

The Knee Joint

- Muscles that cross the Hip and Knee Joints
- Sartorius:
 - Hip flexion Knee flexion
 - Rectus Femoris:
 - Hip flexion Knee extension
 - Tensor Fasciae Latae:
 - Hip abd., flx. Knee ext
 - tenses fascia latae & extends knee via iliotibial tract
 - Biceps Femoris (long head):
 - Hip ext., ext rot. Knee flx., ext. rot.

- Muscles that cross the Hip and Knee Joints
- Semitendinosus
 - Hip Ext., int. rot. Knee flex, int. rot.
 - Semimembranosus
 - Hip ext., int. rot. Knee flx., int. rot.
 - Gracilis
 - Hip add, int. rot. Knee flx.

The knee joint

- Complex structure because of the knee functions:
 - allow mobility (flexion/extension)
 - must have some inherent stability
 - weight bearing joint

The knee joint

- Largest joint in the body.
- Classified as a ginglymus (hinge) joint
- Allows for primarily flexion and extension
- There is, however, some rotation allowed about the knee joint.

Articulating Bones

- Femur
- Tibia
- Patella
- Not part of the knee joint:
 - fibula - it does not articulate with the femur or the patella

Important Structural Landmarks

- Femur
 - lateral and medial condyles
 - convex surface
- Tibia
 - lateral and medial condyles
 - concave surface
 - tibial tuberosity
- Fibula
 - (technically not part of knee, but important structure)

Connective Tissue

- Medial (tibial) Collateral Ligament
- Lateral (fibular) Collateral Ligament
- Cruciate ligaments
 - Anterior (ACL)
 - Posterior (PCL)
 - Named based on attachment point on tibia.
- Menisci
 - medial and lateral

Movements about the knee joint

- Flexion
- Extension
- Internal (inward) rotation
 - Anterior aspect of tibia rotates inward.
- External (outward) rotation
 - Anterior aspect of tibia rotates outward.

Muscles

- Knee Extensors
 - Rectus femoris (two joint muscle)
 - Vastus medialis
 - Vastus intermedius
 - Vastus lateralis

Muscles

- Knee flexors
 - Biceps femoris (long *, short)
 - Semimembranosus *
 - Semitendinosus *
 - Sartorius *
 - Gracilis *
 - Popliteus
 - Gastrocnemius *
 - (* = crosses two joints)

Muscles

- Internal rotation about the knee
 - popliteus
 - semimembranosus
 - semitendinosus
- External rotation about the knee
 - biceps femoris

Popliteus (p104)

- Origin
 - posterior surface of lateral epicondyle of the femur
- Insertion
 - Popliteal surface of the tibia
- Action
 - Knee flexion
 - Internal rotation about the knee

Hamstring Muscles

- Semimembranosus (medial muscle)
- Semitendinosus (medial muscle)
- Biceps Femoris (lateral muscle)
- Actions
 - Knee flexion
 - Hip extension
 - thigh and leg rotation
 - internal (ST, SM)
 - external (BF)

Biceps Femoris Muscle (p105)

- Origin
 - Long head: ischial tuberosity
 - Short head: posterior aspect (linea aspera) of femur
- Insertion
 - Lateral condyle of the tibia and head of the fibula
- Action
 - Hip extension
 - Knee flexion
 - External rotation of the hip and knee

Semimembranosus Muscle (p106)

- Origin
 - Ischial tuberosity
- Insertion
 - Postero-superior surface of the medial tibial condyle
- Action
 - Hip extension
 - Knee flexion
 - Internal rotation about the hip and knee

Semitendinosus Muscle (p107)

- Origin
 - Ischial tuberosity
- Insertion
 - Upper anterior medial surface of the tibia
- Action
 - Hip extension
 - Knee flexion
 - Internal rotation about the hip and knee

Quadriceps

- Four-headed muscle
 - Rectus Femoris (two joint muscle)
 - Vastus medialis
 - Vastus intermedius
 - Vastus lateralis

Rectus Femoris (p108)

- Origin
 - Anterior inferior iliac spine of ilium
 - upper lip of acetabulum
- Insertion
 - Superior aspect of patella & tibial tuberosity via patella tendon
- Action
 - Hip flexion
 - knee extension

Vastus Intermedius (p109)

- Origin
 - upper two thirds of anterior-lateral aspect of femur
- Insertion
 - Upper border of patella
 - tibial tuberosity via patella tendon
- Action
 - Knee extension

Vastus Lateralis (p110)

- Origin
 - inferior border of greater trochanter
 - portion of linea aspera
- Insertion
 - lateral border of patella
 - tibial tuberosity via patella tendon
- Action
 - knee extension

Vastus Medialis (p111)

- Origin
 - linea aspera of femur
- Insertion
 - medial aspect of patella
 - tibial tuberosity via patella tendon
- Action
 - Knee extension

Knee Summary

- Bones
 - femur, tibia, patella
- Joint
 - tibiofemoral
- Movements
 - flexion, extension, internal rot., external rot.
- Muscles
 - Quadriceps, hamstrings, sartorius, gracilis, popliteus
