

# Managing Common Foot & Ankle Injuries

John Turner, MD

FastMed Urgent Care



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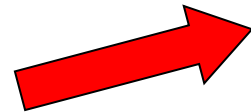


COLLEGE OF  
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MEDICINE

# Pre-Test 1

What is this called?

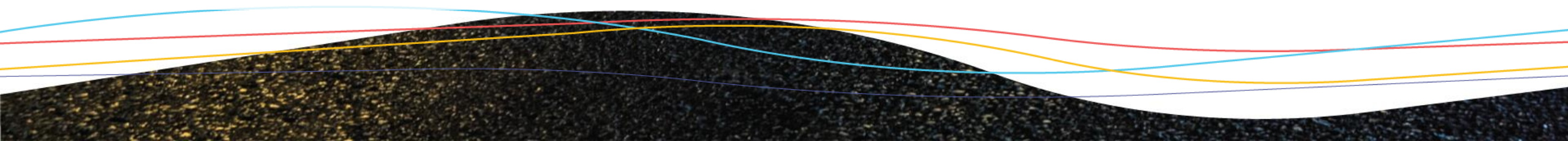
- A. Jones Fracture
- B. Metatarsal avulsion fracture
- C. Salter-Harris II fracture
- D. Metatarsal stress fracture



# Pre-Test 2

**What is the most commonly injured ligament in an ankle sprain?**

- A. Posterior talo-fibular ligament**
- B. Calcaneofibular ligament**
- C. Anterior talo-fibular ligament**
- D. Deltoid ligament**



# Pre-Test 3

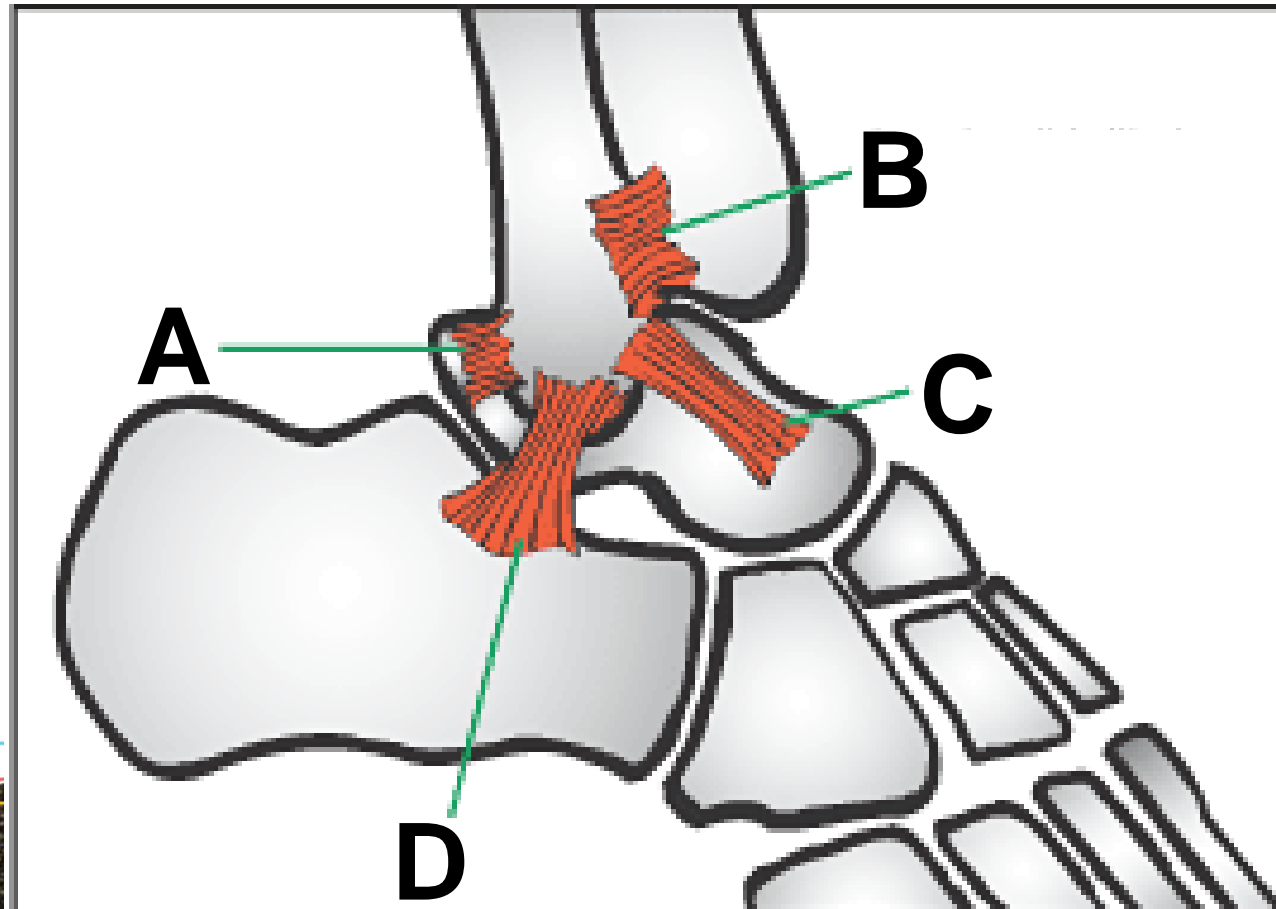
What is this test called?

- A. Appley's test
- B. Talar Tilt test
- C. Anterior Drawer test
- D. Thompson Squeeze test



# Pre-Test 4

Which lateral ligament is injured in a High Ankle Sprain?



# The Challenges...

- Medical Training lacking for MSK system
- Clinicians don't develop exam confidence
- MSK problems #2 reason people seek care
- MSK exam has to hurt when patient is injured
- Clinicians worried about missing bad stuff
- Too easy to dump on ortho, so we do
- **MSK care is not Rocket Science**



# What we are NOT going to cover

- Things you can easily find online
- Lists of diagnosis and treatments

# What we ARE going to cover

- Ways to apply your existing knowledge
- How to think differently about MSK injuries
- Techniques to improve your exam skills
- Practical but generalized approaches to foot and ankle injuries



# Doc, I twisted my ankle...

## Hx

- I twisted my ankle yesterday
- Swelled up immediately
- Hurts to walk on it
- I'm using ice and an ACE bandage



# What is on the differential?

- Ankle fracture
- Ankle sprain
- Tendonitis
- Contusion
- Foot fracture
- Foot sprain

## What is next...

- Think horses not zebras (pretest probability)
- Gather data with the **history**
- Gather data with the **exam**
- Gather data with **tests** (xray)
- Test your hypothesis
- MSK medicine is easy...if you are methodical

## Most Important Tools

1. Your **Heart** – You actually give a darn
2. Your **Head** – You THINK about each patient



# How to form a working Differential

- Take the 3 most likely conditions you think are at play
- Add the 2 diagnoses that if missed, can be devastating to the patient
- Use “data” to test your hypotheses...
- Hunt for horses
- Don't let zebras sneak by (if things don't add, up, keep thinking or gathering data)

1. Likely
2. Likely
3. Likely
4. Worrisome
5. Worrisome

# MSK Exam Principles

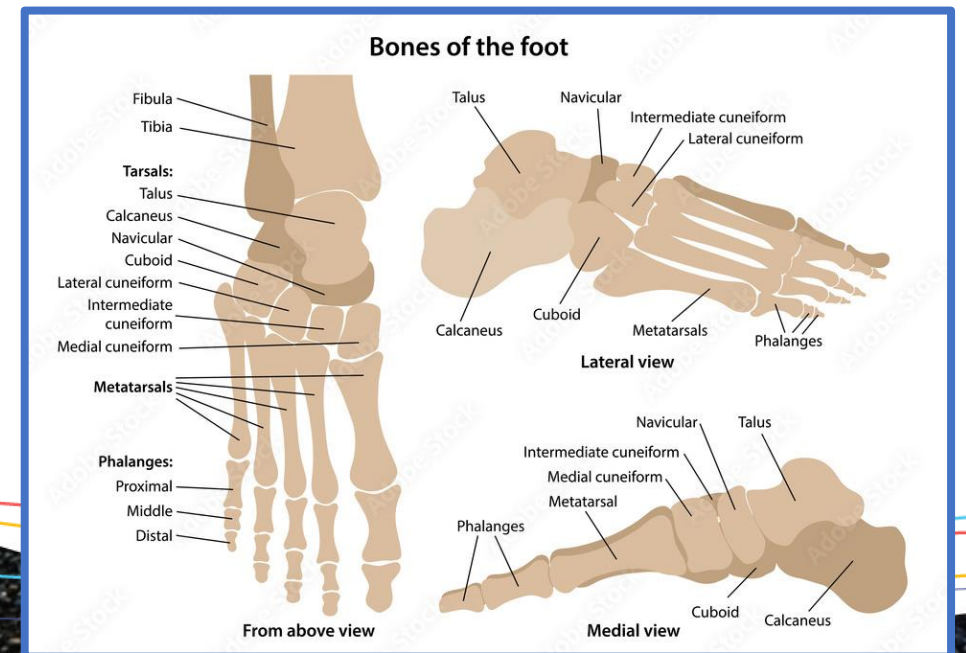
- Exams of injuries ARE painful
- It takes a lot of force to test MSK tissues (many providers too gentle)
- More bones in the feet and hands than the rest of the body combined
- Discreet palpation is a must

52 Bones

66 Joints

214 Ligaments

38 Muscle/Tendons



# Two concerns I hear about this...

## 1. “I don’t want to hurt my patient”

- Be kind – alert patients to what you are doing
- Focus on the important parts of the exam and save less important for last/follow-up

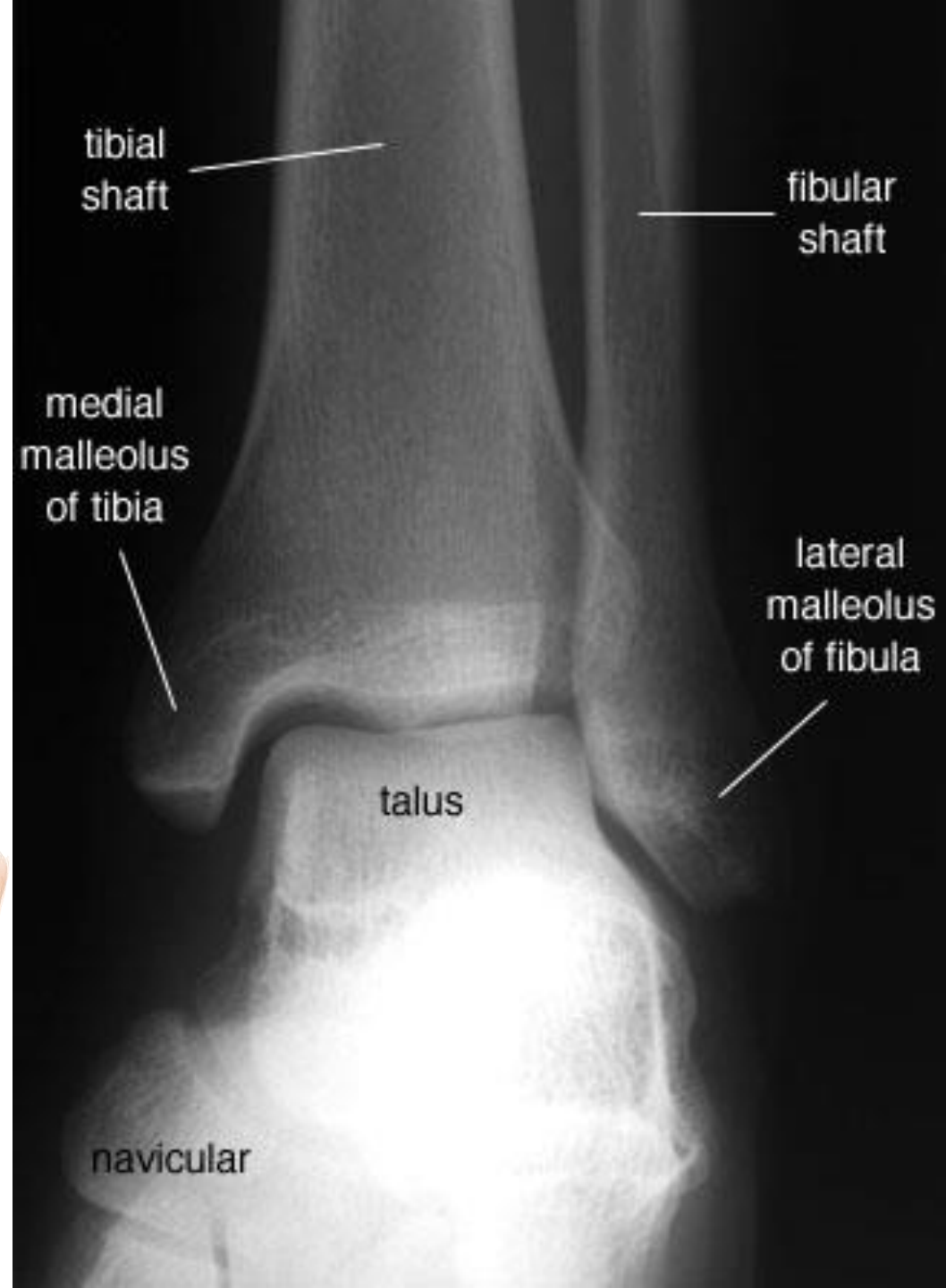
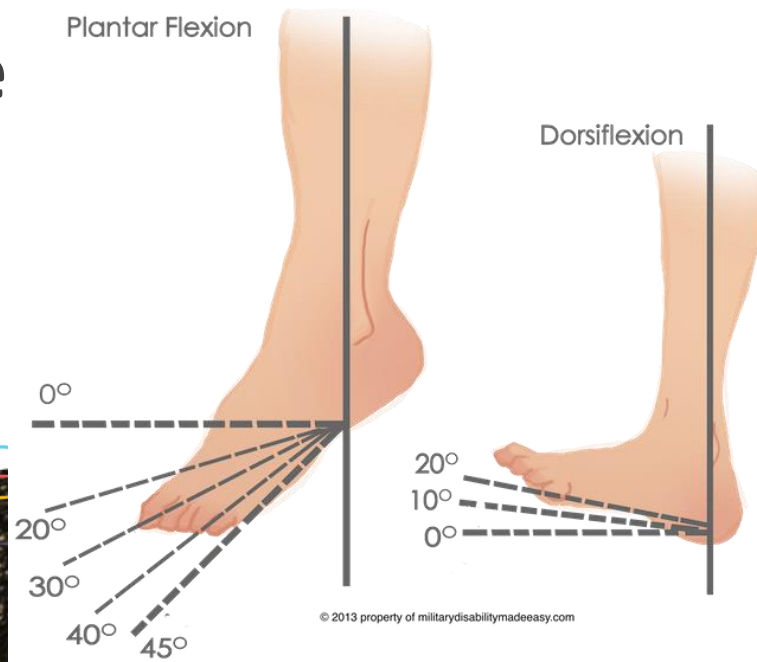
## 2. “I don’t want to injure my patient”

- As long as the patient is aware and has time to stop you - **THEY WILL NOT LET YOU HURT THEM**

**No sneak attacks**  
**No rapid application of force**

# Anatomy

- Ankle is only 3 bones
- **Tibia** – medial and proximal
- **Fibula** – lateral
- This “Mortise” sits on top of the **Talus**
- Moves in 1 plane



# Anatomy

- Divide the foot into 3 sections and use medial and lateral to describe 6 zones.
- Hindfoot
- Midfoot
- Forefoot



DRI



- Subtalar joint- articulation between the **TALUS** and **CALCANEUS**.
- Inversion – combination of Internal Rotation and Supination
- Eversion – combination of External Rotation and Pronation
- Subtalar and midfoot.



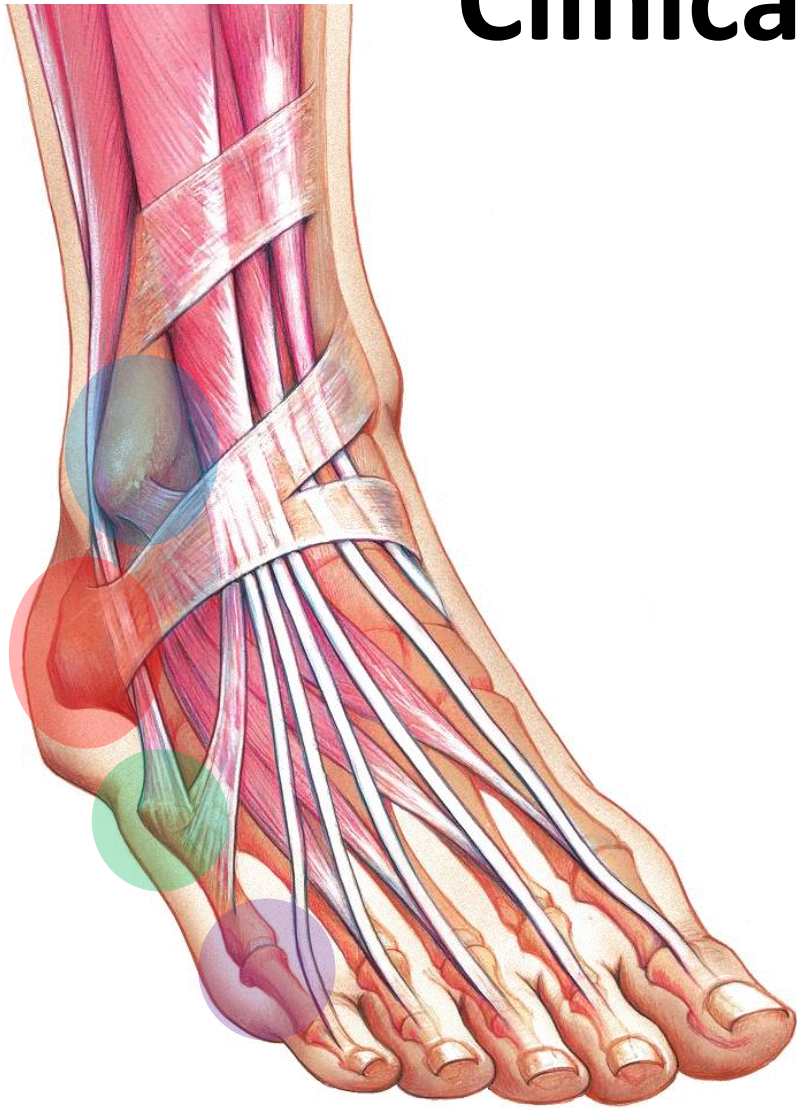
# Clinical Anatomy



Make sure you palpate these structures medially

- **Calcaneus**
- **Medial Malleolus**
- **Navicular Tuberosity**
- **1st MP Joint**

# Clinical Anatomy



Make sure you palpate these structures laterally

- **Calcaneus**
- **Lateral Malleolus**
- **Styloid Process of 5th Metatarsal**
- **5th MP joint**

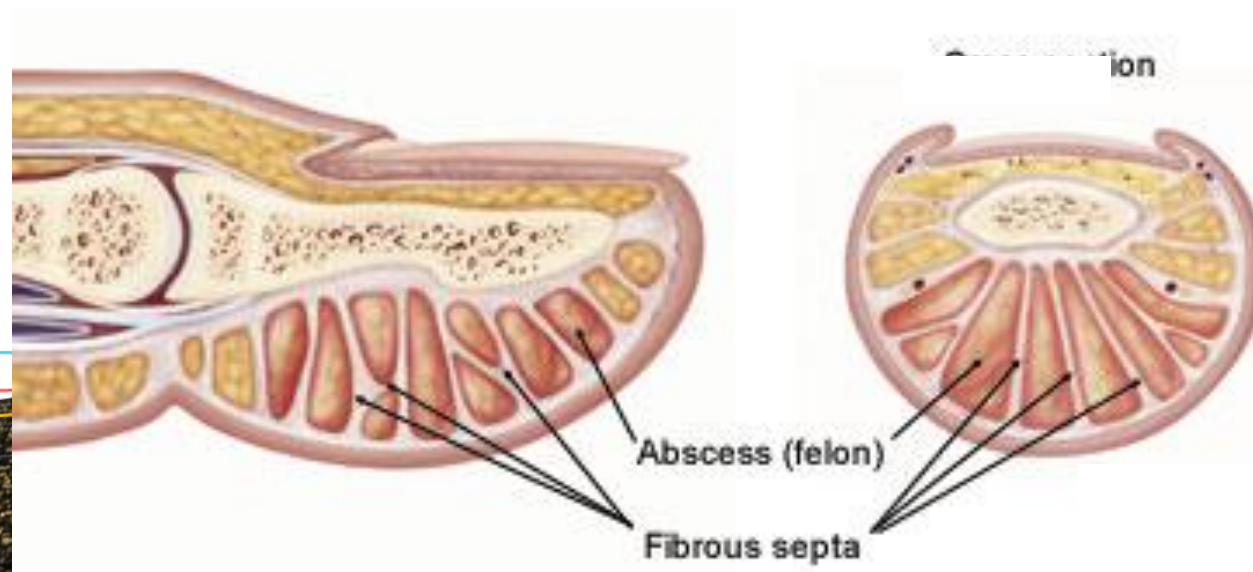
# How to find the Navicular

- Cross your leg
- Start at the medial malleolus and move toward the great toe
- When you feel the bone sticking up you are on it



# Palpation – use the right tool

- Soft feels soft (subtle differences)
    - Muscles, muscle spasm, fluid, lipomas
  - Firm feels firm (harsh differences)
    - Bone, tendon, ligament
- Use the tip of the thumb/finger to palpate for firm and pads for soft



# Lateral Ligaments

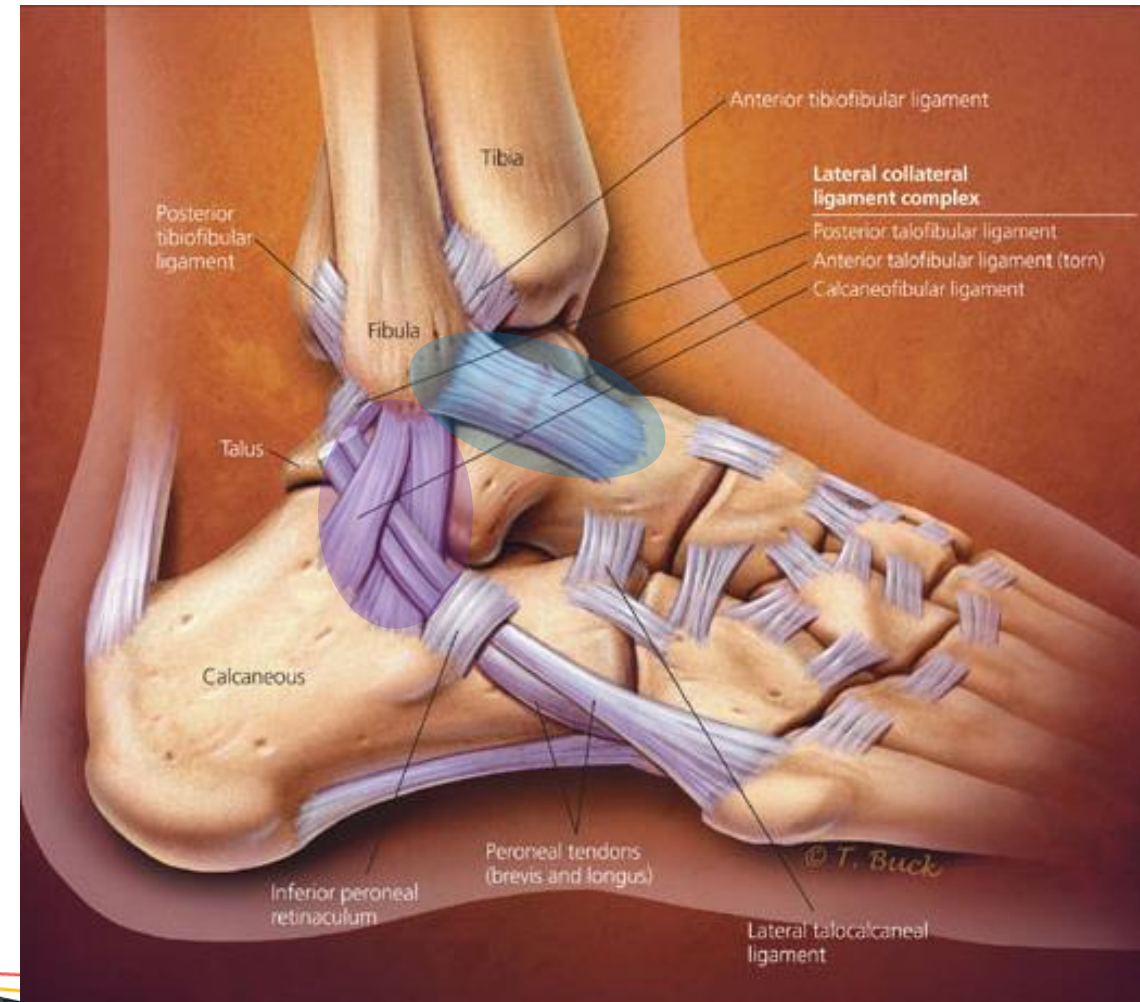
## •Anterior Talofibular

- Most injured
- Go to end of lateral malleolus and forward 1.5 cm and you are on top of it
- Anterior Drawer test

## •Calcaneofibular

- 2<sup>nd</sup> most injured
- Directly inferior to lateral malleolus

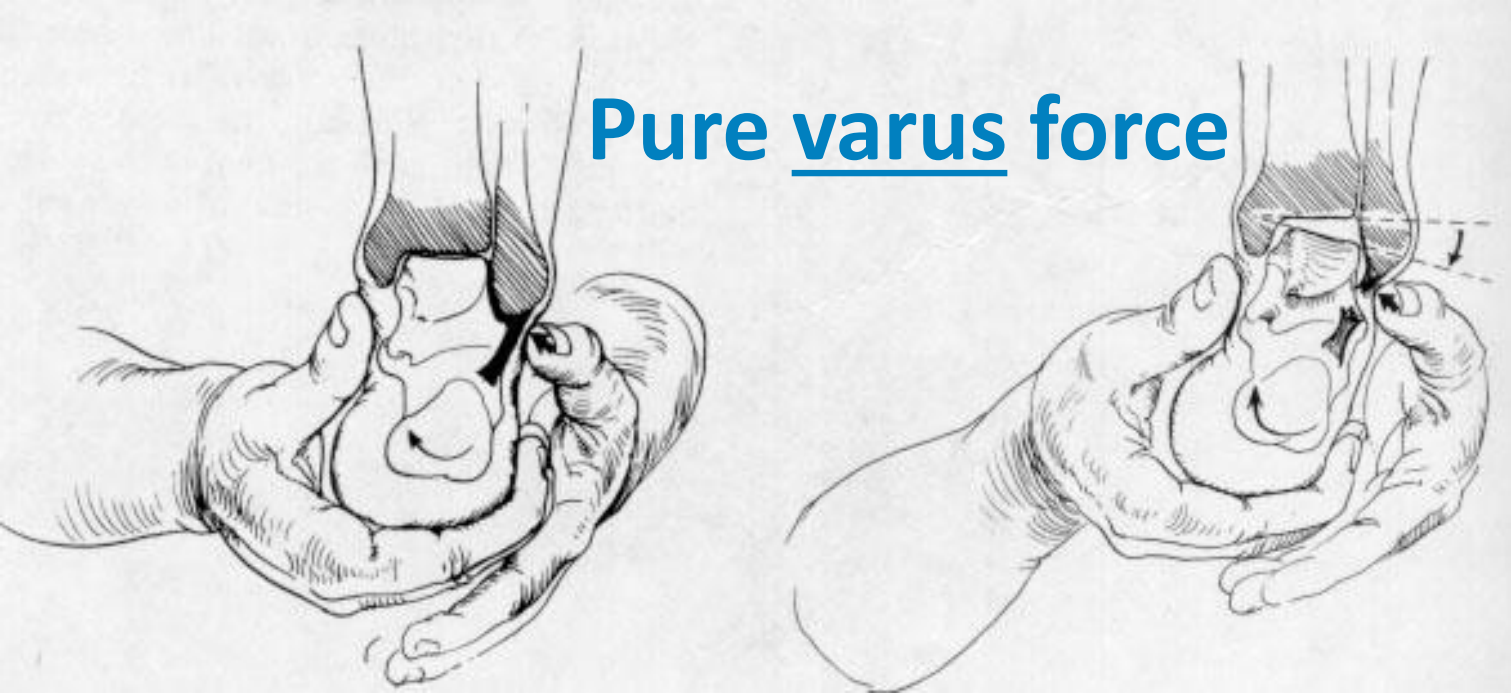
## •~~Posterior Talofibular~~ (IGNORE IT)



# Anterior Drawer test



# Talar Tilt test

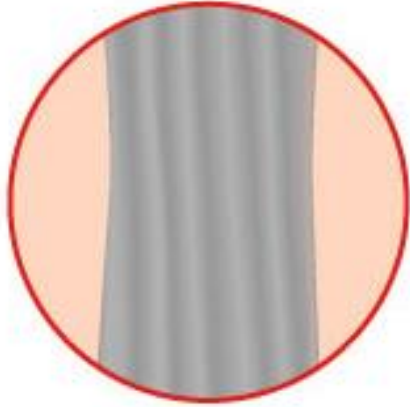


# Minimum MSK Exam

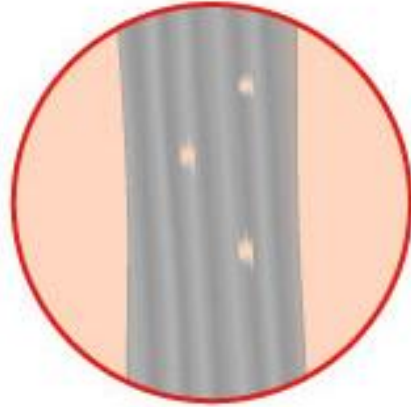
- **Range of Motion**
  - **Palpation for tenderness**
  - **Strength Testing** (most often forgotten)
- 
- **Without thinking about these, every time, you just can't assess the MSK system well.**
  - **Exam results are the key to diagnosis**



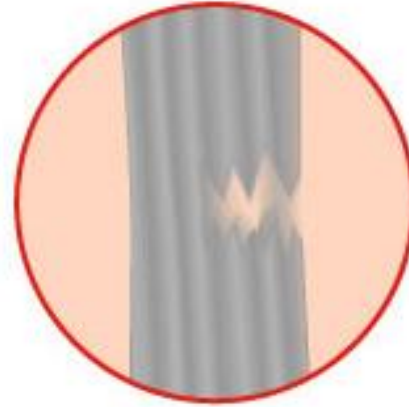
**Normal**



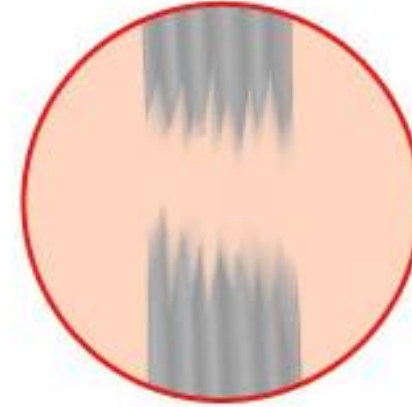
**Grade 1**



**Grade 2**



**Grade 3**



*Stretching &  
small tears*

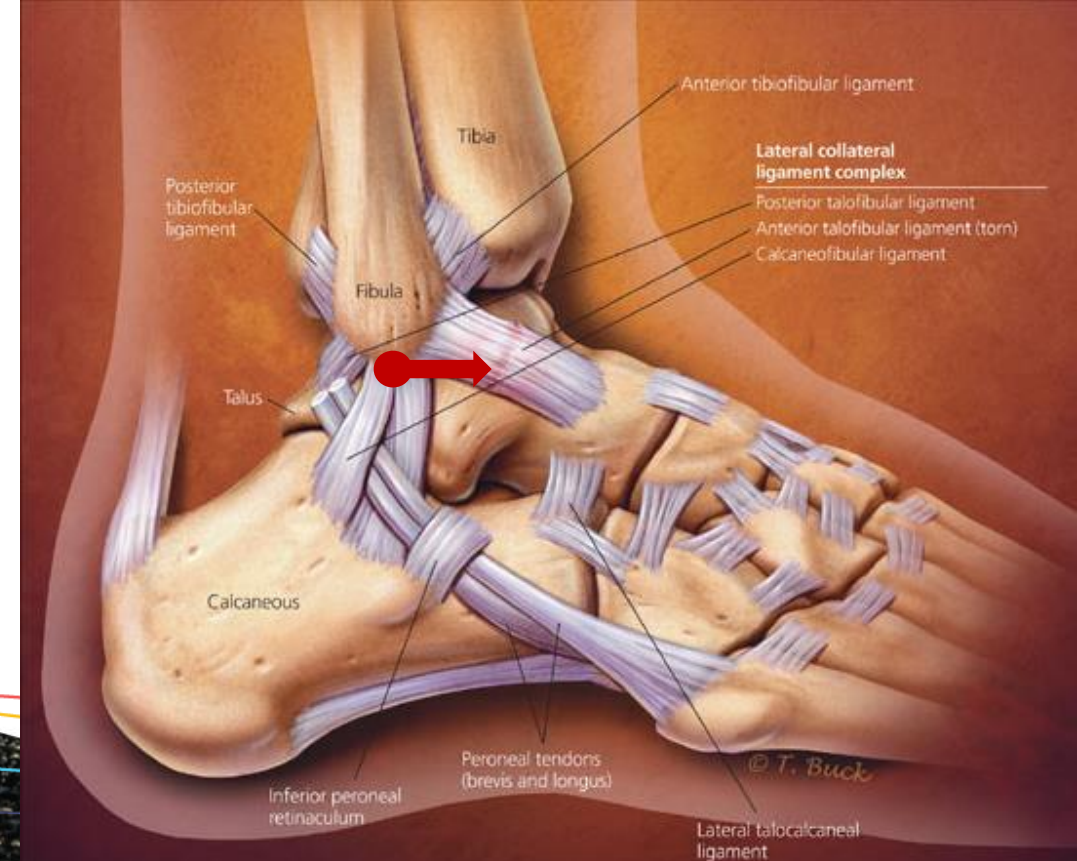
*Larger tear*

*Complete  
rupture*

<p><b>Degrees of tissue injury</b></p>	<ul style="list-style-type: none"><li>• Painful to load</li><li>• Stable</li><li>• Microscopic damage</li></ul>	<ul style="list-style-type: none"><li>• Very painful to load</li><li>• Mild laxity</li><li>• Macroscopic damage</li></ul>	<ul style="list-style-type: none"><li>• ? painful to load</li><li>• Mild laxity</li><li>• Macroscopic damage</li></ul>
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# Palpate for ATF Ligament

- Find the tip of the lateral malleolus – the end of the bone, not the part most protruding out laterally
- Always palpable even with edema
- **Move forward 1.5 cm** and you are over the ATF



# Should you get an X-ray?

Estimated 15% of ankle sprains in the ER setting involve a fracture

## Ottawa Ankle Rules

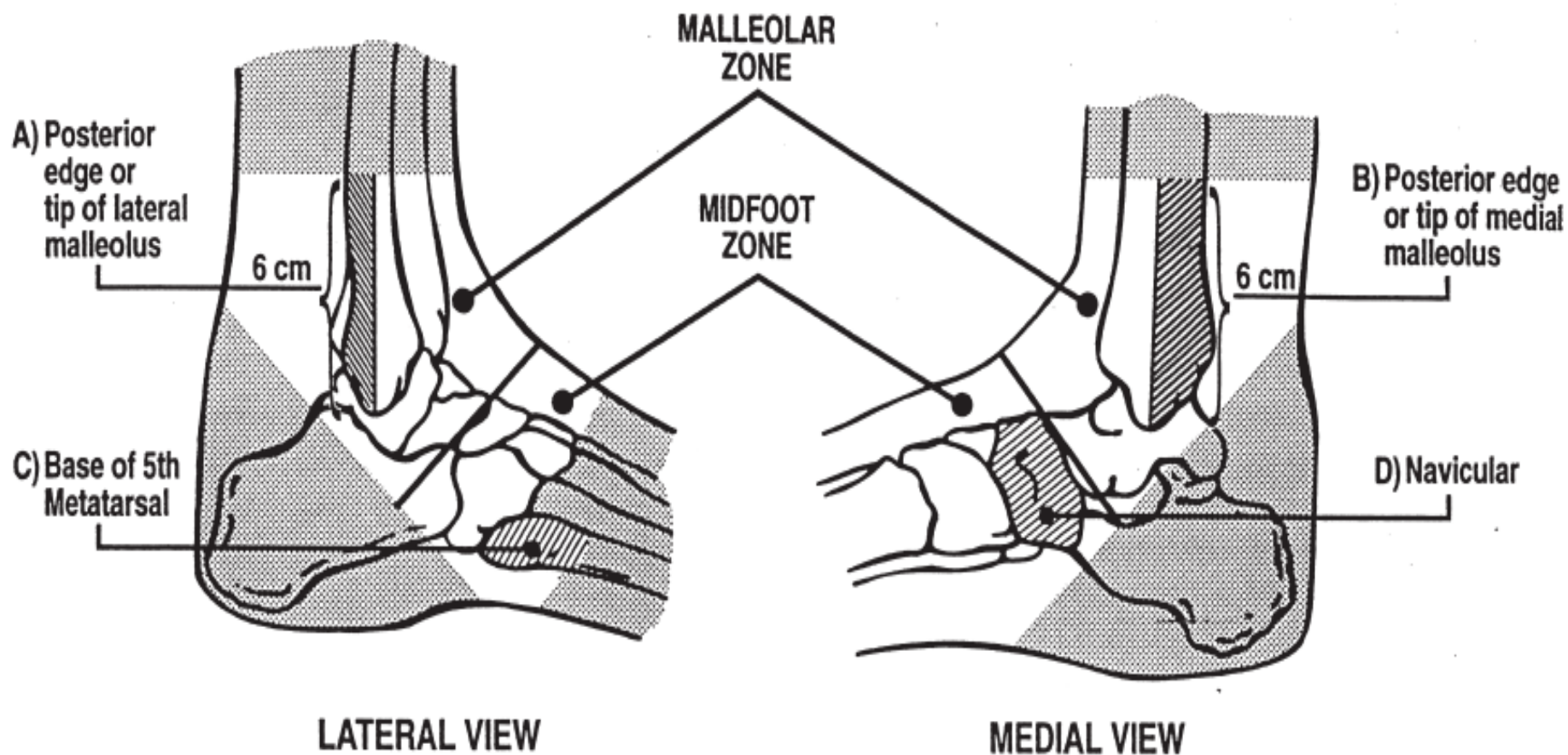
- First published 1992
- Systematic Review found Ottawa Ankle Rules almost 100% sensitive and reduced unnecessary radiographs by 30-40%





# ANKLE RULES

## *For Ankle Injury Radiography*





OTTAWA

# ANKLE RULES

## *For Ankle Injury Radiography*



2023  
CONVENTION

a) An ankle x-ray series is only required if there is any pain in malleolar zone and any of these findings:

1. bone tenderness at A

OR

2. bone tenderness at B

OR

3. inability to bear weight both immediately and in ED

---

b) A foot x-ray series is only required if there is any pain in midfoot zone and any of these findings:

1. bone tenderness at C

OR

2. bone tenderness at D

OR

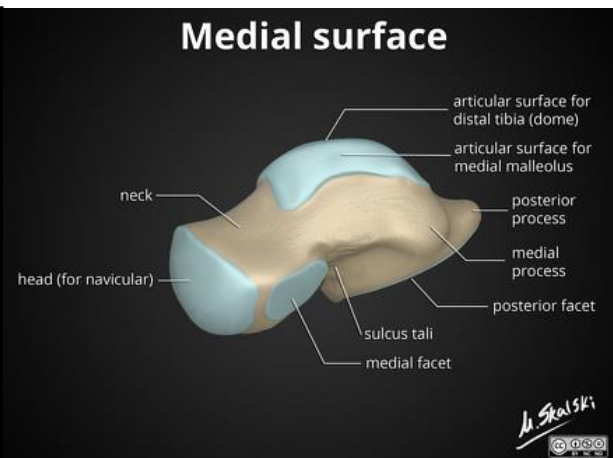
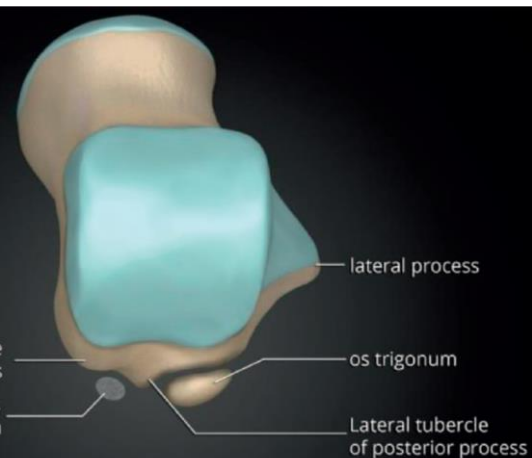
3. inability to bear weight both immediately and in ED

# Foot & Ankle X-ray Anomalies

- Not uncommon variations of normal x-rays findings
- Confusing – difficult to tell if new or old and may change the treatment plan significantly
- Os Trigonum
- Os Peroneum
- Os Naviculare
- Os Subfibulare

# Os Trigonum

- Lateral Tubercle/Posterior Process of the talus develops a secondary center for ossification



# Os Peroneum



# Os Naviculare



# Os Subfibulare



# Ossicle vs Avulsion Fracture

## Ossicle

- Smooth
- Round
- Conforming
- Cortical Edges
- Homogenous density
- Puzzle pieces



## Avulsion

- Jagged edges
- Angular
- Non-Conforming
- Cortical & Cancellous Edges
- Heterogenous density
- Broken pieces

# In Kids with open growth plates

- Usually impossible to tell



# Let's get back to our patient...

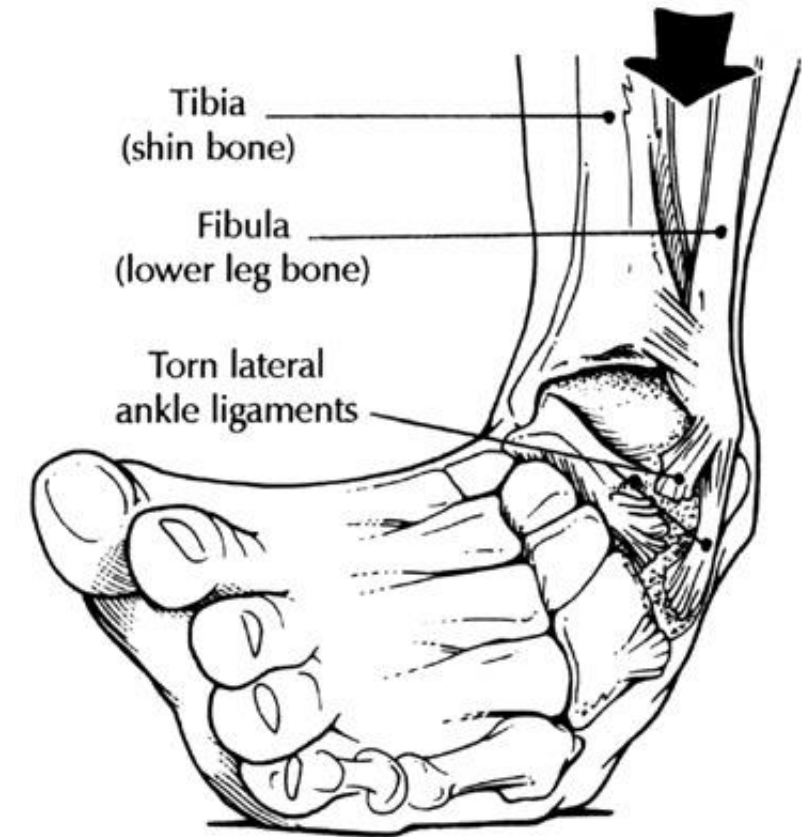
- Tender over ATF and CF ligaments.
- Positive Ant. Drawer, Negative Talar Tilt
- ROM limited in all directions
- X-rays negative



## Ankle sprain

# Ankle Sprain

- Estimated 25,000 ankle sprains daily in US
- Most common orthopedic injury in most sports
- About 90% are inversion injuries
- 73% are isolated ATF injury
- Small, thin, individual **lateral ligaments**
- Strong, thick, broad **medial ligaments**
- Typical resolution 2-4 weeks



# West Point Grading system

- **Severity does not matter much initially**
- **Don't kill patients with ligament testing**
- **2 months out surgery may be indicated for grade 3 tears**
- **Scar tissue functions like ligament**

	Grade 1	Grade 2	Grade 3
Location of Tenderness	ATF	ATF, CF	ATF, CF, PTF
Edema or ecchymosis	Slight local	Moderate local	Significant diffuse
Weight bearing	Full or partial	Difficult w/o crutches	Significant pain
Ligament damage	Stretched	Partial tear	Complete tear
Instability	None	None or slight	definite

# How to treat an ankle sprain?

**P**rotection

NSAIDS- standard

**R**est

Crutches- when needed (judgement)

**I**ce

Brace

**C**ompression

Early ROM

**E**levation

Cast boot? – Occasionally when function matters in the early part of recovery

# Stirrup brace



# “Sweed-O” type brace

# Recovery and Rehab

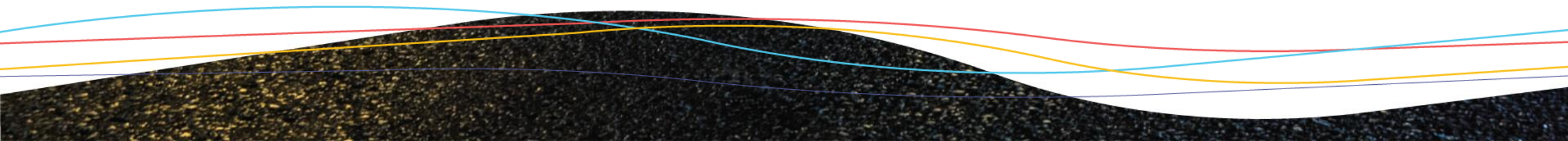
- Follow-up in 2-4 weeks
- PT if not improving
- **MUST re-learn PROPRIOCEPTION**  
(fibers located in ligaments)
  
- Retraining balance is the key to preventing re-injury
- Sweed-O brace prevents re-injury for up to 12 months



**“I twisted my ankle a few weeks ago and it is not getting better...”**

- Inversion ankle injury 5 weeks ago
- Initially couldn't walk for a few days but now walking normally
- Pain on the side of the ankle (malleolus) that radiates up the side of the leg a little

Think about **peroneal tendonitis**

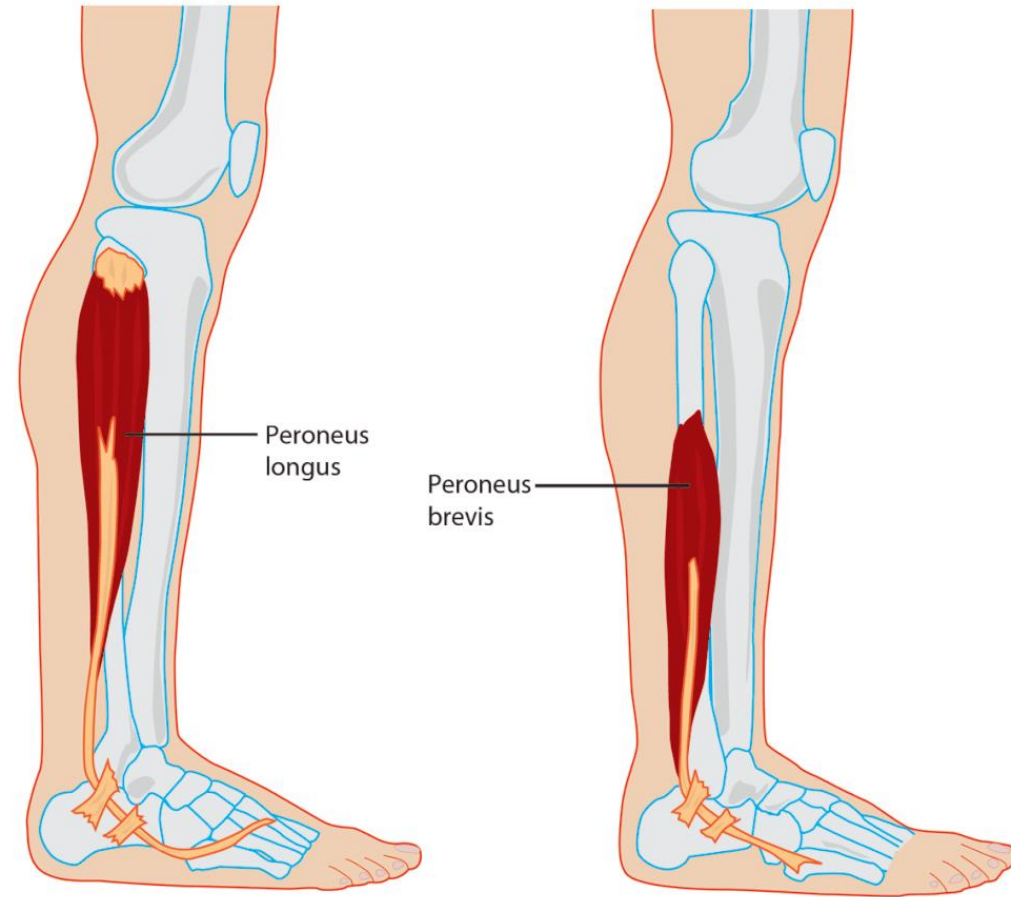


# Peroneal Tendonitis

- Everts and Plantar Flexes ankle/foot
- Primary weapon used against ankle sprains



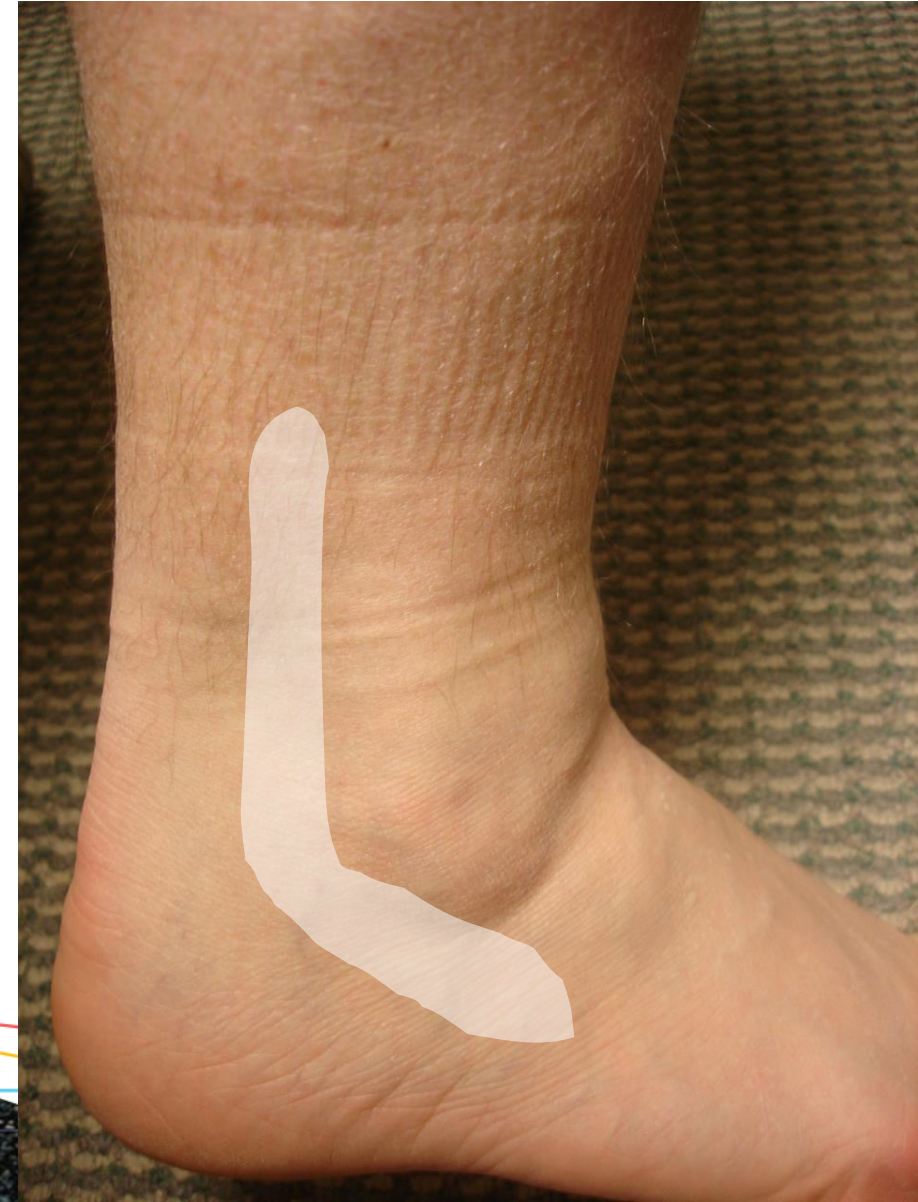
**GOOD LUCK WITH THAT**



- No studies done but my estimate is **20-25%** of typical ankle sprains have simultaneous peroneal tendonitis

# Exam findings

- Focal area of tenderness behind lateral malleolus (**NOT the Posterior Talo Fibular Ligament**)
- Pain with resisted **Active Resistance** (toes pointed down and out)
- Pain with resisted **Passive Stretch** (toes pointed up and in)



# Peroneal Tendonitis

- Recovery is typically 4-6 weeks
- **PRICE**
- NSAIDS
- Physical Therapy (earlier, more common)
- Cast boot might be indicated initially to rest and protect while maintaining function
- Diagnose this in addition to ankle sprain to set expectations



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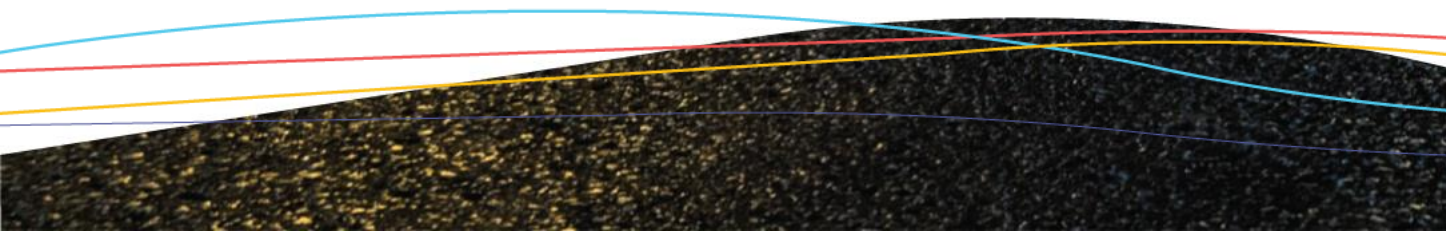
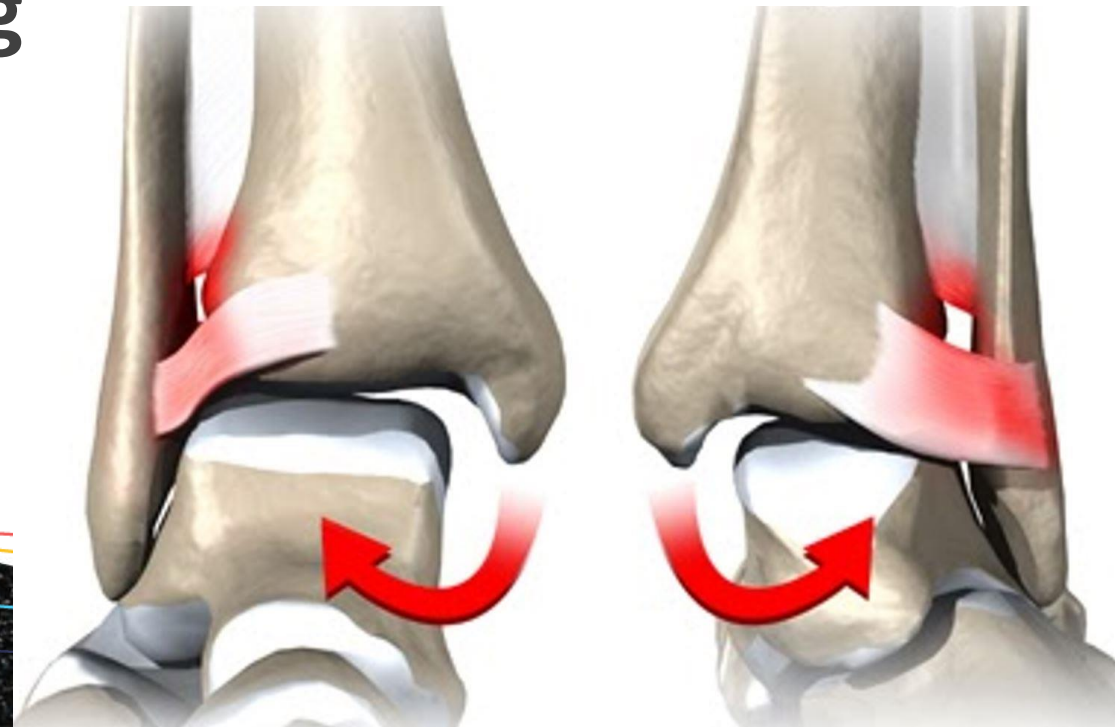
Size: **Medium (Pack of 1)**

X-Small (Pack of 1) \$47.99	Small (Pack of 1) \$47.99	<b>Medium (Pack of 1) \$47.99</b>	Large (Pack of 1) \$47.99
X-Large (Pack of 1) \$52.99			



# High Ankle Sprain

- Injury to the Anterior Inferior **Tibio-Fibular ligament (AITF)** and the Tib-Fib **syndesmosis**
- Foot on the ground when hit from the side and twisted while falling
- Immediate swelling and intense pain
- Pt. will not weight bear at all

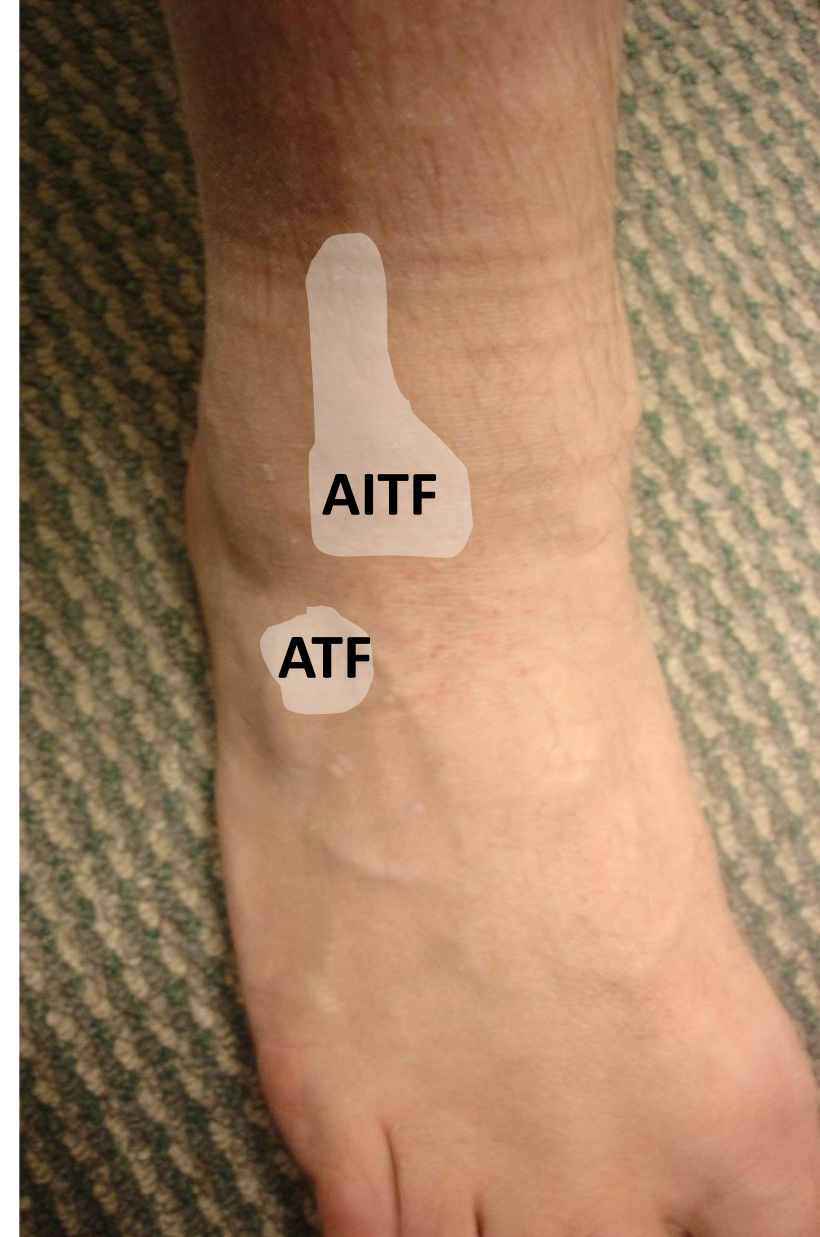


# High Ankle Sprain on Exam

- Pain with dorsiflexion
- Pain with pushing up on the heel
- Pain with external rotation of foot
- Talus acts as a wedge
- Pain with compressing the lower leg side to side which buckles the syndesmosis



**Syndesmosis  
Squeeze Test**



# Blood flows downhill over time



# High ankle sprain

- Treat initially as a typical Grade 3 ankle sprain
- Always get x-rays
- Follow Up in 10-12 days with ortho
- Typical 4-6 weeks recovery
- Cast boot initially
- Crutches if needed
- Early PT if not improving



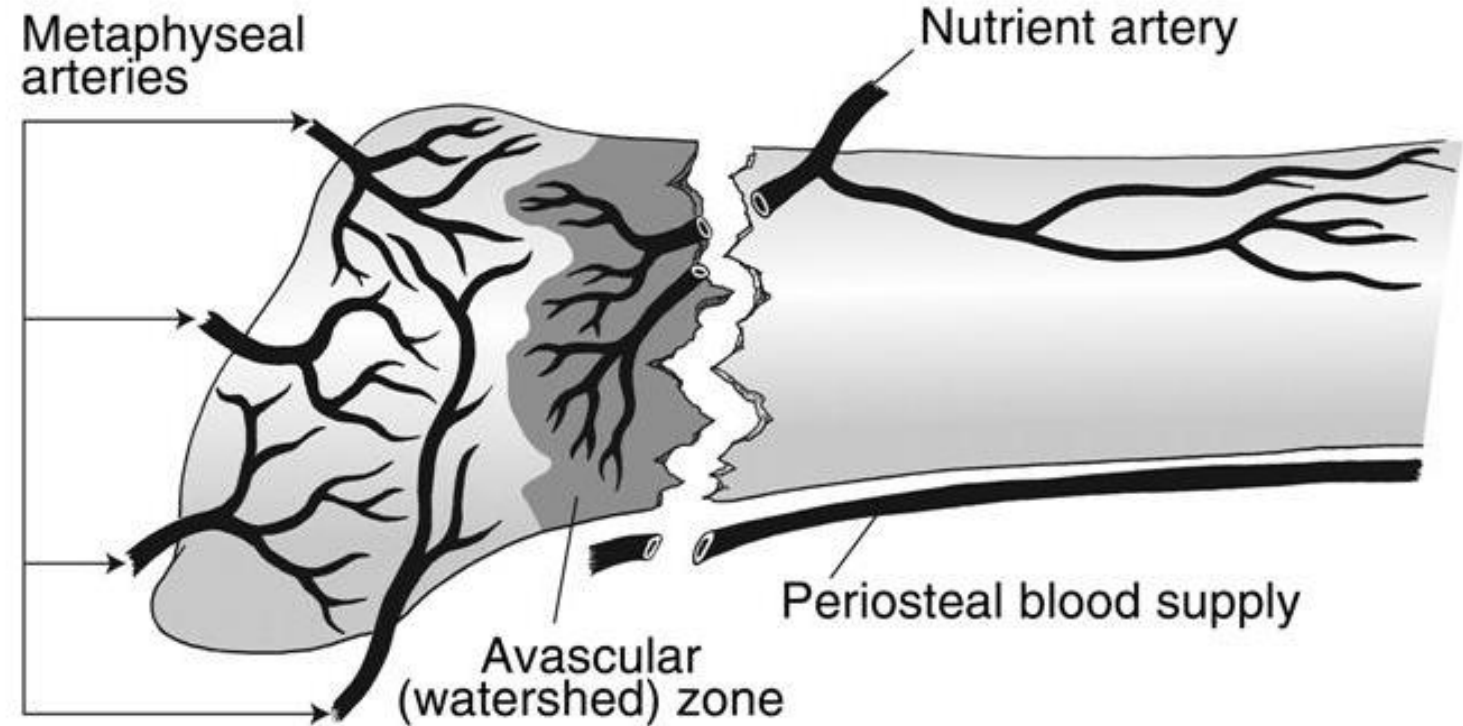
# I twisted my ankle and it really hurts...

- Can't bear weight
- Mild tenderness over ATF
- Mild swelling
- **Tender over base of 5<sup>th</sup> metatarsal**
- Peroneal tendon inserts here

## Jones Fracture



# Jones Fracture



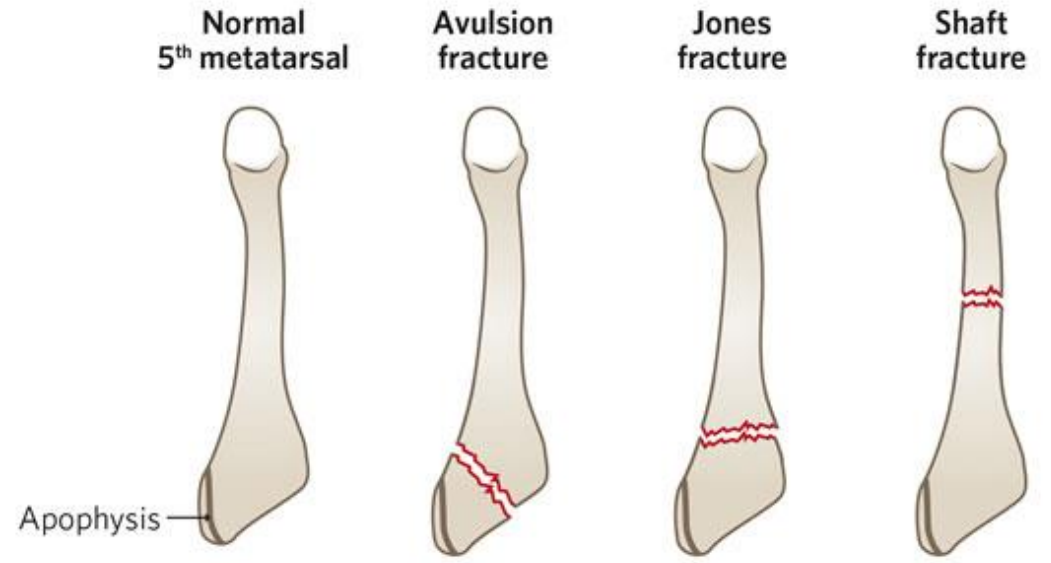
# 5<sup>th</sup> Metatarsal Fractures



**Shaft**

**Jones**

**Dancer's (avulsion)**



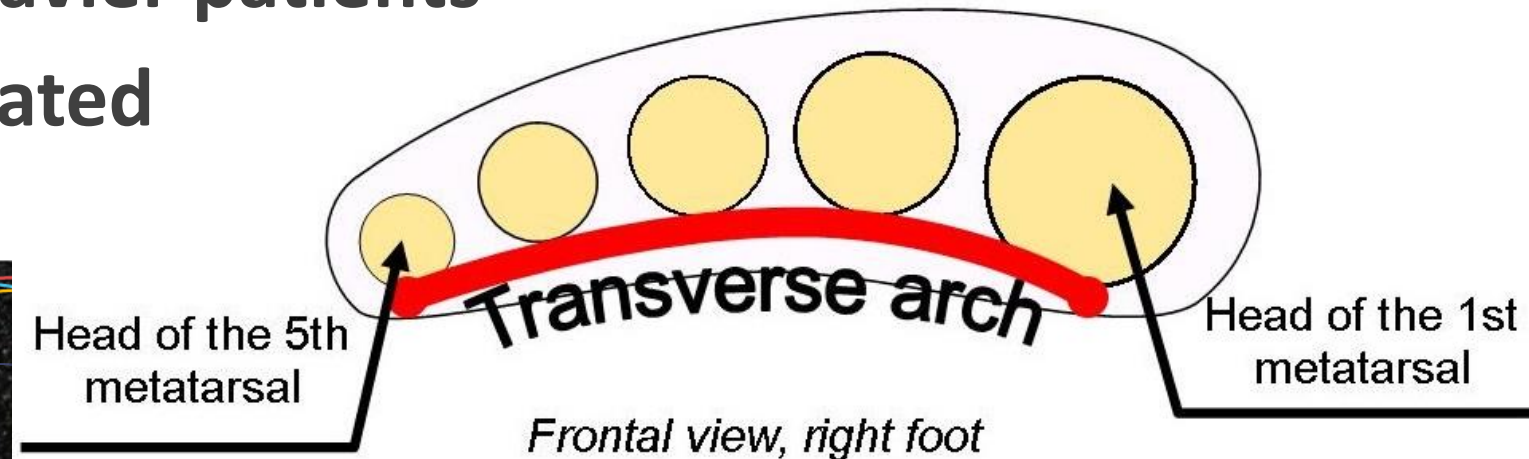
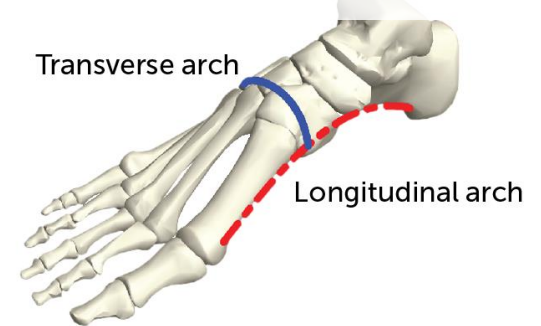
© The Royal Children's Hospital Melbourne, Australia

# Metatarsalgia

- Pain in the central ball of the foot at the 2<sup>nd</sup> and 3<sup>rd</sup> metatarsal heads
- Usually associated with collapse of the transverse arch
- More common with Morton's Foot anatomy
- Typically seen with prolonged time on feet, pes planus, and older heavier patients
- Pain typically activity related

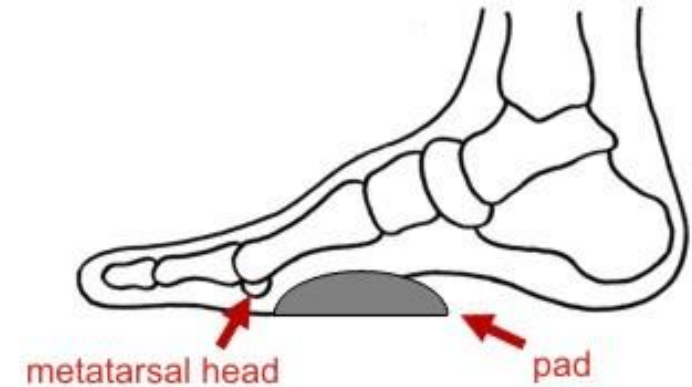


**Morton's Foot**



# Metatarsalgia

- Tenderness, callous at 2<sup>nd</sup>/3<sup>rd</sup> metatarsal heads
- Treatment
  - Acetaminophen and NSAIDs
  - Rest (get off feet)
  - Arch support
  - Metatarsal padding
  - Surgery not typically successful long term unless correcting associated anatomic abnormality
  - Podiatry referral not orthopedics



# Morton's Neuroma

- Entrapment or chronic compression of interdigital nerve at the level of the MTP joint
- Pain, numbness, parasthesias, in the ball of the foot radiating to toes
- Sensation of a “hot poker” between the toes
- Worse with activity and tight shoes
- Most common between 3<sup>rd</sup>/4<sup>th</sup> metatarsals



# Morton's Neuroma

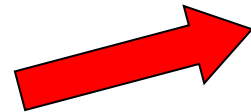
- On exam there is tenderness between but usually not over the metatarsals
- Positive Squeeze Test
- Treatment is similar to metatarsalgia with orthotics/inserts
- Rest the area and get off the balls of the feet
- Steroid injection beneficial for up to 3 months
- Podiatry referral instead of orthopedics



# Post-Test 1

What is this called?

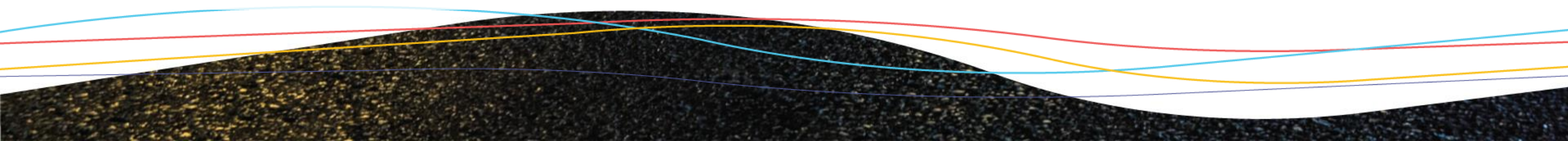
- A. Jones Fracture**
- B. Metatarsal avulsion fracture
- C. Salter-Harris II fracture
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# Post-Test 2

What is the most commonly injured ligament in an ankle sprain?

- A. Posterior talo-fibular ligament
- B. Calcaneofibular ligament
- C. Anterior talo-fibular ligament**
- D. Deltoid ligament



# Post-Test 3

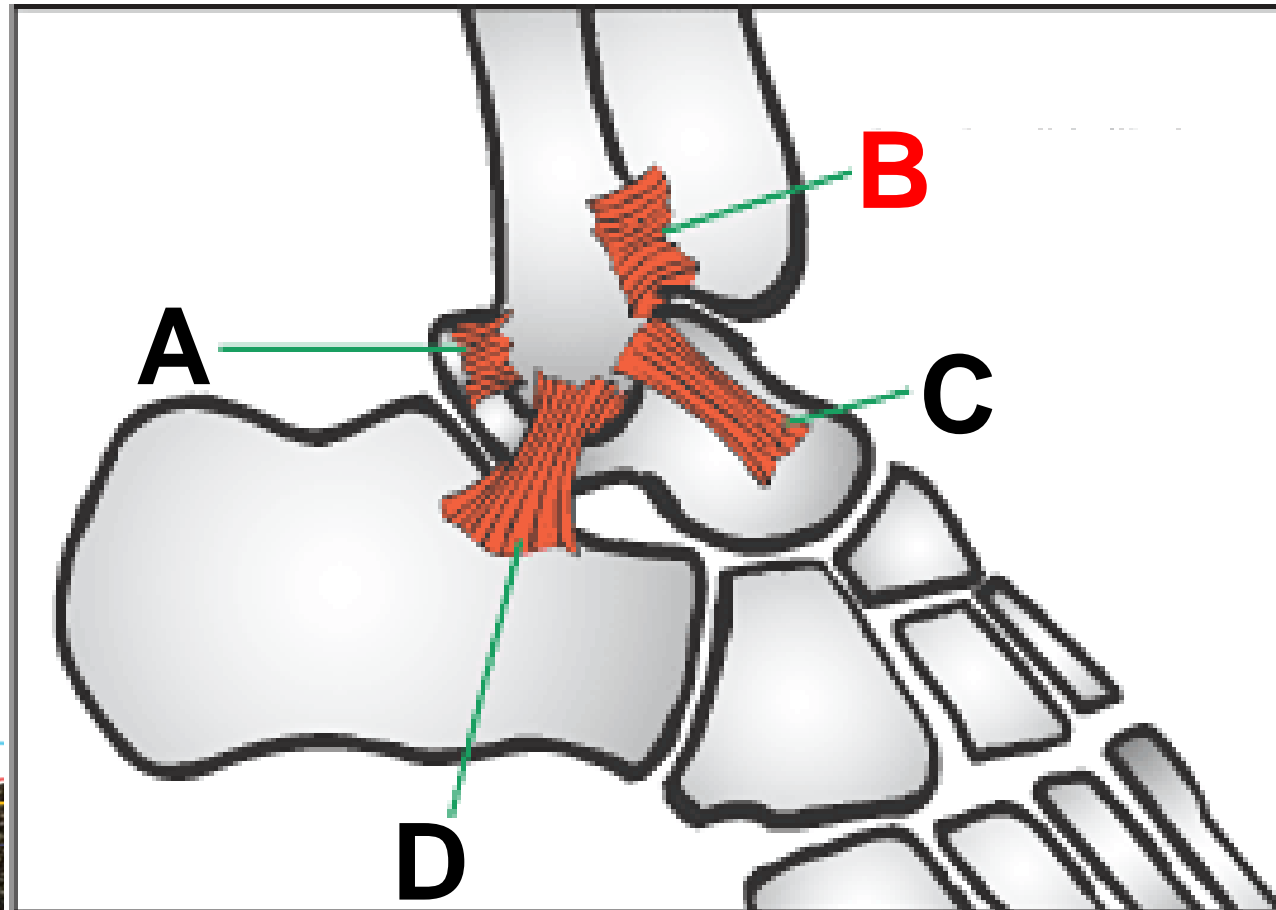
What is this test called?

- A. Appley's test
- B. Talar Tilt test
- C. Anterior Drawer test**
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# Post-Test 4

Which lateral ligament is injured in a High Ankle Sprain?



DRIVING **CHANGE 2023**  
THE URGENT CARE CONVENTION



# QUESTIONS

# How you can drive change:

- **Ankle injuries are very common, most are sprains, and primary care clinicians can manage most adequately. Don't over-depend on orthopedics; get better.**
- **Look for and treat peroneal tendonitis**
- **Recognize ossicles from avulsions fracture**

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