

#### Upper and Lower Extremity Injuries In Athletes: Treatment and Prevention

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GREENWICH STAMFORD HARRISON

## **Outline**

- Shoulder
  - Little Leaguer Shoulder
  - SLAP tear
- Elbow
  - Little Leaguer Elbow
  - UCL injuries
- Hip
  - Hip Pointer
  - Strains/Tendinitis
  - Labral Injury
- Knee
  - MCL injuries
  - ACL tears
  - Meniscal injuries
  - Tendinitis
- Ankle
  - Sprains





#### **SHOULDER INJURIES**

#### Little Leaguer's Shoulder

- Chronic physeal stress fracture
- Average age 14 years
- Due to repetitive rotational stress
- Shoulder pain while throwing
- Insidious onset
- Xray can be normal
  - physeal widening
  - metaphyseal fragmentation
- Rest from throwing for 3 months
- Favorable prognosis





## SLAP Tear

- Tear of superior labrum
- Rare in young throwers
- Mechanism
  - Internal Impingement
  - Biceps Traction
  - Peel-back
- MRI with contrast
- Rest, rehab







#### **ELBOW INJURIES**

#### Little Leaguer's Elbow

- Medial epicondylar apophysitis
- Approaching skeletal maturity
- Traction injury from throwing
- Pain during throwing
- Tenderness & swelling
- XR: widening of apophysis
- Treatment
  - Rest ± immobilization
  - Return to athletics at 12 weeks





### Ulnar Collateral Ligament Injury

- Rare among pediatric population
- Increasing in frequency
- Symptoms
  - Acute  $\rightarrow$  pop, swelling, pain
  - Chronic  $\rightarrow$  insidious pain
  - inability to compete
  - numbness / tingling
- XR: rarely positive
- MRI: more accurate





### Ulnar Collateral Ligament Injury

- Treatment
  - Conservative management
    - Rest, ice, NSAIDs, bracing
    - Core, hip, LE strengthening
    - Address motion deficits
    - Correct pitching mechanics
  - Sport, position change
  - Operative intervention
    - Repair versus reconstruction
    - Return to sport in 1 year





## Injury Prevention

- Strength & Conditioning
- Correct Mechanics
- Manage pitch count
- Manage pitch type
- Periodization
- Early Recognition





### Strength & Conditioning

- Pearls
  - Qualified supervision
  - Appropriate program design
  - Sensible progression
  - Careful selection of equipment
  - Limit heavy lifts
  - Allow adequate recovery time between sessions

#### Prevention

- Pitch counts
  - based on age
  - number of pitches / game
  - number of days rest
  - tournament play





Age Group	Pitches / day
17 – 18	105
13 – 16	95
11 – 12	85
9 - 10	75
7 – 8	50

## Prevention

• Pitch type

Age	Pitch Type
8 ± 2	Fastball
10 ± 3	Change-up
14 ± 2	Curveball
15 ± 3	Knuckleball
16 ± 2	Slider Forkball Splitter
17 ± 2	Screwball



Griewe et al. Clin Sports Med, 2010

## Prevention

- Strategies
  - Observe pitch counts and rest periods
  - No overhead throwing for 2-3 months per year
  - No competition for 4 months per year
  - No pitching > 100 innings per year
  - Avoid pitching for multiple overlapping teams
  - No pitcher / catcher combination
  - Encourage diverse sports participation
  - Avoid radar guns
  - Avoid showcases



#### **HIP INJURIES**

#### Hip Contusions ("Hip Pointer")

- Contusion=bruise
- Common in collision sports
  - Football/rugby
- Self limiting
  - Time, rest, ice, NSAIDS
- Consider extra hip padding





#### Hip Strain/Thigh Strain/Tendinitis

- Strain=stretching or tearing of tendon/muscle
  - Iliopsoas, abductor, quadriceps, hamstring
- Usually due to abrupt/intense activity without proper warm-up
- Esp common for muscle/tendons that cross two joints





### Hip Strain/Thigh Strain/Tendinitis

- Treatment
  - NSAIDs
  - Heat/Ice
  - Compression shorts/bandage
  - Gentle stretching/strengthening program
  - Appropriate rest
- Prevention
  - Flexibility training
  - Appropriate warm up



## Hip Labral Injuries

- Labrum= rim of cartilage surrounding hip socket
- Important roles:
  - Deepens socket (stability)
  - Shock absorption
  - Fluid distribution
- Can be injured due to:
  - Trauma
  - Underlying anatomy
    - Femoracetabular Impingement Syndrome (FAI)



### Hip Labral Injuries

- Treatment
  - Initial rest/activity modification
  - Anti-inflammatories
  - Rehab program
  - Injection
  - Imaging: MRI
  - Last resort:
    - Surgery (arthroscopic)





#### **KNEE INJURIES**

# MCL Sprains

- MCL=Medial collateral ligament
- Sprain=stretch or tearing of ligament
- Most common ligament injury of knee
- Due to inward applied force



### MCL Sprains (continued)

- Treatment:
  - Low grade: brace (if needed), work on motion/strength; Return to play typically in 1-4 weeks
  - High grade (complete tears):
    Brace/crutches for 4-6 weeks,
    RTP after physical therapy
  - Surgery: Rare
- Prevention
  - Strong quadriceps/hamstring
  - Prophylactic bracing
    - Studies are equivocal



## ACL Tears

- ACL=anterior cruciate ligament
- Most common ligament injury RESULTING in surgery
- Critical for knee stability in cutting/pivoting/landing sports
  - Basketball
  - Soccer
  - Football/rugby



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## ACL Tears

- Treatment
  - Surgery
    - ACL reconstruction
      - Replacement not repair
  - Nonop rare in young athletes unless partial tear with no CLINICAL instability
- Prevention
  - ACL prevention programs
    - 15 minutes before each practice
    - Can decrease risk of ACL tears by up to 50%



### ACL Prevention Program

- Warm-up (2 min)
  - Jog, shuttle run, backward run
- Strengthening (4min):
  - Walking lunges, Russian hamstring, single toe raises
- Plyometrics (4 min): jumping, landing, ballistic movements
  - Hop over cone, vertical jumps, scissors jumps
- Agility (4min): cutting, changing directions
  - Forward run/3 step decel, lateral diagonal runs
- Stretching (2 min): dynamic or static



## Meniscal Injuries

- Meniscus is shock absorber of knee
- Isolated meniscal tears uncommon in young athletes
- Treatment:
  - Small, peripheral tear→possible nonop
  - − Larger tears, mechanical symptoms, swelling → surgery



## Knee Tendinitis

- Very common, usually patellar tendinitis
  - Basketball, soccer, cross-country
- "Jumper's Knee"
- In athletes that are still growing→ growth plate inflammation
- Treatment:
  - Ice, NSAIDs, patellar strap, rehab program
- Prevention:
  - Maintain healthy schedule (don't overdo any activity, allow for rest)
  - Progressive training



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#### **ANKLE INJURIES**

## Ankle Sprains

- Most common ankle injury
- 2 types:
  - High ankle sprain
  - Low ankle sprain (conventional)
- Usually twisting mechanism



# Ankle Sprains

- Treatment
  - Almost always nonop
  - Initial immobilization/bracing (boot for more serious sprains)
  - NSAIDS, ice
  - Early rehab program
- Prevention
  - Strengthening/balance training/flexibility training
  - Orthotics (if needed)





#### **THANK YOU!**