Orthopedic Sports Medicine
Physical Examination Workshop

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Workshop Objectives

- Review anatomy of the shoulder, elbow, knee and ankle
- Review disorders associated with the shoulder, elbow, knee and ankle
- Apply specialty tests to specific orthopedic / sports disorders
- Create high performance teams
- Practice specialty physical exam tests
Sports Medicine Examination

Shoulder
- Impingement
- Rotator Cuff
- SLAP Lesion
- Instability
- AC Joint Injury

Elbow
- UCL Injury
- Lateral Epicondylitis
- Medial Epicondylitis

Knee
- Ligament Injury: ACL, PCL, MCL, LCL
- Meniscus Injury
- Patellofemoral: Chondromalacia, Dislocation

Ankle
- Ligament Instability: Medial and Lateral
- Syndesmosis
- Achilles Tendon Tear
Components of Physical Examination

- Inspection
- Palpation
- Range of Motion
- Strength Against Resistance
- Specialty Tests
Shoulder
Shoulder

- Trapezius
- Clavipectoral triangle
- Deltoid
- Pectoralis major
- Clavicle
- Acromion
- Coracoid
- Spine of scapula
- Acromion
- Deltoid
- Teres major
- Medial border of scapula
- Latissimus dorsi
Range of Motion

- **Forward flexion**: 160 - 180°
- **Extension**: 40 - 60°
- **Abduction**: 180°
- **Adduction**: 45°
- **Internal rotation**: 60 - 90°
- **External rotation**: 80 - 90°

**Apley Scratch Test**
General Strength Testing

- Flexion
- Extension
- Abduction
- Adduction
Rotator Cuff Strength Testing

**External Rotation**
- Arms at side, elbow flexed to 90 degrees, externally rotate arms against resistance
- Infraspinatus and Teres minor

**Internal Rotation**
- Arms at side, elbow flexed to 90 degrees, internally rotate arms against resistance
- Subscapularis

**Lift-Off Test**
- Arm internally rotated, push off back against resistance
- Subscapularis

**Empty Can Test**
- Arms out straight, elbow locked, thumbs down, arm at 45 degrees in scapular plane, resist downward pressure
- Supraspinatus
Shoulder Specialty Test

Impingement Signs
- Neer’s
- Hawkin’s

Rotator Cuff
- Drop Arm
- Empty Can

SLAP Lesions
- Speed’s
- O’Brien’s

Instability
- Sulcus Sign
- Apprehension
- Relocation

Biceps Tendonitis
- Yergason

AC joint
- Cross-Arm Adduction
Impingement Signs

Neer’s

Hawkin’s
Rotator Cuff Tests

- Drop Arm Test
- Empty Can Sign
Practice

- ROM
- SAR
- Neer’s
- Hawkin’s
- Drop Arm Test
- Empty Can Sign
SLAP Lesions

Speed’s Test

O’Brien’s Test
Instability

Sulcus Sign

Apprehension

Relocation
Biceps

Yergason’s Test
AC Joint

Cross-Arm Adduction
Practice

- Speed’s Test
- O’Brien’s Test
- Sulcus Sign
- Apprehension
  - Anterior, Posterior, Inferior
- Relocation
- Yergason’s Test
- Cross-Arm Adduction
Elbow
Elbow ROM

Figure 3. Range of motion at elbow joint
(Source: American Academy of Orthopaedic Surgeons)
Elbow Strength Testing

- Flexion
- Extension
- Pronation
- Supination
Elbow Specialty Test

Ulnar Collateral Ligament (UCL)
- Palpable Tenderness
- Valgus Stress
- Milking Maneuver

Lateral Epicondylitis
- Palpable Tenderness
- Extension of Wrist Against Resistance
- Supination of Forearm Against Resistance

Medial Epicondylitis
- Palpable Tenderness
- Flexion of Wrist Against Resistance
- Pronation of Forearm Against Resistance
Ulnar Collateral Ligament

Tenderness over medial elbow at UCL attachment

Laxity on valgus stress of elbow

Milking Maneuver
Lateral Epicondylitis

- Tenderness at attachment of ECRB
- Pain with extension of wrist against resistance
- Pain with supination against resistance
Medial Epicondylitis

Tenderness at common flexors just anterior to medial epicondyle

Pain with flexion of wrist against resistance

Pain with pronation against resistance
Practice

- ROM
- SAR
- Palpation
- Valgus Stress
- Milking Maneuver
- Resisted Extension and Flexion of Wrist
- Resisted Supination and Pronation of Forearm
Knee Ligament Specialty Test

- Anterior Cruciate Ligament
  - Anterior Lachman
  - Anterior Drawer
  - Pivot Shift

- Posterior Cruciate Ligament
  - Posterior Sag
  - Posterior Drawer

- Lateral Collateral Ligament
  - Point Tenderness
  - Varus Stress

- Medial Collateral Ligament
  - Point Tenderness
  - Valgus Stress
Knee Specialty Tests

Meniscus
- Joint Line Tenderness
- McMurray’s
- Apley’s Grind

Patellofemoral Joint
- Retinacular Tenderness
- Patella Compression
- Patella Apprehension
ACL Specialty Tests

Anterior Lachman

Anterior Drawer

Pivot Shift
PCL Specialty Tests

Posterior Sag

Posterior Drawer
MCL & LCL Specialty Tests

MCL Valgus Stress

LCL Varus Stress
Practice

ROM
SAR
Palpation
Anterior Lachman
Anterior Drawer
Pivot Shift
Posterior Sag
Posterior Drawer
Varus Stress
Valgus Stress
Meniscus Specialty Test

McMurray's

Apley's Grind
McMurray’s Test

1. Extend the leg fully and adduct the foot at the ankle.
2. Flex the knee to 90 degrees and simultaneously invert the foot at the ankle.
3. Adduct the foot at the ankle while extending the knee.
4. Flex the knee to 90 degrees and simultaneously evert the foot at the ankle.
Patellofemoral Exam

Retinacular Tenderness

Patella Compression

Patella Apprehension
Practice

- Palpate Joint Line
- Apley’s Grind Test
- McMurray’s Test
- Palpate Retinaculum
- Patella Compression
- Patella Apprehension
Ankle

![Ankle Ligaments Diagram](image)

- **Ankle Ligaments**
  - Lateral view (outside of ankle)
  - Fibula (outer bone)
  - Talus
  - Anterior talofibular ligament
  - Posterior talofibular ligament
  - Calcaneofibular ligament
- **Sprained ankle**
  - Torn ligaments are common injuries in basketball.
  - Tibia (shinbone)
  - Calcaneus (heel bone)
- **Medial view (inside of ankle)**
  - Deltoid (medial) ligament of ankle
  - Posterior tibiotarsal ligament
  - Tibiocalcaneal ligament
  - Anterior tibiotarsal ligament
  - Tubioastragaline ligament
- **Lateral ligament of the ankle**
  - Tibia (shinbone)
  - Achilles tendon (cut)

Fig. 1
Ankle ROM
Ankle Specialty Tests

**Lateral Ligament Instability**
- Talar Tilt
- Anterior Drawer

**Medial Ligament Instability**
- Dorsiflexion of foot and eversion
- Anterior drawer

** Syndesmosis**
- Tibia-Fibula Squeeze Test
- External Rotation

**Achilles Tear**
- Thompson Test
Lateral Ligament Instability

Talar Tilt

Anterior Drawer
Medial Ligament Instability

Dorsi-flexion and eversion of ankle

Anterior drawer
Syndesmosis

Tibia-Fibula Squeeze

External Rotation
Achilles Tendon Tear

Thompson Test
Practice

- ROM
- SAR
- Palpation
- Talar Tilt
- Anterior Drawer
- Dorsi Flexion with Eversion
- Tibia-Fibula Squeeze Test
- Thompson Test


References-Pictures


Slide 6 & 7: www.usuhs.mil/fap/resources/ue/ShoulderExam-StudentsandResidents.ppt


Slide 12: www.usuhs.mil/fap/resources/ue/ShoulderExam-StudentsandResidents.ppt


Slide 16: http://www.mhhe.com/hper/physed/athletictraining/illustrations/ch22/22-17a.jpg

Slide 17: http://www.nismat.org/orthocor/exam/shoulder.html


Slide 20: http://www.sonostics.com/tag/elbow-extension/

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Slide 27: www.saveyourknees.org

Slide 28: http://users.rowan.edu/~stahld07/rom_lab.html


Slide 33 & 35: http://www.mhhe.com/hper/physed/athletictraining/ch20.mhtml


Slide 37: http://www.mhhe.com/hper/physed/athletictraining/ch20.mhtml


Slide 40, 42, 43 & 44: http://www.drchiodo.com/Pages/disorders/ankle_sprains.php