Terminal Learning Objective

- **Action:** Communicate knowledge of “Physical Exam of Musculoskeletal System”

- **Condition:** Given a lecture in a classroom environment

- **Standard:** Received a minimum score of 75% IAW course standards on the formative quizzes and the Physical Exam Practical Test grade sheet

References

- **Clinically Oriented Anatomy**, 6th edition, 2010
- **CURRENT Medical Diagnosis & Tx**, 56th edition, 2012
Agenda

- Define the medical vocabulary components related to the physical exam of the musculoskeletal (MSK) system
- Identify common or concerning symptoms of the musculoskeletal system
- Communicate the important topics for health promotion and counseling for the musculoskeletal system

Agenda

- Communicate the important areas of examination for each of the major joints of the musculoskeletal system
- Communicate the inspection, palpation, range of motion, and maneuvers of the shoulder
- Communicate the inspection, palpation, range of motion, associated structures, and maneuvers of the elbow

Agenda

- Communicate the inspection, palpation, range of motion, and maneuvers of the wrist and hands
- Communicate the inspection, palpation, range of motion, and maneuvers of the spine
- Communicate the inspection, palpation, range of motion, and maneuvers of the hip
Agenda

- Communicate the inspection, palpation, range of motion, and maneuvers of the knee
- Communicate the inspection, palpation, range of motion, and maneuvers of the ankle and foot
- Communicate the limitation in motion of a joint and how to record your findings relating to the musculoskeletal system

Reason

As a SOF medic/corpsman, your ability to conduct a correct physical exam of the musculoskeletal system will be crucial as these patients will represent the bulk of your patient population.

Medical Vocabulary Components
Related to the Physical Exam of the Musculoskeletal (MSK) System
Vocabulary

- **Ligament** – ropelike bundles of collagen fibrils that connect bone-to-bone
- **Tendon** – collagen fibers connecting muscle-to-bone
- **Bursae** – pouches of synovial fluid that cushion the movement of tendons & muscles over bone or other structures
- **Idiopathic** – condition that arises spontaneously or from an obscure or unknown cause

Vocabulary

- **Monoarticular** – pertaining to or affecting a single joint
- **Polyarticular** – affecting many joints
- **Myalgia** – "aches & pains" in the muscles
- **Arthralgia** – pain but no evidence of arthritis
- **Scoliosis** – lateral & rotatory curvature of the spine

Vocabulary

- **Osteoporosis** – bone density loss of greater than 25%
- **Crepitus** – a grating or crackling sound or sensation (as the produced by the fractured ends of a bone moving against each other; foreign bodies in the joint (tear); subcutaneous emphysema)
- **Kyphosis** – exaggerated thoracic curvature
Vocabulary
- Lordosis – exaggerated lumbar curvature
- Subluxation – partial dislocation
- Genu varum – “bowlegs” (genu = knee)
- Genu valgum – “knock-knees”
- Valgus – angulation of the part away from the midline of the body
- Varus – angulation of the part towards the midline of the body

Common or Concerning Symptoms of the Musculoskeletal System

Common/Concerning Symptoms
- Low back pain (LBP)
- Neck pain
- Monoarticular or polyarticular joint pain
- Inflammatory or infectious joint pain
- Joint pain with systemic features
- Joint pain with symptoms from other organ systems
Common/Concerning Symptoms

- Low back pain
  - 2nd most common reason for office visits
  - Midline?
  - Radiating into the legs?
  - Bladder or bowel dysfunction?
  - Red Flags – systemic disease
    - > 50 y/o
    - History of cancer
    - Unexplained weight loss
    - Pain lasting > 1 month
    - Pain at night or rest (>6 weeks)
    - Infection
    - Hx IV drug use

- Neck pain
  - Trauma
  - Radiation
  - Arm/leg weakness
  - Change in bladder/bowel function
  - Degenerative
  - Note: red flags from LBP

Systemic features – joint problems manifesting
- Fever, chills, rash, anorexia, weight loss, weakness
- Organ systems outside the MSK system
The Important Topics for Health Promotion and Counseling for the Musculoskeletal System

Health Promotion & Counseling

- Nutrition, exercise, and weight
  - Balanced diet
  - Nutritional supplements
  - Regular exercise
    - Increases and maintains bone mass
    - Prevents obesity, diabetes, hypertension, PAD
    - Decreases stress
    - 30 min a day walking
  - Weight management
    - Reduces wear and tear on joints

- Low back
  - 60-80% experience 1x / lifetime
  - 30-60% experience recurrences - work related
  - Correct lifting techniques
  - Correct posture
  - Exercise

- Falls – increase in the elderly
  - Exercise helps mitigate these risk factors

- Osteoporosis
  - Any age
The Important Areas of Examination for Each of the Major Joints of the Musculoskeletal System

Common/Concerning Symptoms: Subjective Exam
- Subjective Exam – What the Pt tells you
- Joint pain
  - History (Hx)
    - OPQRST
    - Previous treatments
  - Do you have any pain in your joints?
    - Localized – monoarticular
    - Diffused – polyarticular
  - Pattern of involvement
  - Symmetric
  - Migrating / spreading? – “Does the pain move?”

Common/Concerning Symptoms: Subjective Exam
- Extra-articular – tendons, bursae, ligaments
  - Myalgias
  - Arthralgia’s
- Timing – onset
  - Rapidly – “How long has this been going on?”
  - Insidiously over a length of time
  - Periods of improvement/worsening
  - Over the course of the day
Common/Concerning Symptoms: Objective Exam

- Objective Exam – physical exam findings (Exam, Observation, Inspection, Palpation, ROM, Strength)
  - Inflammation
    - Tenderness, warmth, or redness
  - Swelling
  - Stiffness – resistance to movement
    - Decreased range of motion
    - Changes in level of activity

General Techniques of Examination: Objective Exam

- Observe general appearance
  - Body proportions
  - Gait
- Inspection
  - Joint symmetry of involvement
  - Alignment
  - Bony deformities
  - Skin changes
- Inspection
  - Facial expressions
  - Posture
- Inspection
  - Nodules
  - Atrophy
  - Swelling

General Techniques of Examination

- Palpation
  - Tenderness
  - Swelling
  - Temperature
  - Texture - nodules
  - Pulse
  - ROM – limitations
    - Active – by the Pt
    - Passive – by the examiner
  - Maneuvers - laxity
  - Muscle strength
The Inspection, Palpation, Range of Motion, and Maneuvers of the Shoulder

Anatomy Overview - Shoulder
- Functional anatomy - overview
  - Glenohumeral (synovial) – ball & socket joint
  - Flexion, extension, abduction, adduction, medial & lateral rotation, circumduction
  - **Dynamic stabilizers** – SITS muscles
  - **Static stabilizers** –
    - Bony shoulder girdle
    - Glenoid labrum
    - Articular capsule
    - Glenohumeral ligament

Anatomy Overview - Shoulder
- Bony anatomy
  - Humerus
    - Greater & lesser tubercle
  - Clavicle – pectoral girdle/axial skeleton
    - Articulations: AC & SC joints
  - Scapula
    - Acromion
    - Coracoid process
Anatomy Overview - Shoulder

- Joints and articulations
  - Glenohumeral joint
  - Sternoclavicular (SC) joint
  - Acromioclavicular (AC) joint

- Muscle groups (3)
  - Scapulohumeral group – SITS
    - Supraspinatus
    - Infraspinatus
Anatomy Overview - Shoulder

- Muscle groups (3)
  - Scapulohumeral group – SITS
    - Teres minor

- Subscapularis

- Axioscapular group
  - Trapezium
Anatomy Overview - Shoulder

- Muscle groups
  - Axioscapular group
    - Serratus anterior
  - Rhomboids
  - Levator scapulae
Anatomy Overview - Shoulder

- Muscle groups
  - Axiohumeral group
    - Pectoralis major

- Axiohumeral group
  - Pectoralis minor

- Latissimus dorsi
Anatomy Overview - Shoulder

- Additional structures
  - Articular capsule
  - Bursae
    - Superior acromial bursa
    - Subacromial bursa
    - Subscapular bursa
  - Synovial membrane
    - Glenohumeral joint
    - Synovial sheath (long head BB)

Techniques of Examination

- Inspect
  - Anterior
  - Posterior
  - Swelling
  - Deformities
  - Muscle atrophy
  - Fasciculations
  - Abnormal positioning
  - Color change
  - Skin alteration

- Palpation
  - SC-Joint / clavicle
  - AC-joint / acromion
  - Coracoid process
  - Greater tubercle – SITS insert
  - Intertubercular groove

TIP: Start medially at the SC joint, proceed laterally, end posteriorly. Develop your own “Race Track”
Techniques of Examination

- Palpation
  - Subacrominal bursa
  - Subdeltoid bursae
  - SITS muscles
  - Articular capsule

Techniques of Examination

- ROM
  - Flexion
  - Extension

Techniques of Examination

- ROM
  - Abduction (180°)
    - Glenohumeral motion
      - 90°, palm down
    - Scapulothoracic motion
      - Palm up, additional 60°
    - Final 30°, both motions
  - Supraspinatus, middle deltoid, serratus anterior
Techniques of Examination

- ROM
  - Adduction (45°)
  - Internal rotation (60° - 90°)
    - Or the Apley scratch test
    - Each side
    - Mark
  - External rotation (80° - 90°)
    - Or the Apley scratch test
    - Each side
    - Mark

Muscles:
- Pectoralis major
- Coracobrachialis
- Latissimus dorsi
- Teres major
- Subscapularis
- Infraspinatus
- Teres minor
- Posterior deltoid
- Anterior deltoid, Pectoralis major, Teres major, Latissimus dorsi
Techniques of Examination

• Maneuvers
  ➢ AC-joint: Crossover test
  ➢ Overall shoulder rotation: Apley scratch test
  ➢ Rotator cuff
    • Neer’s impingement sign
    • Hawkins impingement sign
    • Supraspinatus strength
    • Infraspinatus strength
    • Subscapularis strength: lift off / belly press
    • O’Brien Test: AC / Labral
    • Drop-arm sign

Techniques of Examination

• Maneuvers
  ➢ AC-joint – crossover test
    • Horiz. adduct Pt Arm across chest w/ overpressure (pain = positive)

Techniques of Examination

• Maneuvers
  ➢ Overall shoulder rotation – Apley Scratch Test
    • Difficulty suggest rotator cuff disorder

External rotation and abduction
Reach for upper scapula

Internal rotation and adduction
Reach for lower scapula

Compare bilaterally – note level reached
Techniques of Examination

- Maneuvers
  - Rotator cuff – Neer’s impingement sign
    - Arm pronated
    - Scapula stabilized
    - Flex shoulder maximally
    - Passive mnvr
    - Pain
      - Positive test

Techniques of Examination

- Maneuvers
  - Rotator cuff – Hawkins impingement sign
    - Shoulder & elbow flexed to 90°
    - Maximally internally rotating arm
    - Pain = positive test

Techniques of Examination

- Maneuvers
  - Rotator cuff – supraspinatus strength
    - Elevate arms to 90°
    - Internally rotate arms
    - Thumbs pointed down
    - Pt resist downward pressure
    - Weakness
      - Positive test

- Most commonly torn tendon
  - Empty Can Test or Jobe Test
Techniques of Examination

- Maneuvers
  - Rotator cuff – infraspinatus strength
    - Arms at side with elbows flexed to 90°
    - Thumbs pointed up
    - Pt resist internal rotation
    - Weakness
      - Positive test

- Maneuvers
  - Rotator cuff – subscapularis strength
    - Internally rotation shoulder
    - Pt – push hand away from back; elbows forward while applying pressure towards belly
    - Weakness
      - Positive test

- Maneuvers
  - Labral, A/C - O’Brien Test
    - Arm adducted 10° to chest
    - Shoulder flexed to 90°
    - Internal and external rotation
Techniques of Examination

- Maneuvers
  - Rotator cuff – drop arm sign
    - Abduct arm to 90°
    - Lower slowly
    - Cannot hold arm abducted
      - Positive test

The Inspection, Palpation, Range of Motion, Associated Structures, and Maneuvers of the Elbow

Anatomy Overview - Elbow

- Overview
  - Hinge joint – synovial – diarthrosis
  - ROM: flexion, extension, supination, pronation
  - 3 bones: humerus, ulna, radius

- Joints
  - Three articulations
    - Humeroulnar joint
    - Radiohumeral joint
    - Radioulnar joint
Anatomy Overview - Elbow

- Bony structures and features

- Muscle groups
  - Flexors
    - Biceps brachii
    - Brachioradialis
    - Brachialis
  - Extensors
    - Triceps brachii
    - Anconeus

- Pronators/supinators
  - Pronator teres
  - Pronator quadratus
  - Biceps brachii
  - Supinator
Anatomy Overview - Elbow

- Additional structures
  - Olecranon bursa
  - Ulnar nerve
  - Median nerve (not shown)

Techniques of Examination

- Inspection
  - Medial & lateral epicondyles
  - Olecranon
  - Contours
  - Swelling
  - Discoloration
  - Nodules
  - Dislocation

Techniques of Examination

- Palpation
  - Olecranon
  - Epicondyles
  - Grooves – between olecranon & epicondyles
  - Ulnar n. (sensitivity)
  - Dislocation
  - Fx
Techniques of Examination

- ROM
  - Flexion
  - Extension
  - Supination
  - Pronation

- Maneuvers
  - Triangle of points
  - Tennis elbow

- Maneuvers
  - Tinel sign
  - DTRs

Biceps, Triceps, Brachioradialis
The Inspection, Palpation, Range of Motion, and Maneuvers of the Wrist and Hand

Anatomy Overview – Wrist & Hand

- OVERVIEW
  - 8 carpals – 2 rows
    - Proximal articulates with radius
    - Distal articulates with metacarpals
  - Thumb lacks middle phalanx
    - 2-5 phalanges have distal, middle & proximal

Anatomy Overview – Wrist & Hand

- Bony structures
Anatomy Overview – Wrist & Hand

- Joints
  - Wrist joints
    - Radiocarpal joint
    - Intercarpal joint
  - Hand joints
    - DIP
    - PIP
    - MCP (knuckle)

- Intrinsic muscle groups
  - Wrist
  - Fingers
  - Thumb
    - Thenar eminence
  - Thumb/fingers

- Additional structures
  - Tendons
  - Tendon sheaths
  - Carpal tunnel
  - Transverse carpal ligament
Techniques of Examination

- Inspection
  - Normal position
  - Swelling
  - Deformities
  - Contours (see previous slide)
  - Thickening

- Palpation
  - Radial carpal joint
  - Radial styloid b.
  - Carpals
    - Scaphoid b.
  - Metacarpals (MCP)
  - Phalanges (DIP, PIP)
  - Abnormalities (swelling, inflammation, etc.)

- ROM – wrists
  - Flexion
  - Extension
  - Abduction (radial dev.)
  - Adduction (ulnar dev.)
Techniques of Examination

- ROM – fingers & thumbs
  - Flexion
  - Extension
  - Abduction
  - Adduction
  - Opposition – thumb

Techniques of Examination

- Maneuvers – wrist
  - Sensation
    - Radial n.
    - Ulnar n.
    - Median n.

Techniques of Examination

- Maneuvers – wrist
  - Hand grip strength
  - Phalen’s sign
  - Tinel’s sign
The Inspection, Palpation, Range of Motion, and Maneuvers of the Spine

Anatomy Overview - Spine

- Overview
  - Alignment of body weight
  - Primary curves
  - Secondary curves
  - 7 cervical, 12 thoracic, 5 lumbar
  - 5 sacral, 3-5 coccyxal

- Bony structures
  - Vertebral body
  - Vertebral arch
    - Transverse process
    - Spinous process
    - Pedicle, lamina
    - Vertebral foramen
  - Articular processes
    - Articular facets
    - Transverse costal facets (T1 - T12)
  - Intervertebral disc (C5, T12)
Anatomy Overview - Spine

- Joints
  - Intervertebral discs - load
    - Annulus fibrosis
    - Nucleus pulposus
  - Articular facets - flexibility
    - Superior
    - Inferior

- Muscle groups
  - Outer
  - Deep
  - Intrinsic
  - Other

Techniques of Examination

- Inspection – posterior aspect
  - Posture
  - Alignment
  - Symmetry
Techniques of Examination

- **Inspection – lateral aspect**
  - Spinal curvatures
    - Cervical
    - Thoracic
    - Lumbar
  - Skin abnormalities
    - Port-wine stains
    - Café-au-lait spots
    - Hairy patches

- **Palpation**
  - Spinous processes (all)
  - Cervical facet joints
  - Step-off (lumbar)
  - Si-joint (drop-off)
  - Sciatic nerve tenderness

- **ROM & maneuvers – neck**
  - Flexion – “Chin to chest”
  - Extension – “Look up”
  - Rotation – “Look left/right”
  - Lateral bending – “Ear to shoulder”
Techniques of Examination

- ROM & maneuvers – spinal column
  - Flexion – “touch your toes” - careful
    - Measure flexion
      - Mark the lumbosacral junction
      - Mark 10 cm above and 5 cm below (standing)
      - Pt to max flexion (4 cm ↑ norm, < 4 cm not-norm)

Techniques of Examination

- ROM & maneuvers – spinal column
  - Extension
  - Rotational
  - Lateral Bending

The Inspection, Palpation, Range of Motion, and Maneuvers of the Hip
Anatomy Overview - Hip

- Bony structures/joints
  - Coxae
    - Ilium, ischium, pubis
  - Landmarks
    - Iliac crest
    - ASIS
    - Iliac tubercle
    - Pubic symphysis
    - Greater trochanter
    - PSIS
    - Ischial tuberosity
    - Sacroiliac joint

- Muscle groups
  - Flexor group
  - Extensor group
  - Adductor group
  - Abductor group – gluteus medius & minimus

- Additional structures
  - Bursae
    - Trochanteric bursa
    - Ischial (ischiogluteal) bursa
    - Psoas (iliopectineal or iliopsoas) bursa
Techniques of Examination

- Inspection
  - Gait – stance & swing
    - Width of the base
    - Pelvic shift
    - Knee flexion
  - Lordosis?
  - Leg length discrepancies?
  - Atrophy
  - Bruising

- Palpation – bony landmarks
  - Anterior
    - Iliac crest
    - ASIS
    - Greater trochanter
    - Pubic symphysis
  - Posterior
    - PSIS
    - Greater trochanter
    - Sacroiliac joint

- Palpation – inguinal structures/bursae
  - Inguinal
    - Supine, Figure 4
    - Bulges
    - Lymph nodes
    - Tenderness
    - Trochanteric bursa
  - Bursae
    - Psoas
    - Trochanteric - side
    - Ischiogluteal - side
Techniques of Examination

- ROM/maneuvers
  - Flexion
    - Lumbar flattening
    - Opposite knee flex
  - Extension
    - Supine
    - Leg on or off table
  - Abduction

Techniques of Examination

- ROM/maneuvers
  - Adduction
  - External Rotation
    - Medially
  - Internal Rotation
    - Laterally

The Inspection, Palpation, Range of Motion, and Maneuvers of the Knee
Anatomy Overview - Knee

- Overview
  - Largest joint & joint cavity
  - Three articular surfaces
  - Ligament dependent for stability
- Bony structures
  - Medial
    - Adductor tubercle
    - Medial epicondyle
    - Medial condyle
  - Anterior
    - Patella
    - Patellar ligament/tendon
    - Tibial tuberosity
  - Lateral
    - Lateral epicondyle
    - Lateral condyle
- Joint – complex hinge joint
  - Three separate articulations
    - Lateral tibiofemoral joint
    - Medial tibiofemoral joint
    - Patellofemoral joint
Anatomy Overview - Knee

- Muscle groups - knee
  - Extensors
  - Flexors

- Additional structures
  - Medial/lateral menisci
  - Collateral ligaments
  - Cruciate ligaments
  - Suprapatellar pouch
  - Bursae
    - Prepatellar
    - Anserine
    - Semimembranosus

Techniques of Examination

- Inspection
  - Gait – smooth, rhythmic
    - Stumbling
  - Alignment/contours
    - Genu varum (previous slide)
    - Genu valgum
    - Flexion contracture
  - Atrophy
  - Swelling – intra-articular, extra-articular
  - Angular deformity
  - Bruising
Techniques of Examination

- Palpation – Pt on edge of exam table, flexed
  - Tibiofemoral joint
    - Depressions on either side of patellar tendon
    - Tibiofemoral joint
    - Tibial plateau
    - Converging femur/tibia
    - Femoral articulating surface
    - Medial meniscus
    - Lateral meniscus
    - Note pain

Techniques of Examination

- Palpation
  - Medial joint compartment
    - Medial femoral condyle
    - Adductor tubercle
    - Medial tibial plateau
    - MCL
  - Lateral joint compartment
    - Lateral femoral condyle
    - Lateral tibial plateau
    - LCL
  - Patella – patellar tendon – tibial tuberosity
    - Patellofemoral grinding test (knee extended)

Techniques of Examination

- Palpation
  - Suprapatellar pouch
    - 6 cm above patella, palpate down
    - Tenderness, warmth, bogginess
  - Prepatellar bursa
    - “Housemaid’s knee”
  - Anserine bursa
  - Gastrocnemius Semimembranosus bursa
    - Popliteal (Baker) cyst
Techniques of Examination

● Palpation
  ▶ Bulge sign₁ – minor effusions
    • Milk the suprapatellar pouch down
    • Tap medially/laterally – fluid wave
  ▶ Balloon sign – major effusions
    • Palpate each side of the patella
    • Compress the suprapatellar pouch
    • Feel for fluid entering
  ▶ Balloting the patella₂ – large effusions
    • Compress the suprapatellar pouch
    • Push on the patella

Techniques of Examination

● ROM – knee
  ▶ Flexion – “flex your knee”
  ▶ Extension – “straighten your leg”

Techniques of Examination

● Maneuvers
  ▶ McMurray test – clicking/lock during flex/extension
    ▶ Medial meniscus
      – Palpate medial/lateral joint line
      – From heel, rotate externally
      – Apply varus stress
Techniques of Examination

- Maneuvers
  - McMurray test – clicking/lock during flex/extension
    - Lateral meniscus
      - Palpate medial/lateral joint line
      - From heel, rotate internally
      - Apply valgus stress

Techniques of Examination

- Maneuvers
  - Abduction (valgus) stress test – MCL tears
    - One hand – lateral knee
    - Other hand – medial ankle
    - Ligamentous laxity or pain

Techniques of Examination

- Maneuvers
  - Adduction (varus) stress test – LCL
    - One hand – medial knee
    - Other hand – lateral ankle
    - Ligamentous laxity or pain
Techniques of Examination

- Maneuvers
  - Anterior drawer sign – ACL
    - Knee flexed
    - Pull anteriorly
    - Greater than a few degrees of movement indicates ACL tear

  Hamstrings RELAXED!

Techniques of Examination

- Maneuvers
  - Posterior drawer sign – PCL
    - Knee flexed
    - Push posteriorly
    - Greater than a few degrees of movement indicates PCL tear & compare to other knee

The Inspection, Palpation, Range of Motion, and Maneuvers of the Ankle and Foot
Anatomy Overview – Ankle & Foot

- **Bony structures & joints**
  - Malleolus (medial/lateral)
  - Calcaneus
  - Tarsals, metatarsals, phalanges
  - Tibiotalar joint
  - Subtalar joint
  - Proximal, distal interphalangeal joints

---

Anatomy Overview – Ankle & Foot

- **Muscle groups & additional structures**
  - Plantar flexors – gastrocnemius, posterior tibial muscles & toe extensors
  - Dorsiflexors – anterior tibial muscle & toe extensors
  - Deltoid (medial) ligament complex

---

Anatomy Overview – Ankle & Foot

- **Muscle groups & additional structures**
  - Lateral (fibular collateral) ligament complex
    - Anterior talofibular ligament (ATFL) - weakest
    - Calcaneofibular ligament (CFL)
    - Posterior talofibular ligament (PTFL) - strongest
Techniques of Examination

- **History**
  - ID area of tenderness
  - “Pop?”
  - Twisting, plantarflexion-inversion injury

- **Inspection**
  - Deformities
  - Nodules
  - Swelling
  - Effusion
  - Calluses
  - Corns
  - "Pop?"
  - Ecchymosis
  - Circulatory impairment
  - Shoes

Techniques of Examination

- **Palpation**
  - Joints - tenderness
    - Tibiotaral, subtalar, transverse tarsal
  - Bones - tibia, fibula (proximal), malleoli, posterior/inferior calcaneus, metatarsals
  - Ligaments – weakest to strongest
    - ATFL, CFL, PTFL, & deltoid complex
  - Tendons – achilles, peroneal
  - Swelling/effusion

Techniques of Examination

- **ROM**
  - Plantar flexion – “point foot toward the floor”
  - Dorsiflexion – “point foot toward the ceiling”
  - Inversion – “bend heel inward”
  - Eversion – “bend heel outward”
**Techniques of Examination**

- Maneuvers
  - **Anterior drawer test**
    - Anterior talofibular ligament (ATFL) - weakest

**Slide 131**

- Maneuvers
  - **Inversion stress test (Talar tilt test)**
    - Calcaneofibular ligament (CFL)

**Slide 132**

- Maneuvers
  - **Lisfranc’s Fracture**
    - Proximal 2nd metatarsal
    - Midfoot swelling
    - Inability to bear weight
    - Potentially career ending
Techniques of Examination

- Maneuvers
  - Morton's test
    - Interdigital neuroma
    - 3rd & 4th toes

Techniques of Examination

- Palpation
  - Gastrocnemius & soleus muscles
    - Test integrity of the Achilles tendon
      - Pt prone, knee & ankle flexed 90°
      - Squeeze calf
      - Watch for plantar flexion

The Limitation in Motions of a Joint and How to Record Your Findings Relating to the Musculoskeletal System
Joint Limitation
- Limited motion of a joint – diminished mobility
  - Compare with other “good side” – estimate ROM angles
    - “Elbow flexes 45° to 90°”
    - “Elbow flexion deformity of 45° to 90°”

Ortho Consult
- As with radiographs, good idea to compare injured side with good side (e.g., check laxity of knee ligaments in “good” knee first, to see what’s “normal”)
- Once you discover laxity or a complete tear, there’s no reason to do that test over and over, or with more force (causing greater damage)
- Ortho.consult@us.army.mil – interpret x-rays
  - Short turnover for down range

Questions?
Terminal Learning Objective

- Action: Communicate knowledge of “Physical Exam of Musculoskeletal System”
- Condition: Given a lecture in a classroom environment
- Standard: Received a minimum score of 75% on the written exam IAW course standards

Agenda

- Define the medical vocabulary components related to the physical exam of the musculoskeletal (MSK) system
- Identify common or concerning symptoms of the musculoskeletal system
- Communicate the important topics for health promotion and counseling for the musculoskeletal system

Agenda

- Communicate the important areas of examination for each of the major joints of the musculoskeletal system
- Communicate the inspection, palpation, range of motion, and maneuvers of the shoulder
- Communicate the inspection, palpation, range of motion, associated structures, and maneuvers of the elbow
Agenda

- Communicate the inspection, palpation, range of motion, and maneuvers of the wrist and hands
- Communicate the inspection, palpation, range of motion, and maneuvers of the spine
- Communicate the inspection, palpation, range of motion, and maneuvers of the hip

Reason

As a SOF medic/corpsman, your ability to conduct a correct physical exam of the musculoskeletal system will be crucial as these patients will represent the bulk of your patient population.
Break