

## **American Development Model**

**A plan for long-term athlete development**  
*Endorsed by the National Hockey League*



We're extremely pleased to share the news of the revolutionary American Development Model that will be available for local associations to utilize beginning with the 2009-10 season. The ADM was endorsed by the USA Hockey Board of Directors at its 2009 Winter Meeting and has also been endorsed by the National Hockey League. The American Development Model furthers our growth and development efforts as it will provide our member associations -- for the first time ever -- an optimal development blueprint for youth players that will lead to a better experience for our current players and also help attract new players to our sport.

It's hard to put in words the excitement and buzz that has been and will continue to be generated by this new initiative. It will take time for local associations around the country to educate their constituents on the merits of adopting the American Development Model, but there's no doubt that the principles of the program are right for kids.

**- Ron DeGregorio, USA Hockey President**

The American Development Model ... As Americans, we are a competitive people and our country places a tremendous importance on winning. In many cases it is to our detriment, but there can be no doubt our society rewards and cherishes excellence. In ice hockey, we have grown from our seat at the kids' table to one with the grown-ups. As a hockey nation we are now competitive at every event that we enter. Yet for Americans, second best has never been good enough. If you look at our results in men's hockey at the global table, we are currently ranked sixth by the International Ice Hockey Federation. Our results at both the senior men's and U20 championships rarely bring us to the podium. We are now the second largest enrollment country within the IIHF and yet we have not grown into our potential.

The developmental system in the U.S. has evolved over time. Our current structure was not one that was planned; it is one that just evolved into a multi-faceted organization with many different avenues. While diversity is one of our great attributes as a nation, a clear pathway to excellence has never been defined by USA Hockey. Ten years ago, to address some of the issues within our system, USA Hockey took a bold step with the creation of the National Team Development Program. The NTDP has raised the bar on elite player development within the United States. Ten years ago one rarely heard the word "development" within the hockey community, but now it is the buzz word. The NTDP has played an important role as we have grown into a challenger at each event. However, as Americans we are not content with second place and it is now time to move from challenger to champion.

Change is the only path that will move us towards our goal. As the old saying goes, "If you always do what you have always done, then you will always get what you've always got."

### **Rationale Behind the American Development Model**

USA Hockey started with a review of research that has taken place in child and athletic development around the globe. Elite performance studies from multiple sport bodies, governments as well as other endeavors such as music and the arts were evaluated. Through the review of current research, it was quickly concluded that to truly address player development, a completely new way of looking at USA Hockey's structure must be undertaken. Critical development begins at a very early age. As children mature, they each progress through the same developmental stages through the growth and maturation process. Along this path, certain aspects of these stages must be addressed at the appropriate time intervals. Without developing skills and certain physical and

mental attributes at the proper time, the long-term prospects of becoming a truly elite athlete are diminished.

Research has shown that we cannot just focus on older players, an encompassing strategy must be followed. As we evaluated the current research, variations of Istvan Balyi's, long-term athlete development (LTAD) principles are being employed around the globe by more than 100 government health ministries, and sport National Governing Bodies. Within hockey, there is no doubt that countries like Sweden, Finland and the Czech Republic produce high-end NHL players. Their numbers are especially impressive when one considers the populations and player numbers from those countries. In each of those countries, long-term athlete development principles are at the core of their development model.

Long-term athlete development is a generic, conceptual framework for athlete development in sport that can be used as a basis on which to 're-align,' or make more consistent, existing systems and structures. It has been developed by Istvan Balyi, an internationally recognized coach educator, and is based upon a consensus of evidenced research about how young people develop sporting ability, linking more closely the coaching and development of players to their physical and psychological growth.

The American Development Model is a long-term athlete development plan for the sport of ice hockey. It takes into consideration the guiding LTAD principles that are widely accepted around the globe. Consistent with LTAD, the American Hockey Development Model;

1. Integrates training, competition and recovery programming with relation to biological development and maturation
2. Offers equal opportunity for recreation and competition
3. Is participant/athlete centered, coach driven, and parents, officials, administration, sport medicine & sport science supported

It should be recognized that much of LTAD is nothing new. The majority of the research on which it is based is widely accepted, and has been used to underpin physical education teaching for many years. The difference that LTAD brings is a 'packaging' of this theory for mass understanding and a mechanism for applying the theory to better integrate whole sports' development systems (i.e. coaching, training, playing, competition, etc). It is also important that our USA Hockey membership understand that it is not just our hockey people that endorse a LTAD plan, but that sports science and development experts from around the globe endorse this model and are adopting this methodology for their own sports.

All young people follow the same pattern of growth and development, although there are significant differences between individuals in the timing and magnitude of these changes (Armstrong & Welsman, 1997). In relation to physical activity, there are seven key phases of growth and development. The relevant 'stage' of the LTAD hockey model for each phase of growth and development is described below. (England Field Hockey, 2005)

Phase of growth & Development	Stage of LTAD hockey model	Approx. ages
Early Childhood	Active Start	Male 0-6 years Female 0-6 years
Late childhood	FUNDamentals	Male 6-9 years Female 6-8 years
Adolescence - early puberty	Learn to Train	Male 9-12 years Female 8-11 years
Adolescence - late puberty	Train to Train	Male 12-16 years Female 11-15 years
Early adulthood	Learn to Compete	Male 16-18 years Female 15-18 years
Early adulthood	Train to Compete	Male 19-23 years Female 18-21 years
Adulthood	Train to Win	Male 19+ years Female 18+ years

### LTAD Foundation Of Research, Principles and Tools

Long-term athlete development has at its foundation 10 different elements of sport science and child development research. When considering the structure of any athlete development program, these elements must also be considered.

#### 10 Year - 10,000-Hour Rule

It takes years of organized practice to become an expert performer. Research shows this is true of developing any skill, such as learning to play an instrument or playing sport. This is sometimes referred to as the '10 year - 10,000-hour rule' relating to the need to practice for three hours a day for 10 years. Many researchers believe this is just a minimum. The bottom line is that it takes an enormous amount of work to become an elite athlete. This is done through a diverse sports movement and sports skills background. Once this foundation is laid, it takes years of deliberate practice to develop an elite performer at the highest level.

A significant number of players that play in the NHL were never drafted. This means that at 18 and 19 years of age nobody was even willing to take a late-round chance on their potential to make it. Hockey is not an early specialization sport and our programs must include a long-term developmental pathway that provides opportunities for our elite players into their early 20s. This is why USA Hockey endorses the college hockey path as it provides the widest range of developmental opportunity over time. Many players don't reach their potential until their early to mid-twenties.

#### FUNDamentals

All sports begin with basic fundamental movement and core sports skills. The ABCs of movement include agility, balance, coordination and speed, while core sports skills include running, jumping, skating and throwing. It has been shown that children who have a strong, broad-based foundation in the fundamental movements and sports skills from a variety of sports, increase their potential for future success in sports. Whether this is confidence to lead a healthy, and active life in sport, or to become an elite athlete, this strong foundation in the FUNDamentals will help children reach their full potential. Without this foundation, children may never reach their genetic potential.

#### Specialization

Sports are classified as either early or late specialization sports. An example of an early specialization sport is women's gymnastics, where due to growth, girls are potentially retiring from their sport at 14, 15 or 16 years of age. As with other contact/collision sports, ice hockey is classified as a late specialization sport. Hockey players don't reach their full potential until after

full growth maturity. Specialization at an early age limits children from acquiring a broad spectrum of athletic movements and skills that may limit or put a cap on their overall athletic potential. When players specialize too early they can create imbalances in musculature, increase the potential for burn out and cap their athletic potential by not developing a broad base of athletic movement skills.

”Young athletes who participate in a variety of sports have fewer injuries and play sports longer than those who specialize before puberty.”

“Well-rounded, multisport athletes have the highest potential to achieve.” (Brenner 2007)  
- Journal of American Academy of Pediatrics (AAP)

AAP Guidelines:

- Encourage athletes to strive to have at least one to two days off per week from competitive athletics, sports specific training, and competitive practice (scrimmage) to allow them to recover both physically and psychologically.
- Encourage the athlete to take at least two to three months away from a specific sport during the year.

### Windows of Optimal Trainability

There are identifiable stages during a child’s physical and psychological development that offer optimum opportunities to develop particular attributes, such as basic movement skills (agility, balance, coordination and speed); basic sports skills (running, jumping, throwing, skating, and striking), and physical capacities (flexibility, endurance, and strength). Missing these optimum opportunities has been shown to significantly affect a child’s ability to reach his or her full potential.

In our current system, training in early years focuses on outcomes (winning) rather than the developmental process (optimal training). Damage done between ages 6-10 and 10-16 cannot be fully corrected (players/athletes will never reach their genetic potential) and ***national training or sport centers receiving mediocre athletes -- regardless of funding and expertise -- cannot recover from the "damages" of earlier training! (Balyi)***

Elite player development and a sound structure at the 12 & Under level for broad-based skill development are not mutually exclusive. What do we currently produce in the U.S.? We have an over abundance of average players ... very few truly elite players at the very highest levels (NHL), especially when our numbers are taken into consideration. This is due to a lack of the proper focus on training through the appropriate ‘windows of optimal trainability’.

Diagram 2 below (from PacificSport, Balyi et Way, 2005) illustrates windows of optimal trainability for male and female athletes. These critical windows provide accelerated adaptation to training, and if skipped or missed decrease a child’s chance to reach his or her full potential. It must be kept in mind that all systems are always trainable, yet with smaller degrees of adaptation to training over time. In our current system, the window of opportunity on skills development (9-12) is missed through over-competition and under-training.

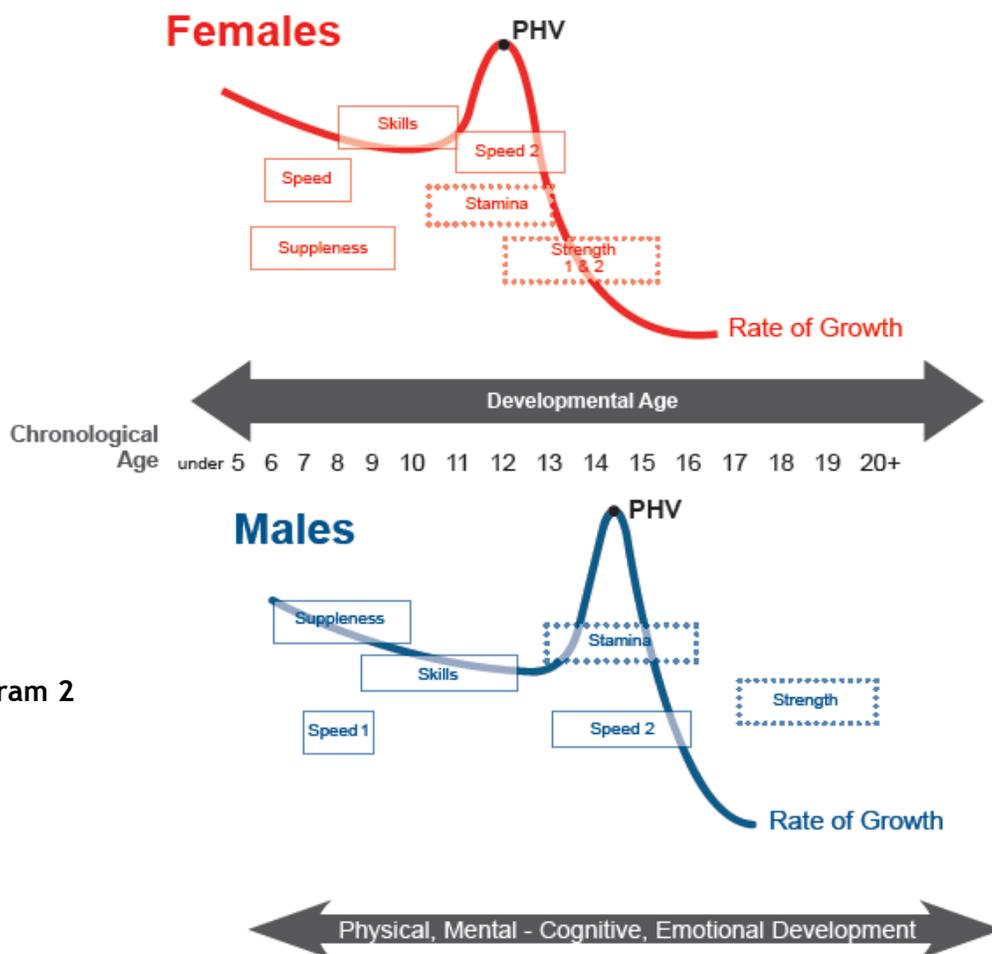


Diagram 2

These critical periods vary between individuals as each child is unique in his or her genetic makeup. While these critical periods follow general stages of human growth and maturation, scientific evidence shows that humans vary considerably in the magnitude and rate of response to different training stimuli at all stages. Some players may show potential for excellence at age 11, while others may not indicate their promise until age 15 or 16. Consequently, a long-term approach to player development is needed to ensure that players who respond slowly to training stimuli are not 'shortchanged' in their development. (Wellness to World Cup, 2008)

The five trainable physical capacities and windows of optimal trainability are:

**Stamina (Endurance):** The optimal window of trainability occurs at the onset of peak height velocity (PHV). This is more commonly known as the adolescent growth spurt. Aerobic capacity training is recommended before athletes reach PHV. Aerobic power should be introduced progressively after growth rate decelerates.

**Strength:** The optimal window of trainability for girls is immediately after PHV or at the onset of the menarche, while for boys it is 12-to-18 months after PHV.

**Speed:** For boys, the first speed training window occurs between the ages of 7 and 9 years and the second window occurs between the ages of 13 and 16. For girls, the first speed training window occurs between the ages of 6 and 8 years and the second window occurs between the ages of 11 and 13 years.

**Skill:** *The window for optimal skill training for boys takes place between the ages of 9 and 12 and between the ages of 8 and 11 for girls.*

**Suppleness (Flexibility):** The optimal window of trainability for suppleness for both genders occurs between the ages of 6 and 10. Special attention should be paid to flexibility during PHV.

Additional capacities have been identified that must also be considered throughout an athlete's development, and in addition to the five physical capacities make up a holistic approach to training.

**Structure/Stature:** The height of a person, before, during and after maturation can be utilized by a coach or parent. Tracking growth as a guideline for developmental age can allow for planning to take advantage of the critical 'windows of optimal trainability.'

**Psychology:** Sport is a physical and mental challenge. The ability to maintain high levels of concentration, yet remain relaxed with the confidence to succeed, is a skill essential to long-term performance in sport. This skill also has the potential to transcend sport and affect our everyday lives. To develop the mental toughness for success at highest levels, training programs are required that address the specific gender and LTAD stage of players. The training programs should include key mental components identified by sport psychologists: concentration, confidence, motivation, and handling pressure. As a player progresses through LTAD stages, the mental training aspect will evolve from 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, these basic skills are then tested in increasingly difficult competitive environments. Ultimately, the planning, implementation, 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 continuation in the game and physical activity in general, dramatically affecting both active lifestyle and podium performance. (Wellness to World Cup, 2008)

**Sustenance:** This category refers to all aspects of replenishing the body for sports and general health. It covers a wide range of topics from nutrition and hydration to rest and recovery. Fatigue, whether it comes from a single practice/competition or builds up over time through a lengthy schedule, can be combated through a proper lifestyle. Whether our children become elite athletes, or we look for better performance in school or just to lead a healthier life, we will all thrive with better education and following a plan that replenishes our physical and mental needs.

**School:** Sports schedules must consider the demands placed upon children from an academic perspective. Education must be emphasized, and the demands of sport should complement the academic schedule, not conflict with it. The stress of class work, examinations, boyfriend/girlfriend issues, and school peer groups play a role in the fatigue and stress levels over our athletes. Coaches and parents must monitor these factors to balance the sports schedule to allow for maximum development both on the ice and in the classroom.

### Biological Age vs. Chronological Age

Biological age should be considered through our development and identification process. As an example, one only need look at the number of early-month birth dates that make up our Under-17 and Under-18 National Teams. Our current system forces players into a compete-to-win, 'peak by the weekend' system that rewards early-maturing players who may not have the ability to be elite



12-year-old female athletes



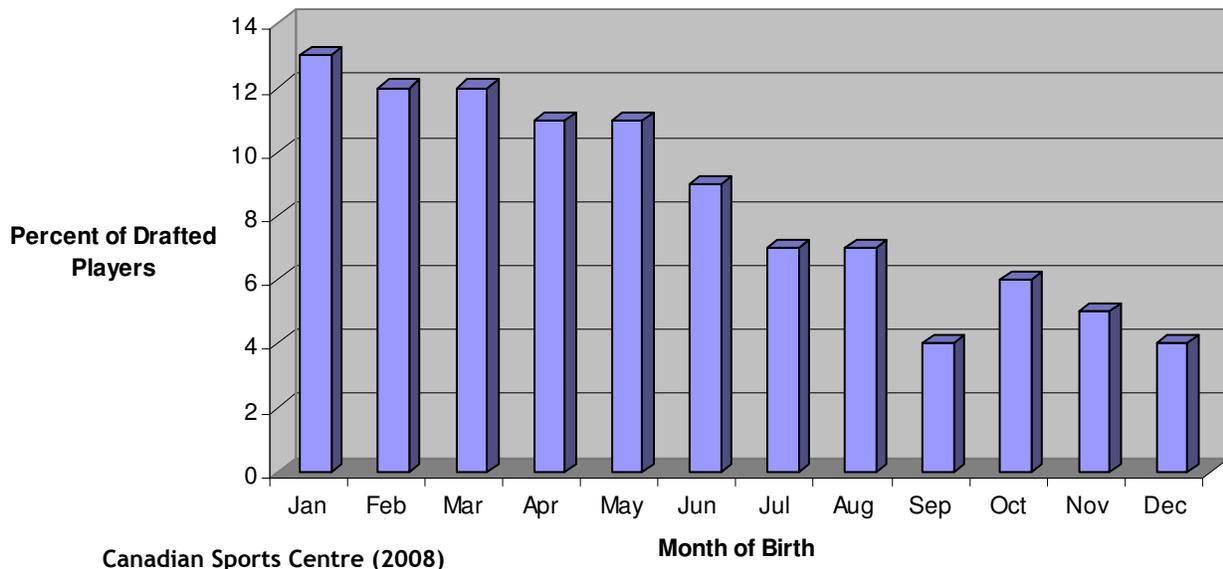
14-year-old male athletes

performers. Late-developing players are excluded and cut, consequently leaving the sport or segregated to a recreation program that limits their training opportunities. These late developers may have huge long-term potential but are eliminated from our system.

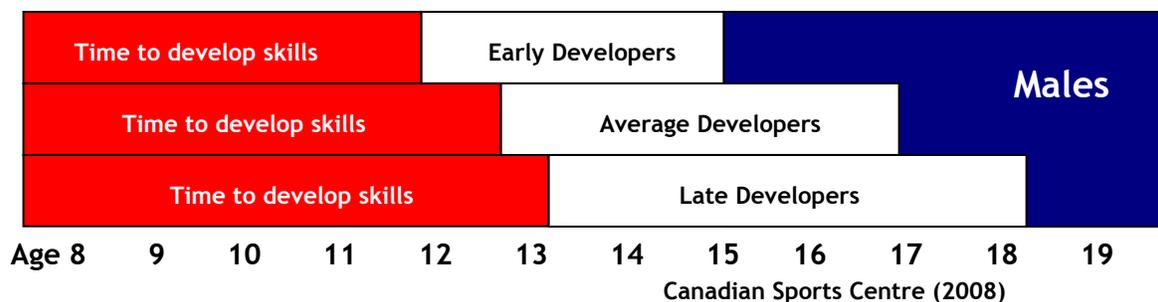
Currently, most athletic training and competition programs are based on chronological age. However, athletes of the same age between ages 10 and 16 can be four-to-five years apart developmentally. Thus, chronological age is a poor guide to segregate adolescents for competitions. Because hockey is a contact sport, early-maturing players are favored within our youth structure. The late developer is eliminated when he may possess better long-term athletic ability.

From the chart below it is obvious that in the Canadian developmental system, potential late-month birth date players have been excluded from the high-performance track. It is highly unlikely that there are less players with long-term athletic potential born in the last quarter of the year than in the first quarter.

**Drafted players by OHL, WHL and QMJHL**



**Training Age** refers to the age where athletes begin planned, regular, serious involvement in training. The tempo of a child's growth has significant implications for athletic training because children who mature at an early age have a major advantage during the Training to Train stage compared to average or late maturers. However, after all athletes have gone through their growth spurt, it is often later maturers who have greater potential to become top athletes provided they experience quality coaching throughout that period. (England Field Hockey, 2005)



Not all players have the potential to become elite players. The American Development Model recognizes this by offering two levels of content from the Train to Train stage forward. The high performance content is aimed at those players who have been identified as potential elite performers, while the standard content offers a reduced level of commitment more appropriate to the majority of players who will form the basis of club teams of the future. The split between the levels of content at the early part of the Train to Train stage are relatively small as it is deemed to be such an important stage in developing a broader base of potential elite players. However, the differentiation between hockey and other sports may necessitate the divergence at this stage. It is important to note that research suggests that there can be numerous players that follow the standard track through the Train to Train and into the Train to Compete stages that will have the potential to become elite performers. This is especially true if they have a diverse sports movement background through playing multiple sports during the FUNdamental and Learn to Train stages.

### Periodization

Periodization is the practice of segmenting the calendar year into appropriate time intervals for preparation, competition and rest and recovery. Athletes at different stages of their development require different training plans to optimize their development through their growth and maturation. The science behind periodization has been used on the international stage with great success in many, many sports. Unfortunately, sometimes a sport's traditions are placed in front of the athlete's needs when planning a periodization schedule. This has an impact on maximizing the player's development.

#### The Great One's message to parents: Let your kids have fun

"In youth hockey, in most cases, it's really important for kids to play other sports - whether it's indoor lacrosse or soccer or baseball. I think what that does is two things. One, each sport helps the other sport. And then I think taking time off in the off-season - that three or four month window - really rejuvenates kids so when they come back at the end of August, they're more excited. They think, 'All right, hockey's back, I'm ready to go.'" Wayne Gretzky. Excerpt from Globe and Mail, September 26, 2008, Erick Duhatschek. Gretzky was a multi-sport athlete himself growing up as he also excelled in baseball and lacrosse.

### **Training to Competition Ratios**

Through a child's growth and maturation, the athletic development model needs change through different stages. The appropriate training-to-competition ratios need to be adhered to in order to maximize a player's time and potential. When a heavy emphasis is placed on competition at an early age, two situations occur. One, ice time is directed toward games, which reduces the amount of quality-deliberate practice time. And two, the focus becomes more outcome-based (winning) and less process-driven (learning the game). There are all kinds of arguments put forth as to why we must allow the imbalance in our training-to-competition ratios to continue, and certainly the 1-to-1 ratio has its place within the recreational Hockey for Life track. However, for our Tier 1 and high performance club programs that are part of our elite development path, the correct ratios must be adhered to at the appropriate ages.

### **System Alignment**

The framework for long-term athlete development is influenced by many factors. We have clubs, schools, and ice arena facilities all with varying interests. To maximize a player's development needs, it's important those entities work together and become mutually supportive as each has its part to play in advancing our game. Players will best develop in a system that is clearly defined, logically structured, and based upon consistent principles. We need a structure that is athlete-centered and looks at the individual player's development. (Wellness to World Cup, 2008)

In a team sport, it is appropriate to look at the collective whole and to provide the direction and lessons that only a team sport can provide. However, we must always consider that each individual is at a different point through the stages of his or her development (early maturer or late maturer for example). The goal is to define our sports system with a pathway that addresses the needs of each individual and maximizes their development as they progress through our system. The LTAD principles shows us that at the earlier ages, both the Hockey for Life group and the ones that end up as high-performance players, should initially be held to the same pathway. Our current sport system mistakenly allows for the separation of the perceived Hockey for Life group and the perceived high-performance group, before any reliable determination can possibly be made. To maximize each player's potential, we need the major parties to re-evaluate current practices and base new practices on current legitimate research, instead of commonly held beliefs in sports myths and the old "that's the way it has always been done" attitude.

### **Physical, Mental, Cognitive and Emotional Development**

Training should consider the mental, cognitive and emotional development of the athlete, in addition to the physical, technical and tactical (including decision-making skills) components of development.

A major objective of LTAD is a holistic approach. This includes ethics, fair play and character building through the various stages. Programming should be designed to consider the athlete's cognitive ability to address these concepts.

### **Continuous Improvement**

Continuous improvement is a key underlying principle of long-term athlete development. This ensures that we are always evaluating our sport and are readily able to respond and implement new sports science innovations and observations. LTAD provides a continuously evolving vehicle for change that all emerging facets of physical education, sport and recreation to ensure systematic and logical delivery of programs to all ages.

## **Long-Term Goals For USA Hockey and the American Hockey Development Model**

USA Hockey has a core goal to grow the game of ice hockey within the United States. We believe that the ADM will provide a pathway to excellence for those that have the ability, as well as a greater overall hockey experience for all our players. The LTAD principles on which our model is founded address the core needs of all our players.

Along with the National Hockey League, USA Hockey has the mutual goal of seeing more American players compete at the highest level of the game.

## **LTAD Stages for the American Development Model**

See the individual LTAD stages of development for specifics to the American Development Model.

**Active Start**

**FUNdamentals**

**Learn to Train**

**Train to Train**

**Learn to Compete**

**Train to Compete**

**Train to Win**

**Hockey for Life**

**Special acknowledgement goes to Istvan Balyi, LTAD expert and Canadian Sport For Life. The two have been the principal developers of LTAD.**

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