Sports Training and the Young Athlete: How Much Is Enough, How Much Is Too Much?

The past 25 years have seen a dramatic increase in the number of sports programs being offered to youngster.

In most communities, organized teams and leagues are available for baseball, soccer, football and basketball, while ice hockey is found in northern climates. Individual sports such as gymnastics, figure skating, swimming, dance, tennis and martial arts are now also frequently available.

In addition to this broad menu of youth sports, the age range for organized sports has also moved downward. Most programs are now offered at age six, while some communities are offering pre-training as young as four years of age.

The common thread of all these organized sports is systematic and repetitive training: kicking at goal, practicing forehands, breaststrokes, plie or releve. Inevitably, if the child progresses in the sport, the amount of training and its complexity increases.

It is widely recognized in coaching circles that talent alone will never ensure excellence in sports at any level without a program of training which not only teaches and refines the skills and techniques particular to each sport, but also the special qualities of strength, flexibility, coordination and physical power needed to perform without injury.

The general characteristics of any sports training program include the duration or volume of training per day; the intensity or variation in intensity through the training session; the rate of progression of training per day, or week; and the periodicity of training through the sports season and off season. The ideal training program progressively refines the skills of the athlete without setbacks such as injuries or "burnout".

In recent years, much attention in the allied fields of sports medicine and sports science has been given to the topic of over training. This research has been focused primarily on elite adult amateur or professional athletes.

These studies have used various parameters to identify over training; decline in performance; psychological parameters such as irritability, depression or altered sleep patterns; physiological parameters such as alterations in the body's hormones or immune systems; and finally, the occurrence of overuse injury.

These overuse injuries in sports are the result of some repetitive pattern of mechanical micro trauma, plus additional physiological or anatomic risk factors. At the present time, these occur with frequencies in most sports that rival acute injuries.

Acute injuries are the result of exposure to a single high-level force, such as a twisted ankle or a fall on the outstretched hand. Overuse injuries in sports, as an example, are shin splints from

training on a hard surface or heel pain from repetitive training on a soft field with inadequate shoe wear.

These overuse injuries: stress fractures, tendonitis, bursitis and fascitis are seen in the adult. Youngsters also may have these injuries from repetitive training, but with the addition of injuries to the cartilaginous growth plates and joint surfaces that are specific only to the very young. While addition "risk factors" such as anatomic abnormalities, muscle imbalances, inadequate show wear and excessive hardness of training surface appear to play a role in many of these injuries, the recurrent theme in almost any overuse injury diagnosed is inappropriate changes in the volume, intensity or progression of training.

Lyle J. Micheli *is the Director of Sports Medicine at Children's Hospital in Boston, Massachusetts. This article was originally featured in the National Youth Sports Safety Foundation's Sidelines publication.*