KNEE (Tibiofemoral) JOINT
Human Anatomy lecture

I. Overview
   ➔ Illustrates trade-off between mobility vs. strength
   ➔ Body’s largest, most complex joint
      - actually 3 joints-in-one --
      - 3 bones
      - 10 ligaments
      - 13 bursae
      - 2 discs

   KNOW Fig. 9.23a, b, c, d

II. Bones and cartilage
   A. Femur and tibia
      1. ends are enlarged & covered with articular cartilage
      ➔
   2. femoral condyles -
   3. tibial condyles –

   B. Patella
      1. largest sesamoid bone
      2. posteriorly covered with articular cartilage
      3. forms planar joint with the femur
      4. Functions
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   C. Fibula
      1. not directly involved
      2. site of c.t. attachment

   D. Articular discs (menisci)
      1. wedge-shaped crescents of fibrocartilage
      ➔
      2. anchored at ends, but mobile
3. Functions?

III. Ligaments and tendons

- no true fibrous capsule

A. Anteriorly

- tendon of quadriceps femoris

  ↓

  patella embedded

  ↓→ patellar ligament

  attached to tibial tuberosity

B. Laterally

1. tibial (medial) collateral ligament

2. fibular (lateral) collateral ligament

3. tendons of “hamstrings” also stabilize laterally

-- insert sketch, lateral view
- In extension, both collaterals are taut
- this prevents you from hyperextension and from falling forward at the knee, **with minimal muscular effort**

C. Posteriorly – 2 membranous ligaments
– insert sketch

- oblique popliteal (="knee-pit")
- arcuate popliteal
- hamstrings, popliteus and gastrocnemius muscles also help

⇒ All help prevent hyperextension

D. Internally (intracapsular ligaments)
1. named after attachment on **tibia**

2. “cruciate” = “cross”
   - anterior cruciate ligament - attached anteriorly, medially on tibia
   - posterior cruciate ligament - more posterior and laterally

3. Functions
   - hold bones together (always taut)
   - prevent tibia from sliding on the femur, both anterior/posterior & side-to-side

IV. **Bursae and fat pads**
A. Bursae - 13
   -- c.t. sacs lined with synovial membrane
   -- small amount of synovial fluid
   -- may communicate with the joint cavity
   -- reduce friction
   - prepatellar bursa -
   - suprapatellar bursa -
   - infrapatellar bursa (superficial & deep) -
B. Tendon sheaths (Fig. 9.5)
   - tubular bursae around tendons
   -

C. Infrapatellar fat pad
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   -

V. Synovial cavity and membrane
   -- extensive and complex potential space: <1ml fluid
   -- injury ↪

VI. Clinical applications
   A. Knee is most commonly injured joint
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   B. Most common injury is lateral blow: “3 C’s” or “Unhappy Triad”
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   -

   C. Severe injuries can be repaired by arthroplasty – Fig. 9.28