Pain, pain, go OA

Frances Tao, MD, MPH

PGY2, Department of Family Medicine, UCLA

Disclosures

None! ☺

Outline

- Epidemiology
- Pathophysiology
- Clinical presentation
- Work up
- Treatment options
- Guidelines from medical societies
- New research

Objectives

- To identify the key clinical features of OA
- To evaluate x-ray results to further support the diagnosis of OA
- To explain the different modalities of OA treatment, and understand the pros and cons of each

Osteoarthritis

Common degenerative disorder of the articular cartilage associated w/ hypertrophic bone changes

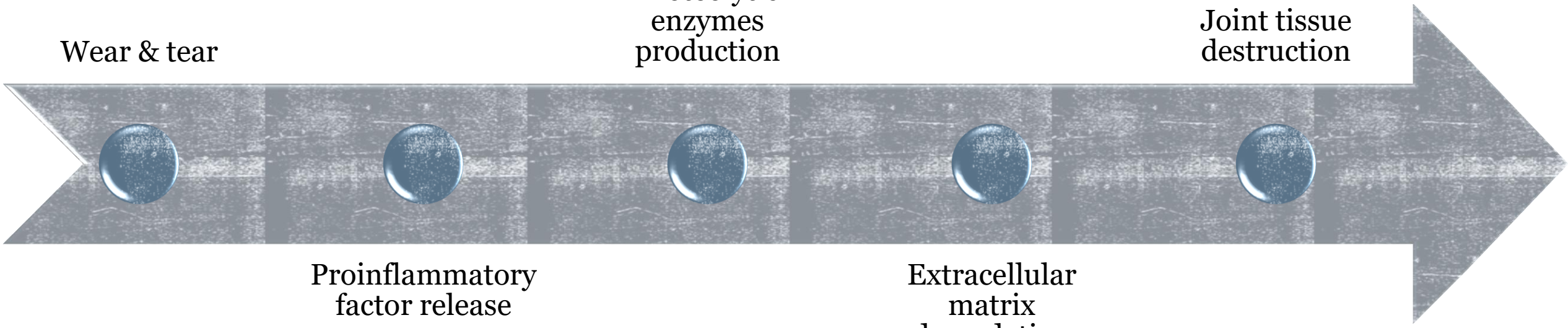
Epidemiology

Epidemiology

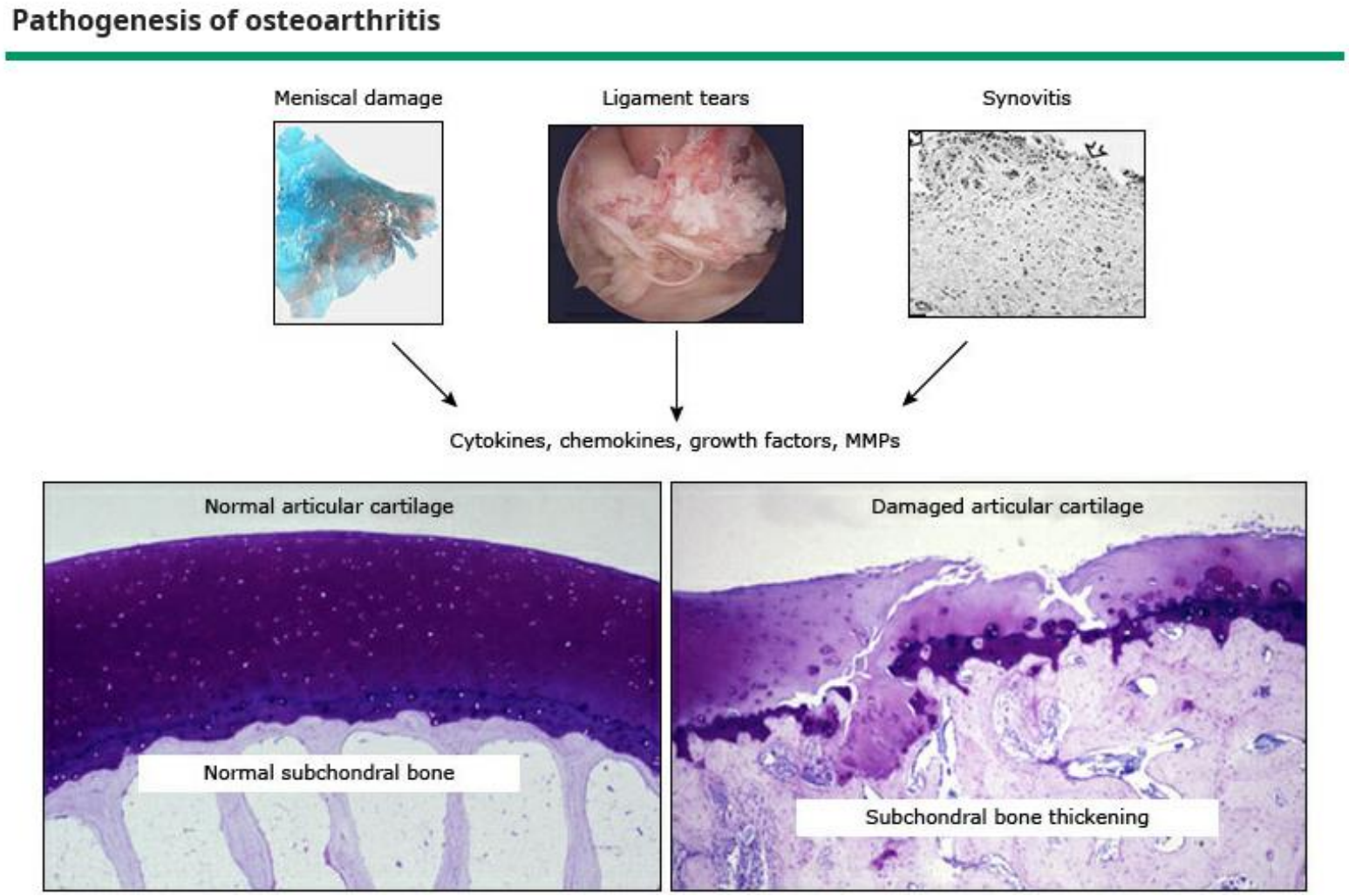
- Prevalence: > 300 million people worldwide
- Lifetime risk of suffering symptomatic knee OA is ~44.7%
- ~ 1 in 11 US adults $\geq$ 60 y.o. diagnosed w/ symptomatic knee OA
- Risk factors:
  - Older age (esp. age > 50)
  - Female sex
  - Overweight or obesity
  - Prior joint injury
  - Job/sport that requires repetitive impact/motion (e.g. bending or squatting)
  - Family history

Pathophysiology

Pathophysiology

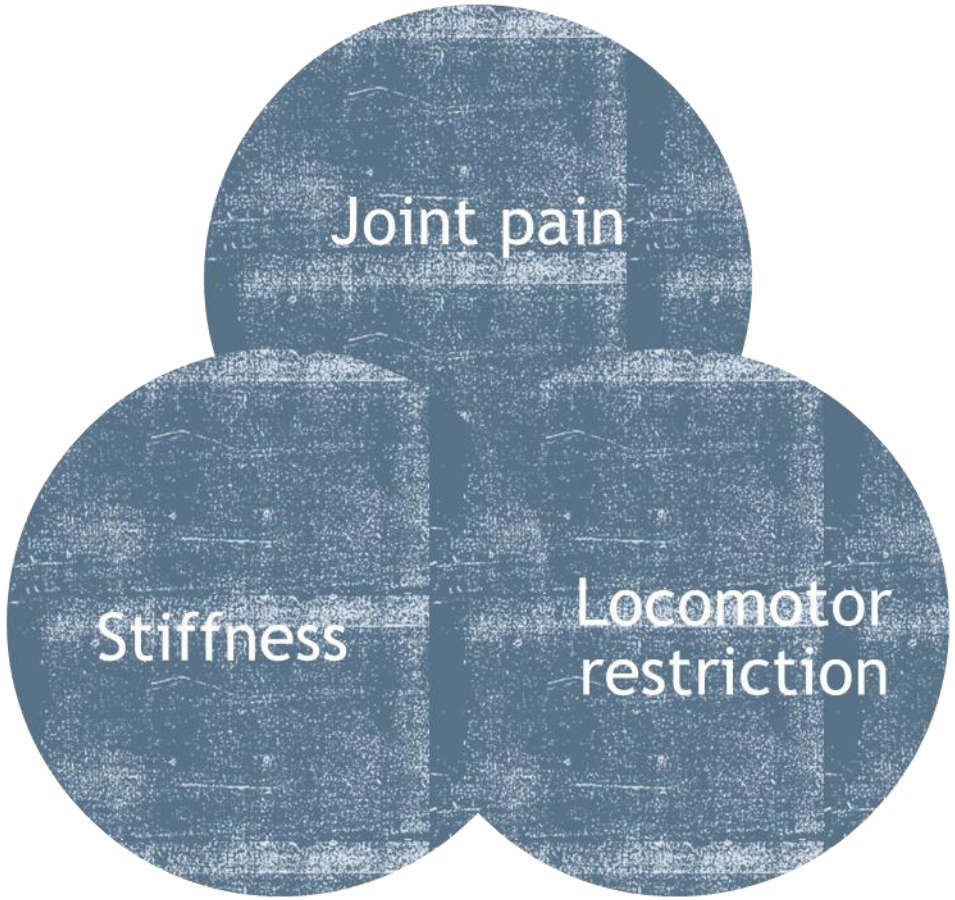


Pathophysiology



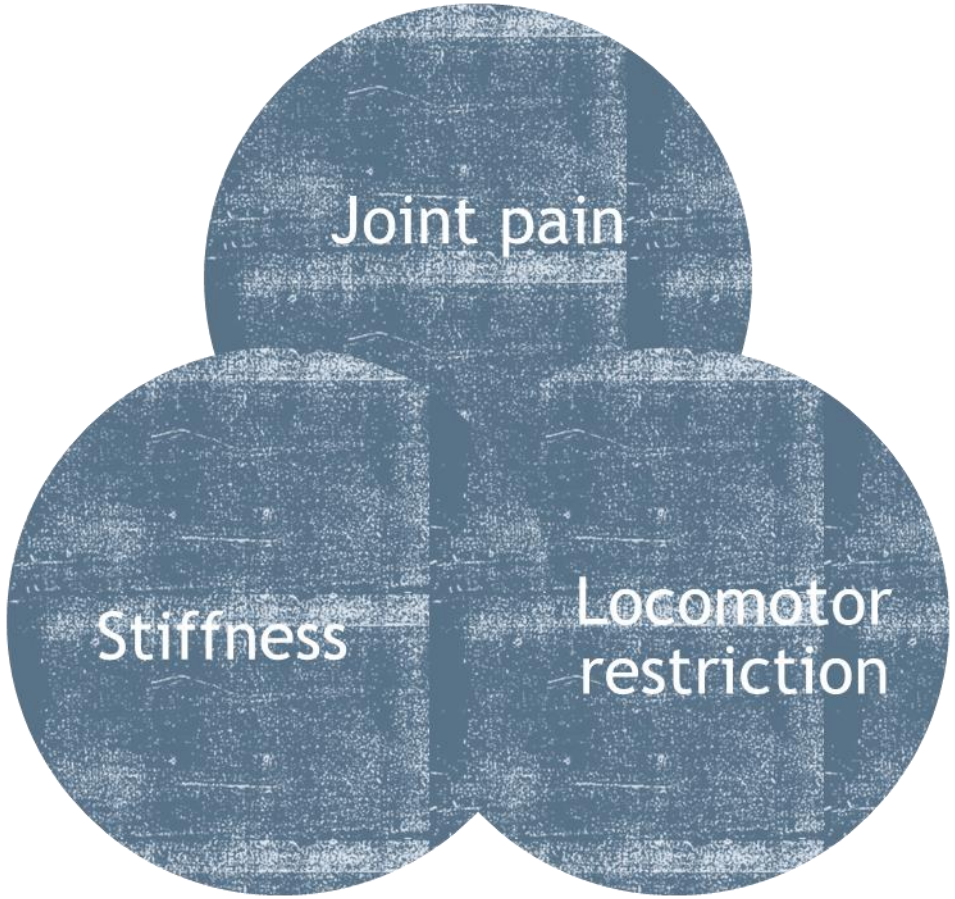
What does a typical patient w/ OA look like?

Clinical Features: Signs & Sxs



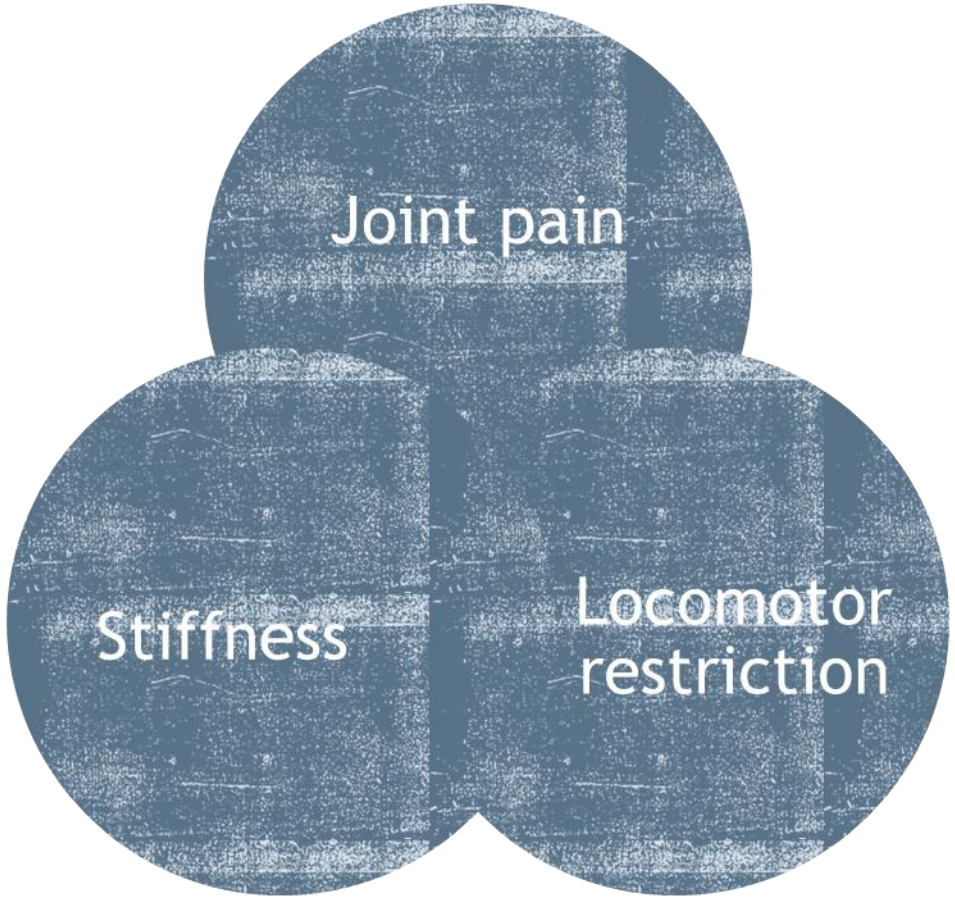
- Pain

Clinical Features: Signs & Sxs



- Pain
- Tenderness
- Limited ROM
- Stiffness

Clinical Features: Signs & Sxs

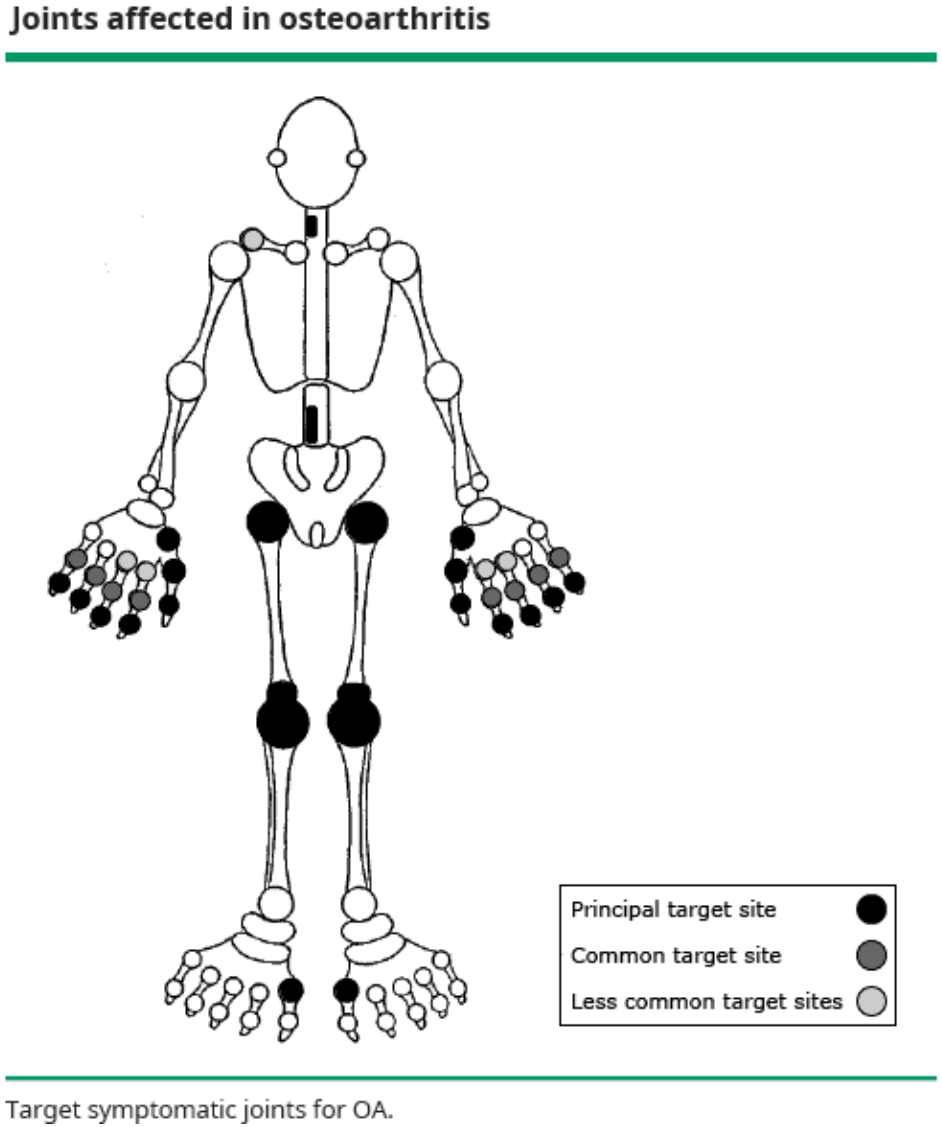


- Pain
- Tenderness
- Limited ROM
- Stiffness
- Bony swelling
- Joint deformity
- Instability

Clinical Features: Joint Distribution

Most commonly in the **hands, knees, and hips-**

though any joint can be involved



Time for investigative work!

Work Up: History & Exam

Table 1. Signs and Symptoms of Osteoarthritis

Hand

Pain on range of motion

Hypertrophic changes at distal and proximal interphalangeal joints (Heberden nodes and Bouchard nodes; Figure 1)

Tenderness over carpometacarpal joint of thumb

Shoulder

Pain on range of motion

Limitation of range of motion, especially external rotation

Crepitus on range of motion

Knee

Pain on range of motion

Joint effusion

Crepitus on range of motion

Presence of popliteal cyst (Baker cyst)

Lateral instability

Valgus or varus deformity

Hip

Pain on range of motion

Pain in buttock

Limitation of range of motion, especially internal rotation

Foot

Pain on ambulation, especially at first metatarsophalangeal joint

Limited range of motion of first metatarsophalangeal joint, hallux rigidus

Hallux valgus deformity

Spine

Pain on range of motion

Limitation of range of motion

Lower extremity sensory loss, reflex loss, motor weakness caused by nerve root impingement

Pseudoclaudication caused by spinal stenosis

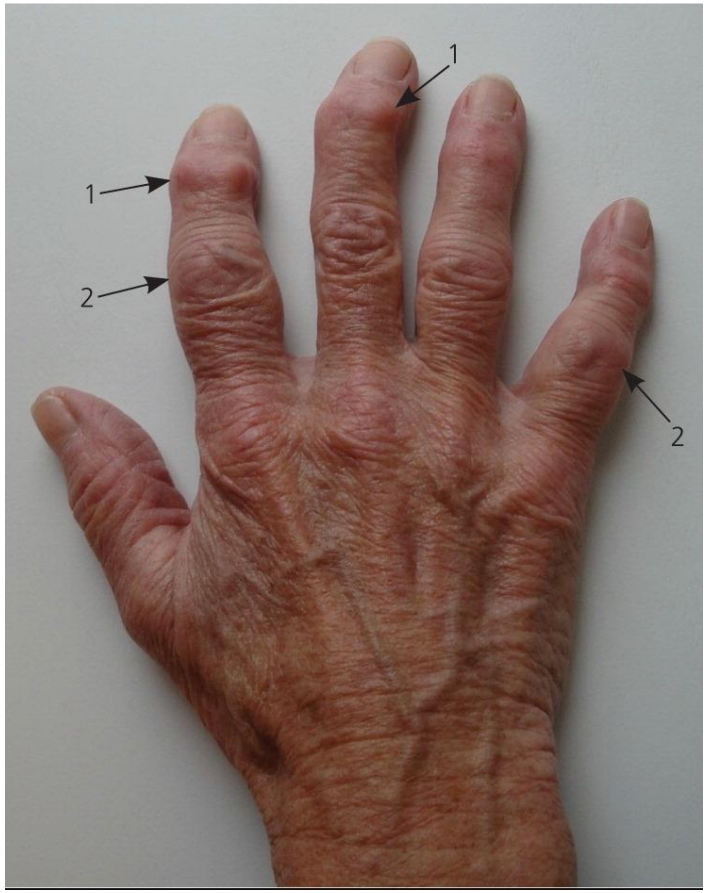


Figure 1.

Hand affected by osteoarthritis. *(1)* Heberden nodes. *(2)* Bouchard nodes.

Work Up: Labs

- Not necessary
- Synovial fluid
  - Noninflammatory or mildly inflammatory w/ < 2,000 WBC
  - Inflammatory effusions can have calcium pyrophosphate (CPP) crystals

Work Up: Imaging

X-ray

- Joint space narrowing
- Subchondral sclerosis
- Osteophytes
- Subchondral cysts

Work Up: Imaging

Figure 2.

Radiograph of a hand affected by osteoarthritis showing *(1)* joint space narrowing, *(2)* osteophytes, and *(3)* joint destruction. Also note changes at carpometacarpal joint *(4)*, which are very common in osteoarthritis.

Work Up: Imaging

Figure 3.

Radiograph of the hips showing *(1)* joint space narrowing and *(2)* osteophyte formation.

Work Up: Imaging

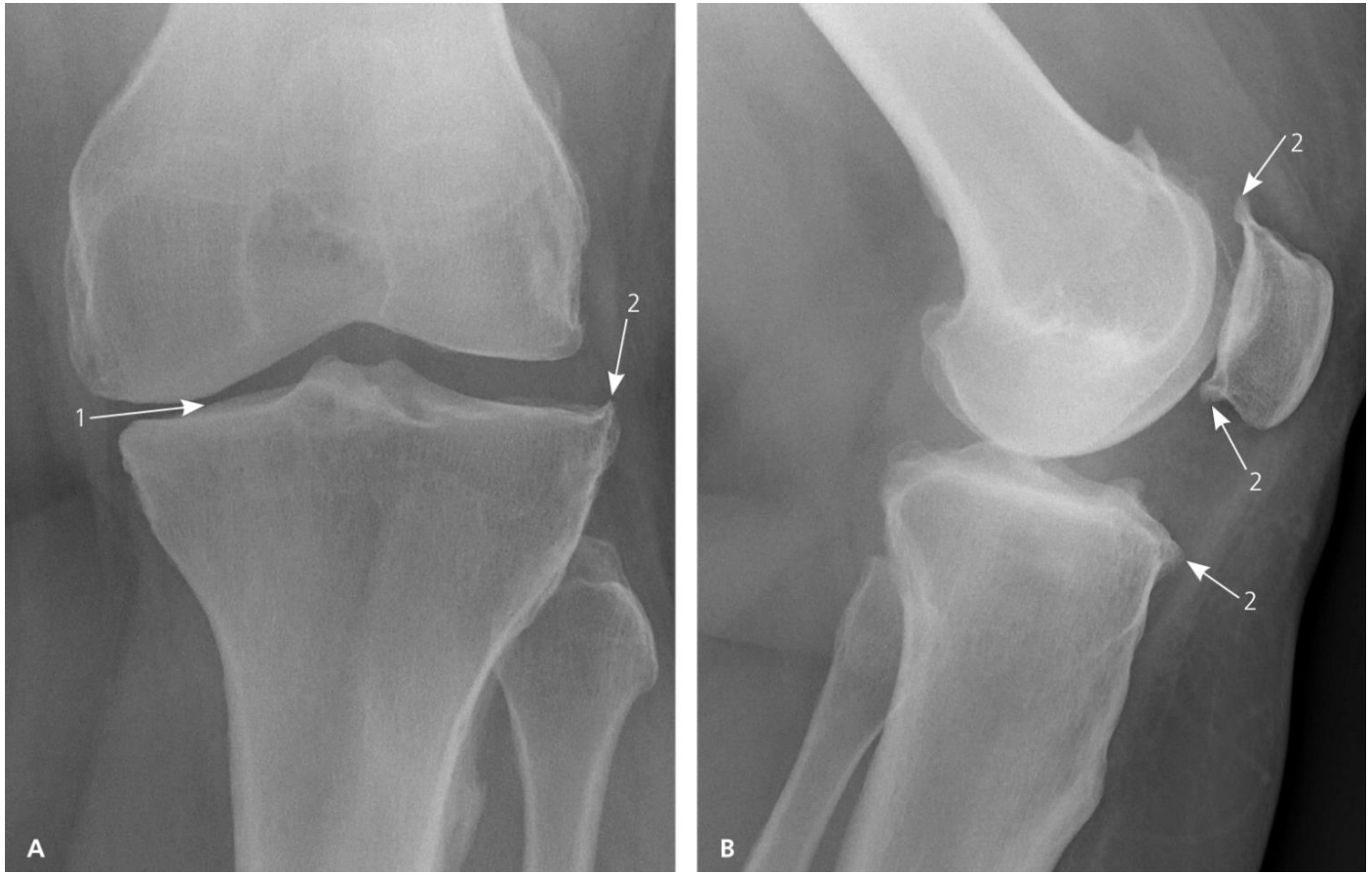


Figure 4.

Radiograph of the knee in *(A)* anteroposterior and *(B)* lateral views showing *(1)* joint space narrowing and *(2)* osteophyte formation.

Work Up: Imaging

MRI

- Can identify earlier stages of disease before XR changes become apparent
- Will pick up cartilage defects, bone marrow lesions
- Also can assess effusions, synovium, and ligaments

Ultrasound

- Can detect synovial inflammation, effusion, and osteophytosis

So, how do we make the pain go away?

Treatment


Nonpharmacological
Pharmacological
Complementary & Alternative
Surgical

Tx: Non-pharmacological

Exercise + PT

Braces + Orthoses

Assistive Devices

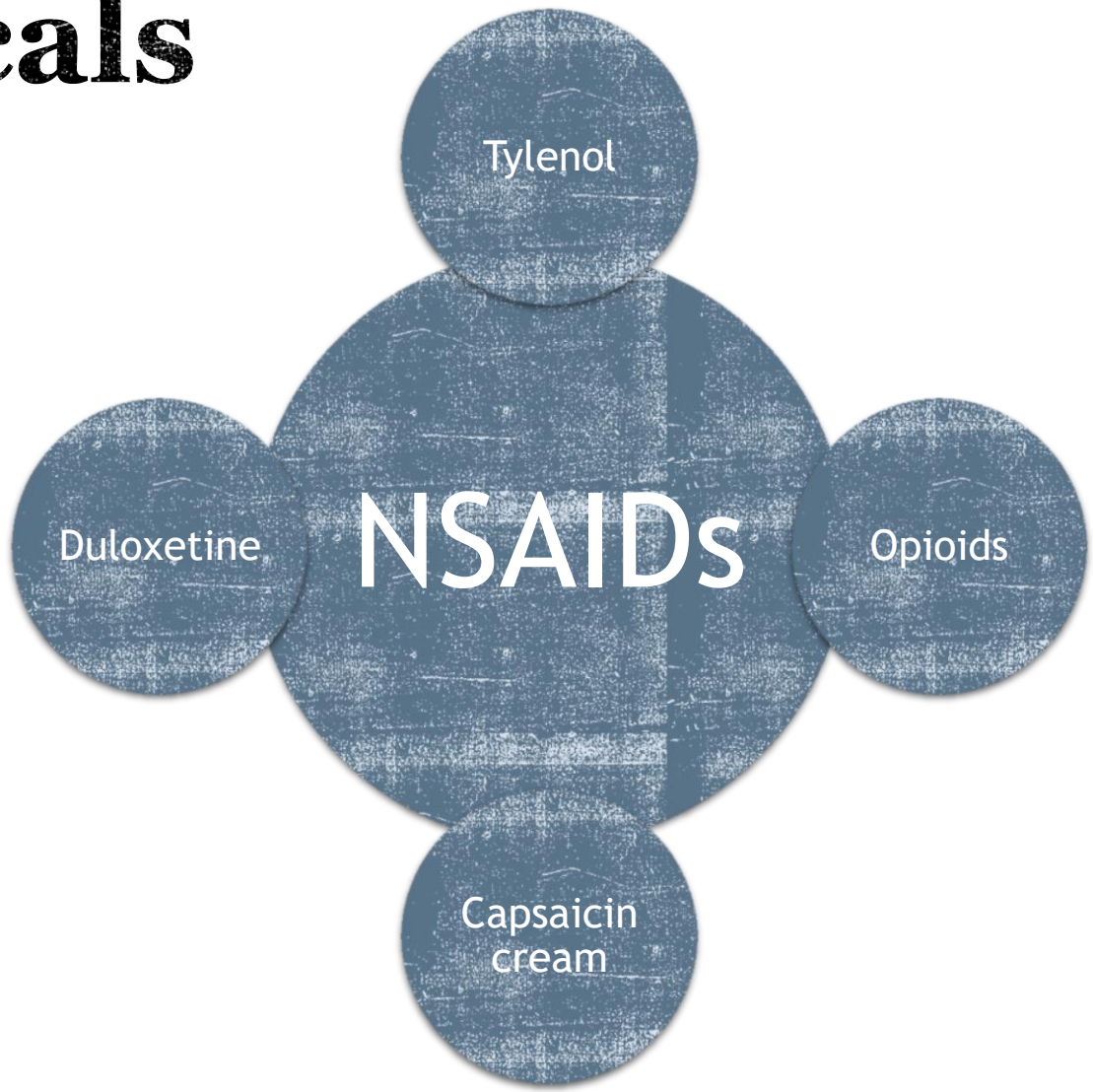
Cognitive Behavioral Therapy

Tx: Pharmacological- Orals and Topicals

Diclofenac/misoprostol (Arthrotec)	50 mg/200 mcg two to three times per day	NA ($195)
Ibuprofen, over-the-counter	400 to 600 mg three times per day	$28† ($30)
Meloxicam (Mobic)	7.5 to 15 mg per day	$16† ($155)
Nabumetone	500 mg two times per day	$40 (NA)
Naproxen, over-the-counter (Aleve)	220 to 440 mg two times per day	$5 ($5)
Naproxen (Naprosyn)	250 to 500 mg two times per day	$20† ($151)
Oxaprozin (Daypro)	1,200 mg per day	$26 ($206)
Sulindac (Clinoril)	150 to 200 mg two times per day	$19 ($92‡)

NA = not available.

**—Estimated retail price of one month's treatment based on lowest typical dosage. Information obtained at http://www.drugstore.com (accessed August 4, 2011).*



Tx: Pharmacological-Injections

Corticosteroid Injection (CSI)

- Faster onset (24-48 hours)
- Shorter relief (4-8 weeks)
- Cost: $

Hyaluronic Acid Injection (HAI)

- Slower onset (1-6 weeks
- Longer relief (up to 6 months)
- Cost: $$$

Tx: Pharmacological-Injections

Table 3.

Cost Comparison of Intra-articular Corticosteroids and Hyaluronic Acid Injections for the Knee

CODE	*DESCRIPTION*	*SELF-PAY FEE*	*PRIVATE INSURANCE REIMBURSEMENT*	*MEDICARE ALLOWABLE FEE*
J3301	Injection, triamcinolone acetonide (Kenalog), not otherwise specified, 10 mg	$17.00	$4.50	$1.54
J7324	Hyaluronan or derivative, Orthovisc, for intra-articular injection, per dose	$880.00	$342.00	$181.10
20610	Arthrocentesis, aspiration, and/or injection: major joint or bursa (e.g., shoulder, hip, knee joint; subacromial bursa)	$182.00	$139.00	$59.81

Tx: Complementary & Alternative Medicine

Limited evidence to support these!

- Vitamin D
- Diacerein
- Avocado soybean unsaponifiables
- Glucosamine + Chondroitin
- Fish oil
- Turmeric + black pepper
- Acupuncture

Tx: Surgery

- Elective surgery
- Consider comorbidities
- Prolonged recovery: 3-4 months
- Can have post-operative long-term pain
- Prostheses can function well for 15-20 yrs

Guidelines from medical societies

Medical societies of interest

Family Medicine Society

- American Academy of Family Physicians (AAFP)

Sports Medicine Societies

- American College of Sports Medicine (ACSM)
- American Medical Society for Sports Medicine (AMSSM)

AAFP Practice Guidelines

Osteoarthritis Management: Updated Guidelines from the American College of Rheumatology and Arthritis Foundation

Am Fam Physician. 2021 Jan 15;103(2):120-121.

AAFP Practice Guidelines

Key points:

- Weight loss, exercise, tai chi, and patient-directed activity programs can improve pain and function in knee and hip OA
- In knee and hip OA, CSI and NSAIDs improve pain and function only over the short term

AAFP Practice Guidelines

Key points (continued):

- Avoid the following:
  - Transcutaneous electrical nerve stimulation
  - Immunomodulators
  - Glucosamine +/- chondroitin
  - Biologic injection therapies
- CBT and balance training appear to improve pain
- Acupuncture and thermal interventions slightly improve pain & function

SPECIAL COMMUNICATIONS

AMERICAN COLLEGE of SPORTS MEDICINE

PRONOUNCEMENT

Effects of Physical Activity in Knee and Hip Osteoarthritis: A Systematic Umbrella Review

VIRGINIA B. KRAUS[1], KYLE SPROW[2], KENNETH E. POWELL[3], DAVID BUCHNER[4], BONNY BLOODGOOD[5], KATRINA PIERCY[6], STEPHANIE M. GEORGE[7], and WILLIAM E. KRAUS[1], FOR THE 2018 PHYSICAL ACTIVITY GUIDELINES ADVISORY COMMITTEE*

[1]Duke Molecular Physiology Institute, Department of Medicine, Duke University School of Medicine, Durham, NC; [2]National Cancer Institute, National Institutes of Health, U.S. Department of Health and Human Services, Bethesda, MD; [3]Georgia Department of Human Resources, Centers for Disease Control and Prevention (Retired), Atlanta, GA; [4]Department of Kinesiology and Community Health University of Illinois at Urbana-Champaign, Champaign, IL; [5]ICF, Fairfax, VA; [6]Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services, Rockville, MD; and [7]Office of Disease Prevention, National Institutes of Health, U.S Department of Health and Human Services, Rockville, MD

ACSM

Results:

- Physical activity decreased pain and improved physical function and improved health-related QOL among pts w/ hip or knee OA, relative to less active adults with OA
- Physical activity of 150 min/wk of moderate intensity exercise in bouts > 10 min, and > 45 min/wk of moderate intensity activity were associated w/ improved or sustained high function
- Benefits of physical activity persisted for up to 6 months following cessation of a defined program

ACSM

Recommendations:

- ✓ Encourage patients w/ lower extremity OA to engage in achieveable amounts of physical activity, of even modest intensities.
- ✓ They can accrue minutes of physical activity throughout the entire day, irrespective of bout duration.

POSITION STATEMENT

AMSSM Scientific Statement Concerning Viscosupplementation Injections for Knee Osteoarthritis: Importance for Individual Patient Outcomes

Thomas H. Trojian, MD, Andrew L. Concoff, MD,† Susan M. Joy, MD,‡ John R. Hatzenbuehler, MD,§ Whitney J. Saulsberry, PharmD,¶ and Craig I. Coleman, PharmD‖*

AMSSM

Results:

- Participants receiving hyaluronic acid injections were 15% and 11% more likely to respond to tx by OMERACT-OARSI criteria than those receiving ICS vs placebo respectively ($p < 0.05$ for both)

AMSSM

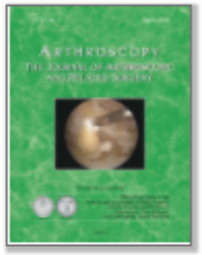
Recommendations:

- ✓ AMSSM recommends the use of hyaluronic acid for the appropriate pts w/ knee OA

New research

Arthroscopy: The Journal of Arthroscopic & Related Surgery

Volume 32, Issue 3, March 2016, Pages 495-505

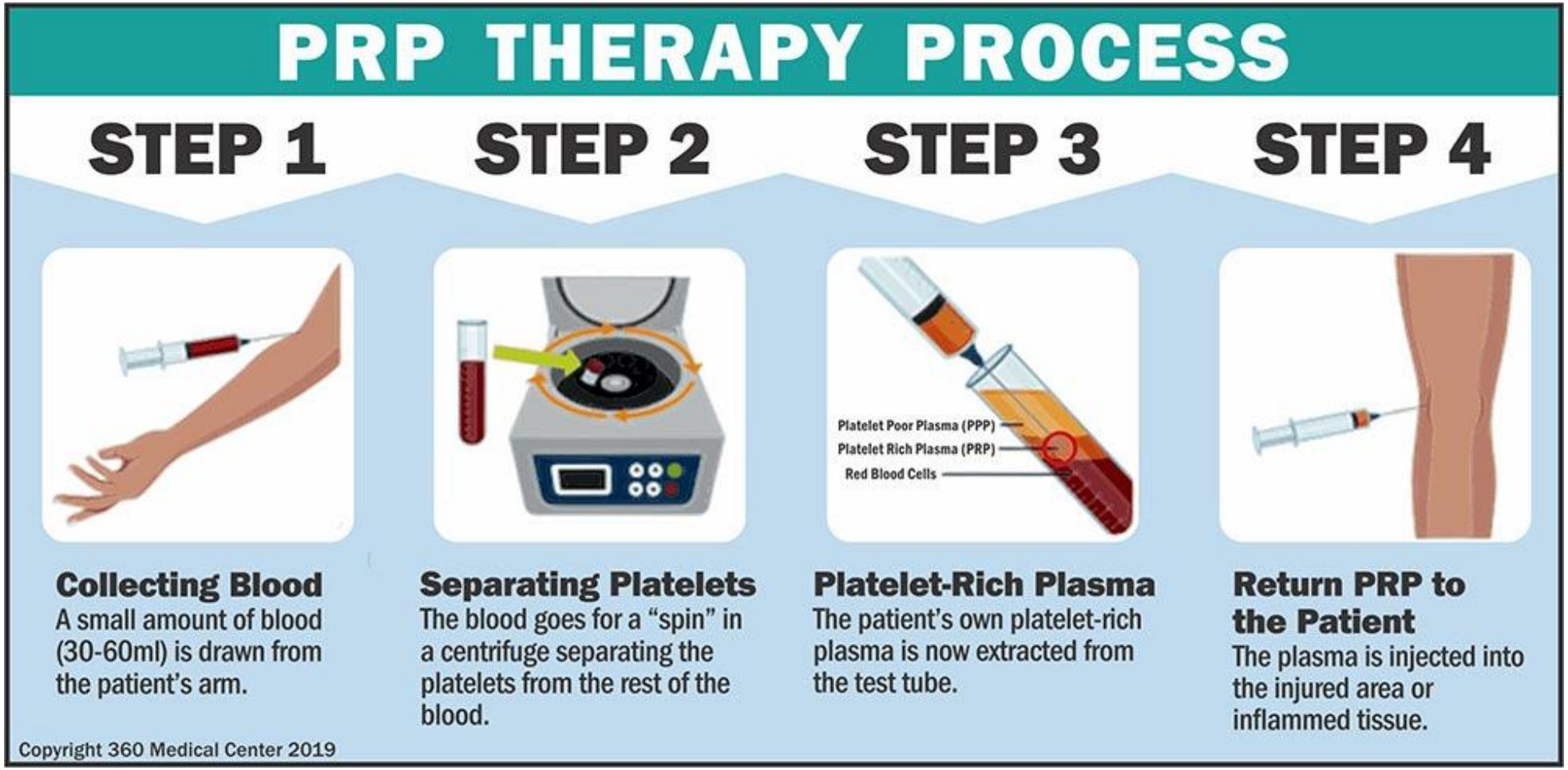


Systematic Review

Efficacy of Intra-articular Platelet-Rich Plasma Injections in Knee Osteoarthritis: A Systematic Review

Carlos J. Meheux M.D., Patrick C. McCulloch M.D., David M. Lintner M.D., Kevin E. Varner M.D., Joshua D. Harris M.D.

Platelet Rich Plasma



Results

- In symptomatic knee OA, PRP injection results in significant clinical improvements up to 12 months post-injection.
- Clinical outcomes and WOMAC scores are significantly better after PRP versus HA at 3 to 12 months post-injection.

Takeaways of OA:

- Clinical features:
  - Joint pain
  - Stiffness
  - Limited ROM
- Work up:
  - No labs needed
  - X-rays > MRI or US
  - X-ray findings:
    - Joint space narrowing
    - Osteophytes
    - Subchondral sclerosis
    - Subchondral cysts
- Treatment:
  - Nonpharmacological + pharmacological
    - Exercise + PT
    - Braces + orthoses
    - NSAIDs +/- Tylenol
    - CSI vs HAI vs PRP
  - Limited evidence for CAM
  - Minimize surgery unless pain remains uncontrolled and severe functional disability

Thank you for jointing! ;)

- Questions?

Citations

Buelt, A. Osteoarthritis management: updated guidelines from the american college of rheumatology and arthritis foundation. *Am Fam Physician*. 2021 Jan 15; 103(2): 120-121. https://www.aafp.org/afp/2021/0115/afp20210115p120.pdf. Accessed July 24th, 2021.

Deveza LA. Overview of the management of osteoarthritis. *UpToDate*. 2021. https://www.uptodate.com/contents/overview-of-the-management-of-osteoarthritis?search=osteoarthritis&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H1992280113. Accessed July 24th, 2021.

Doherty, M, and A Abhishek. Clinical manifestations and diagnosis of osteoarthritis. *UpToDate*. 2019. https://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-osteoarthritis?search=osteoarthritis&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2#H3222307137. Accessed July 24th, 2021.

Kraus, VB, et al. Effects of physical activity in knee and hip osteoarthritis: a systematic umbrella review. *Med Sci Sports Exerc*. 2019 Jun; 51(6): 1324-1339. doi: 10.1249/MSS.0000000000001944.

Loeser, RF. Pathogenesis of osteoarthritis. *UpToDate*. 2020. https://www.uptodate.com/contents/pathogenesis-of-osteoarthritis?search=osteoarthritis&source=search_result&selectedTitle=4~150&usage_type=default&display_rank=4. Accessed July 24th, 2021.

Meheux, CJ, et al. Efficacy of intra-articular platelet-rich plasma injections in knee osteoarthritis: a systematic review. *Arthroscopy*. 2016. 32(3): 496-505. doi:10.1016/j.arthro.2015.08.005.

Sinusas, K. Osteoarthritis: diagnosis and treatment. *Am Fam Physician*. 2012; 85(1): 49-56. https://www.aafp.org/afp/2012/0101/afp20120101p49.pdf. Accessed July 24th, 2021.

Trojian, TH, et al. AMSSM scientific statement concerning viscosupplementation injections for knee osteoarthritis. *Br J Sports Med*. 2016; 50: 84–92. doi:10.1136/bjsports-2015-095683.