Shooting is a Lifetime Sport

Long Term Athlete Development

Saskatchewan Handgun Association
Long-Term Athlete Development Model
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Foreword: Saskatchewan Handgun Association

The Saskatchewan Handgun Association (SHA) has created this Long-Term Athlete Development model to be a blueprint for all stakeholders involved with shooters of all ages. We have done this with the support of our funding partner, Sask Sport, as part of a national initiative in which every sport in Canada has developed a similar model.

The implementation of Long-Term Athlete Development is a milestone for shooting and for Canadian sport. For the first time every sport organization is building its plans around a common framework which aligns the sport system, integrates health and education with sport and physical activity. This document was developed by Saskatchewan's shooting experts, with the assistance of the LTAD Expert Group, and drawing on the experience and best practices of other sports.

This document outlines the key principles of the SHA LTAD Model. The details of how LTAD will be implemented will be developed in the next phase. The successful implementation of the LTAD model will lead to better and more skilful Shooters, a thriving sport supported by quality coaches, officials and volunteers at all levels in Canada.

We, the Saskatchewan Handgun Association, agree that LTAD will be the basis for Shooting development in the province.

What makes Pistol Shooting unique?

Pistol shooting is a late specialization sport. This means that participants tend to enter in 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 pistol shooting sports is that a competitive athlete can maintain peak performance for many years. At the highest international level, many athletes have participated in several Olympic Games, and several have been over the age of 60. 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 (shotgun) from any country in 1976, but the Beijing Olympics in 2008 was her 6th Games.

There are many opportunities for athletes to pursue an Olympic dream, even though they may only begin pistol shooting at an age that would be considered late by many other sports.

Becoming involved in Pistol shooting

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

In Canada, the majority of participants in target shooting sports commence their careers as recreational athletes at the local club level. Introduction into competitive pistol shooting for junior aged athletes most often comes as a result of the involvement of family or close friends. Opportunities also exist for introducing competitive pistol shooting through the Canadian Cadet Corps, but this requires further development.

There is a need to provide positive exposure to pistol shooting to a wider population. More specifically:

- Pistol shooting is a safe, fun sport that develops many desirable physical, motor and cognitive qualities, and should be promoted as such;
- The SHA and its partners need to create opportunities that encourage young people to try pistol shooting for both recreational and competitive goals;
- There is a need for synchronized recruitment and 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 programs);
- There must be more opportunities for adults to enter and pursue high levels of performance within the sport;
- The opportunities for people with physical disabilities must be made more widely known.

It is generally accepted that for late specialization sports like pistol shooting, there is no benefit to doing predictive testing in pre-pubertal children. For mid-to-late pubertal athletes, there may be some benefit to predictive testing, but it will be most useful when applied to athletes who have had previous participation in endurance sports. Using competition results for talent identification is not appropriate for pre-pubertal and pubertal children. For post-pubertal athletes who have well-developed physical literacy skills and a solid foundation in pistol shooting, competition results can be part of a process to identify potential elite athletes.

Overview of the Disciplines of Pistol Shooting

Pistol shooting disciplines (or events) are distinguished by the type of pistol, the type of target, whether moving or stationary, and the distance of the shooter from the target. A score from one to 10 is awarded for each shot, depending on its accuracy. In the final events, partial points can be awarded for shots that are close to the center of the target.

Olympic Pistol Disciplines

Most international pistol shooting takes place at 25 meters distance. The two exceptions are 10M Air Pistol (10 meters) and 50M pistol (50 meters).

50 M Pistol (formerly Free Pistol) - is one of the ISSF/Olympic shooting events. It is free of restrictions regarding weight, trigger pull and sight radius but it must have "open" sights (no scope or dot or laser). The pistol must be of .22 Long Rifle calibre and may only be loaded with one round at a time. This is the ultimate slow fire precision event, with 60 shots fired over a two hour time period at a 10-ring that is just 50 millimetres in diameter. 50 M Pistol is one of the oldest shooting types, dating back to the 19th century and only having seen marginal rule changes since the 1930s. Currently, at the International level, competition in this event is open only to males.

25 M Rapid-Fire Pistol - is one of the ISSF/Olympic shooting events. If you think of Free Pistol as the marathon event then Rapid-Fire is the sprint event for men. Five targets, arranged side-by-side, face the competitor, who must fire one shot at each of the targets within a specified time interval. There are three time intervals. The event begins with a "sighting" series of five shots fired in eight seconds. After that, two five-shot series are fired, each in eight seconds; then another two series, but each in six seconds; and finally, two series, each in four seconds - for a total of 30 scoring shots. All this is repeated a second time for a grand total of 60 shots for score (and ten sighting shots).
Up until the 2004 Athens Olympics, this event typically was fired with a pistol chambered for the .22 Short cartridge. However, beginning 1 Jan 2005, the rules were changed and now the pistol must comply with the Standard Pistol specifications - which requires that the .22 Long

Rifle cartridge be used, rather than the .22 Short - but the time intervals and the targets remain the same. This, too, is a “men-only” event at the International level.

25 M Centre-Fire Pistol - is another of the ISSF shooting events. This event is for centre-fire pistols of caliber 7.62 mm (.30”) to 9.65 mm (.38”). Currently, the most popular choice seems to be European-made target pistols in .32 caliber, although .38 calibre and 9 mm calibre pistols do make an appearance - at least up to the National level. There are a number of design and dimensional restrictions on the pistol, including a minimum trigger pull of 1000 grams (2.2 lbs.), a maximum barrel length of 156 mm (6") and open sights. Single shot pistols are not permitted.
The event is divided into two stages: Precision and Rapid Fire.
The Precision stage is fired first and consists of five sighting shots followed by 30 scoring shots (fired in six 5-shot series of 5 minutes duration each) on the 50-meter Free Pistol target mounted at 25 metres.
The second stage is shot on the Rapid Fire target (all black, with larger scoring rings), which is exposed for 3 seconds and turned away for 7 seconds in a repeating cycle. One shot is fired at each exposure until five exposures have occurred. This 5-shot series is repeated seven times. The first series is for sighting and the next six series (30 shots) are for score. Before each exposure, the shooter must be in a “ready” position with his gun arm pointing not less than 45 degrees below the horizontal, and not resting on any support.
At top-level competitions, this event, as well as 25 M Pistol, may be shot on electronically-scored targets which do not turn but instead utilize green and red lights to indicate the “shoot” and “no shoot” intervals.

25 M Pistol (formerly Sport Pistol) - is both an ISSF and an Olympic shooting event. This is a women's event, which started in the 1960’s. It was first introduced to the Olympic scene in 1984. It is a 60-shot match fired at 25 meters distance and is essentially the same as 25 M Center Fire Pistol, with the exception that the gun used must conform to the Standard Pistol specifications (.22LR, 1000-gram trigger, etc). While at the International level, 25 M Pistol is still shot only by women and juniors, (men have Center-Fire Pistol instead), in many countries there is also male participation at the national level and below.

25 M Standard Pistol - is one of the ISSF shooting events, introduced at the World Championship level in 1970. It has its roots in the NRA conventional pistol competitions. This event combines elements of precision and rapid fire. Any pistol which conforms to the rules (.22 cal., 156mm barrel, 1000gms trigger pull) can be used.
The course of fire is 60 shots, which are fired in 5-shot series. The match is broken into three stages, each with a different time limit. It actually begins with a sighting series of five shots in 150 seconds, but these shots do not count for score. The sighting series is followed by four 5-shot series, each of 150 seconds duration; then four 5-shot series, each in 20 seconds; and finally, four 5-shot series, each in ten seconds. The 20-second and 10-second series begin with the shooter in the “ready” position, with his arm at or below 45 degrees from the horizontal and

not resting on any support.
Although Standard Pistol is not an Olympic event, it enjoys widespread popularity - from the club level upwards to the international level. It is shot at the SHA Provincial Championships and the Canadian National Pistol Championships. In 1970, Standard Pistol was also a women's event, but since then, at the international level, it is restricted to men.

10 M Air Pistol - is an ISSF and an Olympic shooting event for both men and women, but they shoot different matches. Men fire 60 scoring shots over 105 minutes and women fire 40 scoring shots in 75 minutes. An unlimited number of sighting shots are permitted within the time period, but only prior to the competitor firing his/her first competition shot. Consequently, shooters must manage their time to ensure that they complete the match in the allotted time. The pistol has a maximum allowed weight of 1500 grams. It fires a 4.5 mm (.177") calibre lead pellet propelled by compressed air or carbon dioxide (CO2). The trigger pull must be at least 500 grams. There are other restrictions on shape and dimensions and the pistol must be capable of fitting into a box of 420 x 200x 50 mm. Only "open" sights are permitted. The match is shot, single-handed, in the standing position at a distance of 10 meters. The centre of the target, the "ten-ring", is 11.5 mm in diameter.

NRA Pistol Discipline

The NRA conventional pistol competition is a North American event. It is a highly contested competition in the United States, and is also shot in most provinces in Canada.

The NRA competition consists of firing slow, timed, and rapid fire. This is done at 50 and 25 yards outdoors and almost exclusively at 50 feet indoors. Generally an outdoor match will consist of 20 shots, slow fire at 50 yards (two 10-shot strings, 10 minutes per string), 20 shots, timed fire at 25 yards (four 5-shot strings, 20 seconds per string), 20 shots, rapid fire at 25 yards (four 5-shot strings, 10 seconds per string), and the National Match Course (10-shots slow fire at 50 yards, 10-shots timed fire (two 5-shot strings), and 10-shot strings (two 5-shot strings). This match consists of 90 shots for a possible aggregate total of 900 points. For a 2700 aggregate this match is fired once with each gun: .22 caliber rimfire, center fire, and .45 caliber. Many match programs call for only one or two guns, that is a 900 or 1800 aggregate.

Most indoor tournaments are fired with .22 caliber rimfire only for a 900 aggregate. However, some indoor matches use all guns for a complete 2700 aggregate.

There are many other pistol events that are shot. However, these are the main events focused on by the Saskatchewan Handgun Association.

Shown below is a montage illustrating some of the pistols and targets used in the Olympic Pistol Shooting disciplines.

What is Long-Term Athlete Development?

What is the best way for an athlete to develop?

Long-Term Athlete Development answers that question. LTAD is a new wave in athlete development, based on the integration of sport science research with experience in working with shooters and coaches to develop a comprehensive set of development principles. LTAD takes the concept of periodization (the integration of training, recovery, nutrition, and other elements of preparation to create a long-term training plan) to the next level, by integrating preparation over an entire career or lifetime, and considering the holistic development of the individual as well as his/her development as an shooter. Today, every Canadian sport organization is using LTAD as the basis for their long-term planning. More information can be found in the document "Canadian Sport for Life Resource Paper" (C4SL), an LTAD resource paper published by the Canadian Sport Centre.

While a shooter can enter the sport at any age, a key LTAD premise is that participants will not only be more successful in sport, but healthier throughout life if they develop "physical literacy" at a young age – a wide range of skills that include movement, balance, throwing, catching, hitting, etc. The development of sound physical literacy skills, followed by ongoing learning and training introduced during optimal "windows of trainability" keyed to developmental ages and stages, is necessary for any athlete to reach his or her full potential. Missing a step, or introducing the "5 S's" (stamina, strength, speed, skill and suppleness) too early or late, restricts the athlete's potential and makes reaching the highest levels of performance more difficult. However, by understanding the 10 Key Factors of LTAD, coaches can help Shooters of any age participate and achieve their aspirations more effectively.

The 10 Key Factors of LTAD

Ten key factors influencing optimal athlete development have been identified:

1. **The 10-Year Rule:** Research has concluded it takes a minimum of 10 years and 10,000 hours of training for a talented athlete to reach elite levels, while a study of Canadian Excellence and ISSF World Championship Shooters showed it took an average of 7 years to achieve a score of 385/400 for women and 580/600 for men in 10M air pistol - and more to reach a consistent level of top performance. There are no short-cuts.
2. **The FUNdamentals:** Basic physical literacy is the foundation for later athletic success. All athletes, regardless of their sport, are more likely to succeed if early in life they developed a wide range of movement, balance and object control skills.
3. **Specialization:** Broad-based skills and abilities must be developed first. Premature specialization (prior to age 12-14 in shooting) may contribute to lack of essential skill development, overuse injuries, early burnout and early retirement from sport.
4. **Developmental Age:** Young athletes may be early, average or late maturers in a range of physical, mental, cognitive and emotional qualities. It is essential to base athletic training on developmental not chronological age. All too often, early maturers are identified for

special attention and development, while it is the late maturers who may have the greater potential to become top athletes. It is also important to recognize that the early physical maturer may not be mentally or emotionally prepared for the challenges they appear ready to take on.

5. **Trainability:** Trainability is the responsiveness of individuals to training at different stages of growth and maturation. Optimal windows of trainability for the "S's" of Stamina, Strength, Speed, Skill and Suppleness occur at different times- for example, stamina and strength trainability is linked to developmental age, while speed, skill and suppleness (flexibility) are linked to chronological age.
6. **Physical, Cognitive, Mental and Emotional Development:** A holistic approach to athlete development, considering all of these factors, is required for the best results. In addition to the five "S's" of physical development, five additional "S's" including Structure/stature (body type and growth), pSychology, Sustenance (adequate nutrition and rest), Schooling (and stress), and Sociocultural factors must be considered. At any stage, over-emphasis on physical training and winning may not equip the athlete for the all challenges of high performance or for life outside sport. Developing the whole athlete, including character, ethics, and so on, should be the objective of every program.
7. **Periodization:** Periodization is the organization of a training program by manipulating modality, volume, intensity and frequency of training over long-term (multi-year) and annual time frames, using training, competition and recovery periods. LTAD, with its focus on lifelong development, sets context and direction for a sound, periodized training program.
8. **Competition Calendar Planning:** Optimal sport-specific competition calendars are required for all stages of LTAD. Too much competition, especially at younger ages, can detract from development of skills and fitness. Modifying the competition calendar to meet athlete development needs, while it may create logistic challenges, is essential to LTAD.
9. **System Alignment and Integration:** The best results can only be achieved when all organizations and individuals involved in sport are working together in an integrated, coordinated way to support athlete development and success. Coaches, other sport leaders, facilities, organizations and competitions must work together to create an environment that supports athlete development. The LTAD model must become the focus of all shooting leaders and organizations.
10. **Continuous Improvement:** Sport is continuously evolving. Our plans and our organizations must adapt continuously to innovations, research and changes in the sport environment. New research and practical experience will constantly enrich our understanding and approach to LTAD.

The Stages of Long Term Athlete Development

The LTAD model divides shooting development into a series of stages. Within each stage, appropriate development is essential. Only by following age-appropriate activities and building a foundation in each stage for the next can shooters optimally prepare to progress toward their goals. The stages of pistol shooting's LTAD model are:

In pistol shooting, many participants begin at later ages, and come to the sport with some foundation of physical literacy and fitness developed in other activities. No matter what their age, they must progress developmentally from the ***Introduction to Target Shooting*** to ***Training to Win*** stages if they are to become high performance pistol shooters. For those who choose to participate but not pursue high performance, the ***Target Shooting is a Lifetime Sport*** stage is open at any age after basic skills are developed.

For pistol shooters with a disability (AWAD) two more stages are added at the beginning: ***Awareness*** and ***First Contact***. These emphasize the need to make access to sport known to people with a disability, and then to ensure that the sport environment and first exposure are positive and welcoming. Information about LTAD for Shooters with a disability can be found in the LTAD publication No Accidental Champions.

Why Does Pistol Shooting Need A LTAD?

Although pistol shooting in Canada has a tradition of modifying the sport for young participants and introducing skills through programs such as Crossman's, we face many of the same challenges as other sports in Canada. In addition to the shortcomings in government funding support and lack of physical education and sport in schools there are issues directly related to coaches, parents, clubs and administrators. The following is from a general overview of Canadian sport prepared by Sport Canada's LTAD Expert Group, but many points apply to shooting as well:

Coaches

- Training methods and competition programs designed for male athletes are superimposed on female athletes.
- Need more female coaches.
- Lack of understanding of coaching athletes with a disability.
- Coaches largely neglect the sensitive periods of accelerated adaptation to training.
- Adult training programs are imposed on developing athletes.
- Preparation is geared to the short-term outcome — winning — and not to the process.
- Need to promote lifelong learning and development for coaches.

Organizations

- Developmental athletes over-compete and under-train.
- Adult training and competition programs are imposed on developing athletes.
- Chronological rather than developmental age used in training and competition planning.
- Lack of training facilities.
- Programming for profit vs. development.
- Lack of entry level programs.
- Clubs lack specific role and mandate linked to a coordinated system.

Parents

- Parents are not educated about LTAD.
- Parents may not understand the sport system and "which organization does what".

- Sports specialize too early in an attempt to win or to attract and retain participants; parents need to understand and resist this tendency.
- FUN is forgotten.

Sport Leaders

- Competition system interferes with athlete development (skews or reduces training).
- No talent identification.
- No integration between physical education in schools, community programs, and elite competitive programs.
- Failure to integrate athletes with a disability.
- Fundamental movement skills and sport skills are not taught properly.
- Most knowledgeable coaches work at the elite level and volunteers coach at the developmental level where quality coaches are essential.
- May have difficulty funding youth.
- Programming is not a priority.
- Forced to change mission/mandate in pursuit of funding.

As a consequence of a deficient system, athletes may suffer:

- Injury
- Failure to reach optimal performance levels in international competitions
- Poor movement abilities
- Lack of proper fitness
- Poor skill development
- Bad habits developed from over-competing focused on winning
- Undeveloped and unrefined skills due to under-training
- Female athlete potential not reached due to male oriented programs
- Children not having fun as they play adult-based programs
- No systematic development of the next generation of international athletes
- Athletes pulled in different directions by school, club, and provincial organizations because of the structure of competition programs
- Remedial programs needed by provincial and national team coaches, to counteract the shortcomings of athlete preparation
- Fluctuating performance due to lack of talent identification and a clear developmental pathway
- Athletes fail to reach their genetic potential and optimal performance level
- Athletes leave sport and want nothing to do with it later

The SHA's new Long-Term Athlete Development model addresses these issues. By introducing LTAD principles and building an integrated athlete development system around them, we can achieve greater participation and competitive success.

Developing Physical Literacy in Every Child

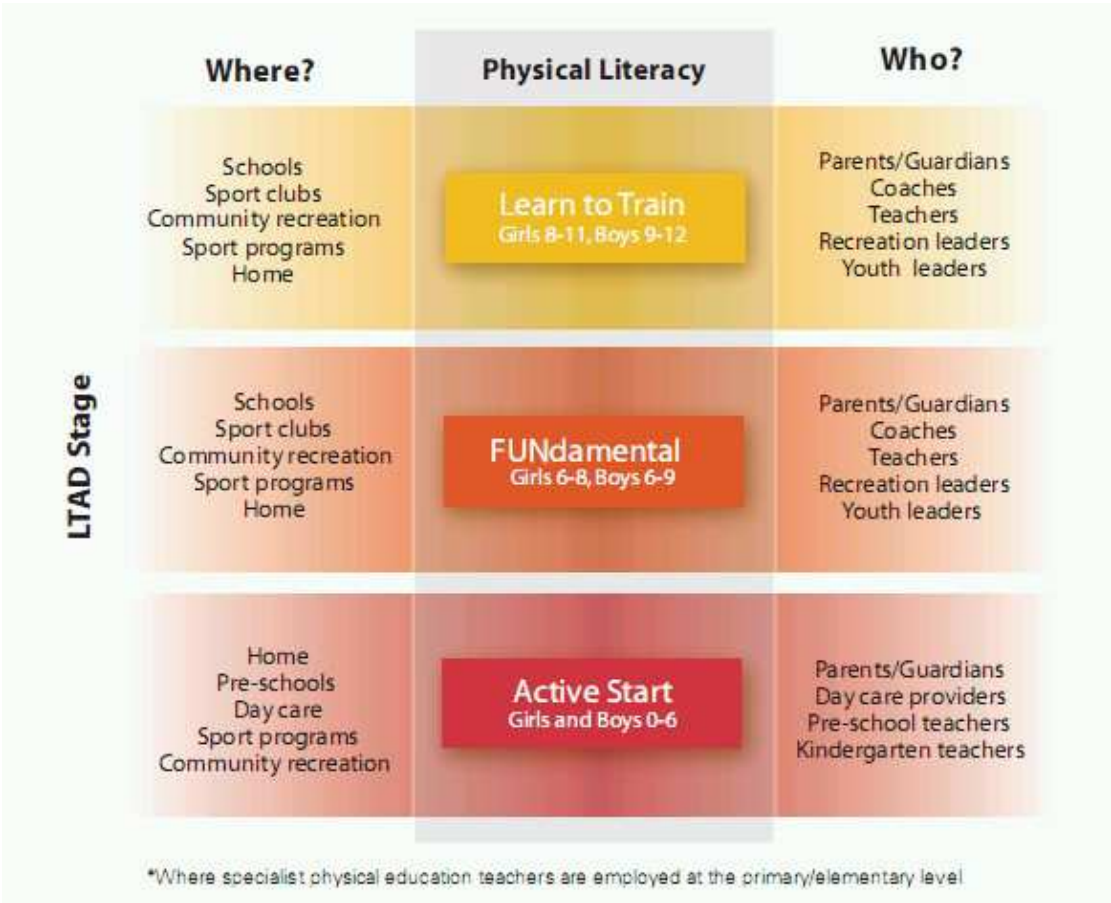
Physical literacy is the development of fundamental movement skills and fundamental sport skills that permit a child to move confidently and with control, in a wide range of physical activity, rhythmic (dance) and sport situations. Physical literacy also includes the ability to "read" what is going on around them in an activity setting and react appropriately to those events.

For full physical literacy children should learn fundamental movement skills and fundamental sport skills in each of the four basic environments:

- On the ground – as the basis for most games, sports, dance and physical activities.
- In the water – as the basis for all aquatic activities.
- On snow and ice – as the basis for all winter sliding activities.
- In the air – basis for gymnastics, diving and other aerial activities.

Sports have recognized that many of the children and youth who enter their programs lack basic movement skills.

Developing physical literacy in our children will take the combined efforts of parents/guardians, day-care providers, schools personnel, community recreation leaders and everyone involved in the Canadian sport system. Each has a role to play if we are to be successful.



The Consequences of Missing-out On Physical Literacy

A child who misses out on developing physical literacy is at a great disadvantage. On the playground and in the park, children really like to play with other children who have the same level of skill as they do, and who can "keep the game going", and, if you can't keep the game going, you won't generally be asked to join in.
Missing out on Fundamental Movement Skills also means that the child is unlikely to choose to take part in a formal sport activity that requires proficiency in that skill, and this restricts their choice of life-long health-promoting activities. It also restricts their opportunities for sporting excellence.
Being unable to perform even a single fundamental movement skill can seriously restrict later opportunities for recreational or competitive activity.

Active Start – Physical Literacy Activities

- Encourage the child to run – not just in a straight line, but with stops and starts and changes in direction. Tag and chasing games are excellent.
- Play catching games with the child. Use a wide range of soft objects, and balls of different sizes. Start with catching a large ball with two hands, and progress towards smaller balls and eventually one handed catching. Remember - Balls that don't bounce too much are great for learning, as are bean-bags.

Physical Literacy During the Active Start Stage of LTAD

- Play games making body shapes – upside down and right-side up. Pretend to slither like a snake, and roll like a rolling pin on the floor, or down a small grassy slope.
- Play throwing games – and start with soft objects that the child can hold easily in his or her hand. Try to get the child to throw at a target, and sometime to throw as hard as they can. Get them to use both the left and right hand when they throw.
- For quiet times, or when in small spaces, play balancing games. Stand on one foot and then try the other – try balancing on different body parts, and try walking along any painted lines on the ground.
- Jump, make shapes in the air, jump to see how high the child can go, or how far. Make imaginary "rivers" and get the child to jump from one bank to the other. Try jumping from one foot, or from both. Make sure the child bends at the knees when they land.
- Introduce children to water activities and learn to swim programs. Get them on skates or skis and out on the ice or snow so that they learn to slide.
- Ride a tricycle, or a bike – with or without training wheels to develop dynamic balance.

Fundamentals – Physical Literacy Activities

- Encourage children to engage in unstructured physical play with their friends every day, regardless of the weather.
- Continue to play catching, throwing, hitting, running and other physically demanding games with both boys and girls.
- If possible, enroll children in programs that offer a wide variety of different activities (multi sport programs) or in a wide range of different activities. Try as many different activities as possible.
- Attend parent-teacher, or other school meetings and advocate for quality physical education programs in the school – with sufficient time allocated (recommended allocation 150 minutes per week – 30 minutes per day) taught by a qualified physical educator.
- ***Don't be concerned with the score***. At this age many programs that include competition don't keep score. This puts the focus of the program on learning and having fun, rather than on doing whatever it takes to win matches, games and leagues.
- Don't believe the myth that early specialization in sports such as soccer or hockey will lead to far greater performance later in life. Developing all-round athletes at this age is far better, but remember that a few sports (such as gymnastics and figure skating) do require early specialization.

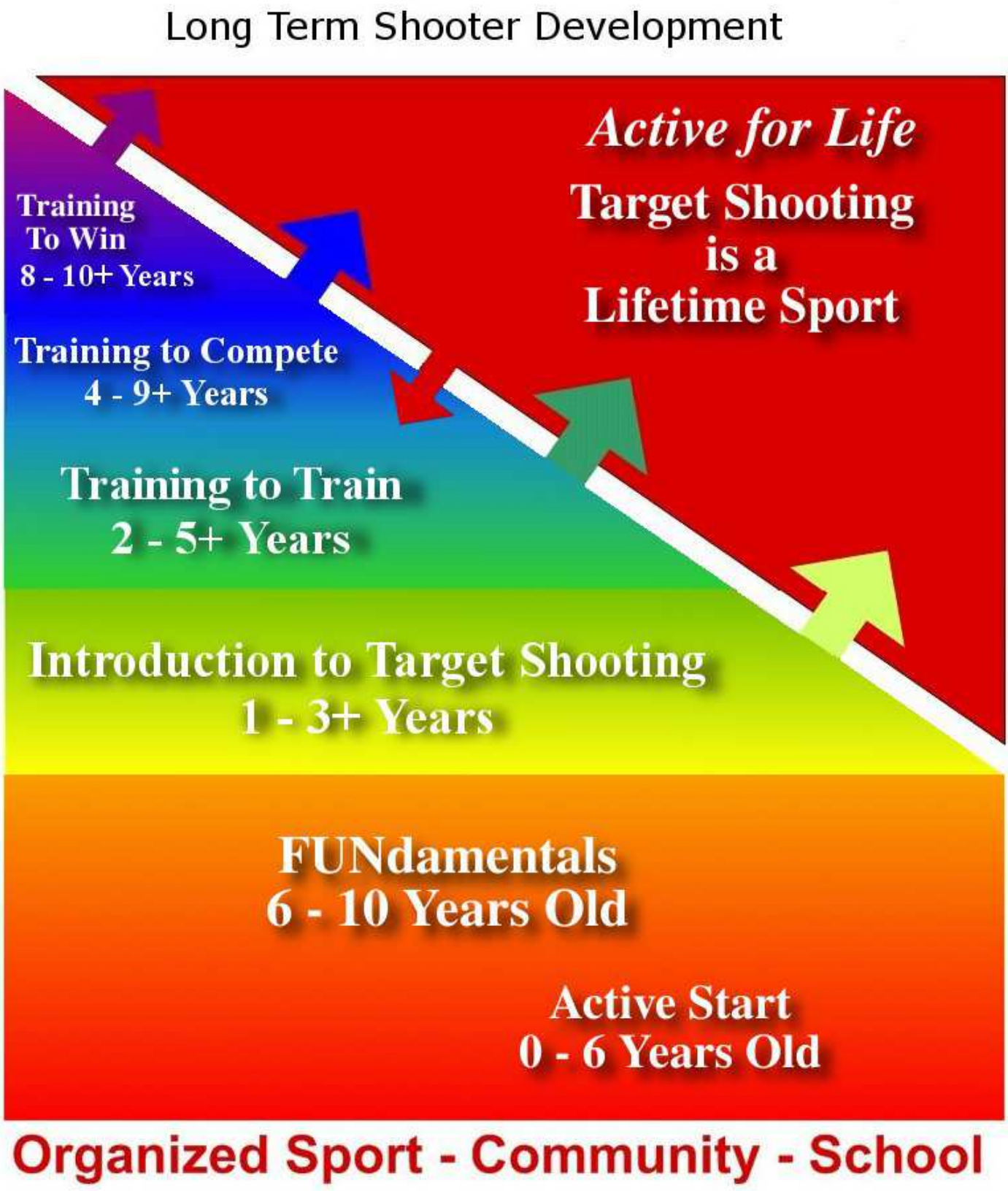
As a nation, we have to change the thinking of many groups that work with young children. Too many organizations think of children as a resource to be brought into their sport, and to be kept in that single sport for as long as possible – the "get them early and keep them" approach. This "get them and keep them" approach restricts the range of physical literacy skills that children develop, diminishes their all-round athletic development, and stops too many children from experimenting with different sport – and finding the one that is just right for them. Long-term, both the sports and the children are hurt by this approach

The SHA Long-Term Athlete Development Model

It only takes a single moment to become a shooter. You may hold a pistol or rifle for the first time at summer camp, accompany a parent or friend on a hunting trip, or watch Olympic shooting on television and decide to become a champion. You may be five years old, or fifty. The essential thing is that the first exposure to shooting provides challenge, reward and enjoyment - in other words, that it is FUN. **Fun is the basis for a lifetime in sport**, a process of life-long development which is captured in the Long-Term Athlete Development Model.

The central concept of the LTAD model is that of continuous learning, continuous improvement, and continuous enjoyment. It is the idea of progressive development from stage to stage, as far as the athlete wishes to go. It is the idea that every achievement is built on what came before, whether those skills were developed in shooting or in other sports, and that to reach his or her goals there is an ideal path in which every step is supported by a sound system of coaching, sport leadership, good facilities, and optimum competition. It is the idea of "Kaizen", the Japanese word for continuous improvement- the understanding that where we are today is not a destination but rather a foundation for tomorrow's achievement.

The following pages depict the journey through shooting, stage by stage, for Pistol Shooters of all ages. A specific section on Developing the Young Shooter follows. For each stage, the key objectives, the balance of Fun, Form, Fitness, Focus and Flow, and the progress markers or "benchmarks" are listed. Remember that while every pistol shooter must progress through every stage to the level to which they aspire, every pistol shooter is also an individual. All abilities are always trainable. These objectives and benchmarks are guidelines for development, not a means to select or reject individual participants.



Long-Term Athlete Development Model

Shooting Stage-by-Stage

FUNdamentals Phase

- The critical element is to ensure that ***athletes have fun***.
- Unfulfilled motives will lead to drop out. Coaches should provide direction, but not expectations. They should make an effort to understand the multiple motives that have brought the participants to the sport. Until the coaches understand why the athlete is there, it is difficult to structure the environment such that the athlete's motives will be fulfilled.
- It is vital that athletes are provided with opportunities to experience success by intrinsic and extrinsic measures.
- Assessments of competence and success should be based primarily upon personal improvement (although athletes can also use normative comparison if they are actually doing better than other people).

Introduction to Target Shooting – Training to Train

- The critical focus of these phases should be athlete motivation. This is where you want to instill a love of the sport. Normally you will only get one chance to keep athletes in the sport, so the first year is critical.
- ***Self confidence is fragile in this phase***. Be careful to set reasonable success criteria for any new skill learning tasks.
- The vast majority of coaching efforts should be aimed at enhancing intrinsic motivation and enhancing perceived competence (by providing opportunities for success).
- Motivation should be based upon the principles of Self-Determination Theory: namely, provide opportunities for autonomy in decision-making (i.e. an element of choice), relatedness (i.e. social/friendship opportunities), competence (i.e. must feel some sense of success, self or norm referenced) and relatedness (attributable to performance on task).
- **The focus must be on process-goals as opposed to outcome goals.** Introduce the idea that goals should focus on things that they can control. Probably a single process goal for shooting and single process goal for shooting at one time is enough. Introduce the idea of post-match reflection (e.g. What did I enjoy today? What did I do well today? What will I try to do better the next time?). Introducing the idea of keeping a very basic "log book" may be a good idea (but becomes essential in the Train to Train phase). Post match reflection becomes the tool for introducing self-awareness.
- Arousal control can be introduced with basic breathing techniques. (Note: teach

both energizing and arousal control with breathing).
- Basic introduction to visualization and self-talk can be implemented (keep it simple, global, and non-technical).
- Coaches should work hard at creating a mastery-motivational climate (where praise and reward is contingent upon athlete effort, personal development, and personal mastery of the environment).

Training to Compete Phase

- Practice and perfect combined mental and physical skills through persistent practice.
- Finely-tuned pre-competition plans, competition plans, and pre-shot routines should play an increasingly greater role in preparation and performance.
- At the onset of the T2C phase, athletes should be sufficiently self-aware to know how they want to feel, and start to understand what they must do to reach their Ideal Performance State (IPS). A good awareness of pre-match and within-match IPS should be established.
- **Goal setting** should now encompass a recognition of the sacrifices that must be made in other areas of one's life in order to accomplish in shooting. Long-term goals now extend into seasonal goals and beyond.
- Athletes should be able to incorporate and understand a variety of coping mechanisms in order to deal with both competitive pressures and non-competitive pressures. For example, athletes should be educated about, and able to employ, a variety of problem-focused coping, emotion-focused coping, and avoidance coping strategies.
- Athletes should recognize (or be taught) about the importance of accessing and employing social support (be it emotional, informational, or tangible) from friends, family, coaches, and team-mates to help deal with the increasing pressures and demands of the competitive environment. Confidence building should continue, and should come from within.
- Athletes should recognize that improvements now come in much smaller increments during the later stages of this phase, so even the smallest accomplishments must be recognized and celebrated.
- Athletes should a have a wealth of confidence-building sources readily available, and must believe in them. Patience must be linked with goal setting because goals become harder and harder to achieve.
- Teach athletes to understand the difference between optimistic attribution styles (e.g. attribute failure to unstable-controllable factors) and pessimistic attribution style (e.g. Attribute failure to stable-uncontrollable factors).
- Critically assess success and failure attributions to provide rigorous self-evaluation.
- Self-talk scripts should be brief, well-learned, and powerful. Thought stopping,

thought substitution, and cognitive restructuring should all be learned and implemented. For example, “perspective taking” is one technique that can be readily employed.).

- Visualization routines should be become detailed, controlled, and incorporate all of the necessary senses (see, feel, hear, emotions, etc.) that will be in operation during performance.
- Arousal control techniques should be practiced and implemented in a variety of settings under a variety of conditions.
- Implementation of team building into this phase given that the athletes are probably training together either with clubs, provincial teams, or junior national teams.
- Acknowledge importance of external stressors (family, work, money, school) and address through social support network (24hr athlete).

Training to Win Phase

- ***Athletes should re-acquaint themselves with their “reason why”*** and should have a complete understanding of their strengths and weaknesses, and should have well-learned mental strategies in place for dealing with each and every situation that they might encounter. Expect the unexpected: always have a plan B.
- Insure that self confidence becomes a habit in this stage.
- The integration of all mental skills should be accomplished, such that combinations of visualization, self-talk, goals, and arousal control can be implemented simultaneously to achieve the desired effect.
- A complete awareness of what can and what cannot be controlled should be in place.
- A clearly defined “athlete philosophy” should be in place that guides behaviour and conduct (this should also include a statement of those things that the athlete values).
- Whenever possible, training behaviours should reflect competition behaviours. Athletes should “test” their psychological skills by creating “simulation” events in their training schedules to determine how well they are able to employ their mental skills strategies.
- Athletes should understand that there is no “magic pill” that will suddenly “work” in the pressure of major competition, and that there is no “quick fix” solution from a psychological perspective. As such, the practice of psychological skills should be a committed goal of athletes in this phase.
- Personal motivation should become the sole responsibility of the athlete.
- Athletes should understand that their ideal performance state is rarely experienced under conditions of high pressure (e.g. World Championships or Olympic Games). As such, learning to function while out of their “individual zones of optimal functioning” becomes as important as learning to find the IZOF in the first place.

The athlete needs to trust the coping skill that he/she has developed to perform in these situations.

- The principles of self-determination theory are once again important. Coaches have to consider the importance of autonomy (i.e. choice), relatedness, and competence on the athletes' intrinsic motivation at this phase of the LTAD and consider giving the athlete some say in his/her training program, No amount of extrinsic motives will ever be as powerful as a strong sense of intrinsic motivation.

Target Shooting is a Lifetime Sport: Pistol Shooting

The ***Target Shooting is a Lifetime Sport*** stage can include Shooters of any age and with any interest. All forms of shooting- target and recreational shooting events, both indoor and outdoor- are valued and supported by the SHA. The growth of the sport in Canada depends on providing programs and opportunities for all these Shooters to allow them to explore their interests and aspirations, while contributing to the greater shooting community.

Participation in multiple modes of shooting is recommended while the shooter is developing and is encouraged for recreation. Only ***Training to Compete*** Shooters need be concerned with specialization**.** ***Target Shooting is a Lifetime Sport*** Shooters and their clubs can help promote shooting by providing inter-club or cross- discipline/division events and facilities (e.g. a target range at a high school event).
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Pistol Shooting's Development Plan

In a long-term athlete development system, optimal preparation for success depends on a progressive building of preparation using the five elements of the ***"pistol shooter development plan"*** – Fun, Form, Fitness, Focus and Flow. These five elements represent an athlete-specific approach to the "10 S's". Each element builds on the previous and each must be introduced at the appropriate stage of development.

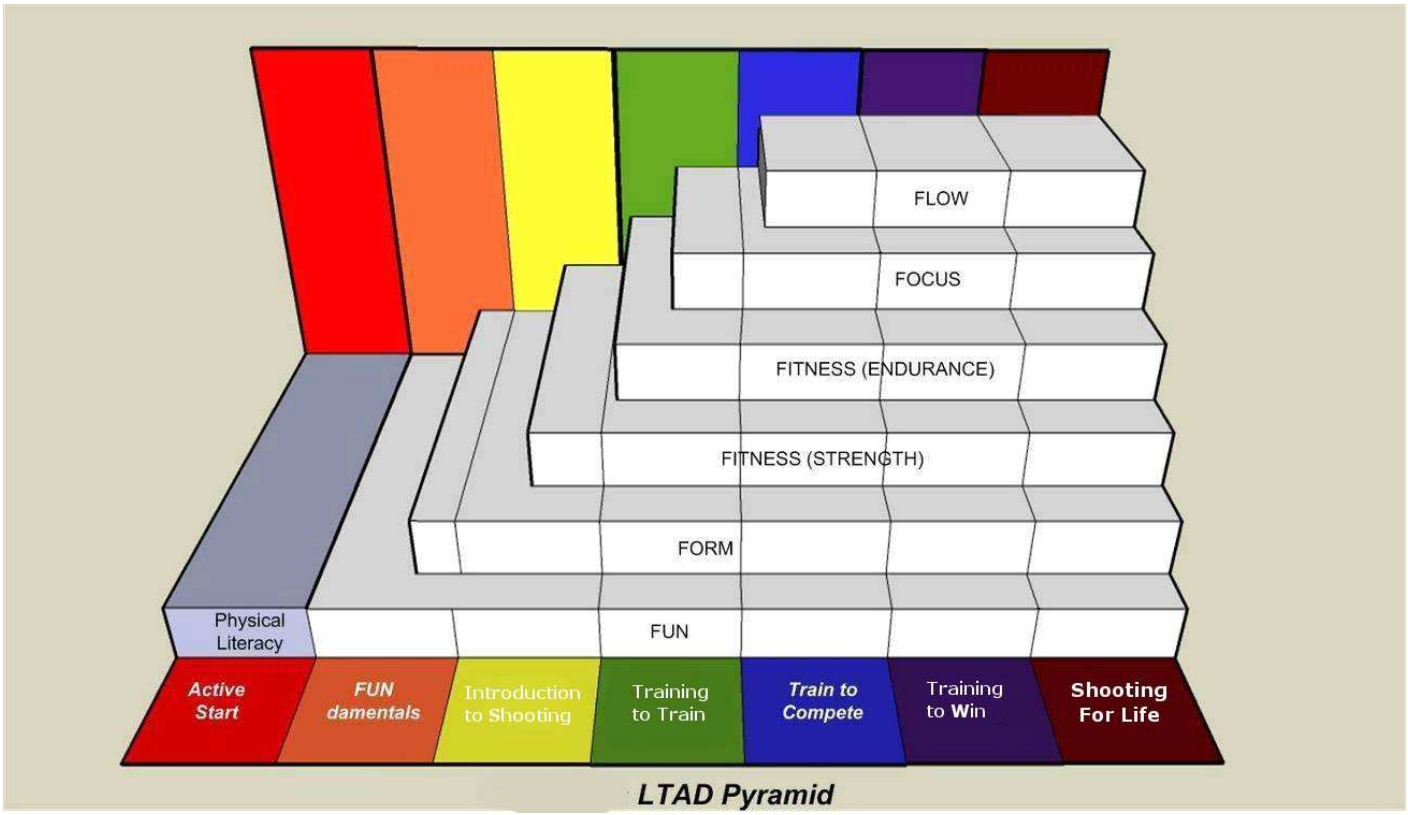
Fun: Opportunity for participation in other activities, unstructured play, and experimentation is essential in every stage to maintain interest and freshness and to stimulate creativity. Remember, the number one reason for drop-out from sport is "it stopped being fun."

Form: The applied biomechanics of shooting. Proper form is the foundation of accurate shot- making, and depends on correct body position and movement sequencing as well as correct equipment selection and underlying posture and strength. Form is based on the physiological and psychological abilities of balance, flexibility, core strength and stability, strength and power, gross and fine motor skills, coordination, visual acuity, and aiming and hitting.

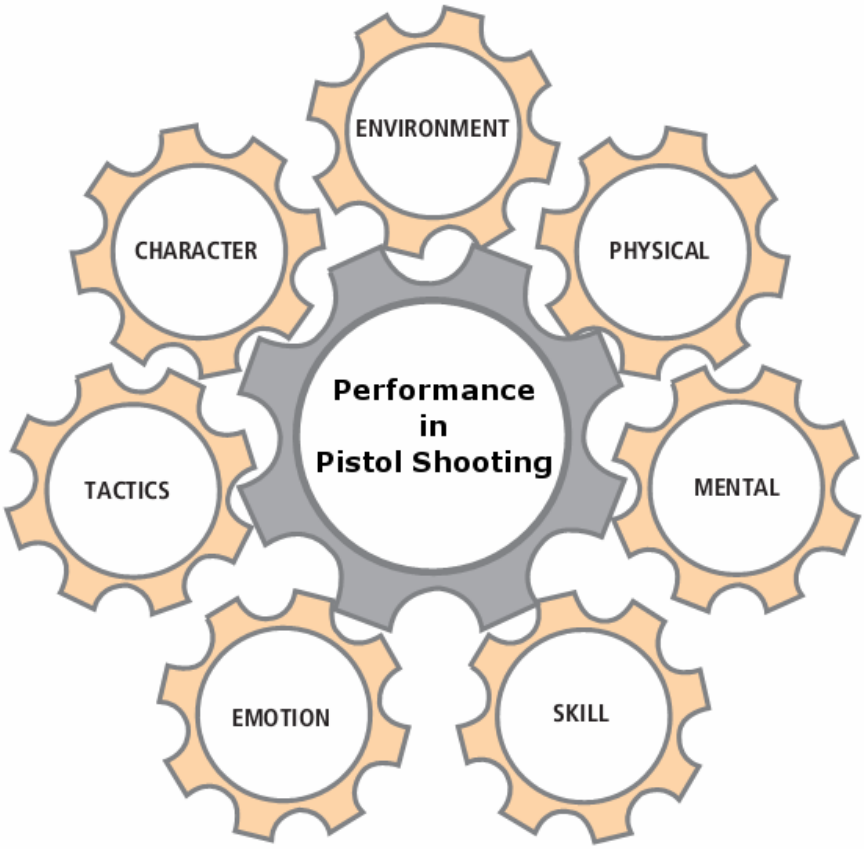
Fitness: Once the basics of good form are in place, the shooter must develop sufficient muscular strength to control the firearm. Increased strength as the athlete develops allows controlled use of firearms, and therefore greater shot control. Bi- lateral development is important to avoid development of postural imbalance and chronic injury. Strength includes the capacities of neuromuscular patterning and adaptation (Strength 1), and hypertrophy (Strength 2).
With basic strength in place, strength-endurance, or the ability to raise the firearm repeatedly without fatigue, becomes critically important. This is particularly essential in competition. Aerobic endurance and continued development of all-round fitness compliments strength-endurance and are also developed.

Focus: "The mental game." Focus includes all elements of mental preparation necessary to cope with competitive pressure and maintain accuracy in all conditions. This includes introducing a shot sequence, and elements of relaxation, self-talk, and focus strategy.

Flow: Flow is the integration of all the key elements plus the accumulation of experience and knowledge of competition, to achieve mastery and high performance. While it contains technical elements (e.g. "how to shoot an Olympic match") and physical/mental components (e.g. how to "feel the shot") it is also in part the confidence that comes from solid preparation.



LTAD Pyramid



Whole Athlete Model, adapted from Istvan Bayli, 2004

Pistol Shooters with a Disability

Shooting is one of only a few sports in which many Shooters with a disability (AWAD) are able to compete with a minimum of equipment or rules modifications. For this reason Shooting is considered “fully integrated” with AWAD competing alongside able-bodied competitors. However, there are special competitive categories for Shooters with a disability.

Shooting was one of the sports at the first Paralympic Games in Rome, 1960. The sport is open to Shooters with a physical disability (including spinal injury, cerebral palsy, amputee and les autres) in functional classes- standing, wheelchair 1 and wheelchair 2. Shooters are classified and compete according to the type and level of disability.

Despite the full integration of AWAD into shooting, more can be done to make the sport known and with a disability are not aware of opportunities in sport, or believe that they will not be able to participate. Shooting, as an integrated sport, has advantages in this regard. Increased promotion of the sport to disabled persons may help increase the number of AWAD entering the sport.

Then comes “first contact”. “First contact” usually refers to the first time an athlete encounters a sport, or has an opportunity to try a sport. It is important to understand that “first contact” works both ways - when the athlete meets the sport and coach, and when the coach meets the athletes. For both coach and athlete, first contact may bring apprehension or fear. The athlete may be asking: “Can I do this? Will I be accepted?”

It can take more courage for an athlete with a disability to try a new sport. Shooting coaches and sport leaders can do their part to help more Shooters take part by understanding the Awareness and First Contact stages and by actively inviting persons with a disability to try shooting. For more information, see the Canadian Sport Centres publication No Accidental Champions.

Pistol Shooters of Aboriginal Descent

Shooting is one of only a few sports in which people of all races and religions are able to compete on an equal basis. The aboriginal community has embraced hunting and shooting for generations. In the SHA long-term planning guide, resources have been identified to embrace the aboriginal community, and educate and introduce them to the sport of pistol shooting.

Educating elders, recreation co-ordinators and band council members in the Northern Communities about the sport of pistol shooting has been identified in the SHA long-term planning guide.

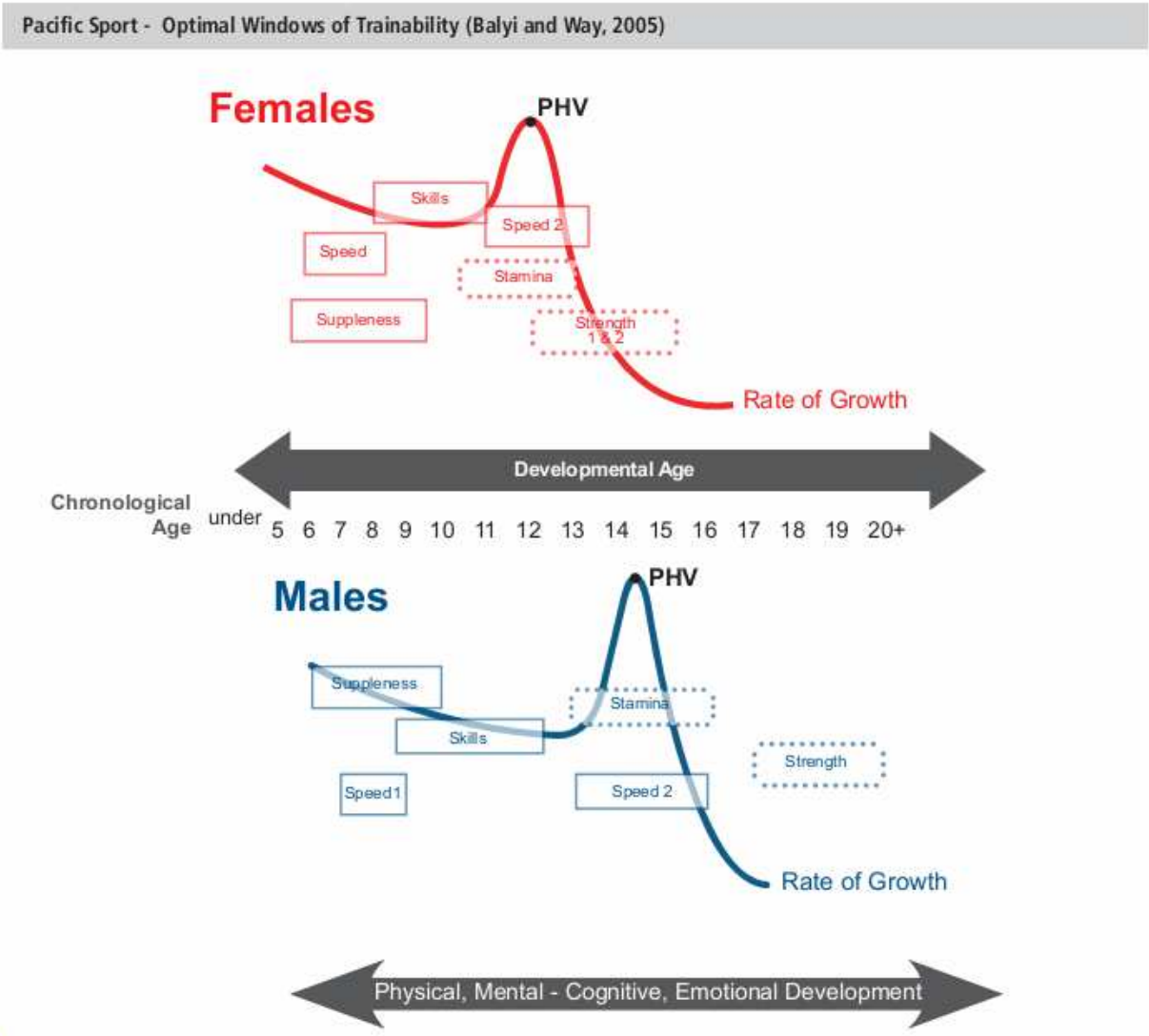
Learn-to-shoot educational seminars in Northern communities, followed by certified coaching seminars are a part of any LTAD, especially in the province of Saskatchewan where a significant portion of the population is of Native descent.

Developing the Young Pistol Shooter

A guiding principle of LTAD is age and stage-appropriate development. Key Factor 4, Developmental Age, points out that individuals develop physically, socially, emotionally, and intellectually at different rates, and that the coach of young Shooters must be aware of the individual's development and able to modify training and competition to suit individual needs.
Providing the right training during sensitive periods of development lays the foundation for optimal performance at later stages. Coaches of Shooters between 9 and 16-18 years old must be aware of these windows and how to work with them

Sensitive Periods of Development

The developmental stages are sensitive for young athletes. The time of Peak Height Velocity (PHV), the maximum rate of growth during the adolescent growth spurt, represents an optimal "window" for training some of the physical "S's" of stamina, strength, speed, skill and suppleness. It is essential that the introduction of this training is based on developmental age, not chronological age. Development occurs at different times for different young athletes.



If the window is missed, the athlete may not develop to full potential. This underlines the importance of youth recruitment, age-appropriate programs, and optimal coaching and competition calendars in shooting. Coaches, especially, must have the expertise to identify the athlete's stage and the programs and systems that will allow the athlete to train and compete appropriately to his or her potential. However, even if windows are missed, all systems are always trainable.

The "10 S's" – Their Importance with the Young Shooter

Holistic athlete development depends on a balanced approach to training which lays a solid foundation for each successive stage. Reference has already been made to the first five "S's" of physical development: Stamina (endurance), Strength, Speed, Skill and Suppleness (flexibility). The optimal development of these skills cannot occur without attention to five more "S's": Structure/stature (body type and growth), Psychology, Sustenance (adequate nutrition and rest), Schooling (or Stress), and Sociocultural factors.

Structure/stature: The tracking of stature as a guide to developmental age allows planning to address the sensitive periods of physical (endurance, strength, speed and flexibility) and skill development. Diagnostics to identify strength and weaknesses is critical to factor "structure" properly into training plans.

Psychology: Ultimately, the planning, implementing, and refining of mental strategies for high-level competition will have a large impact on podium performances. Consequently, the mental training program is critical at all stages of LTAD, as dealing with success and failure will determine whether the athlete continues in the sport and physical activity in general.

Sustenance: Sustenance recognizes a broad range of components with the central theme of replenishing the body, including nutrition, hydration, rest, sleep, and regeneration, all of which need to be applied differently to training (life) plans depending on the stage of LTAD. Underlying sustenance is the need for optimal recovery management: the athlete moves to a 24/7 model which places a high degree of importance on the individual's activities away from the field of play. To achieve proper sustenance and recovery, the coach and/or parent must monitor recovery through the identification of fatigue.

Schooling (or Stress): When designing training programs for young athletes, the demands of school must be considered. This is not only limited to the demands placed by school sports or physical education classes but includes integrating school academic loads, duties, timing of exams and other stresses. For mature athletes, a similar approach must be taken to work. When possible, training camps and competition tours should complement, not conflict, with the timing of major academic or work events. Overstress (the stress of life events over and above sport training) should be monitored carefully.
Interference from other school sports should be minimized, and communication between coaches responsible for delivering the training and competition programs, is essential. Parents should work together with coaches to ensure a coordinated approach.

Sociocultural: Socialization through sport participation can involve broadening of perspective, including ethnicity awareness and national diversity. Within the travel schedule, recovery can include education related to the competition location, including history, geography, architecture, cuisine, literature, music, and visual arts. Proper annual planning can allow sport to offer much more than simply commuting between hotel room and field of play.
Sport socialization also must address sport subculture to ensure general societal values and norms will be internalized via sport participation. As well, coaches and parents must guard against group dynamics which create a culture of abuse or bullying. Ethics training should be integrated into training and competition plans at all stages of LTAD. Overall, sociocultural activity does not interfere with competition activities: It is a positive contribution to the development of the person and the athlete.

Multi-sport, Multi-discipline Cooperation

The goal of LTAD is a physically active life resulting in a host of health and social benefits. With the right foundation and preparation, participants may also go on to become high performance Shooters. Physical literacy developed in the Active Start and FUNdamentals stages is a prerequisite for high performance, and this is best developed through participation in a number of sport activities that help develop the "5 Ss": stamina, strength, speed, skill and suppleness.

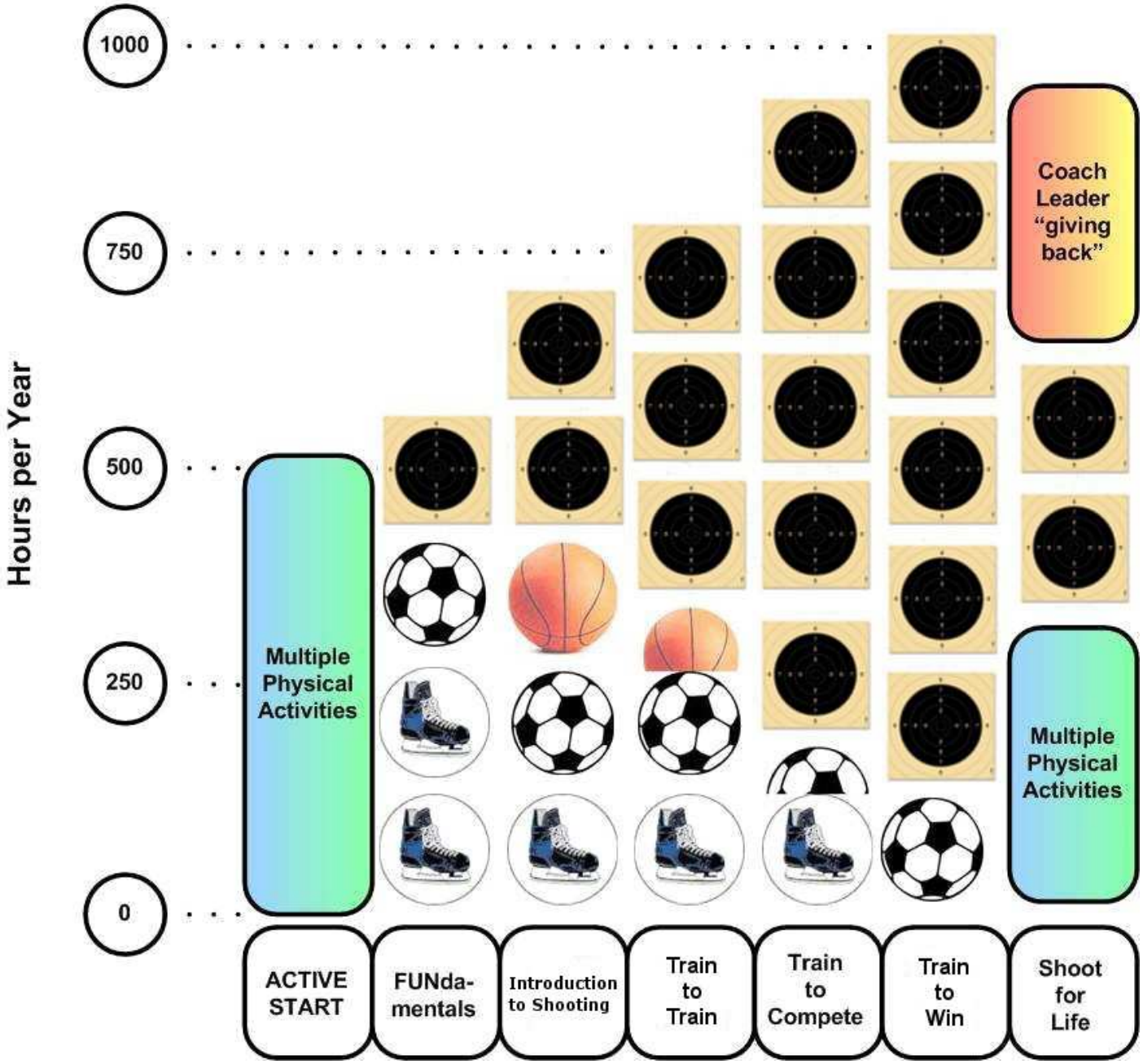
The graph below illustrates how an individual progresses through multiple sport activities as well as disciplines within a specific sport. "Hours per year" is estimated total hours spent in all forms of physical activity. From enjoying a wide range of unstructured activities in the Active Start stage, the individual enters several organized sport programs in the FUNdamentals stage including shooting. Additional shooting disciplines are added in the Learn to Shoot stage to enhance skill development and promote choice. Although the entry discipline may be preferred in the Train to Shoot stage it is ultimately dropped to allow specialization in the Train to Compete stage. Finally, in the Shoot for Life stage time is set aside for giving back as a coach or leader.

In addition to demonstrating the importance of multi-sport, multi-discipline participation in building shooter skills, the model raises another concept- that of cooperation with other sport organizations. For a shooter to participate in more than one sport, coordination of training and competition loads, rest and recovery, travel and other factors is necessary. This will require improved communication between coaches and other sport leaders.

Eventually, all high-level athletes need to make a decision about multi-sport participation. This is particularly true in the case of our high school/College aged members. The process should be one of athlete discussions with coaches and parents.

The final decision should always be made by the athlete. Coaches and parents should support and respect their decision.

Lifelong Physical Activity and Specialization



Summary

Canada can do more to recruit young Shooters and help them develop. At the 2004 Athens Olympic Games, the average age of a male medallist was 27.4 (range 17.6 - 42.9), and the average age of a female medallist was 25 (range 19.8 – 33.2). According to the Ten Year Rule, that means the average age of entry into shooting is from 15 to 17 years old. In the ISSF survey conducted by IOC in 2007, the average age of entry into shooting among international competitors was 16.9.

By age 27, most windows of enhanced trainability are closed, and coaches must pay attention to remediation. Alternately, ways to recruit Shooters in the critical ages from 12-14 can be pursued. These guidelines will prove valuable to coaches of young Shooters.

An Integrated Pistol Shooting Development System

Shooting truly is a sport for life. Across Canada, target shooting is practiced at summer camps, in clubs, and other venues. Hunting remains a popular sport. Currently the SHA has over 500 members and over 40 local clubs. Growth in participation as well as competitive success remains the key objectives of the SHA.

To reach these objectives, we need to work together. Long-term pistol shooting development is athlete-centred, coach-driven and system-supported, so parents, shooters, coaches, clubs, officials and other sport leaders all have their role to play. The best results can only be achieved when all organizations and individuals involved in sport are working together in an integrated, coordinated way to support shooter development and success.

These points outline how each group can contribute to the sport:

Parents:

- Participate in sport with their children.
- Encourage participation of their children in two to three other complementary sports.
- Provide support and guidance and make involvement in sport fun.
- Be educated about shooting and how one can progress through the sport.
- Have basic education on nutrition/recovery.
- Make a long-term commitment to skill/performance progression.
- Understand the ABC's of athleticism: agility, balance, coordination and speed.
- Understand the concept that increased activity reverses the current trends in childhood and adult obesity and cardiovascular disease.
- Understand the concept that inactive adults tend to produce inactive children and that the reverse is also true.
- Understand that children will lose motivation if they feel that cannot match their parents' expectations.
- Be flexible with their expectations; as children pass through different phases of development, parents (and coaches) should modify their expectations as necessary.
- Strive to get an accurate assessment of their children's ability.
- This is about the development of the child; make sure parental expectations of skills, abilities and aspirations are in line with the child's.
- Explore the child's expectations, goals and aspirations.

Shooters:

- Enjoy the sport.
- Become adept at the key physiological proficiencies: balance, flexibility, posture, core stability, strength and power, cardio endurance and performance skills.
- Understand how pressure and stress affects performance.
- Understand their mental performance strengths and weaknesses.
- Know what mental management skills they need to integrate into their personal performance plan to be able to control their emotions focus on the task, and cope with adversity under pressure.
- Become self-reliant and demonstrate taking independent initiative in learning and developing their skills and strategies.

Coaches and Instructors:

- Have a passion for the sport and for excellence.
- Be educated and have a thorough understanding of the LTAD.
- Understand how and where they fit into the "system".
- Know what is required in order to deliver the shooter to the next level.
- Continue to upgrade skills and knowledge.
- Have a general understanding of what is available for Shooters of all levels.
- Accept that effective mental skills are critical to consistent, quality performances at all levels.
- Integrate the mental skills training process into shooting programs.

Clubs:

- Understand their role and what is required to deliver the player to the next level.
- Provide proper coaching, training and competition opportunities.
- Provide proper access to training and competition facilities.
- Provide a support structure i.e. finances, mentoring, resources, instruction, coaching etc.
- Be aware of and encourage junior programs such as Crossman's and other entry programs.

Provincial and National Associations:

- Be a source of information, expertise and support - the backbone to provide the necessary information, contacts, personnel and communications in shooting development.
- Understand what is required to deliver the player to the next level.
- Facilitate discussion among the various stakeholders, clubs, Shooters, appropriate administrators and associations.
- Find means to reduce costs to stakeholders (players, coaches, facilities etc).
- Make sure significant programming is in place to support their role.
- Strive to be the best association at their level.
- Place increasing emphasis on junior development and adult recreational programs to ensure the long-term growth of the sport.

Coach and Leader Development

The ***Target Shooting is a Lifetime Sport*** stage is not just the opportunity to participate in recreational and competitive shooting. It is the time to give back by participating as a coach, official or sport leader. Volunteering is essential to the continued growth of shooting in Canada.

In particular, coaches are the backbone of the sport system. Vital to the development of Shooters at all stages, they are leaders and organizers in community sport (Active Start to Learn to Shoot) and technical experts at provincial and national levels (Train to Compete to Shooting for Excellence). Coaches must have the expertise to identify the stage of maturation of the shooter and the programs and systems to allow that shooter to train and compete appropriately to his or her potential. We need more good coaches at all stages, and every coach must have a clear understanding of LTAD principles. Getting more and better coaching for Canadian Shooters is Job One for sport leaders.

Just as all Canadian sport organizations are participating in LTAD planning, all are also developing new NCCP programs. The following diagram shows the new shooter NCCP in relation to the LTAD model:

Similarly, the recruitment and development of officials and sport leaders is critical to the future of shooting. The SHA plans to increase efforts to recruit, develop and retain Shoot for Life-stage Shooters to contribute to the building of an integrated shooting system in Canada.

When the system provides adequate support, and the shooter attains the key competencies in each stage including previous, foundation stages, then the shooter is able, within his or her own limitations, to reach the highest level of performance. Everyone – shooter, parent, coach, club, association, etc – has to get it right for the shooter to reach his or her full potential. By following the athlete LTAD model and participating as both shooter and builder, we can create a system which allows Shooters to reach their potential.

Planning for Success- Strategic Initiatives

This LTAD model and guide will help put Saskatchewan Shooting on track for long-term success: more Shooters enjoying the sport longer, and achieving more competitive success. However, no model makes a difference until it is put into action. Action means change.

In the development of this model and guide, a number of key issues for Canadian shooting were identified. It is strongly recommended that the following steps be taken to help create the sport we need- an integrated athlete development system which provides seamless support to all Shooters from entry into the sport through to Shoot for Life.

First priority: **Coaching**

1. Improve communication and cooperation between SHA coaches. Hold annual coach training/development seminars in each province.
2. Increase the number of trained coaches at all levels, and ensure they have a solid understanding of LTAD.
3. Make high-performance shooting coaching a profession. Attract expert coaches (including international coaches, e.g. from Korea) to help build the sport.

Second priority: **Leaders**

1. Create more leadership training opportunities in cooperation with the provincial associations.
2. Host regular SHA-PSO conferences and SHA-PSO Presidents meetings to focus on development issues and identify and recruit new leaders.
3. Emphasize the recruitment and support for fund raising volunteers, e.g. VP Marketing at national and provincial levels.

Third priority: **Organizations**

1. Review the SHA structure and programs to re-emphasize equality of programs and service for all forms of shooting.
2. Provide standardized policies, standards and agreements on the SHA web site. Explore SHA-CLUBs agreements to help coordinate efforts and delineate clear responsibilities.
3. Work toward a greater level of support, particularly to strive for SHA staff members.

Fourth priority: **Competitions**

1. Modify format of development competitions to ensure progression of distance is appropriate for all stages. Educate coaches on the appropriate use of club-inter-club-zone-regional-provincial- national-international competitions.
2. Create a technical hosting package for each level of tournaments > clubs, inter-club, zone, etc.
3. Standardize national and provincial championship and Games formats appropriate to level/stages of development, e.g. Provincial and Canada Games have a consistent role for their level/stage.
4. Provide appropriate level of funding to Shooters to ensure national and international stepping-stone events are attended.

Fifth priority: **Facilities**

1. Work to obtain access to long-range indoor shooting facilities of 50+ meters in each zone.
2. Work cooperatively to obtain access to outdoor ISSF-distance facilities, e.g. public land, farms.
3. Obtain mobile timing equipment, ranges, etc to facilitate organization of provincial training camps. Host monthly regional Excellence member's camps (rotating around the province) including observation, seeding, Olympic Match instruction, all under regional coach supervision (indoors in winter, outdoors in summer at full distances).

The Future: On Target

"Through Long Term Athlete Development, the SHA will create a progressive and positive pathway for all our athletes. The result will be improved performance, increased participation, and excellence in competition."

- Vision statement, SHA LTAD Meeting December 2008

Shooting has a long and proud history in Canada. While shooting has never been the biggest sport in Canada, we have had many successes and champions. Hunting remains one of Canada's most popular activities.

Shooting's LTAD model is an essential tool in achieving that future vision. By building an integrated development system that emphasizes the progressive, seamless development of Shooters - ***shooter centered, coach driven and system supported*** - we can reach our goals. There is no doubt this will require hard work, dedication and a willingness to change and cooperate. But with a clear pathway for athlete development in place, we can succeed as never before.

Resources

Biathlon Canada LTAD Model Vol. 1, 2006. Ball, A.,(ed.) Biathlon Canada, Ottawa, ON. ISBN 0-9781096-0-0

Archery Canada LTAD Model Vol. 1, 2008. Archery Canada, ISBN

Shooting Federation of Canada LTAD Model Vol. 1, 2009. SFC Canada ISBN

Canadian Sport for Life, 2005. Balyi, I., Cardinal, C., Higgs, C., Norris, S., and Way, R. Canadian Sport Centres, Vancouver, BC. ISBN 0-9738274-0-8

Coaching Athletes with a Disability, 2005. Coaching Association of Canada, Ottawa ON.

Long Term Player Development Guide for Golf in Canada, 2007. Royal Canadian Golf Association/Canadian Professional Golf Association, Ottawa, ON.

No Accidental Champions, 2006. Balyi, I., Cardinal, C., Higgs, C., Norris, S., and Way, R. Canadian Sport Centres, Vancouver, BC. ISBN 0-9738274-3-2

Recovery and Regeneration for Long Term Athlete Development, 2008. Calder, A., ISBN 978-0-9738274-8-3

Developing Physical Literacy, 2008. Canadian Sport for Life Physical Literacy ISBN 978-0-9738274-5-3

Closer Look: Shooting Tests for Young Shooters

Dominant Hand and Eye

Normally stable; occasionally changes during puberty. The dominant eye is the best eye to use for shooting. It nearly always coincides with left or right handedness.

Equipment Required:

6" x 6" index card with a small hole in the middle (big enough for a finger to fit in), Duct tape, traffic cone or similar object to sight on.

Procedure:

Use the duct tape to mark where the athlete should stand. Place a pistol target six meters (20 feet) away from the duct tape. Ask the athlete which hand they write with – this is their dominant hand. Ask the athlete to hold the card at arms length with this hand and, with both eyes open, align the card so that the target can be seen through the hole. Coach stands in a position where he/she can see both the athlete's eyes and then gives the following instruction: "Please close your right eye". Verify that the right eye is closed and ask "Can you still see the target?"
If the target disappears from view when the right eye closes, the athlete is right eye dominant. If the target remains in view they are left eye dominant. Record which hand they write with (dominant hand) and their dominant eye. Shooting position, shooting instruction and handedness of pistol should be based on these values.

Duration Shooting Test

Equipment:

2 Standard 10M Air Pistol paper targets.

Procedure:

Athletes will shoot 10 scoring shots at the target. Athletes will load each round within the time limits of the test. Athletes may pause between shots at their discretion. Athletes will sight-in themselves with the first target, then must use the second target for the 10 shot precision series. They can receive advice from the coach during the sighting series. There is no limit on the number of shots used to sight-in. Checking of sight-in at anytime during the test is allowed, but there is no time-out allowance for these checks. Time for the test is 15 minutes.

Scoring:

Simple sum of shot points, total out of 100. Every ring counts and every shot counts. Shots that

cut a line count up. If the second target has more than ten (10) bullet holes, the highest scoring shot(s) is discarded. Coach is to record the score and time lapsed.

Precision Shooting Test

Equipment:

Standard 10M Air Pistol Target

Procedure:

Athletes will sight-in or be assisted by the coach before the actual test starts.
Athlete stands in position on shooting lane with pistol loaded. On “GO” athlete raises the pistol and fires one shot. After firing, athlete returns to rest position. During the performance, the coach records the elapsed time from when the shooter has raised and steadied the pistol until the shot is fired.

Scoring:

After each shot the score and the time is recorded for each athlete. At the end of the test (10 shots total) the total score is recorded and the average elapsed time is computed. Calculate the time/score ratio for each shot. Coach can determine the optimum time for quality shots.

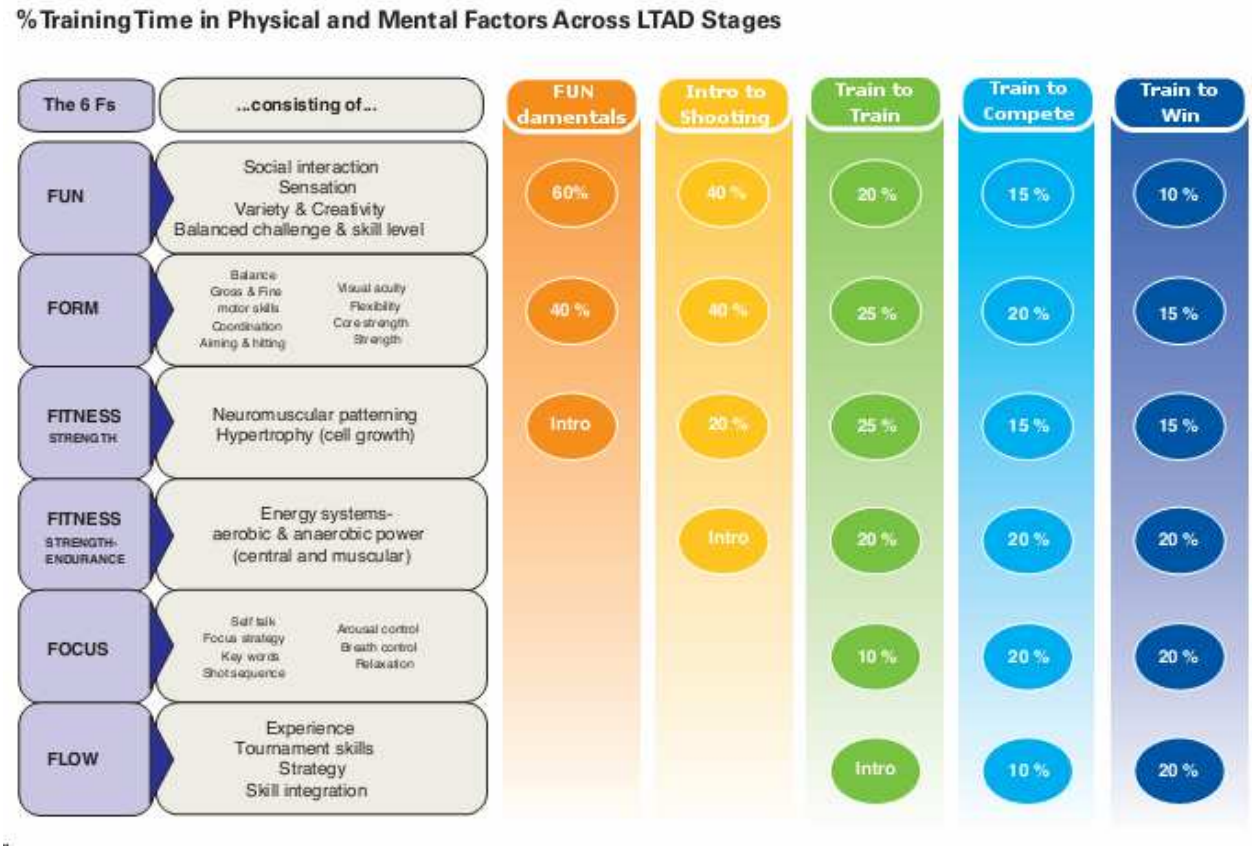
Closer Look: Quality Shots

A key to shooter development is the number of quality shots in training and competition. There is no substitute for time spent refining form and shot-making skill. A 2007 survey of international Shooters at the ISSF World Championship revealed that top-level Shooters shot an average of nearly 850 shots per week, and some shot up to 100,000 shots per year.

What is a "quality shot"? One which is shot with care, focus on proper form, and attention to following the shot-making process, either in training or competition. If the shooter is distracted, overly fatigued, or not concentrating on improvement, it is difficult to shoot a quality shot.

Closer Look: Balancing Physical, Motor and Mental Training Factors

The shooter's development plan of Fun, Form, Fitness, Focus and Flow rests on a foundation of physical, motor and mental competences. These become increasingly integrated as the shooter develops, so it is essential to understand the fundamentals and how to progressively introduce and train them. This diagram shows the components of these factors as well as recommended percent of training time in each of the LTAD stages. Note: these are guidelines. Extra time for remediation must be added if development was incomplete in preceding stage(s).



Closer Look: Shooting Skills Acquisition

Shooting Skill	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Basic Skills							
Understands sight picture	3	4					
Aiming Process	2	3	4				
Aiming Precision	2	3	4				
Natural Alignment	1	2	3	4			
Trigger Control	1	2	3	4			
Make sight corrections	1	2	3	4	4		
Range procedures	1	2	3	4	4		
Pistol fit	1	2	3	4	4		
Performance Skills							
Breathing control	1	2	2	3	4		
Shooting rhythm	1	2	2	3	4		
Setup time	1	1	2	3	4		
Follow through	1	2	2	3	4		
Aiming precision	1	1	2	2	3	4	4
Coping strategies		1	2	2	2	3	4
Self zero			1	2	2	3	4
Advanced Skills							
Shot Analysis			2	2	3	4	
Group Analysis			1	2	3	4	
Shooting Rhythm			1	2	2	3	4
Shooting Speed			1	2	2	3	4
Distraction control				1	2	3	4
Performance evaluation				1	2	3	4

Legend: 1 – 4 represent performance abilities. The numbers represent the level of performance once can expect given the developmental patterns shown above.

1 = Skill recognizable
2 = Basic execution and timing correct
3 = Skill well developed & picks appropriate technique as needed
4 = Skill execution fluid, produced on demand, ready to be polished to elite standards

Closer Look: Shooting Skills Development

Skill	Learn to Shoot	Train to Shoot	Learn to Compete	Train to Compete	Train to Win
Pistol fit	Shared pistols, grip, trigger and sights close to fit.	Minimize shared pistols. Good fit for hand.	Good alignment. Frequent adjustments required until maturation.	Customized grips and tailored sights.	Customized grips and sights tailored for athlete.
Sight Picture	Able to achieve good picture with conscious effort.	Always achieves good picture with conscious effort.	Good sight picture with less conscious effort.	Sight picture is automatic.	
Aiming Process	Coordinates basic elements to shoot a group.	Coordinates basic elements to shoot a distinct group.	Shoots quality group.	Shoots group consistent with 10's thru 8's.	Shoots group consistently in 10's and 9's.
Natural Alignment	Check when reminded and makes adjustments.	Checks regularly and takes time to adjust.	Checks automatically and adjusts position effectively.	Checks unconsciously. Seldom needs correction.	Adjusts as competition progresses automatically.
Breath Control	Attempts good pattern when reminded.	Regulates pattern. Holds mostly appropriate length.	Pattern automated. Resets if sight picture off.	Full control. Hold always coordinated with trigger release and aim time.	
Trigger Control	Distinguish between squeezing and pulling trigger.	Coordination of trigger squeeze with sight picture and breathing.	Smooth release, good trigger position, reflex shot process.	Fully automated shot process.	
Follow Through	Conscious and distinct process on most shots.	Sufficient follow through occasionally forgotten.	Follow through always performed.	Fully automated unconscious follow through.	
Sight Corrections	Requires assistance.	Able to adjust own sights with advice.	Able to self zero.	Anticipates sight corrections during sighting series.	Fully developed capability with no assistance.
Rhythm	3-4 breaths per shot. Often aborts.	2-3 breaths per shot. Distinct rhythm.	2 breaths per shot with consistency.	1 breath per shot with consistent shot times.	1 breath per shot variable on personal preferences.
Shot Integration	Able to count shots. Timing variable.	Pattern on targets consistent.	Good groups. Timing between shots consistent.	Tight groups. Automated tendencies.	
Range Procedure	Safe, under supervision.	Consistent and smooth. Educated.	Fast and efficient. Memorized range sequences.	Automated and instinctive.	
Scores	60% scoring rate.	75% effective scoring rate.	80% effective scoring rate.	90% effective scoring rate.	95% plus effective scoring rate.
Shot Times	Able to generate performance at <10 sec/shot.	Able to generate performance at <8 sec/shot.	Consistently generates performance at 4 to 8 sec/shot.	Automatically generates performance at 4 to 8 sec/shot.	Tailored performance within 4 to 8 sec/shot.
Match Time	Emphasis is not on time.	Conscious effort to control match time within targeted period.	Control of match time to targeted length.	Able to adjust match time to uncontrolled variables.	Fully automated process determined by athlete.
Personal Diary	No emphasis. Brief explanation related to more experienced shooters they meet.	Introduction to personal diary. Coach monitoring and giving advice on input.	Personal diary used for training and competition. Coach advice on use and input.	Personal diary used automatically. Used as a post-match training resource.	Fully automated process. Athlete has extensive detail in it.
Rest Periods	Requires advice from coach.	Takes some periods on own, but needs advice occasionally.	Developing rest period process.	Fully automated and conscious process.	

Alongside physical and mental preparation, shooting demands an extremely high degree of skill. The table below provides guidelines for the acquisition, consolidation and refinement of essential skills in each LTAD stage.

Stage		Fundamentals	Introduction To Shooting	Train to Train	Train to Compete	Train to Win
Years in Sport		6 – 10+ yrs old	1 – 3+ years	2 – 5+ years	4 – 9+ years	8 - 10+ years
Skill Development		ACQUISITION (A) Introduction of skill (movement patterning) Cognitive Stage		CONSOLIDATION (C) Stability of skill through practice (correct execution in variable conditions) Associative Stage		REFINEMENT (R) Fine tuning of skills (Minor improvements and creative solution under all conditions) Autonomous Stage
NCCP Coaching Context		Instructor - Beginner		Instructor- Intermediate	Comp – Dev	Comp – HP
Form	Posture	A	C	C R	R	R
	Stance	A	C	C R	R	R
	Grip	A	C	R	R	R
	Raise	A	C	R	R	R
	Aiming	A	C	C R	R	R
	Shot Execution	A	C	C R	R	R
	Follow Through	A	C	C R	R	R
Equipment	General Maint.		A	C R		
	Selection/Analysis		A	C R	R	R
	Basic Adjustment		A	R		
	Advanced Tuning				C R	R
	Equipment Setup		A	C	R	R
	Backup/Spares		A	A	C	R
	Grip Customizing		R	R	R	R
	Shoes/Glasses			A	C	R
	Jacket/Clothes			A	C	R
Mental Preparation	Breathing	A	C	R		
	Key words	A	C	C	R	R
	Automation of Form	A	A	C	C	R
	Mental Rehearsal		A	C	R	
	Yoga or Relaxation			A	C	R
	Stress Practice			A	C	R
	Goal Setting	Fun	Form	Focus	Focus & Flow	Flow
Tournament Specific Skills	Security	A	C R			
	Indoor Shooting	A	A	C	R	
	Outdoor Shooting		A	C	R	
	Match Shooting			A	C	R
	Back Tension Relief			C	C	R
	Unknown distance		A	C	R	
	Weather conditions			A	C	R
	Altitude				A	C R
	Written shot sequence		A	C	R	
	World Cup				A	C R

Closer Look: Mental Skills

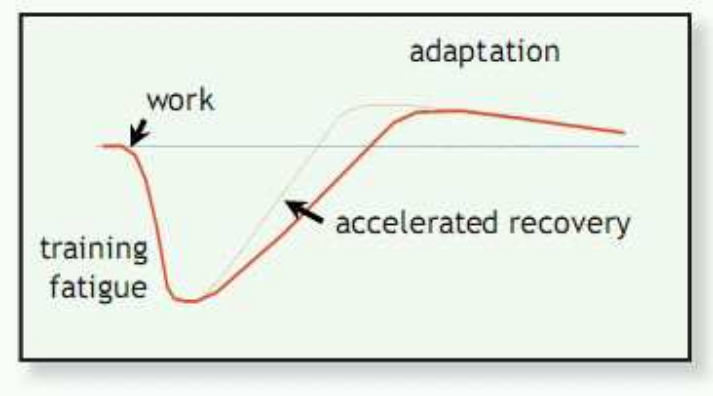
Skill	FUNdamentals	Introduction to Shooting	Train to Train	Train to Compete	Train to Win
Mental model	Ability to use key skills from the shooting model when in the task.	Knows basic competition plan.	Implements basic competition plan. Works on focus and re-focus techniques.	Detailed written plan that is successfully implemented. Able to re-focus if needed.	Detailed written plan well executed. Able to adapt plan for unforeseen circumstanced.
Concentration	Introduced to the concept and importance.	Able to concentrate for several consecutive shots.	Able to concentrate for entire match most of the time.	Able to manipulate concentration during match at will.	Able to concentrate for complete match and auto-adapt to appropriate requirements or changes needed.
Attention Control	Introduced to the concept and importance.	Focuses attention on shooting process for most shots.	Able to direct attention to process for most of the match.	Able to direct attention to process 95% of the time.	Automatically directs attention to process regardless of abnormalities.
Arousal Control	Introduced to the concept and importance.	Attempts to control arousal situations.	Manages arousal control at most matches.	Consciously manages control 95% of the time.	Subconsciously or consciously manages control to optimize performance.
Shooting Plan		Informal plan developed with coach.	Written plan, successful execution with post match analysis.	Able to adapt plan and respond to competition occurrences.	Very adaptable to venue, type of match and adapts plan quickly to changes.

Closer Look: Analytical Skills

Skill	FUNdamentals	Introduction to Shooting	Train to Train	Train to Compete	Train to Win
Shot Analysis	Recognizes bad shot and good shot.	Able to recognize errors in individual shots.	Able to diagnose cause of errors and interpret corrective advice.	Able to diagnose and correct own errors with assistance.	Able to diagnose and correct own errors. Able to call accurate position of shots.
Group Analysis	Recognizes group center of gravity.	Able to recognize and sometimes diagnose tendencies.	Able to diagnose cause of group errors and interpret corrective advice.	Able to diagnose and self-correct errors.	Able to diagnose and self-correct errors.
Competition Analysis	Tendency is to focus on negative things. Coach needs to focus only on positive parts.	Positive interpretation of competition results. Uses simple evaluation tools.	Positive interpretation of results. Identifies mental, physical and technical components for improvement.	Constructive critical review of performance. Able to generate detailed analysis of competition.	Constructive critical review of performance. Self-diagnosis of problems and achievements.

Closer Look: Recovery and Regeneration of an Athlete

The main role of recovery is to help athletes adapt faster to training. This is done by reducing fatigue so athletes can “bounce back” and be ready for the next session or event. This process is a critical step in the “overcompensation” model.



Both work and recovery are very important stages of the adaptive process. Without the appropriate training stimuli there would be no improvement in performance and no resulting fatigue. To maximize the receptivity for athletes to learn, adapt, and improve, it is important for them to aim to begin any training session or event in a non-fatigued state.

Recognizing Fatigue

Prescribing training loads is a complex matter and coaches and athletes spend considerable time developing appropriate programs to suit both the developmental stage and performance level of an athlete. However, identifying fatigue from different types of training and stress tends to get much less attention and may even be overlooked by both the coach and athlete. A good coach understands not only what is being stimulated but also what is being fatigued.

There are several categories of training and competition fatigue for coaches and athletes to consider. If the coach can recognize the main causes of fatigue and the corresponding expressions of these in the athlete, then specific recovery and regeneration strategies can be selected to deal with this fatigue.

Recovery and Long-Term Athlete Development Human growth, maturation and training experience underpin Balyi’s Long Term Athlete Development model. These factors have a critical bearing on the developmental stages of athletic adaptation and trainability.

Chronological age is a poor indicator of individual development especially for adolescents as there is great individual variability in the rate of growth and maturation during puberty. The rapid changes that occur physically, cognitively, socially and psychologically during adolescence are a golden opportunity for the coach to provide athletes with an optimal training base for their sporting future. However, if these developmental stages are handled poorly through inappropriate training and planning, this opportunity can be lost and result in a

restricted training base that limits the long-term potential of the athlete. In worse case scenarios poor training during these years may result in gifted athletes experiencing problems like overtraining, overuse, and burnout.

Consequently the coach is challenged to maximize adaptation by balancing training loads with appropriate recovery strategies to suit the individual needs of athletes. This can be achieved by Teaching athletes about two concepts:

- Monitoring Recovery: “How to listen to your body”(Identifying specific fatigue and the type of recovery needed)
- Recovery Management: “How to look after yourself” (Planning and using recovery strategies)

These two concepts apply to every athlete at all stages of development and sporting experience as both are linked closely with the long-term training adaptations identified in Balyi’s model.

Monitoring athletic performance and fatigue provides a measure of the effectiveness of training and can forewarn of potential adaptation problems. Consistent and systematic monitoring enables the coach to identify specific recovery strategies relevant to the maturation level, training stress, and lifestyle of the athlete.

Table 1: Training and Competition Fatigue

Type of Fatigue	Main Causes for Fatigue	Expression of this Fatigue	Recovery Strategies
Metabolic Fatigue (energy stores)	• Training lasting one hour or more, or • From several (even shorter) sessions a day, & • It can be cumulative when training or performing over a number of days	• Athlete fatigues sooner than is normal for that athlete • Athlete struggles to complete a session or event	• Rehydrate & refuel before, during & after training • Use contrast temperature showers or pool or spa and cold plunge, or active recovery activities • Meal within 1-2 hours of training & monitor hydration
Neurological Fatigue (nervous system) **Peripheral Nervous System Fatigue (muscles)**	• After short high intensity sessions, e.g. weights, plyometrics, complex skill execution, etc. • After long but low intensity sessions especially involving repetitive movements, e.g. steady state swimming, running, cycling, paddling, rowing, etc.	• Reduced localized force production e.g. slow feet. reduced acceleration, poor technique, etc.	• Rehydrate & refuel (including small amounts of protein as well as carbohydrates) before, during & after training • Within 5 - 15 minutes after training use a spa or shower with jets focused on the large & fatigued muscles • After training or later in the day - massage large muscle groups using jostling / light shaking technique
Neurological Fatigue (nervous system) **Central Nervous System Fatigue (brain)**	• Low blood pressure levels • High pressured training session - especially involving rapid decision making & reactions • Poor motivation e.g. monotony of training, emotional factors, injury etc.	• Lack of drive • Lack of motivation	• Steady & regular intake of carbohydrates during training & after training to maintain normal blood glucose levels • After training - unwind, listen to music, visualization • Sauna - contrast hot and cold • Rest
Psychological Fatigue (emotional, social, cultural)	• Lack of team or squad cohesion, personality conflicts etc. • Competition pressures, event venue, residential conditions, parents, coach, media, etc. • Other lifestyle stresses - home, school exams, personal relationships	• Athlete looses self-confidence or self esteem • Poor interaction & deteriorating communication with other athletes & staff • Athlete's body language, increased signs of anxiety, negative attitudes, etc. • Quality of sleep is poor	• Focus on process rather than outcome performance measures • Debrief by identifying 1-3 things that worked well and 1-3 that need more work • Take mind off training with escapist or funny movie, TV, book, or socialize with family & friends • 10-15 minutes before bed switch off from the day by using relaxation techniques
Environmental & Travel Fatigue	• Disruption of normal routines, especially biological clock • Disruption to sleep, waking and meal times • Sedentary & limited body positions on long journeys, i.e. 30 minutes or more • Adapting to different climates and time zones	• Athlete takes longer to warm-up, are slower to start • Unforced errors in the first 15 minutes are well above normal • Athletes fatigue sooner than normal	• Preparation planning will minimise fatigue • Stay hydrated and refuelled • Stay cool in the heat - use a pool, shade, iced towels, etc. • Keep moving as much as possible on long journeys • Minimise visual fatigue by wearing sunglasses outside & limiting time on computers & play stations

Table 2: Monitoring Strategies corresponding with athlete development and increased workloads and stress

Active Start & FUNdamental	Learning to Train	Training to Learn	Training to Compete	Training to Win	Masters Athletes & Coaches
Specific Training Age: 0 years	Specific Training Age: 1-2+/- years	Specific Training Age: 3-7+/- years	Specific Training Age: 8-10+/- years	Specific Training Age: 10-12+/- years	Specific Training Age: 1-100+/- years
At Training (C)* *Smiley Face.* • Energy / tired • Happiness **Reminder (C)** • Toilet (hydration) checks	**Start Recording (A)** • Energy / tired • Self-esteem • Quality of sleep • Illness or injury **Reminder (C)** • Toilet checks **6-9 months (C)** • Limited field and sports specific testing	**Daily Records (A)** • Resting HR • Energy / fatigue • Self-esteem • Quality of sleep • Muscle soreness • Appetite • Body weight • External stresses • Illness or injury • Menstrual cycle **Ongoing (A)** • Toilet checks **2-6 months (SS)** • Musculo-skeletal checks • Sports science & Medicine checks	**Daily Records (A)** • Resting HR • Energy / fatigue • Self esteem • Quality of sleep • Muscle soreness • Appetite • Body weight • External stresses • Illness or injury • Menstrual cycle **Ongoing (A)** • Toilet checks **2-6 months (SS)** • Sports science & Medicine checks **6-12 months (SS)** • Musculo-skeletal checks	**Daily Records (A)** *(as previous stage) Plus:* Individualized testing and screening varies for each sport and athlete (C & SS) Access to facilities and technology, plus the intensity of the competition schedule will influence when and how often testing and screening are done	**Daily Records (A)** • Resting HR • Energy / fatigue • Self esteem • Quality of sleep • Muscle soreness • External stresses • Illness or injury • Menstrual cycle (if relevant) **Ongoing (A)** • Toilet checks **6-12 month (SS)** • Sport Science & Medical checks **Annual (SS)** • Musculo-skeletal checks

* Monitoring responsibilities: (A) = Athlete: (C) = Coach: (SS) = Sport Scientist or Sport Medical Specialist

Table 3: Recovery Strategies corresponding with athlete development and increased workloads and stress

Active Start & FUNdamental	Learning to Train	Training to Learn	Training to Compete	Training to Win	Masters Athletes & Coaches
Specific Training Age: 0 years	Specific Training Age: 1-2+/- years	Specific Training Age: 3-7+/- years	Specific Training Age: 8-10+/- years	Specific Training Age: 10-12+/- years	Specific Training Age: 1-100+/- years
During Training • Rehydrate every 20-30 minutes **After Training** • Drink (water, cordial, fruit juice) & light snack (e.g. fruit, muffin, or yoghurt, etc) • Light stretch • Shower at home	**During Training** • Rehydrate every 20-30 minutes **After Training** • Post game drink & snack • Active recovery • Light stretch • Shower • Meal within 2 hours **Before bed** • Self Massage • Stretching • Relaxation (TV, book, music)	**During Training** • Rehydrate every 20-30 minutes **After Training** • Post game sports drink & snack • Active recovery • Light stretch • Contrast shower • Meal ASAP **Before bed** • Self Massage • Stretching • Relaxation (as for previous stage) Plus: Progressive muscle relaxation, visualization, etc. **Weekly** • Sports massage • Active recovery (e.g. pool, golf, walk dog) • Spa & plunge pool • Stretching session (e.g. Yoga)	**Periodized recovery** *(as previous stage)* *Plus:* • Compressive skins post training • 2 massages a week • Strategies selected to suit specific fatigue (Table 1) • Recovery program individualized • Competition scenarios trialled • Especially recovery from travel fatigue and adjusting to different facilities • Increased range & use of psychological recovery (e.g. lotation, meditation) • Variety of active recovery and rest day activities	**Periodized recovery** *(as previous stage)* *Plus:* Detailed competition planning of recovery programs Fine-tuning recovery strategies for different competition environments Athlete has major input into the recovery program Variation in recovery strategies to prevent monotony	**During Training** • Rehydrate and refuel regularly **After Training** • Post game sports drink & snack • Active recovery • Light stretch • Contrast shower • Meal ASAP **Before bed** • Self Massage • Stretching • Relaxation movie, TV, book, music, visualization, meditation, etc. **Weekly** • Sports massage • Active recovery (e.g. pool, golf, walk dog) • Spa & plunge pool • Stretching session (eg. Yoga)

Closer Look: Sport Medicine & Science Council of Saskatchewan (SMSCS)

The previous discussed aspects are often recognized as skills that are developed through the "10's". Many of the "10's" are therefore viewed as sport medicine or science services. These services can be received through the SMSCS which is an organization funded by Sask Sport Inc so that athletes and coaches can receive additional education from a pool of sport medicine and science consultants within the province of Saskatchewan. The programs and services of the SMSCS are numerous, but how they relate to LTAD is quite important.

Strength & Conditioning / Exercise Physiology (aka: Structure/stature) - Workshops and services are available in core strength, concepts in warm-up/cool-down, weight training, resistance training, foot speed & agility, plyometric training, exercise ball training, metabolic condition (aerobic & anaerobic), physiological program planning and design.

Mental Training (aka: Psychology) - Workshops & progressive consulting are available in the areas of team building and group dynamics, attention, emotional, and arousal control, self awareness, mental imagery, self-talk, goal setting, routines, ideal performance state, mental toughness, and practice effectiveness.

Nutrition (aka: Sustenance) - Workshops and services are available in basic sport nutrition, fluids, weight issues, pre/post event nutrition, nutrition on the road, tournament & multi-event nutrition, and supplements & herbal products.

Biomechanics (aka: Skill Development) - Services are available in analyzing technical skills through the use of slow motion video analysis.

Sport Medicine Education - Services include injury prevention, recognition & care of common injuries, recovery, injury assessments and return to sport programming following injury, drug education and doping control.

Additional educational assistance can be received by contacting the Saskatchewan Handgun Association office, or by contacting the Sport Medicine & Science Council of Saskatchewan directly at 1-888-350-5558.

Closer Look: Club Program Development Model

PHASE	Description	Athlete Coach Ratio	SHA Support	Equipment	Other Equipment	Sask Sport Support	Emphasis
FUNdamentals	Beginners and pre-PHV adolescents	10:1 plus parents	NA	Generic air pistols, targets.	Hearing and eye safety.	N/A	FUN introduction to pistol shooting.
Train to Train	Club based post PHV and high school. Adults in beginning phases.	5:1 plus parents.	Competition attendance funding, Learn to shoot grants	Medium to high quality air pistols. Competition grade targets.	Hearing and eye safety. SCATT machines.	Sport Science	Shooting skills, acquisition for adults, physical exercises.
Recreational Adults	Young adults and older who are recreation shooters.	5:1	Competition attendance, coaching and athlete training seminars. Prov coach for ident and advice.	Medium to high quality pistols. Competition targets for ISSF events.	SCATT machines, target systems.	Sport Science Sask Sport Grants.	Training and competing for recreation. Identify athletes wanting to improve.

PHASE	Description	Training Venue	Competition Opportunities	Training Camps	Testing	Education	Other Sports
FUNdamentals	Beginners and pre-PHV adolescents	Club competitions	2 to 4 regional	Coaching	Crossman Achievements	Public School Adults	2-3 sessions per week plus other sports.
Train to Train	Club-based post PHV, high school and adults	Club and Prov competitions	2 to 4 regional plus 2 provincial	Coaching	SFC classifications	High School Adults	2-4 sessions per week plus limited other sports.
Recreational Adults	Young adults and older who are recreation shooters.	Club and Prov competitions	1 to 3 regional plus provincials	Coaching Training Camps	Prov Coach evaluation if asked for.	Adults College	Individual interests.

Closer Look: Strength and Stamina Training

The Importance of Physical Strength

Pistol Shooting Athletes will achieve a rise in personal scores based on increased physical strength from a weight training program. Studies have shown that a sound physical training program can increase a shooters performance by as much as thirty (30) percent. If an athlete is weak, they will soon find that the exertion of holding the pistol toward the target will cause fatigue and uncontrollable shaking. In other words, greater strength reduces "arc of movement."

The objective of physical training for a pistol shooter is to condition an athlete physically to better withstand the rigors of match conditions. An individual in good physical condition has better developed reactions, better control of their muscles and better endurance; all of which promote consistency in performance.

Developing a Physical Training Program

Physical Conditioning must consist of exercises of a general nature directed toward strengthening the muscles, proper breathing, developing body flexibility and precision of movement. The requirements of pistol shooting are such that drills must consist of exercises which develop the muscles and flexor of the arms and fingers, and the muscles of the shoulders and even the waist. A certain amount of static tension (dynamic) type exercise is valuable if it is not overdone. Whenever a shooter exercises, he or she must put the maximum effort into the exercise. Merely going through the motions of an exercise is of no advantage.

Recognize that physical conditioning is a gradual process and results will not be apparent immediately. As an athletes physical condition improves, the number of repetitions may be gradually increased. Be advised that very heavy exercise like serious barbell weight lifting is discouraged as it can create injuries that will hinder performance more than it will help. A suggested program that consists of daily walking and calisthenics accompanied by every-other-day light dumbbell exercises as most ideal for our purposes.

The Muscle Groups that Matter

While an athlete might benefit from a physical training program that is general in nature and targets all the muscles of the body, a more limited program may suffice. While the legs and back muscles play a role in steadying the stance, you can see from the diagram below where the greatest muscular demand on a shooter lies:

Try to visualize turning your entire arm into an "iron rod" that begins at the shoulder socket and ends at the middle finger. The "rod" is securely held in place by isometrics or contracted opposing muscles. The opposing muscles of the shoulder, triceps, bicep and forearm are at work here; it is not accomplished by "locking the joint" of the elbow. You must recognize that unless your triceps, biceps and forearms are quite strong, you can NEVER visualize or experience this feeling. That is why a weight training program is in order for any pistol shooter.

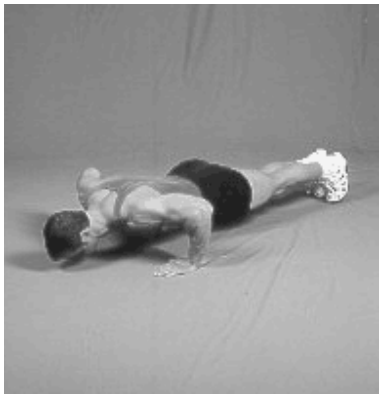
Targeted Exercise Program

A very effective program may only involve a remarkably small investment of time on an athlete's part. Shown below is an example training program that includes two general-fitness exercises that are performed every day, and four strength-building exercises that are performed every other day. Regardless of what program you put together for an athlete, you must remember four things:

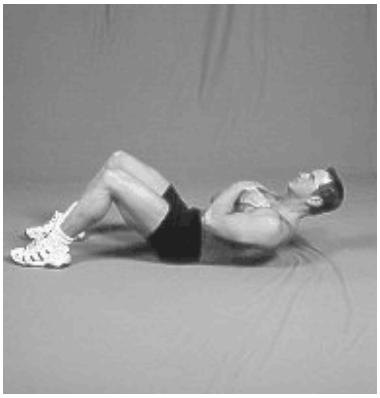
1. Skip any strength-building exercises the day before and the actual day of any match, resuming the program immediately after the match.
2. Avoid injuring tendons or ligaments by starting moderately and progressively increasing repetitions first, and then increasing weight.
3. Increasing the strength of the triceps should be the highest priority of any exercise program.
4. Balance the strength building exercises on both the left and right sides of the body, not just the shooting arm side!

The Daily General Fitness Calisthenics

Targeted at general fitness and stamina, these familiar calisthenics should be performed every day. Two sets of as many repetitions as you can handle should suffice.



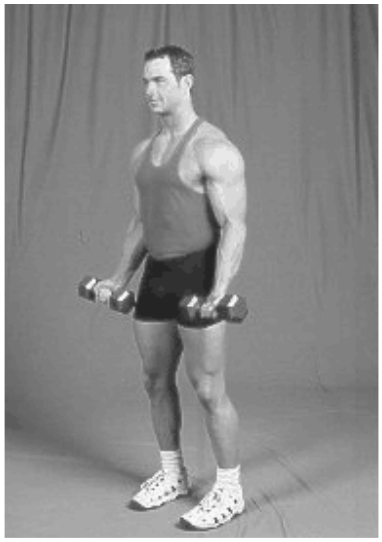
Push-ups



Crunches (sit-ups)

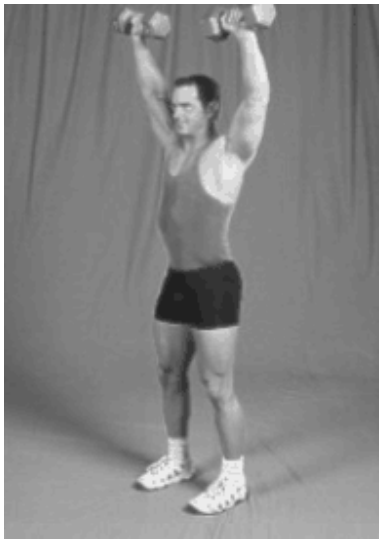
The Every-Other-Day Strength-Builders

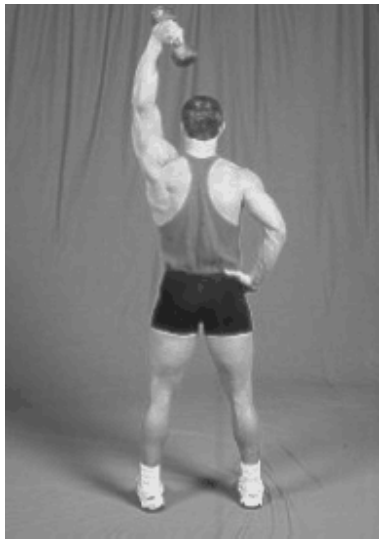
Performed every-other-day to allow for adequate recovery of the stressed muscles that you are developing, you are cautioned not to "overdo it" with these. Two or three sets with "moderate" weight of as many repetitions that you can handle should suffice...



Curls

Forearm Curls





Shoulder Press Behind Head Triceps Press

Establishing Muscle Memory

Much of the goal of training for pistol shooters is to program their "auto-pilot." It is a fact that the muscles themselves have "memory" - a familiarity with the "feeling" of the processes that occur automatically with a learned procedure. While the isotonic exercises described above are excellent for building muscle fiber, it is not entirely enough! Athletes must continue to practice often and utilize the muscles in "real-life" scenarios so that the newly developed muscle fiber also acquires this necessary "memory" needed for effective and consistent results.

All athletes performing specific weight training exercises should consult with a specialist to ensure they are performing the exercises correctly. Utilizing correct form and techniques optimizes the exercise program and reduces the chance of injury.

Closer Look: Shooting Trainability and Definitions

The following information provides definitions of the skills and abilities shown on the target graphs as well as other key skills and abilities needed in shooting.

Abstract Thinking: Thinking about processes, objects and events that may or may not have real world representation.

Aerobic Endurance: Ability to exercise for long durations using aerobic energy systems.

Aiming/Hitting: Hitting a target with an object.

Agility: The ability to move quickly in three dimensions while remaining in control of the movement.

Balance: Ability to remain upright while moving. Includes static balance and balancing while moving or gliding.

Coordination: Moving several parts of the body serially or simultaneously to achieve movement.

Core Strength and Stability: Strength of the core muscles of the trunk, including chest, back and abdomen, which provide an "anchor" for the effective use of arm and leg muscles.

Fine Motor Skills: Movements controlled by small muscles, e.g. hand or finger movements.

Goal Setting: The ability to set targets for future behaviours or outcomes.

Gross Motor Skills: Large movements of the limbs and body using multiple joints and muscle groups.

Memory: Ability to retain and recall instructions, information, and experiences.

Mental Models: Ability to understand and manipulate mental models of real-world processes.

Speed 1: Speed increases due to improvements in neuromuscular coordination.

Speed 2: Speed increases due to improvements in energy systems, anaerobic alactic and lactic.

Strength 1: Strength increases due primarily to increases in neuromuscular coordination, not growth.

Strength 2: Strength increases due primarily to increases in lean muscle mass- hypertrophy.

Strength-endurance: Muscular strength and endurance, allowing repeated static or dynamic muscular contractions with reduced levels of fatigue.

Visual Acuity: Ability to discriminate edges and see objects at various distances.