The Aging Athletes Knee

- Common Sports Knee Injuries
  - Cartilage defects/chondromalacia
  - Meniscal tears
  - ACL tear

- Articular Cartilage injury/Chondromalacia
  - Impact injuries
  - Twisting injuries
  - Overuse
  - Overweight
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Articular Cartilage Injury/Chondromalacia
- Arthroscopic debridement - “clean out”
- Arthroscopic microfracture to form scar cartilage
- Autologous Chondrocyte Implantation
- Cartilage paste implantation
- Osteoarticular transfer from the patient or a donor
Meniscal Cartilage Tears
- Arthroscopic debridement – “clean out”
- Load sharing function of meniscus is lost when it tears
- Removal takes away the irritant effect of the torn meniscus

Arthroscopic repair
- Goal is to preserve load sharing and prevent arthritis from developing

Meniscal transplant
- Has been shown to provide pain relief
- Not clearly shown to prevent arthritis
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- ACL tear
- Pivoting injury with or without contact
- Results in rotational instability – the trick knee
- Articular cartilage contusion in 85% of acute ACL tears
- Meniscal injury in 40% of acute ACL tears
Common result of Injury
- Arthritis
- The loss of articular cartilage in the joint
- Pain, stiffness, loss of range of motion
- On X-ray loss of joint space and bone spur formation
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- Case Study
  - 24 y/o former volleyball player
  - ACL reconstruction and complete lateral meniscectomy at age 14
  - Unable to run, jump
  - Constant pain with walking or standing
  - Pain along lateral joint line

Dx. Severe degenerative joint disease lateral compartment
Stable ACL reconstruction

Case study implications
- Loss of recreational opportunities
- Inability to maintain retail store management position
- Constant pain
- Depression
- Major surgery
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- Treatment options nonoperative
  - Antinflammatory medications - Ibuprofen and its cousins
  - Nutritional Supplements – Glucosamine/Chondroitin Sulfate
  - Cortisone Injections
  - Visco supplementation injections – "joint lubricant"
  - Strength/therapeutic exercise
  - Weight loss
  - Bracing
  - Alternative Injections
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- **Cortisone Injections**
  - Decrease inflammatory activity in the knee
  - May have cartilage preserving effect by decrease in cartilage degrading inflammatory mediators
  - AAOS recommends maximum of 3 or 4 per year
  - Eventually less effective as arthritis progresses

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- **Alternative Injection Treatments**
  - **Platelet Rich Plasma (PRP)**
    - Platelet-rich plasma (PRP) is separated autologous blood with a superphysiologic concentration of platelets. Platelets have high concentrations of bioactive molecules within platelet granules that may decrease the bad effects of OA and increase the good function of cartilage
    - No consensus on technique for separating the blood and randomized controlled studies that clearly prove efficacy are lacking

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- **Alternative Injection Treatments**
  - **Stem Cell Injections**
    - data available is lacking and confusing
    - Regenexx - commercially available stem cell injection treatment protocol. Data at this point does not have conclusive controlled studies but does have anecdotal evidence of clinical improvement. Cost is hard to determine - $5600?
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Alternative Injection Treatments

Stem Cell Injections

Adipose stem cells

- From fat/synovium of knee or other fat tissue

Adult mesenchymal stem cells

- From pelvis aspirate of bone marrow

PRP injections in OA knees

- Improved pain and function at 6 months but no change in MRI findings

Sanchez et al

- 3 injection PRP vs Hyaluron

- Significantly better pain relief at 6 weeks with PRP

Kon et al

- 3 injections PRP vs Hyaluron

- Significantly better pain relief with PRP at 2 months and 6 months in early OA

- Similar outcomes in late stage OA

Treatment Options – Operative

- Meniscal transplant

- Cartilage restoration procedures

- Distal femoral osteotomy

- High Tibial Osteotomy

- Knee replacement
Leg realignment procedures

Purpose is to off load the damaged compartment
- Distal femoral osteotomy to off load lateral (outer) side
- High tibial osteotomy to off load medial (inner) side
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- Osteotomy
  - Outcomes are very good for pain relief
  - Expect improvement for 10-15 years
  - Very durable
  - Can do full activities without restriction

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- Definitive Surgical Management
  - Total knee replacement
  - Partial knee replacement

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- Definitive Surgical Management – Knee Arthroplasty
  - THE indication is relief of pain with walking
  - 80 – 85% very satisfied with procedure
  - Never feels like a normal knee
  - Always some residual symptoms
  - Risks are significant including infection, instability, blood clot
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- Partial Knee Replacement
  - Feels more natural than total knee
  - Indications are the same – pain with walking
  - Must be done under ideal circumstances to have long term success
  - May be done as a temporary replacement meant to last for 10 – 15 years and then revised to total replacement

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- Recommendations following knee arthroplasty
  - Weight lifting should be primarily body weight resistance, or use of low resistance wt machines
  - Low impact aerobic training only
  - OK for golf, tennis, cycling, walking, cross country and downhill skiing, hunting, skating, water skiing
  - NO FOOTBALL, BASKETBALL, JOGGING etc. because of high impact loads
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- Advances in knee replacement
- Better plastic components
- Minor improvements in design
- Custom replacements
- Less blood loss
- Less trauma to extensor mechanism (minimally invasive technique)
- Custom replacements
- Better pain management/anesthesia

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- Pain management
- Anesthesia blocks for peripheral nerves
- Nucynta
  - Less nauseating narcotic
- Exparel local injections
  - Long acting local anesthetic released slowly over 48-72 hours into the surrounding tissue
  - Decreases need for narcotics, frequently tylenol and tramadol adequate for postoperative pain
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