



حکیم سخن در زبان آفرین  
کریم خطا بخش پوزش پذیر  
به هر در که شد هیچ عزت نیافت

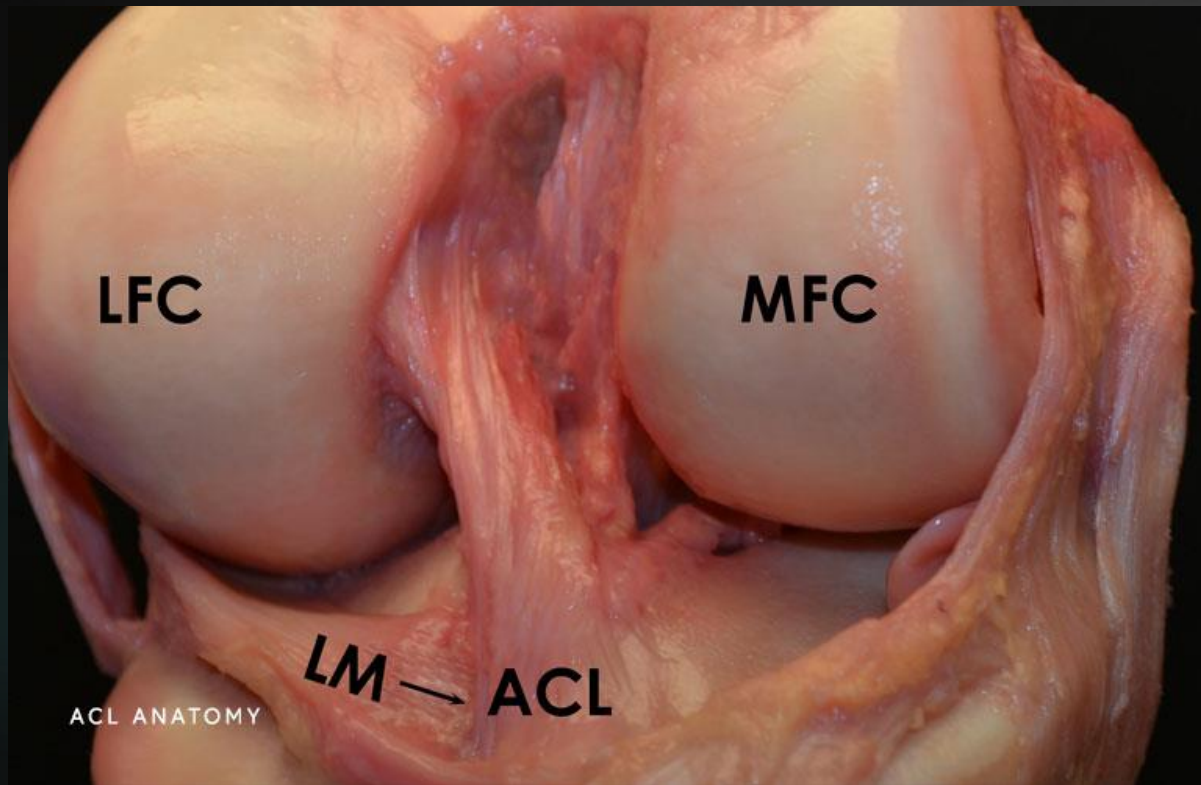
به نام خداوند جان آفرین  
خداوند بخشنده دستگیر  
عزیزی که هرگز درش سر بتافت

# Basic kinesiology of the ACL ligament

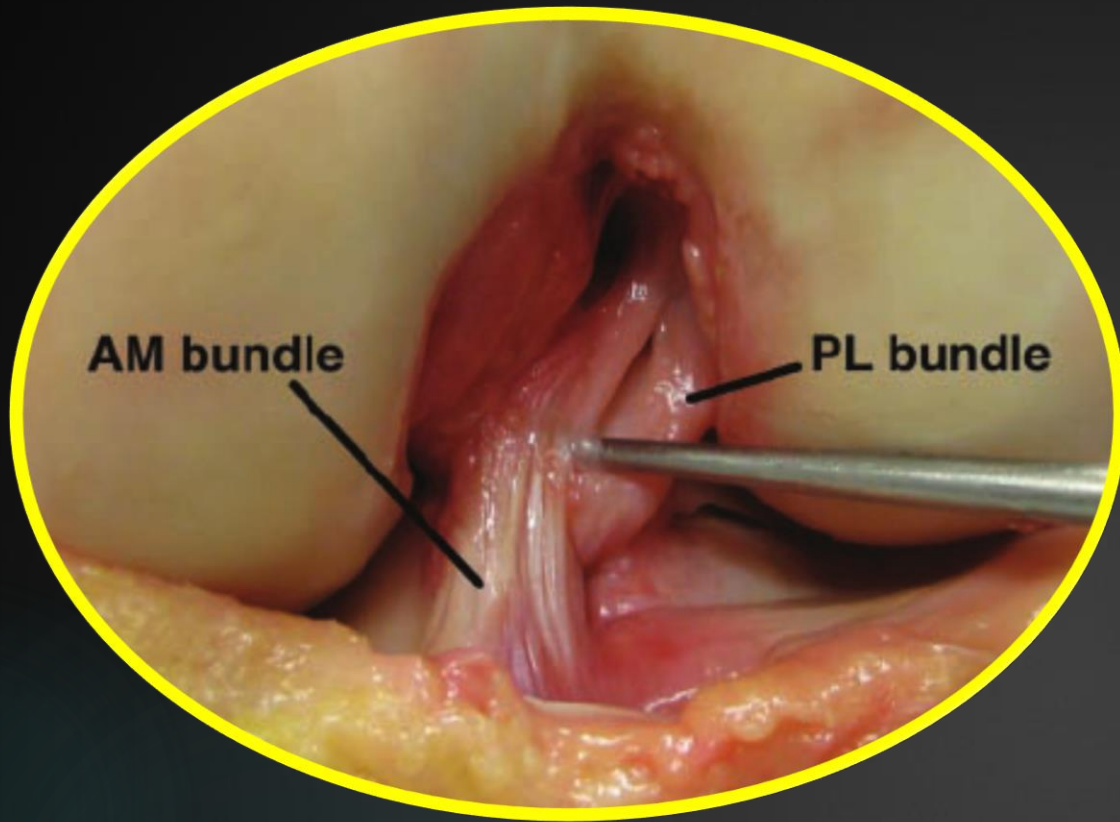
**BY: J.KETABCHI**



- ▶ ACl از باندهای کلاژنی مختلفی تشکیل شده است.
- ▶ این لیگامان حدود ۳۸ میلی متر (بی ۲۵ تا ۴۱ میلی متر) طول و ۱۰ میلی متر (بین ۷ تا ۱۲ میلی متر) ضخامت دارد.



- ▶ مبدا: از قسمت خلفی\_داخلی قسمت میانی کندیل خارجی فمور در فضای بین کوندیلی (اینترکوندیلار ناچ)
- ▶ محل اتصال: حفره در قسمت جلو و خارجی تیغه درشت نی



▶ شامل دو سری باند:

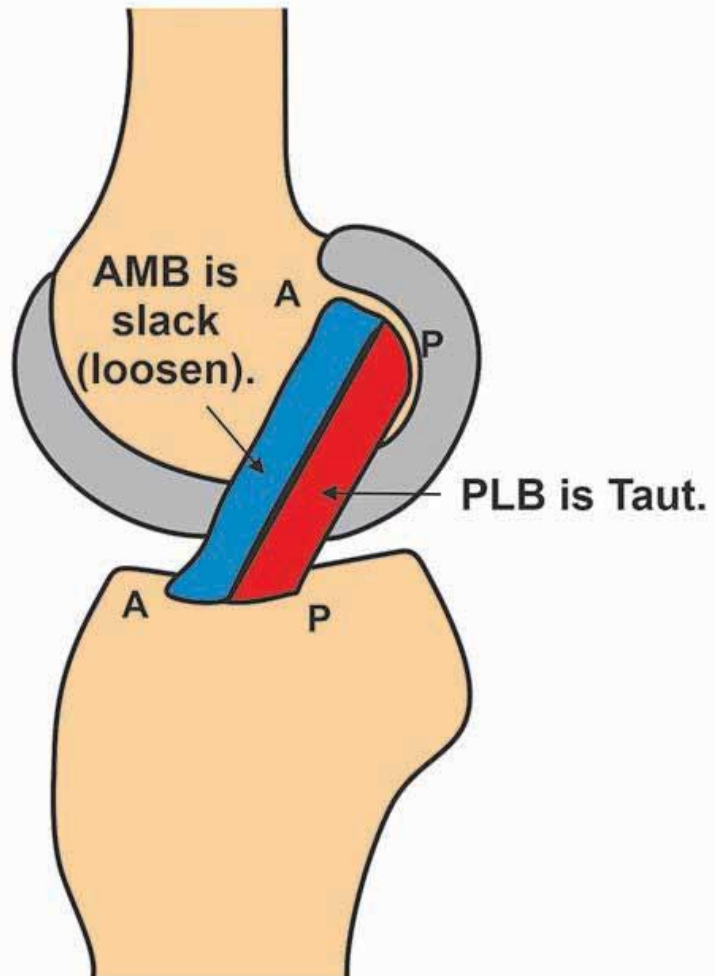
▶ ANTEROMEDIAL

▶ POSTEROLATERAL

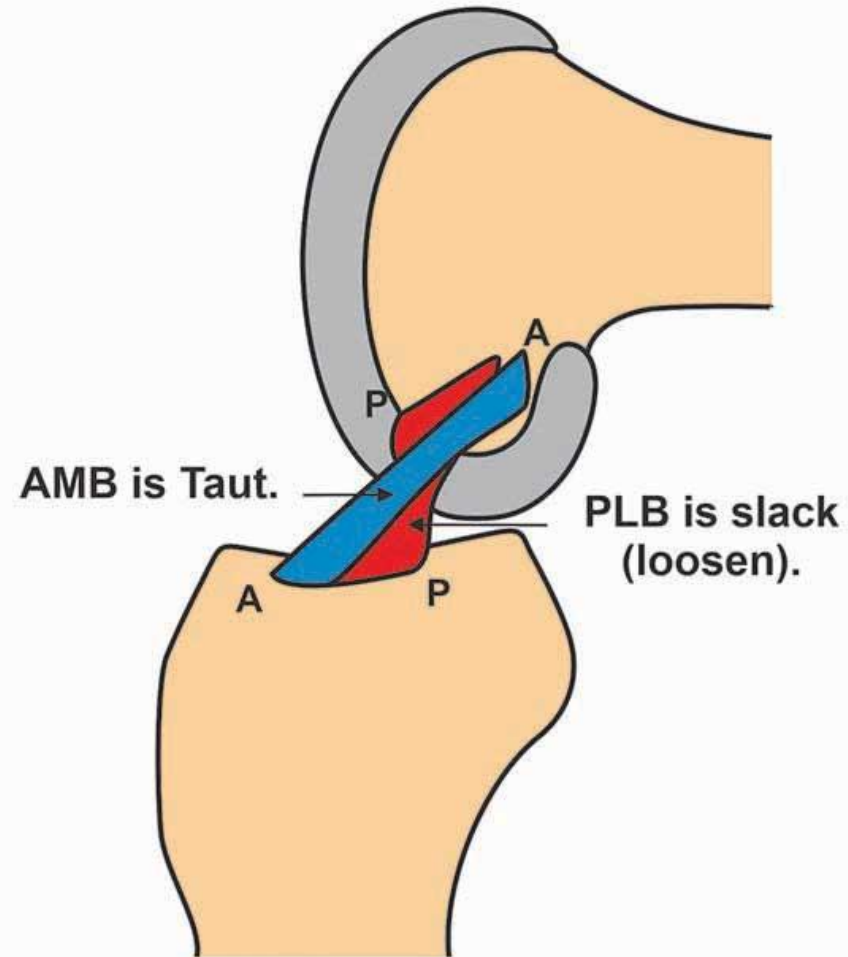
▶ باند آنترومدیال در فلکشن (خم کردن) و باند پوسترولترال در اکستنشن (باز کردن) زانو به حداکثر کشیدگ خود نزدیک می شوند.

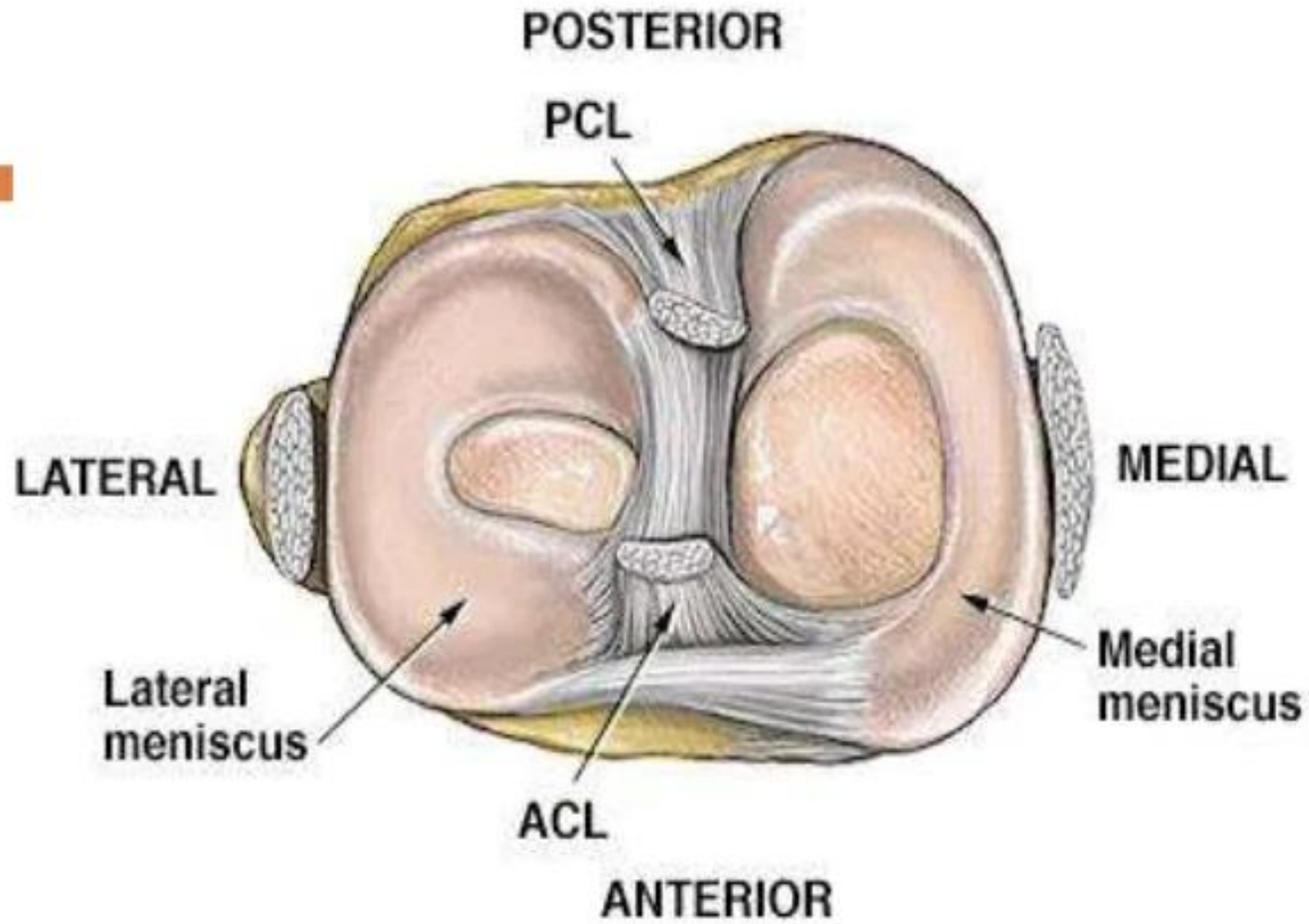
▶ در اکستنشن هر دو باند موازی هستند اما در فلکشن هر دو باند به صورت صلیبی قرار می گیرند.

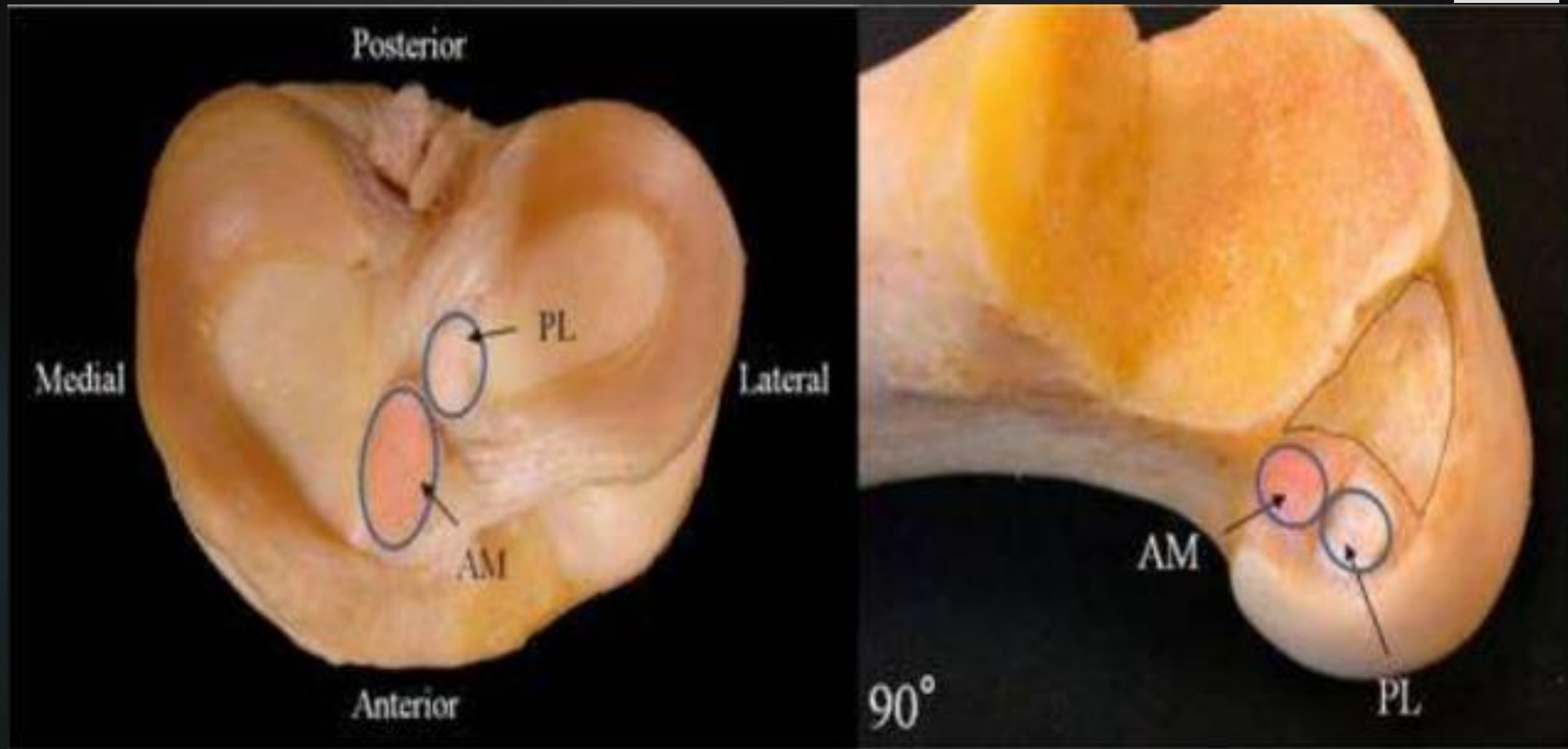
## In Knee Extension



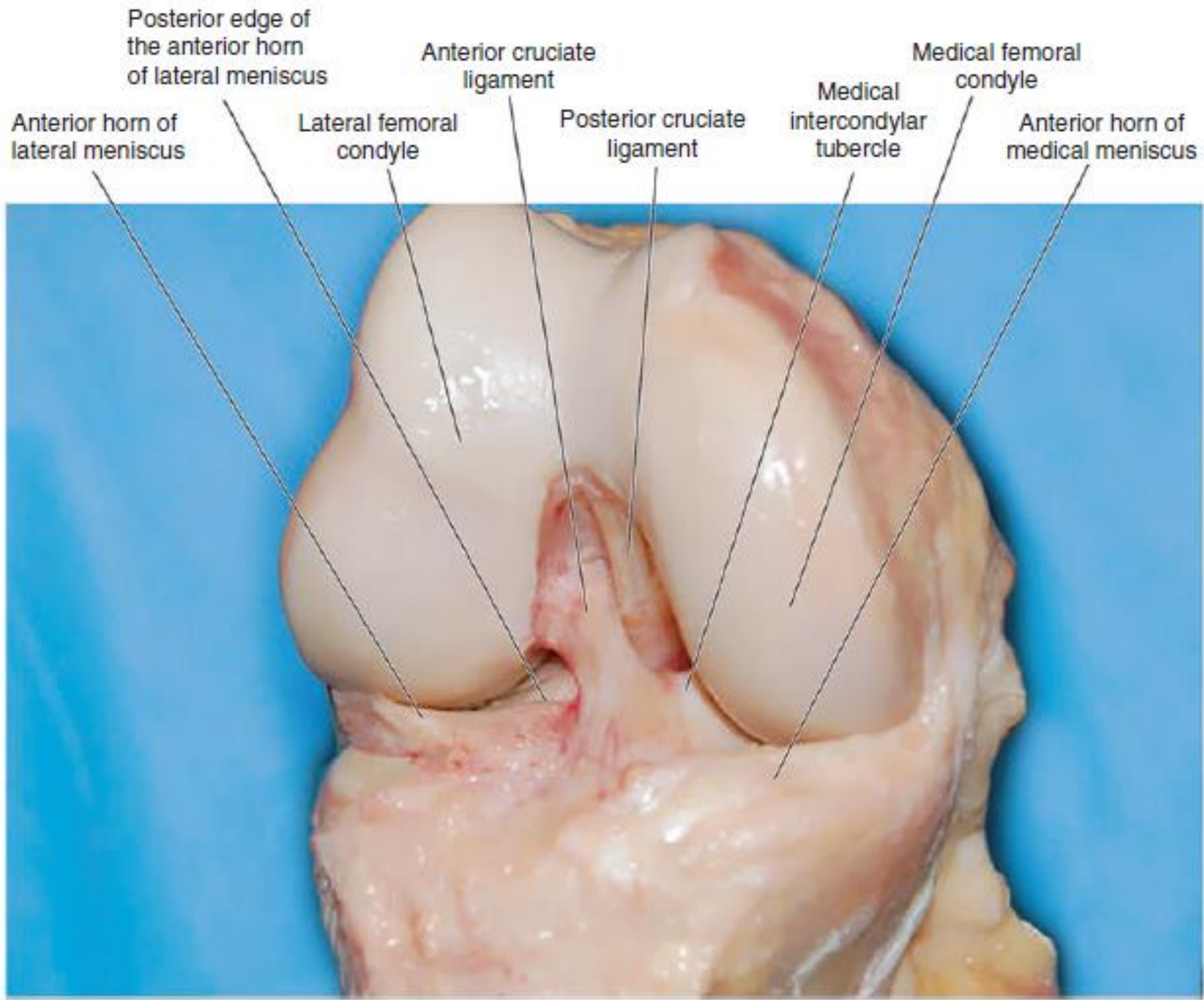
## In Knee Flexion

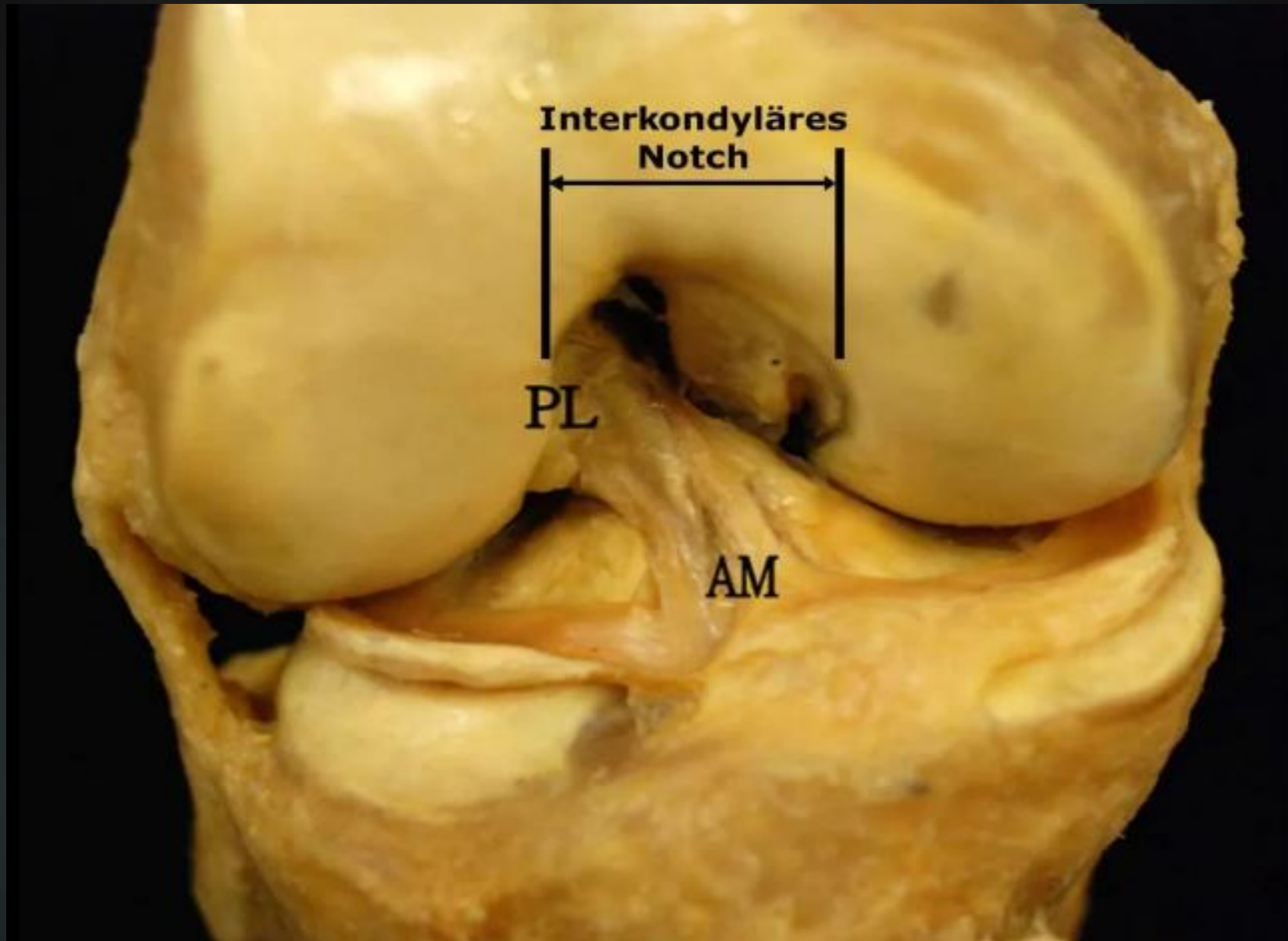




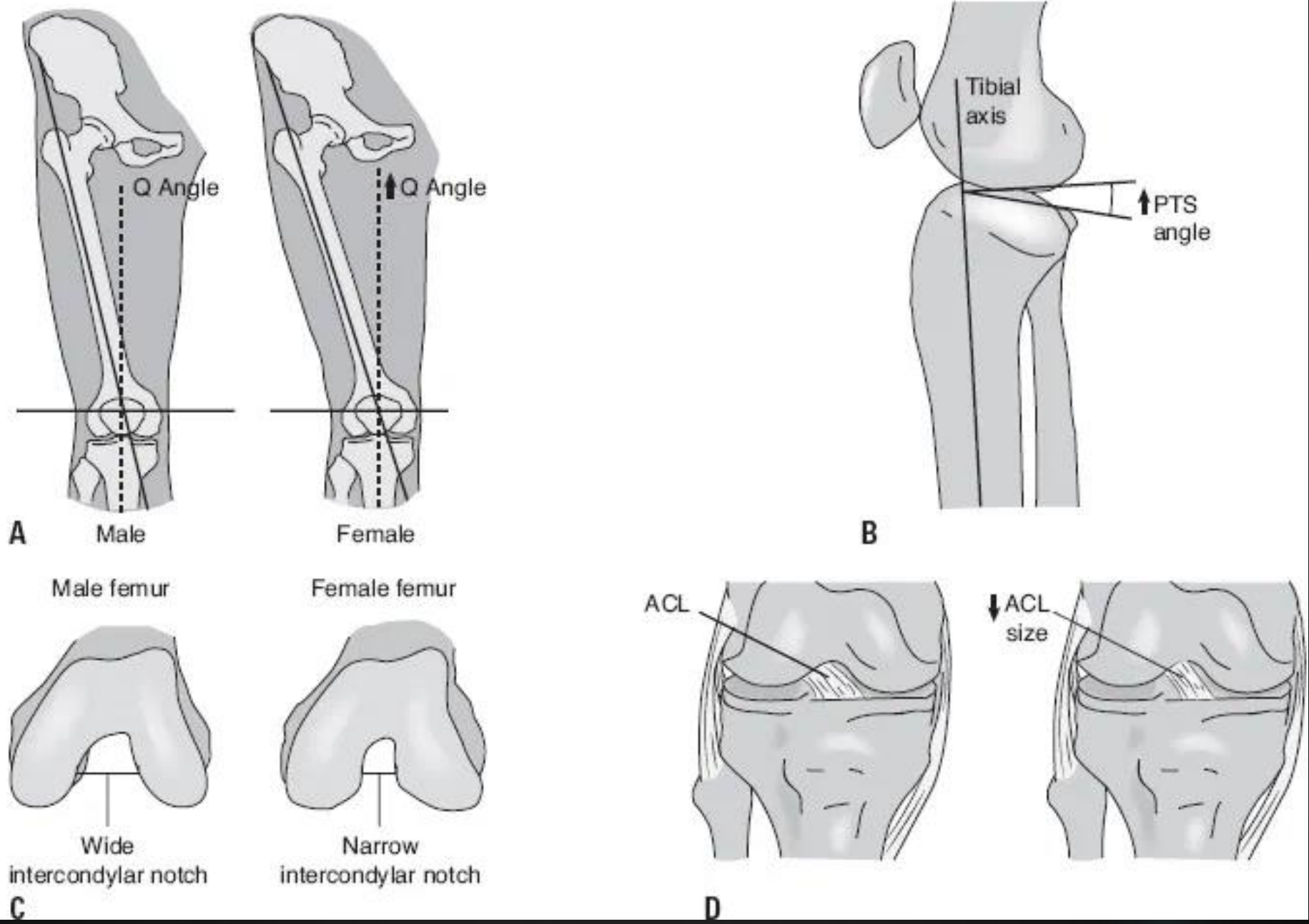








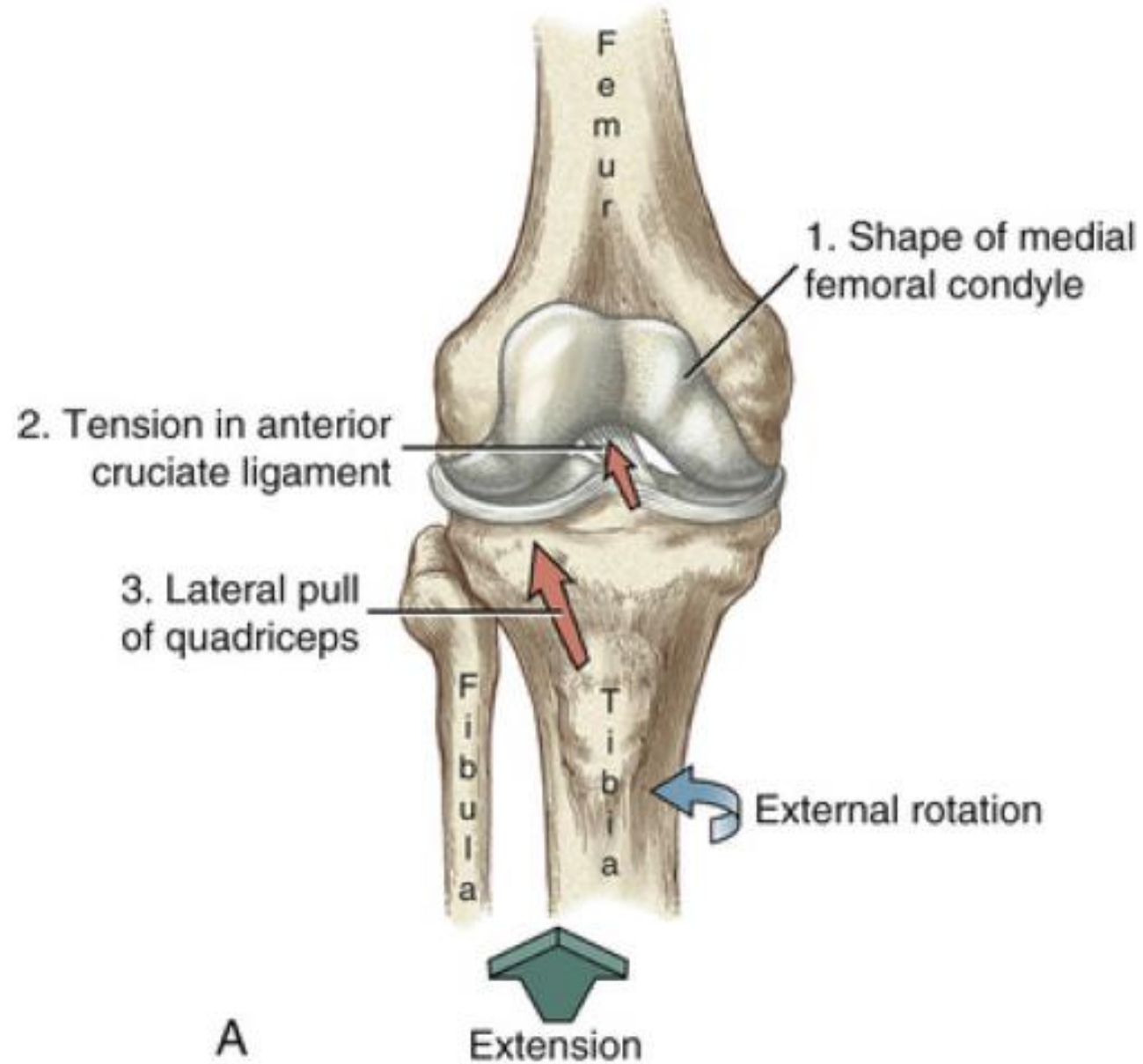
Anatomical factors associated with increased risk of ACL tear in females

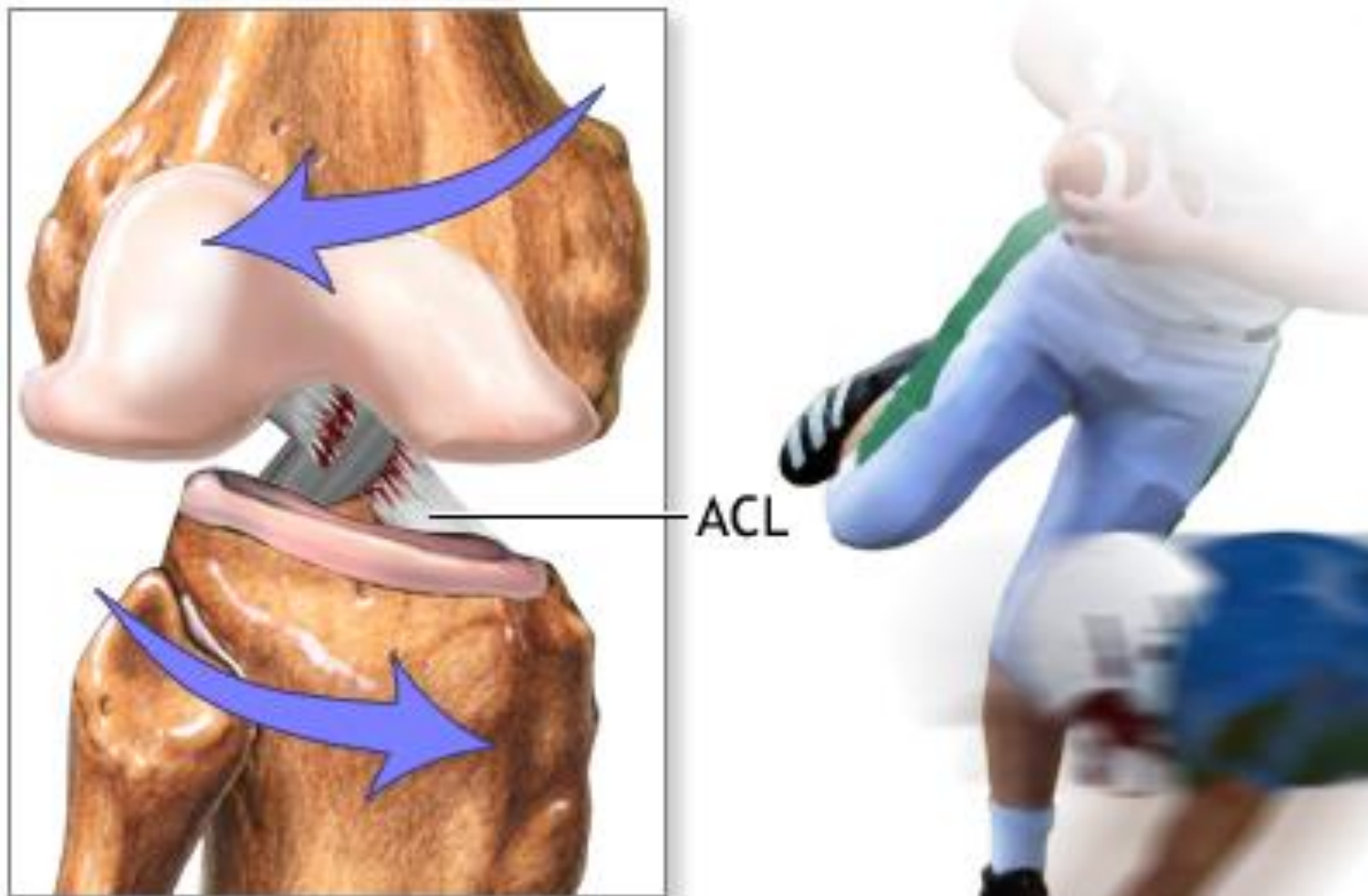


# ACL وظیفه اصلی

▶ وظیفه اصلی لیگامان ACL جلوگیری از جابجایی قدامی درشت نی روی ران و همچنین چرخش داخلی درشت نی نسبت به ران است.

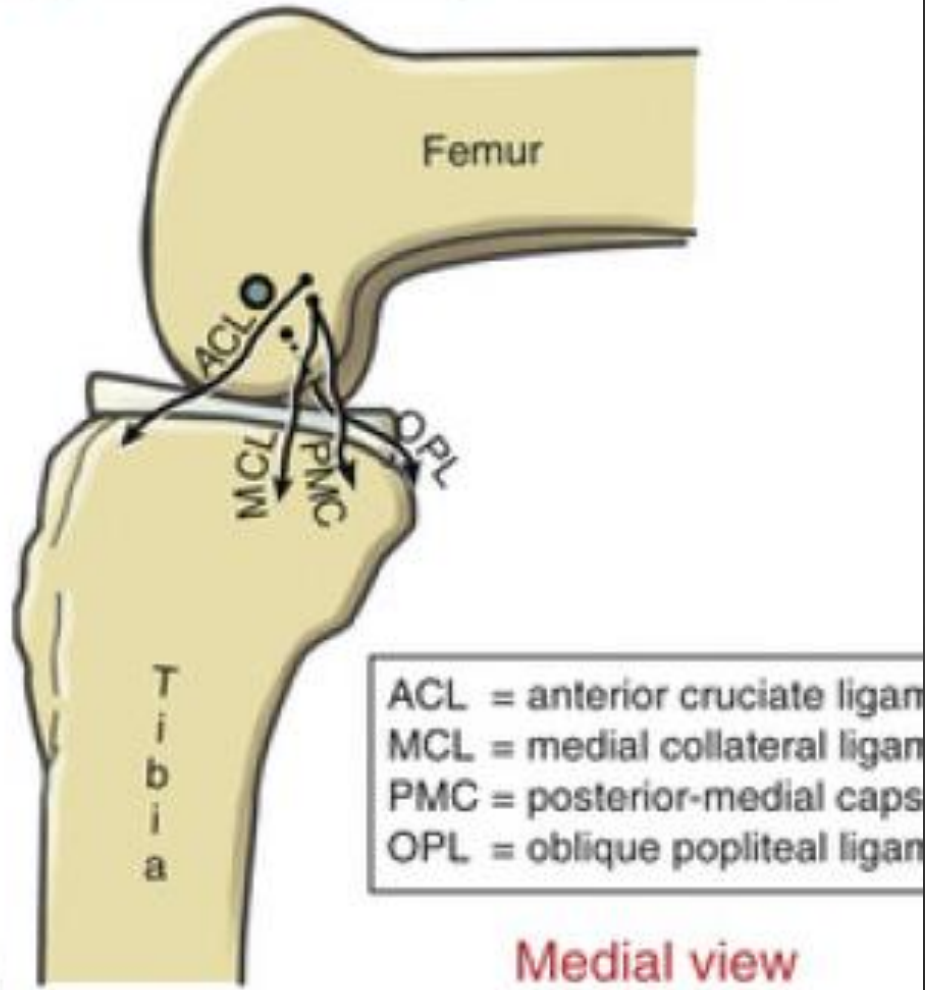
## Factors guiding "screw-home" rotation



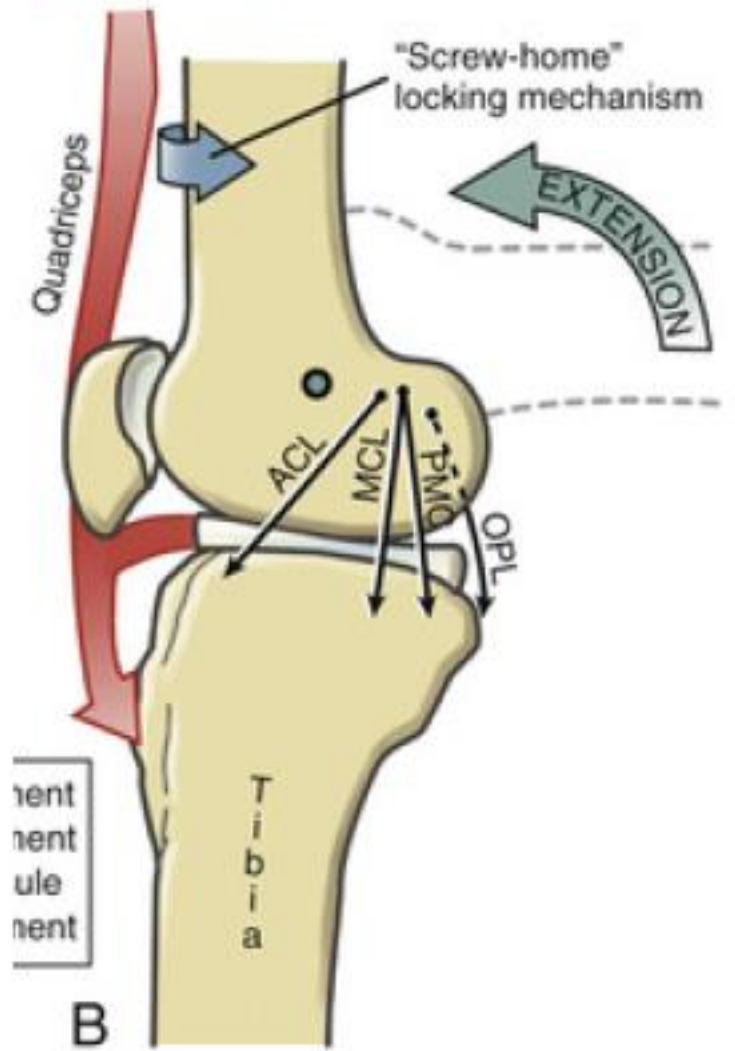


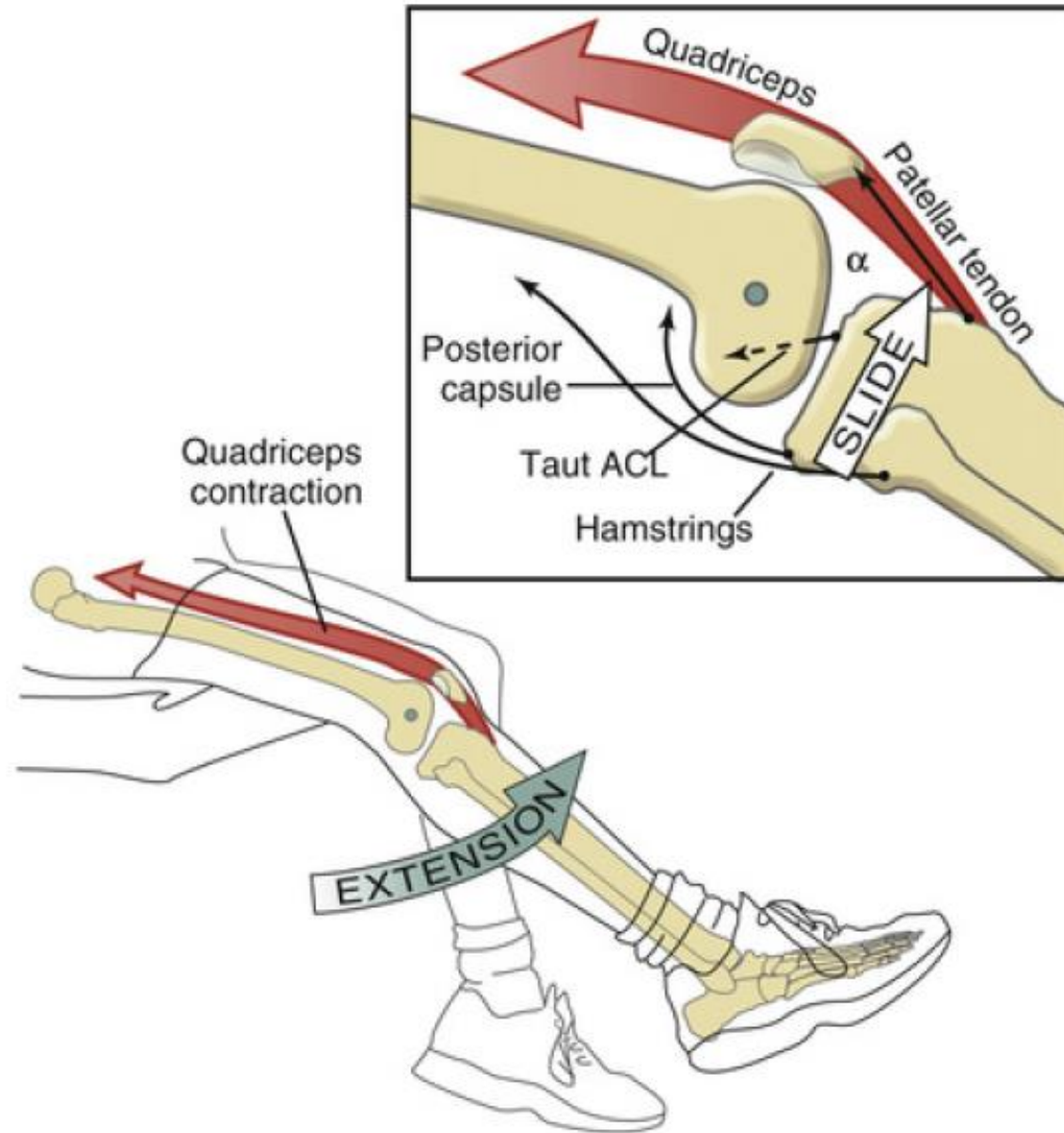
ACL injuries occur when bones of the leg twist in opposite directions under full body weight

### Ligaments relatively slack in flexion



### Ligaments pulled taut in extension

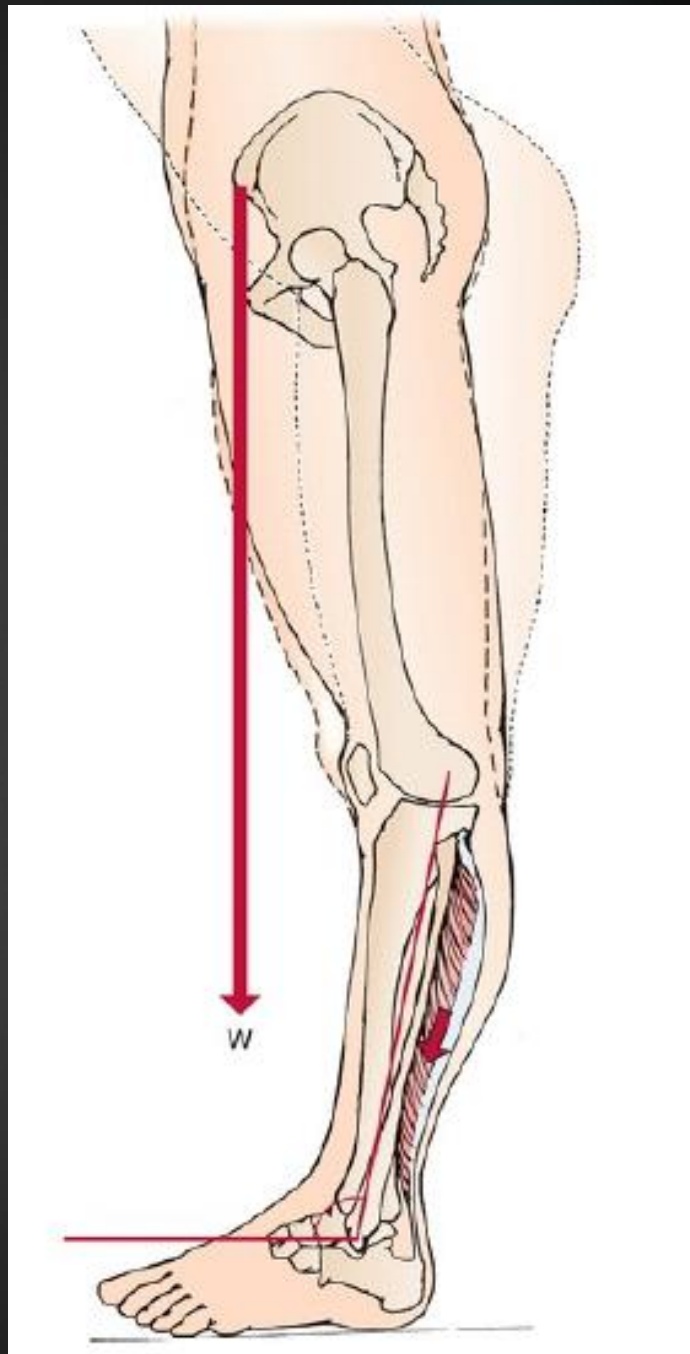
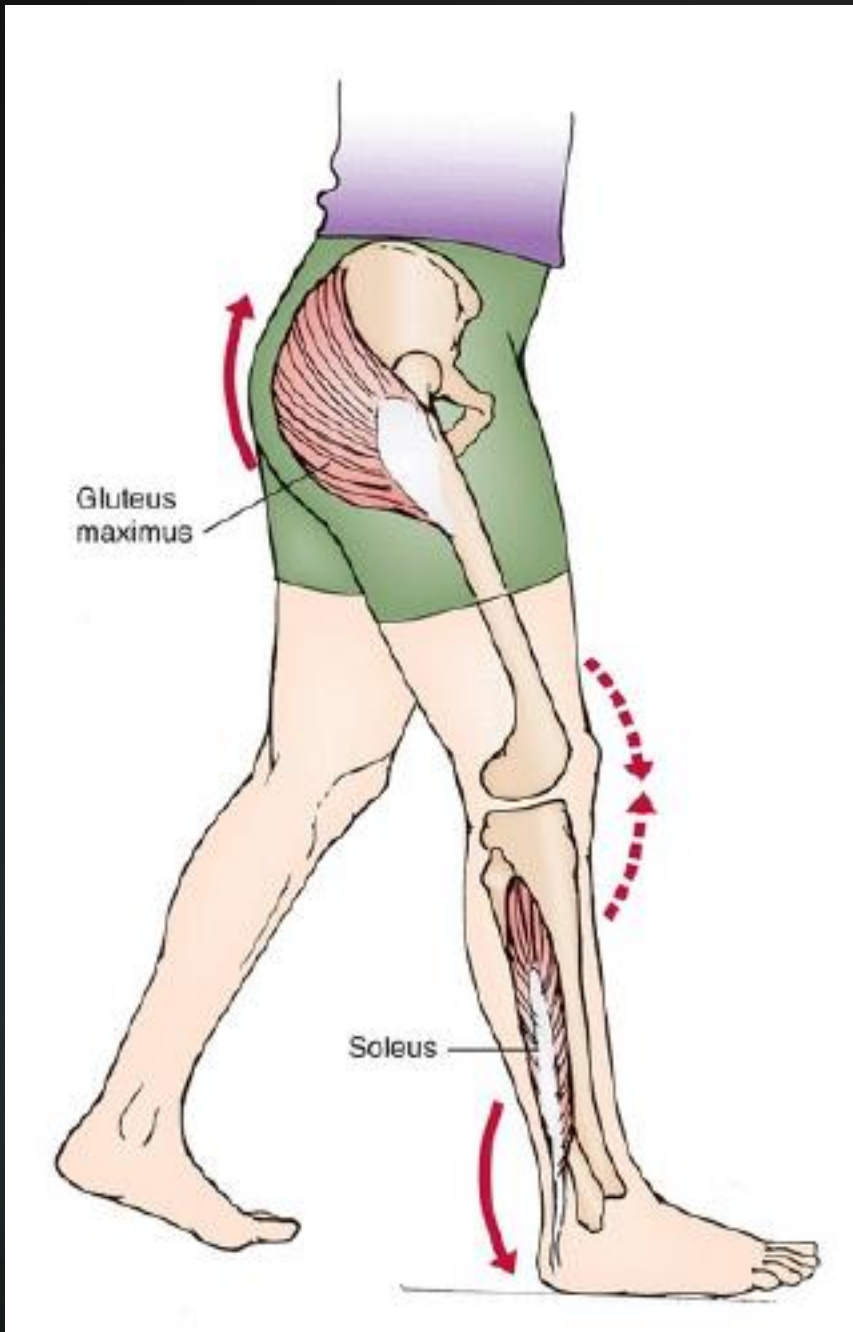


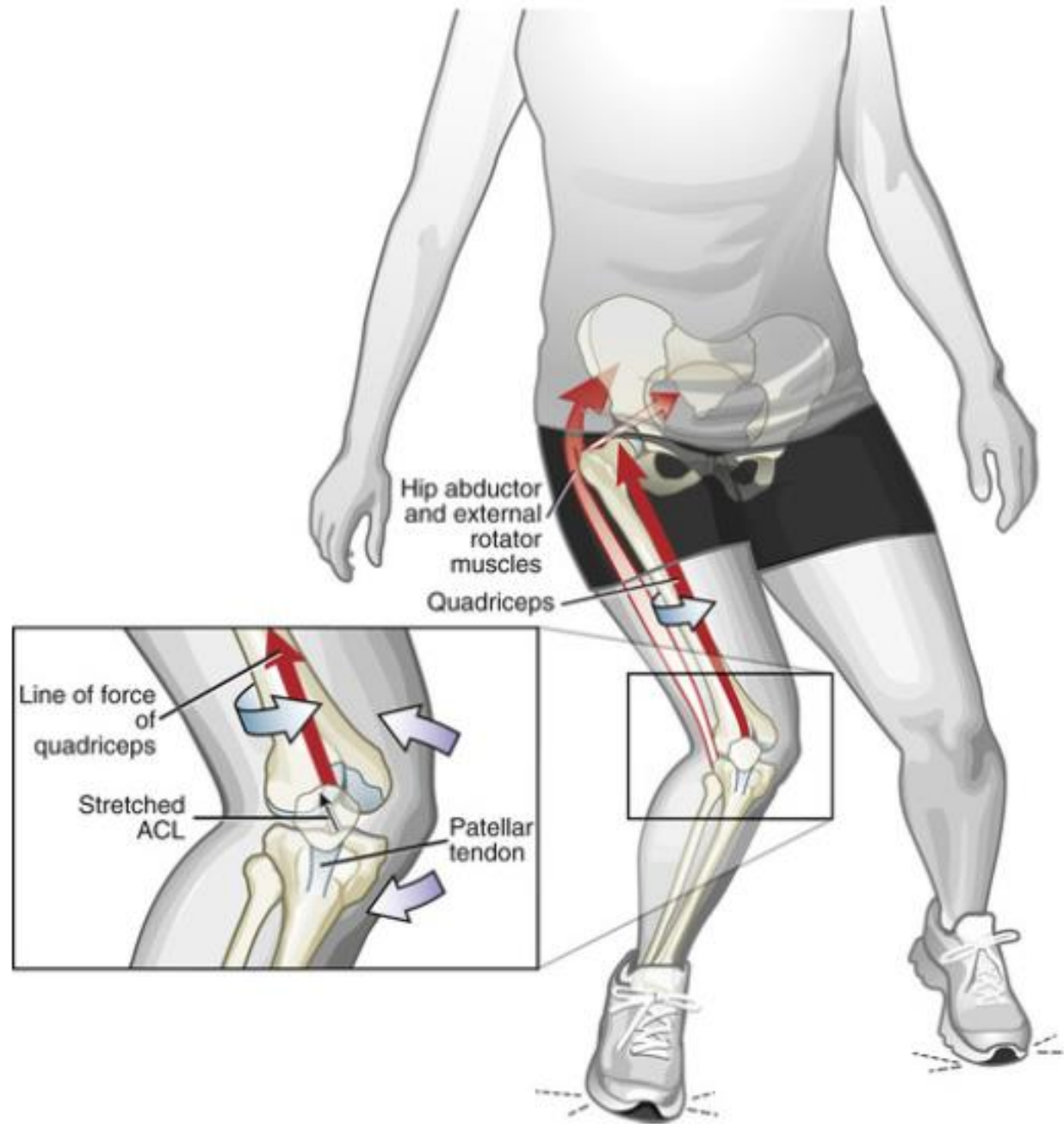


A

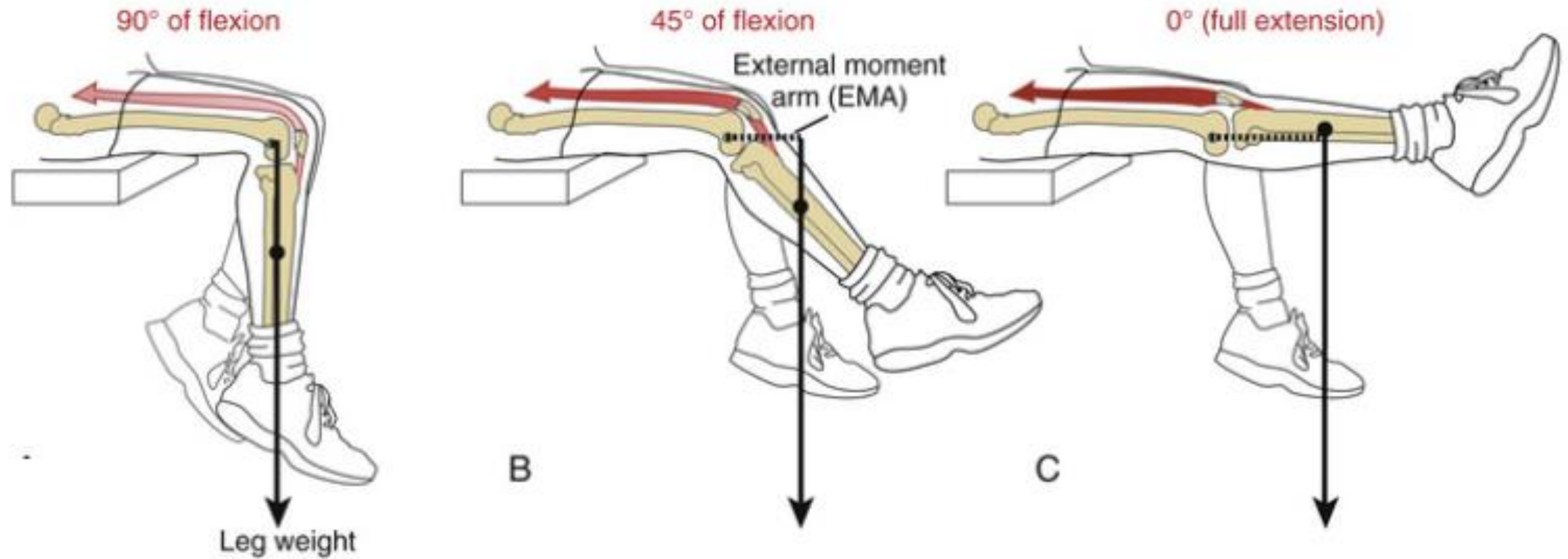
Active knee extension

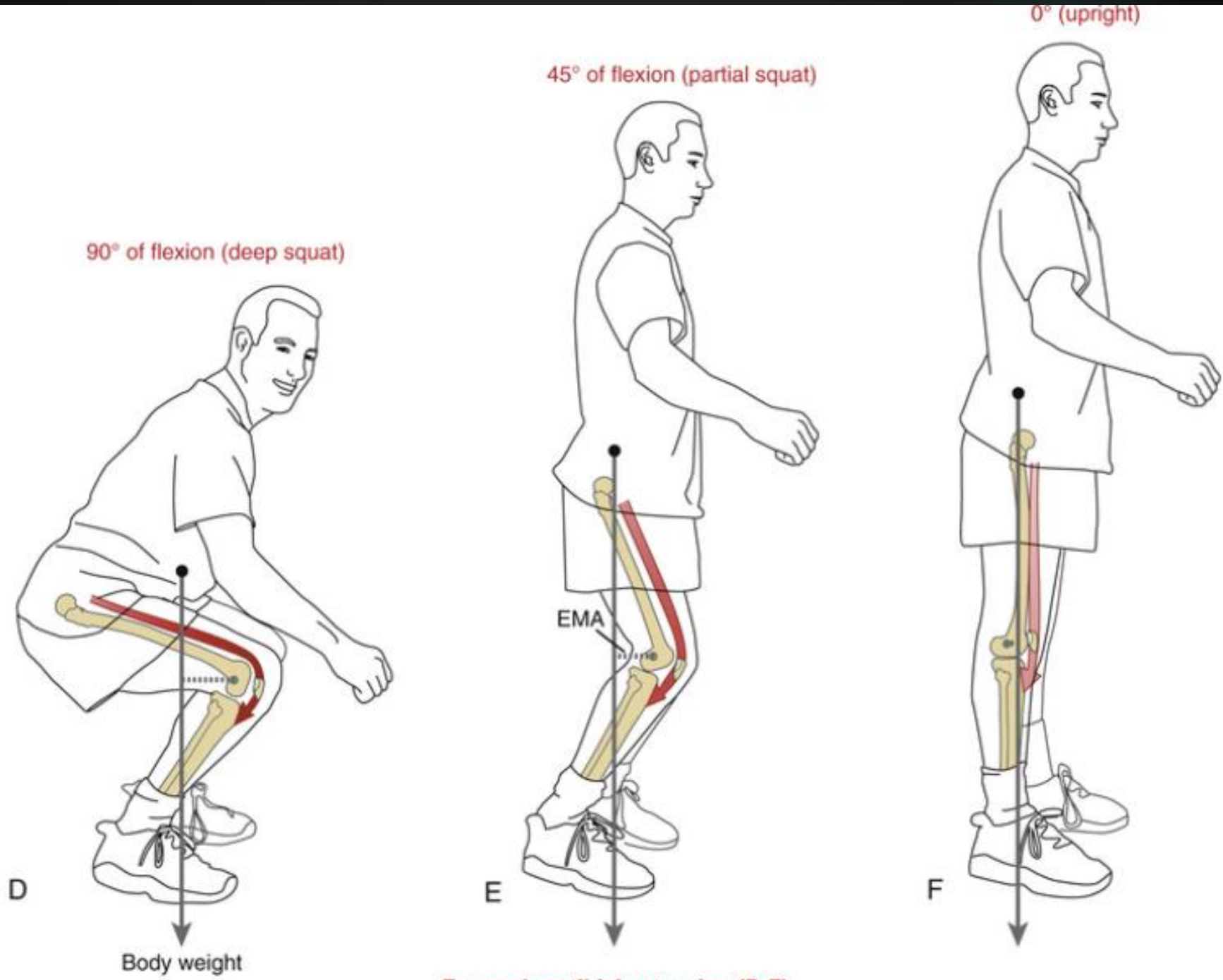






### Tibial-on-femoral extension (A-C)





Femoral-on-tibial extension (D-F)

# ACL Injury Risk Factors

## Intrinsic

(Risk factors specific to the traits of the person at risk)

### Non-modifiable

(e.g., anatomy, medical history, genetics)

### Modifiable

(e.g., strength, core stability, body awareness)

## Extrinsic

(Risk factors beyond the traits of the person at risk)

### Non-modifiable

(e.g., weather conditions, level of competition)

### Modifiable

(e.g., field conditions, participation per week)

# Modifiable Risk Factors for ACL Injury

## Low Back & Pelvis

- Excessive low back arch
- Anterior pelvic tilt

## Hip and Thigh

- Femoral internal rotation
- Femoral adduction
- High quad to hamstring ratio

## Knee

- Increased knee valgus angle
- Smaller knee flexion angle
- Tibial external rotation

## Foot and Ankle

- Foot pronation
- Foot external rotation

## GRADE

# 1

- Mildly damaged.
- Slightly stretched, but is still able to help keep the knee joint stable.

## GRADE

# 2

- Becomes loose.
- Referred to as a partial tear of the ligament.
- Rarely occur.

## GRADE

# 3

- Most commonly referred to as a complete tear.
- The ligament has been split into two pieces, and the knee joint is unstable.



# Systematic Video Analysis of ACL Injuries in Professional Male Football (Soccer)

24

## Study Details

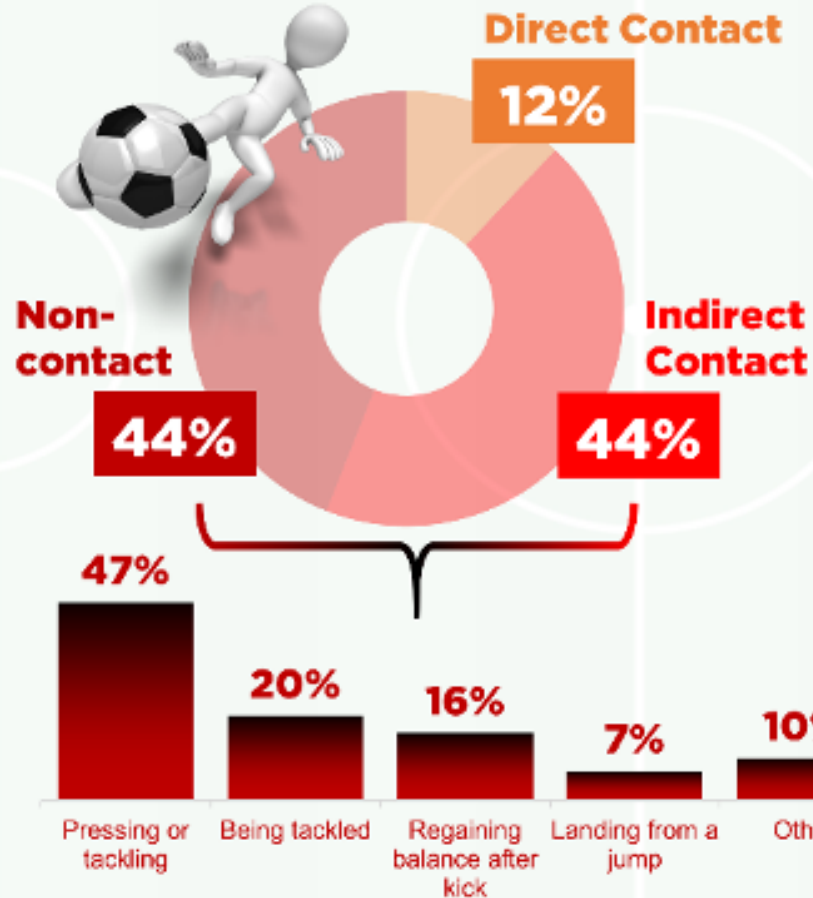
148 *anterior cruciate ligament (ACL)* injuries across 10 seasons of professional Italian football were analyzed with video; in 134 and 107 videos, mechanism and situational pattern, and biomechanical analysis, could be determined, respectively.



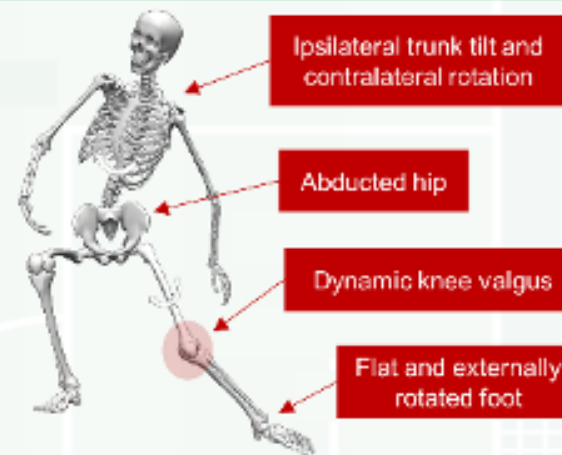
## Main Findings

- 1 Indirect contact ACL injuries were equally as prevalent as non-contact injuries.
- 2 Pressing or tackling, being tackled, regaining balance after kicking, and landing from a jump were the most frequent situational patterns.
- 3 Injuries were more prevalent at start of the match than at the end of the match.

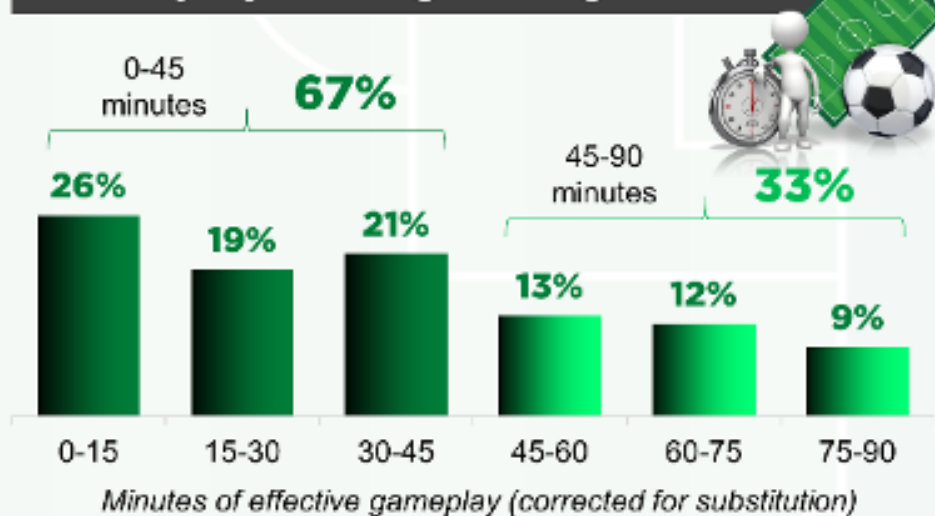
## Injury Mechanism and Situational Patterns



## Most Frequent Inter-segmental Positioning at Injury Frame

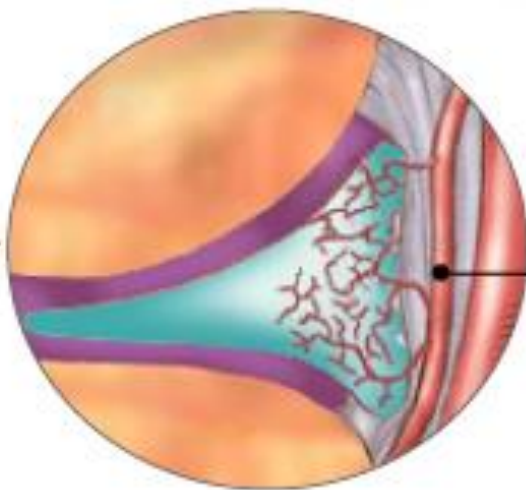
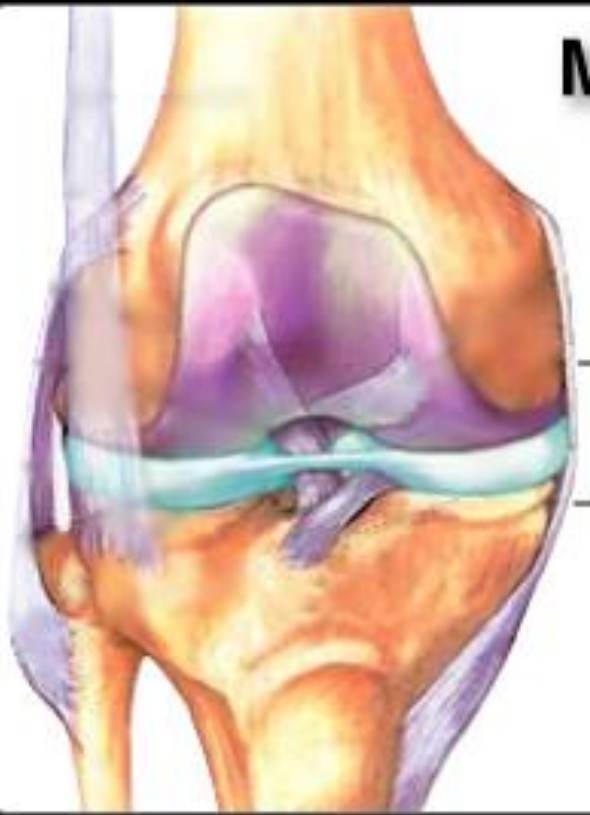


## Injury Timing During Matches





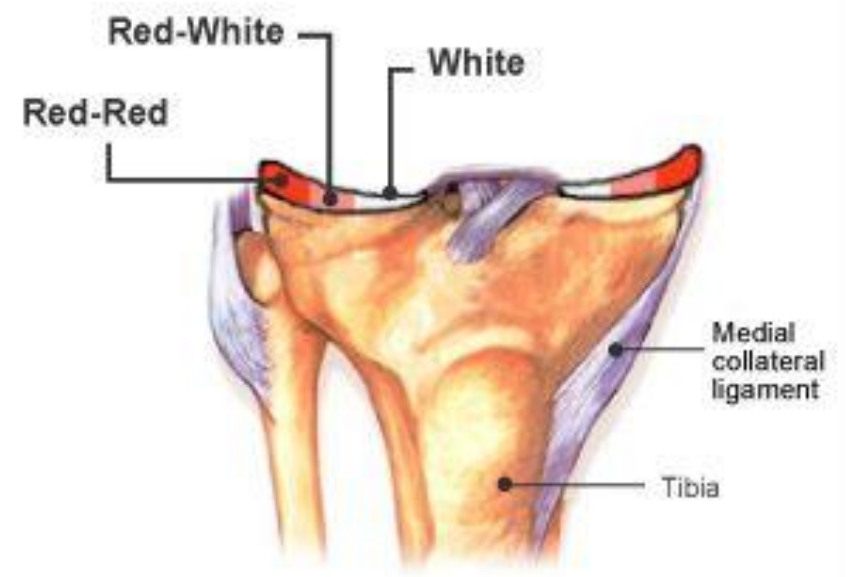
# Meniscus Blood Supply Perimeniscal Plexus



Inferior genicular artery

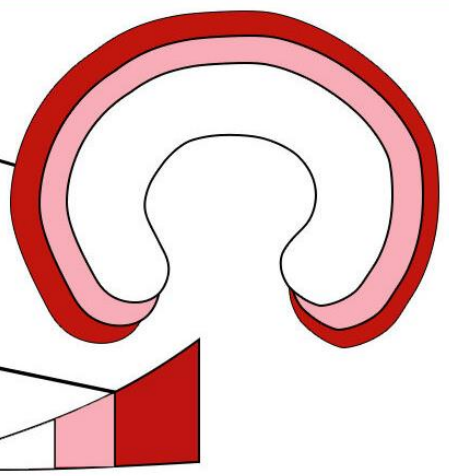
MendMeShop

# Meniscal Blood Zones

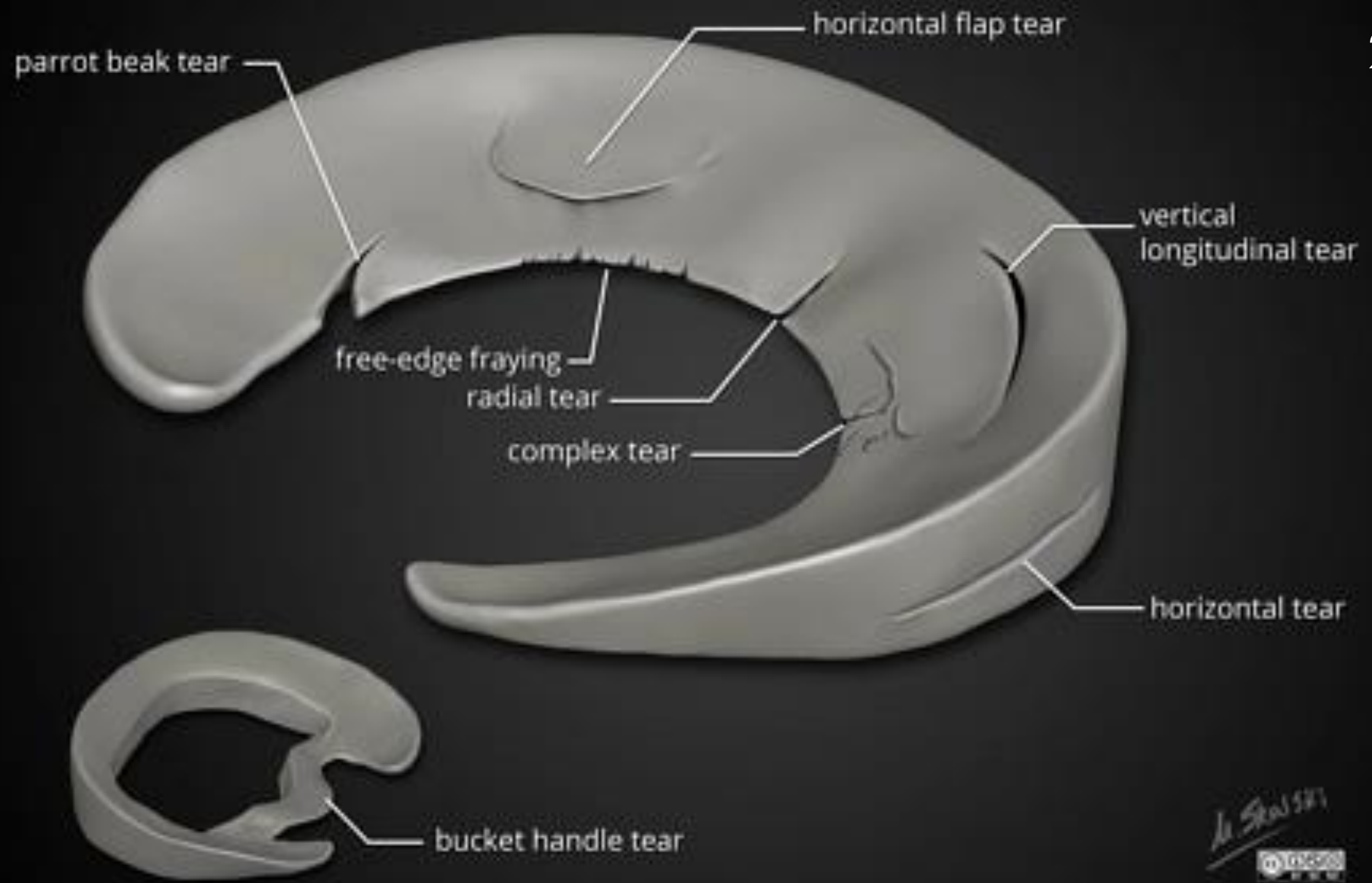


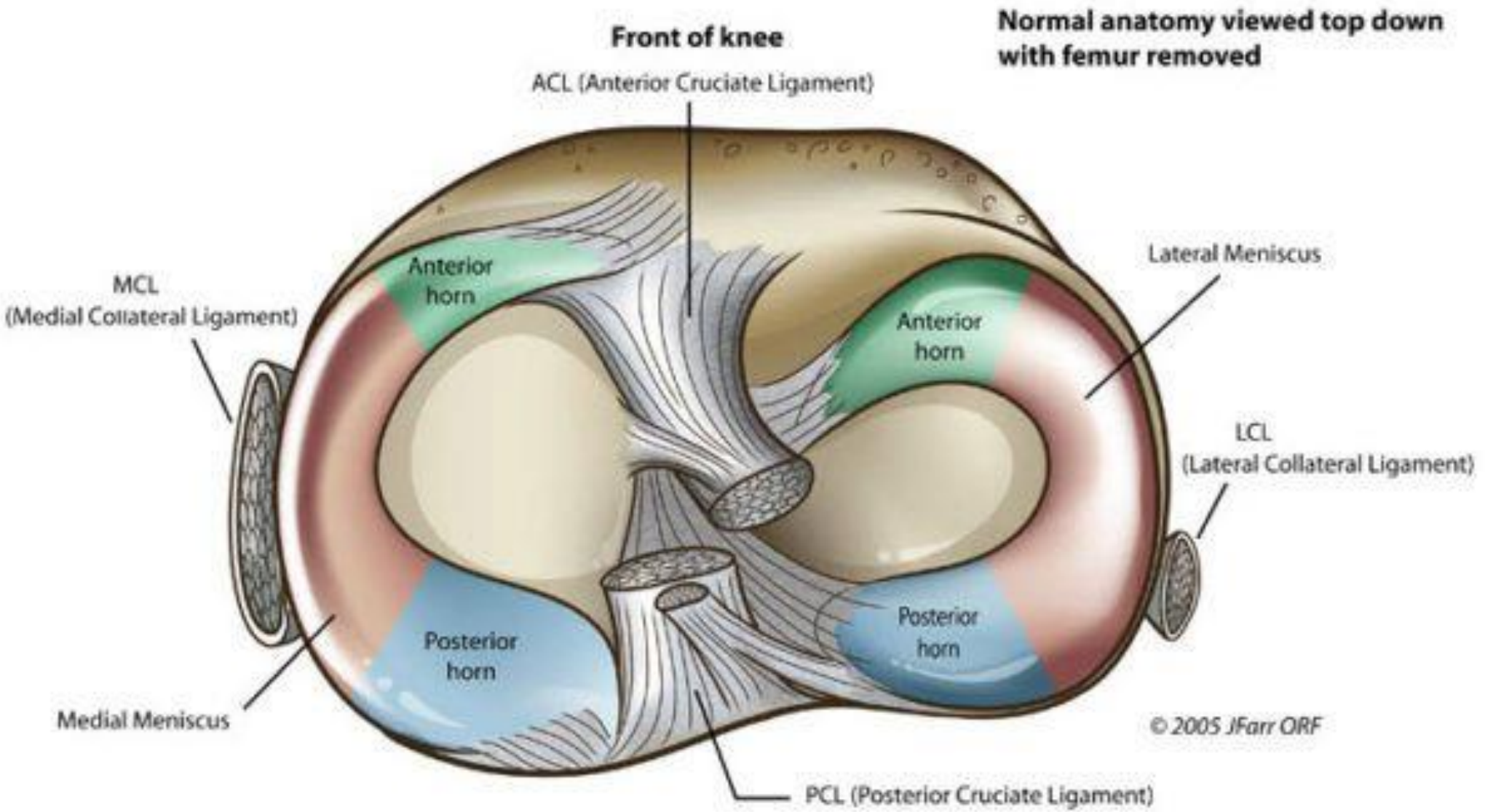
Outer third (red zone)  
Good blood supply

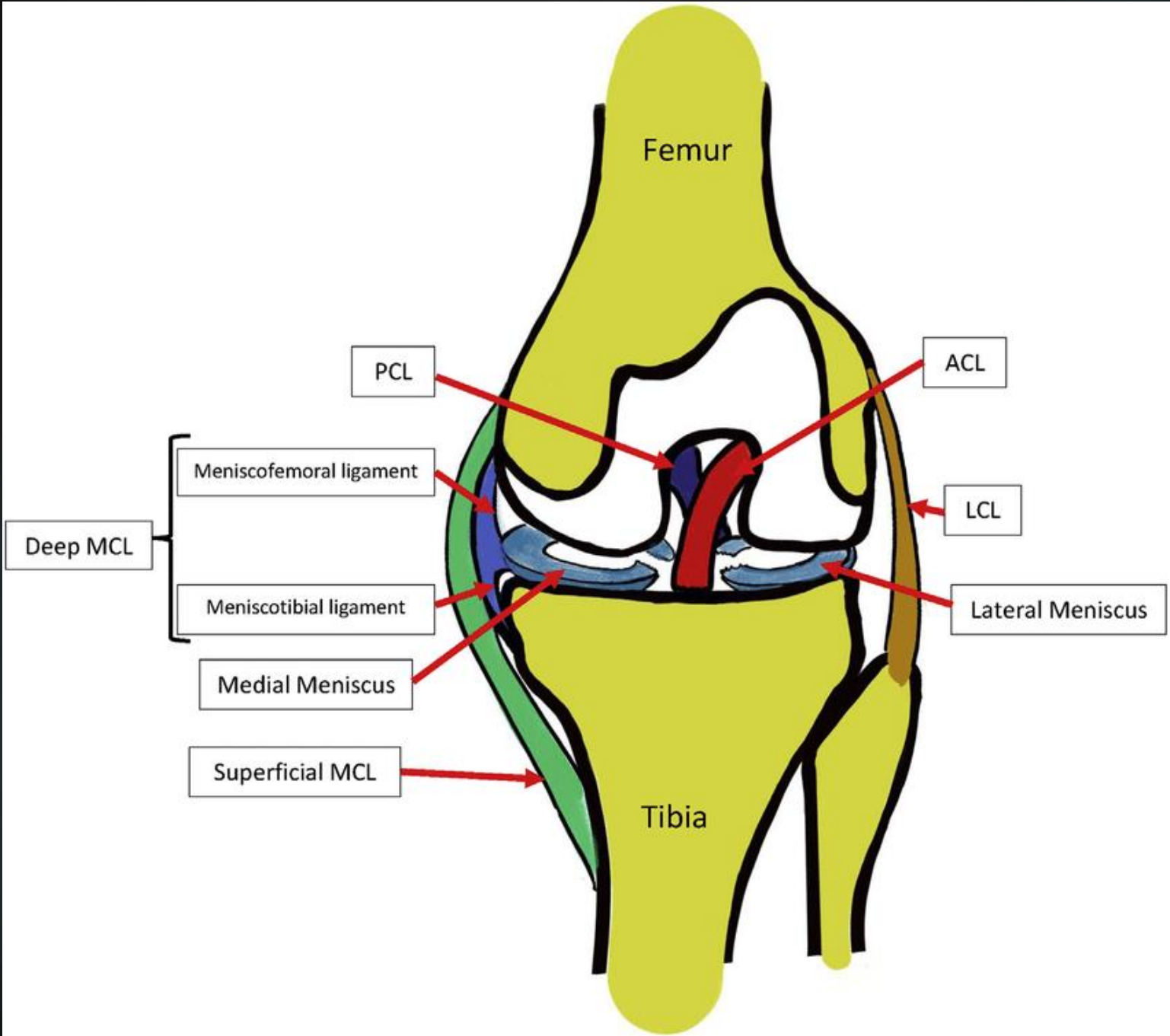
Inner two-thirds (white zone)  
Lacks blood supply

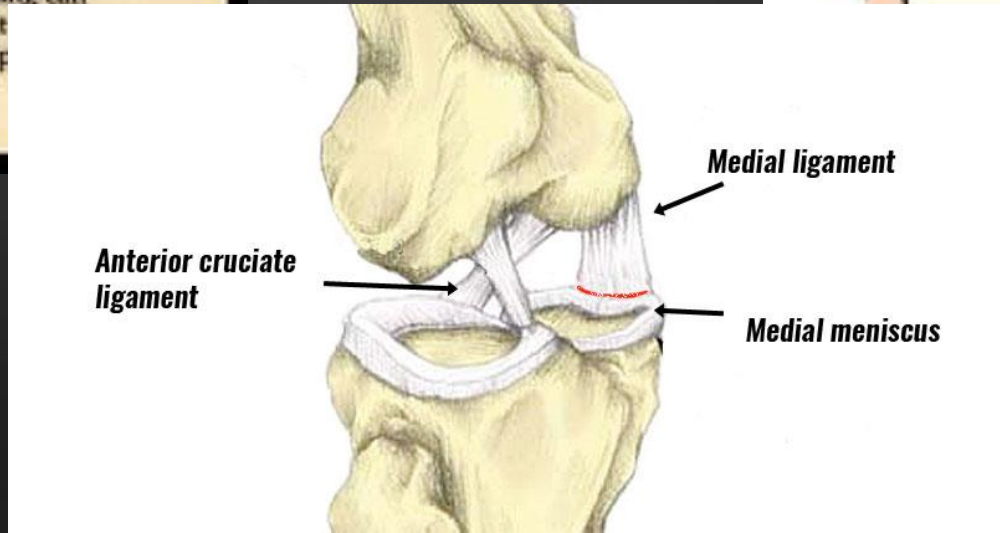
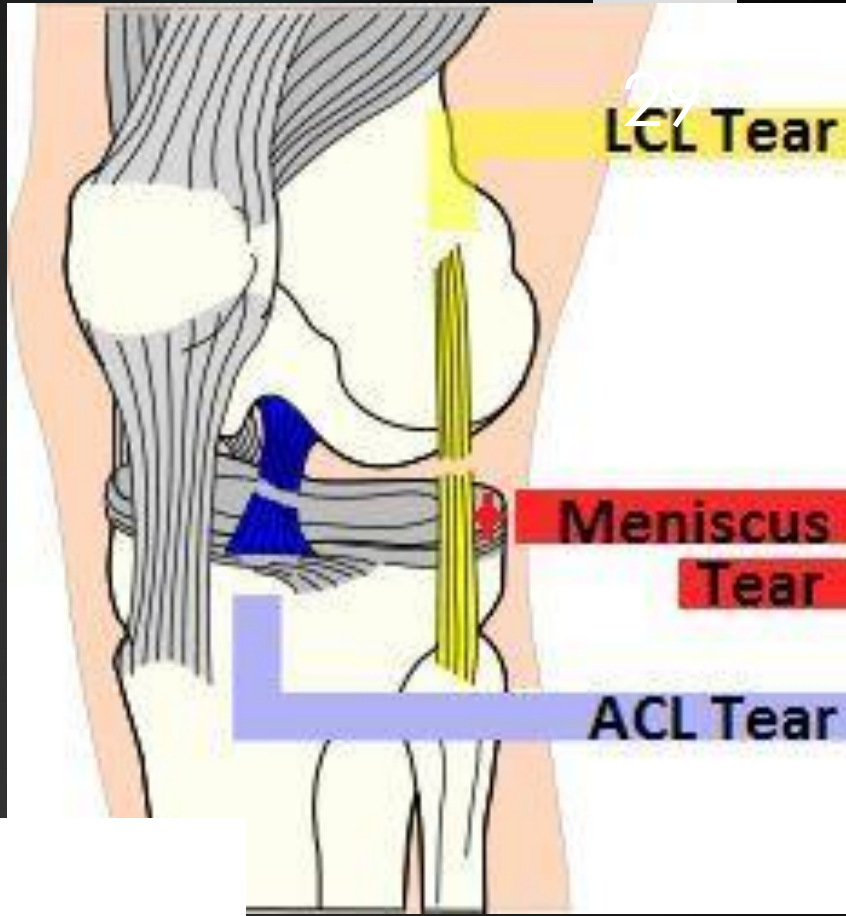
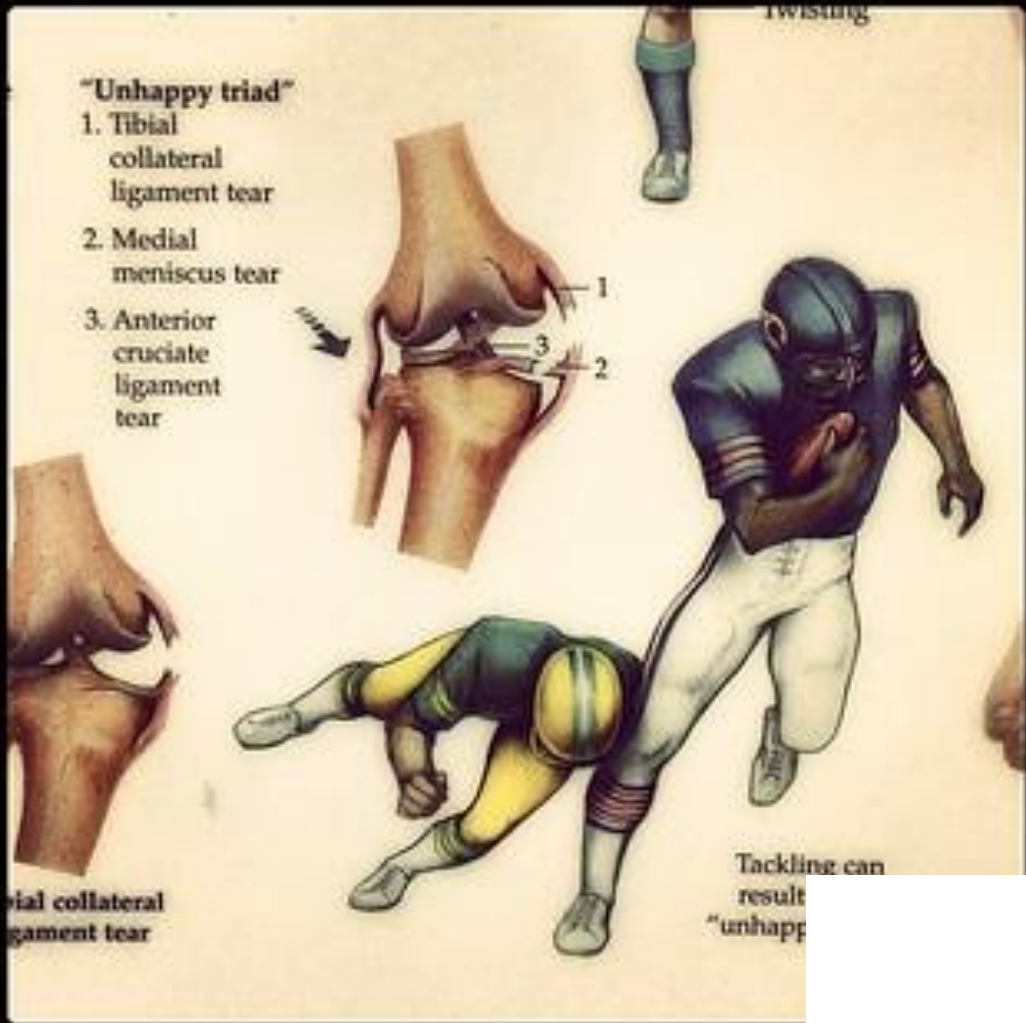


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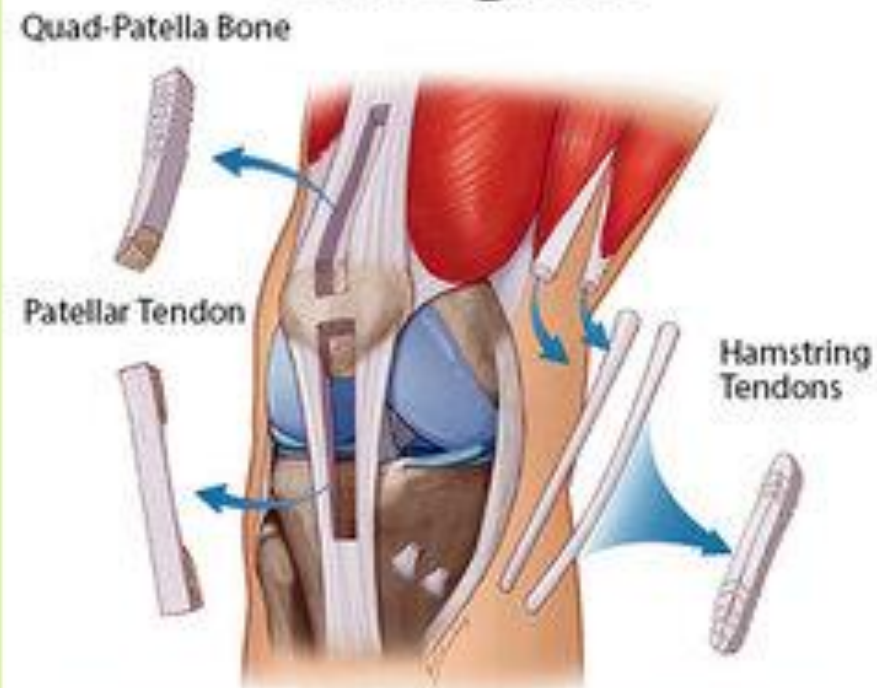


# Reconstructed Anterior Cruciate Ligament Graft Options

## Allograft



## Autograft



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A. *Achilles tendon*



B. *Hamstring tendon*



C. *Patellar tendon*



# Nonsurgical Treatment

- Nonsurgical management is indicated in patients with
  - partial tears and no instability symptoms
  - complete tears and no symptoms of knee instability
  - Who do light manual work or live sedentary lifestyles
  - Whose growth plates are still open (children)

# ANATOMIC SINGLE AND DOUBLE BUNDLE RECONSTRUCTION





Causes of complications of anterior cruciate ligament reconstruction



### سعدی « دیوان اشعار » غزلیات

سر بندگی به حکمت بنهم که پادشاهی  
 تو هزار خون ناحق بکنی و بی گناهی  
 همه جانب تو خواهند و تو آن کنی که خواهی

اگرم حیات بخشی و گرم هلاک خواهی  
 من اگر هزار خدمت بکنم گناهکارم  
 به کسی نمی توانم که شکایت از تو خوانم