Overuse Injuries in Children and Adolescents
Overuse Injury - Epidemiology

- **Adults:**
  - Overuse is seen in sport and occupation

- **Children:**
  - Increasing incidence due to
    - increased sport specialization
    - year round training
    - multisport participation

www.fisiokinesiterapia.biz
Definition of an Overuse Injury in Children & Adults

- Repetitive micro trauma to tissue, where the ability of the tissue to repair itself is outpaced by repetition of the insult.
  - e.g. Sever’s Apophysitis, Osgood-Schlatters
Overuse in Children (they are not little adults)

- Children have different tissues and issues than adults
  - **Tissue**
    - Children: thin bone, soft cartilage, open physes,
    - Adolescents: rapid growth, motor incoordination
  - **Issues**
    - Physiologically more sensitive to environment
    - External motivational forces – Parents, Coaches
Rapid Growth: Inflexibility

- Decreased flexibility may contribute to excessive stress mechanics at joint and phyes
- Especially muscles that cross 2 joints
  - Hamstrings, Gastrocs
Rapid Growth: Motor incoordination

- Poor joint proprioception – loose kinetic chain
Upper Extremity

Shoulder
- Distal clavicle osteolysis
- Glenohumeral instability
- Rotator Cuff Injury
- Labral injury/SLAP
- Little League Shoulder
  Proximal humerus physeal stress injury

Elbow
- Lateral:
  - Tennis Elbow
  - Parson’s Disease
  - Osteochondritis Dissecans
- Medial:
  - Epicondylitis (golfer’s elbow)
  - Apophysitis
  - Little Leaguers Elbow (Medial apophysitis)
  - MCL strain
- Posterior:
  - Olecranon apophysitis
  - Olecranon impingement
  - Triceps tendonitis

Hand & Wrist
- Distal Radius Physeal stress injury
- Wrist flexor/extensor tendonitis
- DeQuervain’s tendonitis
Lower Extremity

**Knee**
- Patello-femoral pain syndrome
- Sinding-Larsen-Johansson
  - Patellar apophysitis
- Runner’s Knee
  - ITB tendonitis
- Osgood-Schlatter Disease

**Leg**
- Shin Splints
  - Medial or anterior Tibia muscle insertion injury

**Pelvis**
- Iliac Apophysitis
- ITB tendonitis
- Iliopsoas tendonitis
  - Snapping hip
- Adductor tendonitis

**Foot & Ankle**
- Sever’s Disease
- Calcaneal Apophysitis
- Achilles Tendonitis
- Plantar Fasciitis
- Peroneal Tendonitis
History & Physical

- History of repetitive and prolonged activity
  - Pain
    - pain after activity
    - pain with activity which affects performance
    - pain at rest
- Physical
  - Generally tender on area of growth plate/bone
    - Requires x-ray
  - Try reproducing pain
History & Physical

First signs of overuse problems that adults should be aware of in younger children:
- Poor performance
- Fatigue
- Vague pain

Consider overtraining and burnout
General Treatment for Overuse Syndromes

- A long period of relative rest
  - weeks to months,
  - rehabilitation and adjustments of modifiable factors

- Modifiable risk factors include
  - improper technique
  - training errors
  - poorly fitting equipment including shoes,
  - muscle weakness and imbalance.
General Treatment for Overuse Syndromes

- Treatment and rehabilitation and return to play decisions should be guided by a team including the
  - physical therapist
  - musculoskeletal physician or PCP
  - parents
  - coach and
- the child or adolescent
Developing Tissues of Children are Susceptible to MSK Injury

- Bone
- Open Physis
- Articular cartilage
- Tendon-Bone junctions
Developing Tissues of Children are Susceptible to MSK Injury

- Bone
- Open Physis
- Articular cartilage
- Tendon-Bone junctions
Developing Tissues of Children are Susceptible to Injury

- Bone is thinner and more pliable
  - Buckle fractures
  - Plastic deformities
Developing Tissues of Children are Susceptible to MSK Injury

- Bone
- Open Physis
- Articular cartilage
- Tendon-Bone junctions
The Open Physis

- **2 types of stresses**
  - **Traction**
    - apophyses – Contributes to bone shape, not longitudinal growth
      - Tibial Tuberosity – Osgood Schlatter’s
      - Calcaneus – Sever’s Dz
  - **Pressure**
    - At end of long bones, contributes to longitudinal growth
      - Gymnast’s wrist
Open Physis

- Growth plate can be 2-5 times weaker than surrounding fibrous tissue (tendon, ligament, joint capsule)
Figure 4  Fifteen year old male football place kicker. (A) Frontal radiograph and (B) magnetic resonance image of right knee showing physeal widening of lateral aspect of distal femoral physis (arrow). (C) Frontal radiograph obtained three months after immobilisation showing near complete resolution of physeal widening. From Laor et al. Reprinted with permission from the American Journal of Roentgenology.
Open Physis Injury: Little Leaguer's Shoulder

- Avg age – 14, tenderness to palpation over the proximal and lateral humerus – physeal injury
- Hx - Seen mostly in pitchers, present after several (7) months of pain. Pain localizing to the proximal humerus during the act of throwing
- Radiographic widening of the proximal humeral physis on x-ray views with internal and external rotation (comparison films)
- Tx - rest from baseball throwing for an average of 3 months with gradual return
Prevention: Pitch counts

- **Pitch counts per day**
  - 17-18 years 105 pitches per day
  - 13-16 years 95 pitches per day
  - 11-12 years 85 pitches per day
  - 10 and under 75 pitches per day

- **Rest recommendations** (16 years and under)
  - 61 pitches or more in a day 3 days rest
  - 41-60 pitches in a day 2 days rest
  - 21-40 pitches in a day 1 days rest
  - 1-20 pitches in a day 0 days rest

- **Rest recommendations** 17-18 years 76 or more pitches in a day 3 days rest
  - 51-75 pitches in a day 2 days rest
  - 26-50 pitches in a day 1 days rest
  - 1-25 pitches in a day 0 days rest

www.Littleleague.org/media/pitch_count_publication.pdf
Open Physis Injury: Osgood-Schlatters

- Hx & Px– growing active child (10-15 y.o), tender Tibial Tuberosity, overuse or direct trauma (x-ray to r/o avulsion), tight quads, hams, adductors and ITB,

- Treatment
  - Rest – relative,
  - PT – stretches (4-5x/day), Muscle strengthening and balance, ice, heat, massage
  - Medications – NSAIDs,
  - Supports -
Open Physis Injury: Osgood-Schlatter's

- x-ray to rule out avulsion fracture
Open Physis Injury: Sinding-Larsen-Johansson

- Apophysitis of the distal pole of the patella
- Hx & Px– growing active child (10-15 y.o), tender distal pole, overuse or direct trauma (x-ray to r/o avulsion), tight quads, hams, adductors and ITB
- Treatment
  - Rest – relative,
  - PT – stretches (4-5x/day), Muscle strengthening and balance, ice, heat, massage
  - Medications – NSAIDs,
Open Physis Injury
Sever’s Apophysitis

Hx & Px – early adolescent, active, pain at heel with activity, tight calf (and other lower extremity) muscles, flat feet,

Mgmt
- Rest - relative
- PT - stretches (4-5x/day), ice, heat
- Medications - NSAIDs
- Supports – good shoes with heel and arch support
Open Physis Injury: Gymnast’s Wrist

- Compression of the distal radius growth plate
- Young gymnasts with chronic wrist pain over the distal radius
- Tx – prolonged rest
Open Physis Injury: Gymnast’s Wrist

- Premature closure of the radial growth plate, causing the radius to be shorter than the ulna (ulnar positive wrist)
  - Abnormal wrist mechanics and chronic pain
Developing Tissues of Children are Susceptible to MSK Injury

- Bone
- Open Physis
- Articular cartilage
- Tendon-Bone junctions
Developing Tissues of Children are Susceptible to Injury

- Articular cartilage – less resistant to repetitive microtrauma than adult cartilage
  - Osteochondritis Dessicans (OCD)
  - avascular necrosis (AVN)
Open Physis & Cartilage Injuries: Elbow tensile and compressive forces

- **Tension** (Medial)- traction load on the medial elbow structures.
  - accelerated growth of the epiphysis from repeated stimulation
    - Apophysitis, Avulsion, UCL laxity or rupture

- **Compression** (Lateral) – chronic compressive forces on capitellum
  - Panners Dz, OCD of capitellum
Open Physes & Cartilage Injuries: Lateral Elbow Panner’s Disease

- Compressive Forces:
  - osteochondrosis of the capitellum
  - younger than age 10 years
Open Physis Injuries: Medial Elbow
tensile forces

- Tension (Medial)- traction load on the medial elbow structures. accelerating growth from repeated stimulation of the epiphysis
  - Associated injuries – Apophysitis, Avulsion, UCL laxity or rupture
Open Physe Injuries: lateral elbow compression

- Same mechanism as Panner’s
- OCD – osteochondritis dissecans of capitellum
  - Seen in adolescents
Developing Tissues of Children are Susceptible to MSK Injury

- Bone
- Open Physis
- Articular cartilage
- Tendon-Bone junctions
Developing Tissues of Children are Susceptible to MSK Injury

- tendon-bone junctions
  - Same mechanism that causes muscle strain or tendon rupture in adult can cause growth plate injury or separation - avulsions
Tendon-Bone Junctions: Avulsion Fractures
Tendon-Bone Junctions: Avulsion Fractures

- Young adolescent
- Mechanism of acute stretch of hamstring with running, jumping, hurdling
- “Pop” heard
- Tx - Non-weightbearing
  - Crutches, donut
Tendon-Bone Junctions: Avulsion Fractures

- Prompt diagnosis to avoid chronic pain
Snapping Hip Syndrome

Iliopsoas tendon over femoral head and iliopectineal eminence.
Base of 5th Metatarsal

- Common area of overuse, basketball, runners
  - Lateral foot pain slowly increases over time
    - pain after activity
    - pain with activity which begins to affect performance and finally
    - pain at rest or acute Jones Fracture
Base of 5th Metatarsal

Normal apophysys, parallel to Metatarsal shaft
Overuse Injury

- Overuse injuries progress from:
  - pain after activity
  - pain with activity which affects performance
  - pain at rest
Overuse in Children (they are not little adults)

- Different tissues and issues in children than adults
  - Tissue
    - Children: thin bone, soft cartilage, open physes,
    - Adolescents: rapid growth, motor incoordination
  - Issues
    - Physiologically more sensitive to environment
    - External motivational forces – Parents, Coaches
General Treatment for Overuse Syndromes

- A long period of relative rest
  - weeks to months,
  - rehabilitation and adjustments of modifiable factors

- Modifiable risk factors include
  - improper technique
  - training errors
  - poorly fitting equipment including shoes,
  - muscle weakness and imbalance.
General Treatment for Overuse Syndromes

- Treatment and rehabilitation and return to play decisions should be guided by a team including the
  - physical therapist
  - musculoskeletal physician or PCP
  - parents
  - coach and
- the child or adolescent
Sports Specialization Training for Children

- Discouraged before adolescence
- Adverse Effects
  - overuse injuries (such as stress fractures)
  - over-training syndrome (physiologic burn out)
  - delayed menarche, amenorrhea,
  - disordered eating
  - injuries to growth plates (gymnast wrist)
  - depression, anxiety, conversion reactions

*Intensive Training and Sports Specialization in Young Athletes* Committee on Sports Medicine and Fitness *Pediatrics* 2000;106;154-157 recommendations based on committee opinion and/or expertise.
Burnout or Overtraining Syndrome

Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes

Joel S. Brenner, MD, MPH, and the Council on Sports Medicine and Fitness

"… a series of psychological, physiologic, and hormonal changes that result in decreased sports performance."
Burnout or Overtraining Syndrome: Symptoms

- fatigue, lack of enthusiasm about practice or competition, or difficulty with successfully completing usual routines
Burnout or Overtraining Syndrome: prevention guidelines

- Keep workouts interesting
  - age-appropriate games and training
  - keep practice fun

- Take 1 to 2 days off per week from organized or structured sports participation
  - To allow the body to rest
  - To participate in other activities.
Burnout or Overtraining Syndrome: prevention guidelines

- 2 to 3 months scheduled breaks from training and competition
  - focus on other activities and cross-training to prevent loss of skill or level of conditioning.

- Focus on wellness and teaching athletes to be in tune with their bodies
  - Look cues to slow down or alter their training methods.
### Pelvic Overuse Syndromes

<table>
<thead>
<tr>
<th>Pelvic Overuse Syndromes</th>
<th>History</th>
<th>Exam Findings</th>
<th>X-ray</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Illiac Apophysitis</strong></td>
<td>overuse history, especially running</td>
<td>Tenderness on iliac crest</td>
<td>x-rays usually normal</td>
<td>PT evaluation, ice, NSAIDs</td>
</tr>
<tr>
<td><strong>ITB tendonitis</strong></td>
<td>Patient points to outside of hip at greater trochanter as area of pain. May have a snapping or “hip popping out” history</td>
<td>+ Ober’s sign</td>
<td>Normal bony anatomy</td>
<td>Ice, NSAIDs, PT evaluation</td>
</tr>
<tr>
<td>≥ Greater trochanter bursitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Iliopsoas tendonitis</strong></td>
<td>History of deep snapping in groin. Overuse in dancers, runners</td>
<td>Patients may reproduce snap: while standing, have patient forward flex hip and rotate out to side</td>
<td>Normal hip and pelvic bony anatomy</td>
<td>NSAIDs, PT evaluation</td>
</tr>
<tr>
<td>≥ Snapping hip</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adductor tendonitis</strong></td>
<td>Overuse history of lower extremity involving adduction: running, cutting, skating</td>
<td>Increased tenderness at area of strain with adductor stretching – “doing the splits”</td>
<td>Normal anatomy. Acute injuries should have x-rays to rule out avulsion fractures.</td>
<td>NSAIDs, PT evaluation</td>
</tr>
</tbody>
</table>

* PT evaluation should include treatment of acute pain and dysfunction, evaluation of mechanics, prescription of appropriate stretches, balance and strength exercises, equipment/shoe wear evaluation and a maintenance program.
<table>
<thead>
<tr>
<th>Knee overuse syndromes</th>
<th>History</th>
<th>Exam Findings</th>
<th>X-ray (AP, outlet, axillary)</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>• Patello-femoral pain syndrome</strong></td>
<td>Anterior knee pain, dull radiation to popliteal area. Slow onset, Hurts with bending, going up/downstairs, after sitting long periods of time. Can ache at night. Occurs during period of rapid growth.</td>
<td>Poor quad tone. Tight quads, hams, ITB and adductors. Very tender p-f joint. Pain can be diffuse with joint line tenderness.</td>
<td>Sunrise view usually shows laterally tilted patellae, otherwise normal bony anatomy</td>
<td>Ice, PT evaluation *, NSAIDs, consider temporary bracing with neoprene sleeve or hinged brace</td>
</tr>
<tr>
<td><strong>• Sinding-Larsen-Johanssoon</strong></td>
<td>Anterior knee pain. Hx of knee overuse activity like running, jumping. Occurs during period of rapid growth.</td>
<td>Tight thigh musculature like in P-F Pain syndrome. Tender at inferior pole of patella</td>
<td>Apophysis of inferior pole of patella may have some irregularity</td>
<td>Ice, PT evaluation, NSAIDs, consider temporary bracing with neoprene sleeve or hinged brace</td>
</tr>
<tr>
<td><strong>• Runner’s Knee</strong></td>
<td>Pain on lateral knee just below joint line. Can come and go with activity. Dull to sharp bony ache. Hx of overuse of knee.</td>
<td>Tight ITB (+ Ober’s sign). May be tender at insertion of ITB on lateral tibial prominence (Gerty’s Tubercle).</td>
<td>Severe cases may mimick a medial meniscus injury. If no improvement with usual tx, an MRI can be performed to r/o meniscal injury</td>
<td>PT evaluation, NSAIDs,</td>
</tr>
<tr>
<td><strong>• Osgood-Schlatter Disease</strong></td>
<td>Anterior knee pain at Tibial Tubercle. Hx of knee overuse. Occurs during period of rapid growth.</td>
<td>Tight thigh musculature like in P-F Pain syndrome. Tender on Tibial tubercle – insertion point of patellar tendon</td>
<td>Apophysis of tibial tubercle may have some irregularity. Acute severe injury may show avulsion</td>
<td>Ice, PT evaluation, NSAIDs, Consider patellar tendon band</td>
</tr>
<tr>
<td><strong>Leg overuse syndrome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>• Shin Splints</strong></td>
<td>Pain up and down front of leg. Increased with running.</td>
<td>Tenderness up and down medial border of Tibia. Point tenderness could be stress fx</td>
<td>No bony abnormality. X-rays should be done to rule out stress fractures if clinically suspicious.</td>
<td>Ice, PT evaluation, NSAIDs,</td>
</tr>
<tr>
<td>Foot and ankle Overuse Syndromes</td>
<td>History</td>
<td>Exam Findings</td>
<td>X-ray</td>
<td>Treatment</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------</td>
<td>---------------</td>
<td>-------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Sever’s Disease</strong></td>
<td>Heel pain hurts with activity, better with rest. Can be bilateral. Associated with lots of running and jumping.</td>
<td>Tender heel at insertion of Achilles’ tendon. Tight calf musculature. Associated with flat feet, pronated heels</td>
<td>Possible irregularities of apophysis at calcaneus.</td>
<td>Ice, PT evaluation, NSAIDs, calf stretches, arch support, supportive footwear</td>
</tr>
<tr>
<td>o Calcaneal Apophysitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Achilles Tendonitis</strong></td>
<td>Similar to Sever’s dz. Pain in heel and lower leg.</td>
<td>Tender Achilles tendon. Tight calf muscles.</td>
<td>x-rays usually not necessary</td>
<td>Ice, PT evaluation, NSAIDs, calf stretches, arch support, supportive footwear, heel lift</td>
</tr>
<tr>
<td><strong>Plantar Fasciitis</strong></td>
<td>Pain on bottom of foot, especially with first steps in the morning. Overuse history. Poor foot support in shoes</td>
<td>with ankle maximally dorsiflexed, the Plantar Fascia will be tight and very tender when palpated. Associated with tight calf muscles, flat feet, high arches, pronated heels</td>
<td>X-rays usually not necessary</td>
<td>Ice, PT evaluation, NSAIDs, calf stretches, arch support, supportive footwear</td>
</tr>
<tr>
<td><strong>Peroneal Tendonitis</strong></td>
<td>Pain on lateral ankle. Overuse hx. Can be associated with ankle sprains. Subluxing peroneal tendons can “pop or snap”</td>
<td>Pain behind lateral malleolus up the peroneal tendons. Pain with resisted foot eversion.</td>
<td>X-rays usually normal but may show bone abnormalities from old injuries.</td>
<td>Ice, PT evaluation, NSAIDs,</td>
</tr>
<tr>
<td><strong>Base of 5th Metatarsal apophysitis</strong></td>
<td>Overuse hx. Pain on lateral side of foot, increased with running and jumping.</td>
<td>Pain at base of the 5th metatarsal where peroneus brevis inserts. Pain increased with resisted eversion.</td>
<td>X-rays should be done to look for stress (Jones) fractures in the metaphysis</td>
<td>Rest, Ice, PT evaluation, NSAIDs,</td>
</tr>
<tr>
<td><strong>Midfoot pain syndromes</strong></td>
<td>Overuse history, especially long distance running.</td>
<td>Pain in midfoot when twisting forefoot with one hand and holding calcaneus steady with the other. May have direct tenderness over tarsal with stress fractures</td>
<td>X-ray to rule out stress fractures of tarsals, especially navicular. Consider CT or MRI</td>
<td>Rest, PT evaluation, arch support, supportive footwear</td>
</tr>
<tr>
<td>o Midfoot sprain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Tarsal stress fractures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fore foot pain syndromes</strong></td>
<td>Overuse history, especially long distance running. Running with cutting may cause turf toe.</td>
<td>Pain in fore foot on metatarsals with stress fractures. 1st MTP tenderness with turf toe. Pain on metatarsal head with metatarsalgia</td>
<td>X-rays to look for stress fractures of metatarsals. Consider CT or MRI</td>
<td>Rest, PT evaluation, arch support, supportive footwear, metatarsal pad</td>
</tr>
<tr>
<td>Joint</td>
<td>History</td>
<td>Exam Findings</td>
<td>X-ray (AP, outlet, axillary)</td>
<td>Treatment</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>---------------</td>
<td>-----------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Shoulder</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rotator Cuff Injury</strong></td>
<td>Slow onset Deep shoulder pain Hurts at night Pain increased with use</td>
<td>Hawkin’s Sign Neer’s Sign Supraspinatus Sign</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Little League Shoulder</strong></td>
<td>Repetitive throwing Proximal arm pain</td>
<td>Pain over lateral shoulder</td>
<td>Widening of proximal humeral growth plate. Comparison views needed</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Glenohumeral Instability</strong></td>
<td>Subluxation or dislocation Joint laxity in other joints</td>
<td>Apprehension Test Sulcus Sign</td>
<td>Hill-Sachs or Bankart lesions with dislocations</td>
<td>P.T., surgical consult</td>
</tr>
<tr>
<td><strong>Distal Clavicle Osteolysis</strong></td>
<td>Pain on top of shoulder, young adult, weight lifting history</td>
<td>AC joint pain</td>
<td>Osteolysis of distal clavicle</td>
<td>Rest, ice, changes in weight lifting routine: more light weight-multiple reps</td>
</tr>
<tr>
<td><strong>Labral Injury/SLAP</strong></td>
<td>Painful “clunks or catching”</td>
<td>O’Briens Sign</td>
<td>Normal bony anatomy MRI with contrast to dx</td>
<td>Surgical consultation</td>
</tr>
<tr>
<td><strong>Elbow</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Panner’s disease</strong></td>
<td>Repetitive throwing</td>
<td>Tender lateral epicondyle</td>
<td>AVN of capitellum</td>
<td>Prolonged rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Lateral Epicondylitis</strong></td>
<td>Lateral elbow hurts with gripping, throwing, opening jars or doors, Pain increased with resisted hand and finger extension</td>
<td></td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Osteochondritis Dissecans</strong></td>
<td>Chronic elbow pain</td>
<td>Bony tenderness</td>
<td>Distal humerus, intra-articular areas of OCD</td>
<td>Surgical consultation</td>
</tr>
<tr>
<td><strong>Medial Epicondylitis</strong></td>
<td>Medial symptoms similar to lateral epicondylitis</td>
<td>Pain increased with resisted wrist flexion</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td>Condition</td>
<td>History</td>
<td>Exam Findings</td>
<td>X-ray (AP, outlet, axillary)</td>
<td>Treatment</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td><strong>Medial Epicondylitis</strong></td>
<td>Medial symptoms similar to lateral epicondylitis</td>
<td>Pain increased with resisted wrist flexion</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Little League Elbow (Medial Apophysitis)</strong></td>
<td>Repetitive throwing</td>
<td>Medial elbow tenderness</td>
<td>Widening of distal humerus medial apophysis</td>
<td>Rest for up to 2 months</td>
</tr>
<tr>
<td><strong>MCL strain</strong></td>
<td>Repetitive throwing or Acute valgus mechanism</td>
<td>+ Valgus stress test</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Olecranon Apophysitis</strong></td>
<td>Overuse of Triceps muscle, pain increased with pushing</td>
<td>Resisted extension of elbow increases pain at Olecranon Tip</td>
<td>Possible widening of apophysis</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Olecranon Impingement</strong></td>
<td>Hyperextension Injury or Repetitive hyperextension of elbow</td>
<td>Pain increased with hyperextension of elbow</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T. Elbow bracing to prevent hyperextension</td>
</tr>
<tr>
<td><strong>Triceps tendonitis</strong></td>
<td>Repetitive pushing or elbow extension</td>
<td>Triceps tendon tenderness at insertion on Olecranon Pain with resisted elbow extension</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
<tr>
<td><strong>Hand/Wrist</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distal Radius Physeal Stress Injury (Gymnast's Wrist)</strong></td>
<td>Repetitive landing on hands</td>
<td>Pain over distal radius</td>
<td>Widening of distal radial growth plate</td>
<td>Prolonged rest, ice, NSAIDs, P.T., consider repeat x-rays in 6 months</td>
</tr>
<tr>
<td><strong>DeQuervain’s Tenosynovitis</strong></td>
<td>Pain in “snuff box” area of wrist with use of thumb</td>
<td>+ Finklestein’s Maneuver</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T. thumb spica brace, consider steroid injection</td>
</tr>
<tr>
<td><strong>Wrist Flexor/Extensor tendonitis</strong></td>
<td>Wrist pain with use or movement</td>
<td>Pain on tendons with resisted flexion/extension</td>
<td>Normal bony anatomy</td>
<td>Rest, ice, NSAIDs P.T.</td>
</tr>
</tbody>
</table>