X-ray and MRI

- Knee complex structure
- X-rays insensitive
- 10% knee cartilage lost before any radiological OA
  

- Indirect visualization of cartilage, not other structures
Structure and pain

**Chondral defects**

**Synovitis**
\[ r = 0.21, \quad P = 0.0003 \]

**Meniscal tears**

**Bone attrition**
Torres et al, Ost Cart 2006.

**BML**

Progression from normal to disease

Normal → Cartilage defects → Radiological OA → Joint replacement

10% cartilage loss
(Jones et al, Ost Cart 2002)

BML       Meniscal       Synovitis       Bone attrition       + ? Others

www.monash.edu.au
Effect of traumatic spinal cord injury on cartilage thickness

Other imaging modalities: Ultrasound

- Inexpensive, no radiation, repeated imaging
- Image dynamic structures in real time
- Synovium imaged with no contrast
- ↓ synovitis in knee OA patients treated with chondroitin sulfate (Møller et al, Ost Cart 2007; Abstract # 44)

Cartilage: femoral condyle  Synovitis  Osteophytes

Nuclear medicine: Positron emission tomography

- Metabolic changes
- 2-18F-fluoro-2-deoxy-D-glucose reflects glucose metabolism
- Foci of inflammation, infection, tumors

Knees with medial OA:
- ↑ uptake in periarticular regions, intercondylar notch, and regions of BMLs

Role unclear

Computerized axial tomography

- Cortical bone & soft tissue calcifications seen better than MRI
- Spiral CT arthrography of knee shows articular surface
- Cartilage defects outlined by contrast
- Qualitative assessment of knee cartilage similar to MRI
- ? Limited role in established or suspected OA