment settings/changes, which allow post event analysis and accountability. Training diary examples are available on-line.

Appendix 3: Resource List

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FEDERATION OF CANADIAN ARCHERS (2008), LTAD Framework Document

FÉDÉRATION QUÉBÉCOISE DE TIR (2005), Plan d'Excellence 2005-2009

GYMNASTICS CANADA GYMNASTIQUE (2008), Long Term Athlete Development.

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VIRU, A., LOKO, J., HARRO, M., VOLVER, A., LAANEOTS, L., VIRU, M. (1999). Critical periods in the development of performance capacity during childhood and adolescence. *Physical Education and Sport Pedagogy*, 4:1, pp75-119.

WHITEHEAD, M (2001) The concept of physical literacy. *European Journal of Physical Education* (6), pp 12-138.

Websites:

<http://www.olympic.ca/Beijing2008/EN/Shooting/sports.htm>

Canadian Olympic Committee Website:
accessed on October 17, 2008

<http://www.paralympic.ca/page?a=293&lang=en-CA>

Canadian Paralympic Committee website:
accessed on October 17, 2008

<http://www.sfc-ftc.ca/main.cfm>

Shooting Federation of Canada website: accessed on November 24, 2008

http://en.wikipedia.org/wiki/Sporting_Clays

Wikipedia website:
accessed on January 5, 2009

Appendix 4: LTAD Steering Committee

Bernie Harrison

Bernie has been a life long target shooter after firing his first shots with the YMCA in 1956. In 1973 he joined the Calgary Rifle and Pistol club in order to gain skill in shooting his first pistol. He remains a life long member of this club.

Over the past 35 years, Bernie has earned positions on club, provincial and national teams and has had the honour of representing Canada at several international competitions. In the 1980s he took a hiatus from shooting to complete his Ph.D. program, then returned to competition shooting in the early 90s and continues to this day.

His officiating career formally commenced in 1977 as preparation for the 1978 Commonwealth Games under the mentorship of Bill Hare. Since that time, he has officiated at innumerable club, provincial and national competitions and has served as Chief Range Officer and Match Director for many National Pistol Championships. In 2005 he was the pistol match coordinator for the World Masters Games. In 2007 Bernie received SFC recognition as Official of the Year. His ISSF credentials are B License level.

Bernie is a certified Level 2 coach and has coached young people at his club and with his provincial association.

Administratively Bernie has served as president of his club (Calgary Rifle and Pistol Club), his provincial handgun association (Alberta Handgun Association), the Alberta Federation of Shooting Sports and is currently a director with the SFC.

Mo Johnson

Maurice (Mo) Johnson has been involved in Target Shooting since the 1970's. He has competed at the provincial and national levels in Rifle events a number of times over this period. In 1991 he began his coaching career and has progressed to NCCP Level 3, as well as being a Course Conductor for Level 2. From 1997-2002, Mo was the Smallbore Director for the SFC and also served as Vice President from 1999 – 2002.

Mo has been very active in the Canada Games program, serving in 1999 as the Team BC coach, moving on to the BC Mission Staff group at the 2003, 2005 and 2007 Games, helping athletes from various sports achieve their personal best. During this time he also coached the BC Junior Rifle team and helped many athletes rise to the national and international level. Mo is presently learning a new target sport, golf, in his spare time.

Rick Ward CD, C Tech, ChPC

Rick started Target Shooting as a kid with his Dad. Later he gravitated to plinking with pistols and in 1986 he joined the Marysville Rifle and Pistol Club where he met Canadian Head Pistol Coach Bob Kierstead, became involved in ISSF Target Shooting and later, with coaching. Over the years he has competed provincially, nationally and internationally with the N.B., ON, AB and Military CISM teams.

Rick has been president of a number of local clubs as well as the N.B Handgun Association, is currently a director of the SFC and a member of the High Performance Committee. Rick started coaching in 1988 and has held positions as Canada Games Pistol Coach, Military Unit, Branch and Brigade Team Coach, Head Coach CISM Pistol Team, Head Coach National Pistol Team and Head Coach Canadian Paralympic Shooting Team. He has coached at the Canada Games, World Cups, Commonwealth Games and Paralympics, as well as being personnel coach to several National and Provincial Champions.

Rick Ward is a Charter Professional Coach (ChPC) with Coaches of Canada. He is an ISSF B License coach, a NCCP Level 4 (completing Level 5) certified Coach and holds a Diploma in High Performance Coaching from the National Coaching Institute.

Susan Verdier

Susan Verdier has been the Technical Director of the Shooting Federation of Canada since 2006. In this capacity, Susan's responsibilities have included the development and implementation of the Federation's LTAD framework, high performance program and coaching areas of operations.

Susan first started working in sport administration in the 1980s as a Program Coordinator with the Canadian Freestyle Ski Association; introduced to the winter sport NSO through her involvement as a volunteer official. Since then, she has worked in various administrative capacities for five additional amateur sport organizations and, as a Freestyle Skiing official, has progressed to the Olympic level.

Susan is the NSO Technical Representative for Target Shooting at the Canada Games, and has served as shooting Team Manager at the 2007 Pan American Games in Rio de Janeiro, 2008 Olympic Games in Beijing and 2010 Delhi Commonwealth Games.

LTAD Expert Group Consultant

Istvan Balyi

Since 1994, Istvan Balyi has been the resident sport scientist of the National Coaching Institute British Columbia. He has worked with several Canadian National Teams as high performance advisor and planning and periodization consultant for major games. He is a world renowned coaching educator and his series on Long-term Athlete Development (LTAD) and periodization have been published in Australia, Canada, the United States and the United Kingdom.

Istvan is currently LTAD advisor for the General Office for Youth and Sport, The Kingdom of Bahrain and South African Sports Confederation & Olympic Committee. He worked with 19 sports in the UK on LTAD, including Rugby Union, Tennis, Cricket, British Swimming, Diving, Water Polo and Synchronized Swimming, British Judo and British Gymnastics.

Istvan is a member Sport Canada's expert advisory group of Long-term Athlete Development and presently works with 21 Canadian sports to develop sport-specific LTAD models.

He authored 3 books, published over 75 chapters and articles and delivered over 400 presentations at national and international conferences on LTAD and Planning and Periodization.

LTAD Project Lead and Writer

Cathy Haines

Cathy Haines is the Chief Technical Officer of Gymnastics Canada. In this capacity, Cathy oversees all technical program areas including 4 Olympic disciplines, several non-Olympic disciplines, Gymnastics for All and Coaching Education Programs. She has many years of experience in artistic and rhythmic gymnastics, as an athlete, coach, administrator, parent and volunteer. Cathy is also responsible for LTAD implementation at GCG, and is involved with several projects, including a physical literacy project with the Foundation Sports. Most recently, Cathy was Team Leader for Artistic and Rhythmic Gymnastics at the 2010 Commonwealth Games in Delhi, India, and is part of the management team for the 600 member Canadian delegation to the 2011 World Gymnaestrada in Lausanne, Switzerland.

From 2000-2009, Cathy was an independent sport consultant based in Ottawa. During this time, Cathy worked with a variety of sports, including Target Shooting, on LTAD and on NCCP design and development.

Special Thanks to the members of the expert review panel:

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Donald Cannon
Dennis Grover
Pat Gustafson
Patrick Haynes
JP Huot
Ed Martin
Cynthia Meyer
Gary Piercey
Ron Todd
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Graphic design

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