

Pain Management of Knee Osteoarthritis

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Objectives

Review:

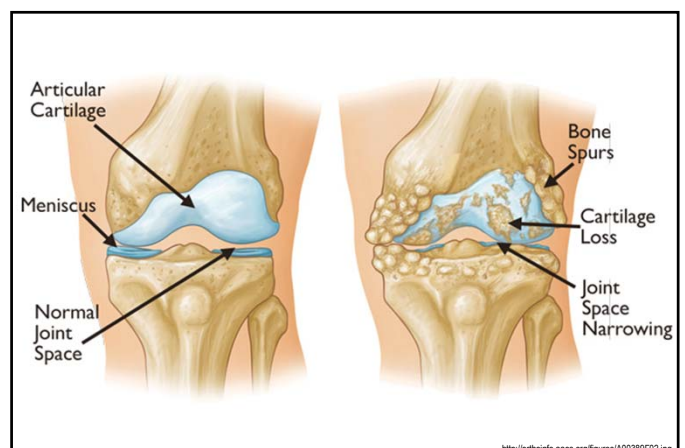
- What is knee osteoarthritis (OA)?
- What causes pain in knee OA?
- Scope of the problem
- Spectrum of care; treatment options

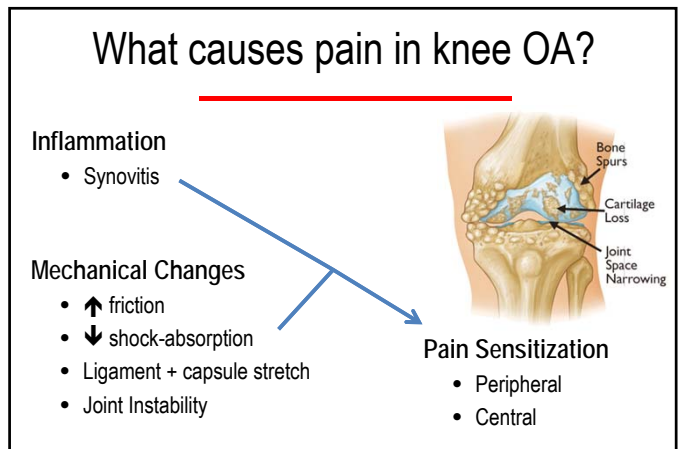
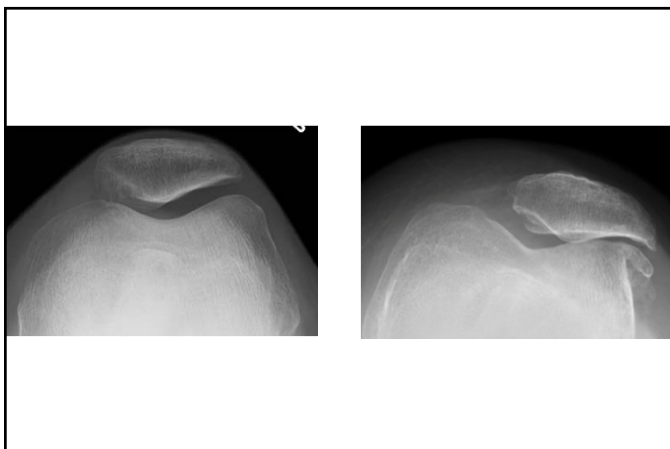


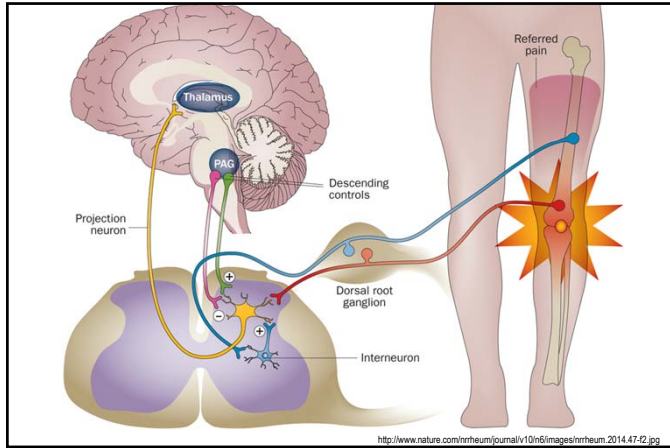
What is Knee OA?

Degenerative condition:

- Synovial inflammation
- Loss of articular cartilage
- Subchondral sclerosis and cysts
- Joint hypertrophy/osteophytes







Scope of the Problem

Chronic Pain due to knee OA is common:

- >25 million (US alone)¹
- 13% of adults >65 years of age²
- 10-20%: chronic pain after knee replacement³

Spectrum of Care

Continued Pain and Disability Despite Treatment →

Weight loss

- Bracing
- Cane/assistive device
- Ice/cryotherapy, Heat
- Oral Anti-inflam meds
- Targeted Exercise
 - Quad, hip girdle
 - Bike/swimming

Formal Physical Therapy

- Strength, mobility
- Gait
- Ergonomics
- Pacing
- Graded home exercise program
- Joint Injection
 - Steroid
 - Hyaluronic Acid
 - Regenerative agents

Joint Denervation

- Radiofrequency
- Phenol/alcohol

Surgery

- Total Knee Replacement
- Partial Knee Replacement

Weight Loss

- Bracing
- Cane/assistive device
- Ice/cryotherapy, Heat
- Oral Anti-inflam meds
- Targeted Exercise
 - Quad, hip girdle
 - Bike/swimming



Formal Physical Therapy

- Strength, mobility
- Gait
- Ergonomics
- Pacing
- Graded home exercise program

Individualized to unique anatomy and biomechanics

Active > Passive

Quadriceps, hip girdle, core strength
- Address imbalances

Gait, movement, lifting mechanics

Techniques for pain exacerbations, pacing

Graded independent exercise program



<http://www.healthadvisor.com/images/11103811/cortisone-injection.jpg>

Joint Injection

- Steroid
- Hyaluronic Acid
- Regenerative agents



Steroid

- Anti-inflammatory
- Nerve membrane stabilizing
- ≤3 per year

<http://www.healthadvisor.com/images/11103811/cortisone-injection.jpg>

Joint Injection

- Steroid
- Hyaluronic Acid
- Regenerative agents



Hyaluronic Acid

- Reduces loading/sheering forces on joint
- Supplement + stimulate production
- 1-5 injections/ 6 months

<http://www.healthadvisor.com/images/11103811/cortisone-injection.jpg>

Joint Injection

- Steroid
- Hyaluronic Acid
- Regenerative agents



Regenerative Treatments

- Platelet Rich Plasma
 - Adipose
 - Bone marrow
 - Placental
- Chondrogenesis
- Early evidence

<http://www.healthadvisor.com/images/11103811/cortisone-injection.jpg>

Joint Denervation
- Radiofrequency

Indications

- Continued pain and functional disability despite conservative management
- Desire to avoid surgery
- Inability to undergo surgery

Joint Denervation
- Radiofrequency

- Thermocoagulation of sensory nerves
- Radiofrequency Energy
 - Vibration of H₂O molecules -> heating
 - Predictable + Controlled lesion size⁴



Joint Denervation
- Radiofrequency

- Genicular nerves
 - Sensory
 - No motor fibers
- Defined anatomic locations



Joint Denervation
- Radiofrequency


- Diagnostic nerve injections
- Small volume of local anesthetic
 - >80% pain relief = positive response



Joint Denervation
- Radiofrequency

Radiofrequency Denervation of the Genicular Nerves

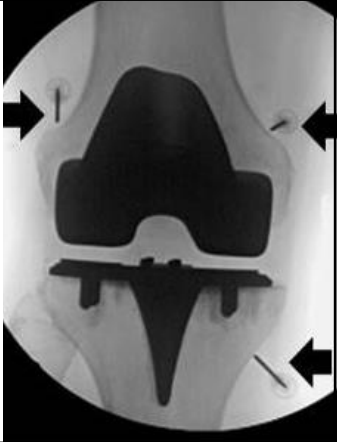
- Light sedation
- Well tolerated
- Safe



Surgery
- Knee Replacement

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Joint Denervation
- Radiofrequency



Spectrum of Care

Continued Pain and Disability Despite Treatment →

| | | | |
|--|--|--|--|
| <p>Weight loss</p> <p>Bracing</p> <p>Cane/assistive device</p> <p>Ice/cryotherapy, Heat</p> <p>Oral Anti-inflam meds</p> <p>Targeted Exercise</p> <ul style="list-style-type: none"> - Quad, hip girdle - Bike/swimming | <p>Formal Physical Therapy</p> <ul style="list-style-type: none"> - Strength, mobility - Gait - Ergonomics - Pacing - Graded home exercise program <p>Joint Injection</p> <ul style="list-style-type: none"> - Steroid - Hyaluronic Acid - Regenerative agents | <p>Joint Denervation</p> <ul style="list-style-type: none"> - Radiofrequency - Phenol/alcohol | <p>Surgery</p> <ul style="list-style-type: none"> - Total Knee Replacement - Partial Knee Replacement |
|--|--|--|--|

Summary

- Knee OA is a common degenerative condition
- Major cause of pain and disability
- Treatments range from conservative to surgical
- Regenerative and joint denervation techniques provide a novel approach to treatment

Orthopaedic Trauma Institute
2017-2018

References

1. Garstang, S, Stitik, T. Osteoarthritis: epidemiology, risk factors, and pathophysiology. *Am J Phys Med Rehabil.* 2006 S2-11
2. Bedson J, Jordan K, Croft P. The prevalence and history of knee osteoarthritis in general practice: a case-control study. *Fam Pract.* 2005 Feb;22(1):103-8.
3. Lewis GN, Rice DA, McNair PJ, Kluger M. Predictors of persistent pain after total knee arthroplasty: a systematic review and meta-analysis. *Br J Anaesth* 2014; 114(4):551-61
4. Cosman ER, Dolensky JR, Hoffman RA. Factors that affect radiofrequency heat lesion size. *Pain Med.* 2014;15(12):2020-36.

Thank You

Questions?

