Honing Down Your Extremity Structural Examination

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Disclosure Information

- We have nothing to disclose
Outline

- Knee
- Ankle/Lower leg
- Elbow
Learning Objectives

• Identify common orthopedic musculoskeletal injuries
• Discuss an approach to history taking for musculoskeletal injuries
• Practice musculoskeletal examination skills
Common injuries

- Knee
- Ankle
- Lower leg
- Elbow
History

- Age
- Environment
- Sport/activity
- MOI
- Competition level of athlete
Physical Examination

- Inspection/palpation
- ROM
- Strength
- Stability/Special testing
Knee pain

- 54% athletes have knee pain yearly
- 1 in 2 will develop knee OA by age 85
- 2 in 3 obese: symptomatic knee OA
- 44% OA: report no physical activity
- Arthritis #1 cause disability in US
- Prior injuries
- Mechanism
- Feel a pop or tear?
- Able to continue playing?
- When did swelling develop?
- Feels unstable? Buckling?
- Catching? Locking?
- What treatments have they tried?
- What workup have they had?
Knee differential

- PFS/PT/Patellar subluxation/Overuse
- Quad/hamstring
- Contusion/fracture
- Meniscus
- Ligament
- Infectious/Rheum/Secondary gain

--- Plans/recommendations
Knee imaging

- Plain films
- MRI
  - Effusion
  - Fracture
  - Laxity
Knee exam

- Inspection/Palpation
- ROM/strength
- Stability
- Special tests/functional
Practice Knee Exam
Ankle physical examination
PROM, Strength testing
Stability, proximal fibula
Sprain, physis
Passive external rotation
Practice Ankle Exam
- discuss lower leg injuries
Ankle injuries

- 30% sports injuries
- Ligament > fracture adults
- Dorsiflexion offers stability
Syndesmosis and Ligaments
Distal fibular fracture

- Inversion
- Stable
Shin splints

- Medial tibial stress syndrome
- History/MOI: often worse after activity. repetitive stress, assoc with poor calf flexibility
- Exam: diffuse tenderness
Compartment syndrome

- Increased intra-compartmental pressure
  - Normal <10 mm Hg
  - 20 mm Hg = refer (30-40 mm Hg = fasciotomy)

- DVT
  - Calf tenderness, clinical suspicion, Wells criteria, Homan’s sign, d-dimer, ultrasound
Calf strain/Achilles

- MOI: sudden dorsiflexion
- Thompson test
Pediatric - Normal plain film
Toddler fracture

- 9m to 3y
- Oblique, lower 1/3
- MOI: torsion
- Initial films may be neg
- 3 week cast
Lower leg management

- Splinting
- Ortho referral
- Stockinette
- Web roll
- Posterior/sugar
  tong
- Elastic wrap
Elbow
Strength testing
Incorrect
Practice Elbow Exam
- discuss elbow injuries
Supracondylar Fractures

- 60% of pediatric elbow fractures
- Fall on an outstretched hand, 90% extended elbow
- Significant potential for neurovascular compromise
- Elbow effusions, decreased ROM and pain are commonly seen
- Median nerve
  - The median nerve is the most commonly injured nerve in supracondylar fractures. Median nerve injury will result in a weak "OK" sign or lack of distal interphalangeal flexion when making an "OK" sign.
- Radial nerve
  - Injury results in weakness of wrist extension, hand supination, and thumb extension ("Thumbs up" sign)
  - Altered sensation is found in the dorsal web space between the thumb and index finger
- Ulnar nerve
  - Injury causes weakness of wrist flexion and adduction, finger spread, and flexion of the distal phalanx of the fifth digit.
  - Ask the patient to firmly hold a piece of paper between the third and fourth digits.
Elbow plain films

- AP, lateral views
Plain films

- Posterior- sail sign
- Anterior humeral line (AHL) should run through the anterior cortex of the humerus and intersect the capitellum in its middle 1/3
Type I – Nondisplaced. AHL intersects the capitellum, an intact olecranon fossa, no medial or lateral displacement, no medial column collapse

Type II – Extends but does not completely transect with some cortical contact. AHL does not intersect middle 1/3 capitellum

Type III – Has a circumferential break in the cortex with displacement of fracture fragments
Management

- Stable or Unstable
- Stable closed fractures
  - Discharged home in a double sugar tong or posterior arm splint with orthopedic follow up within 1 week
Elbow Dislocation

- 2nd most common joint
- Posterior>>>Anterior
- Ulnar nerve can be damaged
Reduction of posterior elbow dislocation

- Stabilize humerus, add longitudinal traction to the forearm
Lateral epicondylitis

- ECRB
- Most common cause of elbow pain
- Rest, ice, counterforce strap
- Injection/fenestration
Medial epicondylitis

- Flexor carpi ulnaris/pronator teres
- Overuse
- Less common, treatment similar to lateral epicondylitis
Elbow immobilization

- Splinting
- Sling


Young GS. Reduction of common joint dislocations and subluxations. In: Textbook of Pediatric Emergency Procedures, Henretig FM, King C (Eds), Williams & Wilkins, Baltimore 1997.


Thank you