

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 bursa
- 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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-
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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?

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III. Ligaments and tendons

- no true fibrous capsule

A. Anteriorly

- tendon of quadriceps femoris

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patella embedded



→ patellar ligament

attached to tibial tuberosity

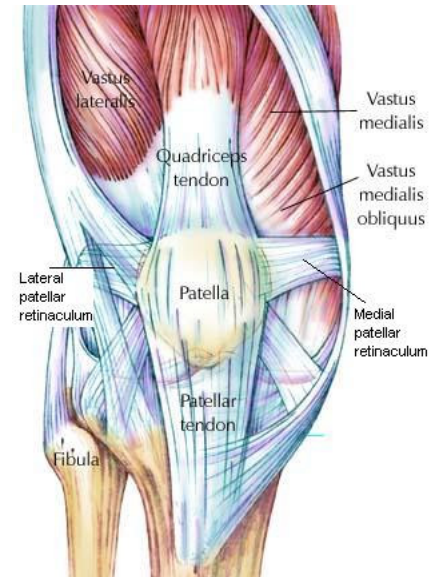
B. Laterally

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 – prevent hyperextension
 – insert sketch

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

D. Internally (intracapsular ligaments)

1. named after attachment on **tibia**

2. “cruciate” = “cross”

anterior cruciate ligament - attached anteriorly, medially on tibia

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posterior cruciate ligament - more posterior and laterally

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3. Functions

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

IV. Bursa and fat pads

A. Bursa - 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

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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