

# Cedera Olah Raga



Oleh:

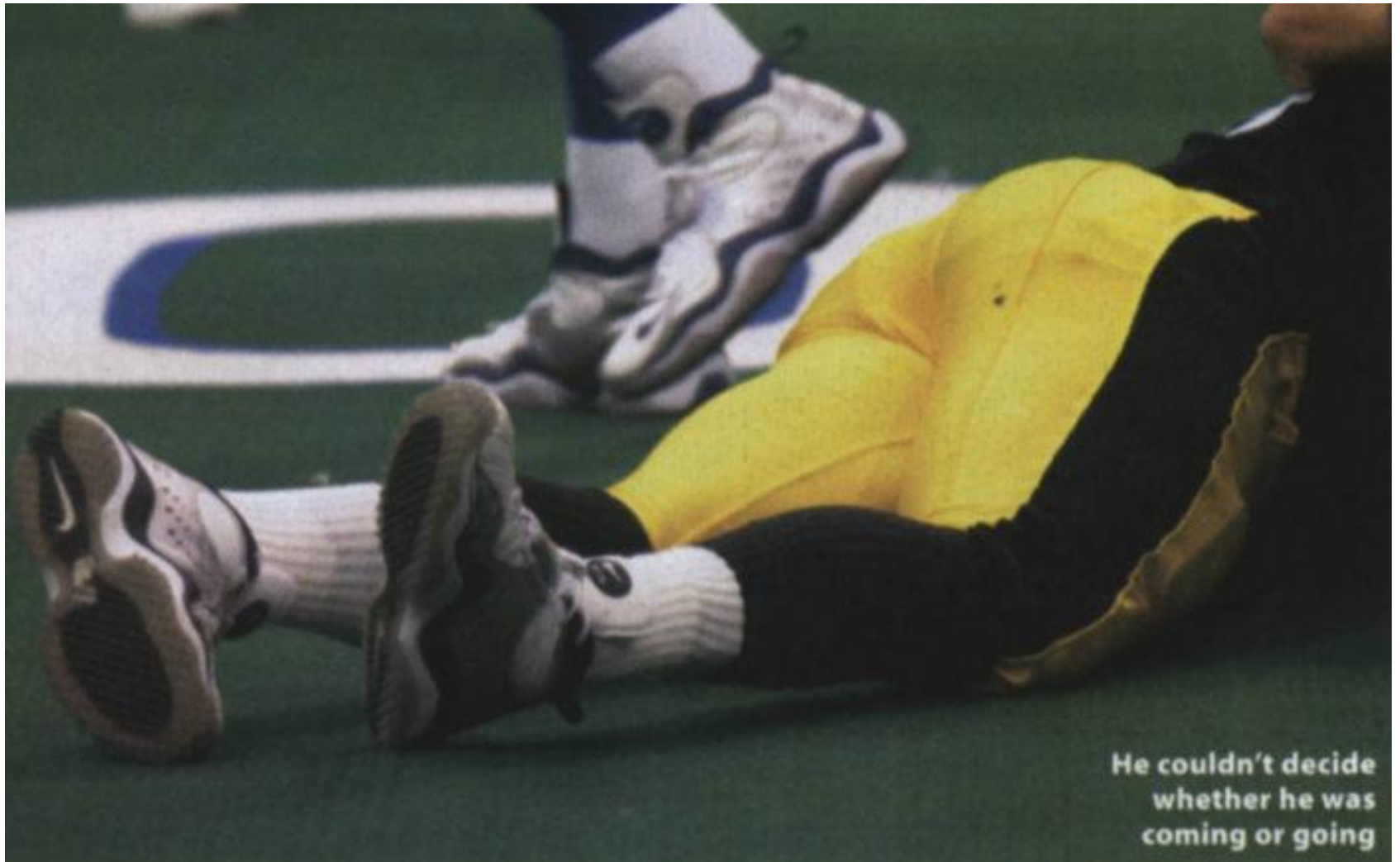
**Aditya Wahyudi, dr.**

**Fakultas Pendidikan Olahraga dan Kesehatan  
Universitas Pendidikan Indonesia**

# What do you think?



# What do you think?



He couldn't decide  
whether he was  
coming or going

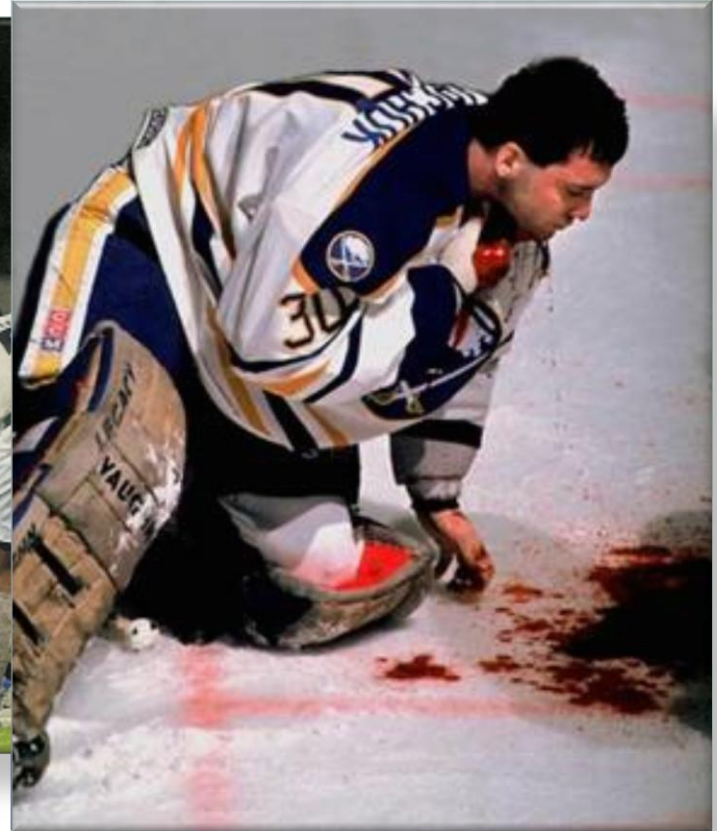
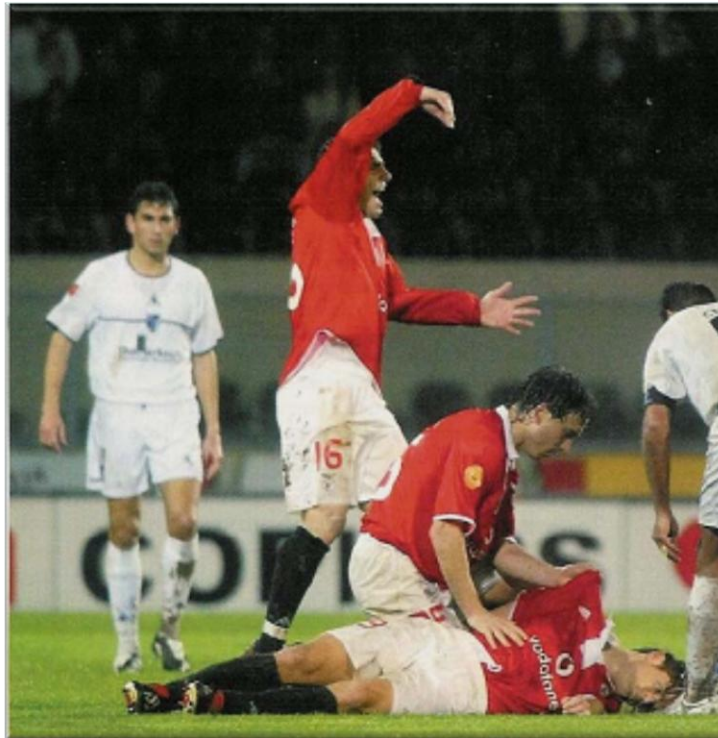
# What do you think?



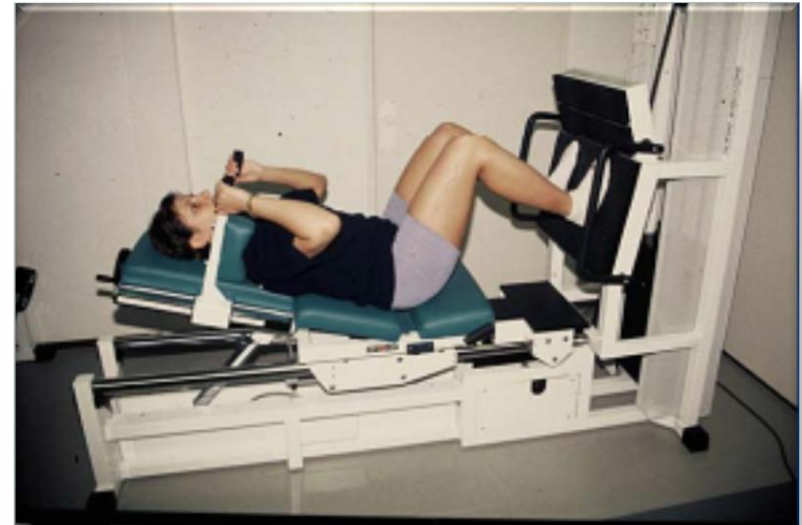
# What do you think?



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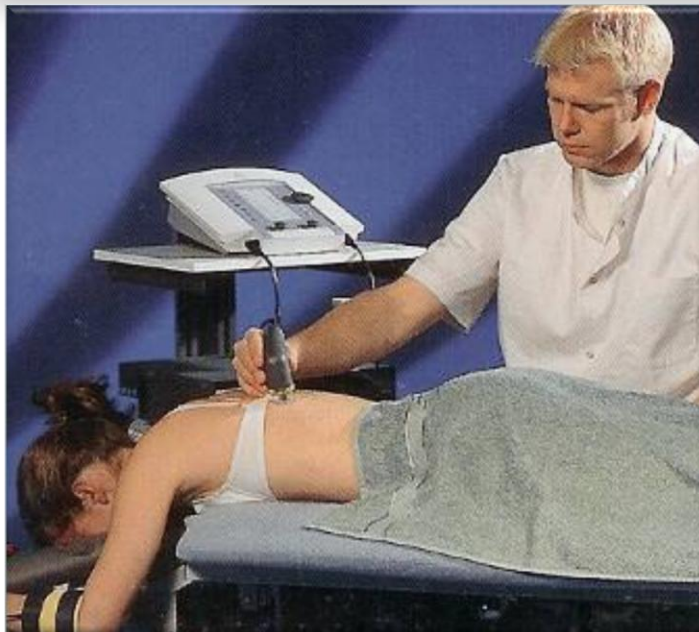
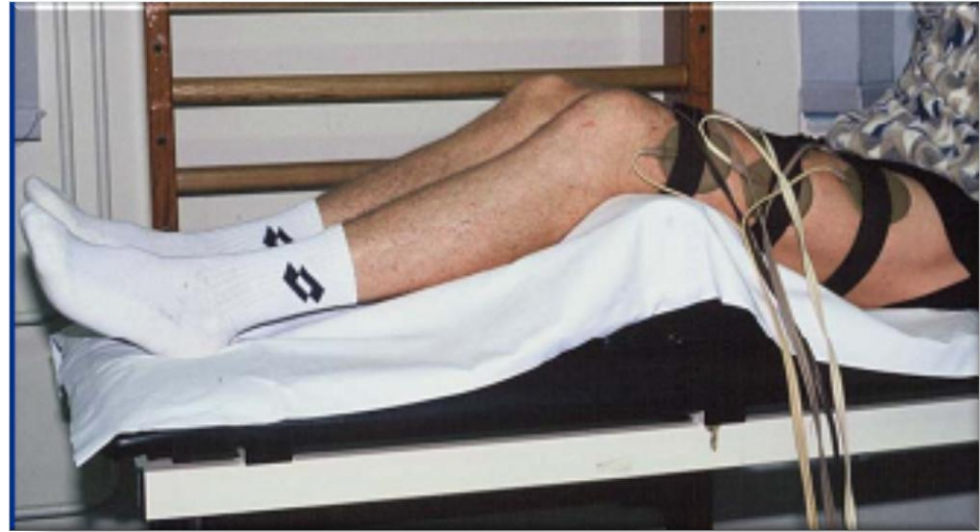
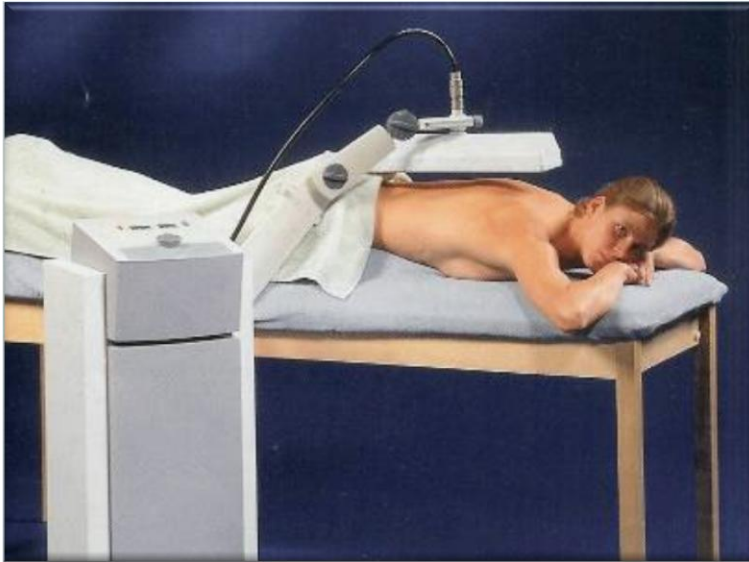


# What do you think?





# What do you think?



# What do you think?

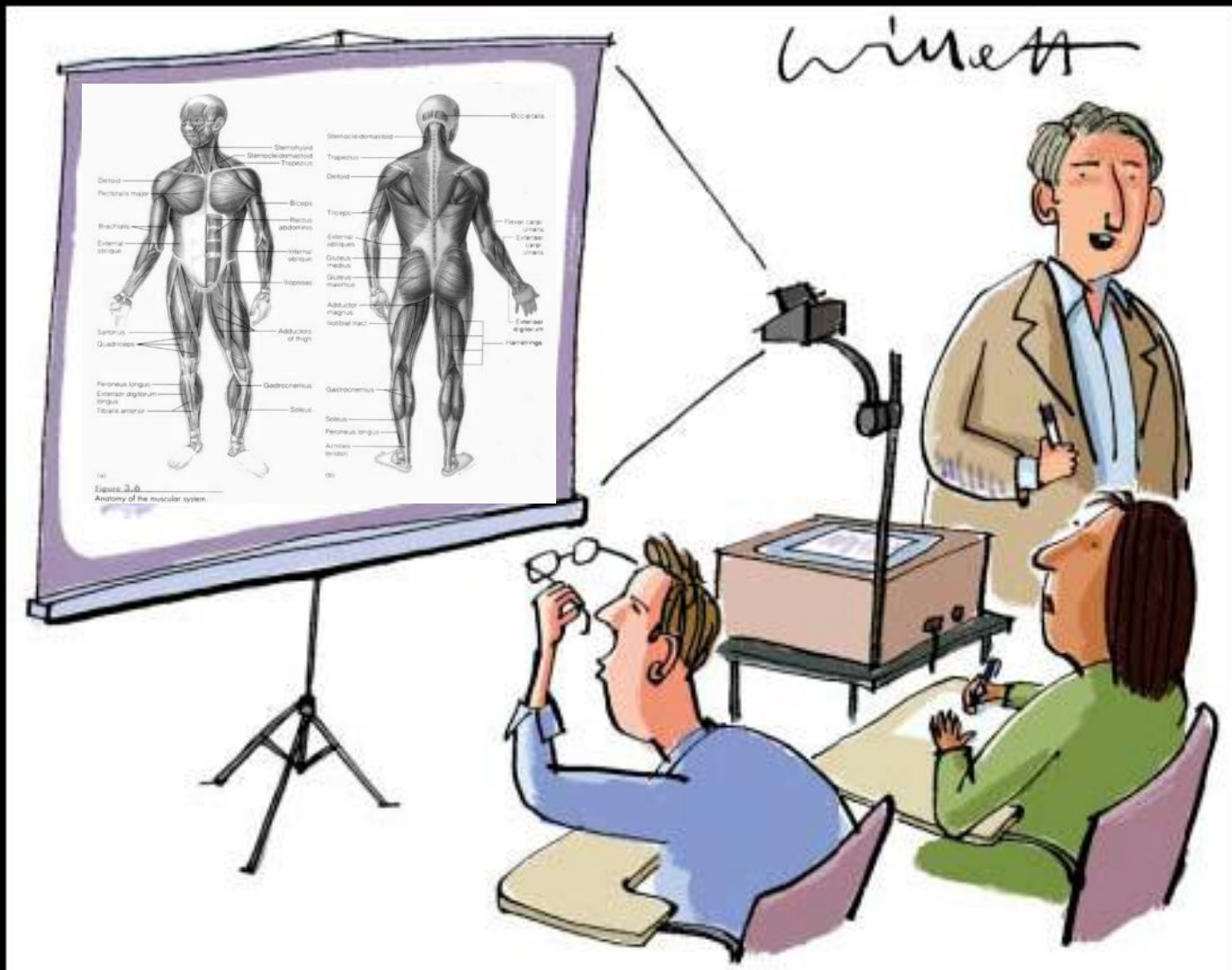
記者席  
cameraman



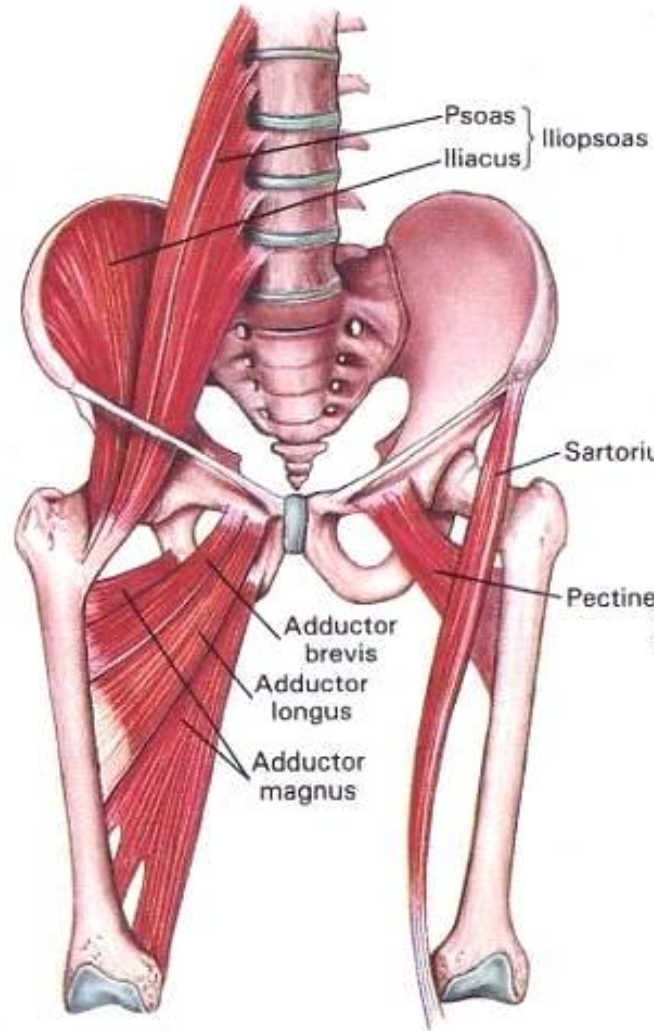
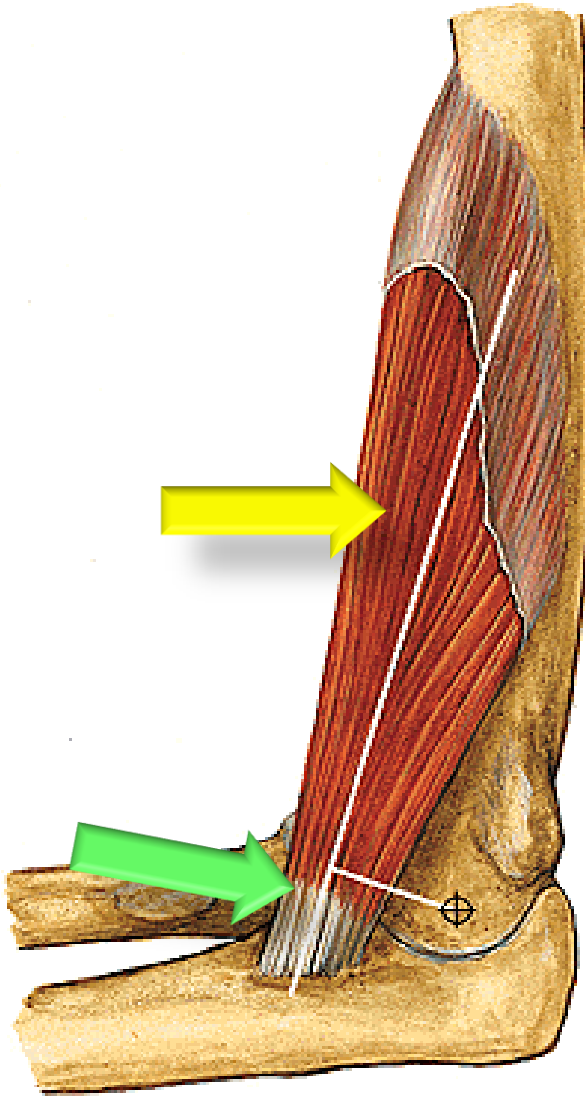
# What do you think?



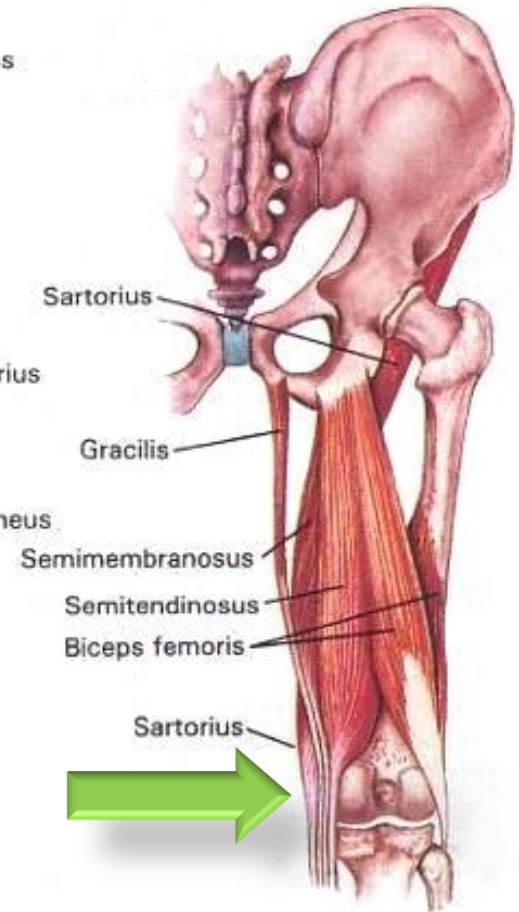
# Review kuliah Anatomi dulu....



# Otot & Tendo

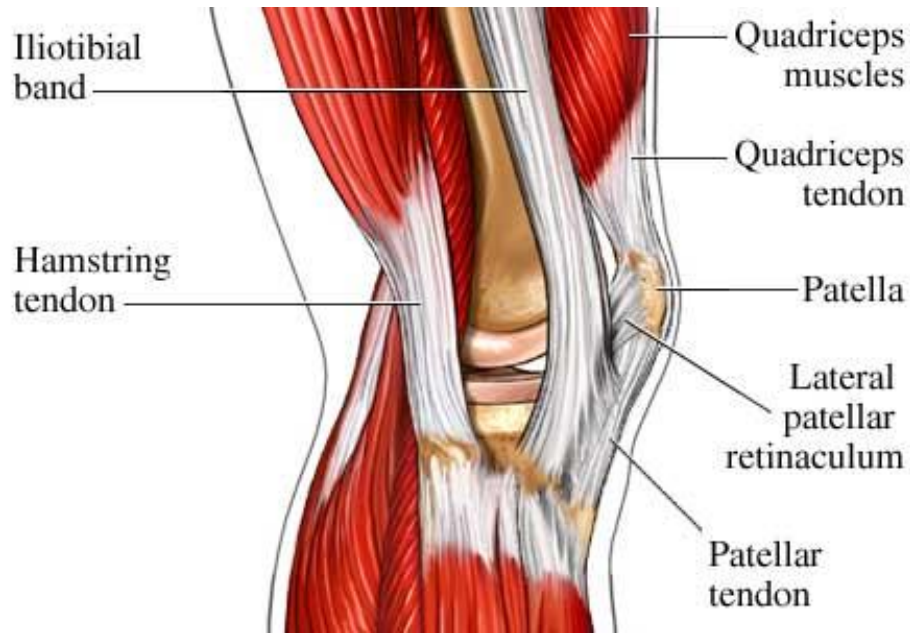


(a) The iliopsoas muscle and the adductor group.

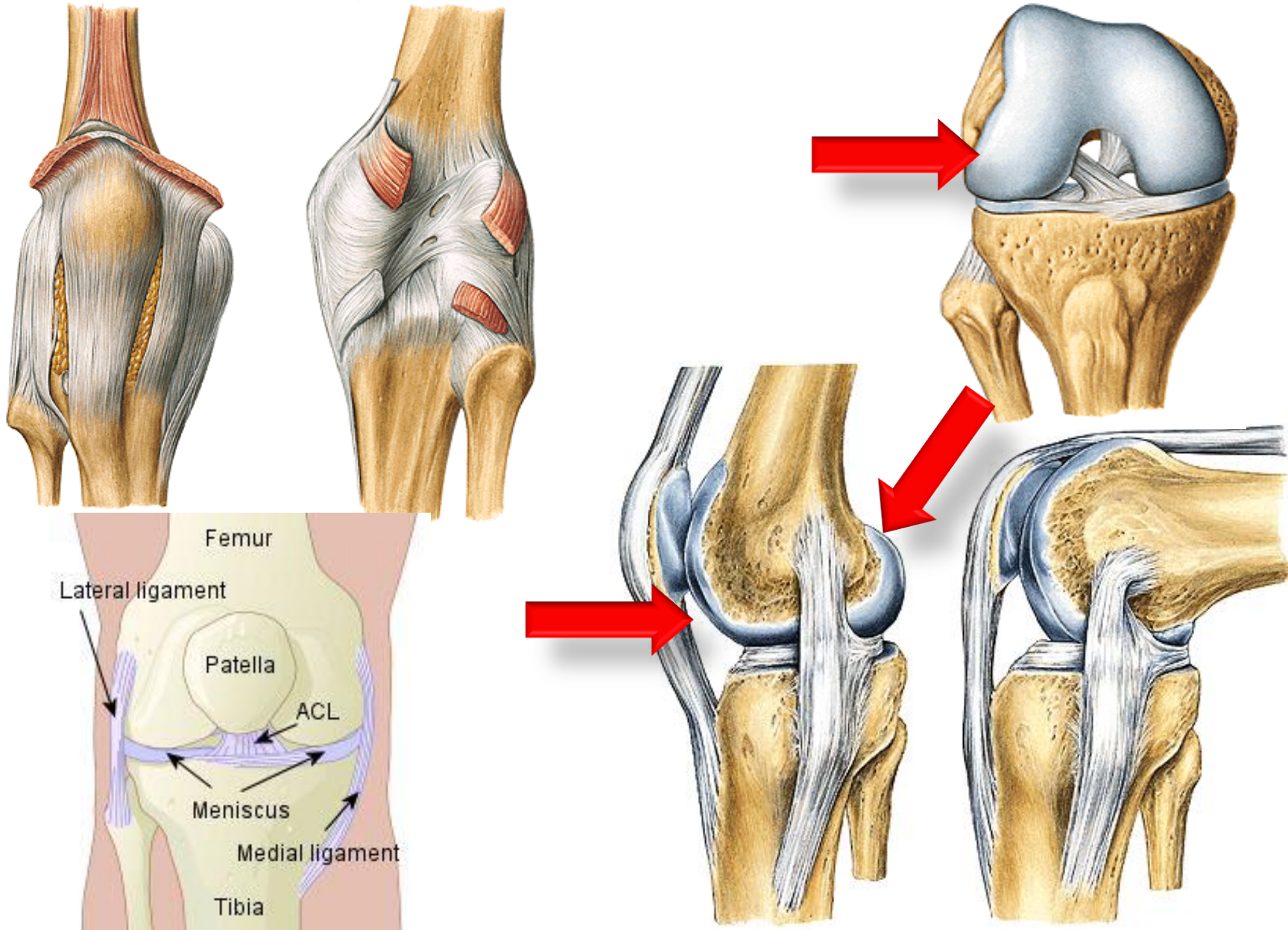


(b) The hamstrings.

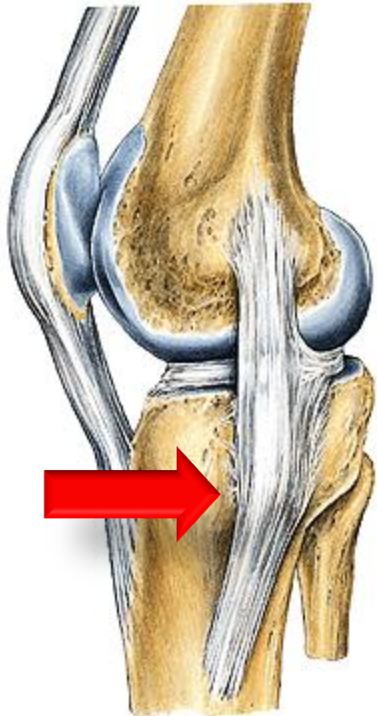
# Sendi & Tulang Rawan Sendi



# Sendi & Tulang Rawan Sendi

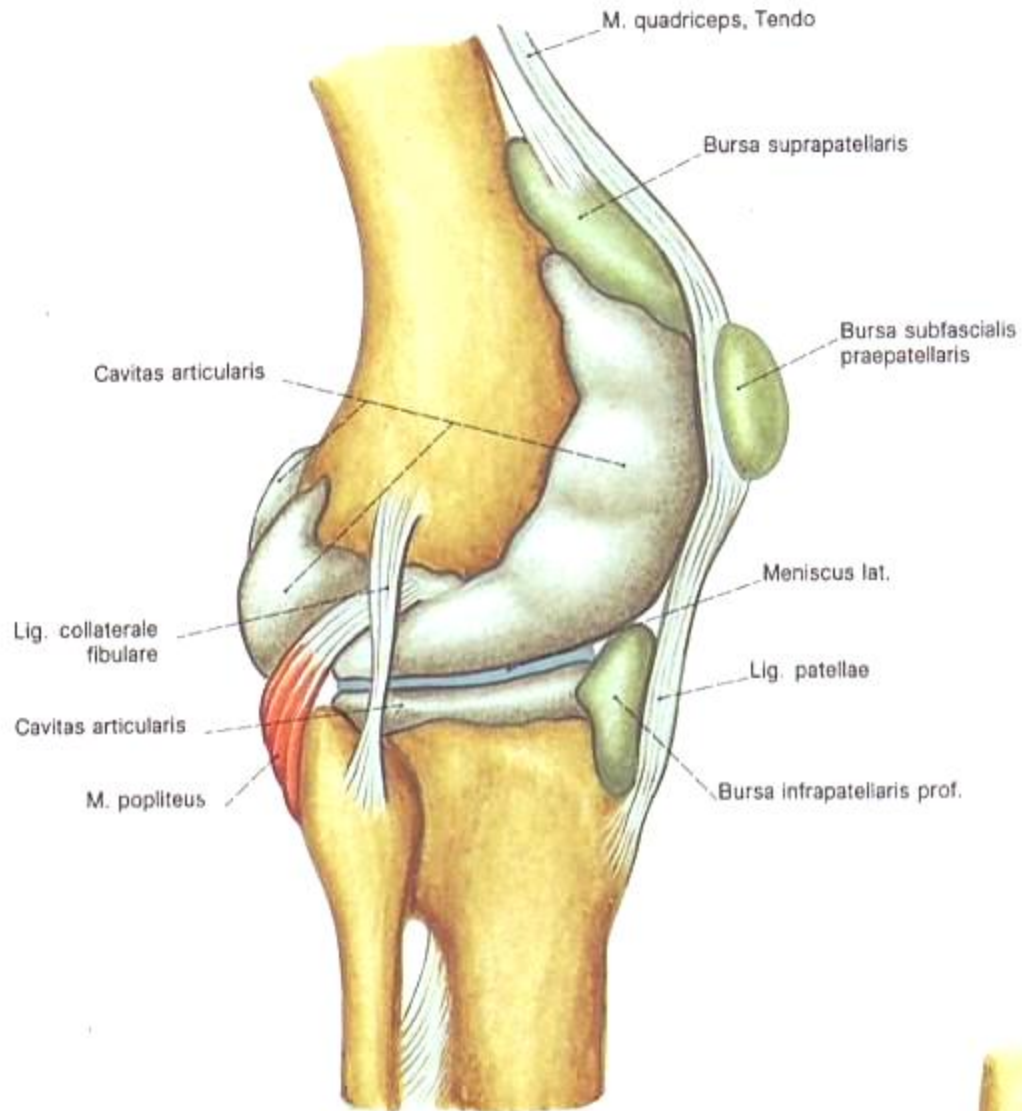


# Ligamen

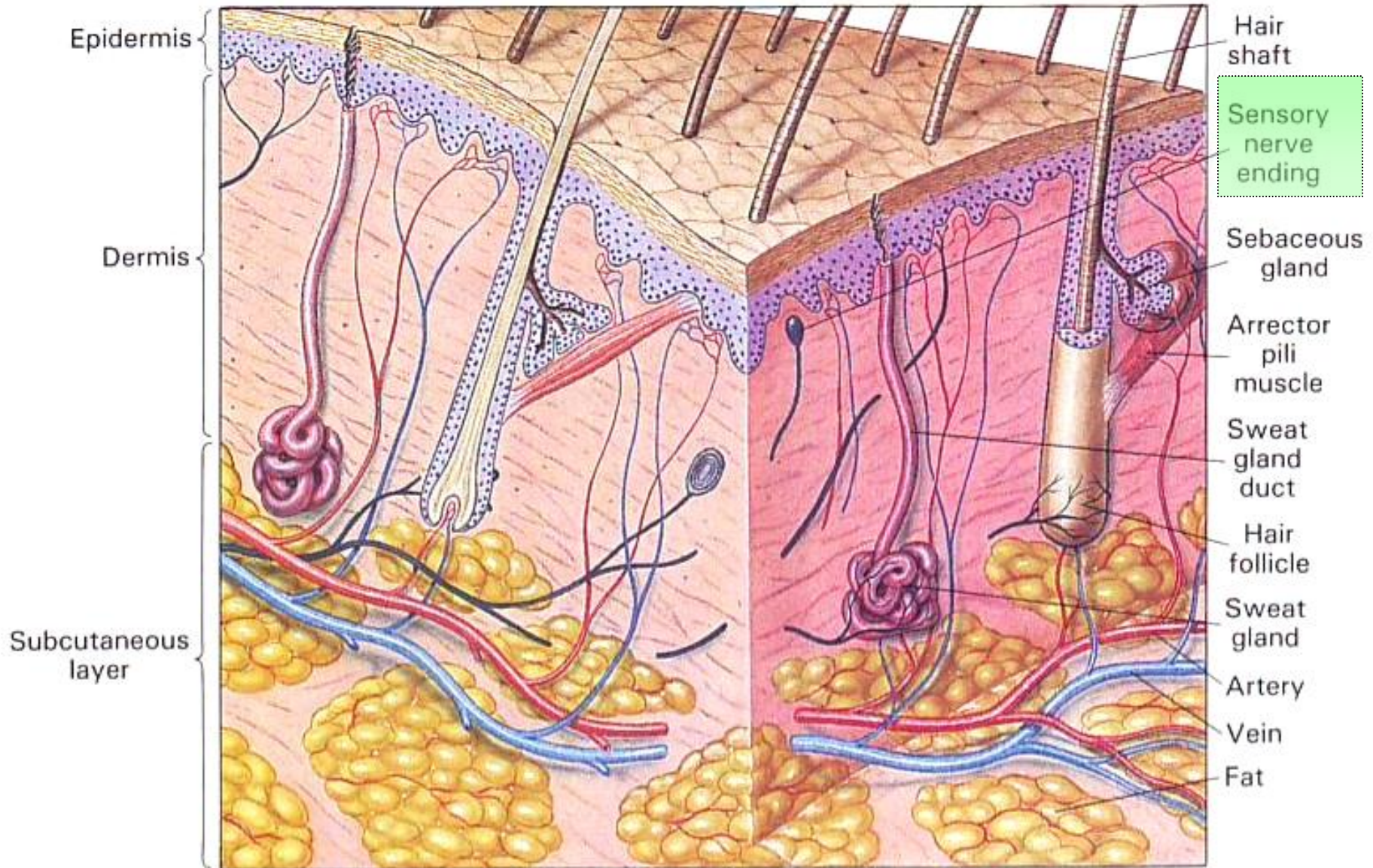




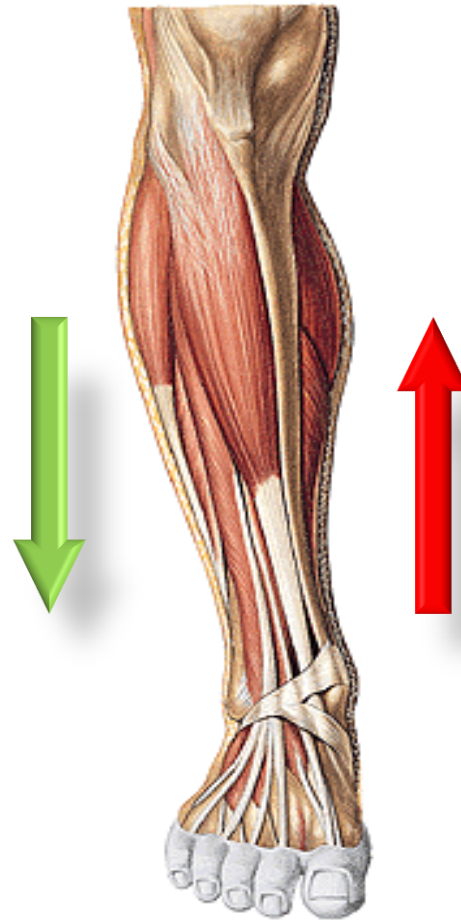
# Bursa



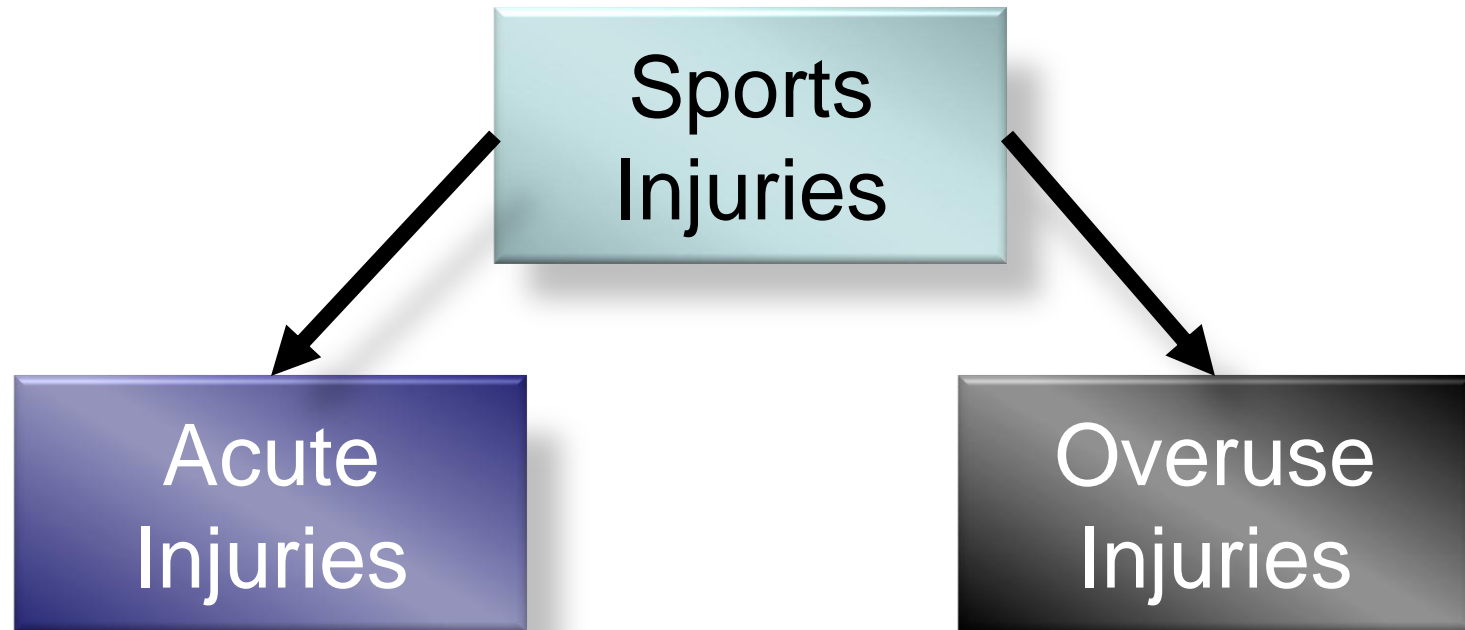
# Indera raba kulit & Propriosepsi



# Indera raba kulit & Propriosepsi



# Dua macam COR

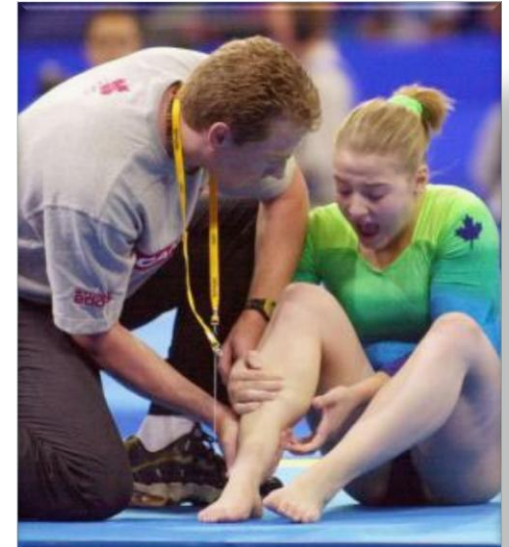


- **Baru** terjadi.
- Lebih **berat** dari overuse injury.
- Luar: pukulan, kontak.
- Dalam: sprain/strain.

- Cedera **ringan** / mikro trauma yang **berulang**.
- Salah teknik, latihan, peralatan.

# Cedera Akut

- Tulang : patah.
- Tulang rawan sendi: retak/robekan.
- Sendi : dislokasi, subluksasi.
- Ligamen : robek (sprain).
- Otot : robek (strain), memar,  
acute compartment syndrome.
- Tendon : robek.
- Bursa : traumatic bursitis.
- Saraf : penekanan, iritasi.
- Kulit : lecet, luka.



# Cedera Kronik / Overuse

- Tulang : stress fracture.
- Tulang rawan sendi: chondromalacia.
- Sendi : osteoarthritis (OA), synovitis.
- Ligamen : peradangan.
- Otot : chronic compartment syndrome, DOMS, fibrosis.
- Tendon : tendinitis, tendinosis.
- Bursa : bursitis.
- Saraf : penjepitan.
- Kulit : lepuh.

# Cedera akut atau overuse?



# Patah tulang



Greenstick  
(incomplete)



Transverse



Simple



Oblique



Comminuted



Spiral



Compound

- Terbuka / tertutup

Tanda:

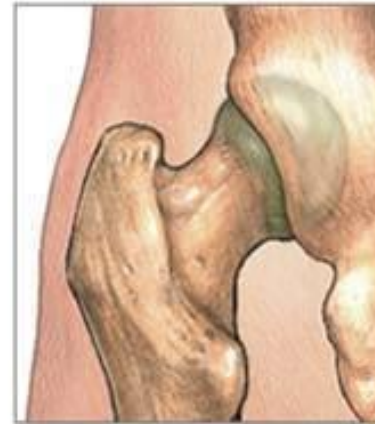
- Nyeri gerak,
- nyeri tekan,
- bengkak,
- deformitas,
- gerakan (-).



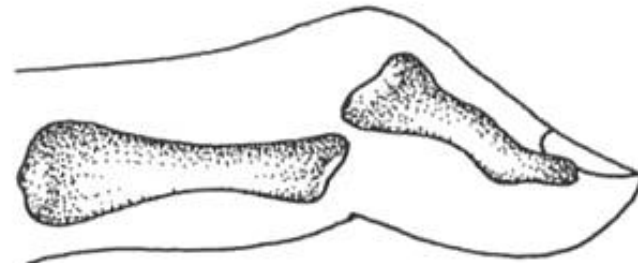
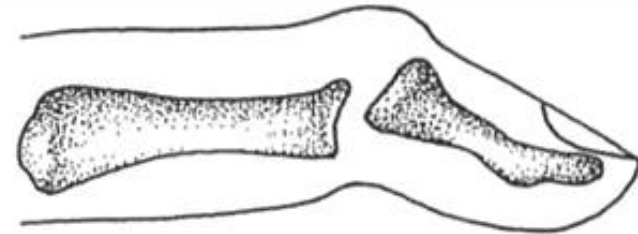
# Sendi: dislokasi/subluksasi.



Normal location



Dislocation



2.2 Subluxation (a) and dislocation (b) of a joint

# Ligamen: sprain

Front view



Side view

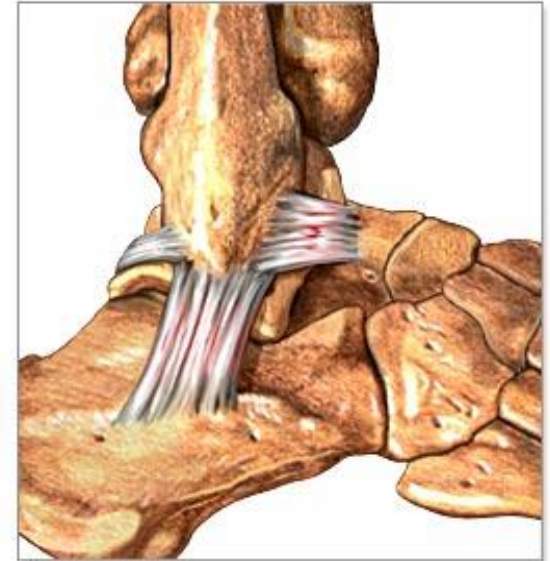


Ligaments



Type I Sprain

- ligaments stretched



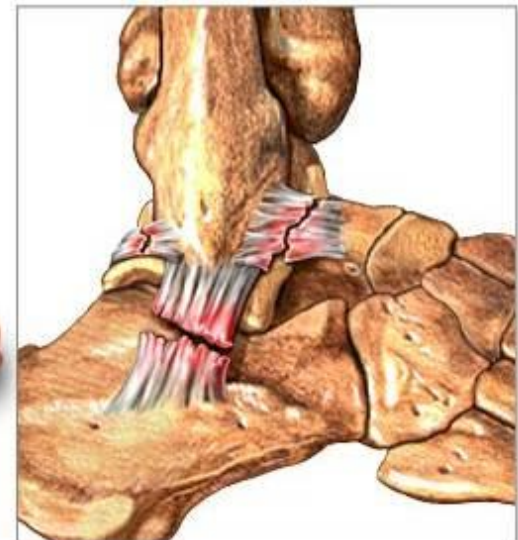
Type II Sprain

- ligaments torn slightly



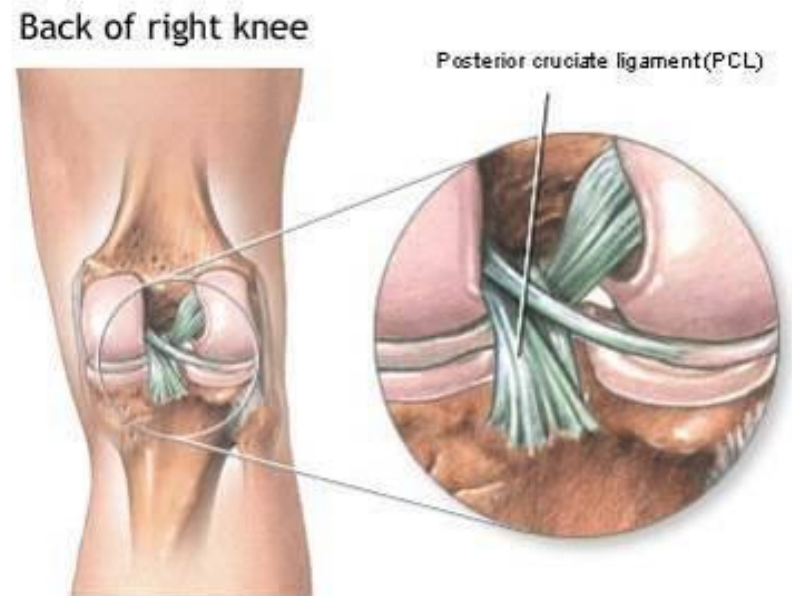
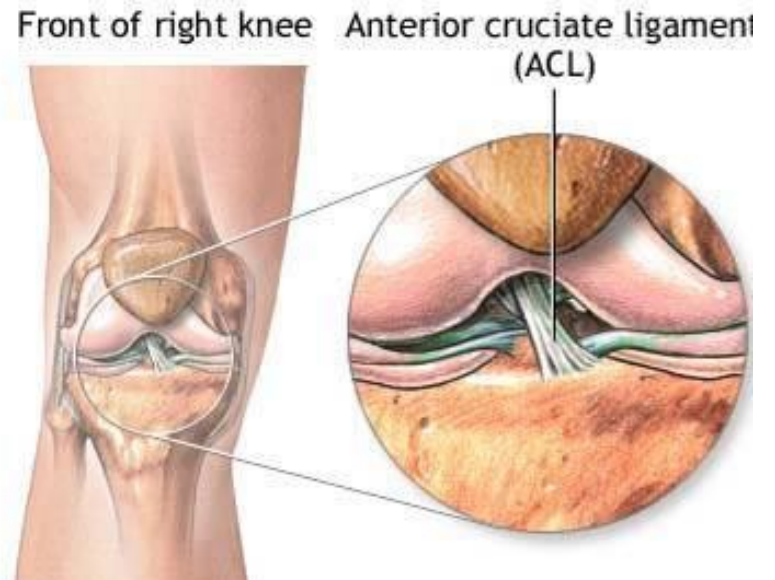
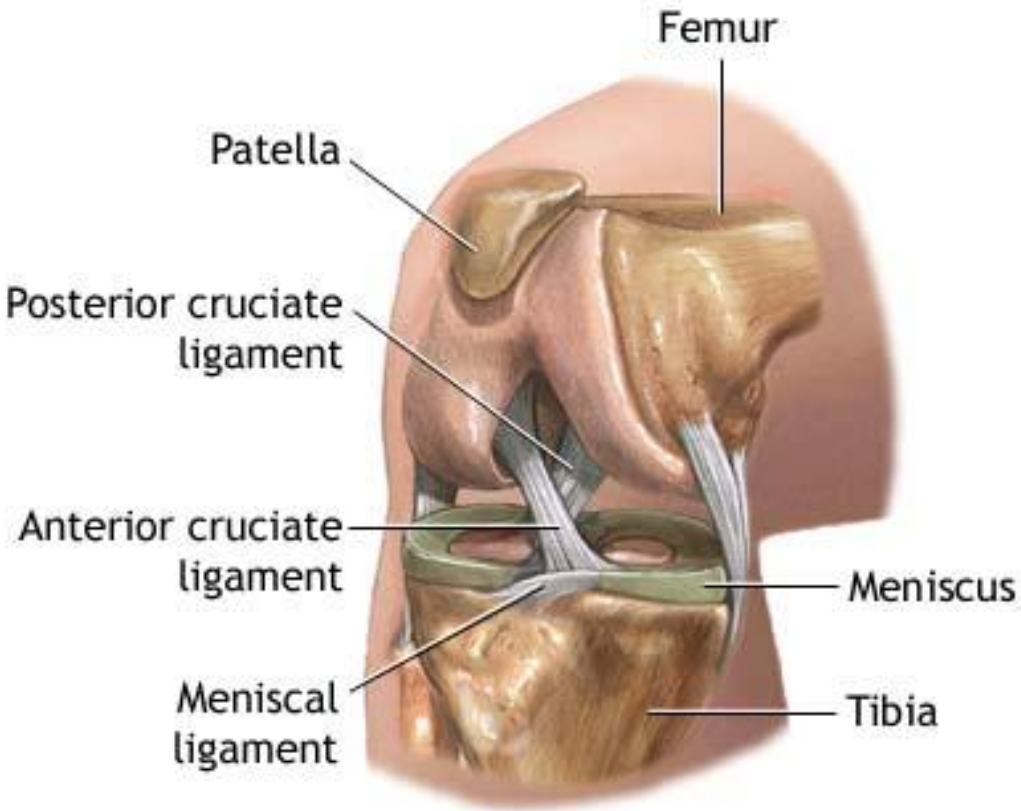
Type III Sprain

- ligaments torn completely



VL

# Ligamen: sprain



Torn anterior cruciate ligament



Tear of the anterior cruciate ligament

Partial



Complete



Avulsion



ADAM.

ACL

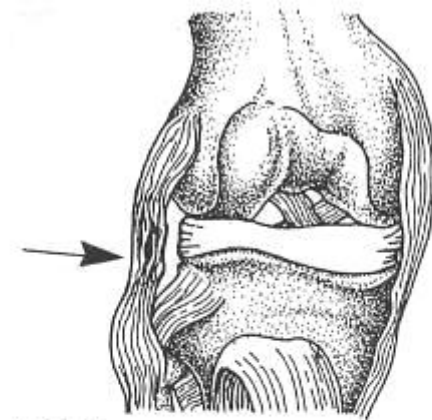
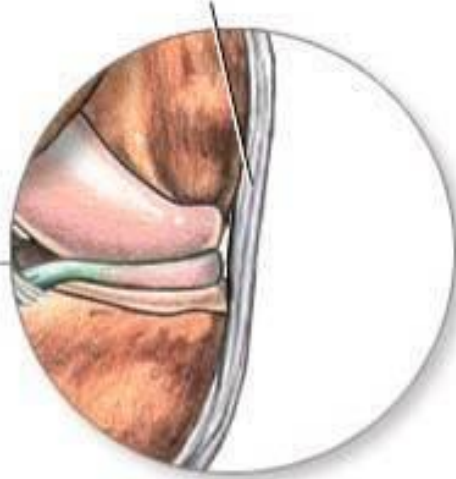


ACL injuries occur when bones of the leg twist in opposite directions under full body weight

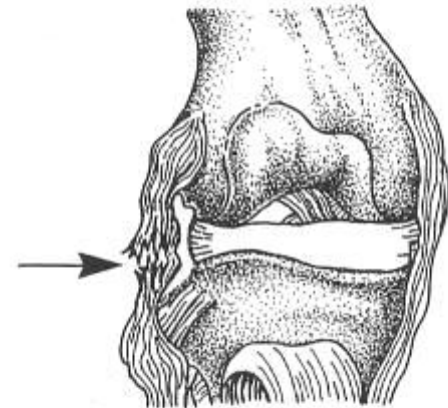
# Front of right knee



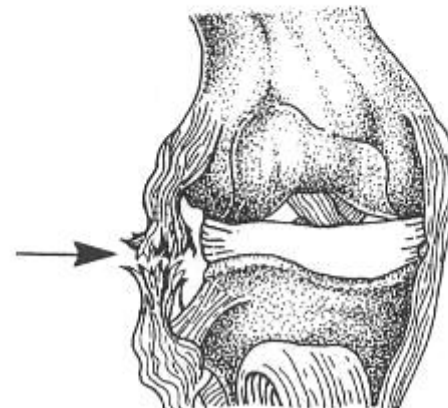
Normal medial collateral ligament



(a) Grade I



(b) Grade II



Normal lateral collateral ligament

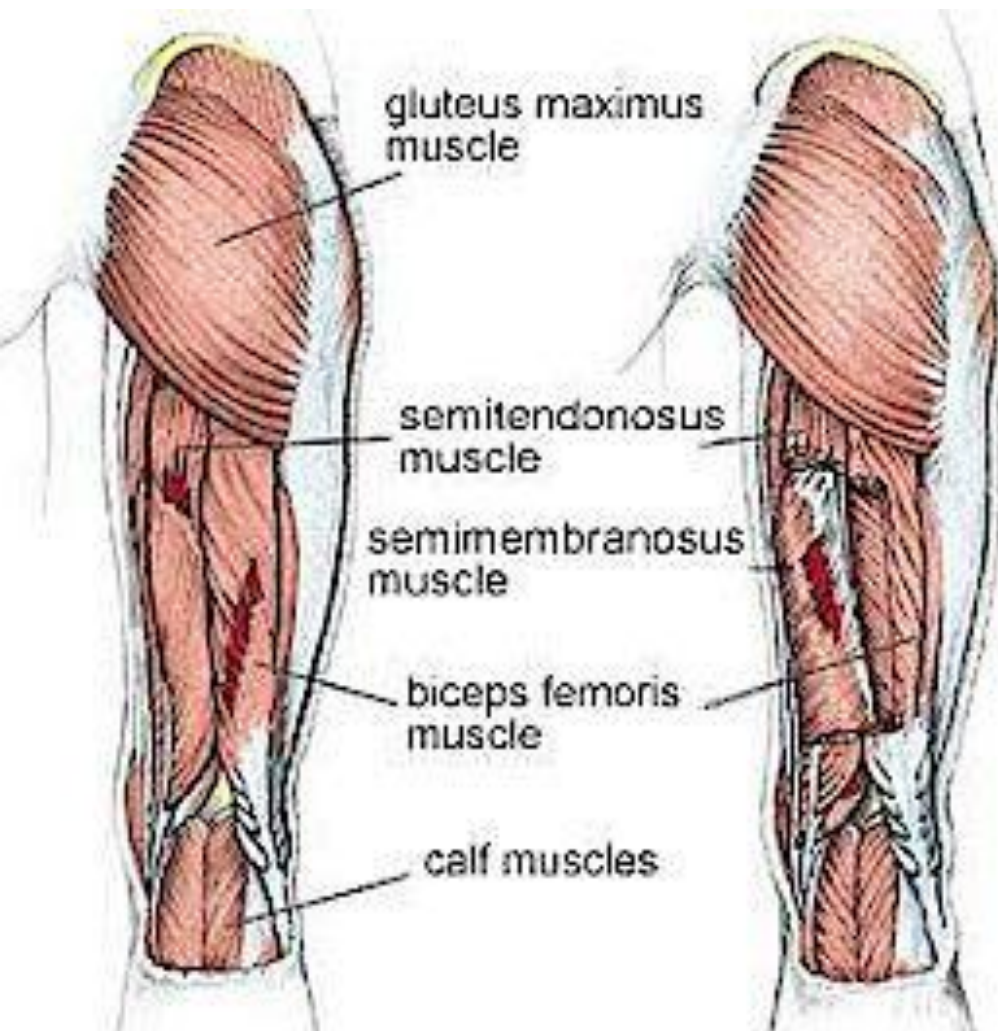
2nd degree injury



3rd degree injury

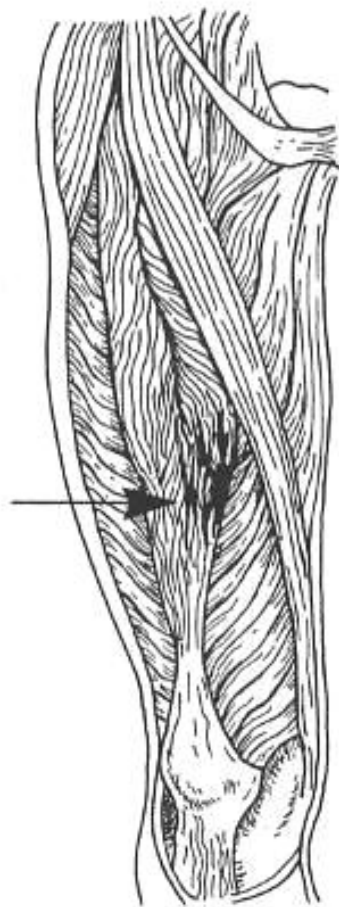


# Strain / Cedera Otot

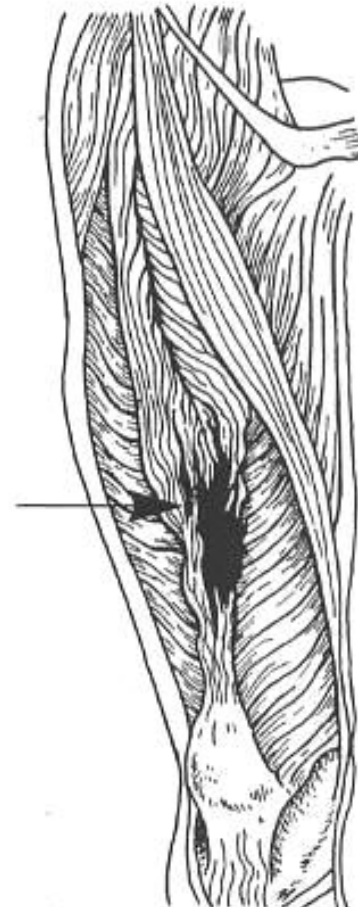


- Cedera paling sering.
- Hamstring, quadriceps & gastronemius  
→ lewati 2 sendi.
- Kontraksi eksentrik > konsentrik.

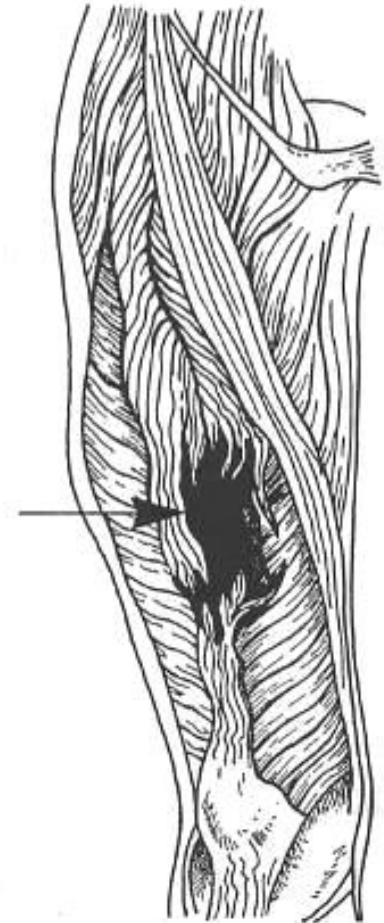
# Strain / Cedera Otot



(a) Grade I



(b) Grade II



(c) Grade III

Derajat:

I. Kekuatan utuh

II. Nyeri saat kontraksi, bengkak.

III. Putus total.

# Strain / Cedera Otot



Strained muscle tissue



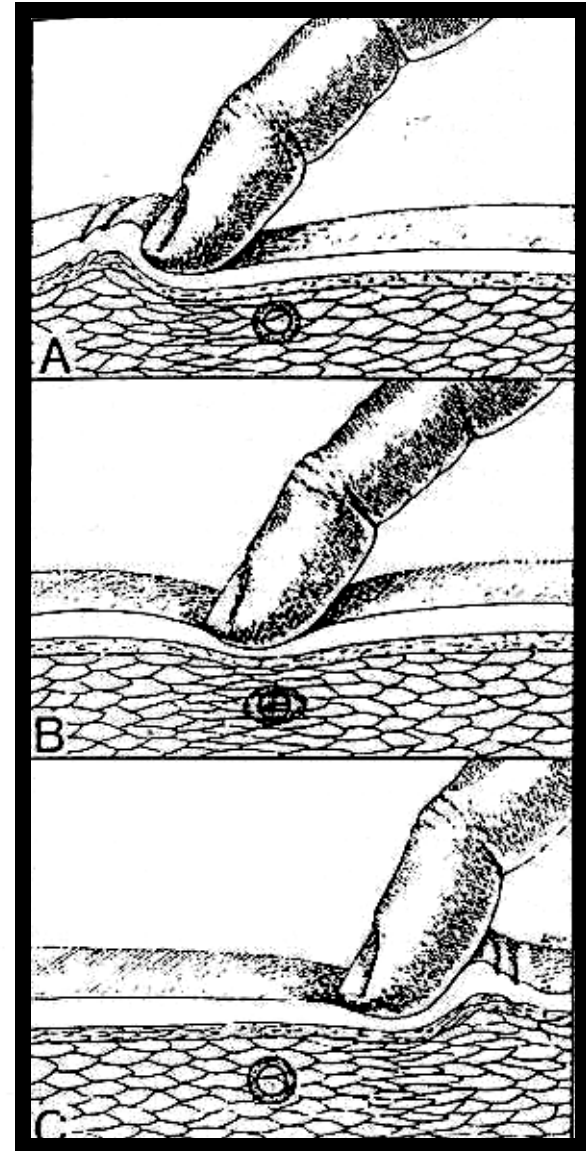
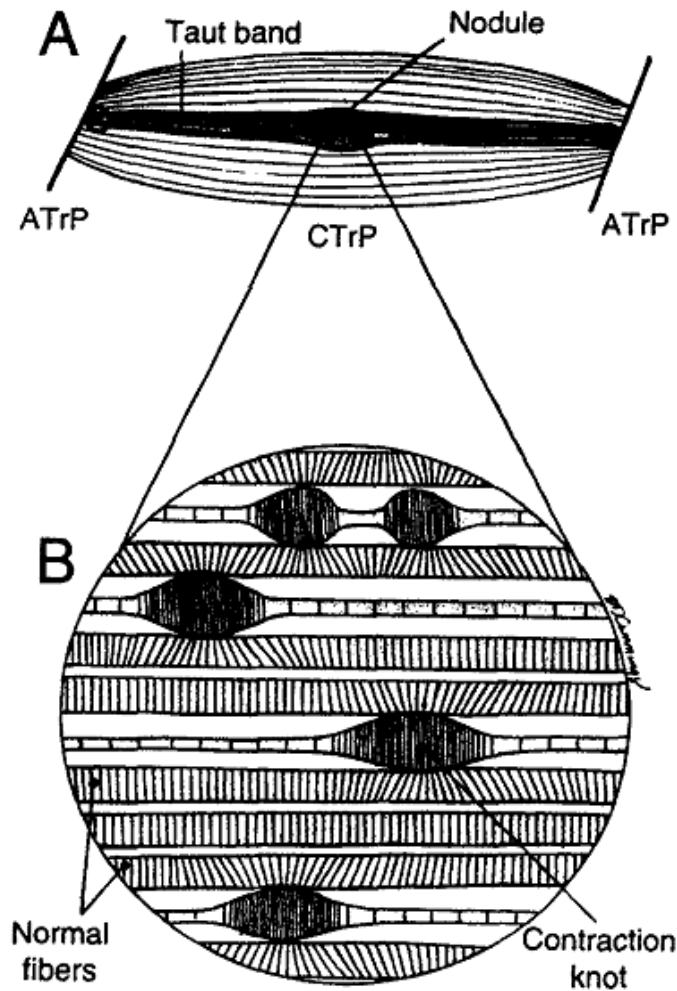
Normal muscle tissue



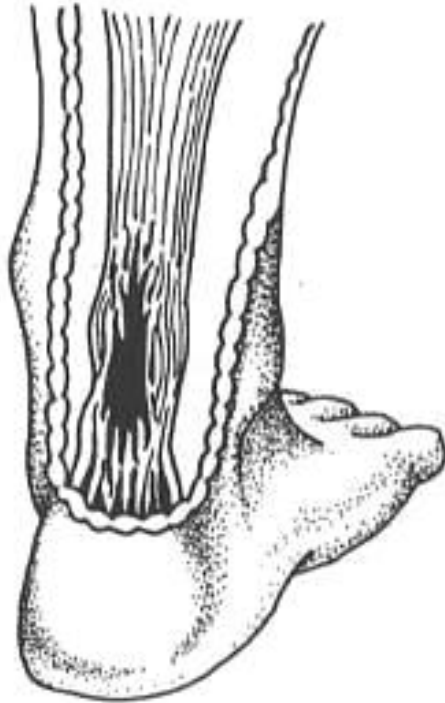


# Strain / Cedera Otot

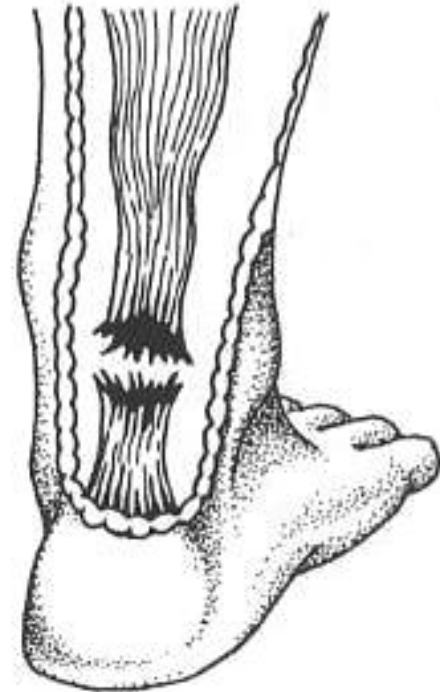
- Taut band



# Cedera Tendon



(a) *Partial*



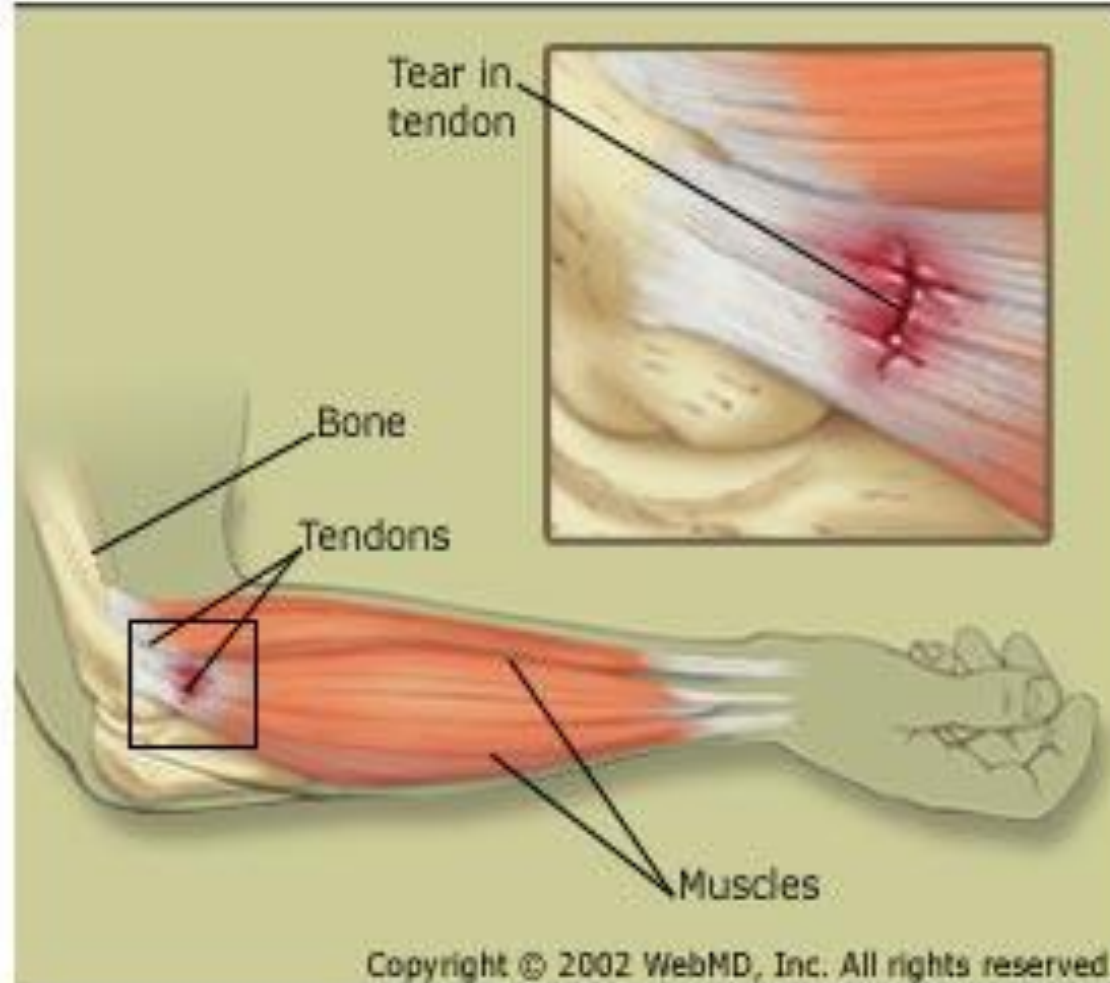
(b) *Complete*

# Cedera Tendon



Patellar tendinitis

Tendinitis (Elbow strain)



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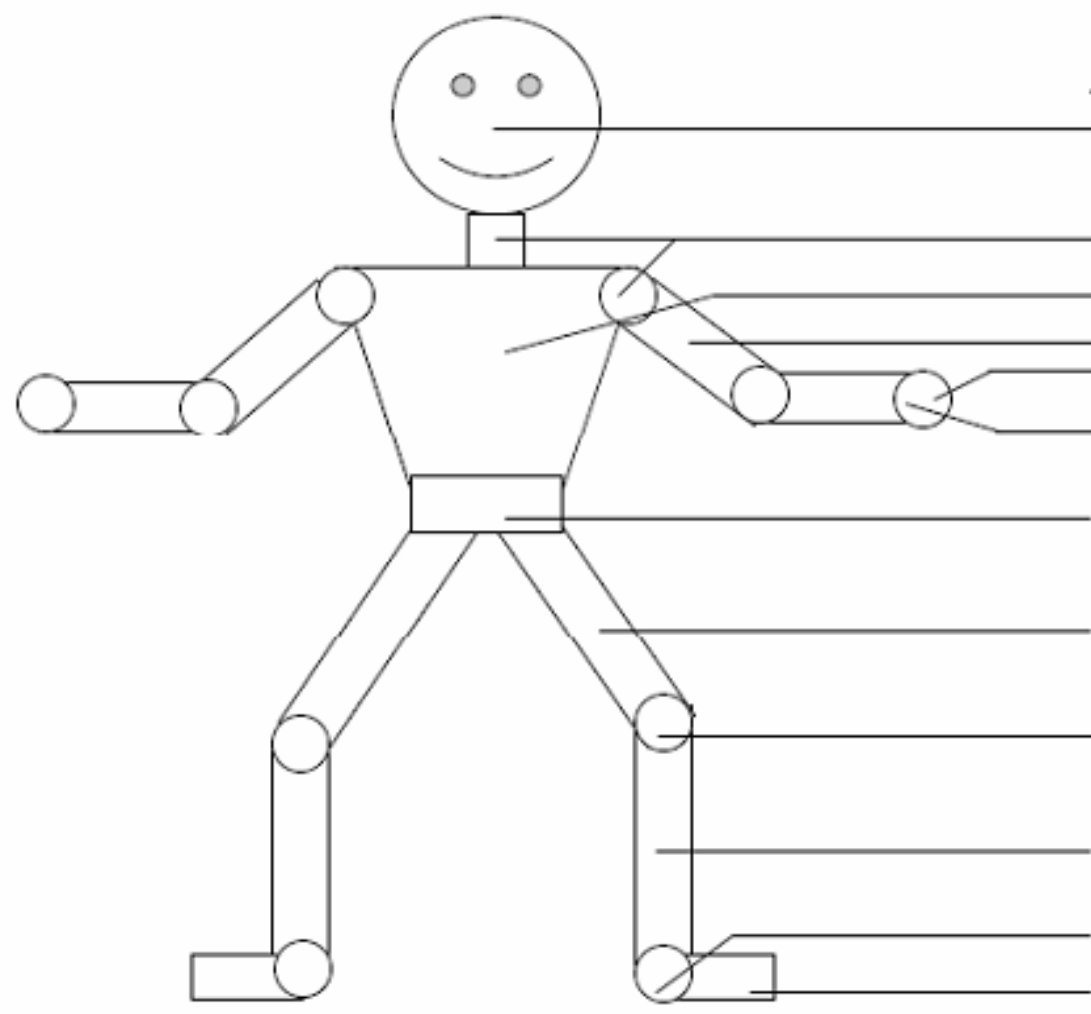
"Remember his weakness is a pulled tendon, so keep it as high as your bursitis will let you, but take it easy with your fast ball because of my bone chips."

# Sports injuries in youth

Backx et al. AJSM, 1991



Universitair Medisch Centrum  
Utrecht



	PE classes (n=79)	Sporting clubs (n=296)	Non-organized sport (n=51)
Head	5	5	6
Neck	3	3	2
Shoulder	1	1	0
Upper arm	4	5	8
Forearm	16	10	14
Hand	8	3	6
Torso	5	5	2
Lower back	5	7	2
Upper leg	15	18	24
Lower leg	3	5	6
Foot	27	26	16
Ankle	9	11	1

# Faktor Risiko Cedera OR

## Faktor Ekstrinsik

- Kesalahan latihan
  - Volume & intensitas berlebih,
  - peningkatan & peru-bahan mendadak,
  - pemulihan tidak cukup,
  - salah teknik, dll.
- Sarana & perlengkapan
- Sepatu
- Kondisi lingkungan

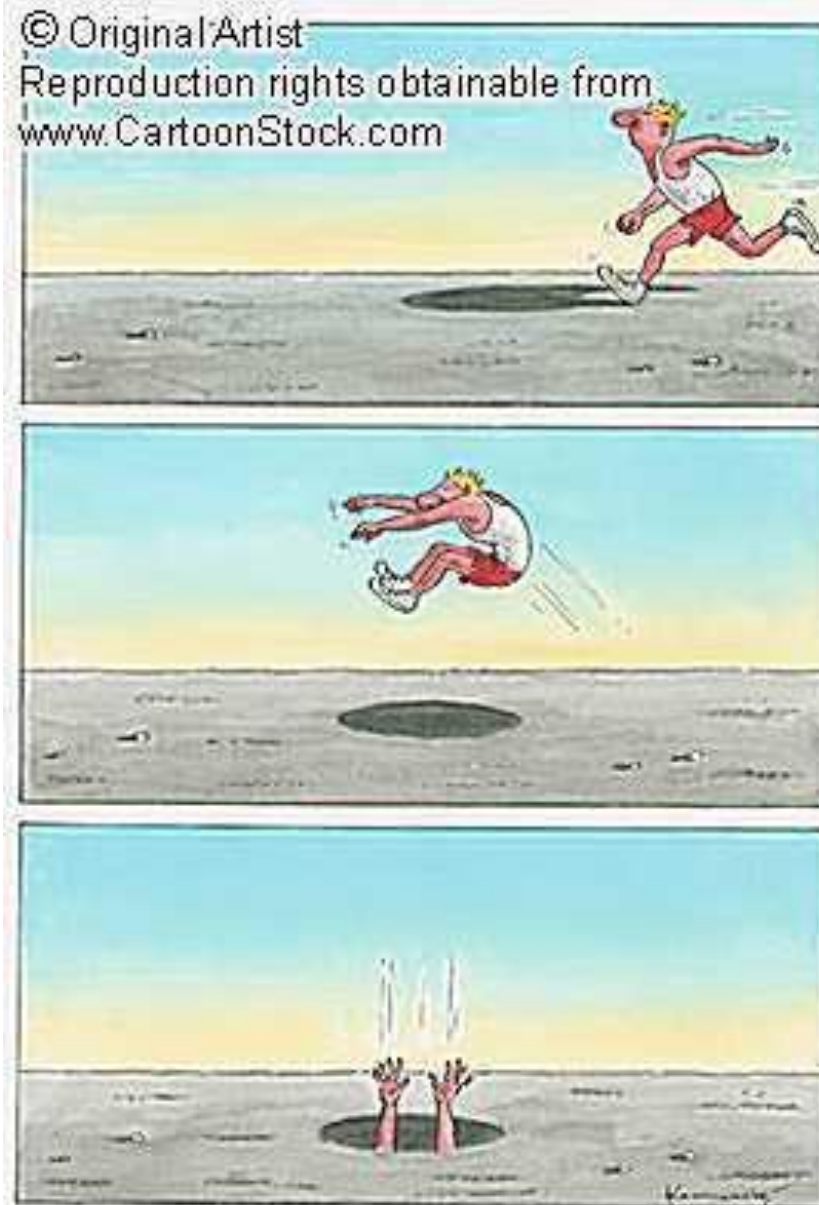


## Faktor Intrinsik

- Malalignment
  - Kaki ceper
  - Lutut X – O
  - Patella alta, dll.
- Panjang kaki beda
- Imbalance otot
- Fleksibilitas kurang
  - Lingkup gerak sendi
  - Tightness otot

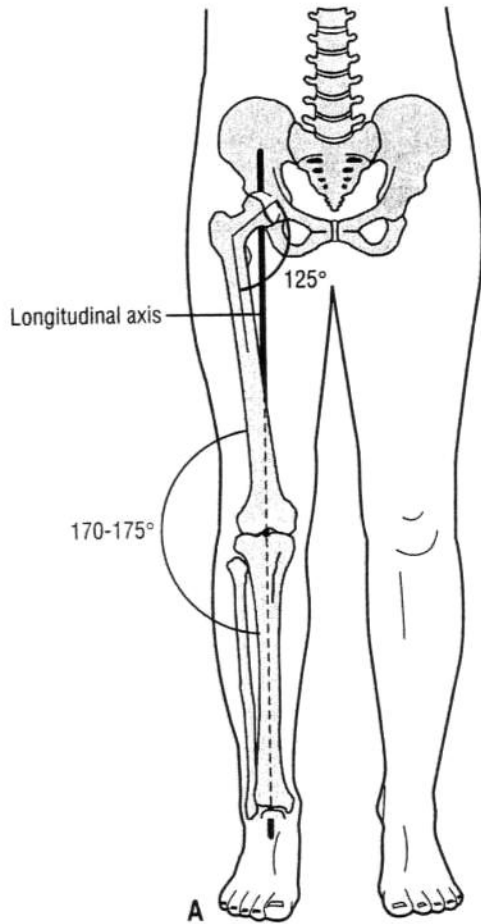


# Kesalahan teknik?



# Masalah Biomekanik

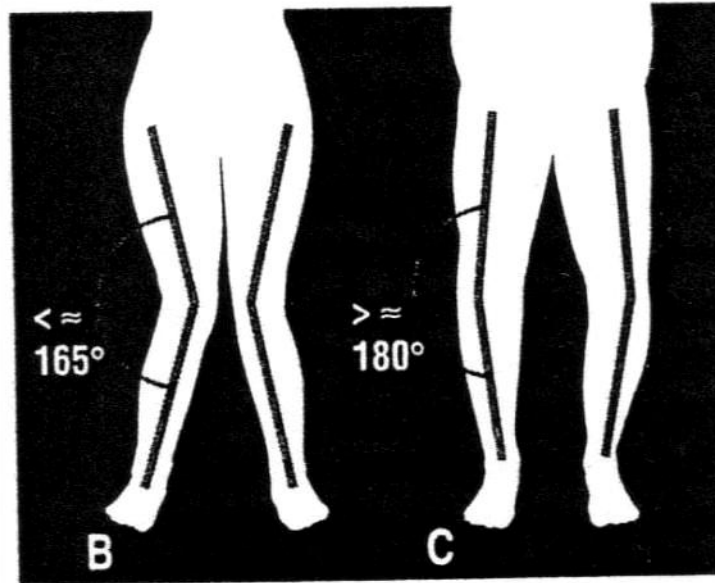
Normal genu valgum



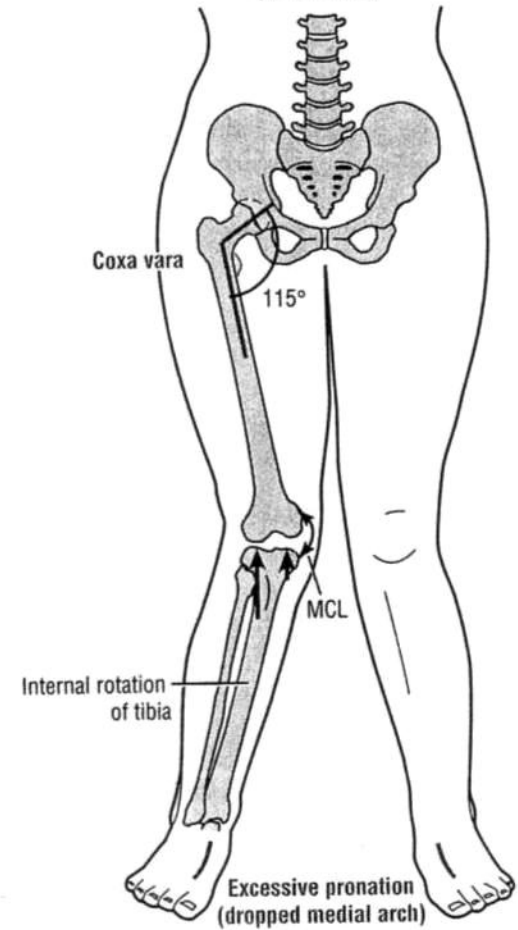
Excessive frontal plane deviation

Excessive genu valgum (knock-knee)

Genu varum (bow-leg)



Excessive genu valgum (knock-knee)





# Masalah Biomekanik

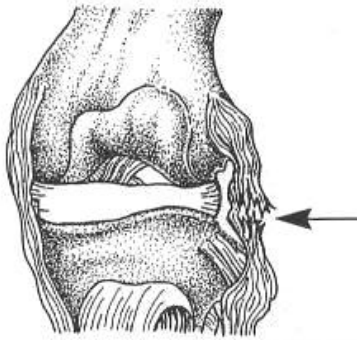
Front of right knee



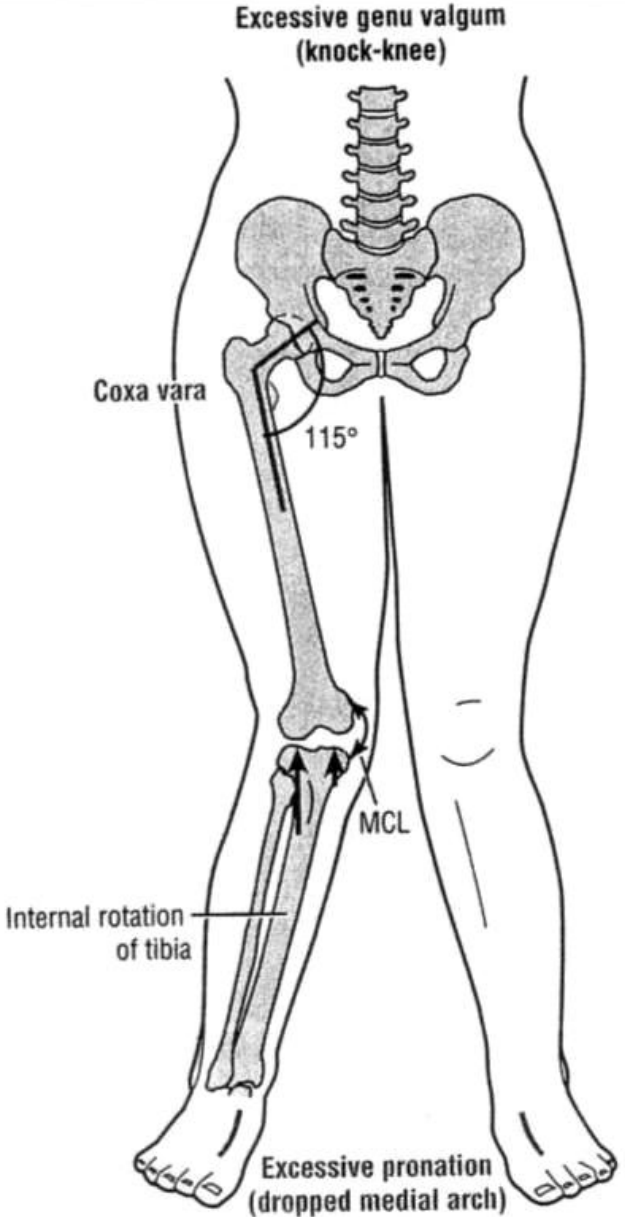
Normal medial collateral ligament



(a) Cross I



(d) Cross II

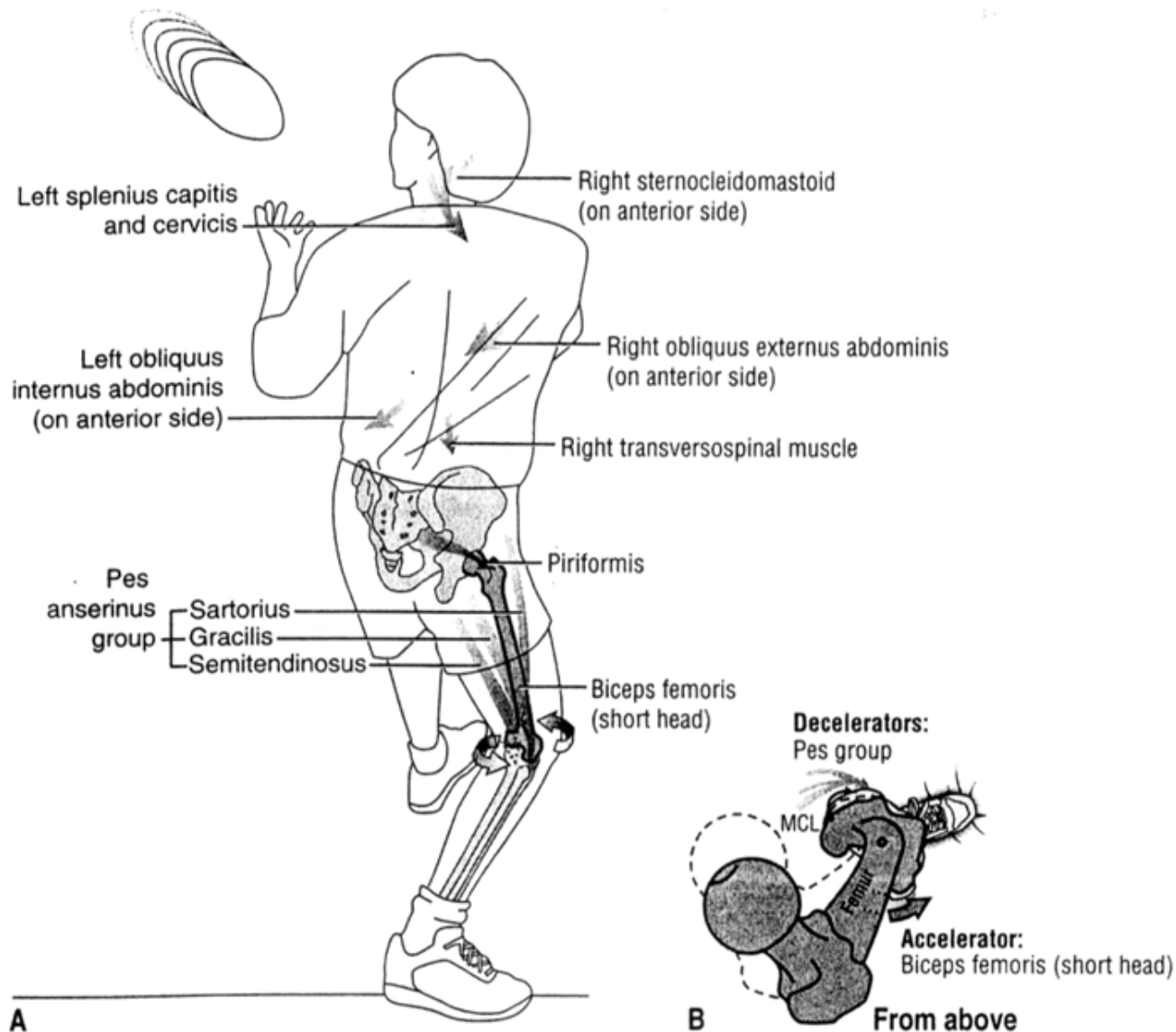


# Strain / Cedera Otot

## Mempermudah cedera otot:

- Pemanasan tidak adekuat.
- Fleksibilitas kurang.
- Ketegangan otot yang berlebihan.
- Fatigue / overuse / pemulihan tidak cukup.
- Muscle imbalance (ketidakseimbangan agonist dan antagonist).
- Cedera sebelumnya.
- Teknik atau biomekanik yang salah.

# Analisa biomekanik cedera otot



**FIGURE 13-33.** A, Several muscles are shown controlling the rotation of the head, neck, trunk, pelvis, and femur toward the approaching ball. Since the right foot is fixed to the ground, the right knee functions as an important pivot point. B, Control of the movement of the right knee within the horizontal plane is illustrated from above. The short head of the biceps femoris contracts to accelerate the femur internally (i.e., the knee joint moves into external rotation). Active force from the pes anserinus muscles in conjunction with a passive force from the stretched medial collateral ligament (MCL) helps to decelerate, or limit, the external rotation at the knee.

# Ada pertanyaan atau komentar?

