Division of Orthopedic Surgery

Focused Interview and Physical Exam (FIPE)

University of Saskatchewan College of Medicine

Orthopedic History

A good orthopedic history requires all of the elements of a good history with specific focus on:

1. A good pain history – injury (yes/no), onset, location, severity, radiation, exacerbating/relieving factors, associated symptoms
2. Mechanical symptoms - locking, catching, instability
3. Neurological symptoms – numbness, tingling, weakness
4. Occupation and the impact of the illness
5. Treatments – physiotherapy, medications, injections, previous surgery
6. Red flags – fever, chills, night sweats, night pain, fatigue, weight loss, loss of appetite
7. Questions specific to the body area of question

General Orthopedic Exam

1. Compare to contralateral side
2. Examine joint above and below
3. Neurovascular Exam

Neurologic

Nerve	Sensory	Motor
Axillary	Lateral aspect of shoulder	Deltoid (shoulder abduction)
Musculocutaneous	Lateral aspect of forearm (lateral cutaneous nerve of forearm)	Biceps & brachialis (elbow flexion)
Radial	1st dorsal webspace of hand	ECRL (wrist extension), EPL (thumb IP joint extension)
Median	Palmar-radial aspect of index finger	Opponens pollicis (thumb opposition), APB (thumb abduction, FPL (thumb IP joint flexion)
Ulnar	Palmar-ulnar aspect of small finger	Interossei (abduction of fingers), FDP to 4th & 5th (ring and small finger DIP flexion)

Vascular: Pulses – brachial, radial (+/- ulnar), capillary refill

Neurologic

Nerve	Sensory	Motor
Femoral	Anterior & medial aspects of thigh	Knee extension (& hip flexion)
Sciatic nerve (see divisions below)		
Tibial	Plantar aspect of foot	Ankle & toe plantar flexors
Superficial peroneal	Dorsal aspect of foot	Ankle evertors
Deep peroneal	1st dorsal webspace of foot	Ankle & toe dorsiflexors

Vascular: Pulses – femoral, popliteal, dorsalis pedis, posterior tibial, cap refill, ABI

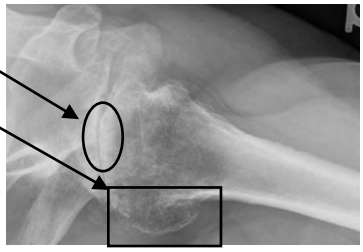
X-ray Interpretation

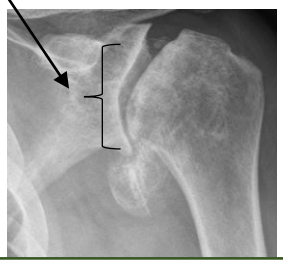
Systematic Approach

1. Identify patient name, age, and gender
2. Comment on the type of x-ray (i.e. Right knee AP)
3. Look for orthogonal view
4. Evaluate ABCss
   - A – Alignment
   - B – Bone
   - C – Cartilage
   - S – Soft Tissue
   - S – Second Lesion

Evidence of arthritis on an X-ray

1. Joint space narrowing
2. Osteophyte formation
3. Subchondral sclerosis
4. Subchondral cysts





References: orthobullets.com, rheumtutor.com, Dr. Sauder, Dr. Buchko, Dr. Dzus, Dr. Lutz, Dr. Spiess, Z. Oleynik

Knee Examination

Inspection: Gait – observe stance and stride, medial/lateral thrust, antalgic (painful) gait, deep squat
SEADS - **S**welling, **E**rythema, **A**trophy (quads), **D**eformity, **S**kin changes
Symmetry – compare to other knee, patient preferably in shorts

Palpation: Bony – joint line tenderness, patella (incl. patellar facets), tibial tuberosity
Soft tissue – patellar and quad tendon, collateral (MCL/LCL) ligaments
Swelling – effusion tests (intra-articular effusion), prepatellar bursitis

ROM: Active then passively measure extension (0°) and flexion (130°) * Some sources state 135° *

History Pearls:

1. Start with a full orthopedic history (pain, mechanical sx, neurological sx, occupational, treatments, red flags)
2. Quick onset swelling (hemarthrosis) is usually a ligament tear (ACL/PCL), intraarticular fracture, peripheral meniscal tear, patellar dislocation
3. Chronic swelling is often meniscal pathology or arthritis
4. History of giving way on pivoting is usually due to ligament injury or instability
5. Clicking and locking can be due to meniscal pathology or loose body
6. Hip pathology can present as knee pain
7. Anterior (often vague) pain is usually patellofemoral pain syndrome

Special Tests

Cruciate Ligaments (ACL & PCL)

- Lachman's Test
  - Most sensitive test for ACL rupture
  - Patient supine, knee flexed at 15°
  - Translate tibia with anteriorly directed force

- Anterior & Posterior Drawer Test
  - Patient supine, knee flexed at 90°
  - Anteriorly and posteriorly translate tibia

- Pivot Shift
  - Start with patient supine and knee fully extended.
  - Internally rotate the tibia, apply valgus force and axial load while flexing the knee

- Others for PCL include sag sign and quads active test

Notable Findings

- *Excess anterior translation indicates ACL injury (Lachman/Anterior drawer)*
- *Excess posterior translation indicates PCL injury (Posterior Drawer)*
- *Clunk with flexion indicates ACL injury*

Collateral Ligaments (MCL & LCL)

- Collateral Exams (performed at 0 & 30° flexion)
  - Apply varus stress to test LCL
  - Apply valgus stress to test MCL

- *With varus stress, laxity indicates LCL injury*
- *With valgus stress, laxity indicates MCL injury*

Menisci

- McMurray's Test
  - Start in flexion, perform external rotation, valgus and extension (tests medial)
  - Start in flexion, perform internal rotation, varus and extension (tests lateral)
- *Pain, pop, or click sensation indicates meniscal injury*

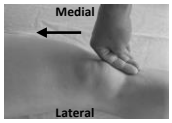
- Thessaly's Test
  - Patient standing on one foot
  - Examiner supports by holding patients hands
  - Patient slightly flexes knee and performs twisting/rotation

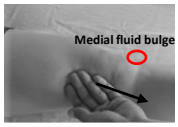
- *Reproduction of medial/lateral knee pain indicates meniscal injury*

- Assess deep squat, joint line tenderness, and knee effusion

Effusion

- Milk-Bulge Test
  - SMILE pneumonic: Palpate for fluid
  - Move **S**uperiorly on **M**edial aspect
  - Then move **I**nferiorly of **L**ateral aspect
  - **E**ffusion will be seen medially

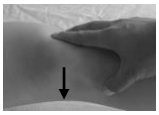




- *Medial fluid bulge indicates effusion*

Patellofemoral Joint

- Patellar Apprehension
  - Leg straight, relax quads and apply lateral force on patella



- *Pain or apprehension indicates patellar instability*

- Grind Tests
  - Push patella into trochlear groove with knee in extension
- *Pain is positive for patellofemoral pain syndrome (PFPS)*

- Osmond-Clarke Test
  - Apply pressure just above patella while patient contracts quadriceps
- *Pain is positive for PFPS*
- *If weak quadriceps, may have false negative test*

Conclude examination with assessment of joint above and below (especially hip), and neurovascular exam

University of Saskatchewan, Division of Orthopedic Surgery, 2020.

References: orthobullets.com, rheumtutor.com, Dr. Sauder, Dr. Buchko, Dr. Dzus, Dr. Lutz, Dr. Spiess, Z. Oleynik

Hip Examination

Inspection

- Gait – Trendelenburg, antalgic (painful), abductor lurch, vaulting and circumducting, shuffling, high stepping (foot drop), scissoring (spasticity)
- SEADS – **S**welling, **E**rythema, **A**trophy, **D**eformity, **S**kin changes
- Alignment – length and resting internal/external rotation. Compare to contralateral side

Palpation

- Anterior hip, lateral over greater trochanter, posterior over SI joint

ROM:

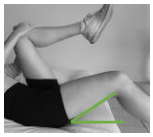
- Passively perform flexion (supine, knee to chest), extension, internal and external rotation, abduction, and adduction. Active ROM rarely performed.
- Strength: hip flexors, adductors, abductors

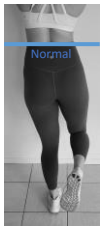
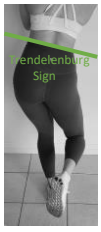
History Pearls:

1. Start with a full orthopedic history (pain, mechanical sx, neurological sx, occupational, treatments, red flags)
2. Pain in groin, anterior or deep within (c-sign with their hand) usually comes from intra-articular hip pathologies such as labral tear, arthritis
3. Lateral pain is often greater trochanteric pain syndrome
4. Buttock pain is usually related to lower back problems
5. Hip pathology can often present as knee pain

Special Tests

		Notable Findings
• Leg lengths ○ With patient supine, measure from ASIS to medial malleolus on each side		• *Length discrepancies may be due to pelvic tilt or abduction/adduction deformities*

• Thomas Test
  ○ Patient supine, fully flex one hip
  ○ Observe contralateral thigh
  ○ Optional: hand under lumbar spine
	 	• *If contralateral thigh lifts off table, this indicates a fixed flexion deformity (hip contracture)*

• Trendelenburg sign / gait
  ○ Patient standing on one leg
  ○ Assess hip level
  ○ Tests abductor muscle weakness of weightbearing side
	 	• *Positive sign: drooping of the non-weight bearing leg. This indicates weakness of weightbearing abductors*

• Abductor lurch ○ Body weight is shifted over the hip when the affected leg bears weight		• *Indicates weakness in abductor muscles, potentially due to hip dysplasia or neuromuscular disorders* • *Examine joint above and below, lumbar spine and knee*
• FADIR (Impingement) Test ○ **F**lexion, **Ad**duction, **I**nternal **R**otation		• *Positive if patient has hip/groin pain* • *May indicate labral tear or femoral acetabular impingement (FAI)*

• FABER Test
  ○ **F**lexion, **Ab**duction, **E**xternal **R**otation
  ○ Place pressure on knee and contralateral hip
		• *Anterior or lateral pain may indicate hip joint pathology such as labral tear or FAI*
		• *Low back pain may indicate SI joint pathology*

Conclude examination with neurovascular exam and assessment of joint above and below

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Shoulder Examination

Inspection: Patient should be in tank top, compare pathological shoulder to opposite side
Observe: SEADS: **S**welling, **E**rythema, **A**trophy (deltoid), **D**eformity (AC joint, clavicle), **S**kin

Palpation: SC and AC joint, scapula, subacromial space, anterior proximal humerus (bicep groove), anterior and posterior glenohumeral joint. Tenderness points and temperature

ROM: Active ROM then passive ROM if active is limited. Compare both sides: Forward elevation and extension, external and internal rotation (arms at sides or abducted to 90°), abduction (180°) and adduction.

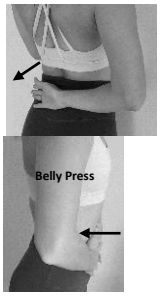
History Pearls:

1. Start with a full orthopedic history
2. Have patients with 1 finger point to where it hurts the most:
   i. Anterior pain over bicipital groove = biceps tenosynovitis/tendinopathy
   ii. Lateral shoulder = rotator cuff (impingement or tear), bursitis
   iii. "Deep", anterior or posterior pain = arthritis in older patient, labral tear in younger individual
   iv. Superiorly over AC joint = AC joint pathology (shoulder separation or arthritis)
   v. Posterior pain over scapula/trapezius = compensatory pain due to shoulder dysfunction (or scapular disorder)
3. Gradual onset pain is often arthritis
4. Instability: investigate mechanism

Special Tests

Rotator Cuff Pathology

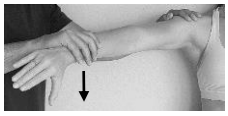
- Lift Off Test – subscapularis (Internal rotation [IR])
  - Hand brought around to spine; palm outward.
  - Ability for patient to lift hand away from back and hold it
  - Ensure patient is not extending at elbow/triceps
- Belly Press – subscapularis (IR)
  - Patient presses abdomen with palm of hand
  - Maintaining shoulder IR with elbow in front of trunk
- Other subscapular tests include bear hug



Notable Findings

- *Weakness on IR may indicate subscapularis tear*

- Jobe's Test – supraspinatus strength
  - Empty can: patient resisting force in abduction and IR
- External rotation strength test – infraspinatus



- *Weakness indicates potential rotator cuff tear*
- *Pain can be tendinopathy and impingement or tear*

Impingement

- Hawkins Kennedy Impingement Sign
  - Flex shoulder and elbow to 90°, and passively perform internal rotation

- *Pain is a positive test and suggests subacromial impingement of rotator cuff/bursa*

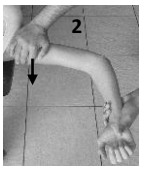
AC Joint

- Cross Body Adduction (Scarf) Test
  - Passively adduct the arm across the body, as if the patient were putting a scarf over their shoulder

- *Pain at the AC joint indicates pathology, such as arthritis*

Instability

- Apprehension (1) & Relocation (2) Test
  1. Patient supine, place the arm in abduction and ER
     - Observe patients face for apprehension
  2. Apply downward (posterior) pressure on humeral head
     - Observe patient for reduction of apprehension



- *Instability or patient uneasiness during apprehension test indicates anterior shoulder instability (GH ligament / labral injury)*
- *Relocation test will provide relief of symptoms due to repositioning the humeral head back into the anatomical position*

- Sulcus Sign
  - Arm in adduction
  - Translate the humerus inferiorly
  - Observe for a depression (sulcus) just below acromion

- *Appearance of a sulcus is a positive sign, which indicates glenohumeral instability and/or ligamentous laxity*

Biceps

- Bicipital Groove Tenderness
  - Apply pressure on anterior humeral head in between greater and lesser tuberosities (can often palpate tendon)
- Other tests include Speed's Test and Yergason's Test

- *Pain indicates long head of the biceps tendinopathy/tenosynovitis*

Conclude examination with neurovascular exam and assessment of joint above and below

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Spine Examination

Inspection	• Expose spine from head to sacrum, gown usually worn • Observe alignment and asymmetry in coronal and sagittal planes • SEADS: **S**welling, **E**rythema, **A**trophy, **D**eformity, **S**kin changes
Palpation	• Midline and parasagittal palpation for point tenderness or step deformities
ROM:	• Assess neck in extension (look up), flexion (chin to chest), lateral flexion (ear to shoulder), and rotation (look L and R) • Assess back with forward bend and backwards bend, lateral flexion, and rotation L and R • Gait: walk, tip toes, heel walk, tandem heel to toe

History Pearls:

1. Start with a full orthopedic history (pain, mechanical sx, neurological sx, occupational, treatments, red flags)
2. A search for red flags is especially important as infections and tumors are more common here
3. Ask neurologic symptoms (radiculopathy will often cause pain that shoots down a specific dermatome)
4. Always inquire about bowel and bladder function and numbness around the sacrum

Neurological Exam

1. Strength
   - ➢ Myotomes C5 – T1, L2 – S1
2. Sensation
   - ➢ Dermatomes C5 – T1, L2 – S1
   - ➢ Light touch and pain
3. Reflexes
   - ➢ Biceps (C5), BR (C6), Triceps (C7), Abdominal muscles (T-spine), Patellar (L3/4), Achilles (S1/2), Plantar/Babinski (UMN).

Straight Leg Raise Test

- With patient supine, passively raise the patient's leg while the knee is straight
- Assesses for compression of lower lumbar nerve roots (L4-S1)
- Positive test when symptoms are elicited with leg raised to >40 degrees
- Suggests lumbar disc herniation

Muscle Grading System

0	Total paralysis
1	Palpable or visible contraction
2	Full active ROM, gravity eliminated
3	Full active ROM against gravity
4	Full active ROM against some resistance
5	Full active ROM against normal resistance

Level	Strength (Myotome)	Sensation (Dermatome)	Reflex
C5	Elbow flexion	Lateral elbow	Biceps
C6	Wrist extension	Thumb	Brachioradialis
C7	Triceps	Middle finger	Triceps
C8	Finger flexion	Little finger	
T1	Finger abduction	Medial elbow	
L2	Hip flexion	Medial thigh	
L3	Knee extension	Medial knee	Patellar
L4	Ankle dorsiflexion	Medial ankle	Patellar
L5	G.toe dorsiflexion	Dorsum foot	
S1	Ankle plantarflexion	Lateral heel	Achilles

Rectal exam for rectal tone in cases of spinal cord injury or suspected cauda equina

Conclude examination with neurovascular exam and assessment of nearby joints depending on clinical presentation (i.e. pelvic / hip examination for low back pain)

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