

Prime for Life: Joints

(Knees to Last a Lifetime)

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The Key to Longevity?

MOVEMENT!

**Greatest Impediment to
Movement with age?**

JOINT PAIN

Osteoarthritis (OA)

- 37.4% of individuals > age 60 with knee OA
- 2030 - 25% of Americans
- Leading cause of immobility/disability > 60
- Symptoms: pain, stiffness, noisy and local swelling
- “Degenerative Joint Disease” or “wear and tear arthritis”
- CDC: “Incurable, progressive and degenerative”???

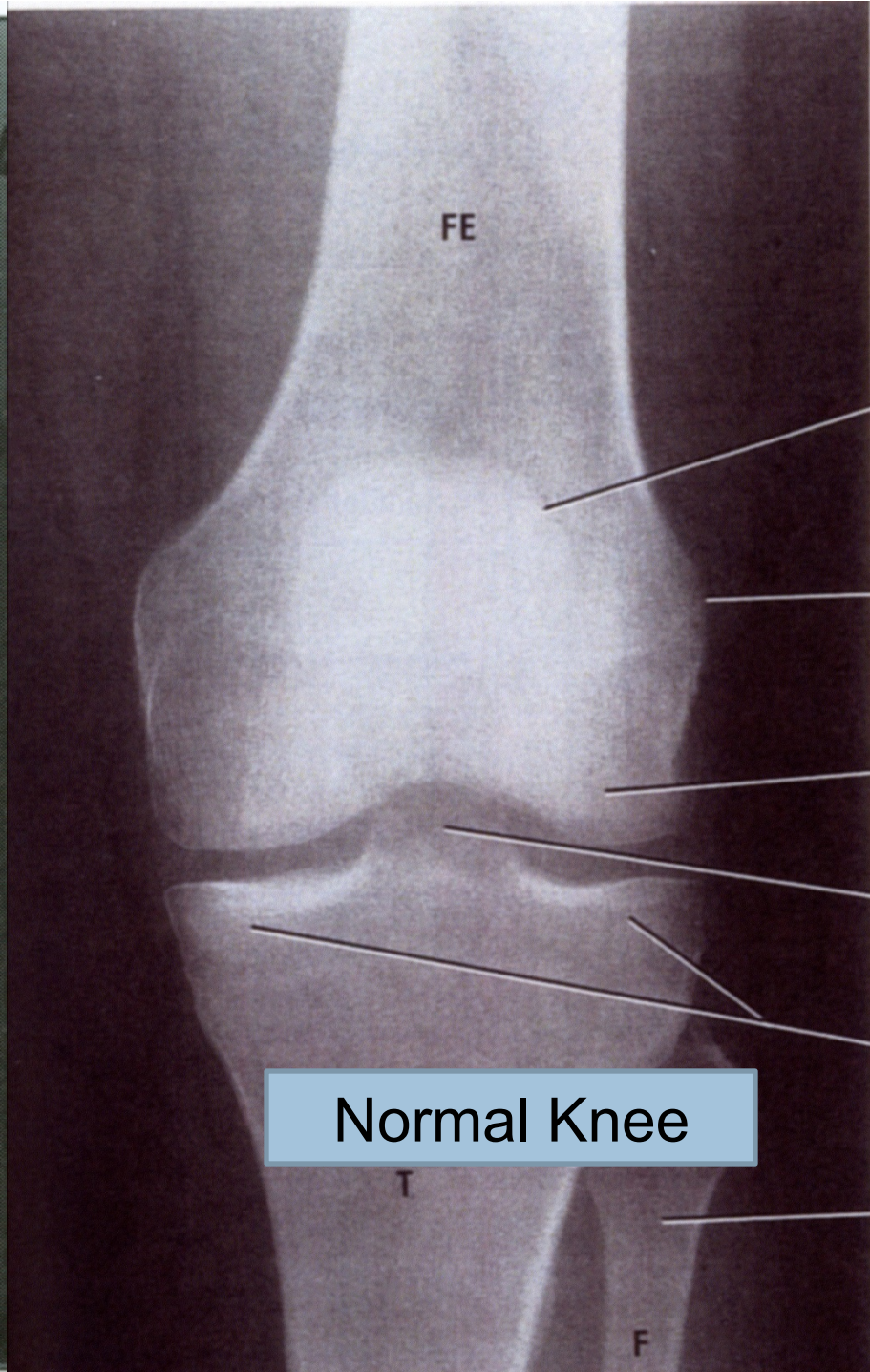
OH NO! We're doomed!

OA

- Excessive stress to entire joint
 - Articular (hyaline) cartilage
 - Synovial lining around entire joint
 - Bone beneath the cartilage
 - Ligaments
- Diagnosed by X-Rays
 - Joint space narrowing
 - Sclerosis (increased bone density)
 - Spurs, lipping around joint



Arthritic Knee



Normal Knee

- Poor correlation between
 - X-Rays & pain
 - X-Rays & activity
- Fear/anxiety and ↓ activity
- Slow or no progression if mechanics improved?
- Untreated OA lesions fared no worse
- Surgically treated OA knee lesions did no better

Is there HOPE?

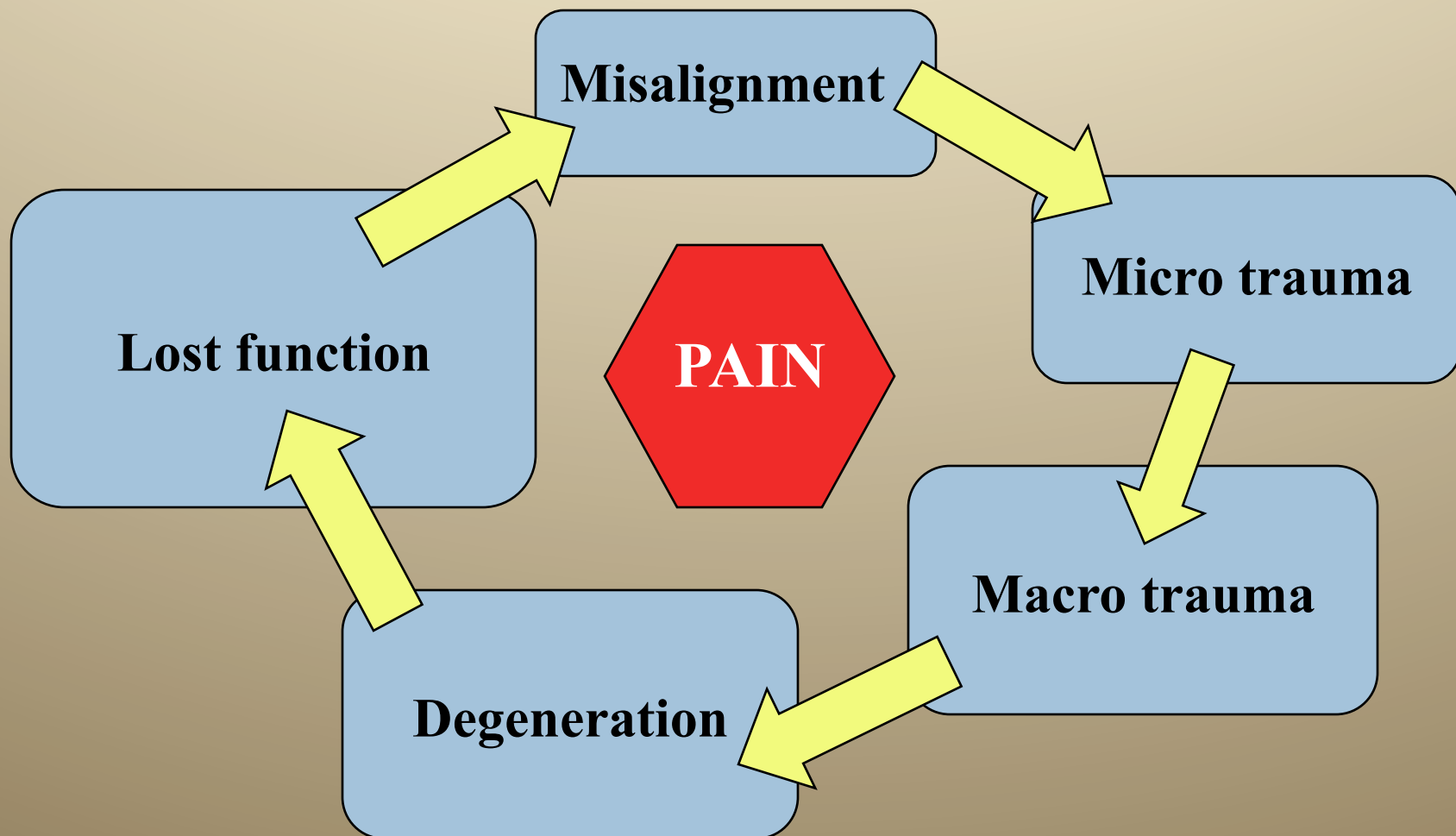
OA Risk Factors

- Excess weight
 - Heaviest 20% with 7-10 X risk!
- Trauma
 - Ligament injuries
 - Meniscal tears
- History of surgery to fix
 - Ligament injuries
 - Meniscal tears

Risks

- NO movement
- Repetitive, excessive twisting
- Rapid impact
- Excessive Joint flexibility
- Misalignments/movement impairments

Digression to Degeneration



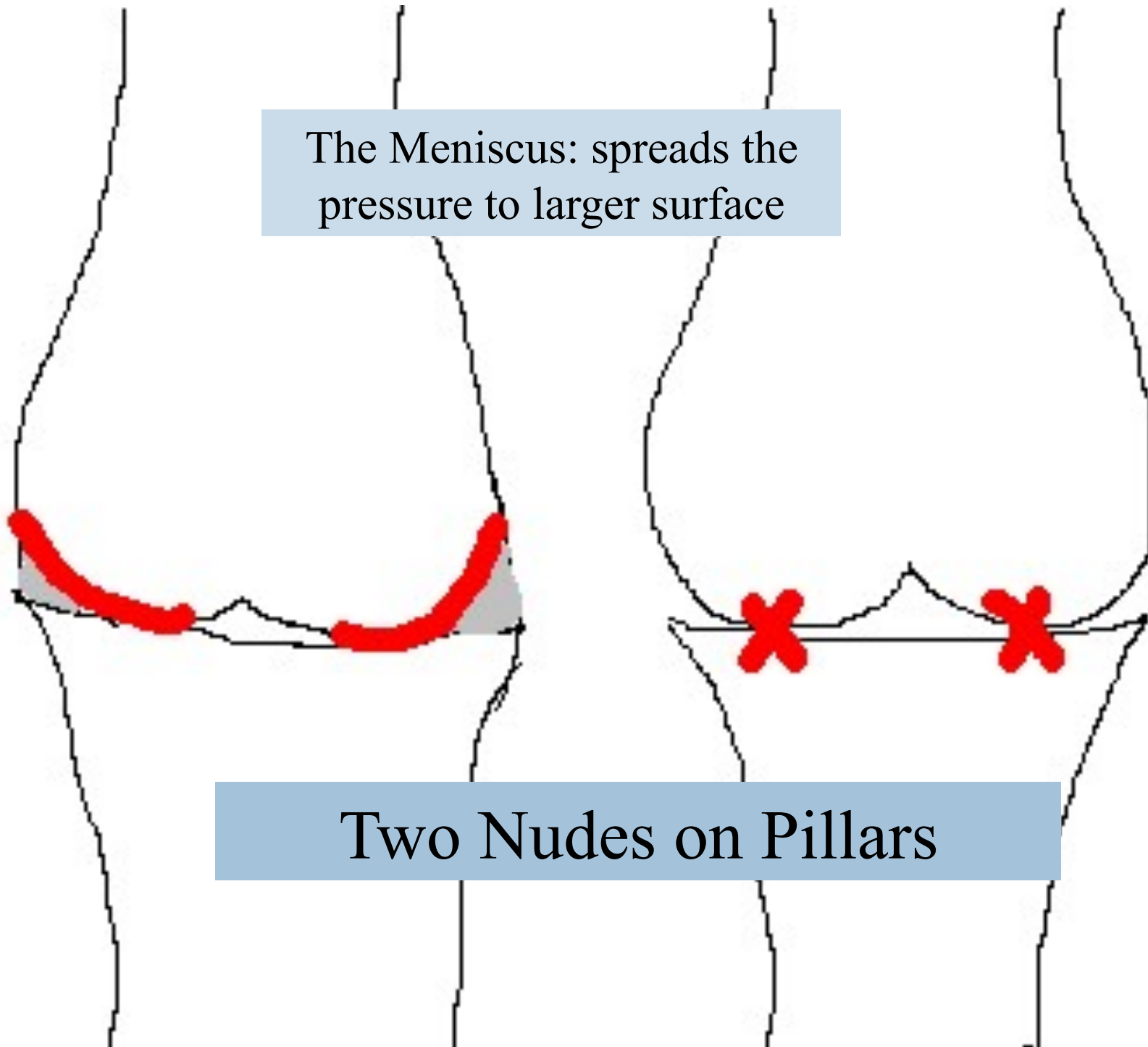
Hyaline Cartilage

- Pearly, slippery joint surface
- More slippery than ice on ice
- Resists compression
 - Like a wet sponge
- NO blood or nerves
- Requires loading and unloading to squish nutrients & waste products in and out

Meniscus = Fibrocartilage

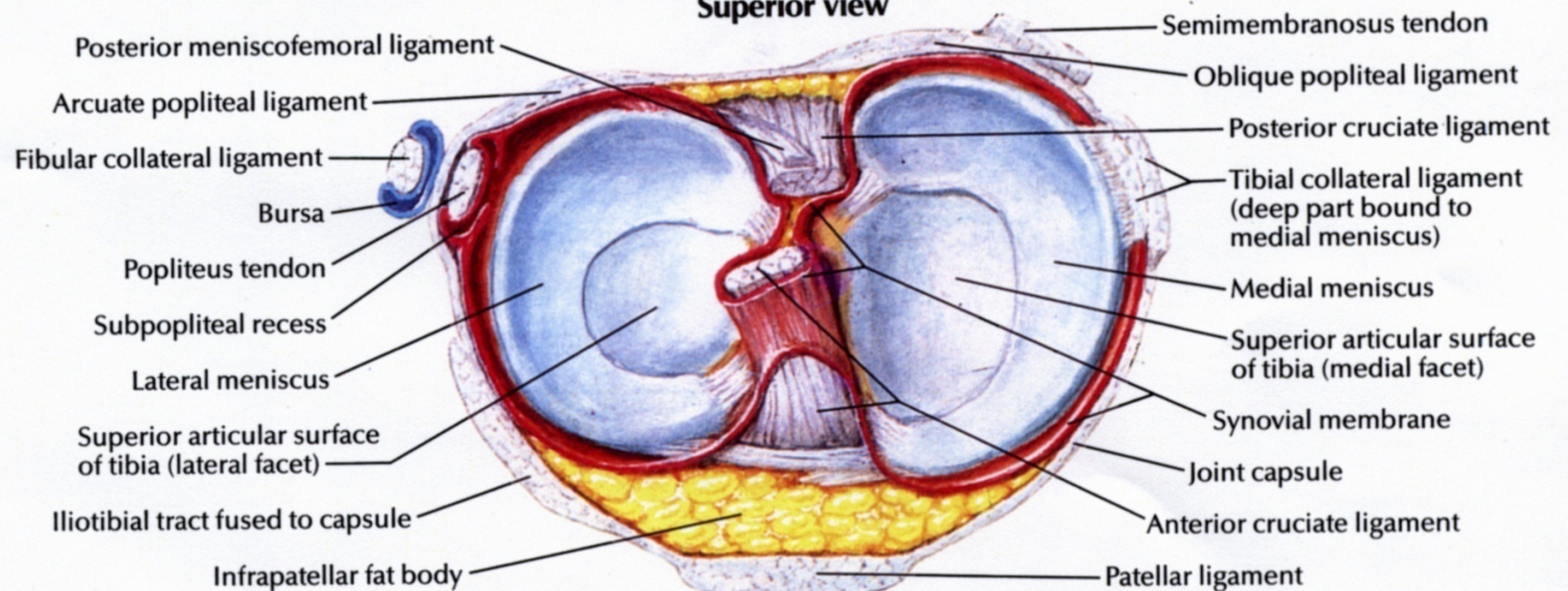
- Similar to outer ear
- Resists tension
- Protects articular cartilage
- Poor blood flow
 - Poor healing
- Tears > common with age
- Poor relationship to pain

The Meniscus: spreads the pressure to larger surface



Two Nudes on Pillars

Superior view



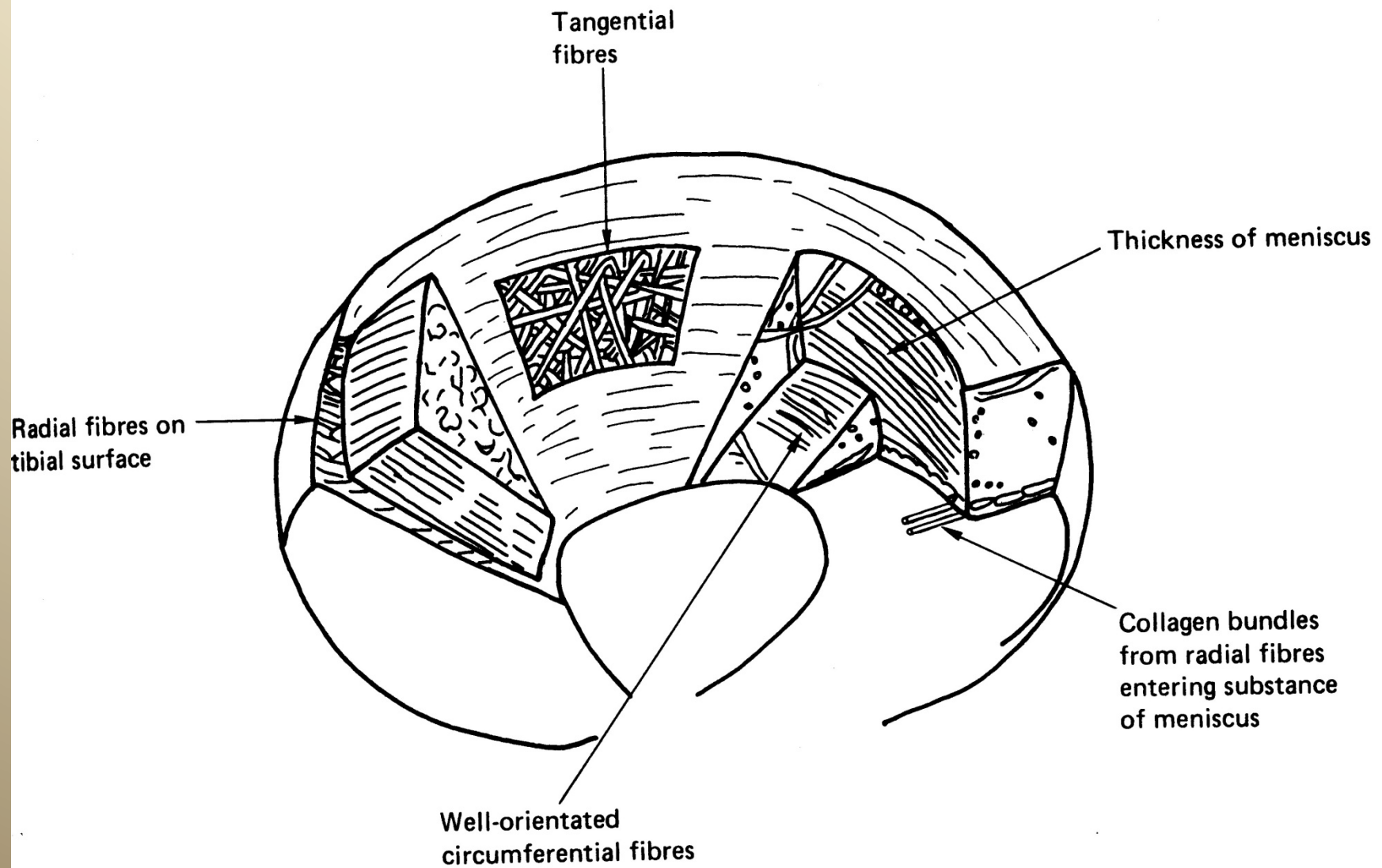
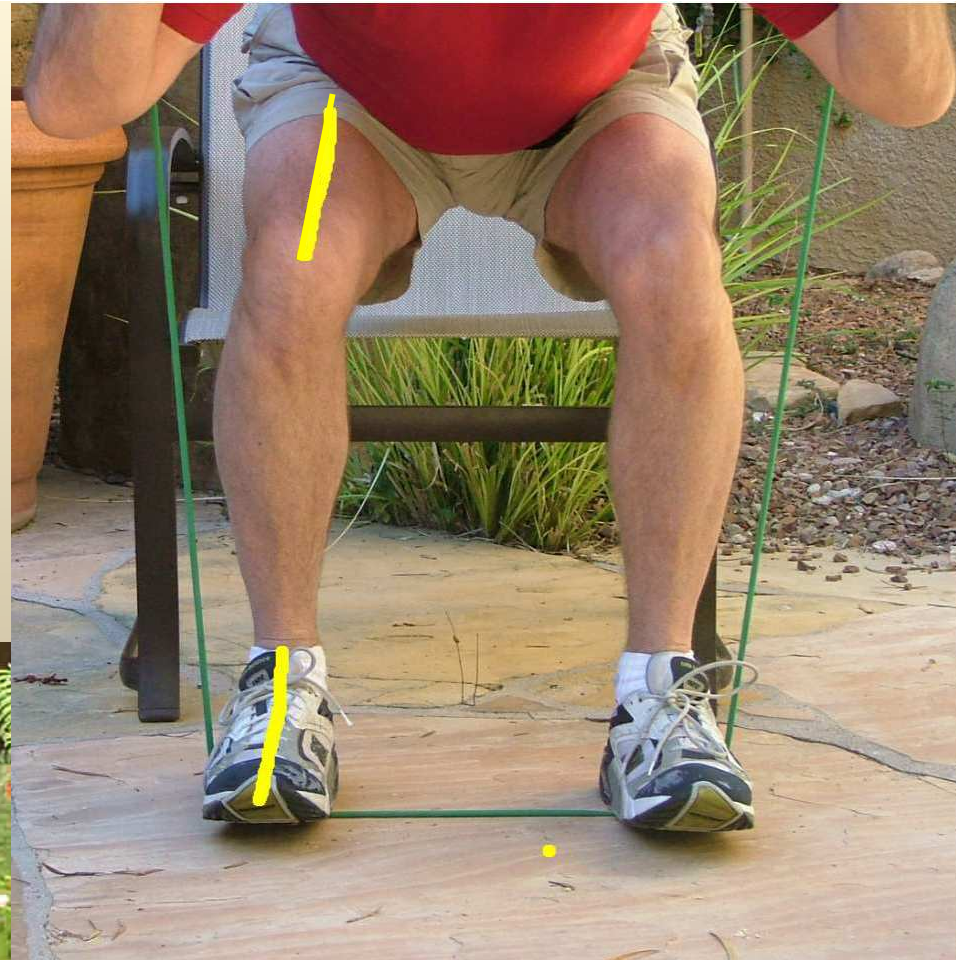


Fig. 5.87 The arrangement of the collagen bundles within the meniscus.



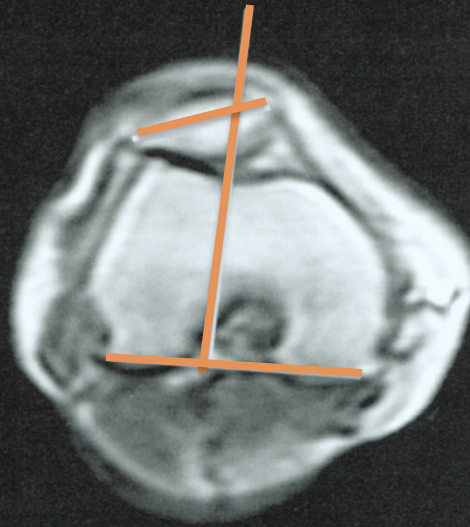
Keep knees behind toes!



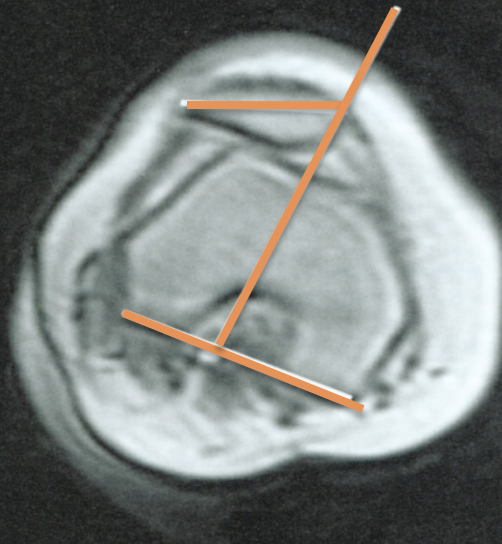
Keep thighs in line
with shoelaces
in sitting & standing
up & down steps

Leg extension

A



B



Partial squat

Prevention and fixes

- Prevent excessive twisting
 - Standing/sitting/stairs...
- Stretch muscles NOT joints
- Optimal exercise
- Healthy weight
- Strength
 - Thighs, hips, buttocks
- Shoes? Orthotics?
- And....

Avoid PAIN!