McMaster University
inspiring innovation and discovery

Dr. Janice Harvey
McMaster Sports Medicine

ANKLE EXAMINATION

HISTORY

Sport / Occupation - Useful in determining mechanism of injury / overuse

Level of Sport/Activity
- Training Schedule
- Position Played
- Terrain
- Footwear
- Warm-up / Cool-down

Pain Characteristics
- Mechanism of injury - very NB. in acute injuries (inversion / eversion / plantarflexion)
- Site - lateral / medial / posterior / anterior / foot
- Duration - constant vs. with certain activities only
- Associated Symptoms - swelling / bruising / locking / giving way
- Ability to walk / weight bear after injury

Treatment to Date - ice, wrap, crutches, x-rays

Previous Injuries to ankle
1st deg injury – **ALWAYS** stable, one lig. involved (ATF)
2nd deg Injury – stable **or** unstable – 2 or more ligs. Involved
3rd deg injury – **ALWAYS** unstable – 3 or more ligs. involved

Other MSK conditions

Medical History / Allergies

McMaster University
Inspiring Innovation and Discovery

Dr. Janice Harvey
McMaster Sports Medicine

ANKLE EXAMINATION

EXAMINATION

Observation
- Deformity - swelling, ecchymosis, abrasions, scars
- Alignment - forefoot & rearfoot varum / valgum, pes planus / cavus, knee alignment
- Appliances - crutches / wrap / brace
- Gait - antalgic, excessive pronation / supination heel / toe walk, squat / duck-walk

Proprioception
- Balance on 1 foot with eyes open, then closed

ROM (range of motion)

- Ddorsiflexion	- Tibialis Anterior
- Plantar flexion	- Gastrocnemius / Soleus
- Inversion	- Tibialis Posterior
- Eversion	- Peroneus

Stability Test
- Anterior Drawer Test

Strength Testing
- Resisted dorsi / plantar flexion
- Resisted inversion / eversion

Palpation

Lateral
- from head of fibula (Superior Tibiofibular Joint) to lateral malleolus
- Anterior inferior tibiofibular (AITF) ligament, Anterior talofibular (ATF) ligament, Calcaneofibular (CF) ligament, Posterior talofibular (PTF) ligament, Peroneals, base of 5th metatarsal

Anterior
- Anterior capsule, Tibialis Anterior, EHL

Medial
- Anterior talotibular (ATT) ligament, Deltoid ligament, medial malleolus, Tibialis Posterior tendon

Posterior
- Achilles tendon

Special Tests
- Impingement (anterior / posterior)
- Tibia / Fibula Squeeze test (Interosseus Membrane)
- Forced dorsiflexion / external rotation (AITF ligament)

McMaster University
inspiring innovation and discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

HISTORY

Age of patient - Certain conditions are more prevalent in particular age groups (Osgood Schlaters, Degenerative Joint Disease)

Sport / Occupation - Useful in determining mechanism of injury / overuse

Level of Sport / Activity
- Training Schedule
- Position Played
- Terrain
- Footwear
- Warm-up / Cool-down

Pain Characteristics

Mechanism of injury
- MOST NB information
  - ? Immediate swelling
  - ? Crack/Pop heard or felt
  - ? Locking / Pseudolocking
  - ? Giving way

Location - anterior (? patellofemoral or referred from hip), posterior (Bakers' cyst/meniscal/hamstring), lateral (iliotibial band/superior tibulofibular Jt.), medial (mcl/meniscal/pes anersine)

Duration - constant vs. with certain activities only

Associated Symptoms - swelling / locking / giving way

Treatment to Date - For similar / related injury

Other MSK conditions

Medical History/Allergies

Family Hx of related conditions:

McMaster University
Inspiring Innovation and Discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

EXAMINATION

Observation and Surface Anatomy

Anterior view

Posture	- esp. in chronic anterior knee pain
Musculature	- quad wasting
Deformity	- swelling, ecchymosis, abrasions, scars
Alignment	- genu varum / valgum / recurvatum, pes planus / cavus, patellar position, Q angle
Appliances	
Gait	- excessive pronation / supination
Surface Anatomy	- Tib. Tubercle, Gerdy's tubercle, joint line, lat. femoral condyle, Fib. head, Pes Anserine insertion, patellar retinaculum

Posterior view

Posture	
Musculature	- gastroc / hamstring wasting
Deformity	- Bakers' cyst, ecchymosis, abrasions, scars
Alignment	- uneven popliteal creases / gluteal folds, rearfoot varus / valgus
Gait	- Trendelenburg / antalgic

Lateral View

Posture	
Musculature	- wasting
Deformity	- lack of full extension, swelling, ecchymosis, abrasions, scars
Alignment	- genu recurvatum, patellar position

McMaster University
Inspiring Innovation and Discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

Range of Motion (ROM)

Quick tests
- squat & duck-walk (good for eliciting meniscal symptoms)
- standing lack of full extension (possible meniscal injury)

Active / Passive ROM- PM: prime movers, AM: accessory movers

Flexion
- 135°
- PM: hamstrings (semimembranosus, semitendinosus, biceps femoris)
- AM: sartorius, gastrocnemius, gracilis, and popliteus

Extension
- 15°
- PM: quadriceps (vastus lateralis, medialis, intermedius, rectus femoris)

Resisted Isometric Contraction Tests

Flexion - hamstrings

Extension - quadriceps

Medial rotation - semimembranosus, semitendinosus, popliteus

Lateral rotation - biceps femoris

McMaster University
inspiring innovation and discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

Special Tests

Patellofemoral Tests

Swelling or Effusion - swelling is something you observe, effusion you have to elicit

Patellar Tap
- simultaneous compression of skin from superior / inferior aspects of the joint, followed by tapping on the top of the patella with index finger
- compare with opposite knee for feeling of fluid under patella

Patellar Tracking
- can be done in a sitting position with hand over patellar facets
- as patient slowly extends leg, or with the patient supine and actively contracting their quads

Osmond Clarke Test - for patellofemoral tenderness - patient is supine & actively contracting quads while examiner compresses patellofemoral tendon at the superior aspect of the patella to elicit pain

Patellar Apprehension Test
- for patellar subluxation / dislocation
- patient is supine, the examiner flexes knee to 20° & applies lateral pressure to medial aspect of patella to elicit apprehension

Patellar Palpation - for retinacular tenderness, crepitous, mobility and tilt of patella

McMaster University
Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

Medial & Lateral Ligament Tests

Medial Collateral Ligament (MCL)

Valgus stress
- patient supine, knee flexed to 30° while examiner applies valgus stress to the knee to elicit pain / instability
- test is repeated with leg in full extension *

(* instability at full extension = more severe damage)

Lateral Collateral Ligament (LCL)

Varus stress
- patient supine, knee flexed to 30° while examiner applies varus stress to the knee to elicit pain / instability
- test is repeated with leg in full extension *
- *** due to natural laxity in LCL – tear is rare***

Anterior Cruciate Ligament Tests

Anterior Drawer Test
- patient supine, hip flexed to 45°, knee flexed to 90°, foot blocked & hamstrings relaxed
- examiner has hands on upper calf, thumbs on either side of tib. tubercle while slowly pulling tib forward

Lachman Test
- patient supine, knee flexed to 20°, hamstrings relaxed, distal femur stabilized with one hand, while grasping prox. tibia with other hand & slowly displacing forward
- this test is more sensitive vs. the Anterior Drawer

Pivot Shift Test
- patient supine, leg supported & fully extended, foot stabilized between arm & side of body, proximal tibia held with both hands
- examiner applies valgus & internal rotation forces, while flexing, the knee
- tibia will drop back into place at approximately 30° flexion

Posterior Cruciate Tests

McMaster University
Inspiring Innovation and Discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

Sag Sign
- patient supine, flex hip & knee to 90° - observe upper anterior tibia for posterior displacement
- best to compare to the other knee in the same position

Posterior Drawer Test
- same position as **Anterior** Drawer Test
- examiner pushes tibia posteriorally to elicit displacement

Meniscal Tests

McMurray Test
- patient supine while examiner flexes knee & hip to a tolerable position for the patient
- examiner then places hand over joint lines while grasping patient's heel with the other hand, applying internal / external rotational force to the lower leg to elicit pain / clunking sensation

Joint Line Palpation
- patient supine with knee flexed to 90°, while examiner palpates joint line from patellar tendon to posterior aspect of the joint
- the joint line is easier to palpate when patients' foot is rotated internally / externally

Passive Extension
- lack of full extension (locked knee)
- look for effusion and quad wasting

McMaster University
Inspiring Innovation and Discovery

Dr. Janice Harvey
McMaster Sports Medicine

KNEE EXAMINATION

Other Tests

Ober Test

- for assessment of Iliotibial Band
- patient lying on side, hips flexed to 90°
- examiner stabilizes hip with one hand, grasps upper knee with the other hand to fully flex then fully extend hip
- Note is made of the resting position of the leg after this maneuver is complete in order to assess tightness of the band
- examiner then places his / her thumb over lat. femoral condyle while patient slowly flexes / extends knee
- a positive test will demonstrate tightness in the band, +/- pain under examiners thumb
- Palpation of the insertional sight on Gerdy's Tubercle may also elicit pain

Hip Assessment – Thomas

- Test to examine iliopsoas, rectus femoris, and iliotibial band
- patient sits on the very edge of the exam table while fully flexing unaffected hip and knee
- patient then grasps flexed limb while slowly rolling back into a supine position, allowing the affected limb to rest in a naturally extended position
- Note is made of the resting height of the knee from the level of the table re: iliopsoas flexibility and the rotated position of the foot, indicating flexibility of the ITB
- Rectus Femoris flexibility can be determined by flexing the extended knee further (i.e. bringing the foot closer to the examination table)

Leg Length Discrepancy / Pelvic imbalance

- useful in assessing chronic knee pain