# Honing Down Your Extremity Structural Examination

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JANUARY 28, 2018

# Disclosure Information

We have nothing to disclose

# Outline



# 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

# 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

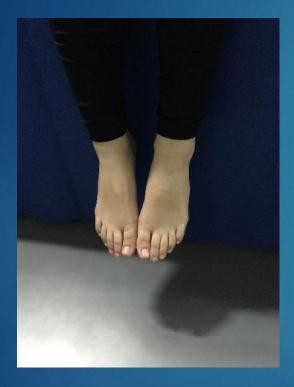


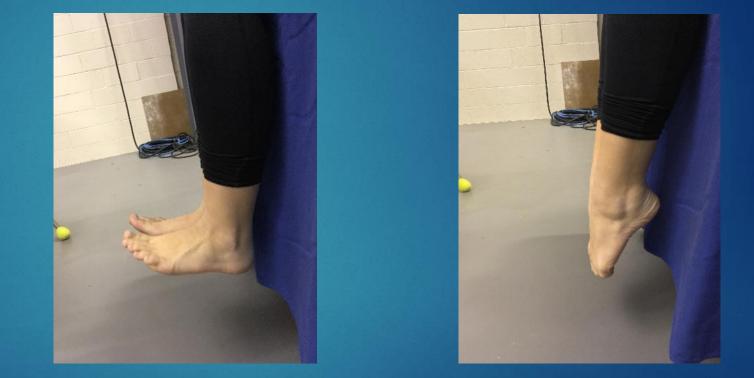
Special tests/functional

### Practice Knee Exam

# Ankle and Lower Leg

# Ankle physical examination





# PROM, Strength testing







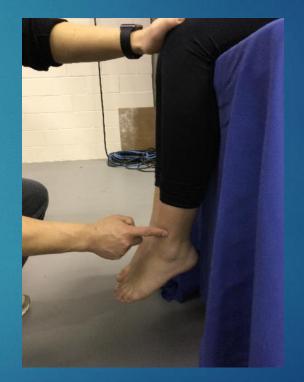
# Stability, proximal fibula



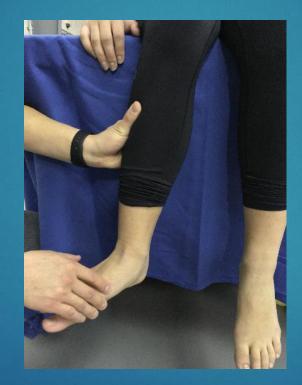


# Sprain, physis





# 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</p>
- 20 mm Hg= refer (30-40 mm Hg= fasciotomy)

#### DVT

Calf tenderness, clinical suspicion, Wells criteria, Homan's sign, ddimer, 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

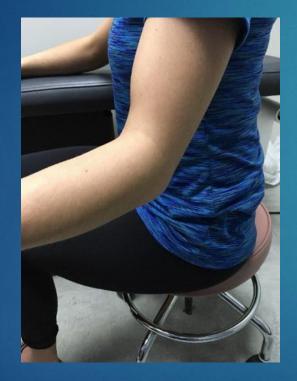
- Splinting
- Ortho referral

- Stockinette
- ► Web roll
- Posterior/sugar tong
- Elastic wrap









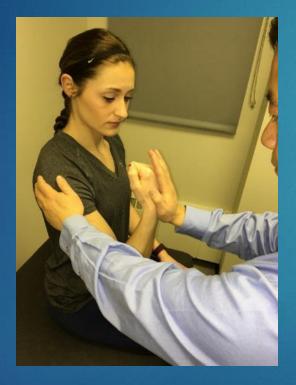








## Strength testing





## 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**

- 2<sup>nd</sup> 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

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