Kid's Sports Corner
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Gymnastic Injuries

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The sport of gymnastics can be traced back to 2000 B.C. when the Egyptians first described their participation in gymnastic-like activities. The ancient Greeks integrated the concept of mind and body through gymnastics, and the Athenians were the first to recognize gymnastics as an Olympic sport in 700 B.C. Later, Galen used gymnastics to train soldiers for the Roman Empire. Gymnastics was redefined through the Renaissance and in the early 1800's, Friedrich Jahn, know as the "Father of Gymnastics," redefined the skills, technique and maneuvers to form the "art" of gymnastics as we know it today. Today, over 2 million people compete in the sport of gymnastics at the club, school, and collegiate level.

In females, the demand for artistry, grace and dance is now just as important as strength and flexibility, which dominates the male side of the sport. In females, gymnastic participation usually starts at age 6; they peak at age 16 and usually retire by 18. Therefore, girls are at the height of their peak growth during their most competitive years. Because of this, the growth plates are common sites of injuries in young female gymnasts. The most common growth plates injured in gymnastics are the wrist, knee, ankle and heel. There are 2 main types of growth plates found in various locations in the body. The first is a *physis,* which is a bar of cartilage found at the ends of long bones. Common physeal injuries involve the wrist and the ankle. In the wrist, the main weight bearing bone is the radius, and during tumbling, the radius absorbs 60-70% of the impact. Through repetitive overuse, the weakened growth plate begins to swell and becomes increasingly painful and stiff. If not treated, the changes occurring in the vulnerable physis will become permanent, leading to premature closure of the growth plate and permanent disability. For this reason, it has been suggested that gymnasts should be encouraged to wear wrist braces, referred to as "tiger paws," during tumbling when they reach USAG level 7 and beyond. Annual wrist x-rays should be considered to identify early changes in the growth plates.

The other area where physeal injuries commonly occur is in the fibula, or the outside of the ankle. The fibula is usually injured during an awkward landing, often "rolling" the ankle inward. The cartilaginous growth plates may be weaker than the ligaments, leading to an injury to the physis. In this injury, the pain is located over the physis, not the ligaments, as in a sprain. These physeal injuries are best treated with a 2-3 week period of immobilization, such as casting.

The 2nd type of growth plate found in the body is the *apophysis,* which does not contribute to lengthening of bone, but serves as an anchor point for a muscle or tendon. Common apophyseal injuries occur in the knee. In kids between the ages of 7-13, the apophysis at the bottom tip of the kneecap, or patella, can be irritated from repetitive running or jumping, which occurs in vault, floor, and conditioning. The growth plate at the bottom tip of the kneecap is the anchor point for the patellar tendon, a continuation of the quadriceps, or thigh muscle. Any activity involving running, jumping, or landing can irritate this apophysis, causing pain and sometimes swelling, similar to a screw and cable being pulled from a plaster wall. This is referred to as **Sinding-Larson-Johansson Syndrome**. Another similar injury involves the apophysis at the top of the tibia, or shinbone, just below the kneecap. This is where the patellar tendon anchors into the tibia. This growth plate is

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active and therefore vulnerable in teenagers. This injury is called **Osgood-Schlatter condition**. These apophyseal overuse injuries are treated with modified workouts, avoidance of pain-provoking activites such as plyometrics, frog jumps, block jumps, and lunges, as well as decreasing time working floor and vault. Ice cup massage and a 10-14 day course of anti-inflammatory medication are very helpful as well.

The third common apophyseal injury seen in gymnasts involves the heel. The heel bone, or calcaneus, is the anchor point for the calf muscles and Achilles tendon. Running and jumping creates a traction injury at the calcaneus similar to that seen in Sinding-Larsen-Johnasson Syndrome. The apophyseal injury to the heel is referred to as **Sever's condition**. Sever's is treated just like S-L-J as described above: modified workouts, ice, anti-inflammatory medication and gentle stretching. Another treatment for Sever's is the addition of silicone gel heel cups in shoes or in a gymnast-friendly sock with a built in heel pad called a Cheetah.

Another injury common among gymnasts involves the lower back, or lumbar spine. With sports requiring repetitive loading of the spine in the arched position, such as tumbling, the lower lumber vertebrae (L4 and L5) are subject to sheer stress. This can lead to a stress fracture through an area of L5 called the pars interarticularis. This stress fracture is commonly referred to a **spondylolysis**. These gymnasts will complain of increasing pain in the low back with tumbling. The pain is located centrally at the L5 level, or pantline, and is made worse by arching the back. Once the diagnosis is made using x-ray, CAT scan, or MRI, a 6 week period of rest with a back brace is recommended, followed by a 6 week course of physical therapy before returning to tumbling.

Tips for preventing injuries in gymnastics:

1. Encourage your child to tell a coach or parent if they have pain *anywhere*. Pain in a young athlete should never be considered normal or *a part of the sport*. Pain that persists beyond 2-3 days despite ice and rest or involves stiffness or swelling should be evaluated by a doctor familiar with the sport.
2. Encourage tiger paws or wrist guards to be used at and above level 7. These will not weaken your child's wrists. They will protect them.
3. Consider annual wrist x-rays with your child's physical if level 7 or above.
4. Encourage a modest period of rest at the end of the season to allow the body and mind to recover. 4-6 weeks is suggested.

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