Overuse Injuries and Disorders among Cyclists

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Evergreen Sports Medicine


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NEDERLANDSE LOTERIJ
SCOTT


London 2012


Capacity
Chronic loading
Training effect
Injury treshold
Workload
1
2
3
4
5
6

Cervical

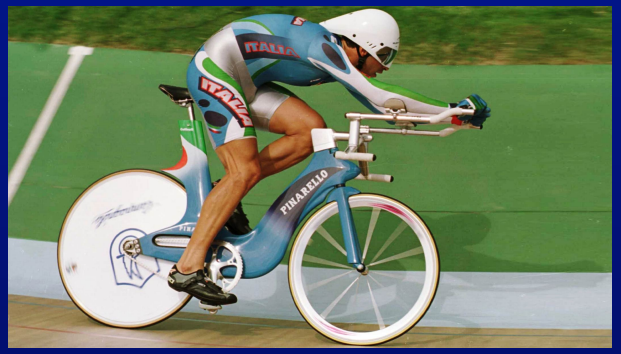
Cervical

- Muscle dysfunction of the paraspinal, levator scapulae and the trapezius muscles
- Hyperextension of the neck during cycling
- Predisposing factors
  - Weak musculature
  - Drop handlebars
  - Raised saddle
  - Heavy helmet
  - Off-road riding
  - Rough surfaces

Cervical

Treatment

- Condition upper back muscles
- Gradually increase aero position
- Widen armrest positioning
- Shorten handlebars
- Raise handlebars
- Lower saddle
- Lighten helmet
- Evaluate warning symptoms

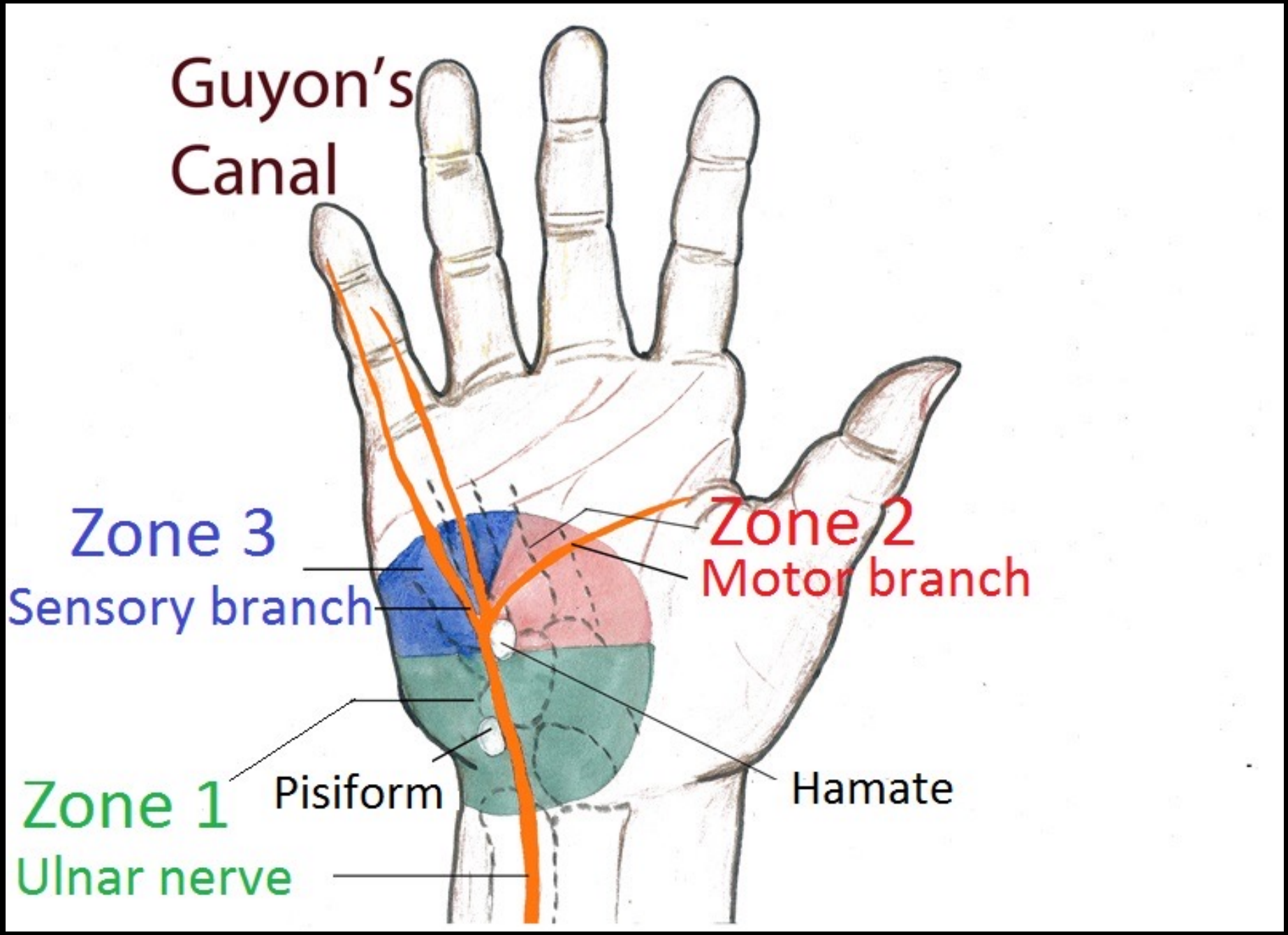


Hand and Wrist

Hand and Wrist

Ulnar neuropathy

- Cyclists' palsy
- Ulnar nerve compressed due to prolonged hypothenar pressure
- Stiffness, weakness, numbness
- 70% cyclists with motor or sensory disturbance during 4-day, 600 km ride
- Significantly prolonged ulnar motor latencies during 6-day, 420-mile ride


Guyon's Canal
Zone 3
Sensory branch
Zone 2
Motor branch
Zone 1
Ulnar nerve
Pisiform
Hamate

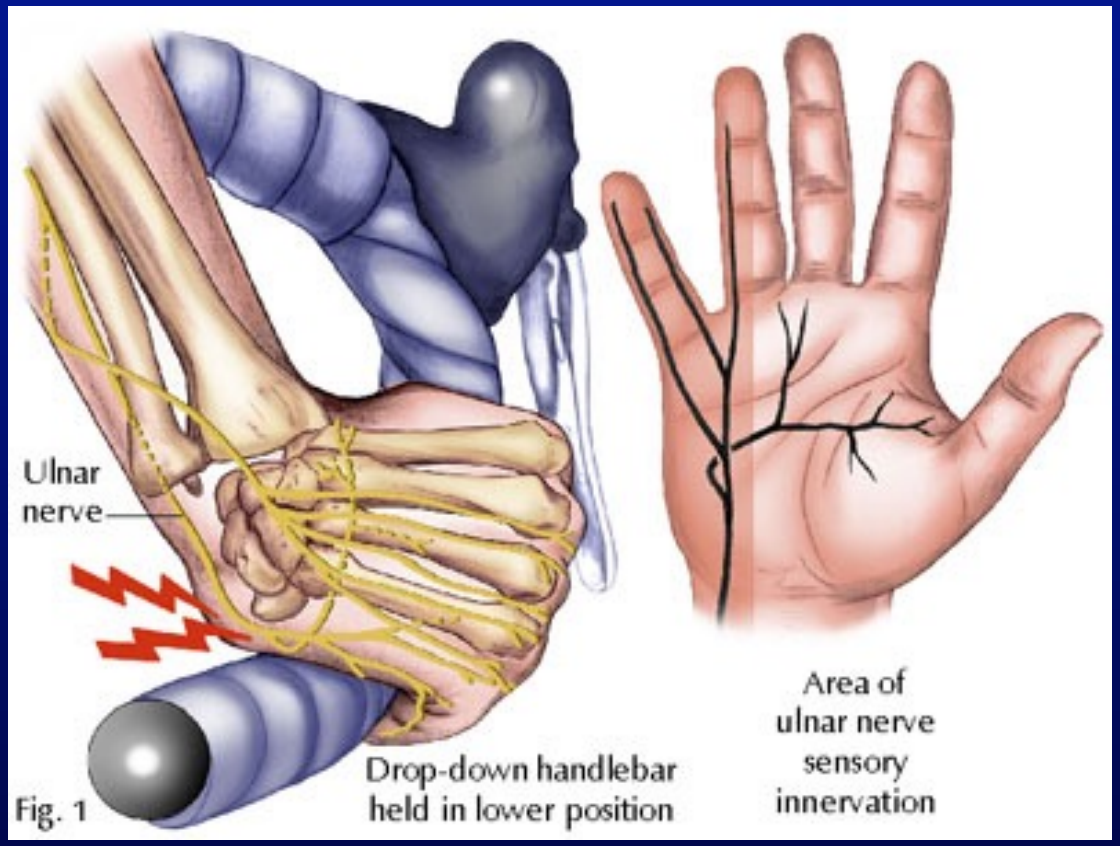
Hand and Wrist

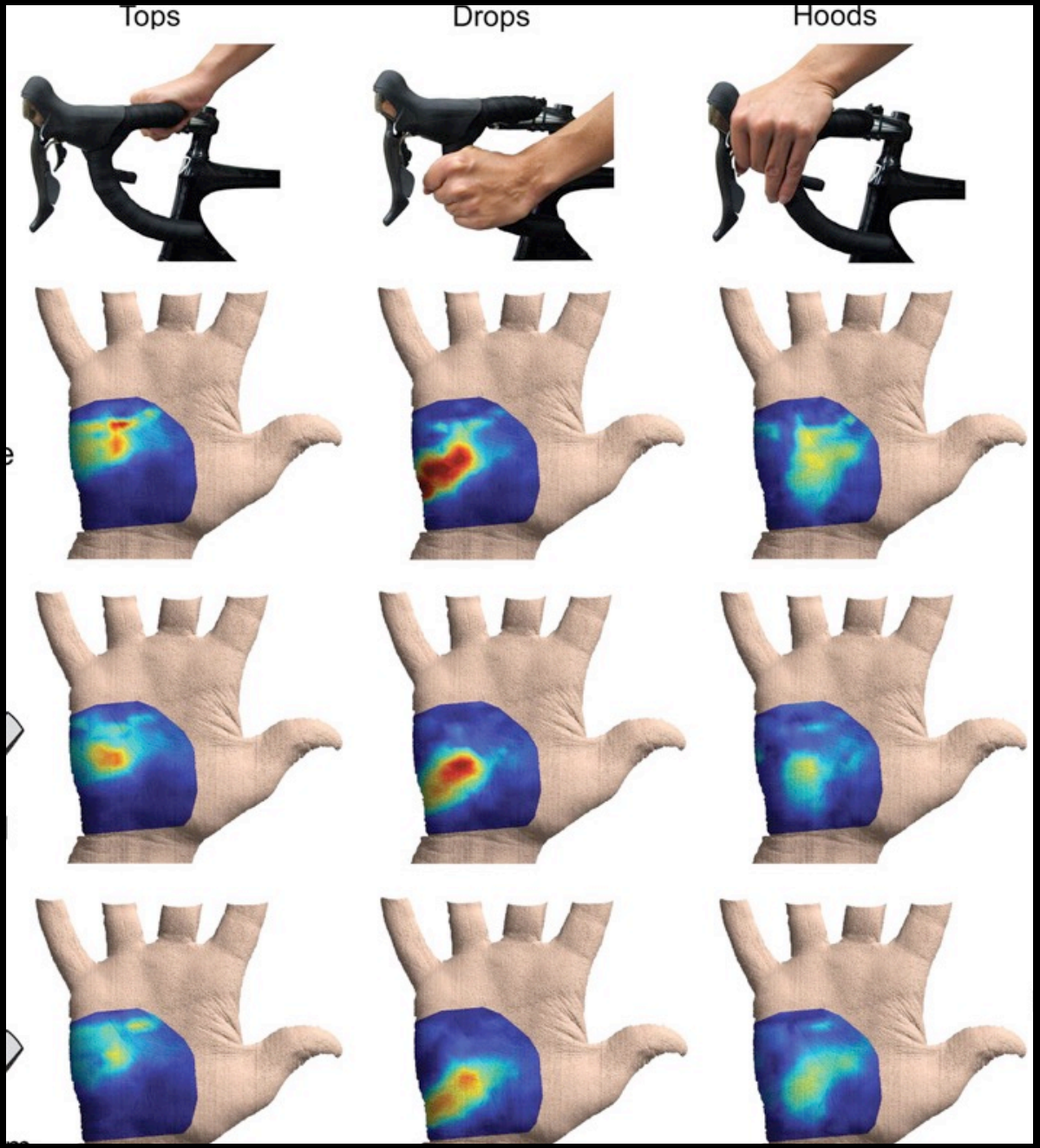
Risk factors

- Prolonged riding without grip changes
- Excessive weight on hands
- Downhill cycling or rough terrain
- Inadequate suspension
- Saddle tilted nose-down
- Handlebars too low or forward
- Poor padding in gloves or bars
- Overly tight grip maintained on the handlebars: ‘‘death grip’’

Hand and Wrist

The drops hand position induced the greatest hypothenar pressure




Tops
Drops
Hoods

Hand and Wrist

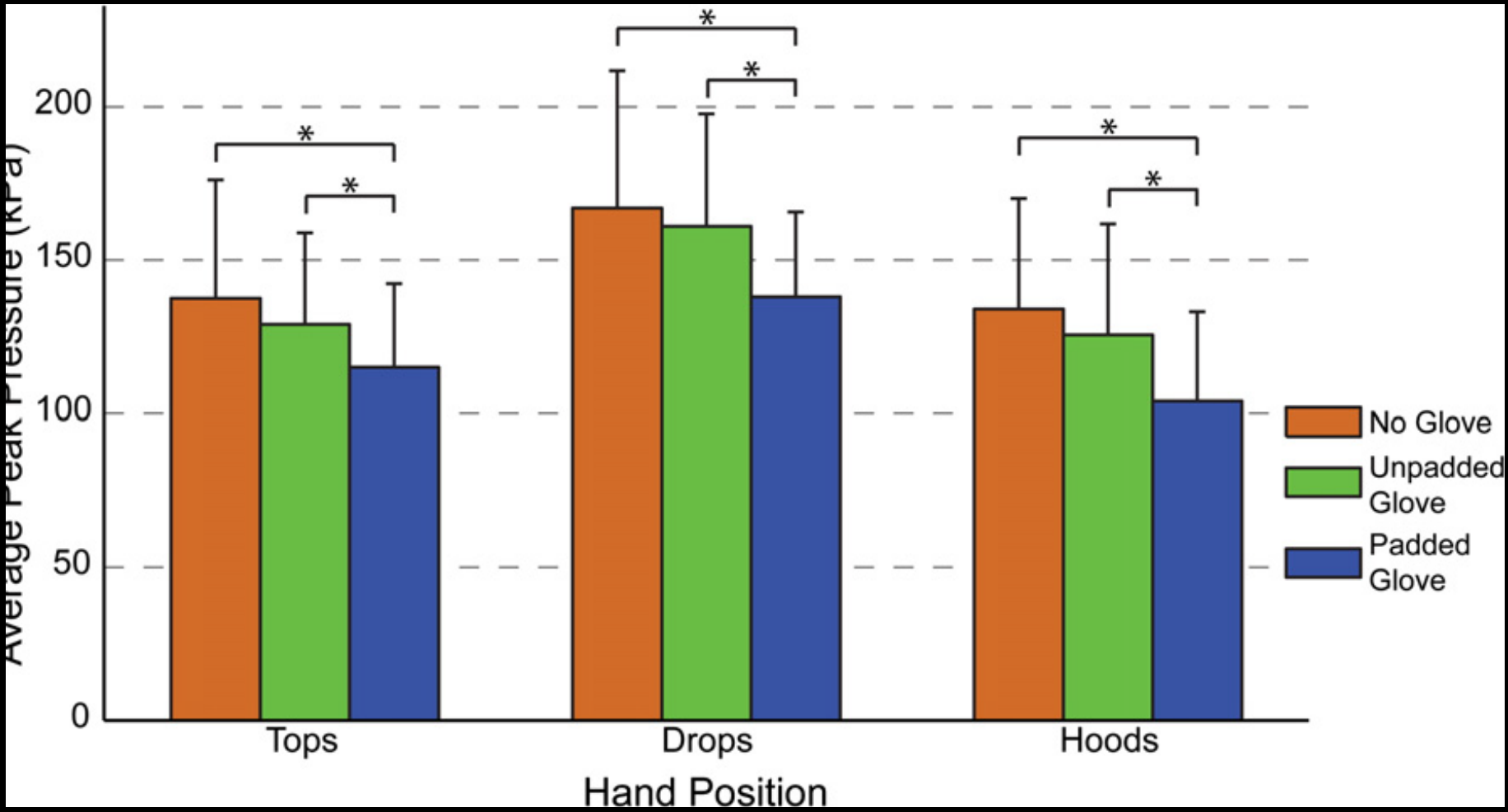
Treatment

- Frequent position changes while riding

pothenar pressure

bar positioning

Slane et al. *Clin Biomech*, (2011);26:642–8.


Average Peak Pressure (kPa)
200
150
100
50
0
*
*
*
*
*
*
Tops
Drops
Hoods
Hand Position
No Glove
Unpadded Glove
Padded Glove

Hand and Wrist

- Most cyclists recover within 2 to 6 months with conservative treatment
- Permanent nerve damage unlikely
- Recurrence possible
- Nerve decompression or transposition for persistent symptoms

Seror P. *Ann Phys Rehabil,* (2015);58:104–10.

Lower Back

Lower Back

- Performance-limiting low back pain common among amateur and elite cyclists (70%)
- Short duration, often <7 days
- Worse with triathlon bike geometry
- Flares with excessive trunk flexion exercises
- Prior back injury or pain are ri
- Excessive lateral flexion and/or spine may also contribute

Van Hoof W, et al. *Man Ther*, (2012);17:312-7.

Lower Back

- Forward bend should be achieved evenly throughout the spine (A)
- Cyclists with low back pain often have flexed lumbar spine, with less anterior pelvic tilt and a more extended thoracic spine (B)

A

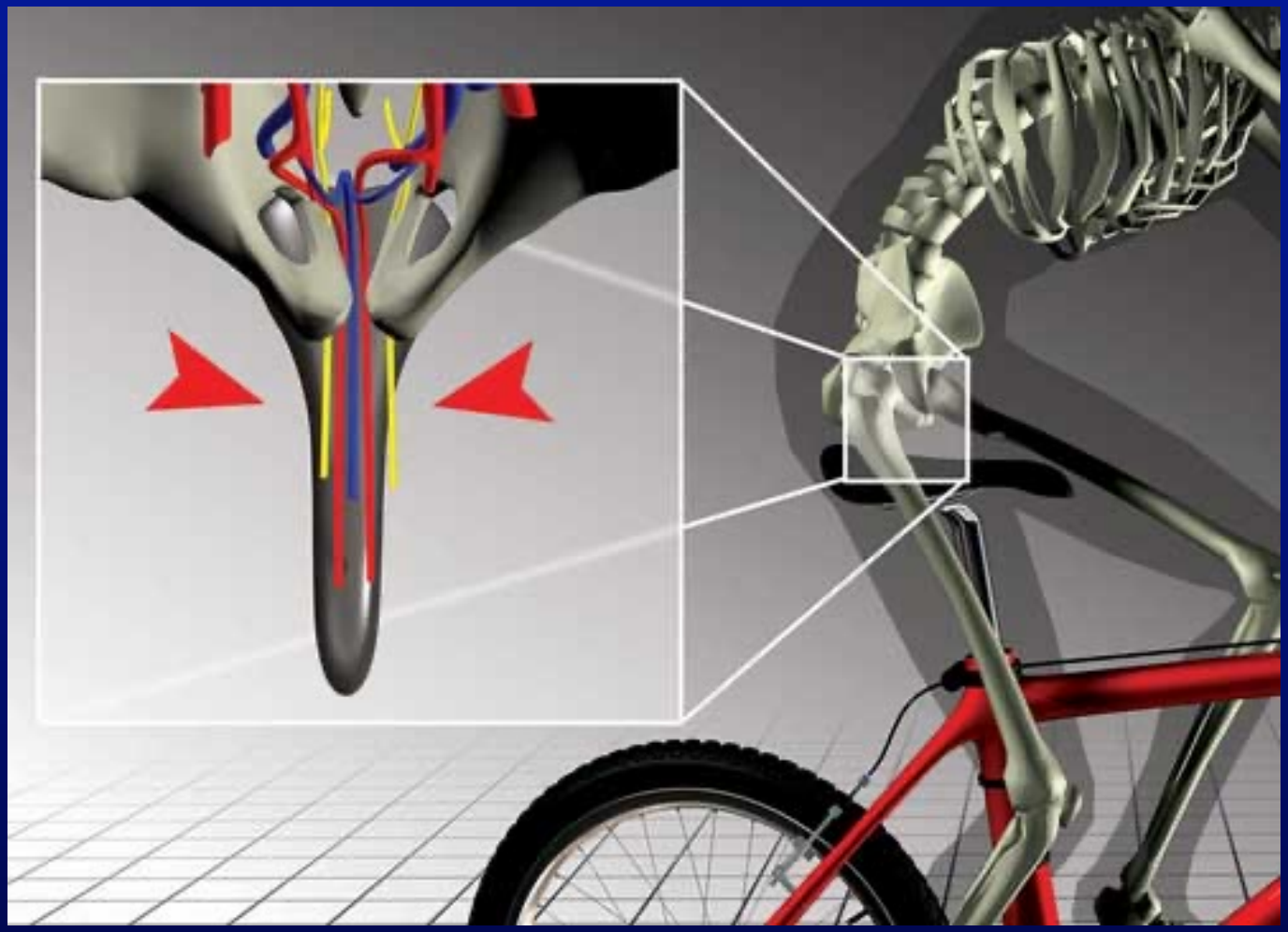
B

Lower Back

Treatment

- Abdominal and core muscle physical therapy
- Relaxed, anterior-tilted pelvic position
- Adjust bicycle fit
  - Lower the saddle
  - Adjust saddle angle
  - Raise handlebars or
  - Adjust handlebar re
  - Modify aerobar posi

Perineum



Perineum

- Common among male and female cyclists
- Paresthesias
- Dysuria
- Sexual dysfunction
- Due to pressure, traction, ischemia, or vibration
- Risk factors
  - Bike fit/saddle
  - Increased time in the saddle
  - Infrequent body position changes
  - Increased body weight

Trofaier et al. *Int Urogynecol J* (2016);27:513-9.

Perineum

- **Erectile Dysfunction**
  - Long distance cycling 13-24%
- **Skin lesions**
  - Chafing, saddle sores, ulcerations, folliculitis, abscesses
- **Pudendal nerve dysfunction**
  - Entrapment and compression between pubic bones and saddle
  - Numbness or pain

Trofaier et al. *Int Urogynecol J* (2016);27:513-9.

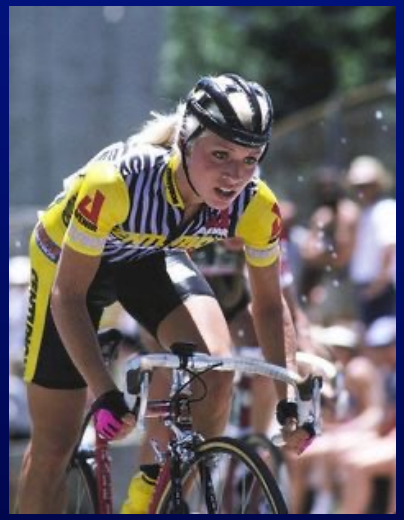
Perineum

- Horizontal back position and pelvis tilting transfers pressure from the ischial tuberosities onto the perineum
- Increased compression of pudendal neurovascular bundle and soft tissues
- Significant decrease (82%) in penile oxygen perfusion occurs during seated bicycling

Perineum

Treatment

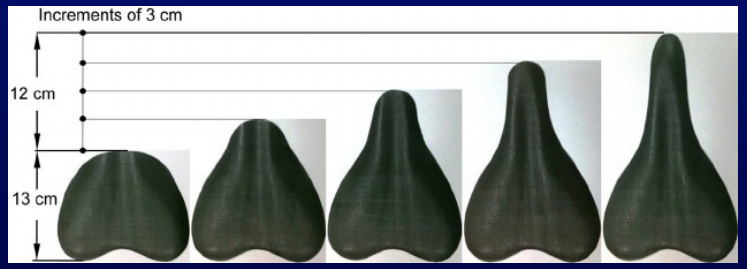
- Decrease regional pressure
  - Increase time away from bike
  - Use position changes during riding
  - Provide chamois care (dry/clean)
  - Try recumbent bike
  - Pursue physical therapy correcting strength imbalances
  - Offer pelvic floor manual therapy
  - Consider pudendal nerve block or radiofrequency ablation



Perineum

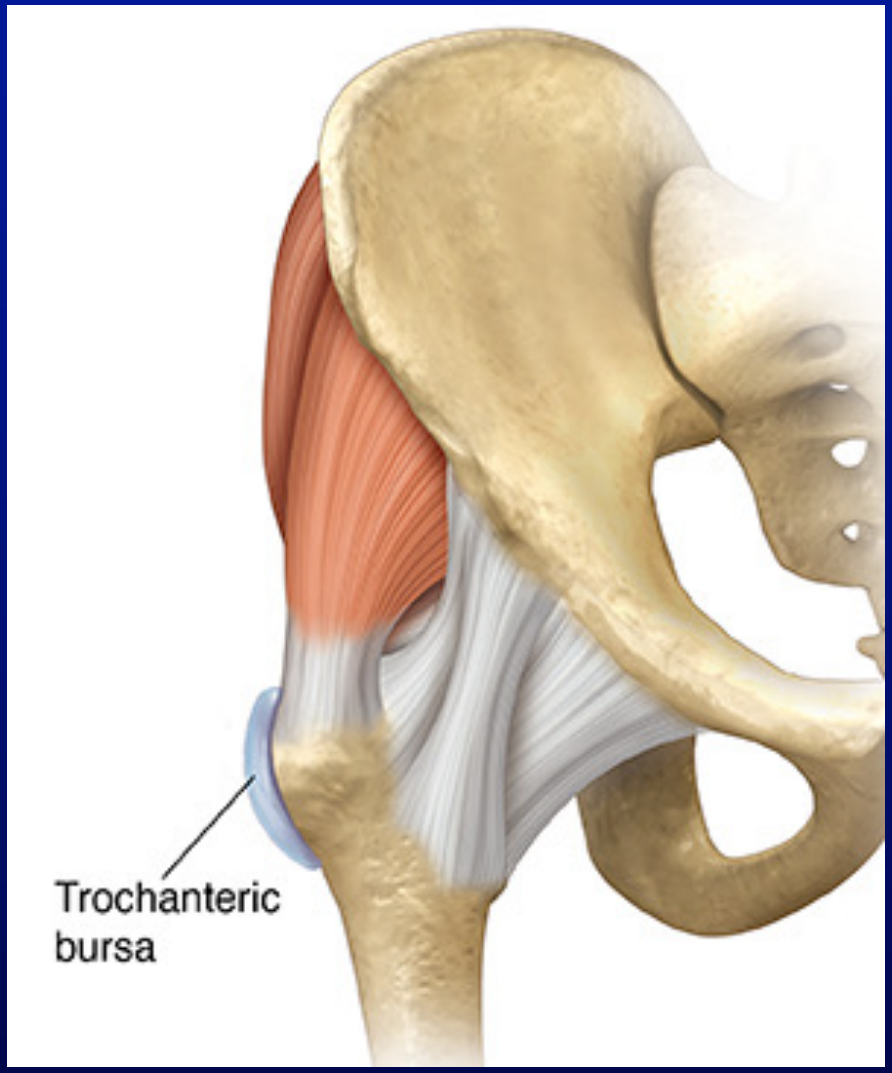
Treatment

- **Bike fit/Saddle modifications**
  - **Raise handlebar position above saddle height**
  - **Adjust saddle tilt**
  - **Decrease padding (40 % vs 19 % have pain)**
  - **Wider saddle has protective effect on the peak perineum and mean total saddle pressures**
  - **Avoid cut-out seats**



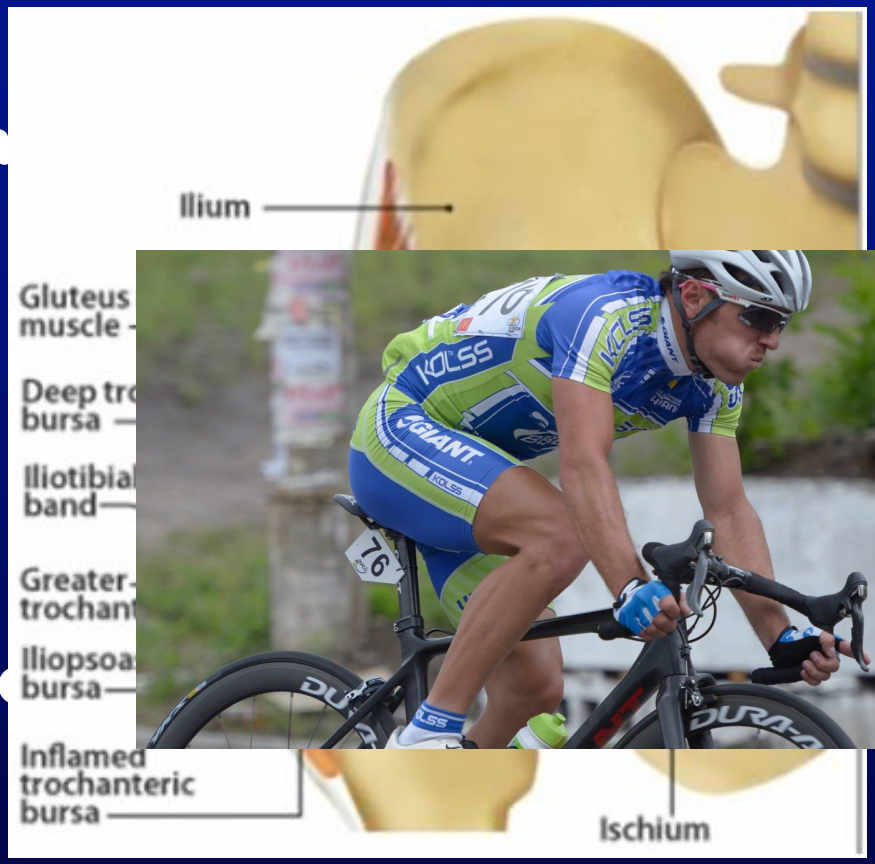
Guess et al. *J Sex Med*, (2011);8(11):3144–53.

Trochanter Pain Syndrome



Trochanter Pain Syndrome

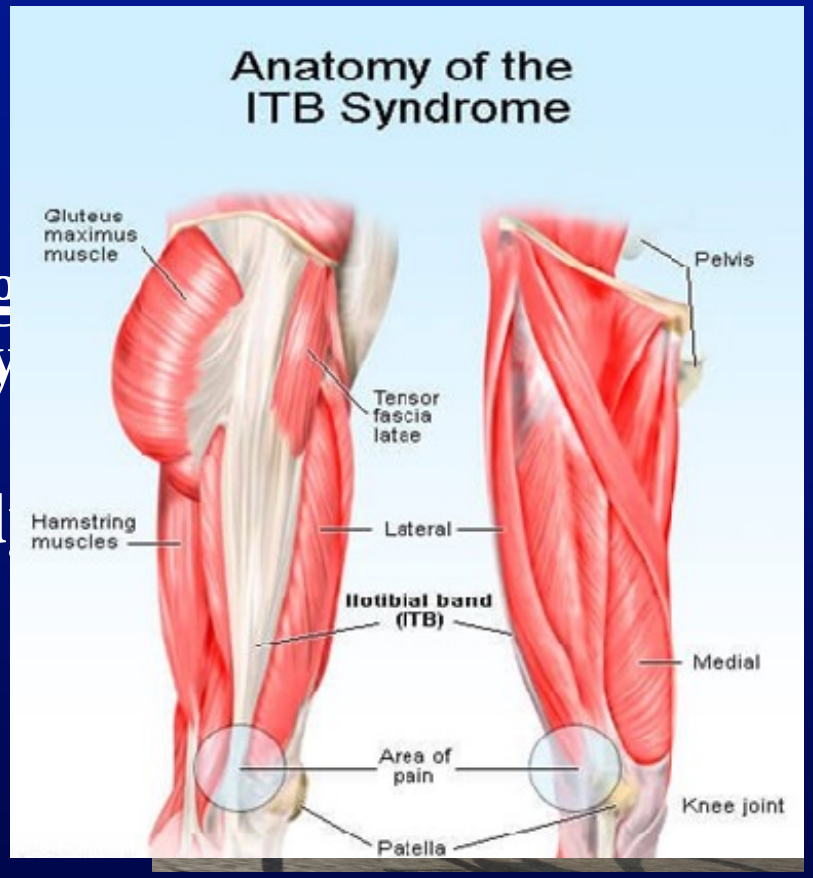
- Gluteus medius tendinopathy
- Bursitis may be present
- Excessive mileage
- Rocking hips while peda
- Treatment
  - Adjust bike fit
  - Physical therapy
  - Manipulation
  - Corticosteroid injecti



Knee

Knee - Lateral

- ITB lies anterior to the lateral femoral epicondyle in knee extension
- ITB pulled anteriorly on downstroke, posteriorly on upstroke
- Repetitive friction of ITB ag
  the lateral femoral epicondy
  degrees knee flexion
- Tender over lateral epicond
- Lateral knee pain/burning
- Snapping sensation
- Positive Ober's test



Knee - Lateral

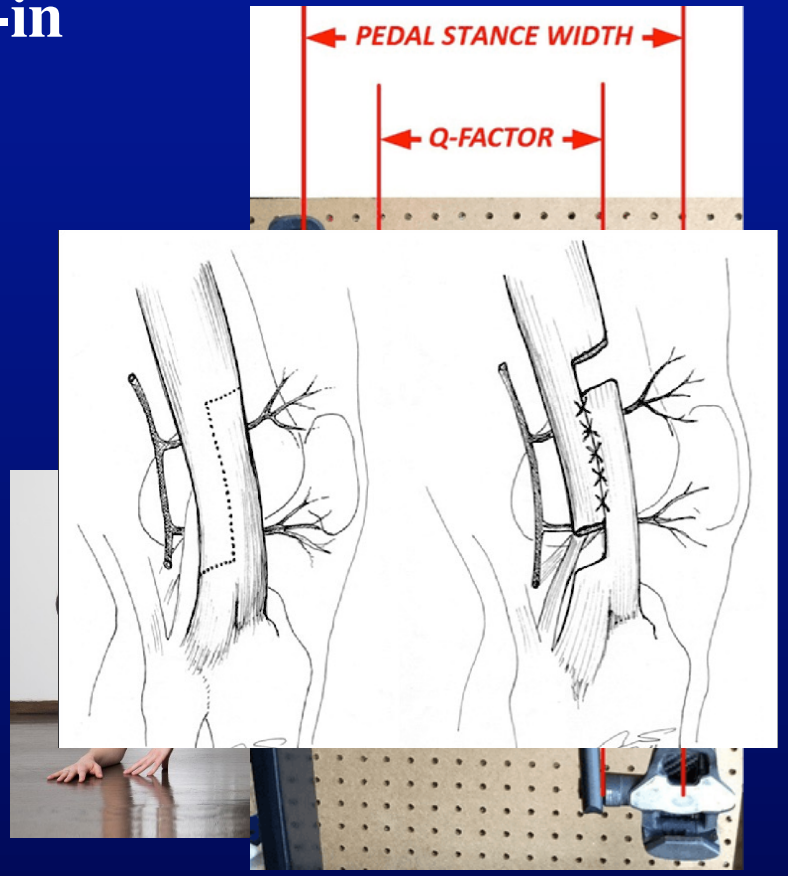
Etiology

- Intensity and mileage increases
- Big gears
- Hills
- Windy conditions
- Time trial racing
- Poor bike fit
- Toes pointing inward
- Worn cleats
- Excessive pedal float

Knee - Lateral

Treatment

- Adjust pedals/cleats to reduce toe-in
  - Shims
  - Increase pedal stance width
- Adjust bike fit
  - Lower saddle
  - Move saddle anterior
- Physical therapy
- Stretching
- Foam rolling
- Corticosteroid injection
- Surgery
  - Removal of elliptical piece
  - Lengthening ITB



Claes et al. *Acta Orthop Belg*, (2015);81:614-9.

Knee - Anterior

- Anterior knee pain common
- Parapatellar, retropatellar or regional tendonitis
- Usually training or bike fit errors
- Fewer classical symptoms
  - "Movie sign"
  - Worse with stairs
  - Kneeling, squatting
- Diagnosis of exclusion

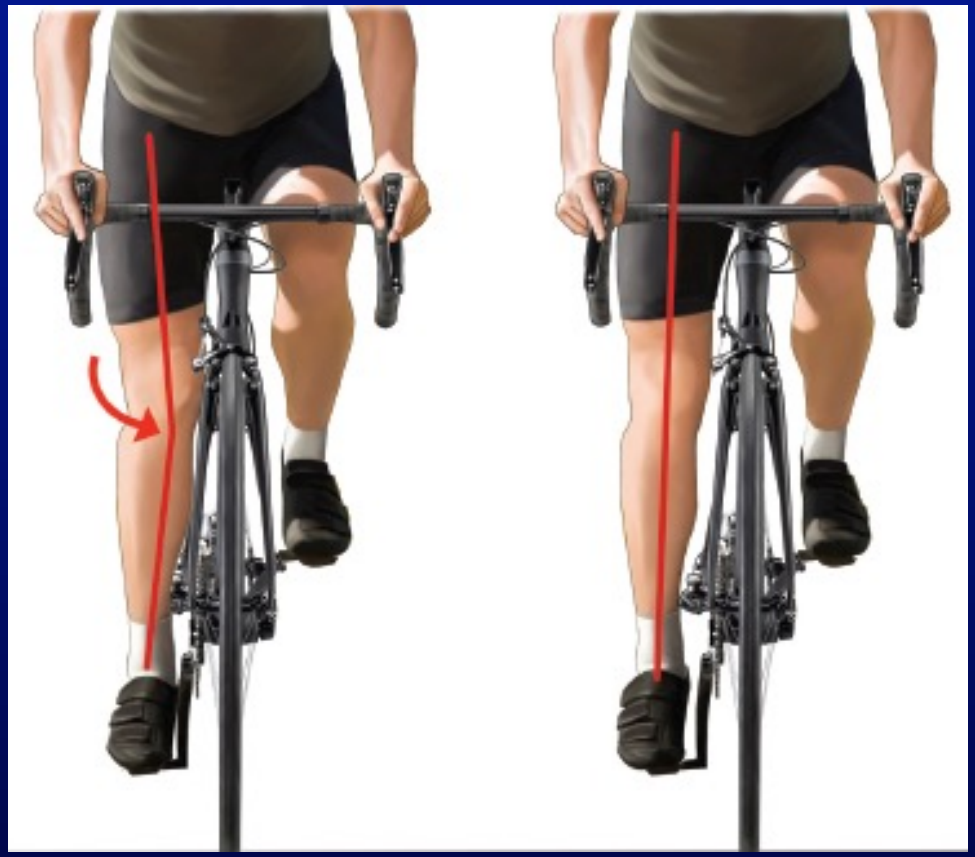
Knee - Anterior

Etiology

- Pushing big gears (large ratio)
- Hill training
- Windy conditions
- Rapid increase in mileage or intensity
- Saddle too low or forward
- Cranks too long

Knee - Anterior

Excessive valgus motion of the knee in the frontal plane is another risk factor



Knee - Anterior

Treatment

- Rest, ice, compression
- ? Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Physical/manual therapy, massage
- Eccentric strength training/VMO rebalancing
- Bike fit adjustments
- Raise saddle height and shorten pedal cranks to decrease compression at top of pedal stroke
- Correct pronation with orthotics/canting of cleats
- Try higher cadence (100-110 rpm)

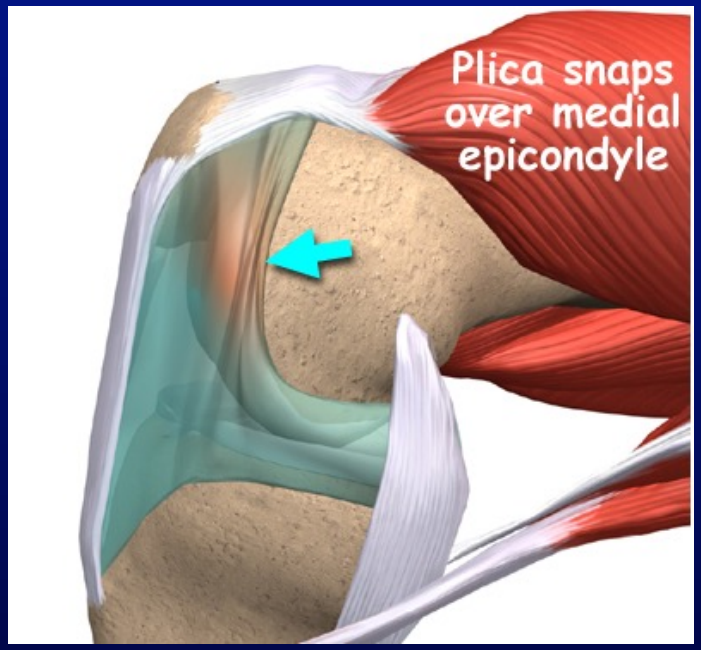
Knee - Medial

- Less common than anterior
- Usually training errors
- Poor bike fit
- Excessive or no pedal float
- Most common etiologies:
  - MCL bursitis
  - Pes anserine bursitis
  - Medial meniscus tear
  - Medial plica syndrome

Knee - Medial

Medial plica syndrome

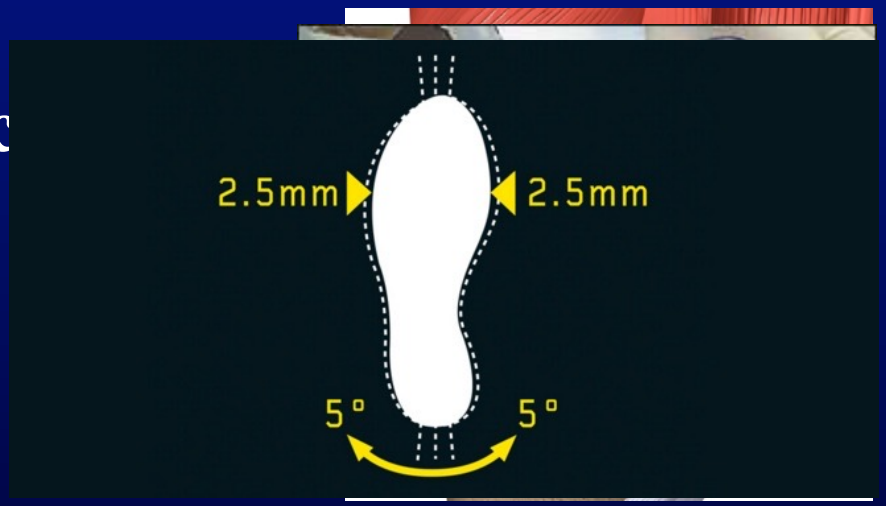
- Thickened plica rubs over the medial epicondyle during knee flexion and extension while pedaling
- Snapping or clicking over antero-medial femoral epicondyle



Knee - Medial

Treatment

- Modification of training
- Modify bike fit
- Pedal adjustment
- Physical/manual therapy
- Local injections
- Surgery for recalcitrant c



Foot/Ankle

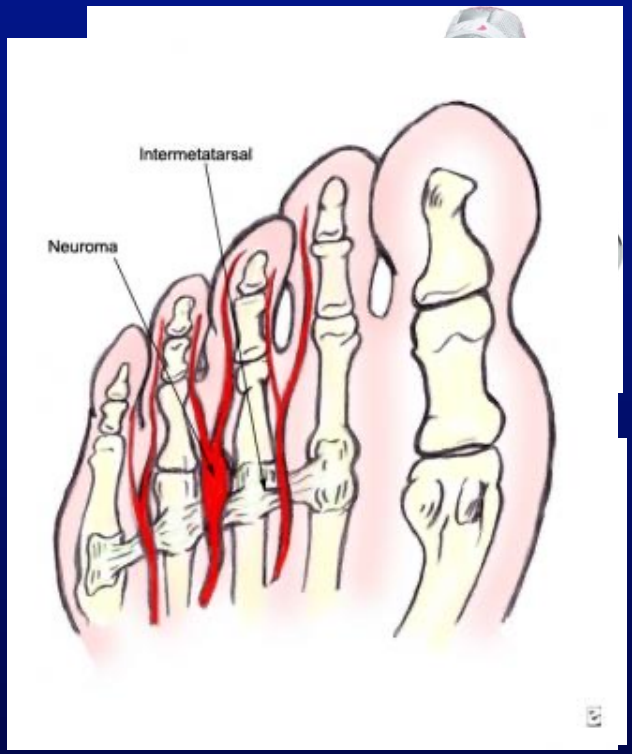
Foot/Ankle

Metatarsalgia and interdigital neuralgia

- Pain and sensory changes
- Worse with longer rides, toe clips or tight shoes

Treatment

- Change shoes or wider toe box
- Orthotics or metatarsal pads
- Adjust cleat placement
- Increase pedal cadence
- Physical therapy
- Cortisone, prolotherapy, PRP
- Neurectomy if needed



Foot/Ankle

Achilles tendonitis

- Cycling shoe sole too soft
- Flat/flexible arch (pes planus)
- Improper cleat position (foot posterior to pedal)
- Excessive ankle motion during the pedal stroke
- Saddle too low increases dorsiflexion
- Saddle too high increases plantarflexion

Treatment

- Move cleats posterior
- Decrease out of saddle ridi
- Cycling orthotics
- Calf stretching
- Eccentric exercises