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BEST PRACTICES

Editor's Preface

It is important to realize that, in any sport, the competition structure always dictates the development structure. (Ken Martel, USA Hockey)

There is wide-spread acknowledgement in the sporting community that a large gap exists between the science and theory of athlete and coach development and the day-to-day reality of athletes and coaches. The present article illustrates in great detail the power of a focused and disciplined long-term organization-wide effort to bridge the gap between theory and practice.

This is the story of USA Hockey's American Development Model (ADM) as told by the lead engineer of the multiyear ongoing effort, Ken Martel. Ken graciously accepted an invitation from Ted Miller, Vice President and Coach Education Director for Human Kinetics, to share the story. All of us here at *ISCJ* believe the USA Hockey story is an unprecedented nationwide experiment in athlete and coach development. The experiment is firmly grounded in athlete development models such as Long-Term Athlete Development (Balyi, Way, & Higgs, 2013) and the Developmental Model of Sport Participation (Côté & Lidor, 2013). Furthermore, the innovative blended coaching methodology is clearly aligned with best-practice suggestions for ongoing coach development (Gilbert, Gallimore, & Trudel, 2009; Lauer & Dieffenbach, 2013).

We offer this story as an example of Best Practices for athlete and coach development in action. This type of article is exactly what we envisioned as a 'bridge article' when we launched *ISCJ* as a global space for formally sharing insights on coaching and coach education. We hope to share many more examples of this type of 'bridge work' from around the world as *ISCJ* continues to grow. Perhaps the USA Hockey article will inspire you to share your story too.

References

Balyi, I., Way, R., & Higgs, C. (2013). *Long-term athlete development*. Champaign, IL: Human Kinetics.

Côté, J., & Lidor, R. (Eds.). (2013). *Conditions of children's talent development in sport*. Morgantown, WV: Fitness Information Technology.

Gilbert, W., Gallimore, R., & Trudel, P. (2009). A learning community approach to coach development in youth sport. *Journal of Coaching Education 2*(2), 1-21.

Lauer, L., & Dieffenbach, K. (2013). Psychosocial training interventions to prepare youth sport coaches. In P. Potrac, W. Gilbert, & J. Denison (Eds.), *Routledge handbook of sports coaching* (pp. 451-462). London: Routledge.

USA Hockey's American Development Model: Changing the Coaching and Player Development Paradigm

Ken Martel
USA Hockey

Despite significant advances in the development and performance of United States-born hockey players since the 1970s, room for improvement remains, especially when one compares the U.S. to its top international competition, much of which succeeds at the Olympic and World Championship level with dramatically smaller pools of talent from which to assemble its elite teams. USA Hockey sought to address this performance discrepancy and fulfill the *full* potential of American hockey through creation and implementation of its American Development Model (ADM), a nationwide reinvention of how hockey was taught at the grassroots level. Based on long-term athlete development principles and founded on sport science and proven child development best practices, the ADM represents a revolution in athlete and coach development. This paper explores the research that helped create USA Hockey's ADM, along with the initiative's methodology, execution and early outcomes.

Ken Martel is technical director for USA Hockey's American Development Model. A longtime coach, Martel has helped guide numerous USA Hockey national teams and a trio of NCAA Division I teams. In 2004, he received the USOC's Counsilman Award for his creative integration of sport science and hockey. He played collegiately at Lake Superior State, winning a national championship in 1988. Address author correspondence to Ken Martel at KenM@usahockey.org.

Sixteen men's ice hockey teams competed at the XXII Olympic Winter Games in Sochi, Russia. The United States was among them, ultimately losing the bronze-medal game to Finland, a country with approximately 37,000 players in its youth hockey ranks. By comparison, the United States has more than 306,000 players and an overall population that dwarfs Finland by more than 310,000,000.

While singular tournament performances by national teams aren't necessarily indicative of a development program's health, for the past 10 years, the U.S. Men's National Team ranking has fluctuated near No. 6 in the world. This despite having more youth hockey players and indoor ice facilities than any other country, excluding Canada (see Table 1). And while the international stature of American hockey has improved dramatically since the 1970s, the question remains obvious: *Shouldn't we be better than sixth?*

And while American youth hockey numbers looked strong by comparison, another question loomed. *Why are the numbers declining* (see Figure 1)? Between 2000–09, youth hockey enrollment among males declined by almost 50,000 despite an overall growth in the total number of American players. It was an alarming signal for change. Recruitment of new players is always part of the solution, but *retention* is a better indicator of program health. USA Hockey tracks player retention and movement between youth hockey organizations, and over time, clear patterns emerged as to which organizations retained players. It was time to take a deeper look.

And so with the questions of on- and off-ice performance at the forefront, USA Hockey began researching best practices in youth sports and age-appropriate sport development with the goal of total improvement nationwide. We examined our own sport as well as other sports on a local and global scale. We examined research on the childhood learning and development process from the pedagogical world, from psychologists and from cognitive development experts. We gathered information from other sports' national governing bodies and the U.S. Olympic Committee.

It soon became obvious that there were basic developmental principles that applied across the entire youth sports spectrum. While the technical skills of each sport differed, the foundational ways that children learned and developed were the same. Knowing that, we examined the American youth hockey landscape as a whole to assess whether its design took these universal developmental principles and best practices into account. Our findings underscored the need for change, revealing development impediments that were common not just in youth hockey, but throughout American youth sports. They included:

- Young athletes under-training and over-competing.
- Adult competition being superimposed on young athletes.
- Training in early years focused on outcomes (winning) rather than processes (optimal training).
- Training dominated by chronological age rather than biological age.
- The sensitive periods of accelerated adaptation to training were not used.
- The best coaches were encouraged to work at elite levels.
- Limited coaching education was provided to those working at the youngest age groups.

Table 1 Registered Players and Indoor Rinks of Major Ice Hockey Nations and U.S. States

Federation	Registered Players				Rinks	Population
	Total	Senior	Jr./Youth	Female	Indoor	
1. Canada	625,152	91,379	446,543	87,230	2,631	34,568,589
2. United States	510,275	137,766	306,813	65,700	1,898	316,668,044
3. Russia	66,551	2,833	63,156	562	386	142,500,892
4. Sweden	64,214	13,060	47,968	3,186	352	9,119,728
5. Minnesota	53,935	7,099	46,351	12,250	194	5,303,925
6. Massachusetts	46,716	3,381	40,064	8,550	134	6,547,629
7. Finland	66,636	24,778	37,071	4,787	259	5,266,250
8. New York	48,544	11,806	34,583	5,264	158	19,378,102
9. Michigan	51,929	22,967	32,394	4,429	206	9,883,640
10. Czech Republic	107,722	82,003	23,209	2,510	157	10,162,213
11. Switzerland	26,446	11,467	14,802	908	158	7,996,961
12. Slovakia	8,280	2,072	5,896	327	47	5,477,038
13. Austria	11,372	5,867	4,853	652	45	8,221,646
14. Norway	6,177	1,968	3,709	500	41	4,660,539
15. Latvia	4,424	2,930	1,417	149	17	2,204,708
16. Slovenia	866	148	687	51	7	1,992,690

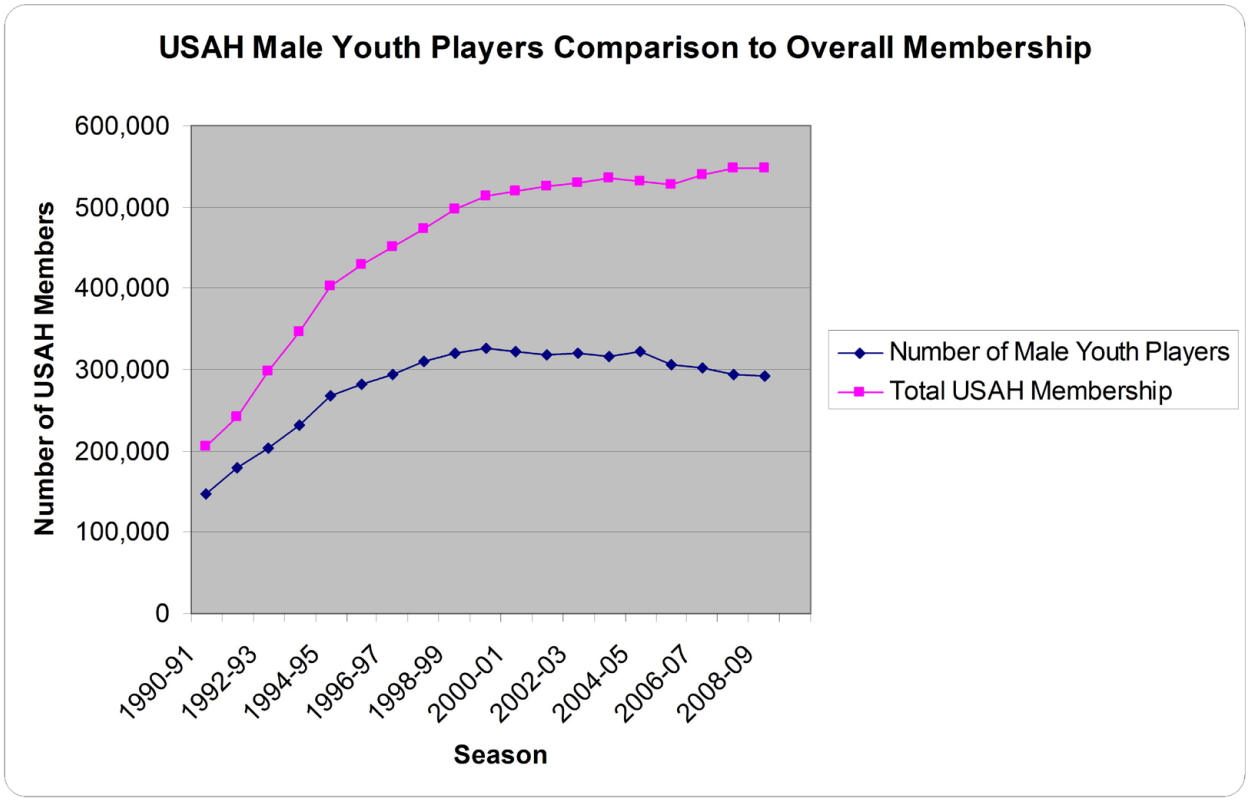


Figure 1 — USAH Male Youth Players Comparison with Overall Membership.

- Parent education was neglected in regard to long-term athlete development (nutrition, regeneration, maturation and psycho-social development, etc.).
- Integration of sport science, sport medicine and sport-specific technical-tactical activities were lacking.

In our sport, 8-and-under (8U) players were being placed in a similar developmental structure to 18-and-under (18U) players. This flawed approach was damaging the athletes and the game as a whole. For those within USA Hockey who were working at the national and international level, the lack of a sound nationwide youth development process was very apparent.

Researching Alternatives

Searching at home and abroad, USA Hockey was able to identify models that were better suited to optimal athlete development. At local levels in Europe, we found athletic clubs in which players were being developed at a quality level and rate that is not currently matched anywhere in North America. We were able to examine the development structures within these clubs and evaluate their adaptability to our American system. In some cases, there was very little that could transfer, based upon cultural differences, however there were also many changes that were easily adaptable. In most cases, we found that there were certain developmental principles that should be followed, principles that create a fun and engaging environment for player development. It all begins with quality programing, which has a profound effect on both development and retention of players.

We discovered one great exemplar tucked away in Northern Sweden. The town has a population of about 40,000 people and is in a location that doesn't allow the local hockey club to recruit young players from other communities, so players must be developed locally. At the top of the club, they have a professional team that plays in the highest level of Swedish hockey, the Swedish Hockey League (SHL). This is arguably the third-best professional league in the world. This small community's professional team has won the SHL championship in each of the past two seasons. In 2014, of the 27 players under contract, 13 were homegrown local kids. This doesn't account for several other local players who are abroad playing in the National Hockey League. This dramatic success was foreshadowed in the 2009–10 playing season, when the club had 21 players that made Swedish national teams at the Under-20, U18 and U17 age groups. The club has approximately 300 players across all age groups. They have a multisport, late-specialization approach. The players are parent-coached up to age 14. Their kids get a similar amount of ice time to players at the same age in

the U.S. Their U7 players skate twice weekly; U10 players skate three times per week and U12 players skate four times weekly. The club focuses on skill development at the young ages and trains all players equally. They don't cut players at the young ages, as the club is open to all.

The major differences between this club and other less productive clubs can be pared down to two things: patience and club culture. The club understands that, at the younger ages, it is impossible to predict who will be a great professional player in the future, so they are patient with their young players and focus on development over results. The other major difference is that they have created an inspired culture within the club. Young kids have role models and successful players that they look up to and want to emulate.

Closer to home, we found another great example of optimal development structure in Ann Arbor, Mich., home of USA Hockey's National Team Development Program. It was in 1996 that USA Hockey decided to change how our best 16- and 17-year-old athletes were training. At the time, it was felt that this was a key developmental stage that was underserved within our country's existing structure. Under the direction of then-U.S. National Team coach Jeff Jackson, a standing National Team program was established for our U18 and U17 national teams. The program consisted of 46 top 16- and 17-year-old American players, who would live, train and compete together over the nine-month school year.

The coaching staff was comprised of successful college and professional coaches who created an environment similar to what had worked with the 19-to-23-year-olds they had groomed previously. While 80% of the program's current infrastructure remains similar to the initial setup, changes in focus for player development have been implemented over the 17-year history of the National Team Development Program (NTDP). This included a shift in player selection, modifications to the training and competition calendar, a greater focus on recovery and rest as part of the development process, and a realization that optimal training and coaching processes vary by age and stage of development. This drove us to customize those processes based on age appropriateness and the individual players' needs and characteristics.

Work on a national player development framework began from our recognition that the single greatest problem with our NTDP has always been that it only affects 46 players per year and that, for the U.S. to continue advancing as a hockey nation, our pool of top players must expand. One of the positive byproducts of our NTDP was that it forced others to improve their support structures in an attempt to compete for players. Simple things like full-time strength and conditioning coaches are now common for clubs, but they were almost nonexistent when the NTDP started. In many ways, our NTDP helped raise the bar for development within the 16-to-20 age category, not only with the 46 players in Ann Arbor, but across the nation. So when USA Hockey began its research on development pathways, it quickly became apparent that, in part through the influences of our NTDP, our older age groups' structures were closer to where we thought they should ideally be, but our nation's development structure was most flawed in the 6-to15-year-old age groups. We needed a way to spread the training and lessons learned at the NTDP, along with those learned from outstanding programs like the aforementioned Swedish example, to the entire nation.

The Idea

The foundation for what was to become our USA Hockey American Development Model (ADM) traced back to the NTDP and its revolutionary training and competition model. It represented a new paradigm in North American hockey development and we borrowed from its best practices to form our ADM.

Through the U.S. Olympic Committee, our research group also came into contact with members of Canada's Long-Term Athlete Development (LTAD) expert group. Based upon our parallel findings, the LTAD framework provided USA Hockey with an initial lens to evaluate our current and future development structure. The athlete-centered developmental approach fit within our own internal directional changes that we found successful with our NTDP. Our ADM was then created from these LTAD principles, adapted to the necessities of ice hockey and our American culture.

Based upon our research, USA Hockey incorporated age-appropriate principles within our ADM. Among them:

- Equipment that is correctly sized to fit the child
- A playing surface that is sized age appropriately to fit the child
- A practice environment that is fun and engaging
- A focus on foundational skills
- Programing that provides better sequencing for long-term development
- Games as a significant portion of the practice environment
  - o Activity-based games
  - o Skill-based games
  - o Game situational role-based games
- Practice and competition environments within the physical and mental reach of the players, yet challenging
- Training, competition and recovery programing that are of proper dosage and duration for the age of the players
- Changes to team roster composition
- Peer teaching opportunities
- Adaptations to the playing rules that promote development and player safety
- Changes to governance rules that promote player development
- Improved use of resources, physical and human

Once USA Hockey identified the core principals and best practices, a basic structure was designed for youth hockey clubs nationwide to use as a template. This basic club structure addressed roster sizes and how teams are formed, optimal ranges in the number of games and formal practice sessions, as well as ideal programming/curriculum for those practice sessions. This youth hockey structure runs parallel with other youth sports, thereby encouraging children to participate in multiple sports so as to enhance their overall athleticism and reduce risk of overuse injuries.

It is important to realize that, in any sport, the competition structure always dictates the development structure. Regardless of how the competition is structured, people will work extremely hard to find success in those competitions, often to the detriment of LTAD and kids' well-being. This is why the competition format was one of the first items our ADM attempted to change at the entry levels of our sport.

Based upon research concerning playing configurations, ice surface size, the number of players involved and the number of skills and game decisions made by players, USA Hockey defined the playing surface size for our 8U age group. The focus on the 8U age group was a strategic decision, because it represents the key entry point for most children into ice hockey and it is important that they begin in an environment that is age-appropriate and helps them succeed.

To fit within the configuration of the standard National Hockey League (NHL)-sized ice surface, the new 8U playing dimensions shift the surface sideways, so that the game is played cross-ice, using the rink's 85-foot width as the length. Divider pads or even portable hard board dividers are used to establish the width of the playing surface at 65 feet, just inside the blue lines. These dimensions were chosen because they provide the best learning environment for 8U players, a downscaling of the adult surface that approximates for kids the number of strides required for an adult to go end-to-end. One side benefit to this structure is that three cross-ice games can be played at the same time, allowing for more efficient use of the ice resource. It also creates a multigame jamboree environment that addresses the psychological component of hockey engagement, enjoyment and development. In this setting, children get frequent fresh starts by playing more than one game within the allotted time periods. They also experience increased opportunities to handle the puck and generate more scoring chances. The cross-ice jamboree structure builds player confidence along with player skills.

Beyond a better game-playing environment, the cross-ice structure positively influences the practice environment. If game competition is no longer on the full-ice surface and is played with simple modified rules, then there is no longer an incentive for coaches to practice with their 8U players on the full ice. The new game environment promotes working on basic skills and basic support play in small areas. There is no incentive for the coach to focus on set positions, offside rules and face-off plays, items that are minimally beneficial to skill development and can be learned at a more appropriate time later in a player's hockey development experience.

Practice structure at the 8U age classification now consists of segmenting the ice into stations, allowing for more skill repetitions and more teams to use the ice, while still dividing the players into smaller organizational units for optimal instruction. Nationally, the typical practice ice slot is 50–60 minutes in duration. With the ADM, the focus in these station-based practices then becomes basic skill acquisition and refinement and small-area games. By tracking the activity levels of players within the ADM structure and comparing those results to activity levels from antiquated practice structures, we discovered that we can double-to-quadruple the number of core-skill repetitions within the same regular 60-minute practice structure by utilizing the ADM. Over the course of a season, this can substantially enhance and accelerate development. We have also been able to show that the level of moderate-to-vigorous physical activity for the players in station-based practices compares favorably to the full-ice single-team practice environment (Kanters, McKenzie, Edwards, Bocarro, Mahar, & Hodge, 2014). This station-based ADM practice format can accomplish the same high level of physical activity, increase the repetitions of core skills and accommodate significantly more players per hour of ice. This has the net result of lowering the cost for players with the potential of providing more ice time, and therefore more development, to the players over the course of the season. It's a win-win.

The ADM practice structure at 8U is designed to focus a specific amount of time on basic skill instruction, and at least 50% of the practice time utilizes a games-based learning environment. Games and drills at this age should be designed with a 1:1 or 1:0 work-to-rest ratio, depending upon the skills and concepts being taught. At this age, youth will self-regulate their energy expenditure in the 1:0 environment. As an example, in a tag-type of game, if a child becomes tired, they will move to the side of the playing area on their own to allow for recovery time, yet they are still involved, reading the play. Once recovered, they rejoin the action in a more vigorous manner. Because ice time is the single greatest expense associated with our sport, we place a high value on utilizing this resource to the best of our ability, in the most efficient manner, as long as the quality of activity and instruction is high.

To aid the quality of instruction during these station-based practices, players can be grouped by ability. This allows the coaches to scale up or scale down the tasks to fit the players. The players can then be rotated though the different stations on the ice to reduce set-up time. It also allows for better usage of coaching talent within a local club. Since our sport, at the youth level, is predominately parent-coached, the coach who has the greatest ability to teach technical skills can then be assigned a skills station. A coach with less technical ability can manage a more self-learning station, like a tag game, instead. This structure has the ability to maximize the local clubs' coaching

ability so that the 50 kids on the ice all get the benefit of the highest quality skills coach.

Beyond the 8U age group, the station-based practice environment can be used and be beneficial with all ages. The ice can be segmented into areas of different sizes based upon the concepts, tactics and strategies being taught. Our ADM offers guidelines for each age group as to the number of practices they should target for a season as well as how the ice might be best used in a multiple-team practice or a single-team practice using the 200-foot-by-85-foot surface. As players get older, use of the full ice surface becomes more important yet, since the ability to "play in traffic" (congestion) is essential, shared-ice practices are still valuable teaching tools. If planned appropriately, using shared-ice practices can reduce costs for players at the older age groups and provide the appropriate training.

At the older age groups, clubs can use the station-based practice environment to put teams of various age groups on the ice together to provide peer-teaching opportunities for players. For example, putting 12U players on the ice with 14U players is a great focusing tool for the 12U group. They know they are playing with older, better players and subsequently their mental engagement increases. They are forced to do things quicker and harder than they might within their own age group. At the same time, the 14U players are put into a position of leadership. They demonstrate the on-ice tasks at a higher level of execution and set the performance bar higher for the younger players to match. These older/younger practice formats can be used by teams or even on a position-specific basis. This has an effect of helping to build a stronger club culture, providing role models that can inspire younger players to emulate their older peers.

A games-based teaching environment was also an important concept that our ADM has advocated within its structure. By using games to teach our sport, we can combine skills and their execution with environmental cues. If the transfer of skills from the practice environment to the game environment is important, then skills cannot be learned in isolation. Actual playing decisions must be tied to each skill execution. For every playing situation that happens in the full-ice 5-versus-5 game, a coach can set up a small-area game that can replicate that situation. This has the effect of placing players in a live-action setting that vastly increases the number of repetitions within that game situation and the frequency. This gives players and coaches an increased opportunity for guided discovery learning and makes it easier for players to experiment with different executions.

USA Hockey has incorporated three different types of small-area games into its practice guidelines: activity-based games, skills-based games, and game situational role-based games. All three are played at all ages along a sliding scale, yet each takes more prominence at different ages, due to the capacities of the kids involved. At the younger ages (8U) there are more activity-based games. These games develop players' agility, balance, coordination and speed on the ice surface. The mission is to provide a lot of physical activity on skates. For players in the 10U to 12U age range, skills-based games become more prominent. These games focus on development of specific hockey-playing skills in a game format that provides a high number of repetitions of those skills.

The last category of games is situational role games. Separate from the goaltender, for skaters, there are four interchangeable roles into which they fall into during play: puck carrier, defender at the puck, offensive support player or defensive support player. Players continuously transition during play between these roles. At the 12U age group and older, these types of games become the dominant staple within the practice structure. These games help provide the hockey sense necessary to play at the highest levels; they focus on teaching decision-making skills.

While USA Hockey has provided the game structure, suggested the practice structures and recommended progressions of game play, coaches are free to teach however and whatever they want within that structure. We have shown them efficiencies, but at the same time, coaches should have the freedom to teach to the need of their specific groups of kids. Every team and child is different. Coaching is always a personal issue and should be focused on the team and the individuals that make up the team. Any successful development model must be adaptable at the local level for the individual players.

Team roster sizes are also an important component of the ADM, and these adjust based on age. At the professional and collegiate levels of our sport, game rosters allow for 20 players to dress for a game. This equates to four forward lines, three defense pairings and two goaltenders. Games at those levels consist of three 20-minute stop-time periods of play. At the youth levels, games are fit into shorter time slots, usually an hour in length for most age groups under 12 years of age. Smaller roster sizes at the younger age groups allow more playing time for each player. The rosters begin small, with the goal of having the players get roughly a 1:1 work-to-rest ratio within the game-time allotment. As the players get older, the ratio changes from 1:1–1:2. In the past, all age groups tended to carry more players than necessary to help reduce the per-player ice costs. In a one-hour time slot, kids were lucky if they got 15 min of playing time. The ADM's smaller rosters allow for every child on the team to play more. The added ice expense for games is mitigated by the shared-ice station-based practices.

Another main focus area for the ADM is governance of play, i.e., the playing rules and organizational rules of our sport. Besides modifying the playing surface, USA Hockey has made two other major rule changes. The first was elimination of 12U national championships and the second was to elevate the age when full body-checking is allowed.

The elimination of a national championship at 12U was done so that USA Hockey was not indirectly incentivizing the recruitment of players to form 'super teams' at the younger age levels. While players should play with and against others of similar ability, having a

national championship at 12U was serving as incentive for teams to recruit players from outside their local area, even to the point of pulling players from one side of the country to the other. Since hockey is a late-specialization sport, there is no need for players at this age to move away from home, or move with their family, across the country to play hockey.

The other major rule change was to increase the age at which full body-checking was allowed in game play. This was first envisioned as a skill-development rule change, but with the benefit of additional current injury data, it also became a player-safety rule change. In terms of skill development, when full body-checking is not permitted, players attempt to hold the puck longer in confrontational situations. They tend to attempt to make more plays, and more high-skill plays, without the fear of potential injury. However, no-check hockey does not mean no-contact hockey, so players in this environment still can angle, close and physically contact an opponent. They just aren't allowed to ignore the puck and hit the opponent. The only change is in the level of force used in the contact situation.

Data show that there are three times more injuries incurred in games that allow full body-checking compared with those that play with body contact-only rules (Emery, 2011). It has also been shown that players who participate with rules that delay full body-checking are not at an increased risk of future injury (in full-checking hockey) compared with those who start earlier in the full body-checking environment (Emery, 2011). In the two years since USA Hockey elevated the allowable body-checking age, it has witnessed an increase in player retention of 4% between the ages of 10 and 11 (the previous transition-to-checking point) as well as a 4% increase at the new transition-to-checking point between 12 and 13. Additional research is currently underway to determine if a further increase in the initial age of body-checking is warranted.

Once USA Hockey created its ADM, a new partnership was created with the NHL. The NHL had always supported its player development pathways, and with USA Hockey showing a steady increase in its ability to supply players to this top professional league, an increased level of support was initiated. This has allowed USA Hockey to, for the first time, have highly trained hockey development staff at the local and regional levels. Having a local presence to meet with, educate and influence local clubs, administrators, coaches and parents has been the single greatest force for improvement.

The ADM Approach to Coaching

As a National Governing Body (NGB), USA Hockey needed to influence a variety of stakeholders to successfully introduce its ADM. USA Hockey is comprised largely of volunteers who work to support the organization and its approximately 1 million players, parents, coaches, officials and fellow volunteers. Influencing the various subgroups required different strategies and resources. USA Hockey realized that the local coach is the primary person who could implement the changes suggested by the ADM. It is the coach who has control over the training and competition environments created. To support coaches in that effort, USA Hockey poured itself into helping them change the game.

Since local coaches control the training and competition environments, the local coach is the greatest agent for change. Unfortunately, support for those coaches at the local level has been limited throughout the history of American hockey. Too often support was simply providing pucks, jerseys and ice time. And traditionally, single-team practices were held with one or two coaches on a full sheet of ice. This was both a poor use of ice and a poor use of coaching capabilities.

In any group of coaches, there's a pecking order, best to worst. It exists even among groups of professional coaches. Each coach has different strengths and weaknesses. By limiting practices to only one of two coaches, the players run a high risk of being exposed only to weaker coaches. Coordinated, combined practices with multiple coaches provide players with access to the club's better instructors, not to mention a pathway to greater success. So as part of the ADM's launch, USA Hockey asked clubs to restructure their coaches into teams of coaches guided by an age-group coordinator who helps organize all the teams and coaches within a particular age classification. Then, to make the most efficient use of ice and coaches, at 12U and younger, USA Hockey recommended that all practice sessions have a minimum of two teams on the ice simultaneously. This number increased to three or even four teams in certain circumstances, depending on the players' age and the practice content.

In this format, among the younger age classifications, coaches have time allotted to practice with their specific team, but most of the practice session is designed to use blended coaching with a focus on skill development. Through this method, players—and coaches—could learn from all of the coaches, rather than only one coach. This allows a local program usually comprised entirely of volunteer coaches to leverage the sum of its coaching ability for the entire group. A coach with more ability in a particular area can then bring his or her expertise to the entire group of kids instead of only to his or her singular team. At the same time, a coach with less experience or acumen can be assigned to work alongside the more experienced coach, which helps the former hone his or her abilities.

Another benefit of the multiple-team, multiple-coach practice structure is more understandable instruction. The acoustics in most ice arenas are poor. In a single-team, single-coach, full-ice practice model, it's difficult for players to hear the coach, which diminishes coaches' effectiveness. Smaller groups in smaller spaces allows for better communication between player and coach, thus the ADM practice structure lends itself to improved communication and feedback that is more player-specific.

Managing this structure is the age-group coordinator, who gathers feedback from all of the coaches and

coordinates practice formats for the upcoming session. A portion of practice is divided into smaller groups for more individualized instruction; another portion is organized into larger groups for the development of coordinated game play (see Figure 2). These larger-group portions can be structured by teams and coached by the specific team coaches, or they can be a mix of players and coaches to introduce different dynamics into the session.

Despite the blended coaching practice methodology, it's important to note that in all situations (on-ice practices, formal competitions (games) and off-ice practices), individual coaches still get time to work with their own teams. However, it's a paradigm shift of sorts from working only with "their own" 12–15 players to more of a club mentality in which they are working with an entire age group of kids.

Moving into older age classifications, another major change to practice structure involves using hard-board dividers to separate the rink into halves at 10U and 12U. This is a departure from when local associations would informally split the ice for a two-team practice. In that scenario, drills and games tended to be cross-ice at best, but usually either exiting one end zone or attacking one end zone. By using hard-board dividers to split the rink, teams can instead have a practice environment that includes both an attacking end and a defending end for drills and games, creating more realistic competition. In this model, a regrouping play now can finish with an attack on goal rather than stopping after the regroup. This format allows coaches to run familiar full-ice drills in a smaller space. The skill executions and player decisions are identical to the full-ice version, but they happen quicker and more frequently in this model.

Another core component the ADM recommends at 10U and 12U is a regularly scheduled free-play day as part of the regular practice rotation. This is designed, in part, to help address what has been observed as a lack of creativity and hockey sense in today's hockey prospect. "Players are bigger, stronger and faster, but I'm not sure they're better hockey players," said Dean Lombardi, president and general manager of the NHL's Los Angeles Kings. "Maybe it's because they don't play on the pond anymore and, you know, just play." The free-play day addresses that deficiency, while also providing a dose of low-pressure hockey played for the pure joy of it.

Hard-board dividers are used to create two half-ice playing surfaces. Three set teams are divided into four even squads and they play two mini-games simultaneously. During a one-hour ice session, each team will play the other in a short round-robin style tournament. The games are played 4v4 and unit changes occur on the buzzer every 60 seconds. During these games, coaches are not allowed to assign positions or give instruction; they are merely there to make sure that safety rules are followed. If a goal is scored during play, the scoring team digs the puck out of the net and play continues in a make-it, take-it style. Players are encouraged to make plays, take chances and be creative. This format has been very well received by players. It provides regular time for them to experiment and self-discover successful tactics. Since there are no assigned positions, players must determine their own spacing and support and are free to arrive at their own conclusions. We have a video sample that shows some sophisticated play by 12U players when left alone by the coaches using the suggested structure: [www.youtube.com/watch?v=syqoZ2md7_Q].

As part of the ADM, practice formats can adjust based upon the needs of players and teams. Some formats allow coaches to work directly with their teams for longer periods of time so that the level of instruction can be more extensive and less hurried. Other formats place an emphasis on pace and repetitions. Participating players can be grouped either in a mixed-ability or like-ability formats.

Climbing to age classifications above 12U, practices can still involve teams sharing ice and working together. However, all teams should also have single-team, full-ice practices to allow for all elements of the game to be linked together. While our sport often requires players to excel under pressure in tight spaces, at 14U, the players are ready to use the full ice surface and advanced to a point where they must understand coordinated play from end to end.

During multiple-team practices in these older age classifications, players can now be grouped by position to hone position-specific skills and tactics. This can be done between two teams or even through designated position-specific practices that include a club's players in the 14U, 16U and 18U classifications. These types of mixed groupings, including players of multiple age classifications, provide peer-to-peer teaching opportunities that yield multiple benefits. At this stage of development, older and more technically or tactically superior players add a potentially beneficial layer of instruction when working with and against younger players. While these concepts are far from revolutionary, within the long-standing and hardened culture of single-team, full-ice practices, these changes, while beneficial, can meet resistance. But by changing that culture to a club mindset, in which everyone is working to make every player better, and everyone is committed to optimizing the use of available physical, intellectual and human resources, player development can make huge advances.

The ADM Approach to Coach Education

USA Hockey began a formal nationwide coaching-education program (CEP) in the 1970s. It was completely voluntary and consisted of a one-day instructional clinic. It remained voluntary until 2000, at which point it became mandatory. This was a critical step in creating a more comprehensive CEP structure, as it was a large cultural change to require a basic introductory level of coaching education. Since most of America's youth hockey coaches were volunteers, our CEP was initially very basic. It was designed primarily for the volunteer parent coach.

Date: *12U Skills Practice 3* **Number of Players:** *3 Teams*
Equipment: *6 nets, barrels, borders, pucks* **Time:** *80 minutes*

Warm-Up: 2v1 Small Area Keep Away (5/5)

Players play 2v1 keep away, passing in small area
Goalies: *B-Fly slide agility*
Agility: 6 Jiri Jumps
Side-to-side lateral jumps with arm swing. Jump high and wide with opposite elbow touching opposite knee.

1ST Rotation: 6 Stations @ 7 min. (42/47)

Station 1: High Low
1v1 at net front; on change of possession, a pass must be made to high or low outlet players before attack. High outlet can shoot or pas. Low outlet can only pass.

Station 2: 1v1 Net Front Game with Support
Coach spots a puck in the pit, O1 vs X1 with each player having their own diagonal support players to create offense. 20-30 second shifts.

Station 3: Catch & Receive Passing
Players start facing each other in four lines. Each line is behind two barrels set up as in diagram. Player with puck does agility skate around barrels, then passes to partner (tape-to-tape, hard and flat with good technique) in opposite line. Do each agility skate for 1 minute then repeat (1-Forward Figure 8, 2-Backward Figure 8, 3-Forward/Backward Transition Skate, 4-Shuttle Passing-No agility

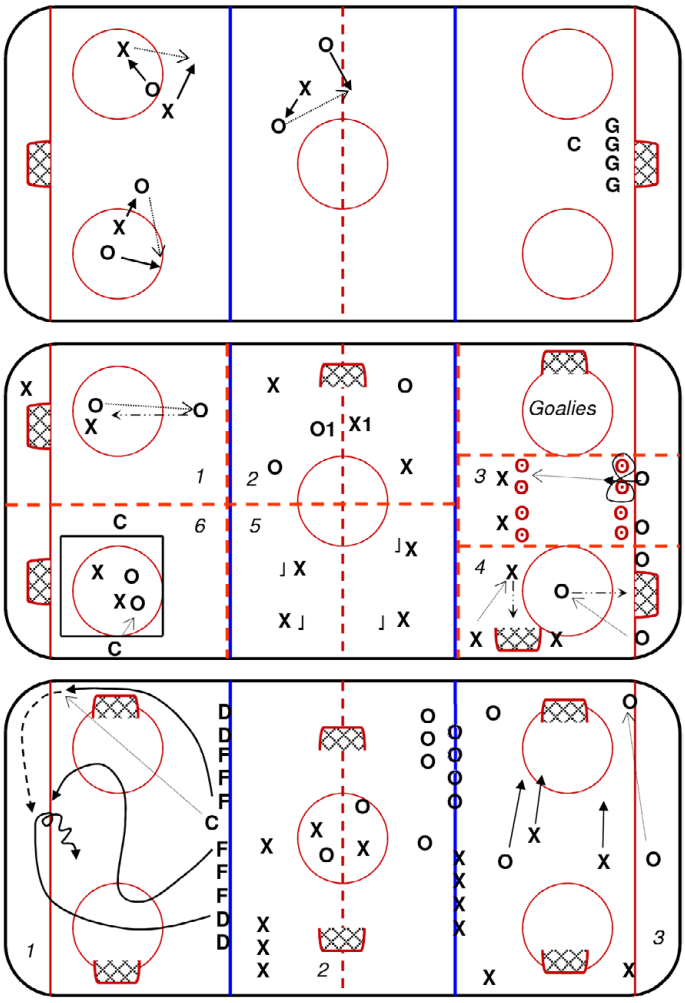
Station 4: Catch & Receive Shooting
Players set up as diagrammed with net-front player receiving alternating passes from players below the goal line. Concentrate on passing & receiving technique as well as having the shooter surround the puck for proper snap-shot or wrist-shot technique. 4 shots per player and rotate.

Station 5: Agility Skating
Small area skating with & without pucks focusing on agility & short burst multi-directional quickness using sticks as guides for edge work.

Station 6: 2v2 Net Front Scoring Game
2 Os (on offense) vs 2 Xs (on defense) battle for body and stick position in net front to score or defend. Coaches alternate passing a puck to the offensive player who positions body and stick for shot….3 pucks from each coach then rotate players.

Goalie World Skating
Focus on post-to-post and out, crease movement. Goalie rotation: #1 to #2 to GS to #4a to #4b to #6

2nd Rotation – 3 Stations w/ Players Grouped by Team – Coaches rotate with their teams (33/80)



Station 1: 1v1 F & 1D Angling & Drive Drill
Coach spots puck in either corner or on net. F1 picks up puck, wheels net, driving wide. F2 must tag up w/ skates touching inside opposite circle & angle F1 to deny middle ice. D1 must skate through circle w/ skates touching inside goal line to gap up & work together w/ F2 to re-gain possession & counterattack. Let counterattack play out, then alternate sides.

Station 2: 2v2 with Support
Players compete 2v2 in a small area using either support player to create 3v2 or 4v2…30 second shifts…support player and 1 teammate enter the game on the whistle.

Station 3: 2v2 Transition Game
Players compete 2v2 with teammates positioned behind the attacking goal line, puck must be passed to either support player on every turnover to create offense by gaining body position & getting open…30 second shifts. (Support players can pass to each other and change the point of attack).

Figure 2 —USAH ADM Practice Structure Sample.

With the implementation of our ADM, we made sweeping changes to the structure and content of our CEP. We built off the mandatory elements that were already in place and learned that, as a whole, coaches were largely accepting of additional requirements, as long as the education quality was high. Today, becoming a USA Hockey coach requires a much more comprehensive effort, but while the process may seem strenuous to some, it ultimately benefits the children and American hockey as a whole.

Growing out of the ADM, our CEP has a clear mission to improve the caliber and quality of coaching in amateur hockey nationwide. Five levels of achievement and five online age-specific modules have been established to educate and train each coach. The program emphasizes fundamental skills, conceptual development, sportsmanship and respect for teammates, opponents, coaches, officials, parents and off-ice officials.

Thirteen district coaches-in-chief use trained coaching education personnel to conduct the first three progressive levels of instructional coaching clinics. The coaches-in-chief organize and conduct the Level 4 clinics, while the director of the CEP conducts the Level 5 clinic. In addition to clinics, USA Hockey developed a full range of instructional materials for coaches to use on the ice, as well as in the classroom. The materials are also used by the USA Hockey Player Development Program and the International Ice Hockey Federation. Materials include clinic manuals, PowerPoint presentations and training videos.

As it relates to coaches' implementation of ADM-specific principles at the younger levels, to maintain players' mental engagement, skills instruction in any station not using a game format should be no longer than the age of the children involved, e.g., eight-minute stations for 8-year-olds. This basic rule allows for the quality of repetitions to stay high. Within the station-based practice environment at 8U, we also ask coaches to limit the amount of group instruction to only what is absolutely necessary. The focus is to get the game/drill started and then teach individually as much as possible, keeping the activity level high and the instruction personalized.

All coaches must enter USA Hockey's Coaching Education Program at Level 1, and must continue their education with a coaching clinic annually until, at a minimum, they achieve Level 3. Once Level 3 is achieved, periodic renewal is required for coaches who have not achieved Level 4. Coaches of national tournament-bound teams (Tier I 14U, 16U and 18/19U and Tier II 16U and 18/19U) must complete Level 4 in their fourth season of coaching, or first season of eligibility, regardless of expiration date. Coaches who attain Level 4 certification are not required to attend any further certification clinics but must adhere to the age-specific requirement.

In addition to the training outlined above, coaches must also complete online age-specific training modules specific to the level of play they are coaching, if they have not already taken that module. This requirement applies to coaches at all levels. Coaches may complete more than one age-specific module in any given season.

Level 1 Topics

The Level 1 clinic establishes a strong foundation of hockey knowledge by focusing on five main coaching competencies (teaching, leadership administration, technical skills, tactical skills). This interactive clinic allows coaches to examine their own coaching techniques and learn ways to communicate with their players, coaches and parents. Each subsequent clinic builds upon that foundation and delves into more specific topics.

Level 2 Topics

The Level 2 clinic covers establishment of a coaching philosophy and practice planning. In total, seven coaching competencies are addressed in the Level 2 clinic (player evaluations, coaching philosophy, bench management, season planning, practice planning, drill planning). Checking the right way is introduced to teach proper body contact at all age levels of play in preparation for full body-checking at the bantam age level. Offensive and defensive concepts are also introduced.

Level 3 Topics

The Level 3 Clinic explores coaching psychology and physiology as they relate to hockey. Player development skills include body checking, overspeed training and dryland training. Discussion includes team concepts and systems, which include defensive, offensive and specialty situations.

Level 4 Topics

The Level 4 Clinic examines in great depth the psychological, motivational and teaching aspects of coaching young athletes, along with the physiological and conditioning requirements of training ice hockey players. It also explores more complex tactics and systems and advanced levels of player skills and development, along with game coaching strategy and suggestions for scouting opponents.

Level 5 Topics

The Level 5 Clinic, or USA Hockey National Hockey Coaches Symposium, examines in great depth the physiological aspects of coaching young athletes. It also takes a more in-depth look at systems of team play and player skill development at the international level. Daily, small-group breakout sessions occur with an assigned leader that addresses present day hockey issues. The Level 5 Clinic is held every two years at a designated site.

Measuring Success

Our initial focus has been on the 8U age category and we are at approximately 80-percent nationwide adoption going into Season 5. Primary indicators of success have been viewed in terms of player retention and player

development. On the retention side, USA Hockey has shown measurable success on the national level with a significant increase in players returning to the sport. Before the ADM's launch, the percentage of players moving out of the 8U age category and into 10U held at 53%. We are now seeing national retention running rates eclipsing 60%. This equates to thousands more players staying with our sport, and ultimately, a deeper player pool at advancing levels all the way up to the NHL.

On a more micro level, individual associations that adopted the ADM early have witnessed extraordinary growth and retention levels. Many of these early adopters are showing retention percentages in the 90-percent range for the same 8U to 10U transition. As the national adoption rate increases, we expect retention rates to continue this upward trajectory.

In reference to players' development, the results are less quantifiable given the brief window of ADM training (four seasons or less) and the age of players exposed (our oldest ADM-exposed players are only now beginning 12U hockey. Anecdotally, there has been a noticeable increase in skill level among ADM-trained players compared with their peers. ADM-trained players are proving both more skilled, especially in tight areas, and more expeditious in their acquisition of those skills. Programs report that the ADM players moving into the 10U age group are far more technically skilled than groups they have had in the past. At 12U, the tactical improvement is also being reported.

In terms of wins and losses, programs that adopted the ADM are also starting to rise. One USA Hockey Model Association tracked their success over a three-season span after adopting the ADM. Monitoring a squirt team (10U) that progressed with a nearly static roster of players, Season 1 produced a 6–24–0 record. Season 2 showed a sharp improvement, with the team advancing to the peewee level and posting an 18–24–3 mark. Season 3 proved to be a watershed campaign, as the team cruised to a 40–12–3 record and a top-15 national ranking. The coach of that team summed it thusly: "We set out to take a theory and put it to practice over the last three seasons using a real-life sports laboratory, and our findings were, 'yes, it works.'"

Next Steps and Concluding Remarks

USA Hockey launched its ADM at the mite level (8U), where a measurable improvement in skill development and player retention soon resulted. Now our focus will expand to address deficiencies in more advanced levels of play at the 12U, 14U and 18U age levels. These levels have fewer volunteer coaches and have aggregated players that have shown an aptitude in our sport. The goal is to increase the level of education and advancement opportunities for coaches in this category. USA Hockey wants to invest in these players and in these coaches who seek to make a full-time commitment to grooming youth hockey players.

This process has already started with the creation of several 20-month paid internships with our NTDP as well as a number of weeklong workshops for coaches with our national teams. In addition, select coaches will be integrated into our weeklong national Player Development Camps to work alongside university coaches, professional and national team coaches who are guiding teams at these camps.

On the horizon is another level of certification directed toward the professional youth coach. This certification would be voluntary on the part of the youth coaches and would involve a weeklong in-person training session as well as projects to complete throughout the season. It would include in-person mentorship and evaluations by national coaching staff personnel. We feel that if the program is of the highest quality, coaches will be eager for the opportunity.

Through this extensive nationwide commitment to optimally developing youth hockey players and coaches, USA Hockey, as well as the NHL, will see a new breed of talent—and a deeper pool of that talent—exceeding anything ever produced in the U.S. In addition, by giving the game back to the kids, their engagement and enjoyment level will soar. We'll create hockey players for life, providing the benefits of exercise, camaraderie and passion for kids *and adults*, who can enjoy the low-impact version of the sport forever. It will literally change the game.

References

Emery, C. (2011). Risk of injury associated with body checking among youth ice hockey players. *Canadian Medical Association Journal, 183*, 1,249-1,256.

Kanters, M., McKenzie, T., Edwards, M., Bocarro, J., Mahar, M., & Hodge, C. (2014, March). Youth sport practice model gets more kids active with more time practicing skills. Paper presented at the Active Living Research Conference, San Diego, CA.