



Curling For Life



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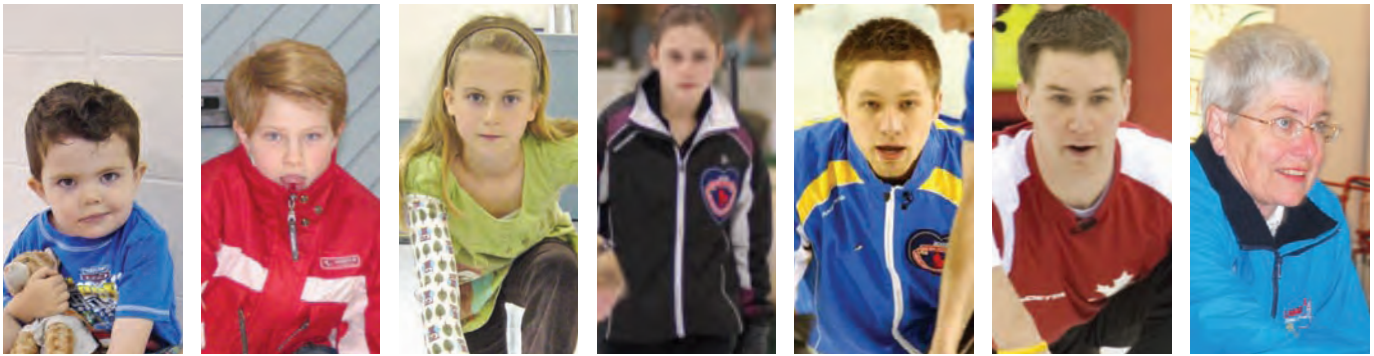
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ISBN 978-0-9782778-2-6
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INTRODUCTION



Lifelong Participation. Achieve Full Potential.



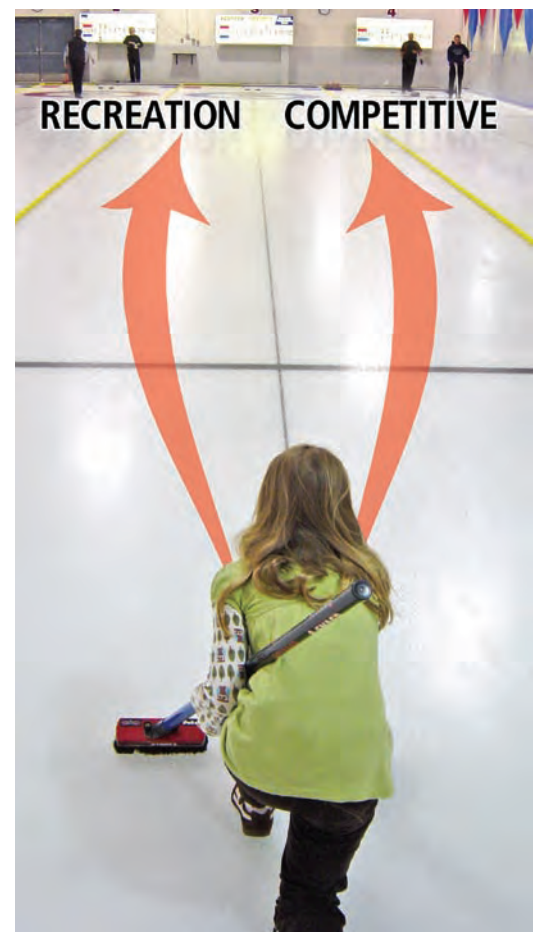
The Need For Long Term Athlete Development In Curling

Curling is one of the oldest sports in Canada, and Canadians have long traditions in competitive achievement and recreational involvement in the game. Curling has been a leader in attracting and retaining recreational sport participants and recent years have seen a surge in demand for both high performance training opportunities and entry-level skill development programs. This demand has highlighted the need for a systematic approach to developing our curling athletes. With increasingly high stakes in the competitive arena, it is critical that there be a systematic, scientific process for consistently producing the best possible Canadian curling athletes and teams.

The Long-term Athlete Development model (LTAD) for Curling identifies the optimal training, competition and recovery principles and practices for our athletes through sequential stages from childhood through to adulthood. It recognizes there are two distinct streams in curling – the lifetime recreational sport and the elite competitive arena – and it is designed to promote and support participants in both.

Promoting excellence alongside recreation is important. While these two groups may experience a similar initial introduction to curling, at some point competitive curling athletes will emerge who wish to pursue the most elite levels of competition. The Curling LTAD model will provide a framework that ensures promising curling athletes have the possibility to achieve their potential through systematic and logical development.

The LTAD model will allow coaches to provide athletes with the best possible support at each stage of their development, and for eventual retirement or re-entry into participation-focused curling. The LTAD will also inform both athletes and parents about key developmental concepts and practices at each stage in the development pathway from frozen pond to podium.

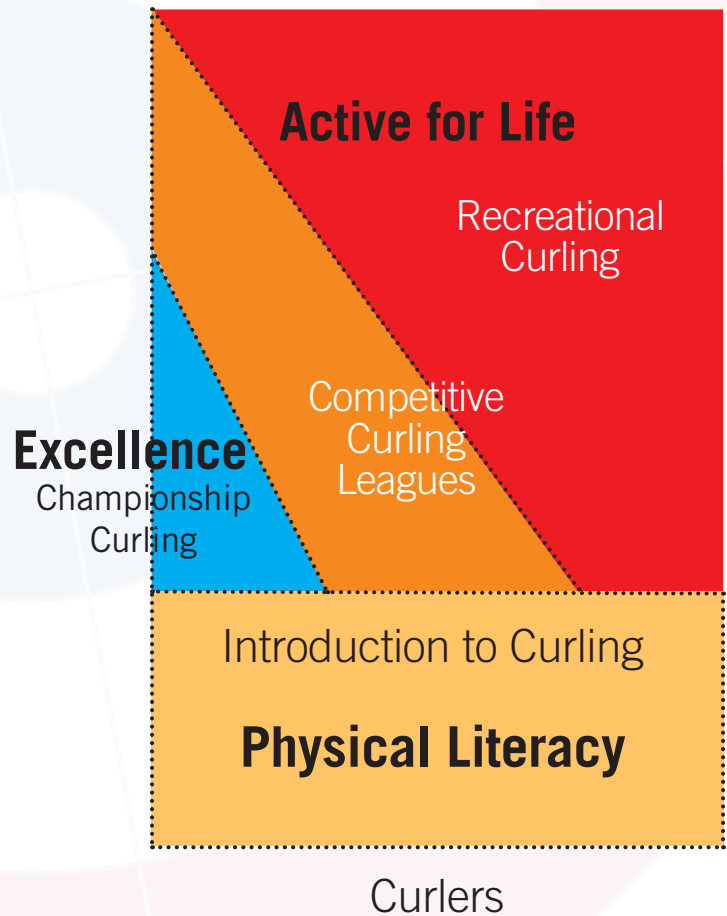


Distinguished Past – Promising Future

While Canada has enjoyed a successful curling history, the LTAD model will enable the nation's competitive curlers to continue to excel into the future. To remain the leading nation in the sport, we must evolve and change, always refining and perfecting the development of our curlers.

LTAD is about achieving optimal training, competition and recovery throughout an athlete's career, particularly in relation to the important growth and development years. The Curling LTAD pathway provides training and competition guidance that will help in the planning of programs to help every participant reach their potential.

The Curling LTAD will provide a developmental pathway for our athletes and it will also target the development of younger players. The integrated system arising from the LTAD model will ensure that curling athletes are placed in the appropriate programs, talent is identified and fostered, and athletes will not "fall through the gaps." The long-term approach will assist clubs and coaches to work towards developing the right training environment for all curling participants, so that they may enjoy curling as a lifetime sport and flourish under appropriate training programs with every opportunity to reach their genetic potential and optimal performance levels.



Nationally – LTAD is a framework for full sport system alignment in Canada, integrating health and education with sport and physical activity.

For Curling – Every athlete entering the sport will have the potential for a positive, individualized experience no matter what their level of participation or competition, and the athlete with podium aspiration and promise will receive timely and appropriate development.

WHY DO WE NEED LTAD?

Canada has long been a leader in the development of curling programs as well as in performance. However, athletes and coaches must constantly strive to learn and improve so they can remain on the leading edge.

The LTAD model for Curling will ensure that Canada continues to excel internationally as well as provide opportunities for new participants to enter the system. Participation in both recreational programs and high performance development will be enhanced and will progress within a systematic framework.

This document examines the main issues related to long-term planning and athlete development in curling. LTAD will guide us in analyzing the Canadian curling system, highlighting its benefits and advantages, while providing a framework that addresses the needs of athletes at every age and level of participation.

This document is designed to stimulate discussion while challenging those involved in the development of curling athletes to continue to pursue excellence through innovative, systematic programs.



Advantages and Benefits of the LTAD for Curling

1. Developing athletes will have age- and ability-appropriate training programs
 - Training and competition programs will be gender appropriate
 - Preparation will pertain to the long-term goal and process rather than short-term outcome
 - Developmental age (versus chronological age) will provide the basis for planning training and competition
 - The competition system will be aligned with the development of the athlete
 - Developmental athletes will train and compete according to an appropriate competition-to-practice ratio
2. Skilled coaches will work at all levels
 - Correct and appropriate fundamental movement skills and sport skills will be emphasized
 - Focus will be on the critical periods of accelerated adaptation to training
 - A planned talent identification system will be in place
 - Coaches will be matched to athletes, teams and programs that align with their knowledge and strengths
3. Parents will have access to information about LTAD principles and their importance
4. Development and training needs of athletes with a disability will be better understood and addressed
5. Planning & Integration will exist at all levels of training and competition
 - Integration will exist between physical education programs in the schools, recreational community programs, and elite competitive programs
 - As a late specialization sport, curling will attract and retain participation at the appropriate time
 - Athletes will reach optimal performance in international competition
 - Best practices will guide athlete development through proper training and competition ratios at each developmental stage
 - Remedial programs will enable promising late-entry athletes to progress at an accelerated rate
 - Athletes will reach their genetic potential and optimal performance levels
6. Lifelong activity and wellness will be encouraged for all participants, while a systematic training path will be available to those who choose high performance competition.
 - LTAD advocates a smooth transition from competition to lifelong physical activity and participation in sport

THE 10 KEY FACTORS INFLUENCING LTAD

Research points to 10 key factors that influence the development of athletes. By building programs around these factors, LTAD ensures that athletes experience optimal development in their chosen sport and lifelong participation in physical activity that will lead to wellness and a healthy lifestyle.

1. The FUNdamentals - Basic Skills

Fundamental movement skills should be introduced during childhood through fun and games; fundamental sport skills should follow. Basic running, jumping, throwing, and movement skills provide the base for all sports.

Basic movement and sport skills create a well educated otherwise known as “physical literacy”. Sports popular with children provide an excellent introduction to skills required for curling: balance, agility, coordination, and strength.

It is important that children develop the basic skills before the onset of their growth spurt. A person that does not achieve basic movement skills may have a lower opportunity to succeed in a variety of sports.

2. Specialization

Curling is a late specialization sport. Athletes should move to specialize in curling between the ages of 12 and 15 to optimize their potential to reach world-class performance levels. This does not mean that they should wait to begin curling at this age, but they should participate in a variety of different sports prior to this age to achieve “physical literacy” If athletes have early involvement in a variety of sports and activities prior to maturation, they will gain the basic physical literacy to better support specialization later.

An athlete with sound fundamental skills can achieve world-class performance levels even if specialization occurs after the ideal age. Using fast-track or remedial training programs, late-entry athletes can leverage their fundamental skills to become highly skilled in curling. There has been recent evidence of this as non-traditional curling countries have become contenders at international competitions.

3. Developmental Age

Growth and development varies greatly between individuals. LTAD considers each athlete’s developmental age rather than chronological age to ensure appropriate programs are introduced as the individual grows and matures.

Identifying early, average, and late maturers will enable the coach to design appropriate training and competition programs that match each athlete’s trainability and readiness. The beginning of the growth spurt and the peak of the growth spurt are very significant in LTAD applications to training and program design.



4. Trainability

All areas of performance are always trainable, but for athletes to reach their maximum potential, windows of optimal trainability must be identified. Trainability focuses on how athletes respond to the training programs at different stages of their growth and development, allowing coaches to design appropriate programs to take advantage of their most significant training periods. If curling athletes are to reach their genetic potential, they must do the right type of training at the right time. If they do not, they will still have the potential to be very good, but they will never be as good as they might have been.

5. The Whole Athlete

LTAD focuses on the whole athlete. Training should include physical, mental, cognitive, and emotional development. A holistic approach to the development of a curling athlete includes emphasis on ethics, fair play and character building throughout. Athletes will learn life skills through sport as they progress through the stages of the curling model.

6. Periodization

Periodization entails coordinating all aspects of training, competition and recovery into a systematic, scientific, integrated plan that will enable the athlete/team to achieve the best possible performance at the desired time.

In curling this means that coaches must decide what needs to be trained, and when to train. The result will be a plan for training, competition, and recovery to produce optimal improvements in performance and achieve peak performance when required.

7. Calendar Planning

Optimal competition planning at all stages is critical to the development of an athlete. At certain stages, developing the skills is more important than competition. At later stages, the ability to compete becomes the focus.

Curling is fortunate to have an abundance of competitions, but care must be taken to ensure that programs at each developmental stage follow an appropriate ratio of training-to-competition.

See Appendix 1 for additional detail.

8. The 10-Year Rule

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

9. System Alignment and Integration

LTAD relates to all stakeholders in sport, recognizing that physical education, school sports, recreational activities and competitive sports are interdependent. Athletes will be exposed to sport through many sources throughout their development, making it essential that all areas of the sport system be aligned, integrated, and built on the principles of LTAD

A curling athlete may be involved in curling through a community centre, school, curling club, or other trial programs or opportunities. Curling relies on schools, recreation centres and other sports to introduce youth to physical literacy and fitness.

An integrated system will ensure that curling athletes who enter at any age or stage will be placed in the appropriate programs, talent will be identified and fostered, and athletes will not “fall through the gaps.”

10. Continuous Improvement

The LTAD model is based on the best available scientific research in the areas of athlete training and human development. However, knowledge, understanding, and sport techniques and theories constantly evolve. The LTAD model should continue to change and grow as new evidence is discovered.



AN OUTLINE OF LTAD - SPORT CANADA MODEL



The first 4 stages, with their respective approximate age ranges, are generally appropriate for all late-specialization sports. In the Training to Compete and Training to Win stages, age ranges vary from sport to sport.



The 10 key factors influencing LTAD

1. The 10-Year Rule
2. The FUNdamentals
3. Specialization
4. Developmental Age
5. Trainability
6. Physical, Mental, Cognitive, and Emotional Development
7. Periodization
8. Calendar Planning for Competition
9. System Alignment and Integration
10. Continuous Improvement

Active Start Stage

Chronological Age
Males and Females 0-6

- FUN and part of daily life
- Fitness and movement skills development
- Focus on learning proper movement skills such as running, jumping, wheeling, twisting, kicking, throwing, and catching
- Not sedentary for more than 60 minutes except when sleeping
- Some organized physical activity
- Exploration of risk and limits in safe environments
- Active movement environment combined with well-structured gymnastics and swimming programs
- Daily physical activity



FUNdamentals Stage

Chronological Age
Males 6-9 and Females 6-8

- Overall movement skills
- FUN and participation
- General, overall development
- Integrated mental, cognitive, and emotional development
- ABC's of Athleticism: agility, balance, coordination, and speed
- ABC's of Athletics: running, jumping, wheeling, and throwing
- Own body strength exercises
- Introduce simple rules of ethics of sport
- Screening for talent
- No periodization, but well-structured programs
- Daily physical activity

Learning to Train Stage

Chronological / Development Age
Males 9-12 and Females 8-11

- Overall sport skills development
- Major skill learning stage: all basic sport skills should be learned before entering Training to Train
- Integrated mental, cognitive, and emotional development
- Introduction to mental preparation
- Medicine ball, Swiss ball, own body strength exercise
- Introduce ancillary capacities
- Talent Identification
- Single or double periodization
- Sport specific training 3 times week; participation in other sports 3 times a week

Training to Train Stage

Chronological / Developmental Age
Males 12-16 and Females 11-15

Sport specific skill development

Major fitness development stage: aerobic and strength. The onset of Peak Height Velocity (PHV) and PHV are the reference points

Integrated mental, cognitive, and emotional development

Develop mental preparation

Introduce free weights

Develop ancillary capacities

Frequent musculoskeletal evaluations during PHV

Move towards specialization

Single or double periodization

Sport specific training 6-9 times per week including complementary sports



Training to Compete Stage

Chronological / Developmental Age
Males 16-23 +/- and Females 15-21 +/-



Sport, event, position-specific physical conditioning

Sport, event, position-specific technical tactical preparation

Sport, event, position-specific technical and playing skills under competitive conditions

Integrated mental, cognitive, and emotional development

Advanced mental preparation

Optimize ancillary capacities

Specialization

Single, double, or triple periodization

Sport specific technical, tactical and fitness training 9-12 times per week

Training to Win Stage

Chronological Age

Males 19 +/- and Females 18 +/-



Ages are sport specific based on international normative data

Maintenance or improvement of physical capacities

Further development of technical, tactical, and playing skills

Modelling all possible aspects of training and performance

Frequent rest periods

Maximize ancillary capacities

High Performance

Single, double, triple, or multiple periodization

Sport specific technical, tactical, and fitness training 9-15 times per week

Active For Life Stage

Enter At Any Age

Minimum of 60 minutes moderate daily activity or 30 minutes of intense activity for adults

Transfer from one sport to another

Move from highly competitive sport to lifelong competitive sport through age group competition

Move from competitive sport to recreational activities

Move to sport careers or volunteering

There is a better opportunity to be Active for Life if physical literacy is achieved before the Training to Train stage



THE 10 “S’s” OF TRAINING AND PERFORMANCE

There are 10 areas of training in sport which will collectively generate a complete, holistic and integrated annual training plan. The first five of these capacities - stamina, strength, speed, skill, suppleness are trainable throughout an athlete's lifetime, but there are clearly “windows of optimal trainability” in the development of each capacity during which training produces the greatest benefit to the athlete's improvement.

These optimal periods vary between individuals as each athlete is unique in their genetic makeup. While the significant periods follow general stages of human growth and maturation, scientific evidence shows that humans vary considerably in the magnitude and rate of their response to different training stimuli at all stages. Some athletes may show potential for excellence by age 11, whereas others may not indicate their promise until age 15 or 16. Consequently, a long-term approach to athlete development is needed to ensure that individuals who respond slowly to training stimuli are not “short-changed” in their development.

The significant periods in trainability are referred to as “optimal periods of accelerated adaptation to training.” If athletes are to reach their genetic potential, correct training must be provided during these periods when there is accelerated adaptation to training. However, the windows are always open.

Familiarity with these concepts will help curling coaches design appropriate programs for athletes.

1. Stamina (Endurance)

The window for training stamina occurs at the onset of the growth spurt or Peak Height Velocity (PHV), commonly known as the adolescent growth spurt. Athletes need increased focus on aerobic capacity training (continuous or aerobic interval workloads) as they enter PHV, and they should be progressively introduced to aerobic power training (anaerobic interval workloads) as their growth rate decelerates. Highly trained aerobic and anaerobic lactic systems allow curling athletes to tolerate intense sweeping with minimal levels of fatigue and maximal levels of recovery. The importance increases as a curling athlete begins to play 8 to 10 end games, and/or two or three games per day over a period of 4 to 10 days.

2. Strength

There are two windows of trainability for strength in girls: immediately after PHV and after the onset of menarche. Boys have one strength window, and it begins 12 to 18 months after PHV. Strength is an integral component to the prevention of injuries and to performance enhancement. As strength is a precursor to power, both throwing take-out weight and high intensity sweeping is enhanced by strength development.



The significant periods in trainability are referred to as “ windows of accelerated adaptation to training.”





3. Speed

There are two windows of trainability for speed. For girls, the first speed window occurs between the ages of six and eight years, and the second window occurs between 11 and 13 years. For boys, the first speed window occurs between the ages of seven and nine years, and the second window occurs between 13 and 16 years. The first speed window is anaerobic alactic power relating to intervals between 0 and 5 second. During the first speed window, training should focus on developing agility and quickness. The second speed window is anaerobic alactic capacity related to intervals between 15 and 20 seconds where training should focus on developing the anaerobic alactic power energy system.

4. Skill - Technical

Girls and boys both have one window for optimal skill training. For girls, the window is between the ages of eight and 11 years, while in boys it is between nine and 12 years. During this window, young athletes should be developing physical literacy. Physical literacy is the development of fundamental movement skills and fundamental sports skills that permit a child to move confidently and with control in a wide range of physical activity and sport situations. It also includes the ability to “read” what is going on around them in an activity and react appropriately to those events. Physical literacy is the foundation of lifelong involvement in physical activity and also for high performance participation.

5. Suppleness - Flexibility

The optimal window of trainability for suppleness (or flexibility) occurs between the ages of six and 10 years in both girls and boys. However, special attention should also be paid to flexibility during the growth spurt.

6. Structure / Stature - Growth & Maturation

This component addresses the six stages of growth in the human body and links them to the windows of optimal trainability. (Phase 1: very rapid growth and deceleration; Phase 2: steady growth; Phase 3: rapid growth until peak is reached; Phase 4: rapid deceleration; Phase 5: slow deceleration; Phase 6: cessation of growth.) Stature (individual height) may be measured before, during, and after maturation to help coaches and parents track developmental age.

By tracking developmental age, coaches can identify the sensitive periods of skill acquisition and physical development (endurance, strength) and design optimal training, competition and recovery programs accordingly.

7. (P)‘Sychology’ - Mental Skills

Sport is a physical and mental challenge. The ability to maintain high levels of concentration and remain relaxed with the confidence to succeed are skills that transcend sport to everyday life. To develop the mental toughness for success at high-level competition requires training programs which are designed specific to the gender and LTAD stage of the athlete. The training programs should include key mental components identified by sport psychologists: concentration, confidence, motivation and handling pressure. As an athlete progresses through LTAD

having fun and respecting opponents; to visualization and self-awareness; to goal setting, relaxation and positive self-talk. To master the mental challenge of sport, those basic skills are then tested in increasingly difficult competitive environments. Ultimately the planning, implementing and refining of mental strategies for high-level competition will determine podium performances. The mental training program is critical at any LTAD stage as dealing with success and failure will determine continuation in sport and physical activity, therefore dramatically affecting an individual lifestyle.

8. Socio-Cultural

Sport provides many opportunities and situations where athletes may internalize general societal values and cultural norms through their participation. This process begins at the community level, and may eventually lead to International experiences as athletes progress through the LTAD stages and begin competing further abroad. For example, socialization through sport may include broadening of social perspective including awareness of ethnicity and national diversity. Through proper planning, recovery periods within the travel schedule can include education about competition locations including history, peoples, geography, architecture, cuisine, literature, music and visual arts. Accordingly, planning can allow sport to offer much more than simply commuting between the hotel room and the competition venue.

Sport socialization also must address sport sub-culture, and 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.

In general, it should be remembered that socio-cultural activity is not a negative distraction or interference with training and competition activities: it is one more opportunity to make a positive contribution to the development of the person and the athlete.



9. Sustenance

Sustenance recognizes a broad range of components with the central theme of replenishing the body. This is to prepare the athlete for the volume and intensity required to optimize training or living life to the fullest. Areas addressed are nutrition, hydration, rest, sleep and regeneration, all of which need to be applied differently to training (life) plans depending on the LTAD stage. Underlining sustenance is the need for optimal recovery management, moving the athlete to a model which places a high degree of importance on the individual's activities away from the field of play. For proper sustenance and recovery management, there is a need to monitor recovery by the coach or parent through the identification of fatigue. Fatigue can come in many forms including metabolic, neurological, psychological, environmental, and travel. While overtraining or over-competition can lead to burn-out, improperly addressing sustenance can lead to the same result.

10. Schooling – Education, Career and Family/friends

In training program design, the demands of school must be considered. This is not limited to the demands placed by school sports or physical education classes, but also includes integrating school academic loads, timing of exams, and other demands. When possible, training camps and competition tours should compliment, not conflict, with the timing of major academic events.

Overstress should be monitored carefully. Overstress refers to the everyday stresses of life, like schooling, exams, peer groups, family, boyfriend or girlfriend relationships as well as increased training volume and intensities.

Interference from other school sports should be minimized, and communication between coaches who are responsible to deliver the training and competition programs is essential. A good balance should be established between all factors, and coaches and parents should be working on this together.

The same holds true for mature athletes in managing a demanding career.

LONG-TERM ATHLETE DEVELOPMENT PATHWAY



The 'Long Term Athlete Development pathway outlines path of a high performance curling athlete. To become a world class curling athlete skills should be mastered as follows:

Active Start

Age: 0 – 6

Objective: learn basic fundamental movements and link them together into a play environment

Daily active play is a way for young children to be physically active. Active play should include both structured (minimum 30 minutes/day for toddlers and 60 minutes/day for preschoolers) and unstructured (minimum 60 minutes a day up to several hours) play.

The focus should be on improving basic skills such as running, jumping, twisting, kicking throwing and catching. Activities should be designed to help children become competent and confident.

Training Area	FUNDamental	Learning To Train	Training To Train	Training To Compete 1	Training To Compete 2	Training To Win 1	Training To Win 2
Programs	Getting started Learn to Curl Club based School based	Club based School based	Club based School based Regional Provincial National	Club based School based Regional Provincial National	Club based University Regional Provincial National	Club: Adult Regional Provincial National	Club: Adult Regional Provincial National National Development Team
Chronological Ages F, M	F: 6-8, M: 6-9	F: 8-11, M: 9-12	F: 11-15, M: 12-16	F: 15-17 +/- M: 16-18+/-	F, M: 18-20+/-	F, M: 21-25 +/-	F, M: 26+
Developmental Or Training Ages	Awareness & Trial	1 – 2	2 - 5	5 – 8	8 - 11	11 - 14	14 +
Talent Identification	Family of club members; schools	Schools; junior programs	Regional & provincial competitions; schools; programs; camps	Regional & provincial competitions; schools; programs; camps	Regional, provincial, national competitions; schools/ university programs; camps	Regional, provincial & national competitions; schools; programs; camps; university games; National Development Program	Regional, provincial & national competitions; schools; programs; camps; university games; National Development Program
Key Competitions	Gym games Multi-sport participation	Sport specific Modified versions of activity	Play downs, bonspiels; bantam regional & provincial League play; Canada Games	Team competitions Regional, provincial, Canada Games; National	Regional, provincial, national and international; university games	Highly competitive Provincial, national, international; university games	Highly competitive Annual training plan Regional, provincial, international
Organising Body		Club; school	Club; school, PSO	Club; school; PSO	Club; PSO; University (NSO)	Club; PSO; NSO; University	Club; PSO; NSO
Performance Services		Club programs	Club programs; PSO programs; Regional Training Centre programs; Sport schools	Club programs; PSO programs; Regional Training Centre programs; Sport schools	Club programs; PSO programs; Regional Training Centre programs; Sport schools & universities	Regional Training Centre; PSO programs; National Training Centre; National Development Team; National Team Program	Regional Training Centre; PSO programs; National Training Centre; National Development Team; National Team Program

LONG-TERM ATHLETE DEVELOPMENT MAP

Training Area	FUNdamental	Learning To Train	Training To Train	Training To Compete 1	Training To Compete 2	Training To Win 1	Training To Win 2
Physical	Basic agility, coordination, balance and speed	Specific and general motor patterns for curling Own body strength exercises Other sports	Sport specific dexterity, flexibility and balance Introduce free weights	Sport specific physical conditioning including flexibility, balance and strength	Maintenance of physical condition, strength and flexibility Sport specific training programs	Maintenance of physical fitness and curling flexibility, balance and strength. Sport specific training programs	Maintenance/ fine-tuning Advanced highly individualized training programs
Nutrition	Healthy lifestyle	Healthy lifestyle through parents, teachers & coaches; Begin to be responsible for healthy, balanced choices	Increased responsibility for healthy, balanced choices; Learning sport nutrition practices	Responsible for healthy, balanced choices; Understanding the requirements of high performance nutrition demands and chrono-nutrition	Responsible for healthy, balanced choices; Understanding of performance requirements and chrono-nutrition	Responsible for performance based plan; Understanding of performance requirements and chrono-nutrition; Professional monitoring	Responsible for healthy, balanced choices; Understanding of performance requirements and chrono-nutrition; Professional monitoring
Growth and Maturation	Fundamental Movement Skills	Self-concept and emotional development	Stable muscular system	Peak strength development	Final preparations of athletic development	Final stages of maturation	Final maturation Medical monitoring
Tactical	Throwing shot to target How to score a point	Concepts of offense and defense Draws, takeouts Scoring	Awareness of shot selection options	Development of game style and plan shot selection	Adaptable Precise in determining strategy/ tactics	Tactical variations and precision Fine tuning strategic plan	In-depth understanding and use of strategy/ tactics Multiple game plans and plans
Technical	Balance on ice surface	Basic delivery skills, Sweeping Skills	Balanced delivery Acquire weight control Consistency in shot making (weight, release) Improve sweeping	Strong technical ability fine tune delivery (weight, release) Improve, modify, and perfect sweeping ability	Excellent technical ability Excellent control Ability to make technical adjustments during delivery (weight, release) Excellent sweeping skills	Excellent technical ability in every area and the ability to identify and correct technical errors (release/weight) Proficiency in sweeping, judging and managing shots	Mastering technical ability in every area and in the ability to identify and correct technical errors release/ weight Proficiency in sweeping, judging and managing shots
Mental	Effort and participation with others	Self-concept developed through experience	Leadership roles Specific mental skills training	Routine planning Refocus skills	Self-analysis of performance Critical thinking	Decision-making skills	Decision making Self-analysis
Team Dynamics	Development of relationships	Participation and cooperation with peers	Team player Athlete coach relationships	Team roles and responsibilities Goal setting	Self-discipline Team roles and responsibilities	Responsibility, self direction and independence	Roles and responsibilities Routines Long-term goal setting

LONG-TERM ATHLETE DEVELOPMENT MAP

Training Area	FUNDamental	Learning To Train	Training To Train	Training To Compete 1	Training To Compete 2	Training To Win 1	Training To Win 2
Personal	Fun while learning	Self-confidence	Self-reliant and an independent thinker	Appreciation of sport	Long and short term goals for sport, education, and life	Life decisions	Positive personal values Leadership
Ancillary Capacities	Equal opportunities Fun and participation	Respect Positive attitude for competition	Introduce procedures for: Warm-up/cool down, nutrition/hydration, taper and peak, recovery/regeneration,	Importance of Training principles	Importance of Training principles	Specific Training principles Code of ethics	Excellent Time management skills Specific personalize preparation
Planning	Participation	Club or school led program	A healthy lifestyle Club or school led program	Coach designed	Coach designed	Coach & consultant designed	Coach & consultant designed
Periodization	N/A	Single 2 minor peaks	Single 3 minor peaks 1 - 3 major peaks	Single 5 minor peaks 1 - 4 major peaks	Single 5 minor peaks 1 - 4 major peaks	Single 5 minor peaks 1 - 4 major peaks	Multiple Single 1 - 4 major peaks
Training to Competition Ratio	N/A	1:1	2:1	3:1	3:1	4:1	4:1
Taper			Before each competition	Before each competition	Before each competition	Before each competition	Before each competition
Recovery and Regeneration			Following each training session and competition	Following each training session and competition	Following each training session and competition	Following each training session and competition	Following each training session and competition

*Please note: in the Fundamental Phase, Learn to Train, Train to Train and Train to Compete 1 and 2 competition may refer to a single competitive game or event. In Train to Win 1 and 2 competition will generally refer to a competitive event

Active For Life

- This stage may occur at any age as the individual transitions from competitive sport to lifelong health and wellness through physical activity.
- Through the adoption of systematic development and training principles, a curling participant can enjoy a life long involvement in curling.
- This may involve re-directing athletes to a new sport, and can involve any level of recreational or organized sport that focuses on participation as opposed to competition.
- The athlete could also make a move towards coaching or officiating.



ATHLETES WITH DISABILITIES

The Canadian curling association is in the process of developing a LTAD resource for athletes with disabilities. Therefore detailed information on LTAD is not contained within this document.

Clubs who are considering offering programs for athletes with disabilities should be aware that while there are many similarities between AWADs (athletes with a disability) and able-bodied athletes, some differences exist that affect the LTAD process.

Athlete development for AWADs requires two new stages: Awareness and First Contact/Recruitment. These stages are particularly important for individuals with an acquired disability who, prior to injury or illness, may have had no contact or knowledge of sports for AWADs.

Awareness Stage

The period following acquisition of a disability is one of transition and great change for most individuals. Some activities in which they were previously engaged may no longer be open to them in the same form, and they may not be aware of all of the sporting and recreation activities that are available. The Awareness stage is therefore intended to inform them of the range of activities in which they can participate as AWADs, and sports organizations should develop awareness plans to make their offerings known.

First Contact/Recruitment Stage

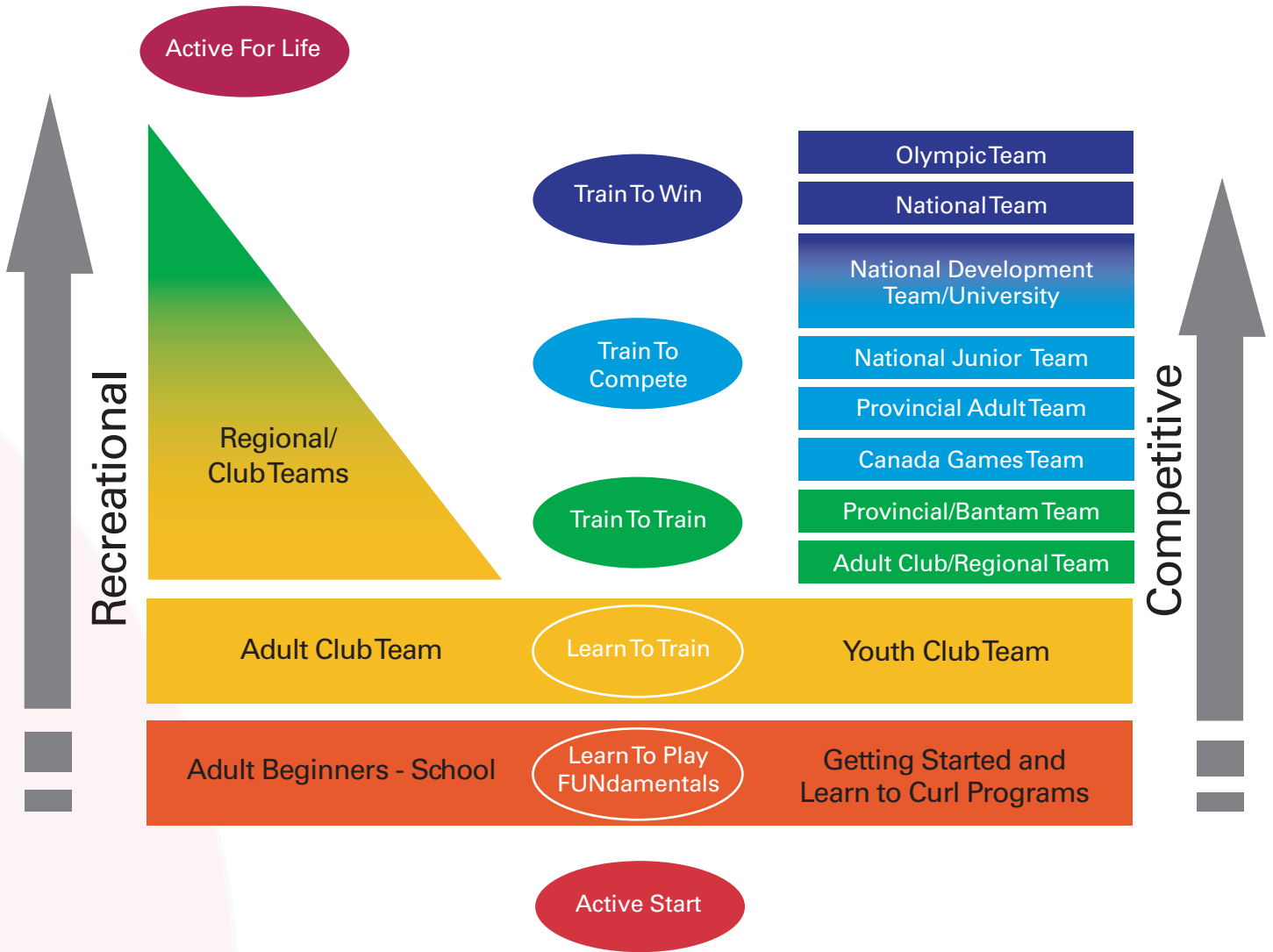
Sports only have one opportunity to create a positive environment for prospective AWADs. It may not be easy for them to make the first approach to a sport, and research shows that if they don't have a positive first experience, they may be lost to the sport and to a healthy lifestyle. The First Contact/Recruitment stage is intended to ensure that their first experience is a positive one. In this regard, athletes who retire from disability competition need to be encouraged to remain involved in the sport as coaches, program volunteers, fundraisers, mentors, or officials as their example and leadership will do much to encourage prospective AWADs and promote their successful entry into sport.

For further information visit www.ltad.ca.



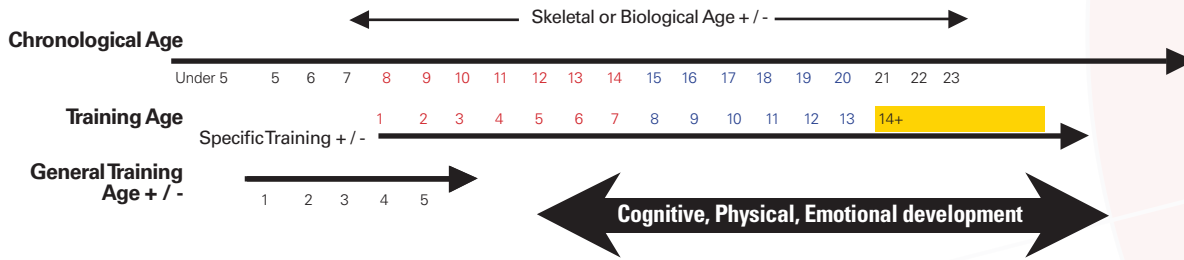
SYSTEM ALIGNMENT AND INTEGRATION CHART

System Alignment and Integration
(Dagg-Jackson and Way 2004)



SYSTEM OF TRAINING AND COMPETITION

Canadian Curling Association – Long-Term Athlete Development Model (Dagg-Jackson, Balyi, Soligo and Way 2006)



	Learn to Play	Learning to Train	Training to Train	Training to Compete 1 & 2		Training to Win 1 & 2	
Female	Age: 6 - 8	Age: 8 - 11	Age: 11 - 15	Age: 15 - 17	Age: 18 - 20	Age: 21 - 25	Age: 24+
Male	Age: 6 - 9	Age: 9 - 12	Age: 12 - 16	Age: 16 - 18	Age: 18 - 20	Age: 21 - 25	Age: 24+
		Single Peak		Double Peak		Multiple Peaks	
ADM	6 7 8	9 10 11	12 13 14	15 16 17	18 19 20	21 to 25	26+
	Active in all Sports Club Awareness Programs Getting Started in Curling (FUNdamentals)	Club Programs School Programs	Club Teams Regional Rep. Teams School Programs	Bantam Competitions HP Centre Teams Canada Games School Programs National U 18 Development Reg./Prov. Development Programs	Jr Competitions HP Centre Regional Rep. Teams Uni/College Teams National Jr. Development Programs Reg./Prov. Elite Programs	Open Competitions Excellence Centre Uni/College Teams National Dev. Programs National Dev. Team Programs Prov Elite Programs	Open Competitions Excellence Centre Club Programs National Team Programs National Dev. Team Programs Prov Elite Programs



ADM = Athlete Development Model
PDM = Recreational Participant Development Model

✳	Based on testing and monitoring.	Optimizing training, competition and recovery loads.	Based on International and national normative data.	Individual Tempo Development varies with each athlete's capabilities and maturation.
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IMPLEMENTATION

The design of the LTAD for curling is just the first step. It is necessary to recognize the model as a vehicle that will guide the sport in every stage of participation from the first time the curling athlete enters the rink through retirement. Curling partners and stakeholders should agree to adopt the LTAD as a quality framework that will provide a road map for the acquisition of skills and competency in the sport.

The LTAD will influence many decisions and directions including:

- Integration throughout the system
- Coach training;
- The development of age and stage appropriate programs;
- Structure and schedules of leagues and competitions;
- Co-operation between sport organizations, coaches, teachers, in the scheduling of training and competition;
- The ability to be part of a national sport strategy/ tactics

SUMMARY

The LTAD for Curling is a philosophy and a vehicle for a cohesive approach to lifelong participation in physical activity and sport.

Curling is a sport which truly promotes participation of young and old and with the implementation of guidelines to provide systematic development, athletes will have the potential to achieve optimal performance and enjoyment at every stage of involvement.

The LTAD helps curling identify potential partners and stakeholders who can join in collaboration of programs and support from Active Start to Active for Life. It will allow the planning of the appropriate requirements for a thriving system at every level. Sufficient numbers of instructors and coaches can be trained and matched up with appropriate athletes and programs in anticipation of specific needs.

A framework for reviewing current practices, developing new initiatives and standardizing programs will guide coaches, athletes, administrators and clubs to provide options for all stages of a curling athletes' development. It will also enable the further integration of athletes with a disability into curling programs.



APPENDIX 1 - ATHLETE TRAINING AND COMPETITION PLAN

Month	FUNdamental Phase F 6-8, M 6-9	Learning To Train F 8-11 M 9-12	Training To Train F 11-15 M 12-16	Training To Compete 1 F 15-17 (+/-) M 16-18 (+/-)	Training To Compete 2 F 17-20 (+/-) M 18-20 (+/-)	Training To Win 1 F 1& M 20-25 (+/-)	Training To Win 2 25 +
May	Other sports	Other sports Training	Other sports Training	Other sports Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific training On ice technical
June	Other sports Training	Other sports Training	Other sports Training	Other sports Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific Training On ice technical	Sport-specific training On ice technical
July	Other sports Training	1 week curling camp	1 week curling camp	Other sports Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific training On ice technical
August	Other sports Training	1 week curling camp	1 week curling camp	Other sports Sport-specific training 1 week camp	Sport-specific training On ice technical	Sport-specific training On ice technical	Sport-specific training On ice technical
September	Other sports	Other sports	High Performance Training (HPT)	HPT	HPT	HPT	HPT
October	Junior curling program 1X/week	1-2X/week on ice	Bonspiel 2-3X/week on ice inc. league	Bonspiel 2-4X/week on ice inc leagues	Bonspiel 2-4X/week on ice inc leagues	2 cash spiels 2-4X/week on ice inc leagues	2 cash spiels 2-4X/week on ice inc leagues
November	1X/week	1-2X/week on ice	Bonspiel 2-3X/week on ice inc. league	Bonspiel 2-4X/week on ice inc leagues	Bonspiel 2-4X/week on ice inc leagues	2 cash spiels 2-4X/week on ice inc leagues	2 cash spiels 2-4X/week on ice inc leagues

Month	FUNdamental Phase F 6-8, M 6-9	Learning To Train F 8-11 M 9-12	Training To Train F 11-15 M 12-16	Training To Compete 1 F 15-17 (+/-) M 16-18 (+/-)	Training To Compete 2 F 17-20 (+/-) M 18-20 (+/-)	Training To Win 1 F 1 & M 20-25 (+/-)	Training To Win 2 25 +
December	1X/week	1-2X/week on ice	Play downs 2-3X/week on ice inc. league	Playdowns 2-4X/week on ice inc leagues	Playdowns 2-4X/week on ice inc leagues	Playdowns 2-4X/week on ice inc leagues	Playdowns 2-4X/week on ice inc leagues
January	Bonspiel 1X/week	1-2X/week Bonspiel	Provincials 2-3X/week on ice inc. league	Provincials 2-4X/week on ice inc leagues	Provincials 2-4X/week on ice inc leagues	Provincials 2-4X/week on ice inc leagues	Provincials 2-4X/week on ice inc leagues
February	Bonspiel 1X/week	1-2X/week Bonspiel	Bonspiel 2-3X/week on ice inc. league	Nationals 2-4X/week on ice inc leagues	Nationals 2-4X/week on ice inc leagues	Olympics Nationals 2-4X/week on ice inc leagues	Olympics Nationals 2-4X/week on ice inc leagues
March	Bonspiel 1X/week	1-2X/week Bonspiel	Canada Games 2-3X/week on ice inc. league Canada Games	Worlds 2-4X/week on ice inc leagues	Worlds 2-4X/week on ice inc leagues	Worlds 2-4X/week on ice inc leagues	Worlds 2-4X/week on ice inc leagues
April	Other sports Training	Other sports Training	Other sports Training	Other sports Sport-specific training On ice technical	Sport-specific Training On ice technical	Players' Championship Sport-specific training On ice technical	Players' Championship Sport-specific training On ice technical

APPENDIX 2 - CCA ADM COMPETITION PATH

ADM Competition Path - Supporting Programs and Services (Dagg-Jackson and Way 2004)



Athlete Development Model (ADM) Competition Path

APPENDIX 3 - CCA COACH DEVELOPMENT MODEL

CCA Coach Development Model (Dagg-Jackson and Way 2004)



GLOSSARY OF TERMS

Adaptation: refers to a stimulus or series of stimuli, which induces functional and/or morphological changes in the organism. The level or degree of adaptation is dependant on the genetic endowment of an individual. However, the general trends or patterns of adaptation are identified by physiological research, and the facts and guidelines of the different adaptation processes, such as adaptation to muscular endurance or maximum strength, are clearly defined.

Adolescence: structurally begins with acceleration in the rate of growth in stature, which marks the onset of the adolescent growth spurt. The rate of growth in stature reaches a peak, begins a slower or decelerative phase, and finally terminates with the attainment of adult stature.

Aerobic capacity: the total amount of energy that one can produce aerobically in the presence of oxygen.

Aerobic power: the rate at which energy can be produced aerobically.

Anaerobic alactic capacity: the total amount of energy that one can produce without the presence of oxygen.

Anaerobic alactic power: the rate at which energy can be produced by the ATP (high energy phosphate) system: it is maximal effort.

Ancillary capacities: refer to the knowledge base and experience base of an athlete and includes warm-up and cool-down procedures, stretching, nutrition, hydration, rest, recovery, restoration, mental preparation, and taper and peak. This is the “how, when and what to do” to enhance training and performance. When athletes reach their genetic potential and physiologically cannot improve anymore, performance can be improved by using the ancillary capacities to full advantage.

Anthropometric Measurements: regular, periodical measurements of standing height, sitting height, arm span, and weight to monitor growth. This helps identify the onset of PHV.

Chronological Age: refers to the number of years and days elapsed since birth. Growth, development and maturation operate in a time framework: that is, the child’s chronological age can differ by several years in their level of biological maturation.

Chrono-nutrition: is the timing of nutritional intake in relation to training or competition, ensuring the likelihood of peak performance
Competition modeling: creating competition models to assist the athlete to maximize his/her abilities and to perform at the highest possible level, also developing favourable competition strategy for success.

Development: acquisition of behavioral competence, learning of appropriate behaviors including social, emotional, intellectual.

Developmental age: the age determined by the physiological factors of maturation

Flexibility: the ability to conduct movements at certain joints with appropriate range of motion.

Formal weight training: introduction of external loads, mostly in the form of dumbbells or barbells, in the training protocol with the objectives of strength and power development

Growth and maturation: are often used together, sometimes synonymously. However, each refers to specific biological activities.

Growth: increase in the size of the body as a whole and of its parts.

Interference principle: training principle which stipulates that some forms of training, or emphasizing the development of one particular variable, may induce a temporary or permanent decrease in performance, or in the functional level of another variable. For example, Strength training may temporary affect the ability to perform highly specialized skills, as greater levels of tension can be generated and/or speed of movement achieved.

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

Menarche: onset of first menstruation cycle.

Mesocycle: is usually comprised of 2-4 microcycles.

Microcycle: is usually a week.

Musculoskeletal screening: The assessment of an individual’s postural alignment, movement patterns and neuromuscular balance. This helps direct efficiency of movement along with the development of proactive injury prevention approaches.

Onset of PHV: the beginning of the growth spurt.

Integrated Support Team (IST): the group of professionals (physician, physiologists, nutritionists, physiotherapists, biomechanists, massage therapists and psychologists) assisting the athlete in collaboration, led by the coach, to achieve elite levels of performances.

Periodization: the structuring of short and long-term training, competition and recovery periods to provide optimum performances at the required time or time series.

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

Periods: preparation, competition and transition times.

Periods of development: critical period refers to a point in the development of a specific behavior when experience or training has an optimal effect on development. The same experience, introduced at an earlier or later time, has no effect on, or retards later skill acquisition.

Phase: generally “General” preparation phase, “Specific” preparation phase, “Pre Competitions” phase, “Competitions” phase and “Transition” phase comprising of 4-6 mesocycles.

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

Physical literacy: the ability to perform fundamental and specialized movement skills and the knowledge, understanding and ability to read the environment

Posture: the static or dynamic positional states of the body maintained via the individual's neuromuscular skeletal system.

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

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

Range of motion: the movement around a joint.

Readiness: refers to the child's level of growth, maturity, and development, which enables him/her to perform tasks and meet demands through training and competition. There are “readiness and optimal periods” of trainability during growth and development of young

athletes, and stimuli has to be timed to achieve optimum adaptation with regard to motor skills, aerobic capacity aerobic power, muscular endurance and strength.

Screening: evaluation of physical, technical, tactical and mental potential of an athlete
Skill: is the ability to carry out a task with maximum certainty and minimum expenditure of energy and time.

Skill development: is the action supported by a pattern of abilities that is learned and developed through practice and has the potential to endure.

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

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

Strength development: action supported by pattern of abilities to develop strength through practice with the potential to remain enduring.

Taper: training phase immediately prior to a competition event where the training load of an athlete is reduced in order to achieve a peak in performance during competition.

Technique: the integration of movement patterns while performing various skills. The better the technique, the more efficient the performance.

Testing and monitoring: regularly scheduled field and laboratory testing, medical and psychological evaluation.

Trainability: refers to the genetic endowment of athletes, as they respond individually to specific stimuli and adapt to it accordingly. Malina and Bouchard defined trainability as the “the responsiveness of developing individuals as different stages of growth and maturation to the training stimulus.”

Training age: the athlete's number of years in the sport.

ACKNOWLEDGEMENTS



This overview of the Long-term Athlete Development (LTAD) plan for curling was produced by a working group that included:

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Design: McAllister Media

Printing: Hemlock Printers

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Published by the Canadian Curling Association

For more information on curling and updates on this topic please visit: www.curling.ca

For additional information on Long-Term Athlete Development refer to Canadian Sport for Life and No Accidental Champions, published by the Canadian Sport Centres or go to www.ltad.ca

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

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