Identifying, Understanding and Training Youth Athletes

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Who will be the next Tiger Woods, Mia Hamm, Michael Jordan or Venus Williams? Many parents believe that, given the right amount of training, coaching and perseverance, it could be their child. There is a certain mystique about talented athletes, whether they are amateur Olympians or professionals, because of their sports mastery and the skills they display. It is not an easy path to success, and few achieve this dream at the highest level.

A lot of parents hope their child will receive an athletic scholarship, not just to help finance expensive postsecondary education, but also as a prestigious feather-in-the-cap for both the proud parents and the youth. While only a tiny percentage of athletes advance to the university varsity level or higher, the other 99% will enjoy and stay in sports for life if they can improve their skills and have a positive experience.

The Long View—Ability and Potential

Predicting success in sports is a challenge at any age, because so many factors impact long-term performance. When children are young, it is very difficult to determine whether they have the right physical, psychological and sociological make-up to be top-level athletes. Combine this with the unknown outcomes of growth and development through puberty, and trying to accurately predict athletes' future performance levels can be like playing the lottery.

With this in mind, we can attempt to create a better experience for all involved—kids, parents, coaches, scouts and recruiters—by doing what we can to analyze and predict long-term sports success. By quantifying the athletic talent required for success, we can help parents harness their enthusiasm, focus their expenditures and spend more time enjoying the childhood and youth sports experience. More than 50% of North American children have their first experiences in organized sport by age 8 or 9, and participation rates continue to rise through the childhood years (Malina, Bouchard & Bar-Or 2004). Parents who understand the athletic attributes needed for sports and who know where to source specialized coaching can allow children to enjoy their athletic development as they follow tangible steps to improve their sports abilities in measurable ways.

From a coaching perspective, understanding athletic ability and potential gives greater vision in athlete selection and overall team development. Coaches of young athletes may prioritize training that improves athleticism as opposed to focusing on the immediate desire to win. The goals should be to encourage healthy activity for inactive kids, teach life skills, develop a long- term enjoyment of sports and give naturally gifted athletes the tools that will help them perform at an elite level.

Predicting athletic success is challenging. If a child excels at a young age, there is no guarantee that this will carry into later childhood or the teen years. Young athletes exist in a continuum of ability from below-average to exceptional. While some of them will excel, as many as 70% of children will not pursue sports past their teenage years (Brown 2001).

Gone are the days of free play with neighborhood friends—they have been replaced with organized sports and scheduled activities to support athletic success. Many athletes are specializing in one sport at very early ages in hopes of a professional career, encouraged by parents who may have specific dreams or plans for their child. Kids who are streamlined into a single sport early in life are robbed of more varied experiences critical to developing overall athleticism. A lower athletic base ultimately limits their sport-specific improvement potential and can lead to burnout. The focus should be on helping young athletes develop skills they will draw on at an older age when they are actually ready to capitalize on sport specialization.

Developing Athletic Talent

The development of athletic talent is a long-term process. Through the athlete development cycle, an athlete progresses to the highest level of his or her ability based on a well-designed plan that allows for long-term improvements. 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 (Ericsson & Charness 1994; Salmela et al. 1998). This translates into more than 3 hours of training daily for 10 years (a commitment that few can or will make). In sports circles, this is referred to as the "10-year rule," and in the preparation of Olympic athletes it is supported by both the U.S. Olympic Committee (2202) and Canadian Sport Centres (2006).

Over the past decade, the sports conditioning field has seen considerable growth in science and practical training alike. In the past, programs had focused on the development of sport-specific skills, strategies and tactics, with most training coming from coaches during regularly scheduled team practices. Sports coaches simply mimicked the sport-specific movements in the conditioning setting without paying much attention to injury prevention, overuse syndrome or overall development. Then, head coaches in some sports began enhancing the training by improving physical traits rather than just replicating specific movement patterns; for example, to improve sprinting ability, track coaches focused on leg strength, power and speed through multijoint lifts and plyometrics. Along with this trend came the use of strength and conditioning coaches who devoted their role to improving each athlete's unique physicality.

Later, as the personal fitness trainer (PFT) field grew, specialty education helped trainers working with athletes to differentiate their skill sets. Today, there are certification programs that designate PFTs as sports conditioning specialists so they can address specific sport-related demands and injury epidemiology.

Athletes and coaches are constantly seeking an advantage over the competition and searching for new tools (including the intangible factors that can make the difference between winning and losing) to help them achieve this edge. There is a constant drive to go faster, jump higher and be stronger. The focus of sports conditioning goes beyond training, marking the difference between having a ripped, more fit body and eliciting peak athletic performance from a smarter, more skilled body. This is reflected in the sports conditioning workout curriculum and long-term plan.

To develop a great athlete, a sports conditioning specialist must design an exercise program that considers many unpredictable situations in which the athlete is forced to read and react to events quickly. Reaction speed and efficiency often determine an athlete's success in beating a defender, preventing a move from an offensive player or even avoiding objects (as in skiing and snowboarding). Ultimately, the ability to read a situation, react and skillfully maneuver the body could decide the outcome of a game or sporting event. Success in sports is based on the ability to move in multiple directions in a smooth and coordinated manner. Winning each "small" challenge along the way is what adds up to a final win.

The Physical Aspects of Sports Success

Physical size seems to play a big part in children's sports, as greater size translates to more strength, longer levers, enhanced speed and other sport-specific skill advantages. When describing the physical attributes that contribute to success, we focus on physical size, strength, power, strength/power endurance, speed, quickness, agility, movement skills, deceleration, balance, reactivity, aerobic power, anaerobic capacity, flexibility, coordination and body awareness.

Each sport requires a different combination of these physical characteristics for success. When designing sports conditioning programs for young athletes, it is important to match the appropriate skills with each sport's requirements, while also evaluating the strengths and weaknesses each athlete has in the above areas.

Coaches (and parents) can complete an anecdotal evaluation of young athletes to develop a general physical-skills checklist. Knowledge of growth and development trends can assist in this process by determining what can be trained and improved at different stages of maturity. Research published in 2005 by Balyi and others discusses optimal windows of trainability based on age and gender. All physical systems are trainable, but during the phases of growth and development there are specific time frames for females and males that should be areas of focus for sports conditioning coaches. Generally, for children ages 5-10, the training focus should be on flexibility, sports skills and speed. During the peak height velocity years of youth (puberty), there is an opportunity to make great improvements in aerobic capacity and speed. Once puberty has progressed, the development of strength should be the focus (ages 13—14 for females and 17—18 for males). The Canadian Sport System integrates all athlete/sport development programs based on the Long-Term Athlete Development model (www.ltad.ca) developed by Istvan Balyi. This model provides an excellent summary of valuable growth, maturation and sport-related research—as well as practical considerations—that all sports and conditioning coaches should understand. Trainers can also refer to IDEA Fitness Journal to access growth- and mat- uration-moderated youth training guidelines (Anderson & Twist 2005a, 2005b).

Development of the physical characteristics needed for sports success can be accomplished through a variety of methods. For example, an athlete can develop great balance and lateral quickness from soccer and then apply those skills to basketball. For focused, timely development, an athlete can work in a sports conditioning training center under the supervision of a specialist who can correct and perfect movement mechanics, which can also reduce the incidence of injury on the playing field. Research shows that athletic training and competition do not appear to accelerate or decelerate the growth and maturity of young athletes regarding height, body proportions or sexual maturation. However, athletic training does have a significant impact on body composition (decreased body fat), motor skills, aerobic power, bone mineral content and skeletal muscle development, giving athletes performance advantages and long-term health benefits (Malina, Bouchard & Bar-Or 2004). Also, the earlier the athletes establish neural and motor improvements, the sooner these upgrades can be used to accelerate their progress.

Without proper sports conditioning, physical skills will disintegrate under duress and fatigue—even in athletes with the mental and emotional attributes and stamina to be the best in critical competitions. In other words, athletes don't rise to an occasion—they sink to the level of their training; so the training bar needs to be set high.

Three Pillars For Youth Training

The training style for youth that we advocate at Twist Conditioning has been packaged into three primary pillars of training:

1. sport movement: agility, quickness, multidirectional speed, external reaction skills, coordination, acceleration and deceleration

2. sport strength: muscular, whole-body, multijoint strength; muscular endurance; explosive power; power capacity; acidosis tolerance; and recovery efficiency

3. sport balance: stability, kinesthetic awareness, proprioception, neuromuscular pathways, transitional balance and internal reactivity

The primary fitness characteristics of aerobic endurance, flexibility and body composition compose the general fitness base from which all athletes build their sports conditioning. The anaerobic energy systems, which drive all three pillars, are more intimately tied to sports conditioning.

The Twist Sports Conditioning Paradigm (see Figure 1) shows the discrete and interconnected variables of the three pillars of conditioning. Trainers manipulate stimulus to stress specific systems in order to challenge and grow each distinct ingredient within each pillar. The entire training plan is athlete-centered and should be based on the following considerations: age, gender, growth stage, psychological development, physiological strengths and weaknesses, specific sport requirements and experience. The magnitude of this list shows the complexity of developing a safe and effective training plan for children and youth.

Later-maturing youth are at a higher risk of being cut from their sports as they navigate the advancement hierarchies, which quickly narrow from community mass participation to a smaller pool of elite players. As this narrowing occurs at younger and younger ages, those kids who could—with time to mature and train—become elite athletes, are more likely to be cut entirely (Hutton & Narayanan 2006). These late bloomers need to receive training resources to get the most out of their physiques so they can stay competitive.

Sports conditioning is also important for early maturers so they can take advantage of their physical maturation. Children who succeed mainly because they have matured quickly are at risk if they ride that edge and train less than their smaller peers, as these are the same peers who will later catch up with and perhaps even pass them in physical size. Early maturers must be challenged in terms of athleticism, especially when they are not challenged sportswise by smaller competitors.

There are profound differences between training an athlete and providing a good fitness workout. Traditional fitness training considers the development of the primary components of fitness—endurance, strength, flexibility and attempts to build better-looking bodies from the outside. Though aerobic fitness, muscular strength and joint mobility are important to sports success, there are a few additional tools that athletes need. Sports conditioning for athletes includes the secondary components of fitness—multijoint strength, power, speed, quickness, agility, movement skills, deceleration, balance, reactivity and anaerobic capacity. This training approach helps all athletes enhance their innate abilities. A program that is grounded in scientific research and the development of athleticism is the key to success.

Periodization

The schedule and design of a year-round youth sports conditioning plan is called periodization, or conditioning in cycles, where different physical components are developed at different densities, intensities, frequencies, durations and loads. Based on scientific principles and methodologies, periodization presents the best time and the best method for conditioning each physical component.

Every sports coach uses the concept of periodization, but the direct application varies by sport and performance level. There is a distinct difference between periodization for a house-league baseball player and periodization for an Olympic track athlete. Coaches begin with a macrocycle (usually 1 year) and then break the season into four phases—off-season, preseason, in-season and postseason or championship. Within these phases there are mesocycles, in which both the development and conditioning of the athlete are structured to build up different attributes—all with a focus on optimum performance at peak times of the year. Each mesocycle is broken into microcycles, which have specific training emphases and variables that contribute to the goals of that particular mesocycle. The more elite the athlete or sports program is, the more complex the plan needs to be. When designing an athletic plan, the sports coach dictates the periodization plan, and the conditioning coach develops workouts to complement that plan.

Periodized conditioning optimizes results, prevents overtraining and structures the routine so that the athlete peaks at key times. The conditioning should be complementary to the demands of practices and the game itself, with an eye to eliciting peak performance in games while simultaneously planning for the long term. Periodization requires understanding what variables affect overtraining and injuries; how to enhance recovery and regeneration; and how to recharge for the next game while handling the volume of training that comes with sports participation. Developing the right periodization formula for each individual athlete (even in a team environment) is one of the greatest coaching challenges.

Because of such challenges, trainer competence is essential for anyone wanting to work on conditioning with young clients who are progressing through critical growth years—any injury can be a serious setback in terms of timely growth and maturation, as well as lost games, practices and training time. Remember, youth athletes are not "little" adults. They have very unique needs, and sports conditioning coaches will make better decisions when they have a well-rounded understanding of these needs.

The Value of Sports Conditioning

We now know that long-term participation in a sport at the highest level of an athlete's potential requires coordinated movement, full-body strength, balance and overall enhanced mechanics to reduce the chance of injury and to improve performance. Sports conditioning grooms young athletes to be better able to apply their sport-specific skills.

Sports conditioning is considered one of the 10 top trends in fitness as amateur and pro athletes, sports coaches, parents, weekend warriors and adult recreationalists all demand this new training style (American Council on Exercise 2006). Traditional fitness training is great for helping people look good and achieve basic fitness goals (weight loss, basic improvements in strength and cardiovascular endurance, more mobility), but athletes of all levels and abilities need a more sports-oriented training focus. Kids handling multiple sports or facing early selection criteria must get on the right track sooner rather than later.

For health clubs and related businesses aiming to add sports conditioning to their revenue streams, hiring qualified coaches that stand apart in their specialization is paramount. Just participating in a gym environment is not sport-specific training. Young athletes need unique exercises that feed into the skill requirements of their sports. Further, coaching these athletes takes more than memorizing and reproducing cool drills. Sports conditioning specialists have a full understanding of the science, training philosophy, exercise methodology, active coaching process, error detection and athletic mechanics required to build more talented athletes. Personal trainers are encouraged to read relevant publications and attend conferences that can help them work successfully within this culture. With this specialized knowledge, conditioning coaches are in a powerful position to impact young athletes in a positive and rewarding fashion.

SIDEBAR: Program Design for the Youth Athlete

Sports conditioning programming has become less about mimicking sport-specific movement patterns and more about enhancing the physical tools for athleticism. This is even more crucial at younger ages. As a general rule, the younger the player is, the more the program should have a general focus. As a sports conditioning coach, you want your program to

• improve fitness;

• increase athleticism;

• build the physical tools that sports participation draws on;

• provide immediate upgrades to the experience of playing sports;

• give athletes the physicality to excel at any new sports they may pick up;

• produce results so that improved sports competence keeps athletes in the game; and

• provide an experience that will secure a positive link between working out and feeling good about sports.

What Separates the GoodFrom the Great?

In addition to good genetics, there are other physical and mental attributes that "great" athletes have in common. These include the following:

• leadership skills

• coachability

• a vast understanding of their sport (both innate and learned)

• an intense work ethic

• a killer instinct

• exceptional read-and-react skills for anticipating their opponent( s)

• standing strength that seems to exceed their weight room strength

• phenomenal speed

• coordinated agility

• a fluid body capable of advanced skill execution

• passion

• emotional stability

• mental toughness

• a positive attitude

• realistic goals

• focus

• effort

• persistence

• a competitive nature

The Basics of a Sports Conditioning Plan for Children and Youth

Developing a sports conditioning program for young athletes involves much more than exposing kids to fast-paced drills and innovative equipment. To train this population safely, you must carefully consider several issues. Start with the following steps:

• Understand the growth and development characteristics of children and youth and the variations between female and male athletes.

• Learn more about the specific requirements, skills, strategies and tactics of the sport in question.

• Investigate appropriate assessment tools for evaluating athletes' individual abilities and deficiencies in movement skills, whole-body strength, balance and coordination; then use the results to determine the proper initial training focus and subsequent training progression.

• Study appropriate training methodologies for developing efficient sport movement skills (agility, quickness, speed, reactivity, coordination, acceleration, deceleration); then search for drills appropriate for the athletes (age, gender, growth), making sure you know how to modify each drill as necessary.

• Study appropriate training methodologies for developing whole-body sport strength and power, including elements of sport specificity and manipulation of emphasis on prime movers, stabilizers and force reducers; then search for suitable exercises.

• Study appropriate training methodologies for developing sport balance (stability, proprioception, neuromuscular pathways); then search for suitable exercises, understanding how to quantify, prescribe and coach balance difficulty.

• Work with a sports coach to develop a periodized plan (macrocycle + mesocycles + microcycles) that supports sport development.

• Create a weekly plan for each athlete (microcycle), addressing how you will train sport movement + sport strength + sport balance using a cyclical approach.

• Develop each sports conditioning workout based on the big picture: macrocycle, mesocycle, microcycle and sports coach requirements.

• Implement your plan, adjusting it within and between workouts.

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