

Structural Techniques for Knee Dysfunction

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The knee joint is one of the most complex joints in the body. Overuse, injury and instability have significant functional implications which often lead to pain and movement restrictions. The gentle, non-invasive structural techniques of Ortho-Bionomy are highly effective in addressing many of the dysfunctions associated with knee issues.

Workshop Objectives

- Understand the anatomical and functional mechanisms of the knee joint
- Assess dysfunction patterns associated with many knee conditions
- Utilise the principles and structural release techniques of Ortho-Bionomy for the knee and lower limb
- Identify client exercises for releasing and re-educating the knee
- Gain skills for working with knee joint issues to help your clients

Knee Pathologies

- Osteoarthritis – OA
- Bursitis
- Plica Syndrome
- Meniscus Injury
- Patellofemoral Pain Syndrome – PFPS
- Osgood-Schlatter's disease and Sinding Larsen Johansson syndrome
- Chondromalacia Patellae
- Osteochondritis dissecans
- Tendinitis
- Baker's Cyst
- Joint Replacement

Anatomy and Function

- Bony Structures
- Muscles
- Menisci
- Joint Capsule and Connective Tissues
- Innervation



Bones of the Knee Joint

Muscle and Connective Tissue Structures

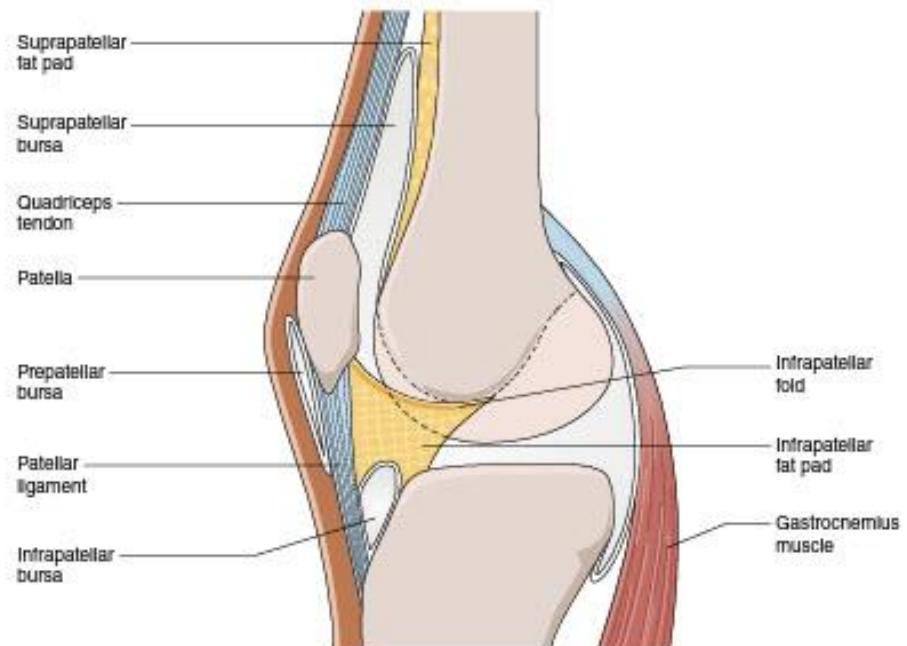
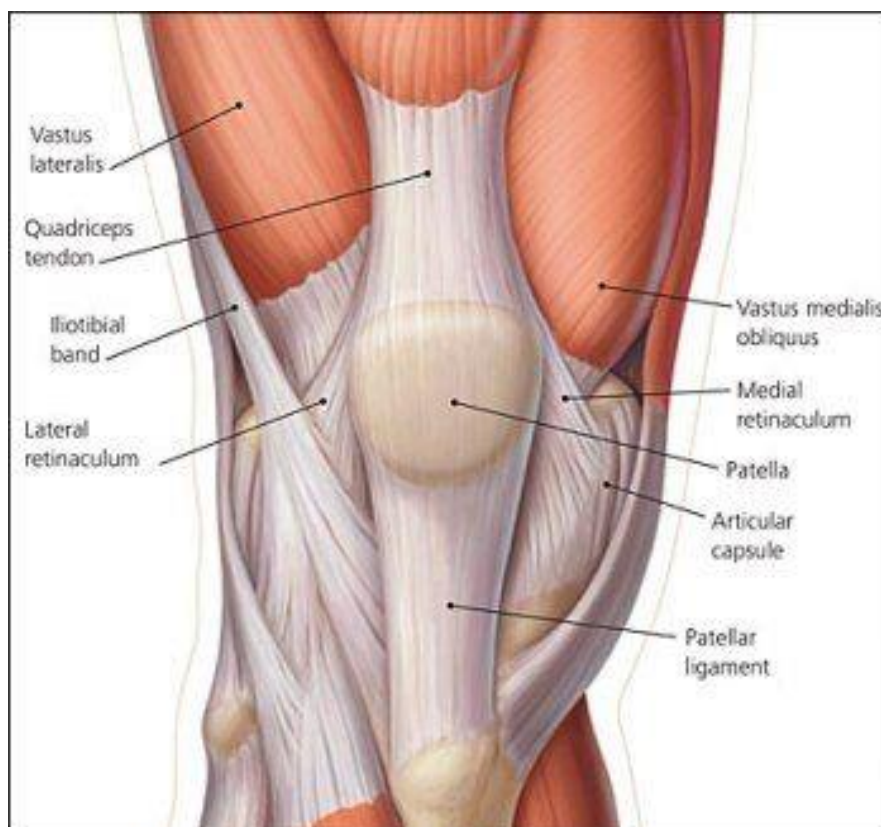


FIGURE 6.13 Sagittal section through the knee complex showing the shape of the capsule in extension.



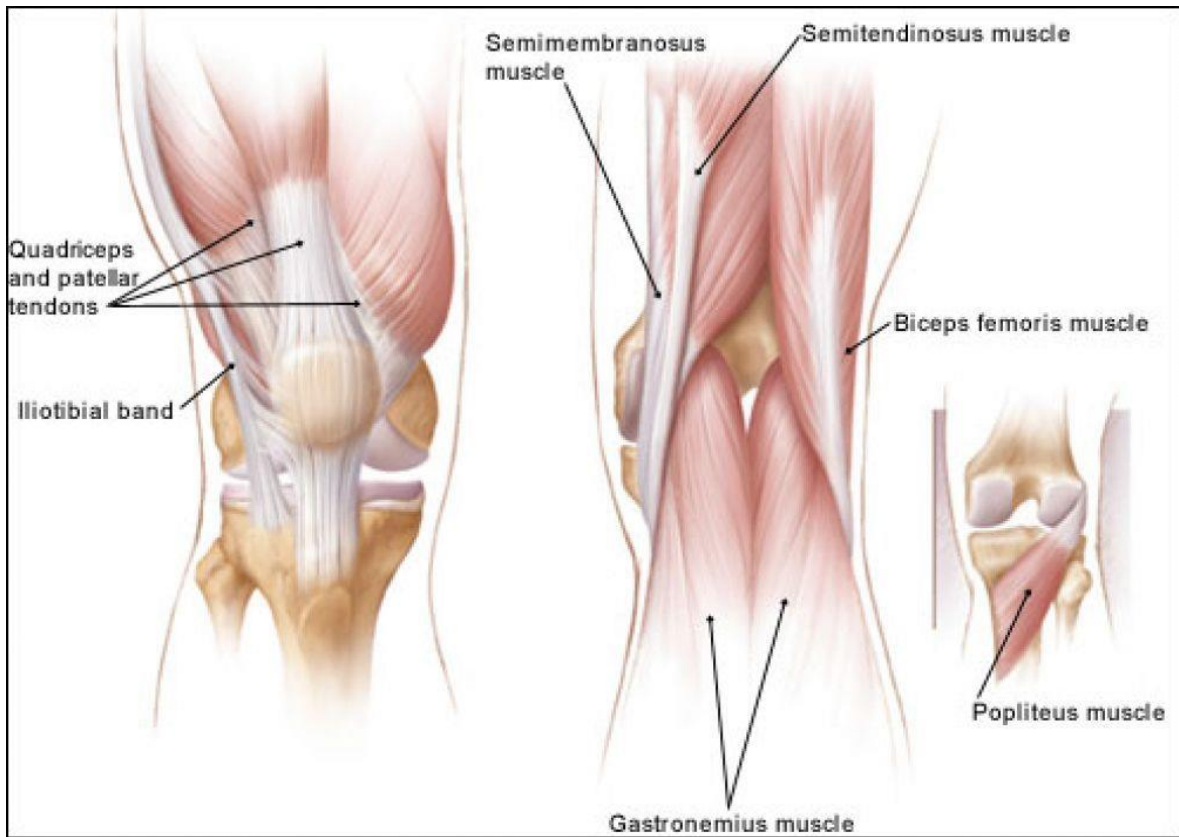


Illustration © 1999 Christy Krames

Menisci

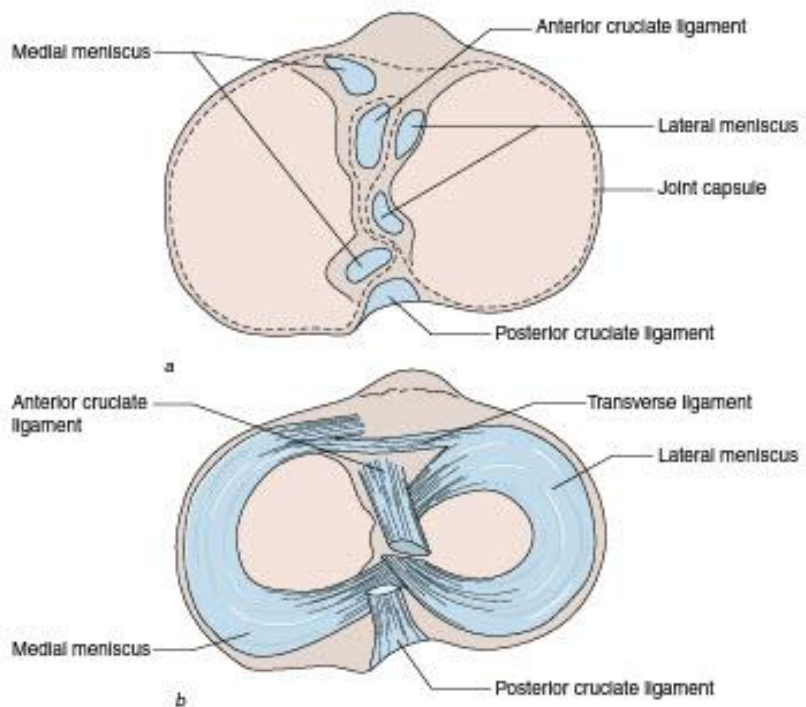


FIGURE 6.11 Menisci and cruciate ligaments. Superior aspect of the right tibia showing the location of (a) the attachments of the menisci and cruciate ligaments and the outline of the joint capsule and (b) the menisci and cruciate ligaments.

Order of Movement in the Knee Joint

Flexion:

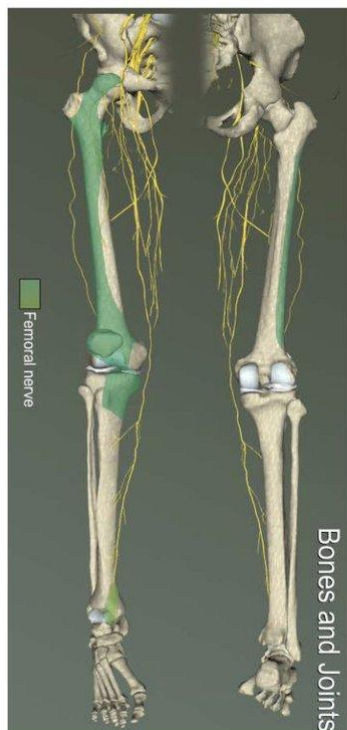
- Lateral rotation
- Glide
- Hinge

Extension:

- Hinge
- Glide
- Medial rotation

Knee Innervation

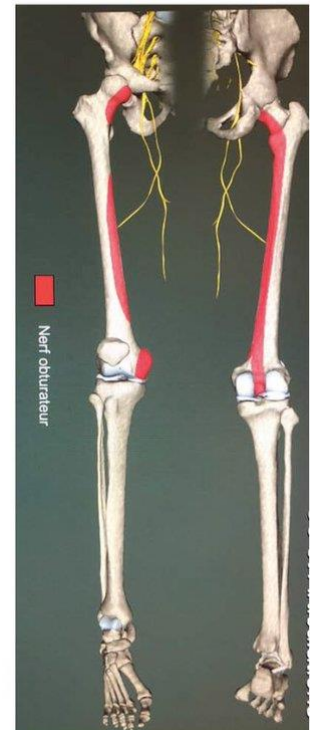
Femoral Nerve

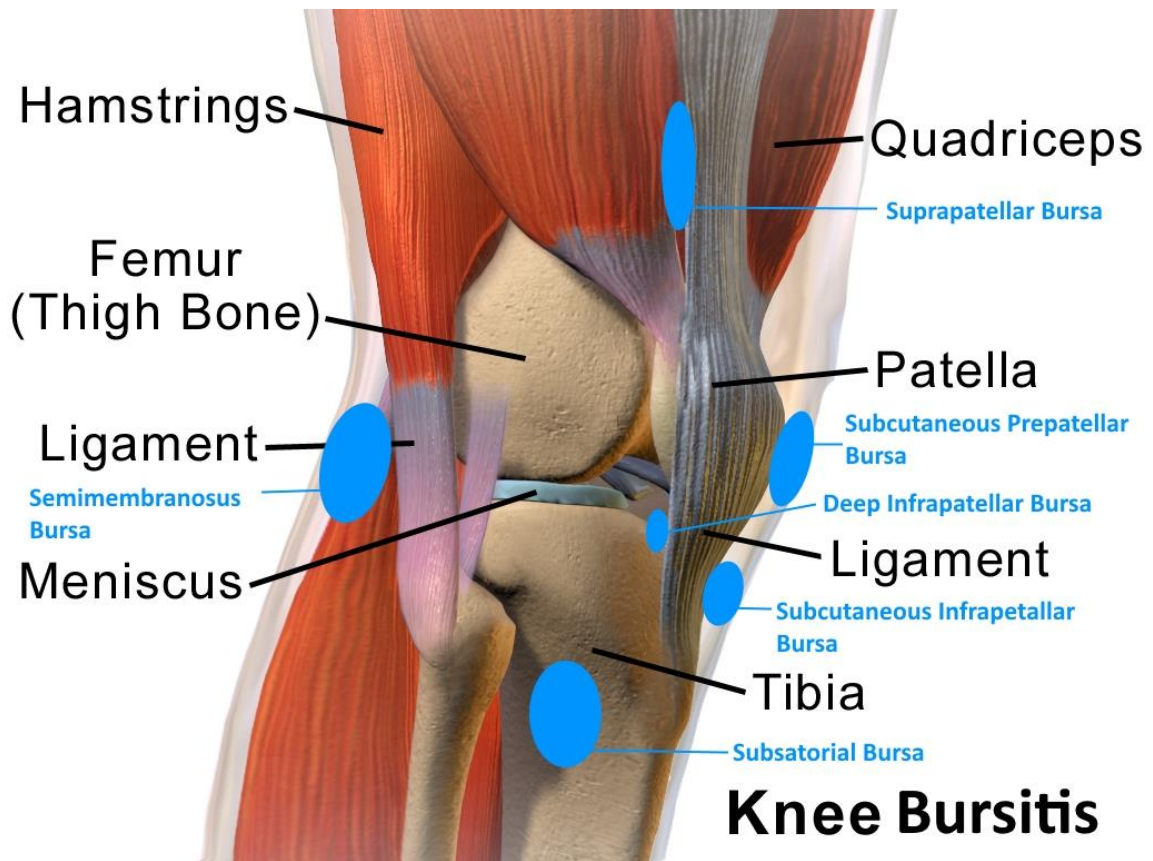


Sciatic Nerve

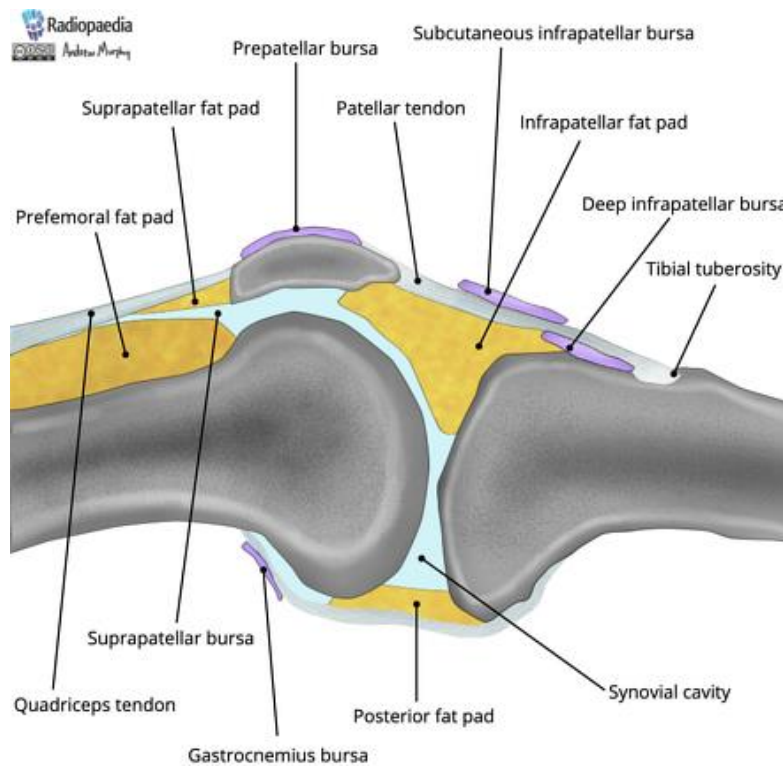


Obturator Nerve





Fat Pads



Developer of Ortho-Bionomy

- **Arthur Lincoln Pauls** (1929-1997) Developed Phased Reflex Techniques, later called Ortho-Bionomy

Principles of Positional Release

- Structure governs function
- Exaggeration of the preferred posture/preferred direction commonly the distortion
- The body will release imbalances when it is in positions of comfort - no pain to release pain
- Follow what the body is doing rather than forcing it
- Use tender points to monitor the tissue for maximum relaxation or softening to identify the release position
- “Fine tune” the position by using gentle movements to stimulate the maximum state of relaxation around the joint

Quality of Contact and Interaction

- Generally a gentle compression will stimulate and speed up the release within a joint or its surrounding tissues
- The most effective method is to do less to initiate the self-corrective reflex and to allow the person to do more for themselves - “Less is more”
- Non-investment in change - it is more important to notice what the outcome is rather than to try to create a specific outcome
- The body has many of the resources to balance itself - our role as Practitioner is to facilitate these naturally occurring processes
- Relaxed hand contact allows greater sensing capacity for the Practitioner

General Protocol for Release Techniques

- Assess the imbalance or identify the point of tenderness or discomfort
- Move the body into a position which either exaggerates the direction of ease or folds around a point of discomfort and maximally softens the area
- Apply a gentle compression (sometimes traction) into the joint - only enough to gently stimulate a response from the body
- Wait 10 to 30 seconds (sometimes up to a minute) for the body to respond
- After the response slowly move out of the position
- Gently move the area or explore a little range of motion
- Recheck the imbalance or point of discomfort
- When monitoring a point of tenderness or discomfort the amount of pressure by the monitoring finger is feather light - the quality of touching a butterfly wing without breaking it
- Releases can be any change in tissue quality, pulse, temperature, rebound, recoil or any other sign from the joint or tissues

Knee

Imbalance Indicators

Pain in the knee cap, knee joint, surrounding muscles, restriction in range of motion and pain with use may be indicators of imbalances in the knee.

Patella (Knee Cap)

- Assess the patella for movement ease or preferences in the following directions: superior/inferior and medial/lateral
- Practitioner gently exaggerates the preference or direction of ease of the patella and applies a gentle compression of the patella towards the knee joint
- After the release or rebound, gently reposition the patella and reassess the movement preferences



Patella Release

Intrinsic Movements of the Knee Joint

Rotation

- Practitioner stabilises the client's thigh with one hand whilst assessing movement preference or ease with the lower leg rotating medially and laterally
- Practitioner gently exaggerates the movement preference and compresses the femur and the tibia toward the knee joint simultaneously
- After the release or rebound, gently reposition the knee and reassess the movement preference



Knee Intrinsic Medial and Lateral Rotation

Lateral/Medial Movement

- Practitioner stabilises the client's thigh with one hand whilst assessing the direct lateral and medial movement of the knee joint by flexing the lower leg towards the midline and laterally
- Practitioner gently exaggerates the movement preference and compresses the femurs and the tibia toward the knee joint simultaneously
- After the release or rebound, gently reposition the knee and reassess the movement preference



Knee Intrinsic Direct Medial and Lateral Movement

Femoral Over Ride (Anterior Slide) and Under Ride (Posterior Slide)

The anterior and posterior slide of the femur along the top of the tibia is held in check by the cruciate ligaments (posterior cruciate ligament (PCL) prevents anterior slide and anterior cruciate ligament (ACL) prevents posterior slide).

Assessment for Exaggerated Anterior OR Posterior Slide

- Practitioner stabilises the client's thigh with one hand
- Placing the other hand proximal and posterior to the ankle the practitioner gently attempts to hyperextend the client's knee
- If there is restriction or incomplete extension of the knee joint then there is likely a Femoral Over Ride
- If there is an excess of hyperextension or a large amount of hypermobility then there is likely a Femoral Under Ride



Assessment for Femoral Over Ride or Under Ride

Releasing a Femoral Over Ride

- Practitioner places their arm under the leg of the affected knee and rests their hand on the anterior of the opposite thigh thereby bringing the femur of the affected side more anterior
- Practitioner places the other hand just distal to the knee on the shin and gently presses the tibia posteriorly
- Practitioner may also apply compression of the tibia into the femur
- After the release or rebound, the practitioner repositions the leg and reassesses using the imbalance indicator assessment



Femoral Over Ride Release

Releasing a Femoral Under Ride

- Practitioner stabilises the client's thigh with one hand whilst placing the other hand distal and posterior to the knee
- Practitioner then gently draws the tibia directly anteriorly (thereby exaggerating the posterior movement of the femur)
- Practitioner may also apply compression of the tibia into the knee joint of that is comfortable
- After the release or rebound, the practitioner repositions the leg and reassesses using the imbalance indicator assessment



Femoral Under Ride Release

Tender Points Around the Knee

- Assess for points of restriction or tenderness around the knee joint especially on the posterior aspects of the medial and lateral condyles of the femur and tibia where the hamstring and calf muscles attach
- Monitoring the point of imbalance the practitioner flexes the client's knee until the point is maximally softened
- If the point is on the medial aspect of the knee the leg is generally dropped laterally whilst bringing the foot towards the midline thereby softening the medial aspect of the knee (the foot may also be inverted to assist the softening further)
- If the point is on the lateral aspect of the knee the leg is generally rotated toward the midline and the foot is brought out laterally thereby softening the lateral aspect of the knee (the foot may also be everted to assist the softening further)
- Practitioner gently compresses the tibia into the knee joint from the bottom of the foot
- After the release or rebound, the practitioner repositions the leg and reassesses the imbalance points



Release Positions for Knee Medial Tender Points and Lateral Tender Points

Self Care

Positional releases (Patella, knee points)

Knee circles

- Standing with knees bent
- Supporting knees with hands over the patellae, moving the legs through “rotation”

Knee/ankle releases and realignment

Standing neutral with feet forward



Standing and shifting weight to outside edge of feet



Lift heels to put weight on the ball of the feet at the base of the little toes



Shift weight across the balls of the feet to the base of the big toes



Then slowly reverse through the positions

Resources

Kathy Kain (1997) **Ortho-Bionomy: A Practical Manual**

Luann Overmyer (2009) **Ortho-Bionomy: A Path to Self-Care**

James Watkins (2010) **Structure and Function of the Musculoskeletal System**, 2nd edition

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