

# NYSHSI: Making Youth Sports a Public Health Solution<sup>SM</sup>

## Sport Specialization

**Sport specialization is a structured and intense approach to enhance specific physical capacities and sport skills to elevate one's competitive ability relative to one's developmental stage.<sup>1</sup>**

Over time, it is hopeful that the young athlete will be able to sustain their advanced abilities throughout adolescence and become a candidate for high-level sport programs or academies that offer the opportunity to practice and compete on the national or international stage.<sup>2</sup> Other potential incentives associated with sport specialization may include the opportunity to participate in intercollegiate athletics and semiprofessional or professional sport clubs.

Because physical abilities and behavioral development are important with regard to beginning specialized training, sole reliance on chronological age may not offer adequate insight into the timing and rate of the various biological, anthropometric and emotional changes during maturation that are important to recognize as part of a holistic athlete-development program. Because of this variability, specialized athlete development is generally categorized as either “early” or “late,” depending upon growth-related markers that can offer guidance in the programming of multiple physical training variables, including but not limited to the frequency, intensity and volume of training.<sup>3</sup>

Early specialization is generally defined as participation in one sport for at least eight months out of the year (often year-round) and prior to the age of 12.<sup>4</sup> It is common practice for sports or activities that require whole-body rotational movements similar to those found in gymnastics, figure skating, diving and other aerial or acrobatic activities to follow an early specialization pathway<sup>5</sup>. For these activities, it is favorable to start specialized skill training early (pre-pubertal, prior to the onset of peak height and peak weight velocity) to allow the young athlete to make the necessary proprioceptive and sensorimotor corrections needed to acquire the more complex aerial and acrobatic skills associated with these sports.<sup>6</sup>

Anthropometric changes as a result of normal human growth and maturation will result in increases in stature (height), limb segment length, circumference and body mass (both muscle and fat tissue). These changes to the physical dimensions of limbs and body segments will alter

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the inertial properties of the limbs, which in turn affect whole-body movement and control.<sup>7</sup> Generally, mastery of these sports at an earlier age with refined sensorimotor ability will enable the young athlete to adapt and regulate movement patterns affected by changing anthropometric features that occur later with the onset of peak height and weight velocity.<sup>8</sup>

In contrast to those sports considerate of earlier specialization, activities heavily dependent upon the expression of muscular strength and power are referred to as late specialization sports. Strength and power are important attributes at any age but are qualities most apparent circa and post pubertal, after peak height and weight velocity. Generally, these sports are team-oriented, racquet or combative types of activities where anthropometric changes do not drastically affect the acquisition, refinement and execution of specific sport skills.<sup>5</sup> Further, muscular strength and power contribute to other important athletic abilities, including speed and agility. Therefore, an understanding of the timing and variability of human growth and maturation is important to help coaches evaluate young athletes and make appropriate adjustments in programming for youth athletic development. This is particularly true as young athletes are exposed to novel movement experiences, sport skills and perhaps different sport positions with unique physical demands or needs, depending upon early or late maturation status. Late specialization affords progressive long-term exposure to varied movement experiences throughout the early developmental stages of athlete development to acquire, develop, and refine general motor ability and the perceptual motor awareness needed to help enable the transfer of key fundamental motor skills to various sport-specific actions.

## Considerations and concerns with sport specialization

When implemented appropriately, holistic athlete development has the potential for not only sporting success but to act as a pathway for continued physical activity throughout the lifespan. Despite this notion, poorly organized approaches to sport specialization can bring about an array of concerns. Overuse injury to soft tissue or bone may occur as a result of frequent competition and sport practice over time without adequate opportunity for rest and recovery. This form of trauma could be further compounded if young athletes are spending additional time with specialized skill and performance coaches outside of the time spent with their sport coach.<sup>9</sup> Poor management of the frequency, volume and intensity of training may lead to chronic pain or discomfort; therefore, it is important coaches communicate and track the physical training of their young athletes to make sure rest and recovery are a key part of a structured training program.

Aside from the physical demands of sport preparation, other factors such as competition, overbearing parents and high-performance expectations may create emotional stress among young athletes. This condition, often referred to as “psychological burnout,” is at times associated with an early or excessive sport specialization approach and may lead to a decline or lack of participation in sport and physical activity. Too much time dedicated to sport and performance training combined with pressure from coaches and parents can lead to a lack of enjoyment, emotional exhaustion or even participation dropout, particularly when there is less time for personal activities or socializing with family and friends.<sup>10</sup>

## Sport sampling versus sport specialization

For youth, sport coaches at times may feel confused or uncertain whether to have a young athlete focus on one sport or to encourage participation in multiple sports.<sup>11</sup> In contrast to sport specialization, sport sampling offers an exposure to a broad variety of movements, sport tactics and environments that can serve to enrich perceptual-motor ability, competence and confidence during childhood and adolescence.<sup>12</sup> This approach, also known as multi-sport participation, does not promote participating in multiple sports simultaneously but rather multiple sport experiences distributed throughout the year.<sup>13</sup> Although specific abilities are unique to every sport, there exist general patterns of movement and tactical characteristics that are interrelated from one sport to another.<sup>14</sup> It is important that parents and coaches understand that a single or multi-sport pathway could bring success to an athlete, but there is no guarantee; therefore, any decision regarding best practice should be made with the best interest of the young athlete in mind.

## Practice and the structure of training

To address concerns related to performance, overuse injury and psychological burnout, it is paramount to allow young athletes ample opportunity for rest and recovery while at the same time evaluating the structure of sport training and preparation. Deliberate practice is a very intensive approach where extensive time and resources are dedicated



by coaches to one sport.<sup>15</sup> The overall amount of training is more focused, demanding and greater in volume with the hope of achieving rapid and early mastery of sport skills, tactics and physical preparation. Deliberate practice is common with the early sport specialization pathway and does not offer young athletes much variety or the opportunity to become involved regarding the organization of practice or the training environment.

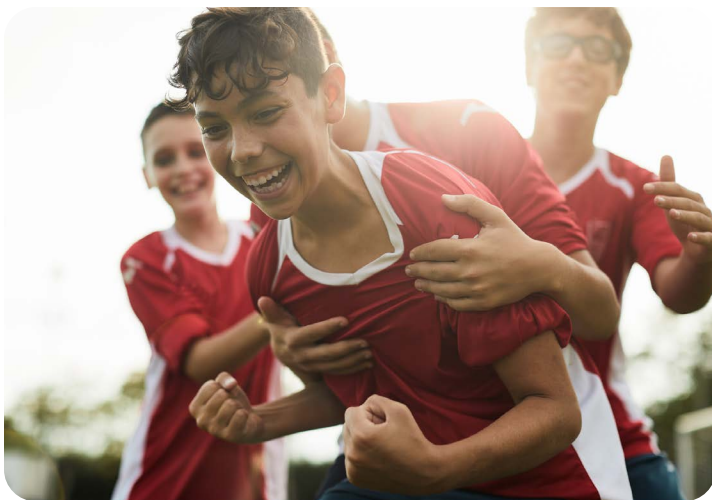
Alternatively, coaches that integrate deliberate play into their practice structure can generate movement experiences that vary from free to structured and accommodate different learning styles and levels of ability.<sup>15</sup> This play-oriented approach encourages greater creativity, self-discovery and experimentation without the pressure of a specific outcome and is often more fun and engaging while at the same time providing greater motivation to participate on a consistent basis.<sup>16</sup> Spontaneous play opportunities can serve to complement sport training, particularly during the early stages of athletic development as young athletes learn to refine general movement ability or basic sport skills.<sup>13</sup> In addition, coaches can change rules, reconfigure boundaries, add barriers or even modify equipment to help address the boredom or redundant and repetitive movement experiences often associated with signs or symptoms of overuse injury, psychological burnout or both.<sup>17</sup>

## Summary

In the pursuit of successful sporting ability and performance, sport club administrators, coaches and parents of young athletes often strive to better understand the advantages or disadvantages of following an early or late specific sport pathway. For all stakeholders, it is important to recognize the influence of age- and maturity-related physical and behavioral changes when implementing sport training and physical preparation programs for youth.

Specialized sport training programs offer a structured and focused approach to enhance sport skills and physical capacities relative to developmental stage; however, this must be done in a manner that does not predispose youth to overuse injury and psychological burnout. Efforts should be made by all involved to share open lines of communication to ensure the training and practice environments in





place offer ample opportunity for rest, recovery and deliberate play as part of a positive athlete development culture. Following this approach will not only enable the enrichment of sport skill and athletic ability but also create a holistic sport experience where movement competence and confidence can serve to promote physical activity and positive psycho-social well-being into adolescence, adulthood and throughout the lifespan.

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