"PEDIATRIC SPORTS INJURIES"

Joseph R Agostinelli, DPM (Retired), FAAPSM (Emeritus)
Colonel, USAF, (Retired), ACFAS/AAPSM,
President, American Academy of Podiatric Sports Medicine
Different Types of Pediatric Sports Injuries

- Bone Fracture
- Concussion
- Growth Plate Injuries
- Muscle Strain
- Sprains/Strains ** Most Common
- Stress Fractures

- High School Athletes - 2 million injuries
  - 500k Dr. Visits
  - 30k Hospitalizations
- 3.5 million kids under age 14 receive medical treatment for sports injuries each year
- Ages 5-14 - 40 % of all sports related injuries treated in hospitals
- Overuse Injuries nearly 50 % of all injuries to middle/high school students  *****
- 20 % age 8-12 and 45 % age 13-14 “ARM PAIN” in a single youth baseball season  - ****
- 21 % TBI of children in the USA of athletes in sports and recreational activities  - ****
6 Most Common Children Sports With Injuries -

- Basketball - 19.5 %
- Football - 17.1 %
- Baseball/Softball - 14.9 %
- Soccer - 14.2 %
- In-line/Rollerblade Skating - 5.7 %
- Hockey - 4.6 %
CDC - more than half of all sports injuries in children “PREVENTABLE “

By age 13 -  70% of kids drop out of youth sports!

Injured Kids In Respective Sports
Ages 5-14 -  28 % Football players
25 % Baseball players
15 % Basketball players
12 % Softball players
Since 2000 - 5 Fold Increase in serious shoulder and elbow injuries among youth softball/baseball players!
**** OVERUSE INJURIES

- Muscle Over Load / Repetitive MicroTrauma
  - strains Musculotendinous unit
  - unable to withstand additional loading
  - further stress, collagen cross-links break and shear forces cause collagen fibril to slide

- Stress Fracture - in ability of the skeleton to withstand repetitive bouts of mechanical loading, structural fatigue develops, then localized pain and tenderness ensues
Risk Factors -

- Sports specialization/year round one-sport training and playing (2-3 months of consecutive rest needed!)

- 5-6 days a week participation
- Spending more hours a week than age in years
- “playing through pain” encouraged
- More than one team /one sport per season
- Prior injury can predict future overuse injury
- More likely to occur during adolescent growth spurt
- “Amenorrhea” – significant stress fracture risk in adolescent girls
- Poor fitting equipment/overscheduling
Doctor’s Role –

- identify high risk overuse injuries
- treat acute/chronic injury appropriately
  - mediating between parent and athlete - ****

*** - EDUCATING

Physicians/Therapists/Trainers/Coaches/Parents/Athletes on prevention techniques?
"MORE IS NOT BETTER!"

Training Level-Appropriate, Overreaching or Overtraining

More is not better!
Specific Lower Extremity Pediatric Sports Injuries

- Spine
- Hip and Pelvis
- Knee
- Lower Leg
- Foot and Ankle
<table>
<thead>
<tr>
<th>Location</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip/Pelvis</td>
<td>Femoral neck stress fracture</td>
<td>Pelvic apophysitis</td>
</tr>
<tr>
<td>Lumbar spine</td>
<td>Pars stress fracture-spondyloysis</td>
<td>Mechanical low back pain</td>
</tr>
<tr>
<td>Lower Leg</td>
<td>Tibia stress fracture</td>
<td>Shin splints, Exertional compartment syndrome</td>
</tr>
<tr>
<td>Ankle</td>
<td>OCD-talar dome</td>
<td>Distal fibula stress fracture, Achilles tendon</td>
</tr>
<tr>
<td>Foot</td>
<td>Navicular stress fracture, Fifth metatarsal proximal diaphyseal stress fracture</td>
<td>Lesser metatarsal stress fracture</td>
</tr>
<tr>
<td>Knee</td>
<td>OCD-femoral condyle or patella</td>
<td>Tibial tubercle apophysitis</td>
</tr>
<tr>
<td>Shoulder-arm</td>
<td></td>
<td>Proximal humeral epiphysitis</td>
</tr>
<tr>
<td>Elbow</td>
<td>OCD-capitellum</td>
<td>Medial epicondyle apophysitis</td>
</tr>
<tr>
<td>Wrist</td>
<td>Distal radial physeal of stress injury</td>
<td></td>
</tr>
</tbody>
</table>
Hip and Pelvis

- Chronic - Pelvic apophysitis
- Femoral neck stress fracture
- Snapping hip
Remember !!!

- Chronic - Groin pull - SCFE

Pediatric and young adolescents do not get groin pulls
Get an X-ray

Hip and Pelvis

- Acute - Apophyseal avulsion

ASIS, AIIS, ischial tuberosity
Rest followed by protected weight bearing
Light isometric stretching and full weight bearing
RTP with full strength and pain free ROM
Knee

• Chronic- Adolescent Anterior Knee Pain (AAKP)

Factors include:
- Imbalance of thigh muscles (quadriceps and hamstrings)
- Poor flexibility
- Problems with alignment of the legs
- Using improper sports training techniques or equipment
- Overdoing sports activities

Symptoms reported include:
- Popping or crackling sounds in the knee when you climb stairs or stand up and walk after prolonged sitting.
- Pain during activities that repeatedly bend the knee (i.e., jumping, squatting, running).
- AAKP is not usually associated with symptoms like clicking, locking, snapping, or giving way of the knee.

Treatment:
- RICE, bracing, stretching/strengthening (PT/HEP)
Knee

- Acute injury with associated effusion warrants X-ray +/- MRI evaluation

Knee

Acute- Distal Femur, Tibial Spine, Tibial Tuber

Knee

Acute- Distal Femur, Tibial Spine, Tibial Tubercle Fracture
Knee

• Acute- Patella Femoral Dislocation
  Reduction, immobilization
  Bracing/ PT vs. scope/ reconstruction

• Acute- ACL tear
  The ACL can be injured in by changing direction rapidly, stopping suddenly, deceleration, landing from a jump incorrectly or direct contact or collision.
  Some report hearing a "pop" with resultant giving away
  Other typical symptoms include:
    Pain with swelling,
    Loss of full range of motion
    Tenderness along the joint line
    Discomfort while walking
  Most are reconstructed with attention to pt maturity and growth remaining
Knee

- Chronic- Apophisitis (O-S, SLJ)

2 Factors

Growth
- Stretching

Activity
- Rest
- Damage vs. Discomfort
- Before: Ibuprofen
- During: knee strap
- After: icing

Knee

- Chronic- Osteochondritis Dissecans

Lesion size, location, and grade determine management
- Early stable lesions managed with rest
- Surgery should be considered for unstable lesions
Lower Leg

- Chronic- Tibial stress fracture
- Exertional compartment syndrome
- Shin Splints

Foot and Ankle

- Acute- Fractures
Foot and Ankle

- Acute - Sprains

  P - protection, physical therapy, prevention
  R - rest, regain motion/strength, return to play
  I - ice, ibuprofen
  C - compression, crutches
  E - elevation
Overuse Injury Prevention

- General fitness essential for sports participation
- Multiple sports activity rather than early focus on a single sport
- Self-regulation to avoid the danger zone of injury
- Avoidance of strict, intense schedules, which may lead to overuse injuries
- Modification of standard rules for specific age groups to ensure safety
- Shorter periods of activity
- Adjustment of court or field size to accommodate players of different aptitudes and ages
- Monitoring of opponent matching to provide safe, level fields of engagement
- Shift focus away from winner-takes-all attitude
- Warm-up and cool-down sessions, with stretching exercises
- Pre-participation physical examination
- Avoidance of maximum weight with exercise training
- Proper hydration
- Adequate adult supervision and officiating
Overuse Injury Prevention

- Encourage athletes to strive to have at least 1 to 2 days off per week from competitive athletics, sport-specific training, and competitive practice (scrimmage) to allow them to recover both physically and psychologically.

- Advise athletes that the weekly training time, number of repetitions, or total distance should not increase by more than 10% each week (e.g., increase total running mileage by 2 miles if currently running a total of 20 miles per week).

- Encourage athlete to limit total participation to less than 12-16 hours per week.

- Encourage the athlete to take at least 2 to 3 months away from a specific sport during the year.

- Emphasize that the focus of sports participation should be on fun, skill acquisition, safety, and sportsmanship.

- Encourage the athlete to participate on only 1 team during a season. If the athlete is also a member of a traveling or select team, then that participation time should be incorporated into the aforementioned guidelines.
Return To Play

- Ability to return to play at the pre-injury level
- “feeling good does not equal healed good”
  - Swelling and pain usually resolve in days –weeks and is the first step to returning
  - Probably only 70-75% recovered inviting reinjury
- Progression should be:
  - Pain free full range of motion and strength
  - Functional drills, endurance and agility
  - Sports specific skills
Additional information

- AAOS.org
- POSNA.org
- STOPSportsInjuries.org
QUESTIONs LATER
Email: jmpa21@cox.net