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New concepts in the prevention, diagnosis and management of common exercise-related injuries



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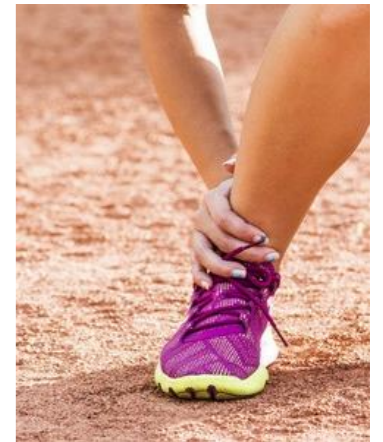
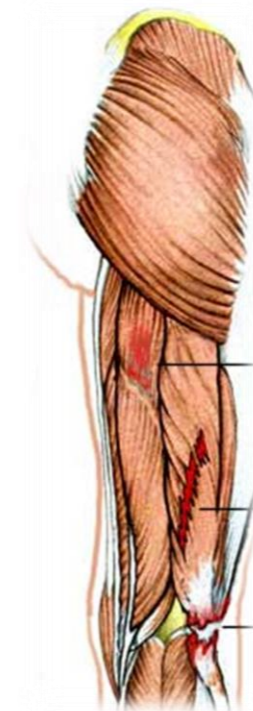
Outline – New concepts in the prevention, diagnosis and management of common exercise related injuries

Four common injuries

1. Acute ankle sprains
2. Acute muscle injuries
3. Chronic tendinopathy (Achilles)
4. Chronic plantar fascial injury

Four key concepts

1. Reducing risk
2. Accurate diagnosis
3. Appropriate management
4. Prevention



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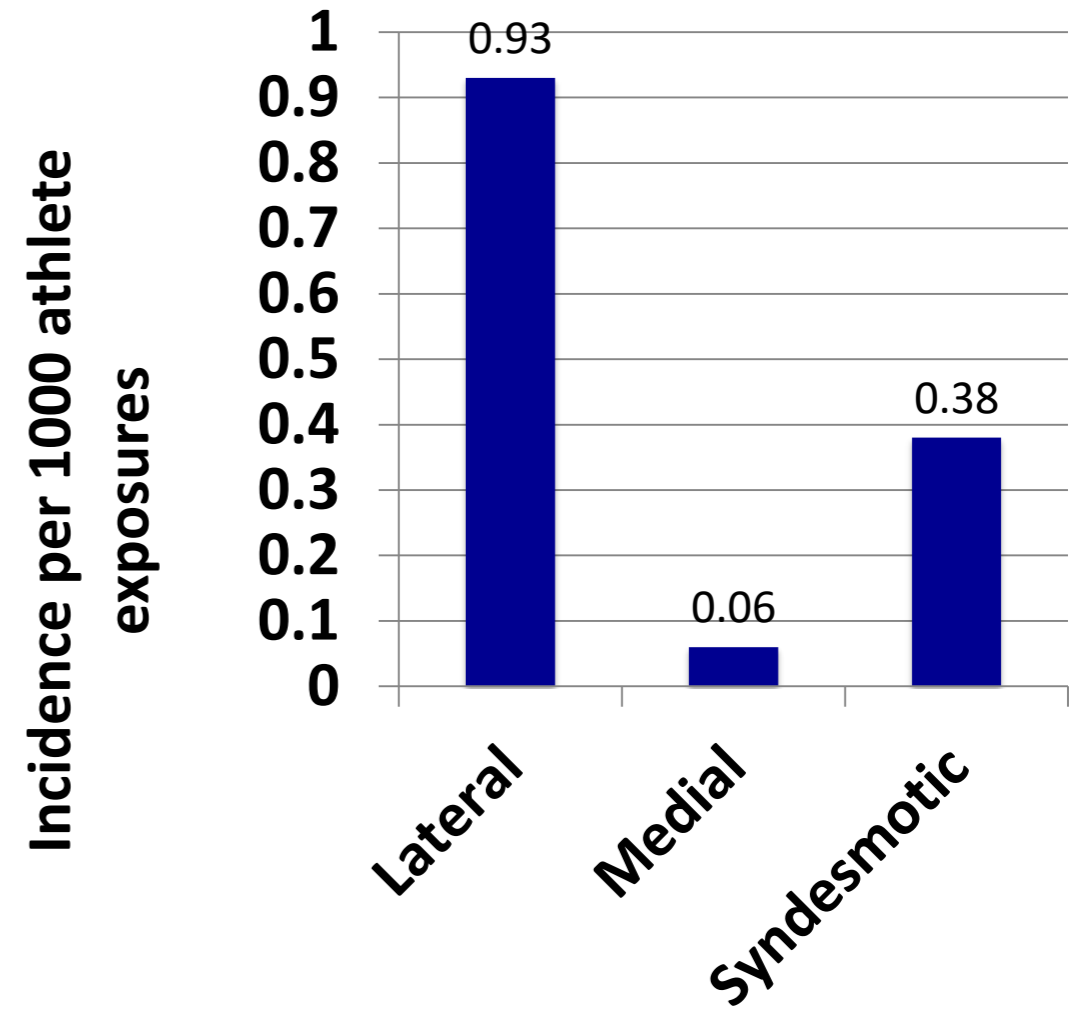
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Ankle sprains - Key concepts



Ankle sprains in sport

- **Most common injury in sports:**
 - 16-21% of all sports-related injuries
 - 10-30% of all musculoskeletal injuries in sport
- **Inversion injury - 1/10 000 people per day**
- **Lateral ankle ligament complex (85-90% of all sprains) – inversion sprain**



Summary

Extrinsic risk factors for lateral ankle sprains in sport

	No or poor evidence	Moderate evidence	Good evidence
Sport type			X
Player position (sport specific)	X		
Footwear	X		
Playing surface	X (basketball, soccer)		
Match play vs. practices		X	

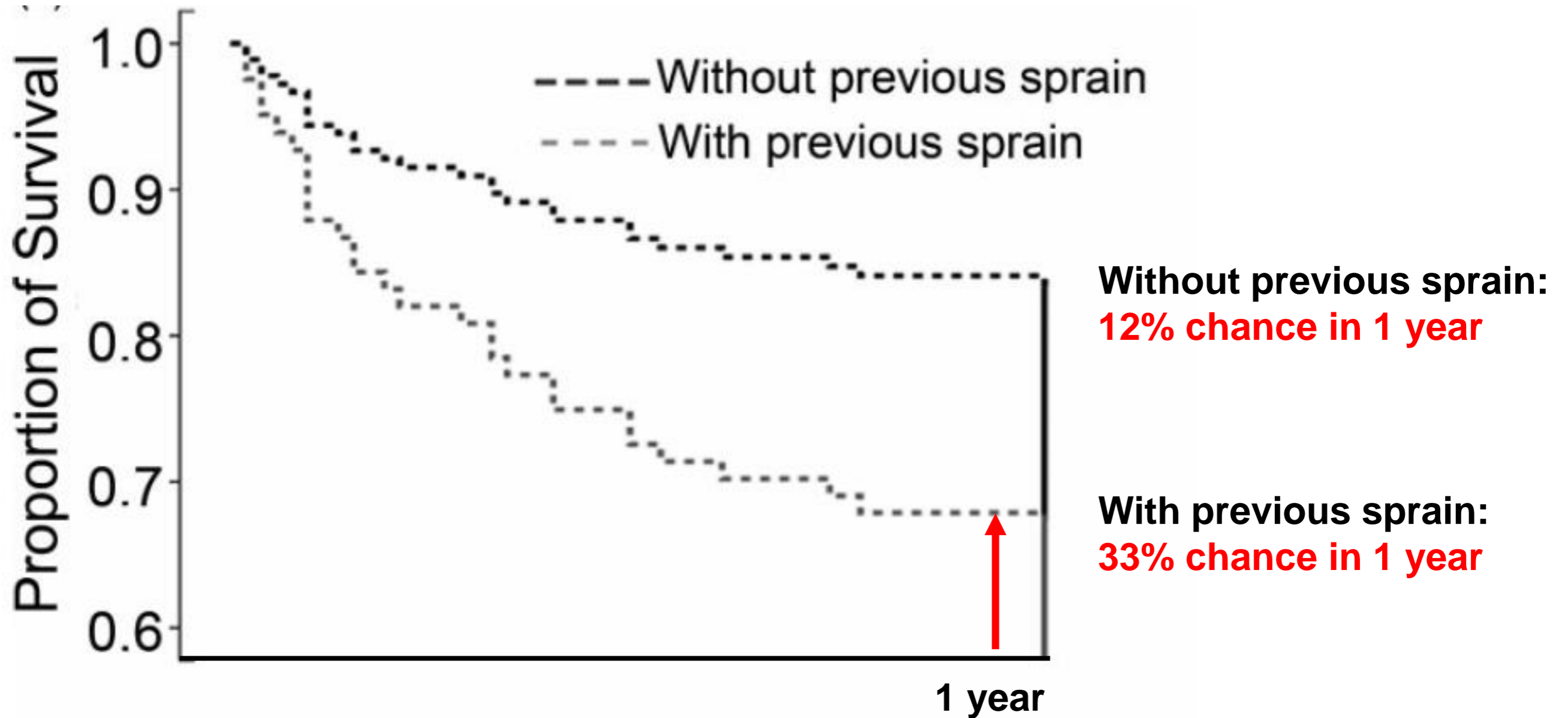
Summary

Intrinsic risk factors for lateral ankle sprains in sport

	No or poor evidence	Moderate evidence	Good evidence
Younger age			X
Female sex			X
Non dominant side	X		
Foot type and alignment	X		
Increased BMI			X
Poor ankle joint range of motion	X		
Increased fast concentric ankle plantar flexion muscle strength			X
Reduced slow eccentric ankle eversion muscle strength			X
Reduced static postural stability	X		
Poor proprioceptive function (reduced passive inversion joint position sense)			X
Reduced muscle reaction time (neuromuscular control) (early reaction time of peroneus brevis)			X
Previous ankle sprain (secondary)			X

Kobayashi T, et al, Sports health, Jan 2016, (online)
Doherty C, et al, Sports Med, 2014, 44; 123-140

Most important risk factor for ankle sprain in sport



Clinical assessment of an athlete with a suspected acute ankle sprain:

History

- History of inversion / plantar flexion
- Acute pain (occasional snap)
- Loss of function
 - Pain with weight bearing
 - Pain with movement)
- Rapid swelling (hours)
- Bruising (24-48hrs)
- Inability to continue activity
- Feeling of instability



General clinical examination

Timing of the examination

- Clinical assessment not very accurate in first 4 days – increases with repeat assessment on Day 4-5

Look:

- Swelling
- Subcutaneous bruising
- Active range of motion (with pain)

Feel:

- Sites of tenderness (ATFL) – NB
- Palpate areas to exclude other injuries
- Palpate systematically for specific areas of possible fractures (**Ottawa Ankle Rules**)

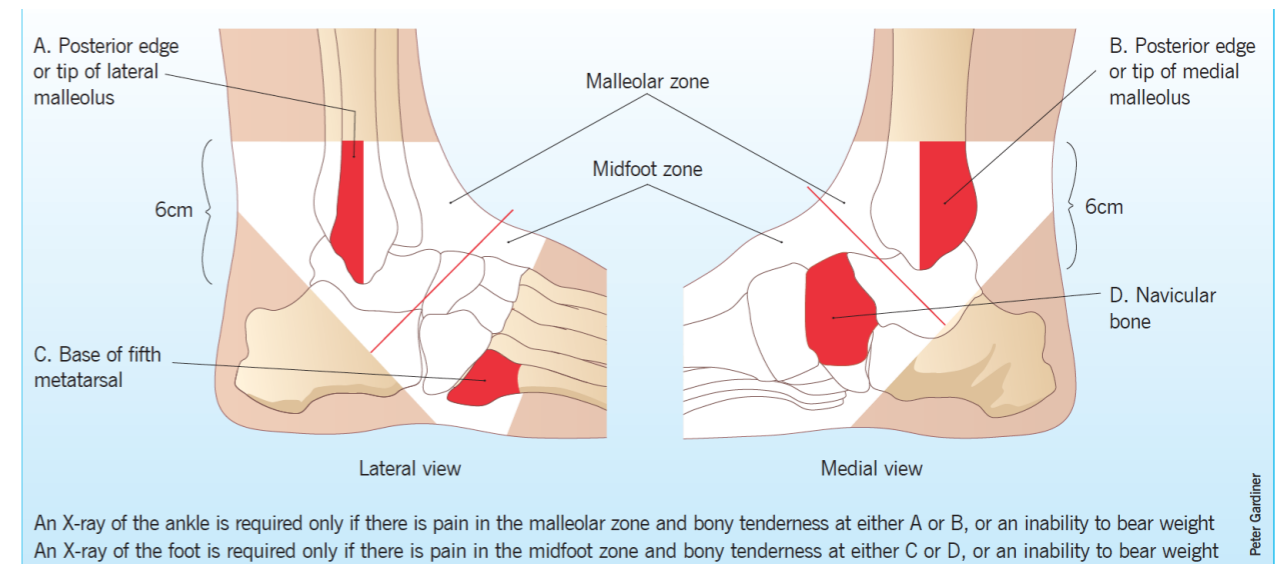
Move

- Passive ROM
- Perform special **stability tests**
- Perform special **diagnostic tests**

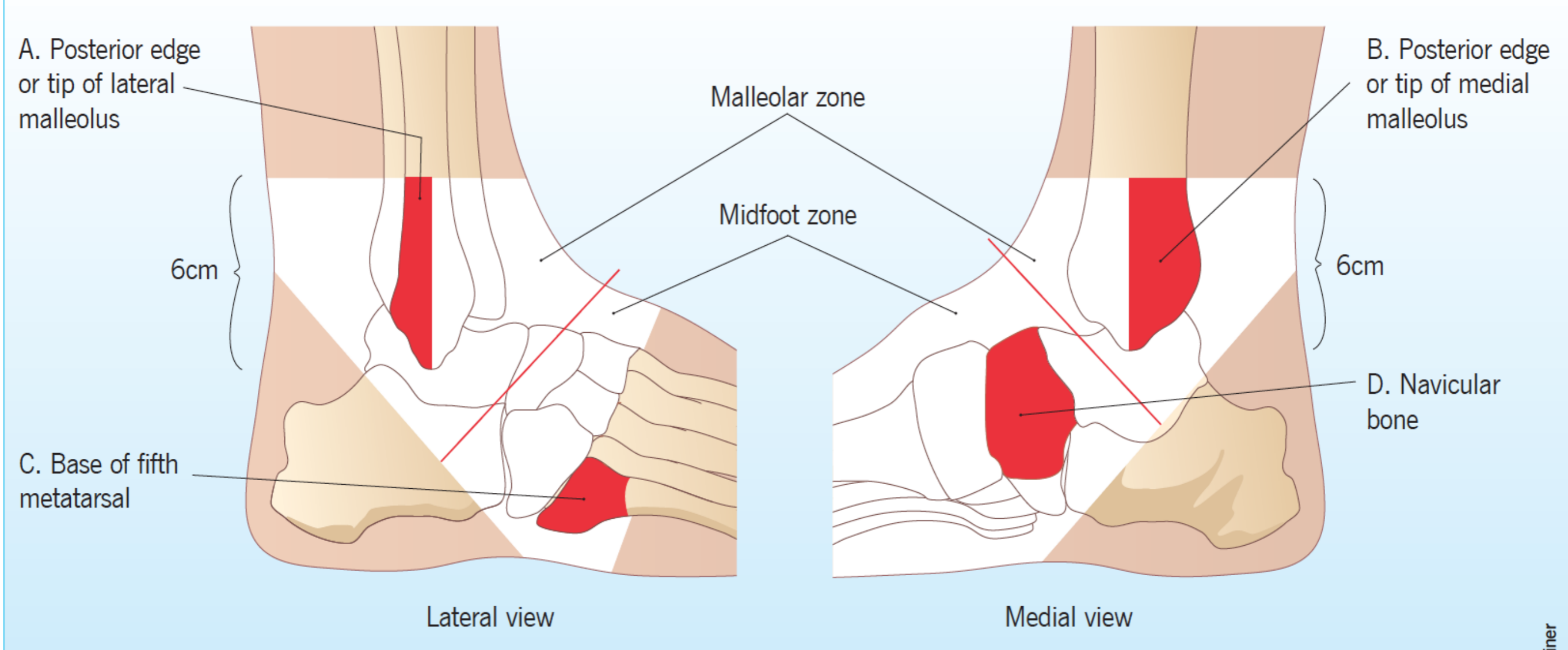


Ottawa Ankle Rules: for X-Rays (100% sensitive, 40% specific)

- **Inability to weight bear on the ankle**
 - Immediately after injury
 - At the time of the assessment
- **Sites of tenderness**
 - **Lateral malleolus**
 - Inferior tip
 - Posterior edge
 - **Medial malleolus**
 - Inferior tip
 - Posterior edge
 - **Navicular tuberosity**
 - **Base of the 5th metatarsal**



Ottawa Ankle Rules: Sites of palpation tenderness



What not to miss?

1. **Syndesmotic sprain**
2. **Deltoid(medial) ligament sprain**
3. **Fractures: tibial, fibular, cuboid, anterior process of calcaneus, lateral process of the talus**
4. **Chondral (60-80%) and osteochondral (6%) lesions**
5. **Subtalar joint ligaments**
6. **Dorsal calcaneo-cuboid or talonavicular ligaments about 20%**
7. **Peroneal tendon (sheath and tendon)**
8. **Superficial and deep peroneal nerve injury**



Acute ankle sprain Treatment

Acute phase (0-2 days)

- Non weight bearing (crutches)
- Ice
- Compression
- Elevation
- Pain control
 - Analgesia (0-24 hours)
 - Non steroidal anti-inflammatory (24hrs to 5-7 days)
- Ultrasound
- Protection (bracing)



Acute ankle sprain Treatment

Intermediate phase (3-10 days)

- Non weight bearing (crutches) – continue if pain on weight bearing
- Pain control
 - Non steroidal anti-inflammatory
- Ultrasound
- Protection (bracing)
- Start with early mobilization (ROM exercises)



Acute ankle sprain Treatment

Late phase (10 days onwards)

- Protection (bracing)
- Rehabilitation
- Mobilization (ROM exercises)
- Muscle strength (isometric, isotonic, concentric to eccentric)
- Proprioception (NB)
- Sports specific rehabilitation



Prevention of ankle sprains

1. General prevention strategies (1° and 2°)

1. Target higher risk groups
2. Athlete education
3. ? Changing game rules

2. Protection (2° only)

1. Protect the ankle after injury (brace / taping)
2. NB for about 6 weeks - only in a previously injured athlete

3. Functional training / rehabilitation (1° and 2°)

1. Restore neuromuscular function (RTP guidelines)
2. All athletes but specifically previously injured athlete

Verhagen E, Br J Sports med; 2010, 44: 1082

Fong, D et al, Sp Med Arthro Rehab Ther Techn, 2009; 1: 14

Kobayashi T, et al, Sports health, Jan 2016, (online)

Doherty C, et al, Sports Med, 2014, 44; 123-140

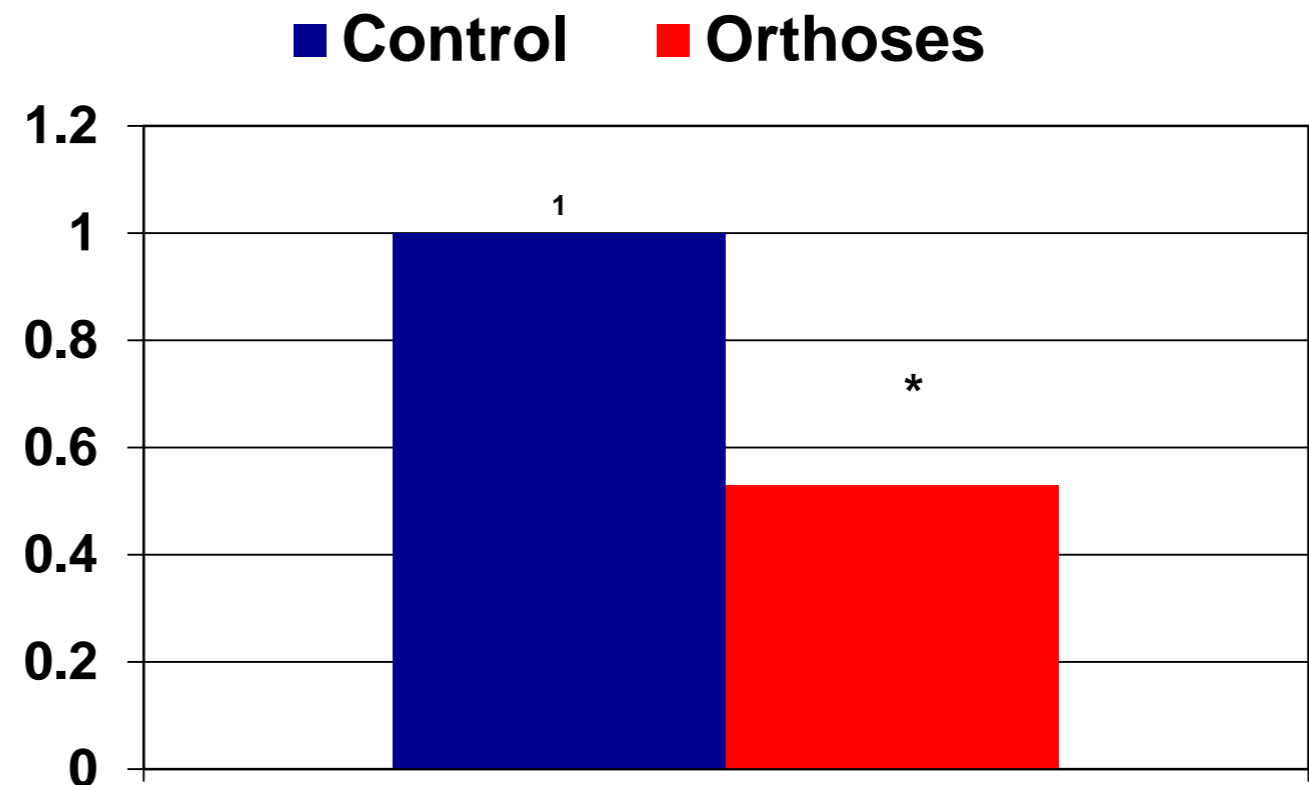
Ankle braces reduce the risk of a subsequent ankle sprain in sport - Cochrane Database of Systematic Reviews

Multiple clinical trial studies



The Cochrane Library

Odds Ratio of ankle sprain injury in sport


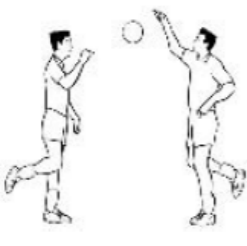

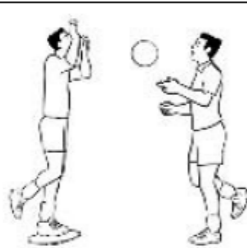


Handoll HHG, Rowe BH, Quinn KM, de Bie R. Interventions for preventing ankle ligament injuries. Cochrane Database of Systematic Reviews Issue 3, 2001

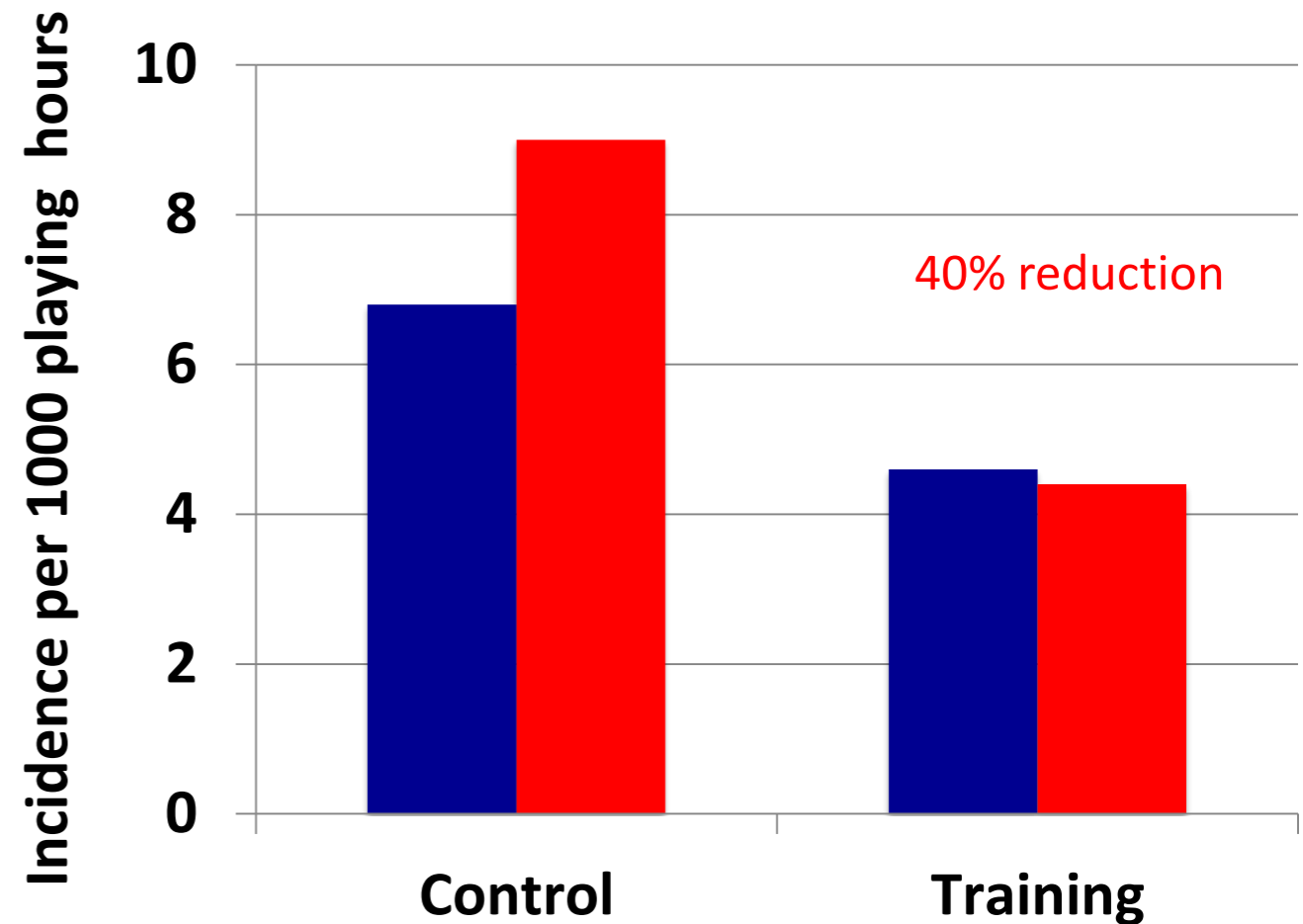
Therapeutic recommendation: The use of an external ankle “orthoses” reduces the risk of ankle sprain in sport by > 5047%

Primary and secondary prevention: Proprioceptive training

36 week home based progressive balance training program – Netherlands group

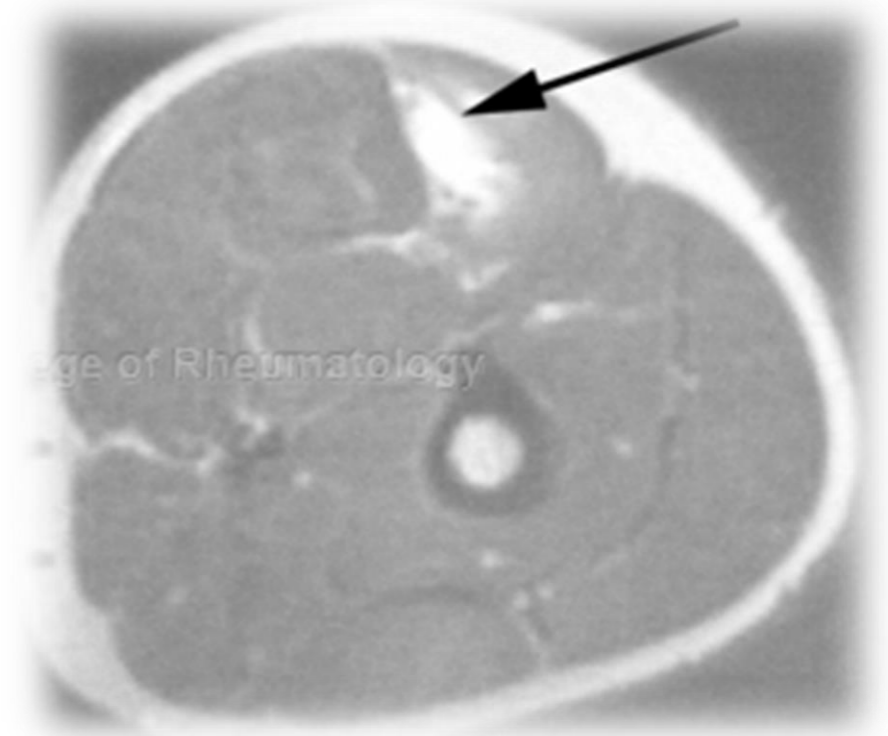
No Material	Ball	Balance Board	Ball & Balance Board
<p>Exercise 1 One-legged stance with the knee flexed. Step-out on the other leg with the knee flexed and keep balance for 5 seconds. Repeat 10 times for both legs.</p> <p>Variations 1 2 3 4</p>	<p>Exercise 3 Make pairs. Both stand in one-legged stance with the knee flexed. Keep a distance of 5 meters. Throw and/or catch a ball 5 times while maintaining balance. Repeat 10 times for both legs.</p> <p>Variations 1 2</p>	<p>Exercise 5 One legged stance on the balance board with the knee flexed. Maintain balance for 30 seconds and change stance leg. Repeat twice for both legs.</p> <p>Variations 1 2 3 4</p>	<p>Exercise 7 Make pairs. One stands with both feet on the balance board. Throw and/or catch a ball 10 times with one hand while maintaining balance. Repeat twice for both players on the balance board.</p>
<p>Exercise 2 One-legged stance with the hip and the knee flexed. Step-out on the other leg with the hip and knee flexed, and keep balance for 5 seconds. Repeat 10 times for both legs.</p> <p>Variations 1 2 3 4</p>	<p>Exercise 4 Make pairs. Stand both in one-legged stance with the hip and knee flexed. Keep a distance of 5 meters. Throw and/or catch a ball 5 times while maintaining balance. Repeat 10 times for both legs.</p> <p>Variations 1 2</p>	<p>Exercise 6 One-legged stance on the balance board with the hip and knee flexed. Maintain balance for 30 seconds and change stance leg. Repeat twice for both legs.</p> <p>Variations 1 2 3 4</p>	<p>Exercise 8 Make pairs. One stands in one-legged stance with the knee flexed on the balance board, the other has the same position on the floor. Throw and/or catch a ball 10 times with one hand while maintaining balance. Repeat twice for both legs and for both players on the balance board.</p> <p>Variations 1 2</p>
		<p>Exercise 10 Step slowly over the balance board with one foot on the balance board. Maintain the balance board in a horizontal position while stepping over. Repeat 10 times for both legs.</p>	<p>Exercise 9 Make pairs. One stands in one-legged stance with the hip and knee flexed on the balance board, the other has the same position on the floor. Throw and/or catch a ball 10 times with one hand while maintaining balance. Repeat twice for both legs and for both players on the balance board.</p> <p>Variations 1 2</p>
		<p>Exercise 11 Stand with both feet on the balance board. Make 10 knee flexions while maintaining balance.</p>	<p>Exercise 13 Make pairs. One stands with both feet on the balance board. Play the ball with an upper hand technique 10 times while maintaining balance. Repeat twice for both legs and for both players on the balance board.</p> <p>Variations 5 6 7 8</p>
<p>Variations on basic exercises: 1 The standing leg is stretched 2 The standing leg is flexed 3 The standing is stretched & the eyes are closed 4 The standing leg is flexed & the eyes are closed 5 The standing leg is stretched & upper hand technique 6 The standing leg is flexed & upper hand technique 7 The standing leg is stretched & lower hand technique 8 The standing leg is flexed & lower hand technique</p>		<p>Exercise 12 One-legged stance on the balance board with the knee flexed. Make 10 knee flexions while maintaining balance. Repeat twice for both legs.</p>	<p>Exercise 14 Make pairs. One stands in one-legged stance with the knee flexed on the balance board, the other has the same position on the floor. Play the ball with an upper hand technique 10 times while maintaining balance. Repeat twice for both legs and for both players on the balance board.</p> <p>Variations 5 6 7 8</p>

- No previous injury (primary prevention)
- Previous injury (secondary prevention)



Number needed to treat for all athletes = 9

Acute muscle strain injury (e.g. hamstring)



Risk factors for hamstring muscle injuries

Intrinsic risk factors		Weak (level 3-4)	Moderate (level 2)	Good (level 1)
Increased age				+ve ✓
Ethnicity	Aboriginal, Black		+ve ✓	
Antropometry	Increased Body Mass Index (BMI)			No ✓
	Increased body weight		+ve ✓	
	Increased height		No ✓	
	Limb dominance		No ✓	
	Functional LLD > 1,8cm		+ve ✓	
Muscle strength	Reduced muscle strength (conc H/Q ratio)		No ✓	
	Reduced functional H/Q ratio (ecc H/ conc Q)		+ve ✓	
	Reduced hamstring conc peak torque			No ✓
	Increased quadriceps peak torque			+ve ✓
	Side to side hamstring ecc peak torque			+ve ✓
	Weak conc hip extensors		+ve ✓	

Management of acute soft tissue injuries – important considerations

1. Care of the patient – reduce pain
2. Limiting size of injured tissue
3. Promoting (? accelerating) healing
4. Using management techniques to create a good “quality” scar tissue
5. What is adequate functional recovery?
(RTP guidelines)



Guidelines for management of an acute soft tissue injury (immediate: 0-60min)

1. **Stop play and perform a brief targeted clinical assessment**
2. **Remove the player from the field (Grade II and III) ? In Grade I injury**
3. **Perform a full clinical assessment**
4. **Management:**
 - **Ice (NB Analgesic effect)**
 - **Compression**
 - **Elevation of limb**



Treating with ice / compression

Does cryotherapy immediately post-injury reduce the area of muscle injury?

■ Control ■ Compression ■ Ice

45

Practical clinical point

Cryotherapy, applied immediately after an experimental muscle contusion injury, reduces the size of the injured area

0

Treating with ice

Does cryotherapy positively influence tissue healing?

74 patients with acute (< 48 hours) sports-related soft tissue injury
Randomly assigned to active cold gel (Ice Power) (GEL) or a placebo gel (CON) groups
Cold gel applied 4 X / day on the skin for 14 days
Clinical assessment conducted at 7, 14, and 28 days.
Pain (VAS), patient satisfaction, disability

Practical clinical point

Cryotherapy, applied 4/day for up to 14 days after soft tissue injury, improves clinical outcomes up to 4 weeks after the injury



Guidelines for management of an acute soft tissue injury: Acute inflammatory phase (60 min to 3 days post injury)

Treatment modalities

1. Rest, ice, compression, and elevation (0-24 hours)
2. Analgesics (0-24 hours)
3. Anti-inflammatory agents *
4. Ultrasound (early - up to week) *
5. Early mobilization (after 48-72 hours)



Anti-inflammatory drugs

Does complete inhibition of the inflammatory process negatively affect tissue strength and therefore possibly increase risk of re-injury?

- Lat
 - Co
 - Co
 - Fo
- mus
days post contusion

Practical clinical point

Corticosteroids, administered immediately after an experimentally induced muscle contusion injury, reduces scar tissue strength after 1-2 weeks

Twitch

0

Day 2

Day 14

Beiner et al, Am J Sports Med, 27, 1999

Non-steroidal anti-inflammatory drugs

Do NSAID's affect ligament strength in a laboratory induced ligamentous injury?

• 50 rate with MCL transected in 60 ■ Celecoxib - injured

Practical clinical point

COX-2 selective NSAID's, administered immediately after an experimentally induced ligamentous injury, reduce scar tissue strength after 2 weeks

Non-steroidal anti-inflammatory drugs

Do NSAID's decrease pain after an acute ligamentous injury?

• 219
lateral
sprain
• Ran
group
2 day
5 day
• Mea
Pain,
walking distance

Practical clinical point

NSAIDs administered >24 hours after an acute ligamentous injury aids in clinical recovery (reduce pain and improve function)

Days

Other novel treatment techniques in the treatment of soft tissue injuries (acute inflammatory and early repair phase)

	Evidence	Timing (post injury)	Clinical application
Muscle relaxants (e.g. Cyclobenzaprine)	Limited clinical evidence	Acute phase if muscle spasm	Requires further investigation
Platelet rich plasma (PRP)	Limited clinical evidence	? 1-7 days	Requires further investigation
Basic Fibroblastic Growth Factor (b-FGF)	Promising (animal studies)	? 1-7 days (angiogenesis)	Requires further investigation
Anabolic agents	Controversial	N/A	Requires further investigation
Anti-fibrotic agent (Suramin)	Promising (animal studies)	? After 5-7 days	Requires further investigation
Relaxin (inhibitor of fibrotic cytokines)	Promising (animal studies)	? 3-14 days post injury	Requires further investigation
Angiotensin receptor blocker (anti-fibrotic agent)	Promising (animal studies)	? 3-5 weeks post injury	Requires further investigation

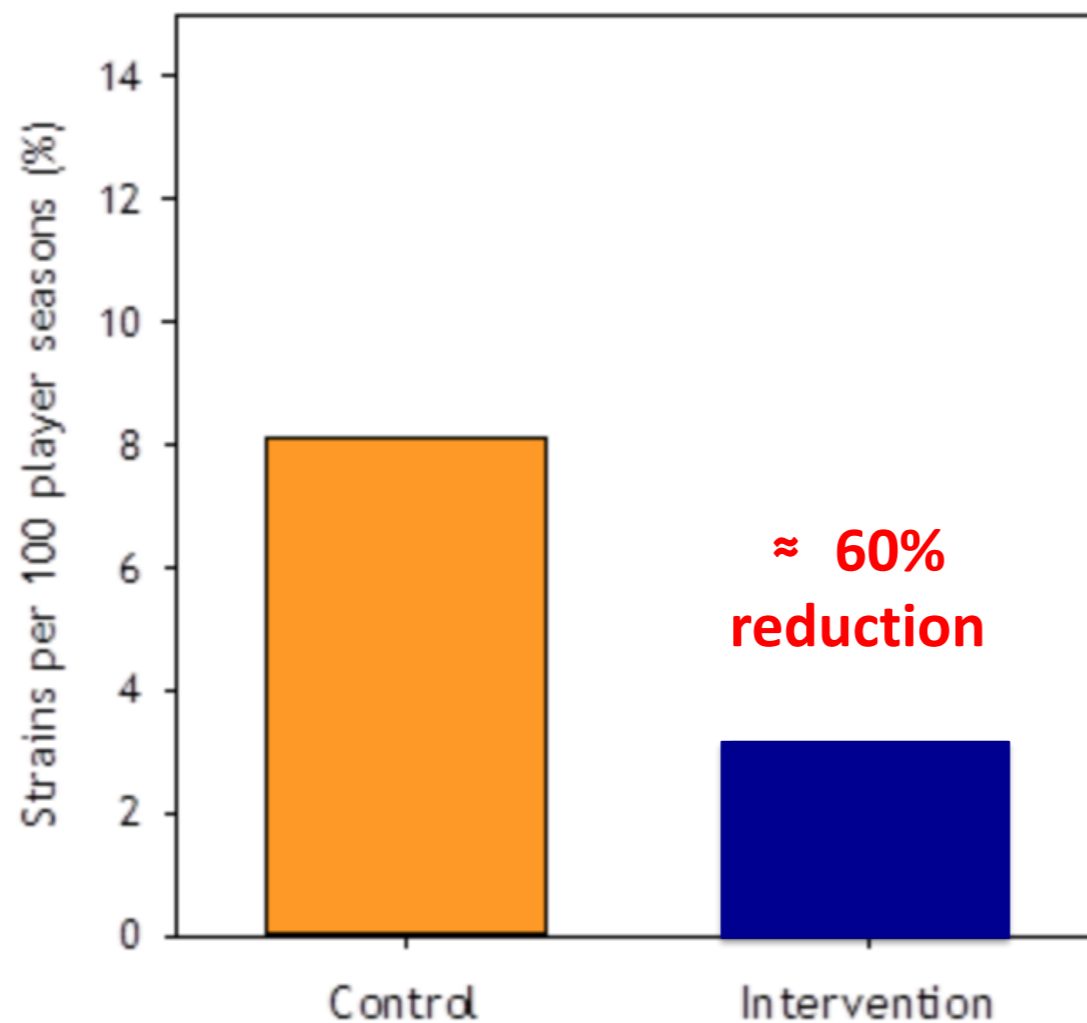
Prevention of hamstring muscle injury



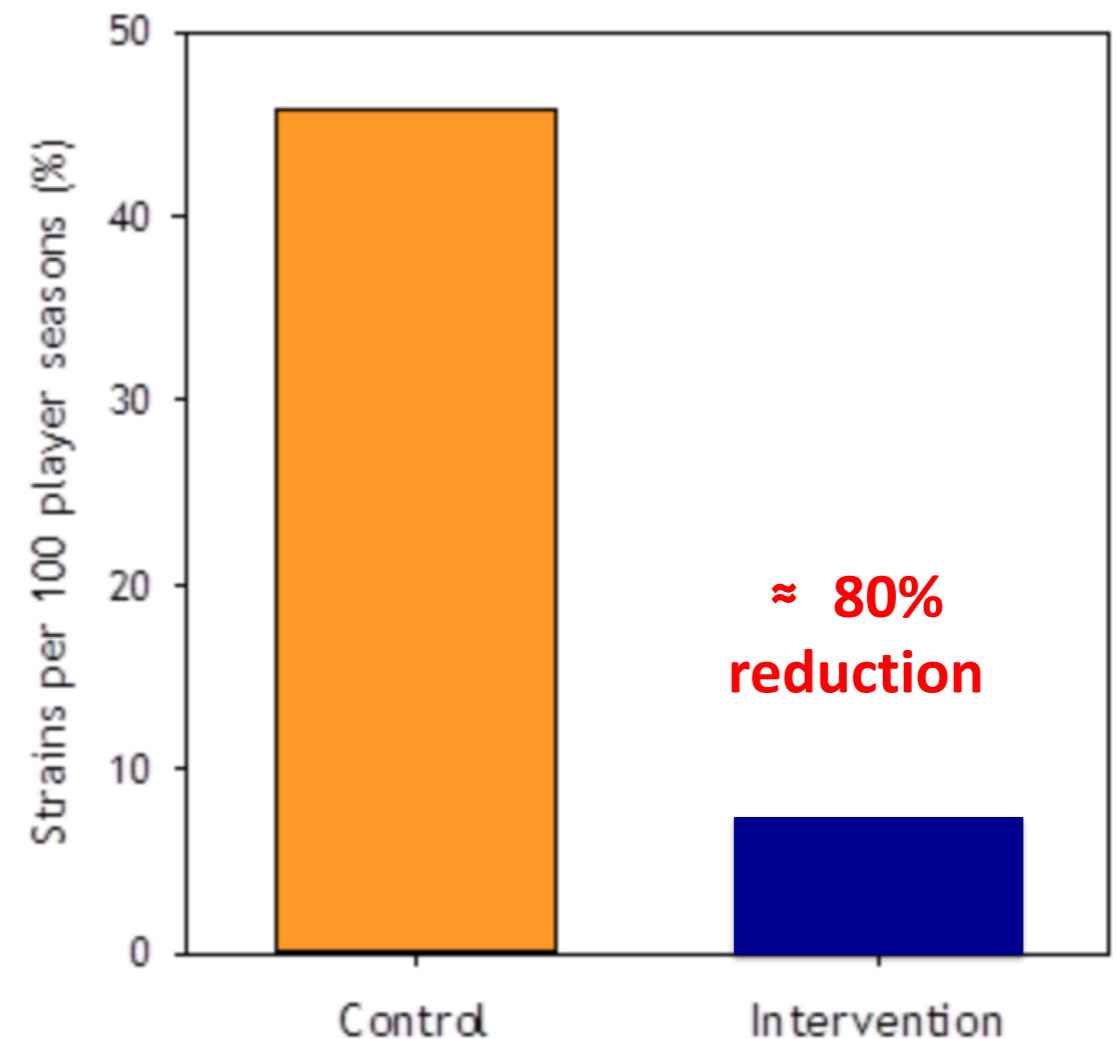
**Nordic hamstring exercises to increase eccentric
muscle strength**

Effect of implementing “Nordic” eccentric hamstring muscle strength training

First injury



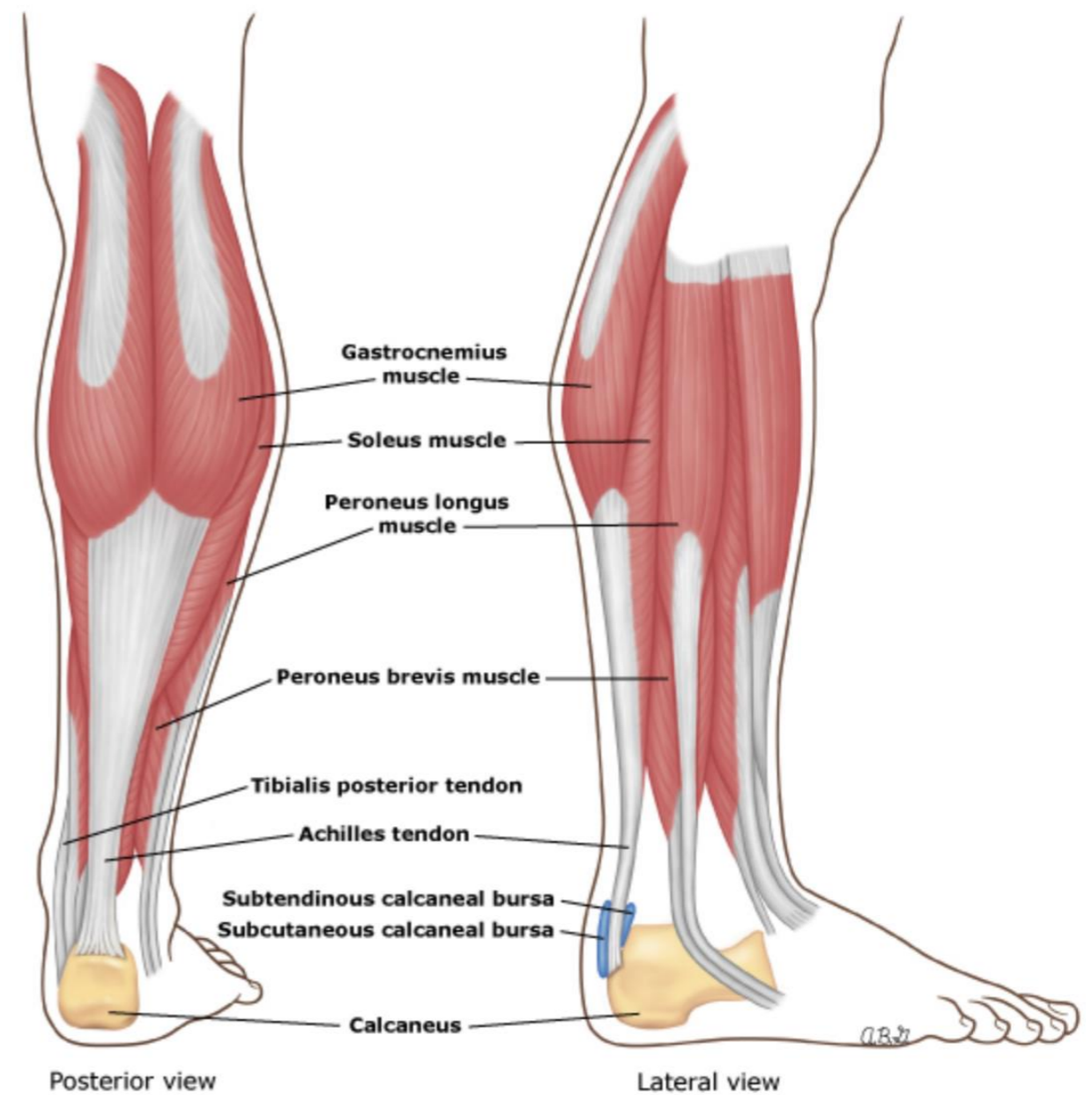
Recurrent injury



Petersen et al; Am J Sports Medicine, 2015, 39: 2296

Chronic tendinopathy (Achilles)

- Key concepts

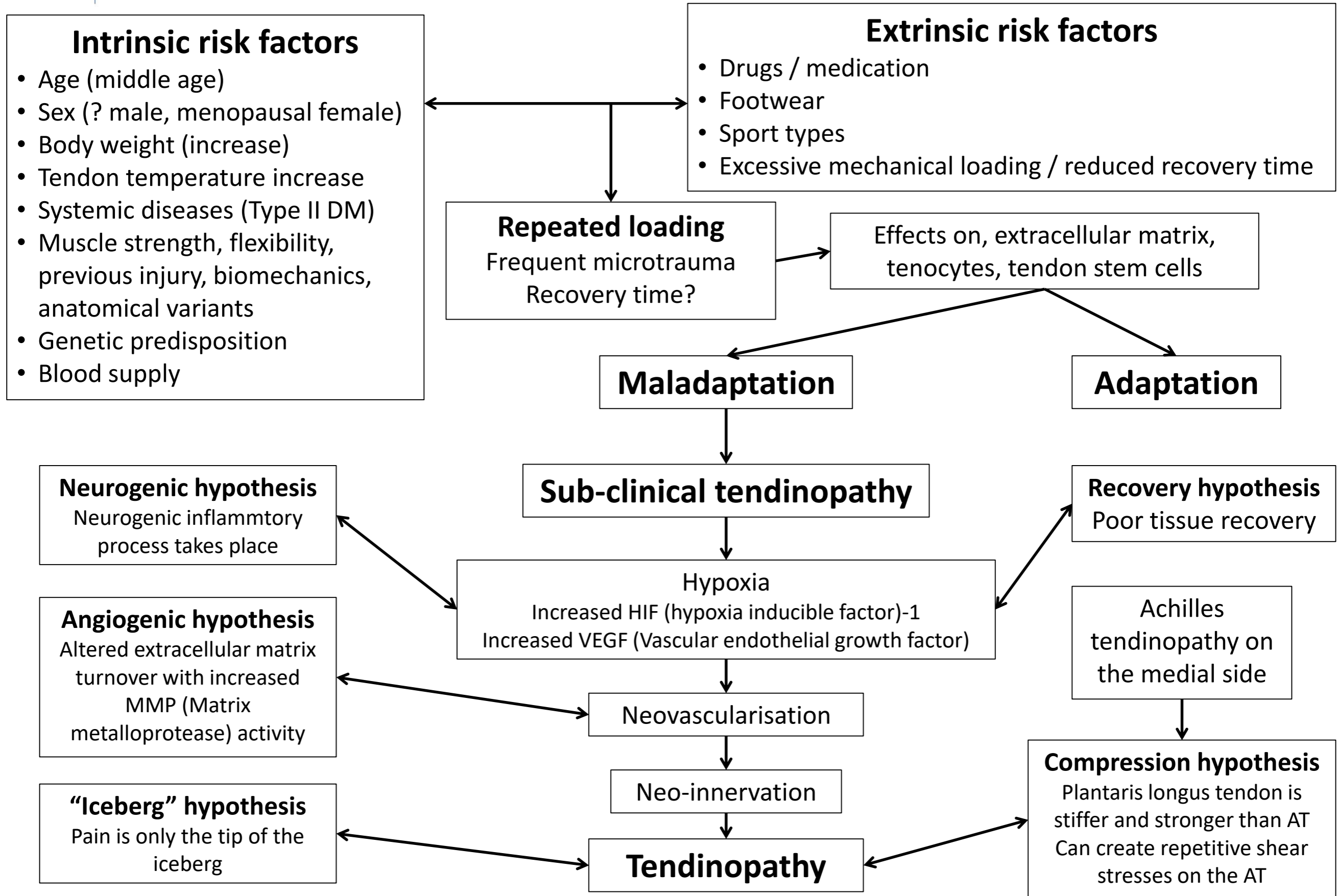


Introduction - Achilles tendinopathy

- Common in running and jumping sports (distance running, athletics, squash, volleyball, netball)
- 9% of all overuse injuries in 12 months period before a race (recreational 56km and 21.1km runners; n=44 440)
- 5% of athletes have careers ended through this injury
- 5.6% of non-athletic population
- Distribution (pain in distal Achilles region)
 - 66% mid-portion
 - 20% insertional
 - 14% retrocalcaneal bursa / insertion

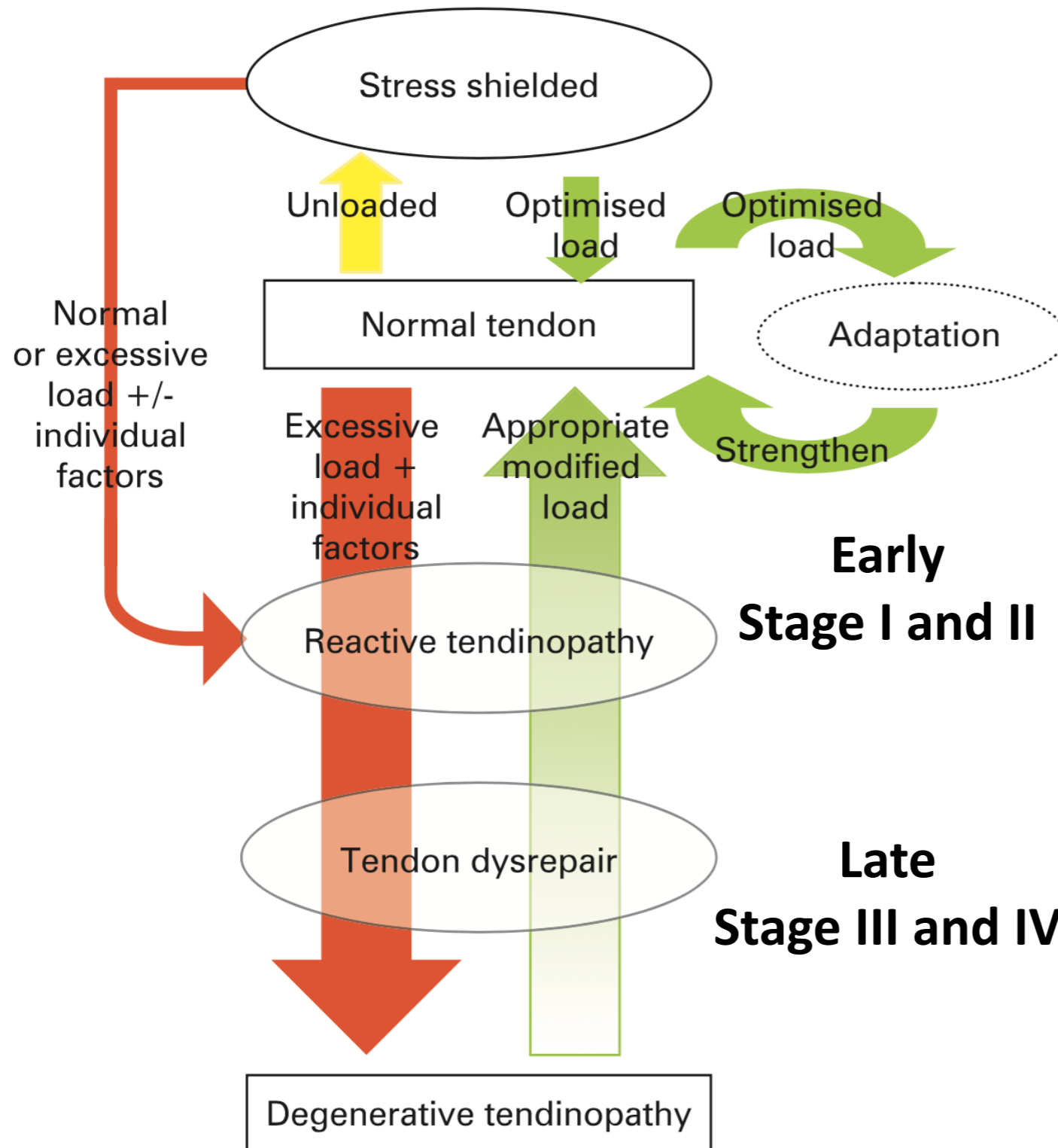


Risk factors and pathogenesis - Achilles tendinopathy

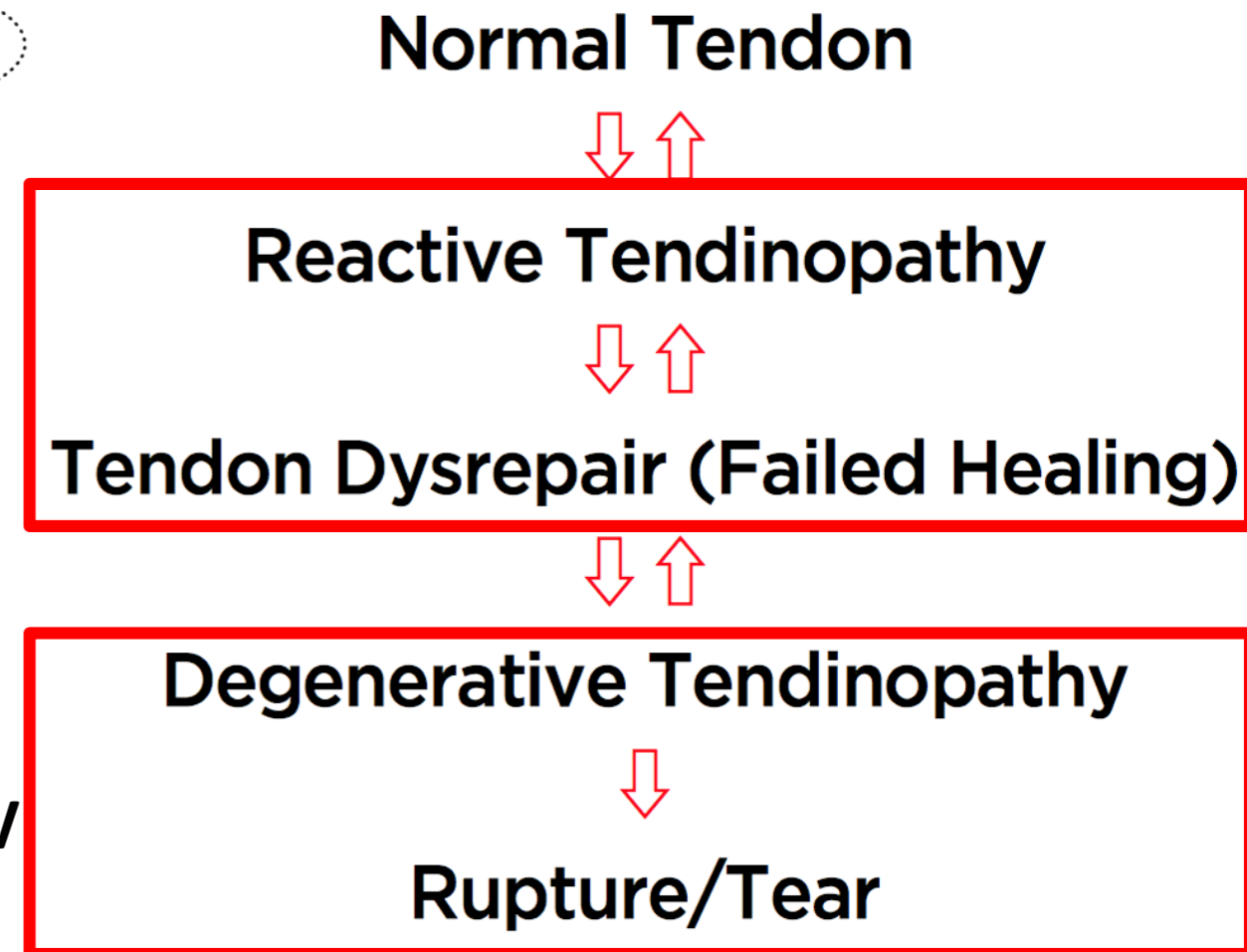


Pathology / Pathophysiology – Achilles tendinopathy

Adaptation and changes in a tendon in response to loading



Clinical stages of tendon pathology



Clinical Diagnosis - Achilles Tendinopathy

History

- **Pain** in the Achilles tendon region – gradual onset (days – weeks)
- **Early morning** pain or after prolonged inactivity e.g. sitting (often better with activity in early stages)
- May notice **swelling** (reactive and advanced stages)
- NB: Duration of pain and history of “loading”
- NB: Identify extrinsic and intrinsic risk factors

Clinical examination

- **Tenderness** over Achilles tendon (mid-portion = 66%) (3-5cm proximal to the calcaneus)
- Tender area does not move with passive plantar/dorsi flexion = paratenon involved (shift test)
- **Swelling / thickening** of tendon
- **Nodules** in tendon (move with PF/DF)
- NB: Assess for extrinsic and intrinsic risk factors

Clinical examination tip 1

“shift” test



Pain “shifts” with plantar / dorsi flexion – Pathology in the tendon

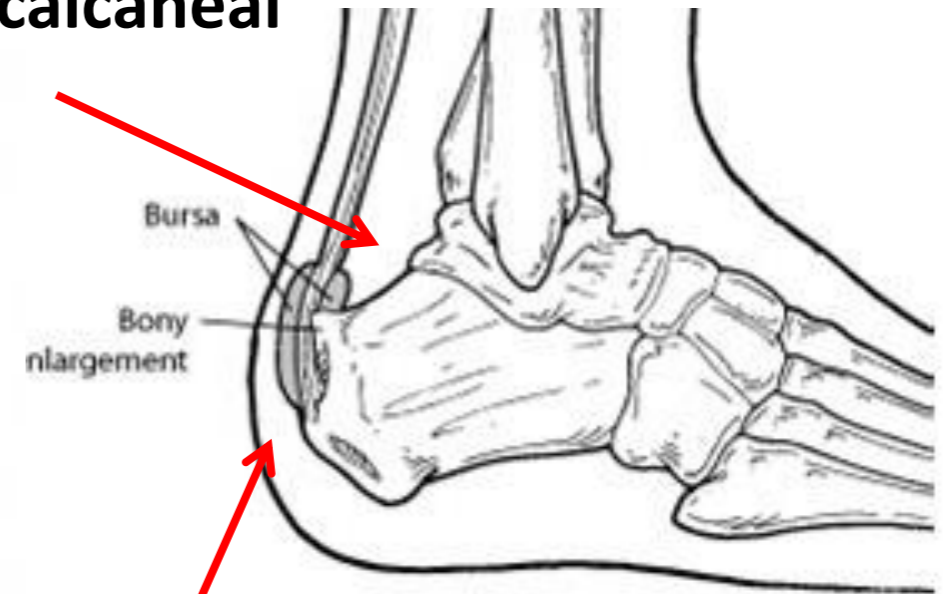
Pain does not “shift” with plantar / dorsi flexion – Pathology in the paratenon and/or tendon

Clinical examination tip 2: Careful palpation – differential diagnosis

Haglund's



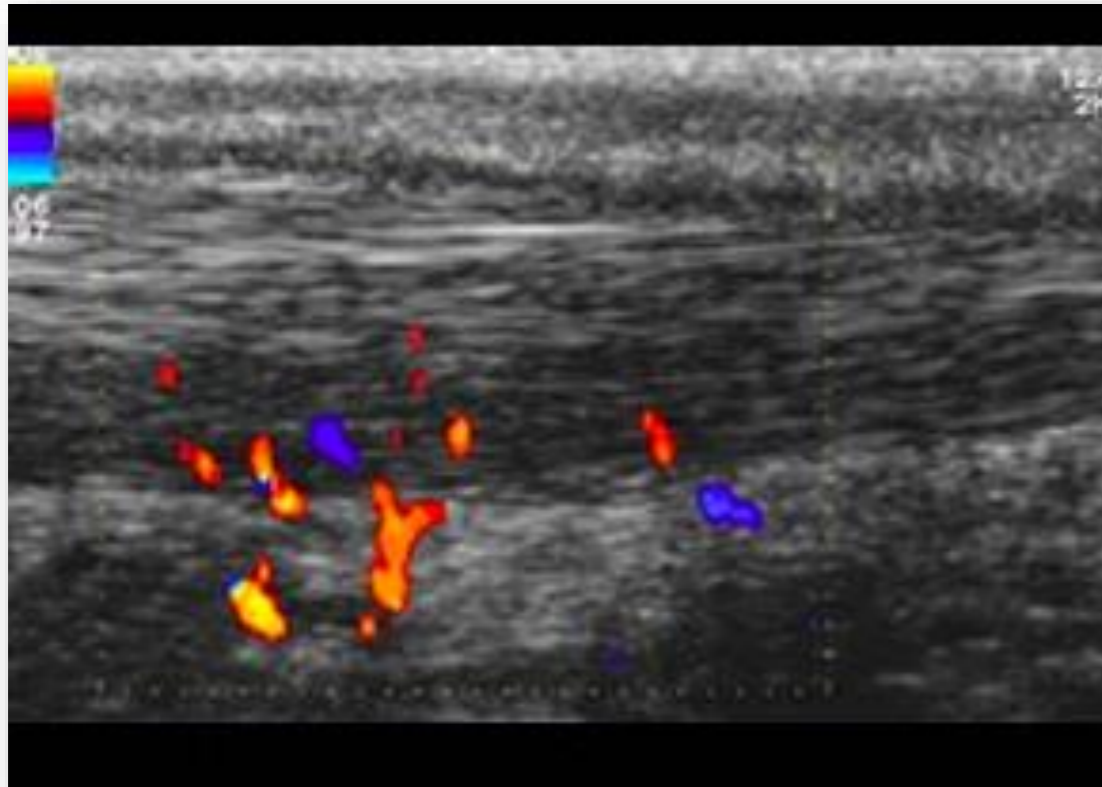
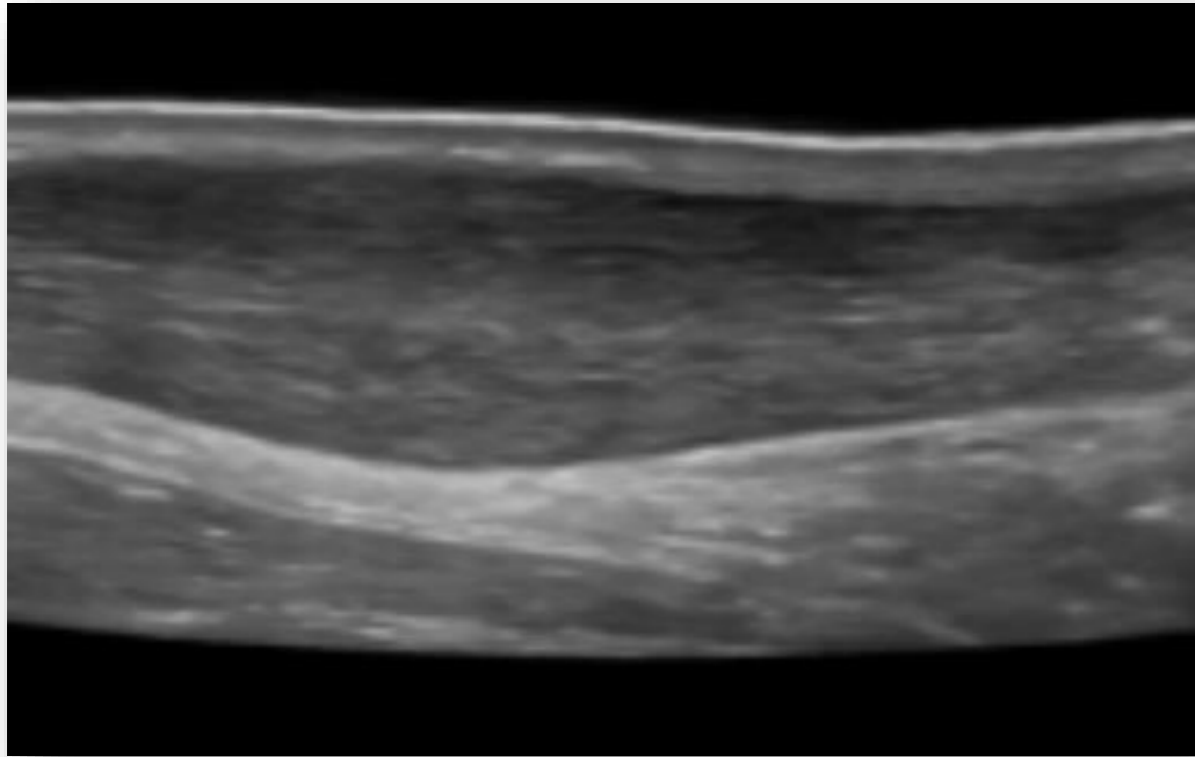
Retrocalcaneal
bursa



Insertional Achilles
tendinopathy

Special investigations

Ultrasound – Preferred Imaging in Achilles tendinopathy



Special investigations

MRI: NB for other conditions that may mimic Achilles tendinopathy



Posterior impingement: posterior talarocalcaneal ligament



Calcaneal bone stress injury

Clinical staging of Achilles Tendinopathy

	Stage 1 / 2: Reactive / Early dysrepair	Stage 3 / 4: Late dysrepair / Degeneration
Pain	<ul style="list-style-type: none"> • Acute onset (days to week or two) • Severity - variable 	<ul style="list-style-type: none"> • Chronic (> 6 weeks) • Severity - variable
Tenderness	<ul style="list-style-type: none"> • Present 	<ul style="list-style-type: none"> • Present (variable)
Swelling	<ul style="list-style-type: none"> • Mild to moderate 	<ul style="list-style-type: none"> • Moderate to severe
	<ul style="list-style-type: none"> • No nodules 	<ul style="list-style-type: none"> • Nodular
Ultrasound	<ul style="list-style-type: none"> • Fusiform swelling • No or small hypoechoic areas • No or minimal neovascularisation 	<ul style="list-style-type: none"> • More extensive hypoechoic areas • Fibre disruption • Neovascularisation (numerous and large vessels)
MRI	<ul style="list-style-type: none"> • Increased tendon diameter • No or minimal or altered signal 	<ul style="list-style-type: none"> • Swollen • Altered signal

What not to miss?

Differential diagnosis of pain in the Achilles / distal calf region

- **Achilles tendon**

- Mid-portion Achilles tendinopathy
- Insertional Achilles tendinopathy
- Tendon rupture
- Achilles tendinopathy 2^o to:
 - Lipid accumulation
 - Inflammatory (Rheumatological)
 - Quinolone Antibiotics
 - Statin Rx

- **Other muscle / tendon injuries**

- Calf muscle tear (gastrocnemius, soleus)
- Accessory soleus muscle
- Abnormal plantaris tendon (mechanical, ingrowing)

- **Other bony and soft tissues injuries**

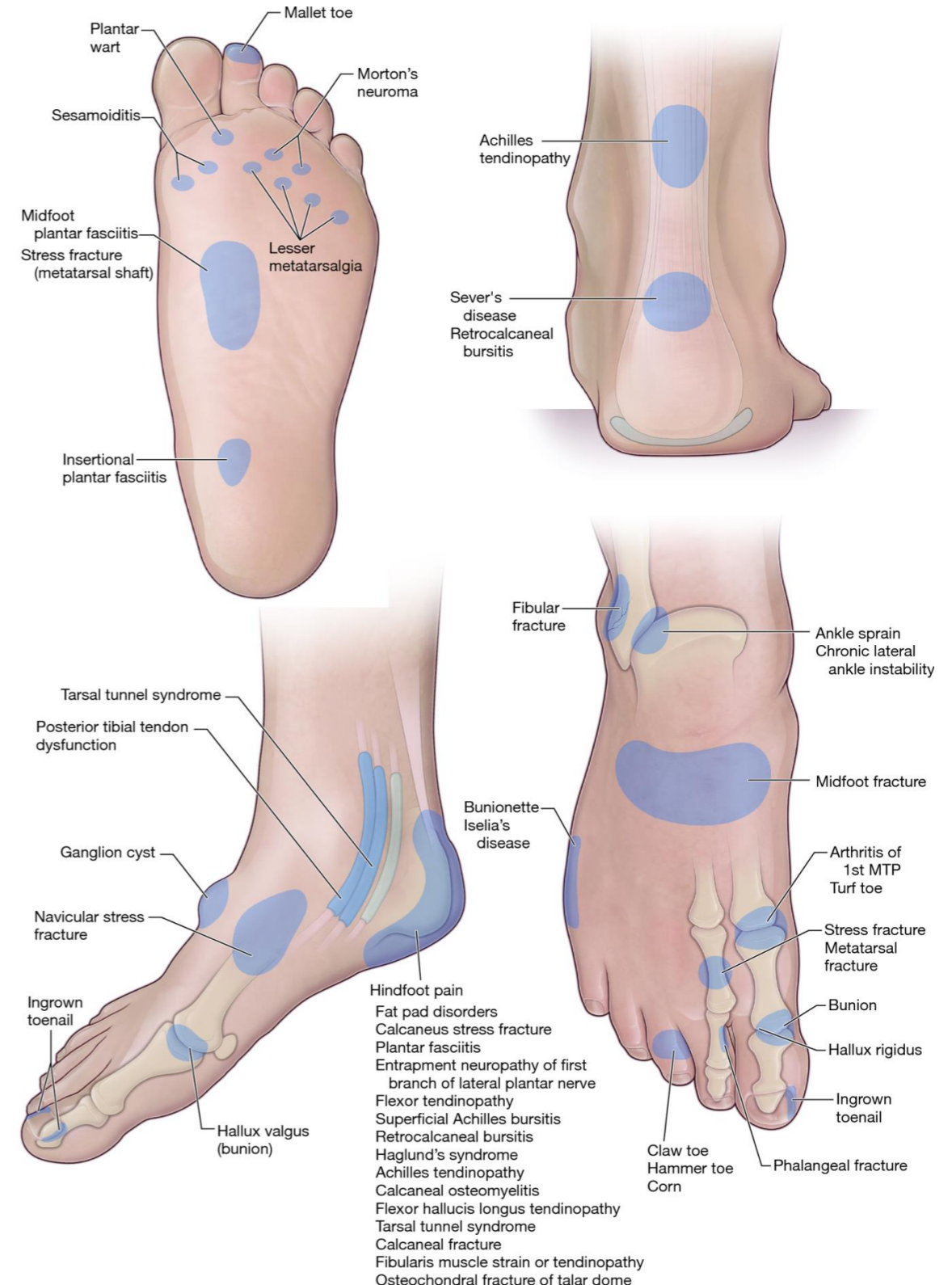
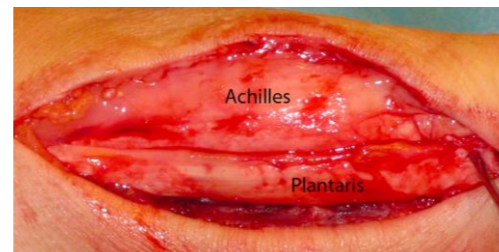
- Retrocalcaneal bursitis
- Haglunds syndrome
- Sever's disease (growth plate injury)
- Posterior impingement syndrome
- Tibial / Calcaneal bone stress

- **Vascular**

- Deep vein thrombosis
- Peripheral arterial disease

- **Neurological**

- Nerve entrapments
- Referred pain



Management - Stage 1 and 2

Reactive tendinopathy / early dysrepair

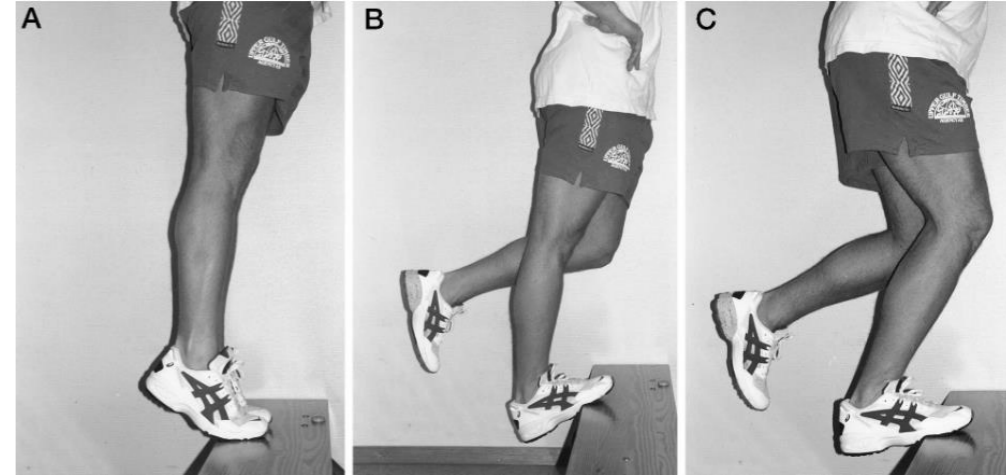
- Step 1: Address and treat risk factors
 - Extrinsic (modifiable)
 - Rest and load management (tendon response in type 1 collagen precursors peaks around 3 days after a single bout of intense exercise)
 - ? Immobilize (short period) – taping / boot
 - Footwear (heel raise)
 - Intrinsic (modifiable)
 - Weight loss
 - Tendon cooling
 - Identify and treat systemic diseases (Type II DM)
 - Identify and treat muscle strength, flexibility, biomechanics
 - Foot core rehabilitation
- Step 2: Pain management
 - Heel raise
 - Night splint
 - NSAID's (tenocyte and aggrecan inhibition)
- Step 3: Gradual return to activity
 - Load management



Management - Stage 3 and 4

Late dysrepair / Tendon degeneration

- Step 1: Address and treat risk factors
 - As in Stage 1
- Step 2: Controlled loading - eccentric
- Step 3: Pro-inflammatory treatment
 - Moderate evidence:
 - Extracorporeal Shock Wave Therapy (ECSWT)
 - Injection therapy (Polidocanol - sclerosing)
 - ? Deep massage
 - ? Nitrate patches
 - ? Injection therapy (Hyperosmolar dextrose, Haemodialysate)
 - Poor evidence:
 - Injection therapy: PRP, anticoagulants, protease inhibitors
- Step 4: Consider non-invasive surgical treatment
 - High-volume injection (anterior stripping)
 - Percutaneous tenotomy (Tenex)
- Step 5: Consider more invasive surgical treatment
 - Minimally invasive tendon stripping, mini “open” scraping, open debridement
 - Other: plantaris tendon release, gastrocnemius recession



High volume stripping injection

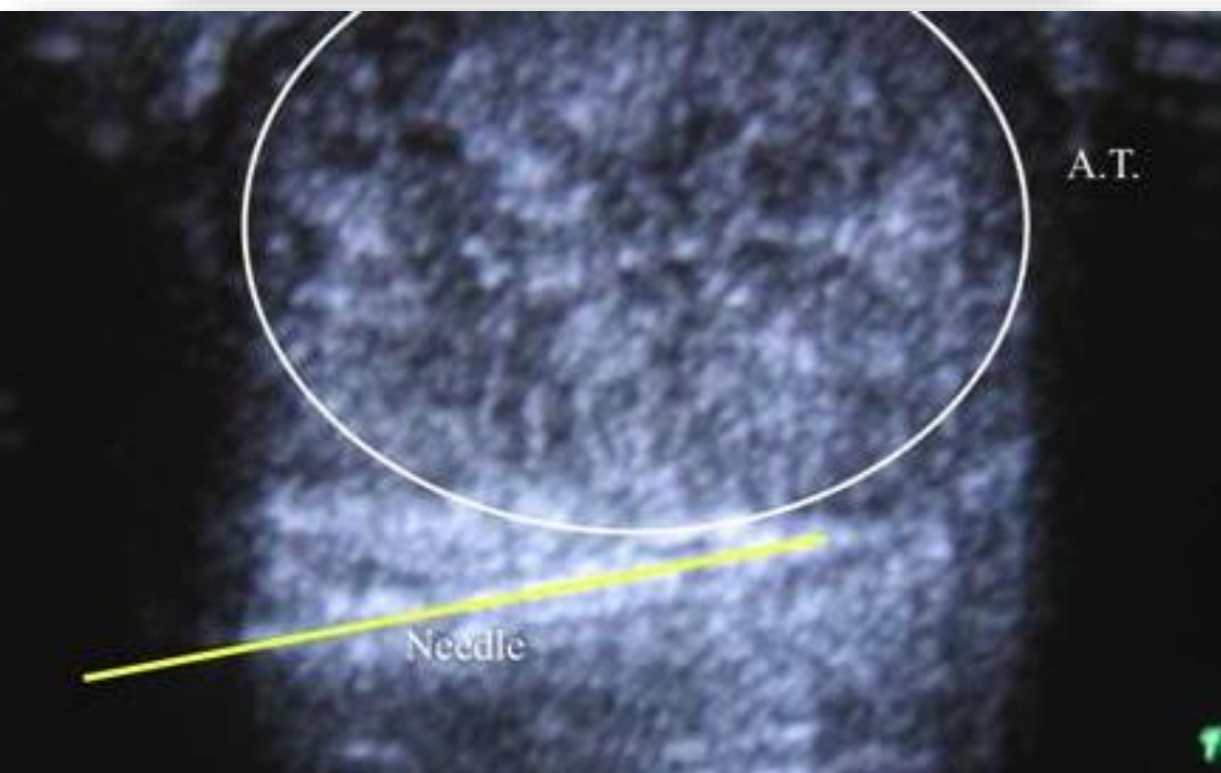


What do I use?

40 ml Saline

10 ml Marcaine

? 2 ml Celestone Sol



Chronic Plantar Fascial injury - and other foot conditions that drive us crazy!



Anatomy and Biomechanics

Plantar Fascia

- Anatomy
 - Longitudinal collagen fibers
 - Antero-medial calcaneus to proximal phalanges – five digital bands
 - Continuous with AT
- Important for normal foot biomechanics
 - Medial longitudinal arch maintained by plantar fascia, bony, ligamentous, intrinsic foot muscles (foot core)
 - Greatest tension in PF at heel off (with dorsiflexion of the toes)(windlass effect)
 - Inflexibility of posterior muscles and tendon – increased PF tension

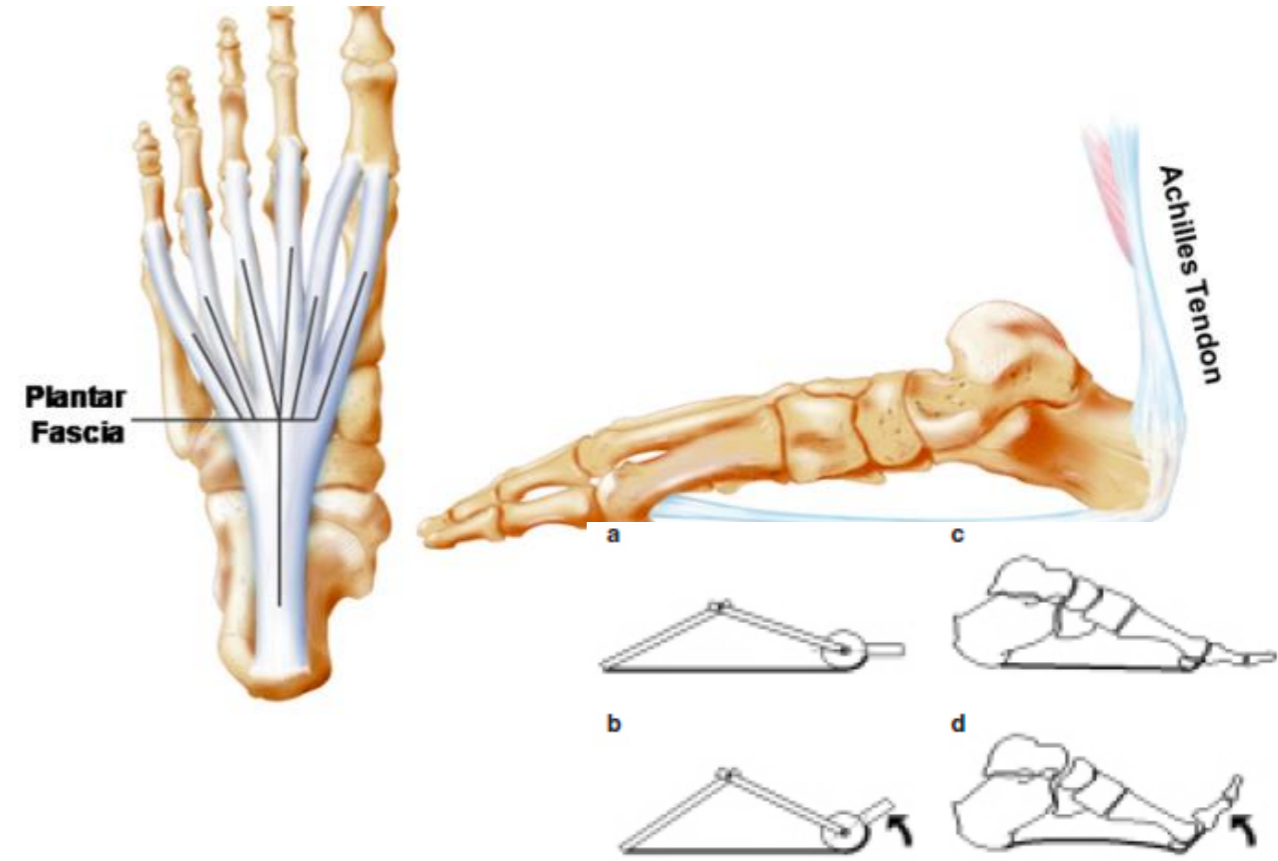


Fig. 7. Hick's windlass effect in the foot. (a) Mechanical windlass in



Epidemiology – Plantar Fasciopathy

- Point prevalence: 10-16% in population
- 1 million visits to medical professionals a year in USA
- Significant health burden
- Older age
 - Younger – lower prevalence
 - Older athletes – higher
- Sex – conflicting
- 8% of running injuries
- Self limiting (24 months)
- Painful & disabling affecting quality of life (QOL)



Risk Factors - Plantar Fasciopathy

Intrinsic

- Increased age
- Obesity
- Pregnancy
- Decreased ankle dorsiflexion due to tight Achilles / calf muscles
- Tight posterior lower limb muscles especially hamstrings
- Weak intrinsic foot muscles
- Rheumatological disease (Reiters, Rheumatoid, Ankylosing spondylitis)
- Diabetes
- Chemotherapy

Extrinsic

- Occupation
 - Prolonged weight bearing
 - Change in surface (hard)
- Physical load
 - Increased load (training)
 - Excessive foot pronation
 - Rearfoot eversion
 - Arch height collapse
- Inappropriate footwear
- Sleeping posture
- Type of sport
- Increased load

Clinical Diagnosis

Plantar Fasciopathy (Fasciitis)

History

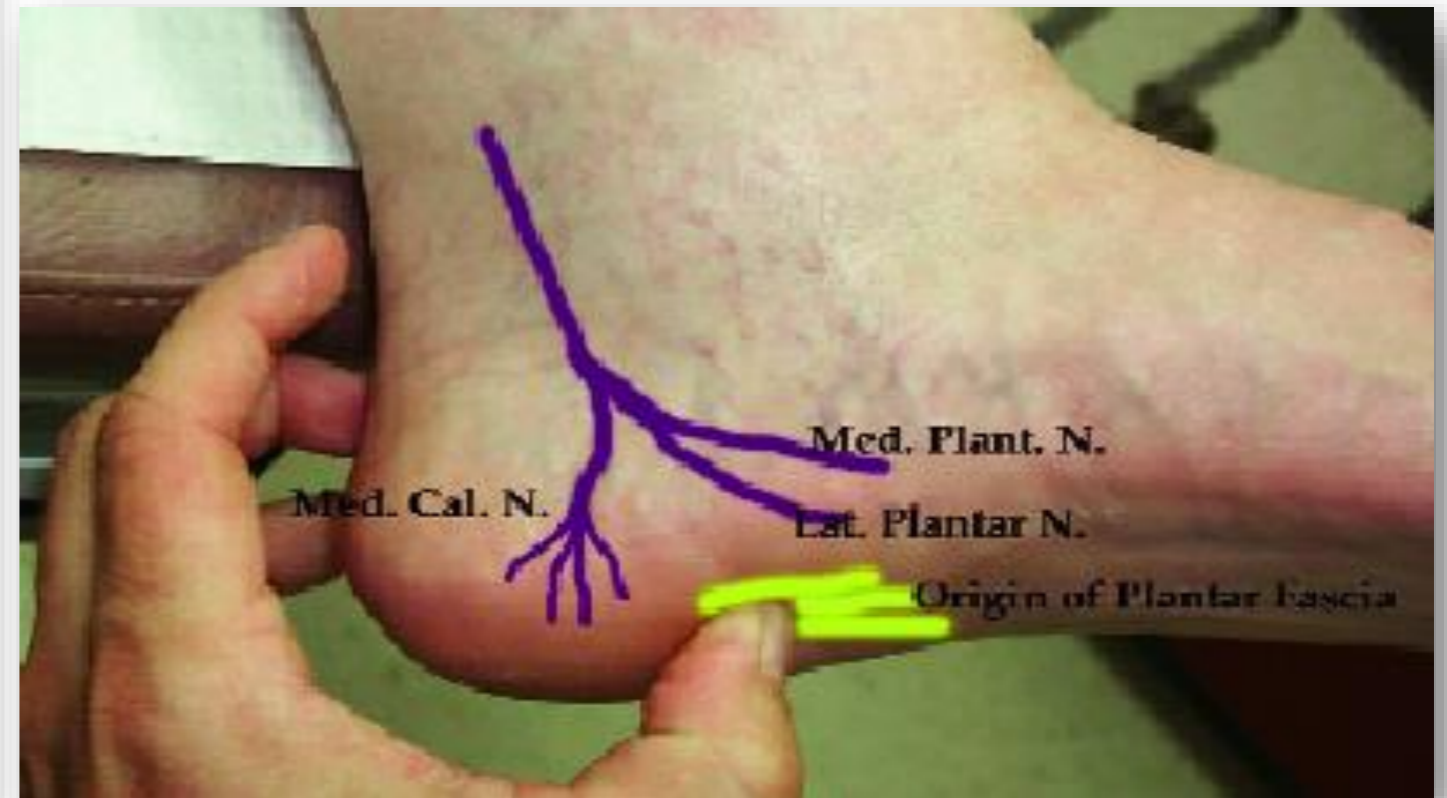
- Pain in the heel region
- Early morning pain or after prolonged inactivity e.g. sitting (often better with activity in early stages)
- NB: Duration of pain and history of “loading”
 - Acute: < 4 weeks
 - Sub-acute: 4-12 weeks
 - Chronic: > 12 weeks
- NB: Identify extrinsic and intrinsic risk factors

Clinical examination

- Tenderness over origin or mid-portion of the plantar fascia
- Aggravated by dorsi-flexion of the big toe
- NB: Assess for extrinsic and intrinsic risk factors

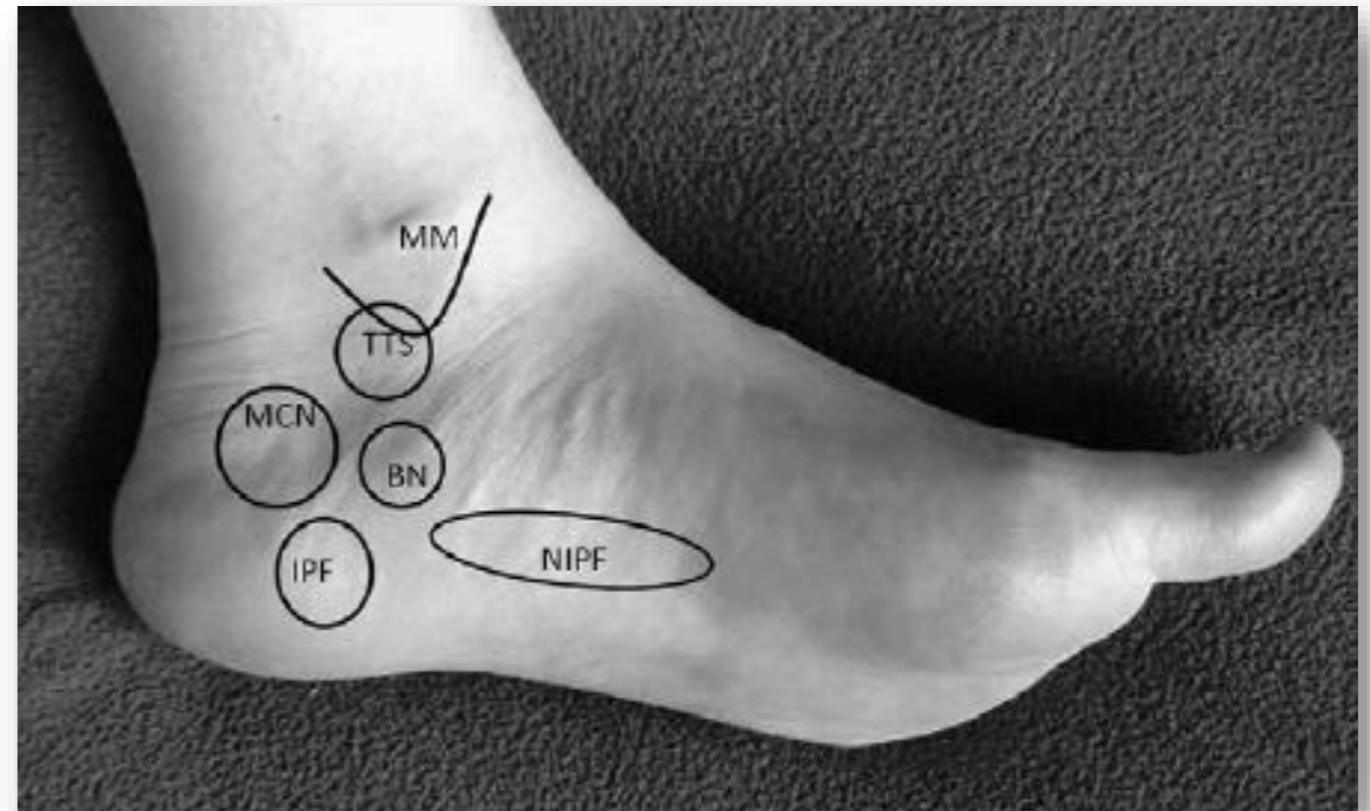
Clinical examination

Careful palpation



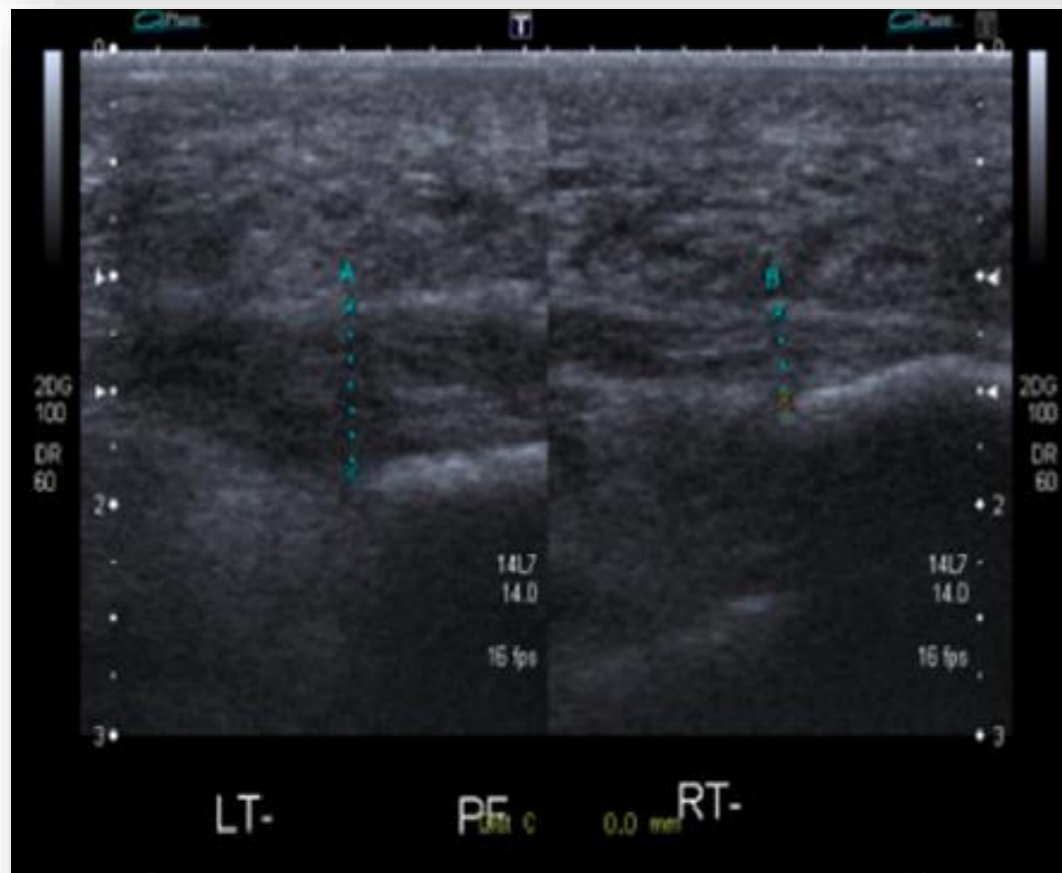
Differential Diagnosis - Plantar Fasciopathy

- Tendons:
 - Tibialis posterior tendinopathy
 - FHL / FDL tendinopathy
- Bursae:
 - Retro-calcaneal (sub-tendinous) bursitis
 - Sub-cutaneous bursitis
- Bony pathology
 - Calcaneal bone stress injury
 - Talar dome bone stress injury
 - Sever's (young adolescents)
 - Osteomyelitis
 - Osteoid osteoma
- Nerve entrapments
 - Tarsal tunnel syndrome
 - Medial calcaneal nerve entrapment
 - Lateral plantar nerve entrapment
- Other soft tissue
 - Fat pad contusion
- Rheumatological conditions
- Referred pain
- RSD
- ? Multiple structure pathology



Special investigations

Plantar heel pain (PF) – exclude other causes



Principles of Management – Plantar Fasciopathy

- Step 1: Identify and address risk factors
 - Load mx
 - Footwear
 - Weight loss
 - Foot core
- Step 2: Pain management
 - Unload (taping, splint)
 - Ice massage
 - Stretches
 - Night splint
 - NSAID (not really helpful)
 - Corticosteroid injection (pain relief, ? Risk of rupture)
- Step 3: Pro-inflammatory Interventions
 - ECSWT (Good evidence)
 - Dry needling (US guided)
- Step 4: Gradual loading and return to activity
 - First NWB then progress



Summary – chronic injuries

Some take home messages!

- Up to 80% (AT) and 90% (PF) of patients will be healed with a non-operative approach
- Have a patient centered graded approach to your management (Stages in AT)
- Identify and treat risk factors
- Limited use of corticosteroids
- Weight loss is NB in both conditions
- Pro-inflammatory Mx/HVSI are promising (Later stages)

Time for the quiz!

1. Get your smartphone or tablet
2. Are you connected to the internet?
3. Use your Free wifi access
4. Go to www.menti.com
5. Ready to go if you see this displayed?
6. Your 5 digit code (number) to enter
7. Choose name (alias) – optional (for the quiz section)(end of lecture)



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