

Sport Medicine Virtual Physical Examination Guide

Objectives:

1. Provide a physical exam template to help guide virtual encounters for sport and exercise medicine physicians, medical students, residents, family physicians, and other practitioners during the COVID-19 pandemic and beyond.
2. Develop a standardized script to allow practitioners to easily communicate the steps required for patients to perform physical exam maneuvers.
3. Provide a learning tool for medical students, residents, family physicians, and other practitioners to perform virtual musculoskeletal physical exams.
4. Improve the organization and efficiency of the physical exam portion of the virtual sport medicine encounter.

Please see corresponding “Patient Instructions” documents. Practitioners may consider providing this to patients prior to their encounter. This will allow the patient to prepare and then guide the palpation portion of examination.

Disclaimer: *This document represents a guide and does not encompass all physical exam maneuvers that may be relevant during a virtual visit. Please continue to use your clinical judgment and modify as needed in order to meet the needs of the individual patient.*

Table of Contents

<u>Topic</u>	<u>Page Number</u>
Upper Extremity	
• Shoulder	3
• Elbow	6
• Wrist and Hand	8
Lower Extremity	
• General Observation	11
• Hip	11
• Knee	14
• Ankle	17
• Foot	19
Spine	
• Cervical Spine	20
• Lumbar Spine	21
Neurological Exam	23
Palpation Diagram Legend	
• Upper Extremity	24
• Lower Extremity	25

Upper Extremity:

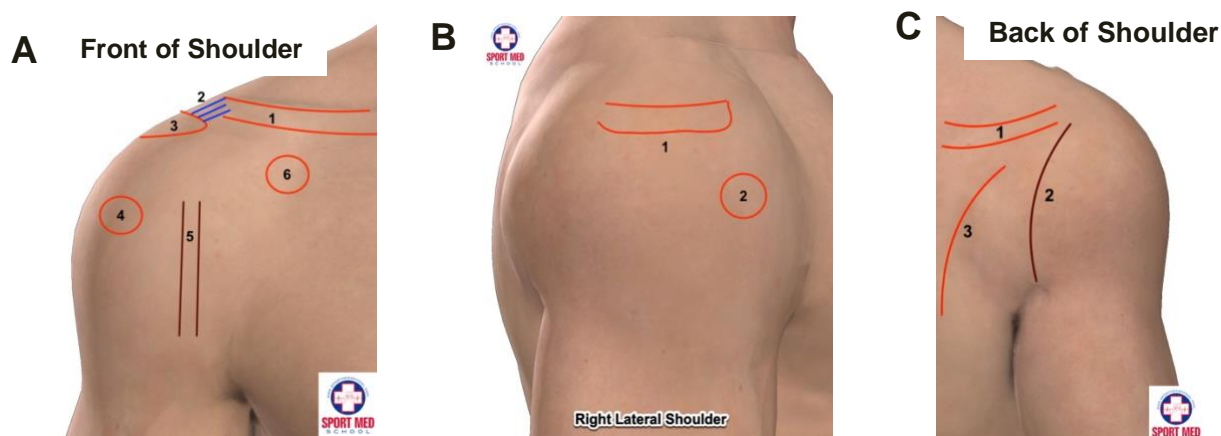
Shoulder:

Inspection:

- Ask patient to stand and expose shoulders (remove shirt vs tank top vs sports bra etc.).
- Observe patient as they face forwards, to the left, backwards, and to the right.

Palpation:

- Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*
- Begin midline at the sternoclavicular joint and progress laterally along clavicle.
- Palpate AC joint, coracoid process, anterior/posterior joint line, greater tuberosity, etc.



Range of Motion:

Side of Shoulder

- Examiner to demonstrate shoulder range of motion on camera. The patient can mimic these movements.
- Active ROM: forward flexion, extension, abduction, adduction, external rotation, internal rotation
- Painful Arc:
 - "Tell me when you start to feel pain and when your pain resolves."
- Passive ROM:
 - *Consider omitting if there is pain-free AROM.*
 - *If AROM is limited or painful, examine PROM in the affected range.*
 - *Consider trying these movements supine if the patient's pain is limiting their ability to complete the movements.*
 - *"Try to relax the affected shoulder. Use your other hand to grasp your forearm (or wrist) and move the arm over your head (flexion). Repeat with moving to the side (abduction)."*
 - *Use a paper towel roll, foam roller, rigid ruler, or other similar objects, or a door frame to test passive ER.*
 - *If someone else is present, the patient can lie down and Examiner can instruct in passive flexion, abduction, and ER.*

Strength:

- **NOTE:** *Instead of 5-point scale, consider asking patient to quantify their strength in one of the following ways:*
 - i) Normal, subtle weakness, fairly weak, or no movement.
 - ii) Percentage decrease compared to the contralateral limb
 - *Documentation:*
 - *'patient reported equal strength to guided self-resisted ER'*
 - *'patient reported pain and subtle weakness of guided self-resisted ER'.*
 - *'patient reported pain and 25% decrease in strength of guided self-resisted ER'*
 - *If another individual is present examiner could instruct them to perform tests.*
 - *Examiner could also demonstrate on themselves.*
- Forward Flexion:
 - "Straighten your arm directly in front of you. Place your opposite hand just above your elbow joint. Now press upwards into that hand with your arm, while pressing down with your hand."
- Abduction:
 - "Straighten your arm out to the side at shoulder height (or other degrees of abduction). Place your opposite hand just above your elbow joint. Try to keep your shoulders facing forward as best you can. Now press into that hand."
- External and Internal Rotation:
 - "Tuck your elbow to your side with your elbow at 90 degrees. Place your opposite hand on the outside (ER) or inside (IR) of your forearm. Keeping your elbow against your body, rotate against resistance."

Special Tests:

- Empty Can/Jobe's Test:
 - "Straighten your arm directly in front of you. Turn your thumb to the ground. Move your arm about 15 degrees away from your body. Place your opposite hand just above your elbow joint. Now press into that hand. Does this cause pain? If so, where?"
- Hawkins-Kennedy Test
 - "Straighten your arm directly in front of you. Bend your elbow 90 degrees. Rotate your arm to the ground and bring your elbow across to the midline of your body, while slowly rotating back and forth. Does this cause pain? If so, where?"
- Neer's Test
 - "Straighten your arm by your side. Rotate your arm so your thumb is facing behind you. Grab your wrist or forearm with your opposite hand and lift your arm straight over your head. Does this cause pain? If so, where?"
- Belly Press:
 - "Place the palm of your hand on your stomach. With your opposite arm grab your wrist. Try to pull your palm off your stomach while trying to keep the palm on the stomach. Does this cause pain? If so, where?"

- O'Brien's Test:
 - "Straighten your arm directly in front of you. Bring your arm across your body. Turn your thumb to the ground. Place your opposite hand just above your elbow joint. Now press into that hand. Does this cause pain? If so, where? Now rotate your arm so your palm is facing the ceiling. Place your opposite hand just above your elbow joint. Now press upwards into that hand. Does this feel better, worse, or the same as the first position."
- Speed's Test:
 - "Straighten your arm directly in front of you. Now rotate your arm so your palm is facing the ceiling. Place your opposite hand just above your elbow joint. Now press upwards into that hand."

Common Injuries:

- Rotator Cuff Syndrome
- Tendon tear - rotator cuff, proximal vs distal biceps, pectoralis major
- AC joint separation
- Frozen shoulder/glenohumeral OA
- Some anecdotal reports from neurology colleagues and news reports about possible COVID-related brachial neuritis (?Parsonage-Turner)

[Return to Table of Contents](#)

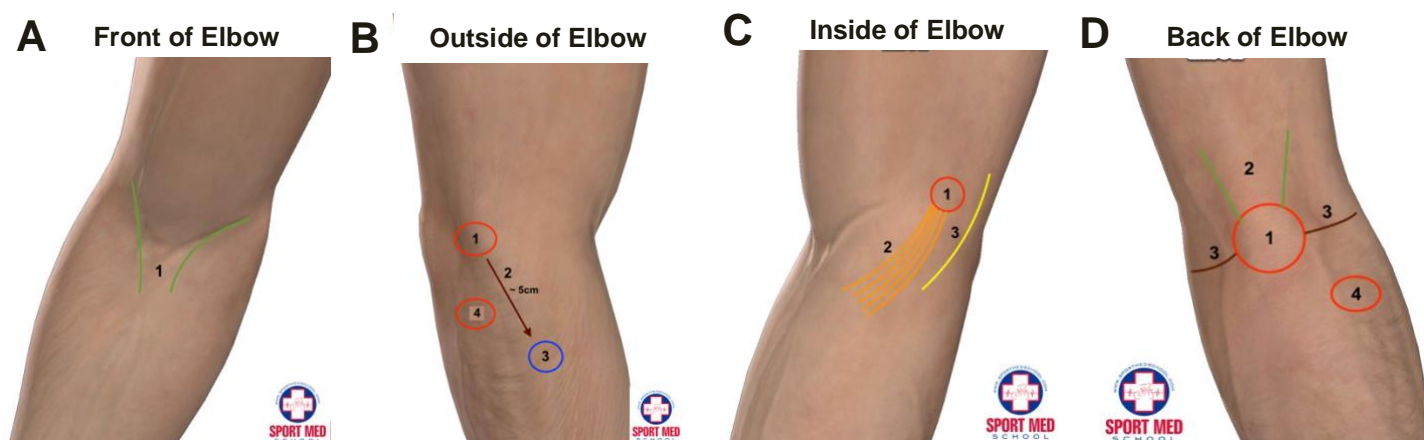
Elbow:

Inspection:

- Ask patient to roll up their sleeves or change into a t-shirt
- Observe patient as they face forwards, to the left, backwards and to the right.

Palpation:

- Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*
- Start laterally at epicondyle, move medially to supinator/arcade of Frohse, then move inferoposteriorly to radial head/radiocapitellar joint, then posteriorly to olecranon bursa and triceps insertion. Then switch to medial epicondyle and move posteriorly to cubital tunnel. If relevant, ask the patient to find a ropy structure behind the bone and either tap the structure or rub it to try to reproduce the symptoms. Potentially ask the patient to extend and flex the elbow with light pressure over the area to identify any snapping coming from that region.



Range of Motion:

- Examiner to demonstrate elbow range of motion on camera so that the patient can mimic.
- Active ROM: Full extension, full flexion, pronation, supination
- Passive ROM: if lacking full active ROM, can attempt to use the other arm to force flexion/extension.

Strength testing:

- Resisted elbow flexion:
 - "Turn your palm to face the ceiling. Place your opposite hand on your forearm. Try to bend your elbow while resisting with your opposite hand."
- Resisted elbow extension:
 - "Bend your elbow. Place your opposite hand on the back of your forearm. Try to straighten your elbow while resisting with your opposite hand."

- Resisted Wrist Extension:
 - “Straighten your arm directly in front of you with your palm facing down and make a light fist. Cover your fist with the opposite hand. Try to use this covering hand to stop yourself from moving your fist upwards. Don’t make too tight of a fist. If that’s not painful, repeat the same thing but first move your first downward, then try it again”
- Resisted 3rd Digit Extension:
 - “Keeping your arm straight and your palm facing down, bend your wrist towards the floor, with your fingers straight. Now take the 3rd finger of your opposite hand and place it on the back of the 3rd finger of the testing hand. Press into this finger with your 3rd finger only. Does this cause pain, if so where?”
- Resisted Wrist Flexion:
 - “Straighten your arm directly in front of you (as much as you can) with your palm facing up and make a light fist. Cover your fist with the opposite hand. Try to use this covering hand to stop yourself from moving your fist upwards. Don’t make too tight of a fist. If it’s too awkward, lower the bad arm slightly to make it easier to reach. If it doesn’t hurt yet, try to push harder. Does this cause pain, if so where?”
 - **Alternate** “Either grab a weight or fill a plastic bag with some cans or other heavy objects. While sitting, support your arm on a flat surface (leg/table), straighten your arm directly in front of you with your palm facing up. Hold the bag by the handles and try to keep your wrist parallel to the floor. When it hurts, point to the location of the pain. If this doesn’t hurt, try to lift the bag higher using only your wrist. If it still doesn’t hurt, add a few cans.”
- Supination
 - “With your arm at 90 degrees and elbow to your side, straighten your fingers with wrist in neutral position. Place your opposite hand on the back of your affected hand. Now rotate your forearm trying to bring your palm to the ceiling. Resist this movement with your opposite hand. Does this cause pain, if so where?”
- Pronation
 - “With your arm at 90 degrees and elbow to your side, straighten your fingers with wrist in neutral position. Place your opposite hand on the palm of your affected hand. Now rotate your forearm trying to bring your palm to the floor, Resist this movement with your opposite hand. Does this cause pain, if so where?”

Common Injuries:

- Medial epicondylopathy
- Lateral epicondylopathy
- Olecranon Bursitis
- Cubital Tunnel Syndrome
- Ulnar Nerve Subluxation
- Radial Head Fracture

[Return to Table of Contents](#)

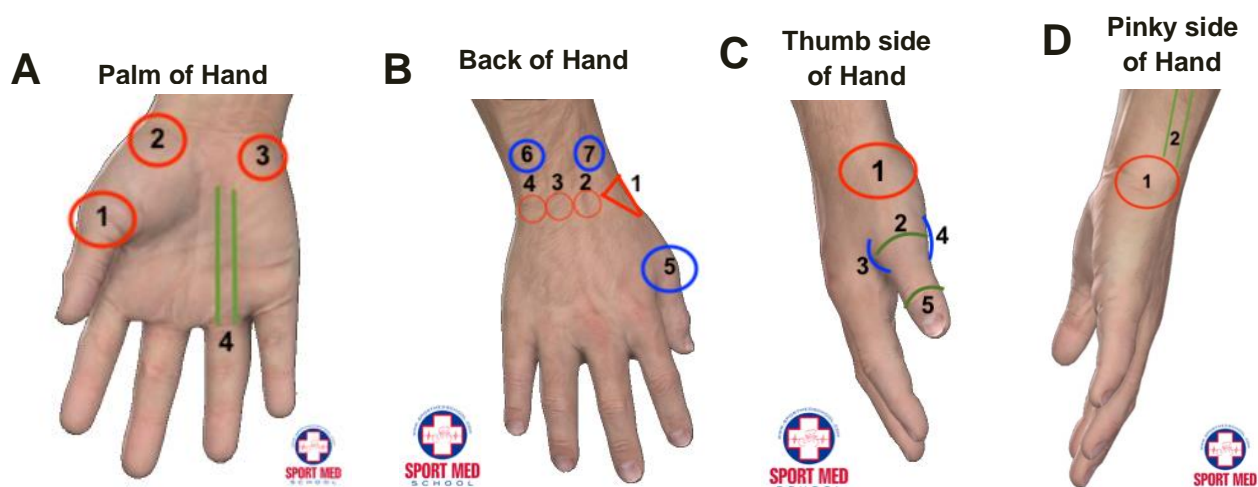
Wrist/Hand:

Inspection:

- Ask patient to roll up their sleeves or change into a t-shirt
- Observe from front and ask patient to show both the dorsal, palmar, radial and ulnar aspects of both hands.
- Examiner to demonstrate positions for patient to mimic.

Palpation:

- Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*
- Use focused exam to palpate only the relevant structures on the portion of the hand and wrist that are painful



Range of Motion:

- Examiner to demonstrate wrist & finger range of motion on camera so that the patient can copy your movements.
- Active ROM: Full extension, full flexion, pronation, supination, and if relevant: finger abduction, thumb flexion & extension, make a tight fist (to observe interphalangeal joint ROM)
- Passive ROM: if lacking full active ROM, can try using the other arm to move through limited ROMs.

Strength testing:

- Resisted Wrist Extension:
 - “Straighten your arm directly in front of you with your palm facing down and make a light fist. Cover your fist with the opposite hand. Try to use this covering hand to stop yourself from moving your fist upwards. Don’t make too tight of a fist. If that’s not painful, repeat the same thing but first move your first downward, then try it again”

- Resisted Wrist Flexion:
 - “Straighten your arm directly in front of you (as much as you can) with your palm facing up and make a light fist. Cover your fist with the opposite hand. Try to use this covering hand to stop yourself from moving your fist upwards. Don’t make too tight of a fist. If it’s too awkward, lower the bad arm slightly to make it easier to reach. If it doesn’t hurt yet, try to push harder. Does this cause pain, if so where?”
 - **Alternate** “Either grab a weight or fill a plastic bag with some cans or other heavy objects. While sitting, support your arm on a flat surface (leg/table), straighten your arm directly in front of you with your palm facing up. Hold the bag by the handles and try to keep your wrist parallel to the floor. When it hurts, point to the location of the pain. If this doesn’t hurt, try to lift the bag higher using only your wrist. If it still doesn’t hurt, add a few cans.”
- Radial Deviation:
 - “Making a fist, place your other hand on the inside of the fist. Push into this hand”
- Ulnar Deviation
 - “Making a fist, place your other hand on the outside of the fist. Push into this hand.”
- Finger abduction:
 - “Spread your fingers as far apart from each other as you can. Use your other hand to try to press your second and third fingers towards each other while you resist.”
- Finger opposition:
 - “Bring your thumb and second finger together to make an ‘okay’ sign. Using the index finger of your other hand, try to pull through between your thumb and second finger to break your grasp.”
- Thumb extension:
 - “Bring your thumb into a ‘thumbs up’ position. Using the index finger of your other hand on the back of your thumb just below the nail, try to push your thumb down.”
- +/- Finger adduction
 - “Place a piece of paper between your second and third (or third and fourth) fingers and squeeze your fingers together to grip. Use your other hand to try to pull the piece of paper out from between your fingers. Compare your strength to the other side.”
 - Alternative:
 - “Make a “peace sign” with your affected hand, place the 2nd and 3rd fingers of your opposite hand in the between your peace sign. Now squeeze your fingers together.”

Sensation:

- Ask patient to lightly touch each finger and report any numbness or altered sensation in relation to the contralateral side.
- Consider thumb, 3rd digit, and 5th digit to increase efficiency.

Special tests

- Phalen's test:
 - "Bring the backs of your hands together (Examiner demonstrates) and stay in this position. Let me know if you get any tingling in your fingers"
- Tinel's sign
 - "Using your opposite second or third finger, tap the middle of your wrist on the palm side (Examiner demonstrates). Does this cause any tingling in your fingers? If so, which ones?"
- Finklestein's test
 - "Give me a thumb's up. Now tuck your thumb in, close your fist over the thumb. Using your other hand, move your wrist downward."

Common Injuries:

- Carpal Tunnel Syndrome
- DeQuervain's Tenosynovitis
- TFCC injury
- Radiocarpal impingement/dorsal ganglion cyst
- Scaphoid fracture
- 1st CMC OA
- Trigger finger

[Return to Table of Contents](#)

Lower Extremity:

General observation for all Lower Extremity Exams:

- Gait analysis
- Toe Walk and Heel Walk
- Double Leg Squat
 - Can consider 3-way squat:
 - Traditional squat: with feet and knees shoulder width apart, slowly squat into a chair.
 - Sumo squat: keeping the knees as wide apart as possible, slowly squat into a chair.
 - Knock knee squat: keeping the knees as close together as possible, slowing squat into a chair.
- Single Leg Squat
- Duck Walk
 - “Squat down like a baseball catcher so your buttock is on your heels and heels are off the ground. Take a few steps forward in this position. Does this cause any pain? Where?”
- Single leg stance
 - “Stand near a wall and place a hand on the wall for balance if needed. Raise your asymptomatic foot until the thigh is parallel to the floor. Hold this position for up to 30 s.”

Hip:

Partially adapted from Owusu-Akyaw et al. 2019 (<https://bmjopensem.bmj.com/content/5/1/e000574>)

Gait Analysis/Observation as above

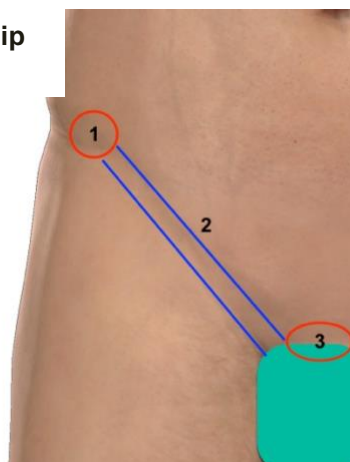
Seated position:

- Range of Motion:
 - Internal and External rotation:
 - “Please sit in a chair with your knees bent at 90 degrees. Please arrange the camera so I can see your whole lower half. Now rotate your hip so your sole is away from you and then towards you.” *Examiner to demonstrate on their own camera as well*
- Strength Testing:
 - Resisted adduction:
 - “Please sit in a chair with your feet flat on the ground. Place a fist in between your knees. Squeeze your fist with your thighs with as much force as possible for up to 5s.
 - Resisted abduction:
 - “Staying in the chair, place a belt or exercise band around your knees. Now push the knees apart with as much force as possible for up to 5 s.

Lying supine (*bed, couch, yoga mat, floor, etc.*)

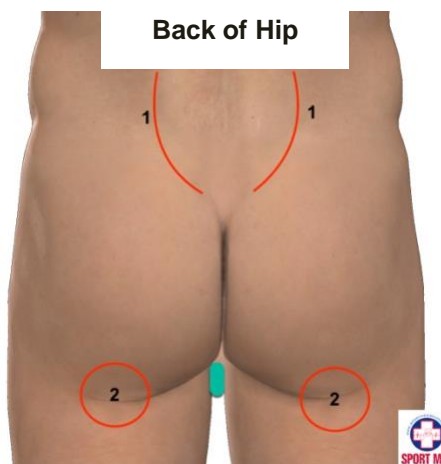
- Palpation:
 - Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*

A Front of Hip



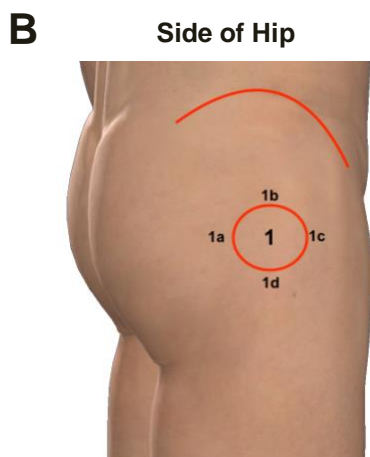
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Back of Hip



- Log Roll
 - “Lay flat on your back, relax as much as possible. Have a family member place one hand just above your knee and the other below. Roll the leg like a rolling pin. Does this cause pain? If yes, where?”
 - *May need to defer if another individual is not present.*
- Supine Flexion:
 - “Lay flat on your back. Bring your heel as close your buttocks as you can. Now bring your knee up to your chest in line with your shoulder.
 - *Can also have patient bring knee lateral or medial to shoulder if indicated.*
 - *Point to where you feel the pain.*
- FABER
 - “Place the outside of your ankle of the affected leg on your opposite knee. Now let your knee fall to the side. Does this cause pain? If yes, where?”
- FADIR
 - “Bring the knee of the affected leg across your body to the opposite hip. Now rotate your lower leg away from you. Does this cause pain? If yes, where?”
- Resisted hip flexion test (Stinchfield test)
 - “Keeping your leg straight, lift your affected leg about 10 cm off the bed/floor. Have your family member gently press your leg down while you resist this movement (**or use your hand to gently press your leg down**). Does this cause pain? If yes, where?”

- Side lying position
 - Trochanteric palpation:
 - “Lay on your side with your painful hip facing the ceiling. Bend your knees to approximately 60 degrees. Starting at your hip bone (iliac crest) palpate the down the outside of your hip until you reach another bony bump. Palpate on top, in front, below, and behind and directly on top of that bump. Where does it hurt the most?
 - Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*



- Other tests to consider if indicated include:
 - Passive stretches to identify muscular injuries
 - Quad stretch/hamstring stretch/psoas stretch

Common injuries:

- FAI
- Snapping psoas
- Hip flexor strain
- Greater trochanteric pain syndrome
- Hamstring strain/tear
- Labral injury/tear

[Return to Table of Contents](#)

Knee:

Standing Position:

Inspection/observation

- Ask patient to stand in front of the camera with it focused at knee level.
- Observe for any asymmetry, and for obvious effusion, swelling, erythema, or deformity.
- Ask patient to point to site of pain with one finger.
- Observe gait.
- Observe for effusion
- Double Leg Squat (refer above)
- Single Leg Squat
 - Observe for dynamic knee valgus.
 - “When in the motion does the pain begin. Pinpoint where the pain is coming from?”
- Thessaly Test
 - “Stand on one leg holding on to a wall, table, or counter for balance. Bend into a quarter squat and twist side to side (examiner demonstrates). Does this cause any pain? Where?”
- Full squat/duck walk
 - If no severe pain on any above maneuvers
 - “Squat down like a baseball catcher so your buttock is on your heels and heels are off the ground. Take a few steps forward in this position. Does this cause any pain? Where?”

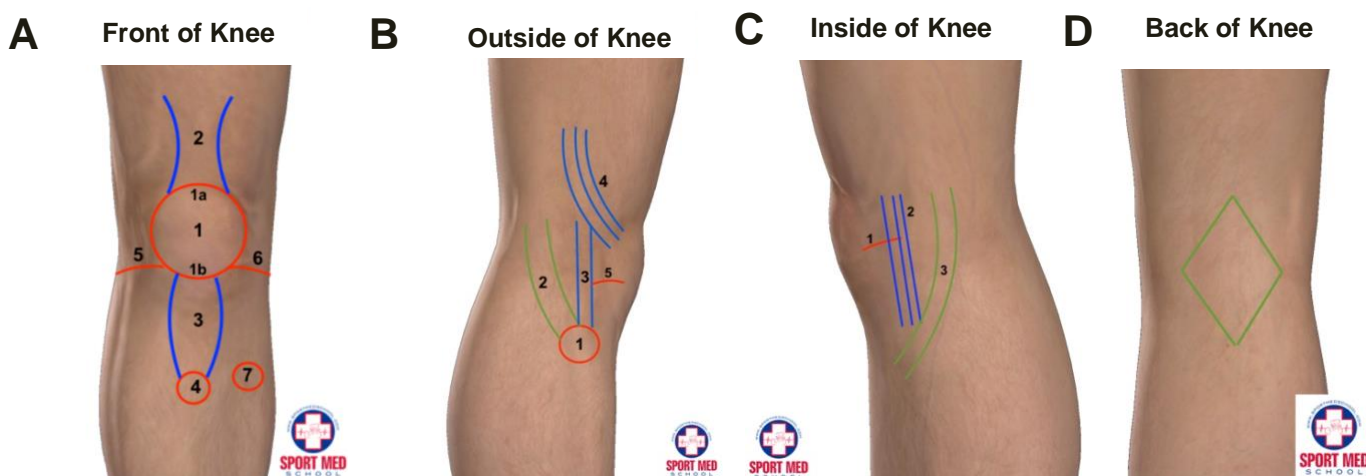
Seated Position:

- Range of Motion: *Can also be completed lying supine*
 - Extension
 - Ask patient to sit in a chair or on the floor facing to the side.
 - “Straighten both knees as much as you can. Does this cause any pain?”
 - If unable to get to full extension: “Try to relax your knee as much as you can. Using your hands apply gentle pressure to the top of your thigh to try to straighten your knee.”
 - Extension lag
 - “Keep your knee straight and raise your leg up off the floor. Try to keep your knee completely straight.”
- Flexion
 - “Staying sideways to the camera, lie down on your back (or remain in the chair). Bend your knee as much as you can - see if you can get your heel to your buttocks. Compare to the other side.”

- Power
 - Extension:
 - “Sit in a chair. Straighten your knee. Place your hand on your shin and try to push it down so that your knee bends. Use your thigh muscles to try to keep your knee straight.”
 - *Option: Use a belt or TheraBand as resistance*
 - Flexion:
 - “Sit in a chair with your feet on the floor. Place your hand on the back of your calf. Try to bend your knee against the resistance of your hand.”
 - *Option: Use a belt or TheraBand as resistance*

Lying/Sitting Position on couch/bed/yoga mat/ground etc.:

- Palpation:
 - Patient sits on the floor or couch with knee flexed to 90 degrees and foot on ground, turning to face towards the camera.
 - Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide. Ask patient to report pain, and if this is the site of their concern.
 - *Option: Examiner demonstrates where to palpate on self.*



- Patella compression/apprehension
 - “Sit on the ground (or on a couch) with your legs straight in front of you. Gently push the front of your kneecap down towards the ground. Does this cause any pain?”
 - “Place your thumb and index finger on either side of your kneecap and try to gently move it to the side. Repeat, trying to move it to the other side. Does this cause any pain? Does it feel too loose, or like it might come out of place?”

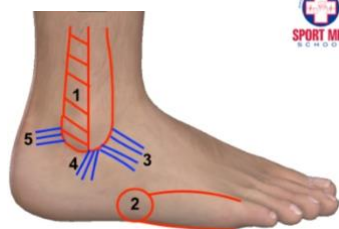
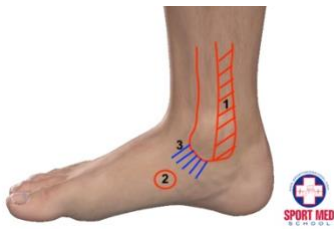
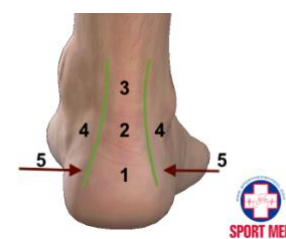
Ligaments

- Valgus stress:
 - Example of RIGHT Knee
 - “Take your left hand and grab the inside of your right ankle. Place your right hand on the outside of your right knee. Now at the same time push your ankle away from you with your left hand while pushing your knee towards you with your right hand. Does this cause pain or feel loose? If so, where”
 - **Alternate**
 - “Drag the inside of your foot along the floor, while bringing your hip towards you”
 - *Examiner to demonstrate dragging the medial heel along the floor while the hip moves into adduction*
- Varus stress:
 - Example of RIGHT Knee
 - “Take your left hand and grab the outside of your right ankle. Place your right hand on the inside of your right knee. Now at the same time push your ankle towards you with your left hand while pushing your knee away from you with your right hand. Does this cause pain or feel loose? If so, where”
 - **Alternate**
 - “Drag the outside of your foot along the floor, while bringing moving your hip away from you”
 - *Examiner to demonstrate dragging the lateral heel along the floor while the hip moves into abduction.*
- Sag Sign:
 - “Please move the camera so I can look at the outside of your knees. Bend your knees to about 90 degrees while keeping your feet flat on the floor”
 - *Examiner to observe for displacement of the tibia*
 - *Note: Accepting ideas on ACL/PCL testing*
 - *Acute ACL Injuries may be best diagnosed virtually with a thorough history that is significant for classic mechanism of injury (eg. Pivot shift with resultant hemarthrosis) and confirmed with advanced imaging such as an MRI.*

[Return to Table of Contents](#)

Ankle:

- General:
 - Gait/Squats as above as indicated
 - Observe Arch
 - Bilateral calf raise
 - Back on heels
 - Single leg stance test
- Power
 - Heel and toe walking can be used as alternative for plantar & dorsiflexion testing
- Effusion:
 - Ask the patient to position the camera so that you can see the front of both ankles while they are seated with feet on the floor. Observe for any asymmetry. Ask patient to lift up toes toward the ceiling and observe for loss of extensor tendon definition, which may indicate effusion.
 - Ask the patient to stand up and position the camera so you can see the back of both ankles. Look for fullness on either side of the Achilles tendon, which may indicate effusion.
- Palpation (this can be performed first if indicated)
 - Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide.
 - *Option: Examiner demonstrates where to palpate on self.*

A Outside of Foot/Ankle**B** Inside of Foot/Ankle**C** Front of Foot/Ankle**D** Back of Foot/Ankle

- Range of Motion
 - Ask the patient to position the camera so you can observe their ankle from the side.
 - In a seated position, examiner to guide and demonstrate plantar & dorsiflexion.
 - With the camera showing the dorsal aspect of both feet, examiner to instruct and demonstrate inversion & eversion.
 - Consider weight bearing lunge
- Power
 - Dorsiflexion
 - “Move your ankle to bring your toes toward your shin. Using your hand, try to push the top of your foot down while resisting with your ankle muscles.”

- Plantar flexion
 - “Place your hand on the ball of your foot. Try to point your foot down against your hand”
- Inversion
 - “Place your hand on your instep. Use your foot and ankle muscles to push against your hand.”
- Eversion
 - “Place your hand on the little toe side of your foot. Use your foot and ankle muscles to push against your hand.”
- Syndesmosis injury
 - Squeeze test
 - “Place one hand on either side of the middle of your lower leg, well above the ankle joint. Push your hands in towards each other (Examiner demonstrates). Does this cause pain? Where is the pain?”
 - Standing dorsiflexion/external rotation
 - “Stand with your feet hip width apart. Squat down about halfway. Keep both feet planted on the ground, and twist so your knees are facing toward the unaffected side. Does this cause pain? Where is the pain?”
- Achilles
 - Examiner to demonstrate and guide Thompson test:
 - “Kneel on a chair with your feet hanging off the edge, facing sideways to the camera so that your ankle and foot are in view. Squeeze the largest part of your calf.”
 - “Use your thumb and index finger to find either side of your Achilles tendon. Gently squeeze and tell me if you feel pain.”
 - Repeat to examine proximally and distally along Achilles.

Common Injuries

- ATFL sprain
- High ankle sprain
- Tib post insufficiency
- Achilles tendinopathy

[Return to Table of Contents](#)

Foot:

- Inspection:
 - General gait observations as above
 - Arch
- Palpation:
 - Examiner to guide patient through self-palpation, using corresponding pictures and numbers. Refer patient to the palpation guide. See above
 - *Option: Examiner demonstrates where to palpate on self.*
 - Cuboid, cuneiforms, Lisfranc joint
 - Metatarsal squeeze
- Range of Motion:
 - Flexion and extension of metatarsophalangeal joints
- Strength testing
 - 1st toe dorsiflexion
 - “Place your finger on top of your big toe. Push into your finger trying to lift your big toe up while your finger pushes in the opposite direction. Compare to the other side, does it feel different? Is there pain? If so, where?”
 - 1st toe plantar flexion
 - “Place your finger on the bottom of your big toe. Push into your toe down with your finger pushing in the opposite direction. Compare to the other side, does it feel different? Is there pain? If so, where?”
 - 2nd-5th toe flexion and extension
 - Repeat above for 2nd and 5th toes
- Special test
 - Windlass test
 - “Grab your big toe and pull it towards you. Does this cause pain? If so, where?”

Common injuries:

- Base of 5th MT fracture
- Plantar Fasciitis
- Peroneal/tib post tendinosis/tenosynovitis/insufficiency
- Stress fractures
- 1st MTP OA
- Morton’s neuroma/metatarsalgia

[Return to Table of Contents](#)

Spine:

Cervical Spine:

- Observation:
 - Observe from front, left side, right side, and back
- Palpation:
 - Examiner to guide & demonstrate self-palpation of midline c-spine spinous processes, cervical paraspinals, and upper trapezius
- Range of Motion
 - Observe flexion/extension from the side, rotation & lateral flexion from the front
 - Examiner to demonstrate movements
- Myotome Screen
 - Resisted shoulder abduction, elbow flexion & extension, thumb extension, finger abduction (all described above).
- Peripheral nerve screen as in hand & wrist section
 - Finger abduction:
 - “Spread your fingers as far apart from each other as you can. Use your other hand to try to press your second and third fingers towards each other while you resist.”
 - Finger opposition:
 - “Bring your thumb and second finger together to make an ‘okay’ sign. Using the index finger of your other hand, try to pull through between your thumb and second finger to break your grasp.”
 - Thumb extension:
 - “Bring your thumb into a ‘thumbs up’ position. Using the index finger of your other hand on the back of your thumb just below the nail, try to push your thumb down.”
 - +/- Finger adduction
 - “Place a piece of paper between your second and third (or third and fourth) fingers and squeeze your fingers together to grip. Use your other hand to try to pull the piece of paper out from between your fingers. Compare your strength to the other side.”
 - *Alternative:*
 - “Make a “peace sign” with your affected hand, place the 2nd and 3rd fingers of your opposite hand in between your peace sign. Now squeeze your fingers together.”
- Dermatomal screen
 - Examiner to guide/demonstrate self-exam to light touch of medial & lateral forearm, thumb, 3rd and 5th fingers

[Return to Table of Contents](#)

Lumbar Spine:

Standing:

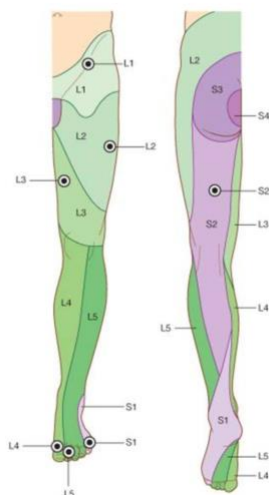
- Observe patient from front, side, back
- Gait
 - Normal Gait
 - Heel Walk and Toe Walk
 - Tandem Walk
- Range of Motion:
 - Forward flexion, extension, rotation, lateral flexion
 - Examiner to demonstrate and patient to mimic
 - Which motion causes pain? Where?
- Trendelenburg:
 - Hands on hips, lift one leg off the ground. Remain in this position for 30 seconds.
 - Examiner to demonstrate and patient to mimic
- Repeated heel raises (double leg then single leg)

Sitting:

- Strength testing:
 - Hip Flexion:
 - “Keeping the knee bent at 90 degrees place hand on thigh just above your knee. Push into that hand. Compare to the other side. Does it feel different? “
 - Knee Extension:
 - “Sit in a chair. Straighten your knee. Place your hand on your shin and try to push it down so that your knee bends. Use your thigh muscles to try to keep your knee straight. Compare to the other side. Does it feel different?”
 - *Option: Use a belt or TheraBand as resistance*
 - Ankle Dorsiflexion
 - “Move your ankle to bring your toes toward your shin. Using your hand, try to push the top of your foot down while resisting with your ankle muscles. Compare to the other side. Does it feel different?”
 - 1st toe Dorsiflexion
 - “Place your finger on top of your big toe. Push into your finger trying to lift your big toe up while your finger pushes in the opposite direction. Compare to the other side. Does it feel different?”
 - Plantar flexion
 - “Place your hand on the ball of your foot. Try to point your foot down against your hand. Compare to the other side. Does it feel different?”

- Seated Slump Test
 - “Sit on a high chair or your bed where your legs can dangle. Sit up straight. Straighten your affected leg out in front of you with the toes pointing up. (check for symptoms). Now slouch into bad posture, that is, allow your back to be rounded. (check for symptoms). Tuck your chin into your chest (check for symptoms). Now repeat with the other side in the same order to compare (only if affected side was equivocal)
- Sensation: Self palpation - light touch, compare dermatomes

Dermatomes of the lower limb



[Return to Table of Contents](#)

Neurological Exam:

Cranial Nerves:

- *CNI: Ask if patient has noticed any change in smell? Concern for COVID?*
- CN II-III: Inspect pupils for symmetry if video quality allows (ask patient to move close to camera)
- CN III: Inspect eyelids for ptosis
- CN III, IV, VI: Check extra-ocular movements by having patient track finger if video quality allows. If unable, ask patient to look to the right without moving the head, then look to the left while observing for nystagmus or change in range of movement. Ask patient to look to the right, then look up and down while keeping gaze to the right. Repeat on the left.
- CN V motor: Ask patient to place fingers on each side of jaw (Examiner to demonstrate), clench teeth together, and feel for equal contraction on both sides.
- CN V sensory: Examiner to guide/demonstrate self-exam to light touch at each side of forehead, cheeks, and chin.
- CN VII: "Raise your eyebrows. Close your eyes tightly. Show me your teeth." Observe for asymmetry.
- *CN VIII: not really amenable to virtual assessment*
- CN IX: listen to patient's voice quality (assess for hoarseness or nasal quality)
- CN X: if video quality allows, ask patient to move close to camera, open mouth, and say 'ah'. Observe for symmetrical palate rise and uvula deviation.
- CN XI: "Shrug your shoulders." Observe for asymmetry or inability to elevate one shoulder.
- CN XII: "Stick out your tongue." Observe for deviation or fasciculations.

Motor:

- As above

Sensory:

- As above

Cerebellum:

- Examiner to demonstrate RAM
- Observe tandem walking (if safe after observation of regular gait)
- Romberg test
 - "Stand with your feet together, then close both eyes." Time for 20-30 seconds and observe ability to maintain upright posture with minimal swaying.
- Pronator drift
 - "Stand or sit with both arms straight forward with your palms up. Close your eyes." Time for 20-30 seconds and observe for pronation or downward drift.
- Rapid Alternating Movements
 - "Take the back of one hand and place it on the palm of the other. Now turn your wrist so both palms are together. Repeat the motion as fast as you can. Examiner to demonstrate."

[Return to Table of Contents](#)

Palpation Diagrams Legend

Upper Extremity

Shoulder

<i>Picture</i>	<i>Number</i>					
	1	2	3	4	5	6
A	Clavicle	Acromioclavicular (AC) Joint	Acromion	Greater Tuberosity	Long Head of Biceps Tendon	Coracoid Process
B	Acromion	Greater Tuberosity				
C	Spine of Scapula	Posterior Joint Line	Lateral Border of Scapula			

Elbow

<i>Picture</i>	<i>Number</i>			
	1	2	3	4
A	Distal Biceps Tendon			
B	Lateral Epicondyle	Common Extensor Tendon	Radial Tunnel	Radial Head
C	Medial Epicondyle	Common Flexor Tendon	Ulnar Nerve	
D	Olecranon	Triceps Tendon	Medial and Lateral Joint Line	Radial Head

Hand

<i>Picture</i>	<i>Number</i>						
	1	2	3	4	5	6	7
A	1 st MCP joint	Scaphoid Tubercle	Pisiform/Hook of Hamate				
B	Anatomic Snuffbox	Lunate	Triquetrum	Pisiform	1 st MCP	Ulnar Styloid	Lister's Tubercle
C	1 st /2 nd Extensor Tendon Compartments	1 st MCP joint line	Ulnar Collateral Ligament	Radial Collateral Ligament			
D	TFCC	ECU tendon					

[Return to Table of Contents](#)

Lower Extremity

Ankle/Foot

Picture	Number				
	1	2	3	4	5
A	Posterior edge of distal 6cm of Lateral Malleolus	Base of 5 th Metatarsal	Anterior Talofibular Ligament (ATFL)	Calcaneofibular Ligament (CFL)	Posterior Talofibular Ligament (PTFL)
B	Posterior edge of distal 6cm of Medial Malleolus	Navicular	Deltoid Ligament		
C	Anterior Tibiotalar Joint Line	Anterior-Inferior Tibiofibular Ligament (AITFL)	1 st Interphalangeal Joint	1 st Metatarsophalangeal Joint	Lisfranc Ligament
D	Achilles' Tendon insertion	Achilles' Tendon midportion	Achilles' Tendon proximal portion	Kager's fat pad	Calcaneal Squeeze
E	Plantar Fascia Origin	Sesamoid Bones			

Knee

Picture	Number						
	1	2	3	4	5	6	7
A	Patella 1a: Superior Patella pole 1b: Inferior Patella pole	Quadriceps Tendon	Patella Tendon	Tibial Tubercle	Lateral Joint Line	Medial Joint Line	Pes Anserine Bursa
B	Fibular Head	Biceps Femoris Tendon	Lateral Collateral Ligament (LCL)	Iliotibial (IT) Band	Lateral Joint Line		
C	Medial Joint Line	Medial Collateral Ligament (MCL)	Pes anserine/Semitendinosus Tendons				
D	Popliteal Fossa						

Hip

[Return to Table of Contents](#)

Picture	Number		
	1	2	3
A	Anterior Superior Iliac Spine (ASIS)	Inguinal Ligament	Pubic Symphysis/Tubercle
B	Greater Trochanter		
C	Sacroiliac (SI) Joint		

