Common Orthopedic Injuries in Children

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Objectives

Upon completion of this lecture, the nurse practitioner will be able to:
- Discuss various pediatric orthopedic injuries
- Review nonpharmacologic treatment options for the child with an orthopedic injury
- Review the pharmacologic treatment options for the child with an orthopedic injury

Finger Sprain/Injury
14 year old boy
- Playing basketball
- Ball is passed to him – ball hits him on the end of the finger
- Causes finger to bend backwards
- Immediate pain in the distal and proximal metacarpal joints

Sprains
- Sprains of the fingers are very common injuries among children, particularly athletes
- Sprain: partial tear of the supporting soft – tissue structures of the joints (collateral ligaments)
- Can also result in a dislocation of the joint (most common is the proximal interphalangeal joint)

Sprains of the Finger
- Thumb and little finger are the most frequently injured
- Also the most commonly fractured fingers
  - Distal phalanx accounts for 45 – 50% of the fractures of a finger
History

- Patients almost always report a history of trauma
  - Often times a result of getting hit with a ball at the end of the finger
- Patient may report an abnormal appearance of the finger/joint – a deformity developed immediately after the injury
  - Well-meaning friends often assist with reducing the finger (if dislocation occurred)

Physical Examination

- First inspection
  - Look for any obvious abnormalities
  - Edema
  - Ecchymosis
- Palpation
  - Begin at the MCP
  - Palpate lateral aspects of the phalange - working your way toward the end of the finger
  - Palpate on the lateral and medial aspect of the finger assessing for deformities or tenderness
Physical Examination

- ROM
  - Flexion
  - Extension
  - Abduction
  - Adduction

Special Maneuvers

- Apply medial and lateral stress to the PIP joint
- If the joint angulates, it is likely that a complete tear of the collateral ligament has occurred
- If there is no angulation – assume just a sprain has occurred

Applying Lateral Stress to the Joint
Additional Testing

- X-ray is often performed
  - This will rule-out an underlying fracture
  - Also can help with the diagnosis of a dislocation

Treatment Options

- Diagnosis
  - History and physical examination
  - X-ray
- Therapeutic
  - If dislocated, a closed reduction will be performed; digital block administered
  - Buddy taping or Splint can be applied
  - Usually left on for approximately 2 weeks
  - Should be removed to move the finger through ROM everyday

Splints

- Splints are placed on the hand in the position of function
- Never tape a finger straight – think about a finger that becomes frozen in that position
Buddy Taping/Splinting

Splinting in the Position of Function

Treatment Options

- Educational
  - Ice on/off – 20 minutes increments for the first 48 hours
  - May then switch to heat
  - NSAID’s for inflammation reduction
  - Elevate
  - Rest
  - Monitor for changes in color or sensation, change in ROM
Continued Pain or Limited ROM

- Occasionally, a corticosteroid injection will be administered into the finger
- Physical therapy / occupational therapy may prove beneficial for this individual

Shoulder Dislocation

14 year old young woman

- Skiing at Loon Mountain
- Falls onto right shoulder
- Immediate pain – decreased movement
- Shoulder looks funny – asymmetric
- Seen by healthcare provider in ER
Statistics

- Shoulder is the 3rd most commonly injured joint in sports/athletic activities
- Shoulder injury is most common in children and adolescents (individuals under 40 years of age)
  - After 40 – muscles and ligaments tighten up
- Also more common in women with poor muscular support of the shoulder
- Shoulder is the most mobile joint in the body
- Shoulder dislocation can occur as a result of 2 reasons: trauma or laxity of the joints
  - Children: dislocation is usually related to trauma

Anatomy of the Shoulder

Glenohumeral joint
- Ball and socket joint of the shoulder
- Humerus is the upper bone in the arm

Clavicle
- Attaches medially with the sternum and laterally with the acromion
- This is known as the acromioclavicular joint (best felt by shrugging the shoulder)
- Stabilizes the glenohumeral joint
History of a Shoulder Injury

- Symptom analysis
  - Including: arm dominance
  - Location
  - Intensity
  - Duration
  - Radiation
  - Mechanism of injury
  - What have they tried in the past to treat, if it has occurred before

Physical Examination

- Helpful to be able to look at the back/shoulders uncovered so that a comparison may be made
- Examine the shoulder first in the standing position
- Look for asymmetry
- Ask patient to locate area of pain before you begin moving/assessing the arm/shoulder

Range of Motion of Shoulder

- Flexion (move arms upward)
- Extension (move arms downward and behind back)
- Abduction
- Adduction
- Internal rotation
- External rotation
- Horizontal rotation
  - Shoulders oppose each other
Range of Motion

As patient is performing range of motion – you should observe for:
- Asymmetry
- Winging of the scapula
- Obvious grimacing
- Abnormal movements of the shoulder and surrounding bones/muscles

Specific tests for the Shoulder

Apprehension test
- Performed to assess instability of the shoulder
- Lay patient down
- Externally rotate shoulder so forearm is flat against bed
- Place your hand on the patients shoulder (posterior) just above the scapula
- Apply anterior pressure
- Can cause the joint to dislocate or slide anterior
- Patient will automatically guard if +

Apprehension Test
Relocation Test

- Same as apprehension test except:
- Now: hand is applied to front of the shoulder
- Pressure is applied posterior
- + relocation test: relief is obtained by applying this pressure

Shoulder Dislocation

- This occurs when the shoulder is forced beyond the limit of its normal range
  - Most often acute
  - Can be recurrent
- Humeral head displaces from the glenoid
- This can occur in varying degrees
- Most common: anteroinferior dislocations
Most Common: Anterior Glenohumeral Dislocation
- Accounts for 98% of dislocations
- Occurs as a result of extreme external rotation
- When this occurs, you will often see the humerus located in the anterior axilla
- 2 Different Causes:
  1. Direct posterior blow to the proximal humerus
     - Quarterback throwing a ball and hit it shoulder
  2. Horizontal abduction force on the humerus

Pathology of Dislocation
- Anterior capsule becomes stretched or torn
- Can also cause a small, avulsion fracture
- Can be accompanied by an injury to an axillary nerve, rotator cuff injury or a variety of different ligament issues
  - “Dead arm syndrome” – athletes who suffer this injury can occasionally report transient numbness and tingling after the injury

Dislocation of the Glenohumeral Joint

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Clinical Presentation

- Will hold shoulder/arm to side
- Will grip the forearm with the opposite hand
- Most will report a dislocation to you

Physical Examination Findings

- Space is present underneath the acromion where the humeral head should rest
- Anterior mass – this is the humeral head in the anterior axilla
- Check around the tip of the shoulder during the examination for diminished sensation: this can indicate that the axillary nerve has been injured

Remember....

- Shoulder dislocation can occur as a result of trauma but...
- Can also occur if the joints are lax
Many Children Have Lax Joints

- 60% of children and adults have lax joints
- In the shoulder, laxity, if it is present, should be unidirectional
- It is unusual to see multidirectional instability and therefore, when you see it – think pathology
  - I.e. trauma in past

So....

- Patients who have shoulder instability often report that their shoulder recurrently slips out of the joint
- First episode may have occurred as a result of an injury but not always
- Most common complaint: slips out when the arm is in a throwing position
- Often caused by laxity or tear of the glenoid labrum

Inferior Instability – Sulcus Sign

- A common form of instability is inferior instability
- Patient is in a sitting position with the arm at the side
- Pull down on the humerus
- + sign: discomfort just distal to the lateral acromion
- Will see an opening or gap at top of the humerus – ½ to ¾ inch will form
Sulcus Sign (Inferior Instability)

Treatment for Shoulder Dislocation

Acutely
- Apply ice 20 minutes on/20 minutes off
- Stabilize shoulder – can put into a sling until child evaluated in the emergency room
- Give standing order of ibuprofen or acetaminophen
- Refer to ER
- Reduction of dislocation will be performed
Adverse Outcomes

- Axillary nerve palsy
  - Check sensations before and after reductions
- May need general anesthesia if not successful

Aftercare Instructions

- Repeat x-ray is usually performed
- Immobilization of the arm will be performed (2 – 6 weeks is common)
- Physical therapy – increase muscle strengthening
  - Toning exercises to improve internal and external rotation
  - Isometric external rotation: take a theraband or bungee cord – hold in both hands with elbows at side – pull outward
  - Isometric internal rotation: take a bungee cord or band and tie on a closed door – put other end in hand – pull inward toward body

Aftercare Instructions

- Prevent shoulder from “freezing”
- No sports until FROM and no pain
- Children with recurrent dislocations:
  - Devices are available when child is involved in activities
  - Surgery may need to be performed
Injection May Be Performed

- For individuals with chronic or continued pain after the dislocation – dexamethasone injection into the shoulder may be performed

CT or MRI May Be Needed

- CT or MRI may eventually be needed; this will help to identify torn ligaments/muscles
  - MRI is usually performed for more chronic or recurrent injuries; best test
- Performed when patient fails to recover as expected or surgery is being considered
- Also performed in individuals with recurrent dislocations

Elbow Injuries
4 year old

- Walking with parents
- Wants parents to pick her up; both pull her up by her wrists/hands so she can jump and swing
- Develops acute pain in her right elbow and is now holding her right elbow at her side
- What happened??

Nursemaid’s Elbow

- Referred to as: “pulled elbow” because it occurs when a child’s elbow is pulled and partially dislocates. Also known as Radial head subluxation
- Because a young child’s bones and muscles are still developing, it typically takes very little force to pull the bones of the elbow partially out of place, making this injury very common.
- It occurs most often in children ages 1 to 4, but can happen any time from birth up to age 6 or 7 years old.

Anatomy

Annular ligament is often weak in children and can predispose them to subluxation
Treatment

- Can reset/reduce the elbow with a simple procedure
- NSAIDs
- ICE

Knee Injuries

Anatomy of the Knee

- Knee is the largest joint in the body
- Knee has no stability of its own
  - Depends upon ligaments, muscles, menisci and joint capsule for support
  - Most important ligaments of the knee
    - Medial and lateral collateral ligaments
    - Anterior and posterior cruciate ligaments
Knee Consists of...

- Distal femur, proximal tibia and the patella
- Rely on the ligaments, joint capsule and the menisci for support

Anatomy of the Knee

Remember....

- Ligaments:  
  - Connect bone/bone
- Tendons:  
  - Connect muscle to bone
Ligaments

- **4 major ligaments in the knee**
  - **Anterior cruciate ligament**
    - Attaches the medial border of the lateral femoral condyle to its insertion site on the medial tibial spine
    - This ligament prevents forward movement and rotation of the tibia on the femur
  - **Posterior cruciate ligament**
    - Attaches the lateral aspect of the medial femoral condyle to the posterior aspect of the tibia
    - Prevents posterior subluxation of the tibia on the femur

- **Medial collateral ligament**
  - Stabilizes the knee and prevents valgus (outward) stress

- **Lateral collateral ligament**
  - Runs from the lateral femoral condyle to the head of the fibula
  - Stabilizes the knee and prevents varus (inward) stress

Two Menisci

- **Medial meniscus**
  - Medial meniscus has less mobility than the lateral meniscus and is therefore more susceptible to tearing
  - This injury is rare in childhood but can occur but is common in the teenage years

- **Lateral meniscus**
  - Larger than the medial meniscus
  - Less susceptible to injury
History of Injury

- History related to the injury is crucial
- How did the pain start or occur?
- What makes it worse or better?
- Fever, chills, symptoms of infection?
- Popping or ripping sounds at the time of the injury?
  - ACL: often hear a pop; also will hear a pop with a traumatic meniscal injury
- Does knee lock or give way?
  - Meniscal injuries: tend to lock

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History can provide clues

- Injury: ligament or meniscus tear
- No injury: overuse
- Non-contact injury: ACL
- Contact injury: All ligaments should be suspected
- Pop: ACL
- How long before swelling occurred?
  - Within hours: ACL
  - Overnight: meniscus

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History can provide clues

- Squatting is limited: meniscus
- Where does it hurt?
  - Medial joint line: medial meniscus tear
  - Lateral joint line: lateral meniscus tear

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Physical Examination

- Gait
- Edema
- Bony Palpation
  - Medial aspect
  - Lateral aspect
  - Superior aspect
  - Inferior aspect

Anterior Cruciate Ligament Injury
Case Study
- 15 year old girl playing lacrosse
- Stops while playing defense – feet are firmly planted on the ground
- Gets hit from the side – causing knee to pivot or shift
- Immediate pain in the knee
- Unable to stand up or apply weight
- Heard a loud, readily audible pop
- Within 1 hour – knee significantly edematous

ACL Injury
- Anterior Cruciate ligament
  - Prevents anterior displacement of the tibia
  - Helps control rotation of the tibia on the femur
  - Very often occurs when the foot is planted solidly on the ground and the leg is twisted by the rotating body: lacrosse, soccer, basketball, skiing

ACL Injury
- Patient often hears a pop
- Unable to continue activities
- Acute hemarthrosis: blood entering the knee occurs within a few hours of the injury
Anterior Cruciate Ligament

Anterior Drawer Test
- Done to look for ACL tear
- Place the knee in 90 degrees of flexion
- Patient is supine
- Sit on the patient’s foot
- Place your hands around the proximal tibia
- Pull the tibia toward you or forward
- > 1cm movement: + anterior drawer
Lachman’s Test

- Most sensitive test for ACL tears
- Flex the knee to 20 degrees
- Stabilize the distal femur with 1 hand, pull forward on the proximal tibia with the other hand
- Must wait until muscles (hamstrings) relax
- + ACL tear: feel a movement of the tibia
- Compare this with uninjured joint

Posterior Cruciate Ligament Tear
13 year-old boy who presents after getting knocked down during a football game – was in a semi squatted position – hit from behind suddenly and significantly
Fell forward onto his right knee
Unable to bear weight or get up
Immediate pain and swelling of the knee

Posterior cruciate ligament
- Runs from the anterior aspect of the femur to the posterior aspect of the tibia
- Prevents backward displacement of the tibia on the femur
- Major stabilizer of the knee joint
- Very likely that if the PCL is torn - the ACL, meniscus or the collateral ligaments will also be damaged

PCL tears are often part of a more complex injury to the knee
- Often times – it will be present with a knee dislocation, vascular injury or significant joint instability
History Associated with a PCL Injury

- Usually have fallen on a flexed knee
- Or...sustained a significant blow to the anterior aspect of the knee while the knee is in a flexed position
  - I.e. MVA accidents – knee hits the dashboard

Additional History

- Edema is significant and immediate
  - Occurs within 3 hours of the injury
- Decreased ROM
- Inability to ambulate after the injury
- Unlikely to report locking or giving way

Physical Examination Findings

- Inspect knee
  - Usually see a large effusion
  - If knee is aspirated – hemarthrosis is common (when this is seen – it indicates a tear or fracture of an intraarticular structure)
  - Posterior Sag Sign
Posterior Sag Sign

- This is often positive
- Have child lay on the table
- Flex both knees into a 90 degree position
- Inspect the knees (looking from the sides of the legs) – compare uninjured side to the injured side
- Positive sign: Posterior sag of the injured knee

Physical Examination

- Palpate the various areas of the knee
- ROM
  - Flexion
  - Extension
- One additional special maneuver
  - Posterior Drawer Test
Posterior Drawer Test
- Performed to look for a PCL tear
- Patient lays supine
- Flex knee to a 90 degree angle
- Place pressure on the proximal tibia
- > 1cm sliding of the tibia (posteriorly) is considered a + test

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Posterior Drawer Sign

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Additional Treatment Options
- Diagnostic:
  - X-ray/R/O Avulsion Fracture
    - Sometimes the trauma can be so significant that it can cause an avulsion fracture – pulls a portion of the tibia off
  - MRI or Arthroscopy makes the diagnosis
- Therapeutic
  - Rest
  - Ice
  - Elevate
  - Compression
  - Crutches
  - NSAIDs
  - Physical therapy

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Meniscus Injury

- Meniscus: C-shaped disks in the knee
- Meniscus functions as a shock absorber
- Located between the femoral condyles and the tibial plateaus
  - Injury: Disruption of the fibrocartilage pads located between the femoral condyles and the tibial plateaus
  - Significant injury leads to limited ROM of the knee, locking of the knee, swelling or an effusion and premature OA

Meniscus

[Diagram of the knee with labels for menisci, collateral ligaments, and meniscofemoral ligaments]
Trauma

- Meniscal injuries are usually caused by a twisting injury to the knee

History

- Often a traumatic injury
- Complains of locking, popping and giving way
- Or...can have a sense that the knee is not moving normally
- Individual has a difficult time squatting
- Difficult time going up and down the stairs

Physical Examination

- Loss of ROM
- Inability to squat or kneel
- Palpable popping on the joint line
- Joint effusion
- Medial joint line tenderness
- Unable to perform duck-waddling maneuver
Specialty Testing

- McMurray Test
  - Although this test is very specific for a medial meniscal tear (true positive), it has a very high rate of false negatives
  - In other words, this will only be seen 10% of the time; when it is positive, it is highly likely that a meniscal tear has occurred. However, a negative test does not rule it out
  - Performing this test:
    - Ask the patient to lie supine with legs flat
    - Flex the knee completely
    -Externally rotate the tibia (relative to the femur) to trap the medial meniscus
    - A popping sensation under the examiners fingers is abnormal

- Apley's Compression Test
  - Also used to diagnose a meniscal injury
  - Procedure
    - Have patient lie prone with affected leg flexed to 90 degrees
    - Knee to patient’s thigh to stabilize it
    - Lean hard on the heel to compress the medial and lateral meniscus between the tibia and the femur
    - Rotate tibia internally and externally
    - If it produces pain, probable meniscal damage
    - If pain is produced on the medial side: medial meniscus injury
Apley's Compression Test

Thessaly Test

Procedure
- Weight-bearing
- 20 degree flexion
- Patient twists
- Look for it to recreate the pain
- 94% accuracy: meniscus tear

Treatment
- Ice
- NSAIDs
- Physical therapy
- Surgery
Medial Collateral Ligament Injury

Definition: irritation of the ligament that serves as the inner hinge ligament of a child’s knee

When present – often is present in conjunction with other injuries such as meniscal tear, anterior cruciate ligament tear, posterior cruciate ligament tear

Medial Collateral Ligament Strain

Collateral Ligaments
Medial Collateral Ligament Injuries

- Often graded
- First, second or third degree injury
  - First: ligaments are irritated and inflamed but are intact
  - Second: Partial tear
  - Third degree: Complete tear and gross instability of the knee

History

- Commonly occurs with a valgus force to the knee (abduction) without any rotation
- An example of this – football clipping injury – hit from the right/posterior side
- Most are able to ambulate after this injury provided that there is no other significant injury

Swelling
Stiffness
Tenderness medially
Patient reports difficulty walking, pivoting and twisting
Instability is infrequently reported
Physical Examination
- Always helpful to examine the normal knee first
- Again – same inspection, palpation, ROM as previous knee injuries
- Apply medial stress to the knee
  - A joint space opening of less than 5 mm is considered a grade I tear
  - Grade III: opening of 10 mm or more

Additional Testing
- X-rays of the knee are usually not necessary for the diagnosis
- Avulsion fractures with this injury are unusual
- MRI – needed when additional injuries are suspected
  - This is usually done with a 2nd or 3rd degree as it is likely that additional damage to the meniscus or the ACL is present

Treatments
- Goal of treatment is to allow the ligament to reattach and to strengthen the muscles and ligaments of the knee
- Also, must prevent re-injury
Treatments

- Immobilization of the knee is common with this particular injury
  - Velcro straight-leg knee immobilizer should be worn continuously throughout the day
- Crutches recommended
  - This is recommended for at least the first 7 days after the injury
- Ice: first 48 hours; on and off
  - Apply to the medial joint line

NSAID's

- Child should sleep with the leg straight if possible
- Restrict activities for the first 2 – 4 weeks after the injury
- Physical therapy

Physical Therapy and Home Exercises

- These are often begun about 7 – 10 days after the initial injury
- Perform those exercises which strengthen the supporting structures of the knee
- Straight – leg raising exercises are the most common
  - Knee should be completely straight when performing these as any flexion or deviation can put undue stress on the ligament
Prognosis

- First degree sprains: heal completely 90% of the time
- Healing may take 1 -2 months
- Second degree – less predictable
- Third degree – surgery is usually performed

Ankle Sprain/Injury

Case Study

- 11 year old female who is walking out of a store; doesn’t see a sidewalk and steps off - lands on the outside of her right ankle and foot
- Ankle/foot invert
- Immediate pain and swelling on lateral aspect of ankle
- Difficult time ambulating
Ankle Sprains or Injuries

- Ankle sprains/injuries are the most common musculoskeletal injuries
- Approximately 25,000 people sprain an ankle every day
- Although most sprains are simple and will resolve uneventfully, 40% of patients have residual symptoms
- Lateral collateral ligament is the most often injured (85% of the injuries)
- Injuries to the distal fibula or tibia occur with 5% of all ankle sprains

Pathophysiology

- An ankle sprain is a partial tear or significant stretching of the ligaments of the ankle joint
- Depending upon mechanism of injury – different ligaments are involved
- Most common injury: inversion
  - Lateral collateral ligament is made up of 3 bands: anterior and posterior talofibular ligaments and the calcaneal fibular ligament
  - 1 or all 3 of these “bands” can be injured

Anatomy of the Ankle

[Diagram of the ankle showing ligaments and bones]
Different Classifications
- Acute
- Recurrent
- Chronic

Three Grades of Acute Ankle Sprains
- Grade I
  - Limited to the anterior talofibular ligament (ATFL)
  - No ankle instability
- Grade II
  - Involves both the ATFL and the calcaneal fibular ligament (CFL)
  - Mild laxity of 1 or both ligaments
- Grade III
  - Involves both ligaments
  - Significant injury and significant instability

Symptoms
- Pain
- Swelling
- Bruising
- Weakness of the ankle
- Instability of the ankle
- Decreased range of motion
  - Many report feeling a “pop” followed by swelling and inability to walk
Physical Examination Findings
- Tenderness inferior and anterior to the lateral malleolus
- Edema
- Bruising: same location
- Pain worsened by inversion of the foot
- Pain is usually not worsened by plantar flexion or by eversion
- Decreased ROM
- Ankle instability

Watch for…
- Tenderness at the base of the 5th metatarsal – this is the location of the lateral collateral ligament insertion
  - May indicate an avulsion fracture
  - Heals in an average of 4.5 weeks
  - No difference in healing between short cast or a healing shoe

Also…
- Need to watch for tenderness of the talus
- Ankle inversion injury: can cause a fracture of the lateral aspect of the talus
Anterior Drawer Test of the Ankle
- This tests for ATFL ligamentous instability
- Put the ankle joint in a neutral position
- Then...pull the ankle anteriorly with slight medial rotation
- Positive Anterior Drawer test: forward subluxation of the ankle

Talar Tilt Maneuver
- Place an inversion stress on the heel of the foot with the foot in a plantar flexion
  - Instability/subluxation of the joint indicates: ATFL ligament instability
- Now: repeat this same maneuver with the foot in a neutral position or dorsiflexion
  - Instability/subluxation of the joint indicates: CFL instability
Talar Tilt Maneuver

Additional Sign
  Talar Knock Sign
  - Rocking the ankle back and forth may produce a knocking – or Talar Knock sign
  - This indicates that a separation has occurred between the tibia and fibula (in the interosseous membrane)

Diagnosis
  History and physical examination
  X-rays: most are normal
  - May report an effusion
  - R/O: fracture of the fibula, talus or calcaneus
Ottawa Ankle Rules

Ankle X-ray is only required if there is any pain in the malleolar zone and any one of the following:
- Bone tenderness along the distal 6 cm of the posterior edge of the tibia or tip of the medial malleolus, OR
- Bone tenderness along the distal 6 cm of the posterior edge of the fibula or tip of the lateral malleolus, OR
- An inability to bear weight both immediately and in the emergency department for four steps.

Ottawa Foot Rules

Any pain in the midfoot zone and any one of the following:
- Bone tenderness at the base of the fifth metatarsal (for foot injuries), OR
- Bone tenderness at the navicular bone (for foot injuries), OR
- An inability to bear weight both immediately and in the emergency department for four steps

Ottawa Rules

Use in children > 6 years of age
96-100% sensitive (True positive)
Moderate specificity (true negative)
Reduces X-rays by 36%
Treatment Goals

- Allow the ligaments to heal
  - Ligaments reattach themselves to the insertion sites
  - Strengthening of the ligaments
  - Prevent recurrent sprains
  - Remember...the ligaments are very weak and subject to recurrent injury

Pharmacologic Therapy

- NSAIDs can be very helpful
  - Decreases inflammation if taken in correct amounts
  - Also helps with the pain

Nonpharmacologic Treatment Options

- Limited weight bearing
  - Crutches
  - Appropriate fitting is essential
- Immobilization
  - ACE wrap
  - Air cast
  - Boot
  - Short-leg walking cast
Immobilization

- Immobilization is very important as there is a 10 – 20% recurrent ankle sprain rate
- This should be performed for at least the first 1 week

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Grade I Treatment

- Ankle brace and ice
- Immediate weight bearing is fine as are non-weight bearing exercises such as bicycling
- Discontinue brace in 1 week - 1 month

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Week 1 - 3

- Patient should begin gentle stretching exercises beginning first with dorsiflexion and plantar flexion
- Begin toning exercises once flexibility is improved
- Advise patient to wear high-top shoes
- Avoid basketball, running, aerobic activities
  - These are called stop-and-go sports
  - Increased risk of re-injury
  - Can take months for this injury to completely heal

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Grade II Treatment

- Protected weight bearing
- Lateral stabilizing ankle brace
- Can begin non-weight bearing exercises after 7 days
- Weight bearing exercise: may resume after 2 – 3 weeks

Grade III Treatment

- Immobilized with a removable walking cast for approximately 3 – 4 weeks
- This is also followed with physical therapy

Physical Therapy

- Can be very helpful
- This is usually initiated after the acute phase; once swelling is decreased
  - Goal: strengthen ligaments
Prognosis

- Majority of ankle sprains heal uneventfully
- Recurrent ankle sprain occurs in approximately 10 – 20% of the patients
- Inadequate healing can occur if the child does not observe the activity limitations recommended
- 2% of ankle sprains require surgical intervention

When is Surgery Considered?

- Most ligamentous injuries will heal on their own; even Grade III
- Even Grade I ankle sprains can result in chronic pain if not treated properly so...our best defense against surgical intervention is appropriate treatment
- Recurrent ankle sprains that occur despite physical therapy and bracing
  - Brostrom procedure is the procedure of choice
  - ATFL and CFL are cut and reattached at the correct insertion site

Thank You!!!

I would be happy to entertain any questions
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