Sports Injuries for School Nurses
34th Annual School Health Conference
Aug 4, 2012
Greg Canty, MD
Medical Director, Center for Sports Medicine
Attending Physician, Emergency Medicine
Assistant Professor of Pediatrics and Orthopaedics
Disclosures

- Neither I, nor any family member, have a financial relationship with products discussed in this presentation.
The “Gameplan”

1. Recognize the epidemiology behind sports-related injuries in young athletes
2. Identify unique injuries of the student-athlete and the risk factors behind overuse injuries
3. Formulate a plan for when a student-athlete can return to play
Show Me the Numbers!

- 30 - 45 million children participate in some form of athletics
- > 7.3 million athletes participate at the high school level annually and numbers increasing
Sports Medicine for the Pros?

Reality check

Football

• 6-17y = 2,867,000
• Varsity = 1,029,435
• College = 57,593
• NFL = 1643

Much less resources for evaluation !!
Scope of the Injuries

- High school athletes account for >2 million injuries annually
  - > 500,000 doctor’s visits
  - > 30,000 hospitalizations

- Athletes < 14 yo are treated for more than 3.5 million sports injuries annually
Acute vs. Overuse Injuries

- **Acute** - injuries such as fractures, dislocations, sprains, strains result from a single event caused by maximal forces

- **Overuse** - tendonitis, apophysitis, periostitis, stress fractures, and fasciitis result from repetitive, submaximal trauma and develop over time
Why all the Problems?

- Increased risk due to immature bones, insufficient rest after injury, poor training, and poor conditioning
- Sports specialization at earlier and earlier ages
- Year-round participation
- Tremendous pressure from peers, coaches, parents, and community
The Growing Bone...

- Distal femoral physis
- Distal femoral epiphysis
- Proximal tibial physis
- Proximal tibial epiphysis
- Tibial tubercle apophysis
Epidemic of Overuse Injuries!

Nearly 50% of all injuries sustained by middle school and high school students during sports are overuse injuries.*

Overuse injuries can cause permanent damage and increase the chances of surgeries and arthritis later in life. Keep kids in the game for life by regularly discussing how they feel physically before, during, and after games and practice. Open lines of communication can help keep athletes in top physical condition all year round. Become an advocate for safe sports participation.

For more information, visit www.STOPSportsInjuries.org

Causes of Overuse Injuries

Extrinsic factors
- Nature of the sport
  - contact, endurance, etc
- Training regimens
  - overtraining
- Coaching
- Playing surface
- Equipment

Intrinsic factors
- Age
- Maturation
- Gender
- Flexibility
- Alignment
- Strength
  - imbalances
- Proprioception
Case #1

12 y/o elite gymnast presents complaining of wrist pain that markedly worsens with tumbling
**Gymnast Wrist**

- Stress injury of the distal radial physis due to weight bearing
- Dorsal wrist pain during handstands and handsprings
- Tenderness to palpation over dorsal portion of distal radius
- + Pain with push-off testing
- Bilateral wrist films
Case #2

- 13 yo baseball pitcher presents c/o of severe pain in R shoulder. Was trying to “shake it off” when he threw a pitch and pain markedly worsened.
“Little League” Shoulder

Compare
Humeral Epiphysitis

- aka Little League Shoulder
- Typically boys between the ages of 11-16y
- Most often associated with throwing
- Repetitive torsional stress may cause widening or separation of the physis
- Repetitive microtrauma causes tenderness over the physis and pain/weakness with resisted internal/external rotation
Case #3

- 13 yo baseball pitcher presents c/o of severe pain in R- elbow when throwing. He felt a sudden “pop” in the last game.
Little League Elbow

- Medial elbow pain with throwing
- Widening of apophysis of medial epicondyle
Little League Elbow

- Mechanism: valgus compression load on elbow, producing a traction apophysitis of the medial epicondyle and compression of lateral structures (radial head, capitellum)
Treatment for Overuse Injuries

- Active rest until symptoms resolve
- Address technique, flexibility, and muscle imbalances with rehabilitation
- Vary positions/sports upon return
- Emphasize to young athletes and their families the importance of injury prevention
- Prevention is key - i.e. pitch counts, rest days, pitch types
Prevention of throwing injuries

- Preseason strengthening program - rotator cuff, hip, trunk, and lower extremity
- Address technique and mechanics
- Graded return to throwing that starts 6-8 weeks before the start of the season
- Closely follow recommended pitch counts
- Rest days !!
STOP Sports Injuries

SPORTS TIPS

BASEBALL INJURIES

Injuries in young athletes are on the rise, but elbow and shoulder injuries in children are on the verge of becoming an epidemic. Thousands of children are seen each year complaining of elbow or shoulder pain. Damage or tear to the ulnar collateral ligament (UCL) is the most common injury suffered and is often caused by pitchers throwing too much. This ligament is the main stabilizer of the elbow for the motions of pitching. When it becomes damaged, it can be difficult to repair and rehabilitate.

HOW IS AN ELBOW OR SHOULDER INJURY DIAGNOSED?

If a young athlete is throwing too hard, too much, too early, and without rest, a serious elbow or shoulder injury may be on the horizon. If the athlete complains of elbow or shoulder pain the day after throwing, or movement of the joint is painful or restricted compared to the opposite side, see a physician familiar with youth sports injuries immediately.

Maximum Pitch Counts

<table>
<thead>
<tr>
<th>Age</th>
<th>Pitches/Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–8</td>
<td>50</td>
</tr>
<tr>
<td>9–10</td>
<td>75</td>
</tr>
<tr>
<td>11–12</td>
<td>85</td>
</tr>
<tr>
<td>13–16</td>
<td>95</td>
</tr>
<tr>
<td>17–18</td>
<td>105</td>
</tr>
</tbody>
</table>

Source: Little League Baseball

Rest Periods Required

<table>
<thead>
<tr>
<th>Ages 7–16</th>
<th>Ages 17–18</th>
<th>Required # of Rest Pitches</th>
</tr>
</thead>
<tbody>
<tr>
<td>61+</td>
<td>76+</td>
<td>3 calendar days</td>
</tr>
<tr>
<td>41–60</td>
<td>51–75</td>
<td>2 calendar days</td>
</tr>
<tr>
<td>21–40</td>
<td>26–50</td>
<td>1 calendar day</td>
</tr>
<tr>
<td>1–20</td>
<td>1–25</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: Little League Baseball
STOP Sports Injuries

SOFTBALL INJURY PREVENTION

Softball injuries in young athletes are on the rise and nearly as frequent as baseball injuries, but they generally result in less time lost to competition. These injuries most commonly involve the back, shoulder, forearm, wrist, and hand. Pitchers are not more prone to injury than position players; catchers and infielders have similar injury rates. However, pitcher injuries differ from position player injuries because pitchers use a windmill motion that places unique demands on the back, neck, shoulder, forearm, and wrist.

WHAT ARE THE MOST COMMON OVERUSE INJURIES IN SOFTBALL?

For pitchers, the most common overuse injuries are shoulder tendinitis (inflammation of the tendon), back or neck pain, and elbow, forearm, and wrist tendinitis. For catchers, back and knee problems in addition to overhead throwing shoulder problems are the most common. For other position players, overhead shoulder and sometimes elbow problems predominate.

MAXIMUM PITCH COUNTS

<table>
<thead>
<tr>
<th>Age</th>
<th>Pitches/Game</th>
<th>Pitches/Day Days 1 &amp; 2</th>
<th>Pitches/Day Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8–10</td>
<td>50</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>10–12</td>
<td>65</td>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>13–14</td>
<td>80</td>
<td>115</td>
<td>80</td>
</tr>
<tr>
<td>15–over</td>
<td>100</td>
<td>140</td>
<td>100</td>
</tr>
</tbody>
</table>

REST PERIODS

Once girls begin to play competitively, they often play two games per day on two or three consecutive days. Two days of rest for pitchers is essential to prevent injuries. Additional guidelines include:

- Girls < 12 years - only 2 days of consecutive pitching
- Girls > 13 years - only 3 days of consecutive pitching

Rest means no live pitches, including batting practice. Pitchers may need to ‘loosen up’ with a flexibility routine on the second rest day and can participate in hitting and field drills.
The pitcher should never play what other position?
Case #4

- A 15 y/o female basketball player comes to your office with a large, swollen right knee
- She injured the knee last night during basketball practice
- She remembers a “pop” and has had difficulty walking due to pain and the large amount of swelling
Acute Traumatic Knee Effusions

- High risk for pathology!!
- Exam very difficult initially due to guarding
- Must be re-examined in 3-5 days for optimal exam
- Most are eventually diagnosed with either an ACL tear, patella dislocation, osteochondral injury, or fracture
Ligamentous injuries

- More recognized in teenage athletes (rare before 11)
- ACL & PCL intra-articular so expect acute traumatic effusion
- Females risk > male
- MRI not a substitute for good exam and best used as a pre-operative tool!
- ACL repair NOT URGENT!
The ankle is the most commonly injured joint by student-athletes.

One study found the amount of money spent diagnosing and rehabilitating ankle injuries was comparable to the amount spent on coronary artery bypass surgery.
Ankle Fractures

- The **SH I of the distal fibula** - the “ankle sprain of the immature skeleton”
- Clinical diagnosis! Tenderness over the physis and mild soft tissue swelling
- X-rays usually normal except for soft tissue swelling
- Excellent prognosis & low risk
Ankle Injuries with Foot Pain

- Avulsion fractures of the 5th metatarsal
- Caused by pulling of the peroneus brevis
- Ask them to point directly to the pain!
Ankle Sprain Management

- Air stirrup or ASO
- Encourage ambulation
- NSAIDs
- Encourage ROM
- Grade III (rare) – rigid stirrup splint
- Proper take-home instructions
Discharge Instructions

- 80% incomplete & 50% lack any follow-up
- Think of your favorite radio-station...PRICE-FM

- P = protection
- R = rest
- I = ice
- C = compression & cast/splint care
- E = elevation
- F = follow-up
- M = medications & mobility
Returning to Play After an Injury

- Gradual return
- Pain-free with range of motion
- Minimal of 85-90% of baseline
- Clear understanding of risks
- Must demonstrate ability to perform sports-specific functions
- Awareness of coaches/athletes/families
Pearls for Sports Injuries

- Be a detective!
  - Isolated Acute injury?
  - Acute injury with chronic complaints?
  - Chronic injury/pain?

- Functional return-to-play
  - Full range of motion without pain
  - Ability to perform necessary tasks for sport
Case #5

- 16 yo wrestler presents to your office c/o infected bruises after “skinning” himself up in match last week.
- He also reports mild malaise and some subjective fevers.
- He doesn’t know anyone else with similar symptoms...yet!
Herpes Gladiatorum

- Endemic among wrestlers and rugby players
  
  Herpes gladiatorum
  Herpes rugbiaforum

  - Herpes accounted for 39% of all skin infections

- Almost exclusively caused by HSV-1
Herpes Gladiatorum

- 15 Reported studies from 1964-2001

Prevalence
- High School 2.6 - 29%
- Collegiate 7.6 - 12.8%
- Division I 20 - 40%

*median prevalence 20%
Herpes Gladiatorum: Return to Play

- Must be on antivirals for at least 5 days
- No new lesions for 72 hrs before competition
- All lesions must be dried and covered with an adherent crust
- No systemic symptoms
What are your student athletes doing?
The nice thing about sports medicine is it allows us to take something kids are excited about (sports), and hopefully teach them about something they’re not always excited about...*their health*.

Vito Perriello, Jr, MD, FAAP
© 2011 Children’s Mercy Hospitals and Clinics. All Rights Reserved. • June 2011

Center for Sports Medicine

- Acute sports-related injuries
- Sports-related fractures
- Sports-related concussion
- Overuse Syndromes
- Sports-fellowship trained physicians
- RAPID Access appointments for acute injuries
- Scheduling Hotline (816) 701-HURT

Children's Mercy Hospitals & Clinics
Kansas City