

KNEE INJURY PREVENTION WORKSHOP

Presented by

**Ian Wee – Principal Occupational Therapist
Managing Director**

Feb 2010

ANATOMY OF THE KNEE

● Bones

○ Femur

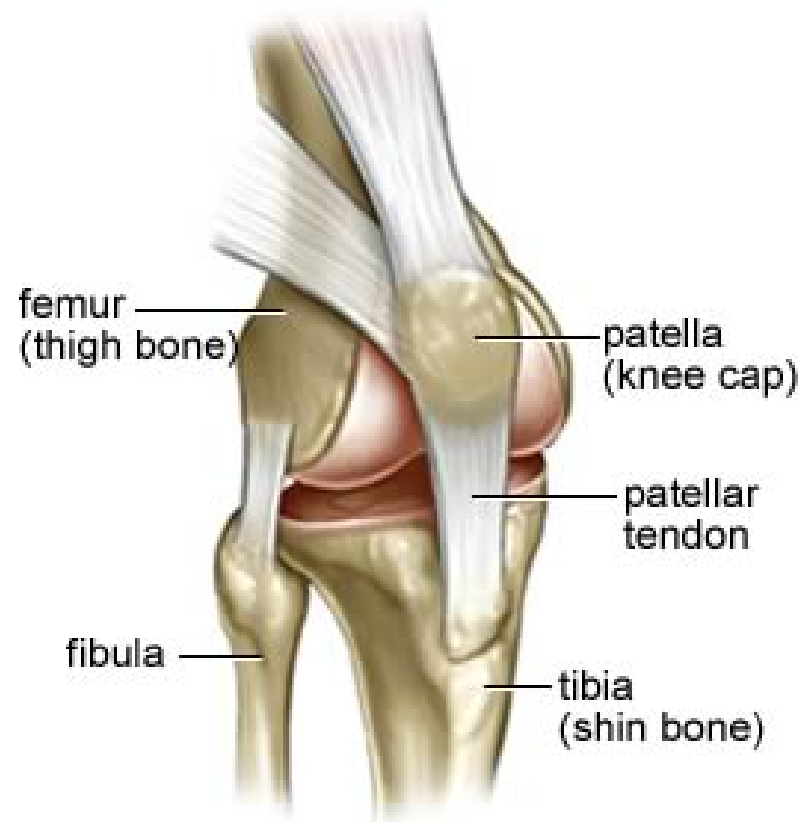
○ Tibia

○ Fibula

○ Patella

○ Cartilage

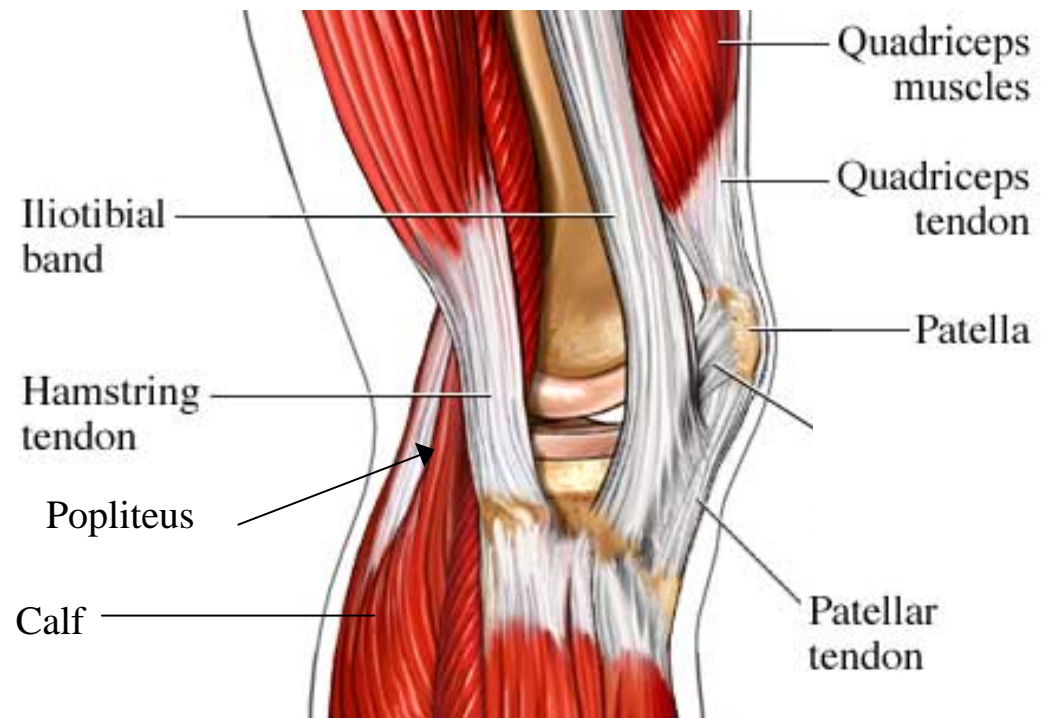
○ Hinge joint



ANATOMY

● Muscles

- Quadriceps
- Hamstrings
- Adductors
- Sartorius
- ITB
- Calves
- Popliteus

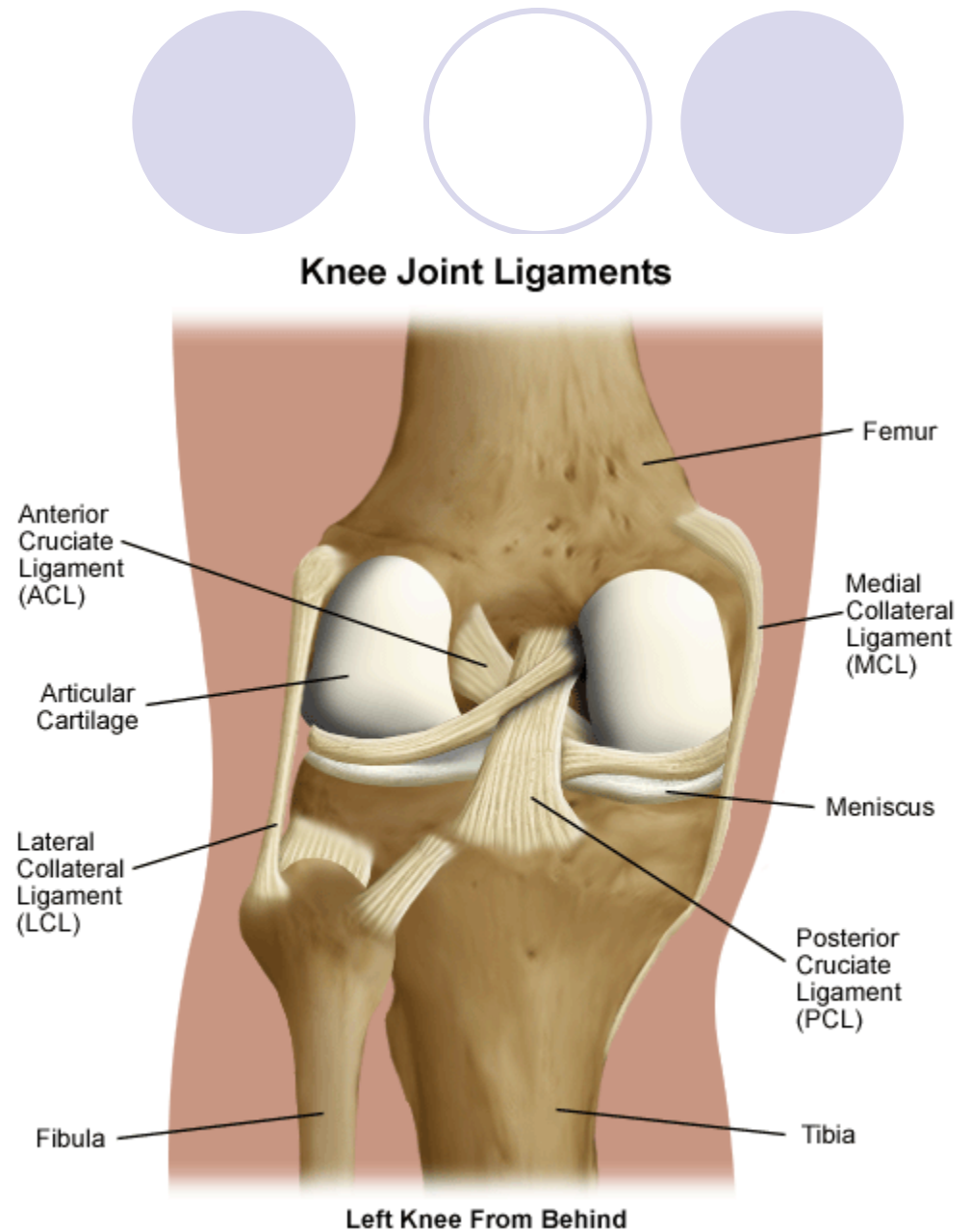


ANATOMY

- Ligaments

- Anterior cruciate
- Posterior cruciate
- Medial collateral
- Lateral collateral

- Meniscus



COMMON INJURIES



- Bone

- Fracture
- Arthritis

- Muscle

- Strain*
- Tear
- Tightness*
- Tendonitis*

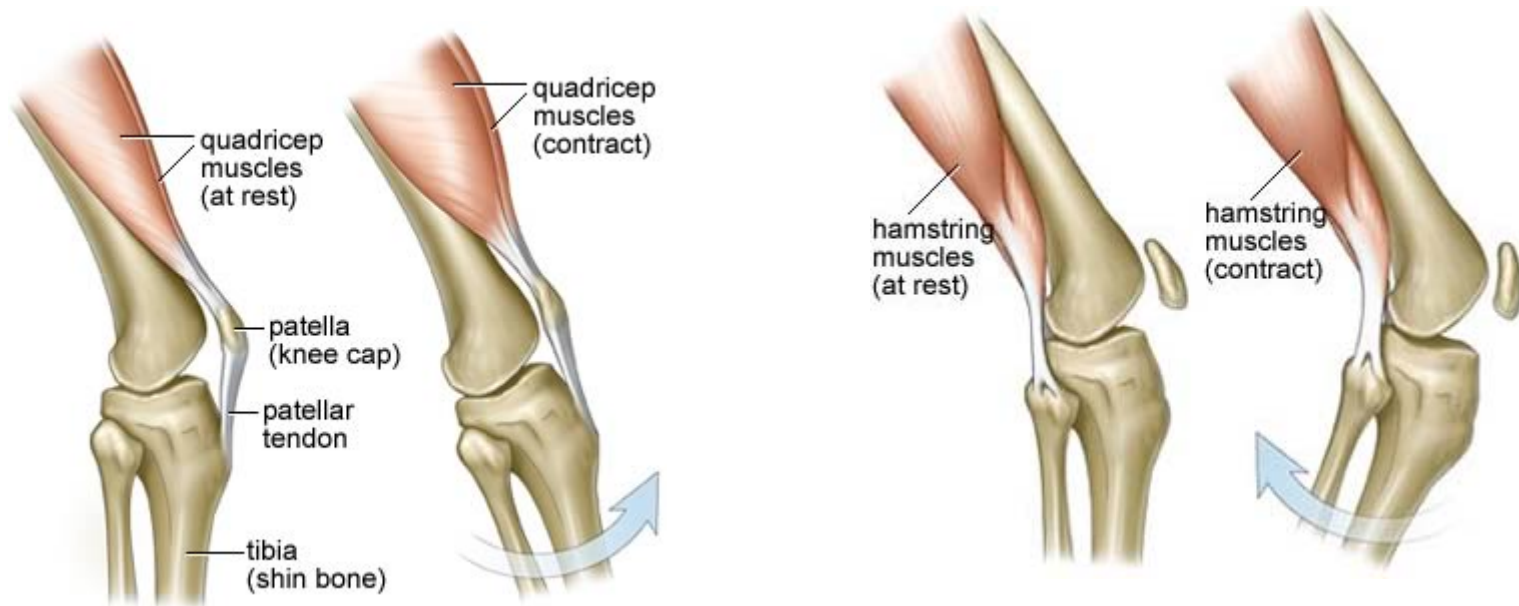
- Ligament

- Sprain*
- Tear

- * Denotes the main type of injuries that cyclists present with

BIOMECHANICS

- Internal and external forces which act upon the body



Common Knee That We See @ PIHC....

- Patellar Tendinitis
- Chondromalacia
- Iliotibial Band Syndrome
- Collateral Ligament Overstrain
- Popliteal Tendinitis or Overstrain

Patellar Tendinitis



- Inflammation of the patella tendon, usually due to overstrain
- Microscopic tears which heal over time producing microscopic scars
- Tearing and scars of this microscopic nature cause the tendon to enlarge producing friction thus resulting in pain
- Symptoms normally include pedalling or walking, especially down stairs
- Normally associated towards the lower end of the tendon
- Worrisome sound called Crepitus, which is due to decreased lubrication

Chondromalacia



- Softening or degeneration of cartilage behind the patella
- If left uncorrected it causes joint surface instability hence producing arthritic condition
- Pain experience behind patella would normally be its presenting complaint
- Often occurs with those who do hard climbing which includes up and down stairs or continually pushing big cycling gears or even excessive weight training.
- Aching and stiffness is often experienced after prolonged sitting
- One of the main causes of patella instability that often leads to unequal wear of this joint



Iliotibial Band Syndrome

- Connective tissue from hipbone to the insertion below the knee on each lateral side of the legs
- Symptoms often sharp stabbing pain on the outside and middle of the knee
- Starts off with a twinge then progresses to a degree of pain often described as a stabbing sensation.
- Biomechanical factors such as bow feet or flat feet can also cause this condition

Collateral Ligament Overstrain

- Similar to ITB conditions, it generally affects the stabilising ligaments on either side of the knee
- These ligaments act as stoppers to maintain the integrity of the hinge joint which is the knee
- Often pain is presented on either side and can be directly associated with feet or hip instability due to poor posture or bike / work set up.

Popliteal Tendinitis or Overstrain



- Triangular muscle situated at the posterior aspect of the knee often described as the 'soft tissue' of the joint
- Subject to intense deep pain with discomfort experienced when sitting or over extending the walk.
- Bow legged people suffer from this condition a lot

TREATMENT METHODS - GENERAL

- Acute

- RICE
- Gentle cross friction muscle mobilisation
- Gentle ranging and stretching but not beyond stretch reflex.
- Soft tissue treatment involving muscle and joint mobilisation techniques to stabilize major muscle groups first before smaller /intrinsic muscles are worked on.

- Chronic

- Postural re-alignment. Check hip and feet biomechanics
- Dynamic stabilisation / treatment methods

PIHC Methods Used



- Formostar Far Infra Red – Chronic Conditions
- Key Module Treatment – for acute / post operative care including muscles, ligaments and tendons
- Hands On Soft Tissue techniques – involving muscle mobilisation and adjustments to assist with muscle fibre realignment and feedback to nervous system
- Huber Dynamic Treatment Systems
- Vibration Science with WBV 3000
- Exercise Physiology
- Feet Biomechanics through Podiatry
- Therapeutic Massage

Key Module Techniques



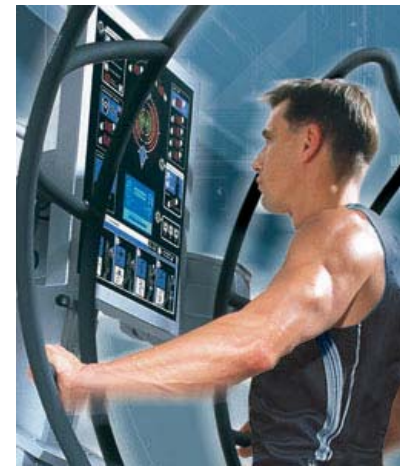
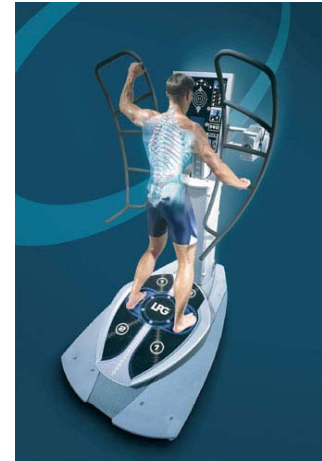
- Reverse Pressure Roller & Suction Pressure to prevent ischemic compression of soft tissue
- Pressure hence intensity is variable
- Recovery rate up to 70% faster than conventional hands on approach

WBV 3000 – Use of science of vibration



- Varying the intensity of the vibration (harmonic frequency) can assist with knee joint strengthening
- Use of various positions

Huber Dynamic Systems



Formostar Far Infra Red



- Use of core deep heat for recovery of ligaments, tendons and muscles
- Variable intensity setting
- Static positioning and the silicon wrap provides comfort and warmth to the patient



If you are interested.....

- Speak to one of the PIHC practitioners at your next treatment session.
- Grab a brochure about the various techniques & technologies available on www.pihc.com.au
- Email Ian Wee at: ianwee@pihc.com.au
- For non PIHC patients contact us on 92405266 (North of River) or 93648626 (South of River) for an appointment