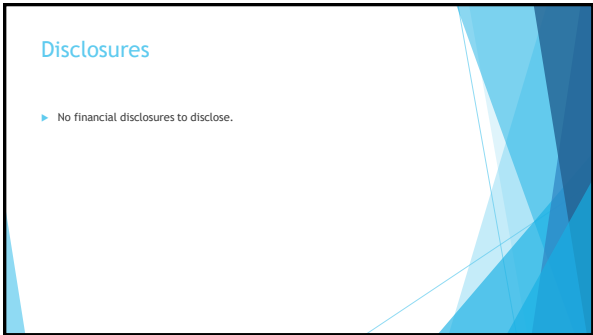


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2



3

What NOT to Expect

- ▶ This lecture is not a comprehensive review of how to treat specific injuries
 - ▶ “RICE,” stretching, medication, activity modification, appropriate treatment strategies, etc.
- ▶ This is not a comprehensive review of all special tests and techniques used to diagnose a specific injury
 - ▶ Imaging is hardly discussed in this presentation and should be done at the physician’s discretion
- ▶ This is NOT a cookie cutter approach. Every injury requires professional judgment and discernment

4

Structure

- ▶ What you hear
- ▶ What you see
- ▶ What you do to diagnose
 - ▶ Special test demonstration
- ▶ What you do to prevent
- ▶ Case Study

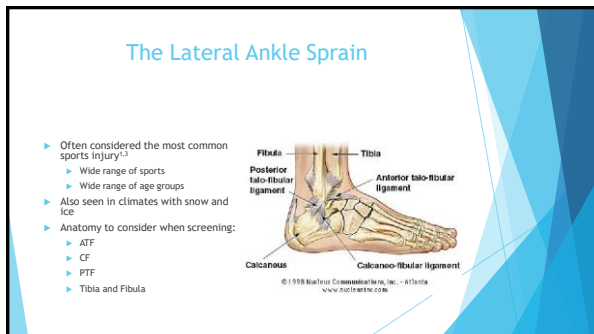
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From my clinical Experience:
If it’s in RED = SUPER IMPORTANT!!

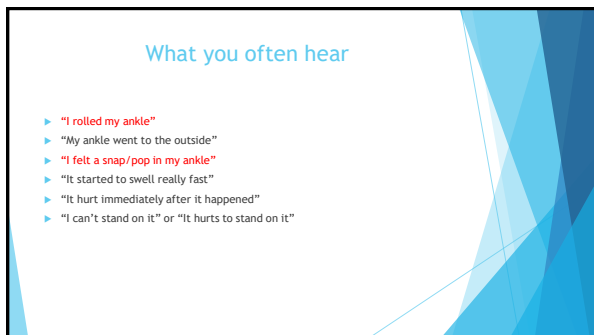
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8



9

What you often see

- ▶ Ankle swelling
 - ▶ Lateral ankle
- ▶ **Ecchymosis** on the lateral ankle or lateral foot near base of 5th met
- ▶ Ecchymosis posterior to the lateral malleolus (can be superior, inferior, or both to lateral malleolus)
 - ▶ May indicate sprain/strain of fibularis longus and brevis

10

What you often do to diagnose

- ▶ Identify damaged structures
 - ▶ ATF, CF, PTF, fibularis longus, fibularis brevis
- ▶ Talar Tilt Test
 - ▶ Time appropriate?
- ▶ Anterior Drawer Test
 - ▶ Time appropriate?



Talar Tilt Test
Assessment

11

What you often do to prevent

- ▶ The greater the damage, the greater the need to follow up
 - ▶ At higher risk of another lateral ankle sprain^{1,3}
- ▶ Anatomical laxity of the ankle
 - ▶ Compromised integrity of the ligaments
- ▶ Balance/Proprioception Training
 - ▶ Significant damage of lateral ankle structures results in lasting deficits³
- ▶ Use of ankle taping methods
 - ▶ Recommended?
- ▶ Use of ankle brace in return of sport³
 - ▶ Recommended?

12

Case Study

- ▶ Dr. Page reported he was grappling when his opponent put him in an ankle lock. He and his opponent both report hearing an audible pop. Dr. Page reported a hot burning sensation in his lateral ankle followed by immediate pain with weight bearing and immediate swelling. A few hours later Dr. Page reported he noticed bruising along his lateral foot that traveled to his “5th digit.”
- ▶ Talar tilt test - positive (for ATF)
- ▶ Anterior drawer test - positive
- ▶ Location of bruising - ATF and base of lateral foot to 5th digit
- ▶ Location of pain with palpation- ATF
- ▶ Dr. Page’s conclusion: Partial or complete rupture of ATF
- ▶ Follow up with balance training once pain and swelling decreased

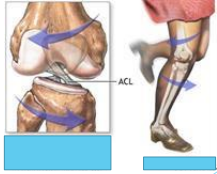
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ACL TEAR

14

ACL TEAR

- ▶ Often considered a “plant and pivot” injury
- ▶ More common in female vs male⁴
- ▶ Results in increased laxity of knee and higher likelihood of damaging other structures of the knee⁵
- ▶ Anatomy to consider when screening:
 - ▶ ACL, LCL, MCL, MENISCUS



15

What you often hear

- ▶ “I was just running and when I tried to change directions my knee buckled and I fell.”
- ▶ “It happened the moment I planted my foot”
- ▶ “I heard a loud pop in my knee”
- ▶ “It swelled really fast”
- ▶ “It just feels weird now”
- ▶ “My knee feels loose”
- ▶ “I had immediate pain”
- ▶ “I had no immediate pain”

16

What you often see⁶


- ▶ Nothing
- ▶ Edema in the knee
 - ▶ Can be significant
- ▶ Patient wary to weight bear, run, or rapidly change directions when running
- ▶ Antalgic gait
 - ▶ Acute phase

17

What you often do to diagnose

- ▶ Listen to mechanism of injury (case study)
- ▶ Look for loss of ROM
- ▶ Special tests (test unaffected knee first)
 - ▶ Lachman's Test
 - ▶ Swelling
 - ▶ Anterior Drawer Test
 - ▶ Swelling

Lachman's Test



The diagram shows a person's knee in a flexed position. A hand is placed on the femur (thigh bone) and another hand is on the tibia (shin bone). A red arrow points forward, indicating the direction of the anterior drawer test.

18

What you often do to prevent

- ▶ Pre-surgical intervention
 - ▶ Linked to better recovery?
- ▶ Post surgical intervention
 - ▶ Safe restoration of pain free ROM
 - ▶ Safe strengthening
 - ▶ Safe single leg stability training
- ▶ Gradual return to sport
 - ▶ Agility drills
- ▶ Education on moving feet vs planting feet
 - ▶ Especially at beginning in return to sport

19

Case Study

- ▶ Dr. Page's friend "Jim" called with a report of a knee injury. He reported he was wrapping presents for Christmas and his kids came home early. He stated that he picked up the presents and started to run to hide them. While running he realized he forgot a present and planted his right foot to pivot and "do a 180" to retrieve the final present. He reported his knee buckled with immediate pain (no audible pop or sensation of "something popping"). Jim went on to report his knee "felt stiff," but no significant swelling was reported. Finally, Jim reported his knee felt "weird...something is wrong."
- ▶ Negative Lachman's Test within 24 hours
- ▶ Negative Anterior Drawer Test within 24 hours
- ▶ Continued pain with knee motion and report of "a loose knee"
- ▶ Dr. Page's conclusion: Partial or complete tear of the ACL
- ▶ Immediately sent to seek an MRI
 - ▶ Why?


20

MENISCAL TEAR

21

Meniscal Tear

- ▶ Often thought of as a “shear and compressive” injury
- ▶ Can be seen in long distance running
 - ▶ Uneven ground
- ▶ More common to tear medial meniscus
- ▶ Anatomy to consider when screening:
 - ▶ Medial and lateral meniscus, ACL, MCL, LCL, PCL



22

What you often hear

- ▶ “I had immediate pain”
- ▶ “I have a new clicking in my knee”
- ▶ “My knee catches/locks”
 - ▶ Stairs
 - ▶ More severe
- ▶ “My knee buckles on me”

23


What you often see

- ▶ Nothing
- ▶ Swollen knee
- ▶ Patient has antalgic gait
- ▶ Patient sits with injured knee straight out
 - ▶ Posterior tear

24

What you often do to diagnose

- ▶ Mechanism of injury
- ▶ **Focal tenderness**
 - ▶ Joint line/tibial ridge
- ▶ If medial meniscus:
 - ▶ Pes anserine tenderness
- ▶ Thessaly Test
- ▶ McMurray's Test
- ▶ Weight of patient



Thessaly Test

25

What you often do to prevent

- ▶ Pre-surgical intervention
 - ▶ Small peripheral tear⁴
- ▶ Post-Surgical intervention
 - ▶ Safely restore pain free ROM
 - ▶ Safely improve strength
 - ▶ Safely improve single leg stability
- ▶ Adaptation of sport
- ▶ Gradual return to sport
 - ▶ Agility drills
- ▶ Weight loss
- ▶ Education of moving feet vs planting feet
 - ▶ Football

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Case Study

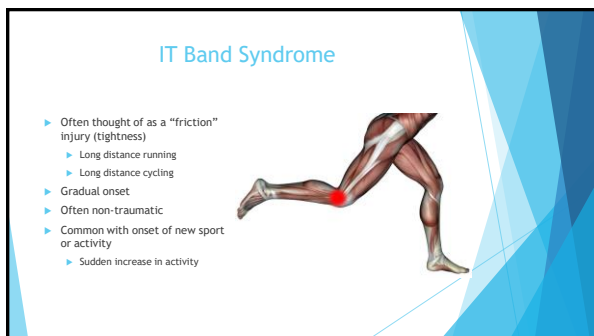
▶ “Betty” is a 35 year old female who weighs 215lbs. She reported that she started to train for a 10k race. She stated she has been running outside and that she has recently experienced knee pain and stiffness. She reported she had “pushed through” the pain, but she has now started to get R hip pain with running. She also reported R knee pain with regular ambulation, a semi-regular buckling sensation, and significant pain with ascending and descending stairs. Finally she reported little to no visible swelling.

- ▶ Ambiguous McMurray Test
- ▶ Positive Thessaly Test
- ▶ Pain with full knee flexion
- ▶ Significant point tenderness to medial joint line and pes anserinus
- ▶ Dr. Page's conclusion: torn medial meniscus

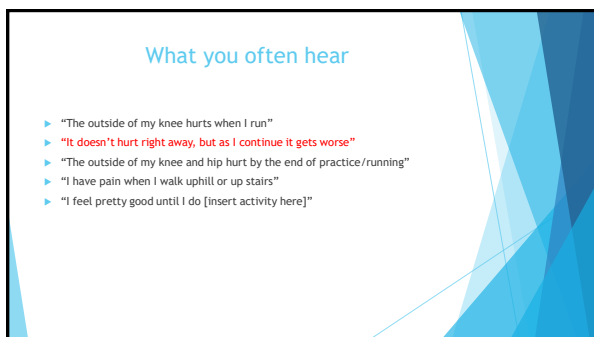
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28



29



30

What you often see


- ▶ Nothing

31

What you often do to diagnose

- ▶ Look for: gradual onset, no known mechanism of injury, sudden increase in work load, pain with prolonged running
- ▶ Warmth on lateral knee after running and onset of symptoms
- ▶ Ober's Test
- ▶ Noble's Compression Test
- ▶ Gait analysis demonstrates significant discrepancy in motion
 - ▶ Arches in feet
- ▶ Find weaknesses in hip musculature

Ober's Test



32

What you often do to prevent

- ▶ Stretching??
- ▶ Hip strengthening
 - ▶ Abductors
 - ▶ Adductors
 - ▶ Rotators
- ▶ Gait training
- ▶ More gradual increase in activity
- ▶ Possible orthotics

33

Case Study

- ▶ Dr. Page's best friend started training for a marathon. He is an athlete and always trains hard. He started developing lateral left knee and hip pain 7-9 miles into a run. He reported ice and NSAIDs decreased his pain after running, but almost without fail right around 7 miles his knee started to hurt and as he continued to run his hip started to hurt. He tried to switch to long distance cycling to give his body a break, but the pain inevitably started in the knee after an hour of riding.
- ▶ Positive Noble's Test
- ▶ Negative Ober's Test
- ▶ 5/5 strength in hip
- ▶ Dr. Page's conclusion: IT Band Syndrome
- ▶ Patient was fine after 2 weeks of rest and gradual return to running


34

EXTERNAL ROTATOR CUFF STRAIN/TENDONITIS

35

External Rotator Cuff Strain/Tendinitis

- ▶ Often considered a "deceleration" injury
- ▶ Often seen in baseball and softball athletes
 - ▶ Baseball pitchers
- ▶ Often in younger players who have not developed posterior musculature
- ▶ Anatomy to consider:
 - ▶ Rotator cuff, long head of biceps, scapula (position)



36

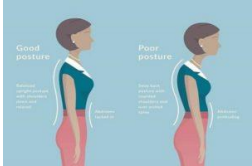
What you often hear

- ▶ “It hurts when I throw the ball”
- ▶ “It hurts when I wind up”
- ▶ “It only hurts after I have been throwing the ball”

37

What you often see

- ▶ Nothing
- ▶ **Winging scapula**
- ▶ **Sway back posture**
 - ▶ Often in younger athletes



38

What you often do to diagnose

- ▶ No known mechanism of injury
- ▶ What part of the throw causes pain?
- ▶ Pain with AROM external rotation (wind up phase)
- ▶ Pain with PROM internal rotation
- ▶ **Anatomical tenderness to palpation of infraspinatus and teres minor**
- ▶ May have positive impingement tests (covered later)
 - ▶ Swelling
- ▶ Look for a sudden increase in throwing activity

39

What you often do to prevent

- ▶ Strengthen external rotators
- ▶ Strengthen serratus anterior
- ▶ Strengthen rhomboids
- ▶ Gradual increase in activity
- ▶ Functional strengthening in overhead throwing position
- ▶ General rotator cuff strengthening for stability
 - ▶ Multi-directional
- ▶ Maintain good ROM
 - ▶ Loss of internal rotation and excessive external rotation is sometimes normal in overhead pitching

40

Case Study

- ▶ “Jarred” is an 11 year old boy who just started baseball at his school. He also played in a travel league on the weekends. He is the pitcher for both teams and has been complaining to his mother that his arm hurts after each game. Jarred is a poor historian and states “I don’t know, it just hurts every time I throw the ball.”
- ▶ Pain with wind up phase of pitching
- ▶ Pain after throwing the ball
- ▶ Pain with PROM internal rotation
- ▶ Sway back posture
- ▶ Increased winging scapula on the right
- ▶ Positive for impingement
- ▶ Dr. Page’s conclusion: irritation of external rotator tendons and swelling resulting in impingement
- ▶ Patient recovered after 2 weeks of rest (parent’s were not happy), gradual return to sport, and strengthening program

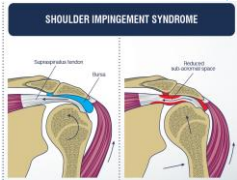
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SHOULDER IMPINGEMENT

42

Shoulder Impingement

- ▶ Often thought of as an overhead injury
- ▶ Overhead athletes
 - ▶ Tennis, volleyball, golf, and weight lifting/CrossFit
- ▶ Anatomy to consider:
 - ▶ ACJ, long head of biceps, supraspinatus, labrum



SHOULDER IMPINGEMENT SYNDROME

43

What you often hear

- ▶ “It hurts when I raise my arm over my head”
- ▶ “It only hurts in a certain range”
- ▶ “It only hurts with certain [specific] activities or motions”
- ▶ “The pain starts at my shoulder and shoots halfway down my arm”
- ▶ “I can’t sleep on that side”
 - ▶ Supraspinatus involvement

44

What you often see

- ▶ Poor posture
 - ▶ Forward shoulders and forward head
- ▶ Winging scapula


45

What you often do to diagnose

- ▶ Painful Arc?
 - ▶ 60-120 degrees
- ▶ Near's Impingement Test
- ▶ Hawkins Kennedy Impingement test
- ▶ Ask if it hurts to sleep on the affected side
- ▶ Poor GHJ rhythm with shoulder elevation (2:1 ratio after 30 degrees elevation?)
- ▶ No mechanism of injury or known trauma
 - ▶ Make sure swelling from another injury is not causing symptoms of impingement.

Hawkin's Kennedy Test

Hawkins-Kennedy Test



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What you often do to prevent

- ▶ Train/strengthen external rotators
 - ▶ Why?
- ▶ Specific stretching/mobilization of the GHJ capsule
- ▶ Correct GHJ rhythm if incorrect
 - ▶ Tricky
 - ▶ Should be a 2:1 ratio of movement after the first 30 degrees of elevation
- ▶ Activity modification
- ▶ Sleep position adaptation
- ▶ Use of Kinesio Tape, Rock Tape, etc...

47

Case Study

- ▶ “Ronald” is a middle aged man who started golfing again. He reported pain in his left shoulder with end of range wind up and after his follow through on his golf swing. He stated the pain increased as the game continues and that he often wakes up at night from pain (he is a side sleeper). He is also able to reproduce his symptoms through various shoulder motions that are all performed above 90 degrees of shoulder elevation.
- ▶ Positive Hawkin's Kennedy
 - ▶ More similar to golfing motion
- ▶ Negative Near's
- ▶ No winging scapula
- ▶ Poor GHJ rhythm (scapula did not start to upwardly rotate until approximately 80 degrees of left shoulder abduction)
- ▶ Dr. Page's conclusion: Impingement syndrome
- ▶ Patient recovered quickly with adaptation of sleep position and strengthening program

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Final Takeaways

- ▶ Lateral ankle sprain
 - ▶ Rolled ankle, felt snap/pop, ecchymosis present
- ▶ ACL tear
 - ▶ Audible Pop, “feels weird,” mechanism of injury
- ▶ Meniscal tear
 - ▶ Knee buckles, focal tenderness, patient sits with injured knee straight out
- ▶ IT Band syndrome
 - ▶ Hurts with prolonged running/activity and Noble’s Compression test
- ▶ External rotator cuff strain/tendonitis
 - ▶ Anatomical tenderness, winging scapula, sway back posture
- ▶ Shoulder impingement
 - ▶ Pain with shoulder elevation and pain that travels to deltoid tuberosity region

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Questions?

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