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Knee Osteoarthritis management and counseling tips.

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Knee osteoarthritis

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DEGENERATIVE JOINT DISEASE OF THE KNEE OR KNEE OSTEOARTHRITIS:

- Most common in the elderly
- Happens due to wear and tear and progressive loss of articular cartilage
- Eventually leads to disability. The intensity of the symptoms and the rate of progression varies
- Common clinical symptoms include knee pain that is gradual in onset and worse with activity, knee stiffness and swelling, pain after prolonged resting, and pain that worsens over time
- Treatment for knee osteoarthritis begins with conservative methods and progresses to surgical treatment when conservative treatment fails. While medications can help slow the progression of RA and other inflammatory conditions, no proven disease-modifying agents for the treatment of knee osteoarthritis currently exist

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ETIOLOGY:

Knee osteoarthritis is classified as either **primary** or **secondary**

- **Primary knee OA**

  Is the result of articular cartilage degeneration without any known reason. This is typically thought of as degeneration due to age as well as wear and tear.

- **Secondary knee OA**

  Is the consequence of either an abnormal concentration of force across the joint as with post-traumatic causes or abnormal articular cartilage, such as rheumatoid arthritis (RA)

Possible Causes of Secondary Knee OA

- Posttraumatic
- Postsurgical
- Congenital/malformation of the limb
- Malposition (varus/valgus)
- Scoliosis
- Rickets
- Hemochromatosis
- Chondrocalcinosis
- Wilson disease
- Gout/ Pseudogout
- Acromegaly
- Avascular necrosis
- Rheumatoid arthritis
- Infectious arthritis
- Psoriatic arthritis
- Hemophilia
- Paget disease
- Sickle cell disease

RISK FACTORS for Knee OA

Modifiable

- Articular trauma
- Occupation – prolonged standing and repetitive knee bending
- Muscle weakness or imbalance
- Weight
- Health – metabolic syndrome

Non-modifiable

- Gender - females more common than males
- Age
- Genetics
- Race

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EPIDEMIOLOGY

- It is the most common type of OA diagnosed. Its prevalence will continue to increase as life expectancy and obesity rises.
- 13% of women and 10% of men 60 years and older have symptomatic knee OA.
- After 70 years, the prevalence rises to as high as 40%.
- The prevalence of knee OA in males is also lower than in females.
- Not all patients with radiographic findings of knee OA will be symptomatic.
- 15% of patients with radiographic findings of knee OA were symptomatic.
- Not factoring in age, the incidence of symptomatic knee OA is roughly 240 cases per 100,000 people per year.

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HISTORY

- For chief complaint of knee pain, it is essential to obtain a detailed history of symptoms. ✓
- Knee pain can be referred from the lumbar spine or the hip joint. ✓
- It is key to identify risk factors associated with secondary knee OA. ✓

HISTORY

The history of the present illness should include the following:

- Onset
- Specific location of pain
- Duration of pain and symptoms
- Characteristics of the pain
- Alleviating and aggravating factors
- Any radiation
- Specific timing of symptoms
- Severity of symptoms
- The patient's functional activity

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EVALUATION:

In addition to a thorough history and physical, radiographic can be obtained

Recommended views:

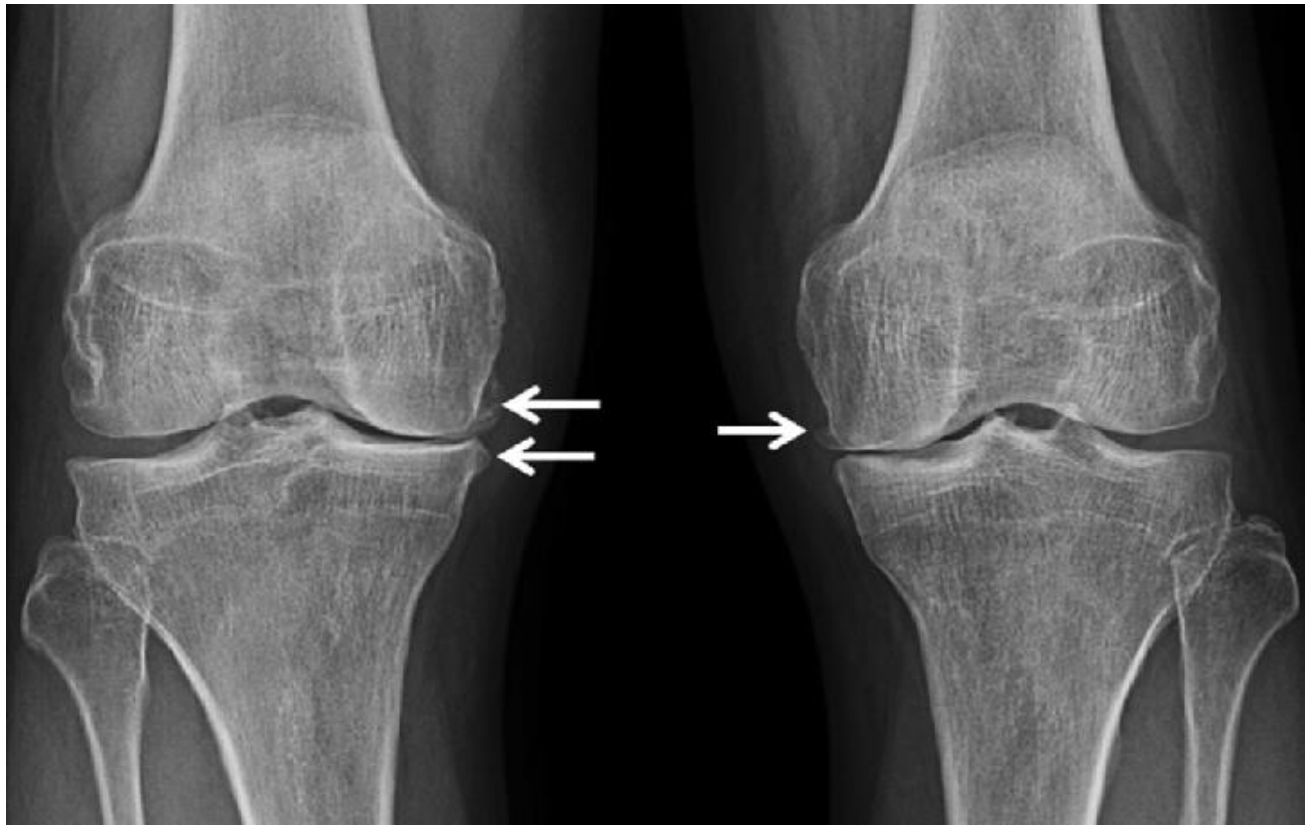
- Standing anteroposterior (AP)
- Standing lateral in extension
- Skyline view of the patella.
- A standing 45° posteroanterior (PA) view of the knee gives a better assessment of the weight-bearing surface of the knee.

- ❑ Standing radiographs of the knee must be obtained. This gives an accurate representation of the joint space narrowing present. Allowing to view the degree of deformity and overall alignment of the lower extremity.
- ❑ If films are taken with the patient supine, may give a false sense of joint space and alignment and should not be used to evaluate suspected knee OA

EVALUATION

Radiographic Findings of OA:

- Joint space narrowing

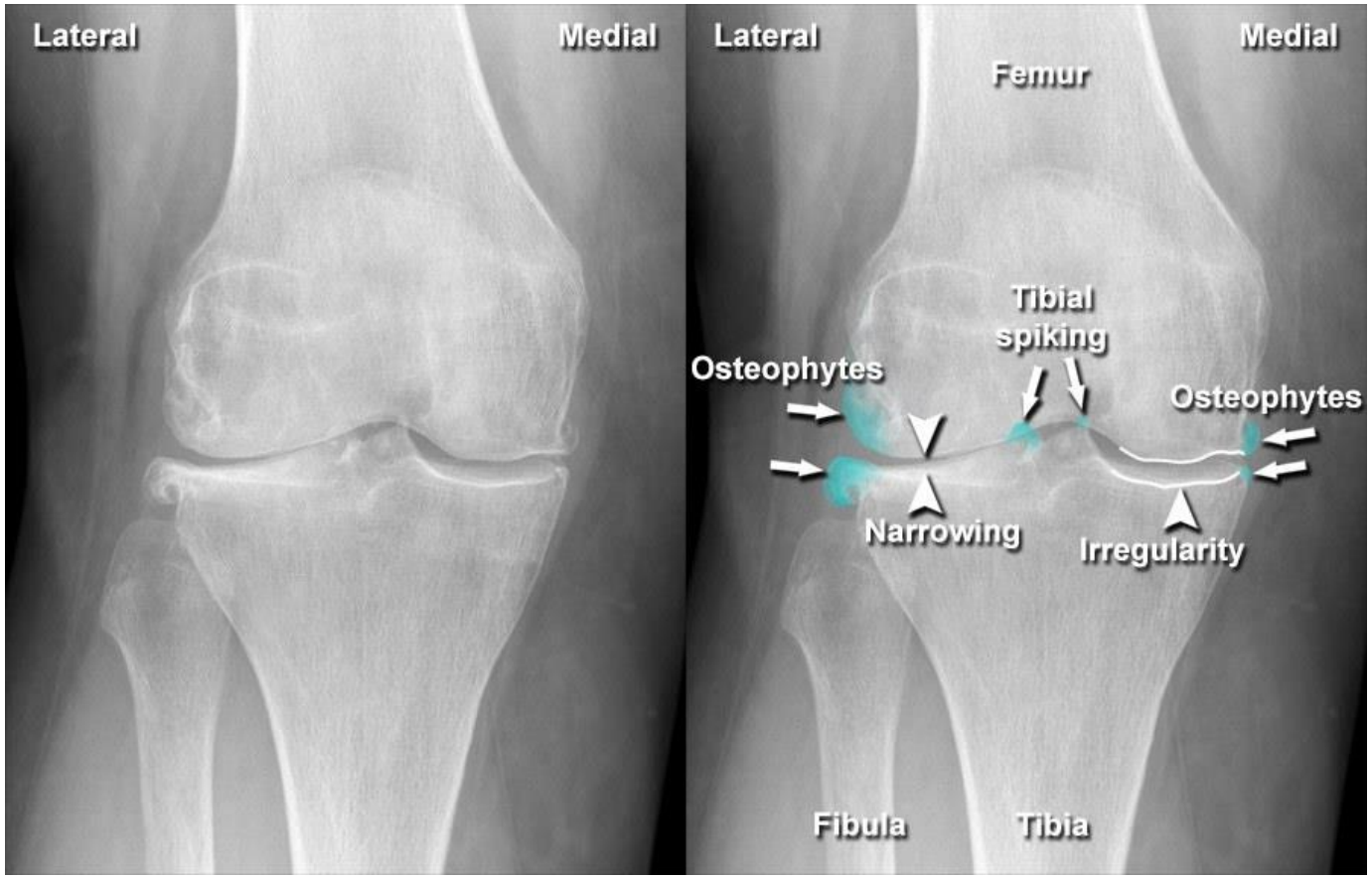


https://www.researchgate.net/figure/Degenerative-osteoarthritis-of-the-knee-joint-There-is-progressive-joint-space-narrowing_fig7_321164615

EVALUATION

Radiographic Findings of OA:

- Osteophyte formation



https://www.radiologymasterclass.co.uk/tutorials/musculoskeletal/imaging-joints-bones/osteoarthritis

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EVALUATION

Radiographic Findings of OA:

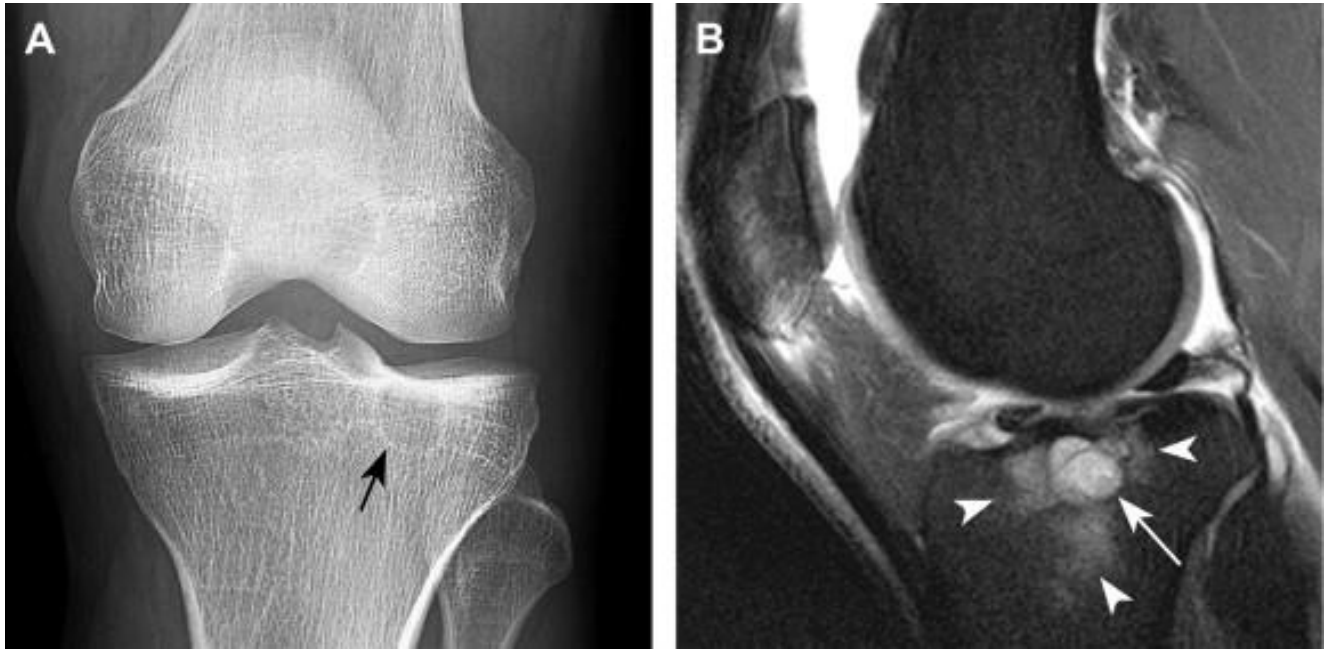
- Subchondral sclerosis

https://www.researchgate.net/figure/Examples-of-JSN-osteophytes-and-subchondral-sclerosis-on-a-tunnel-view-radiograph_fig6_292074481

EVALUATION

Radiographic Findings of OA:

- Subchondral cysts



https://www.sciencedirect.com/science/article/pii/S1063458409000776

Knee osteoarthritis. Can we prevent OA?

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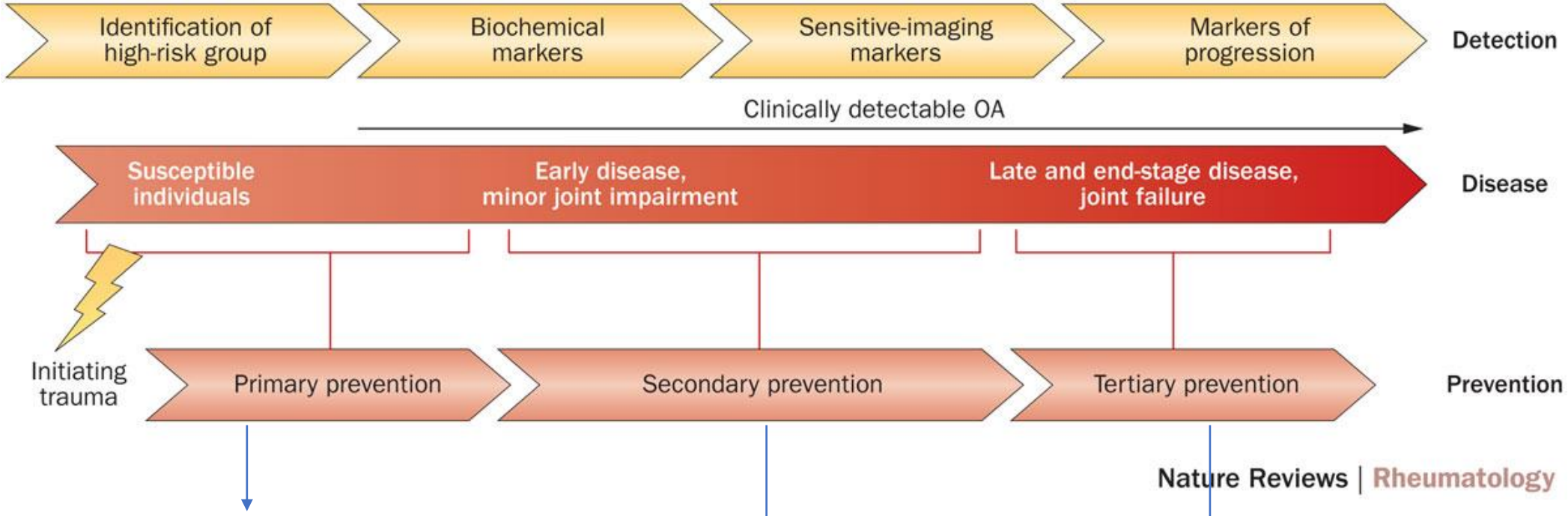
As Family Medicine Physicians our answer should be yes to this question most of the time.



Prevention of knee injury
Prevention of Obesity
Promotion of active lifestyles

Early treatment of OA to prevent progression of the disease

Rehabilitation to promote mobility
Symptoms management

Roos, E. M. & Arden, N. K. (2015) Strategies for the prevention of knee osteoarthritis *Nat. Rev. Rheumatol.* doi:10.1038/nrrheum.2015.135

Functional classification

Mild knee osteoarthritis – Patients with mild knee OA have low levels of or intermittent knee pain with relatively well-preserved joint function and quality of life.

Moderate/severe knee osteoarthritis – Patients with moderate to severe OA have persistent pain which significantly impairs functionality, activity participation, and quality of life.

Exercise

- Provides pain relief, functional improvement, and joint protection.
- Alongside weight loss when indicated, is a core component of knee OA management
- For all patients with knee OA , irrespective of their age, radiographic disease severity, pain intensity, functional levels, and comorbidities
- There is moderate to high-quality evidence suggesting that land-based exercise improves knee pain and function with moderate effect size immediately after treatment.
- Provides comparable effect comparable with that reported for oral nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen

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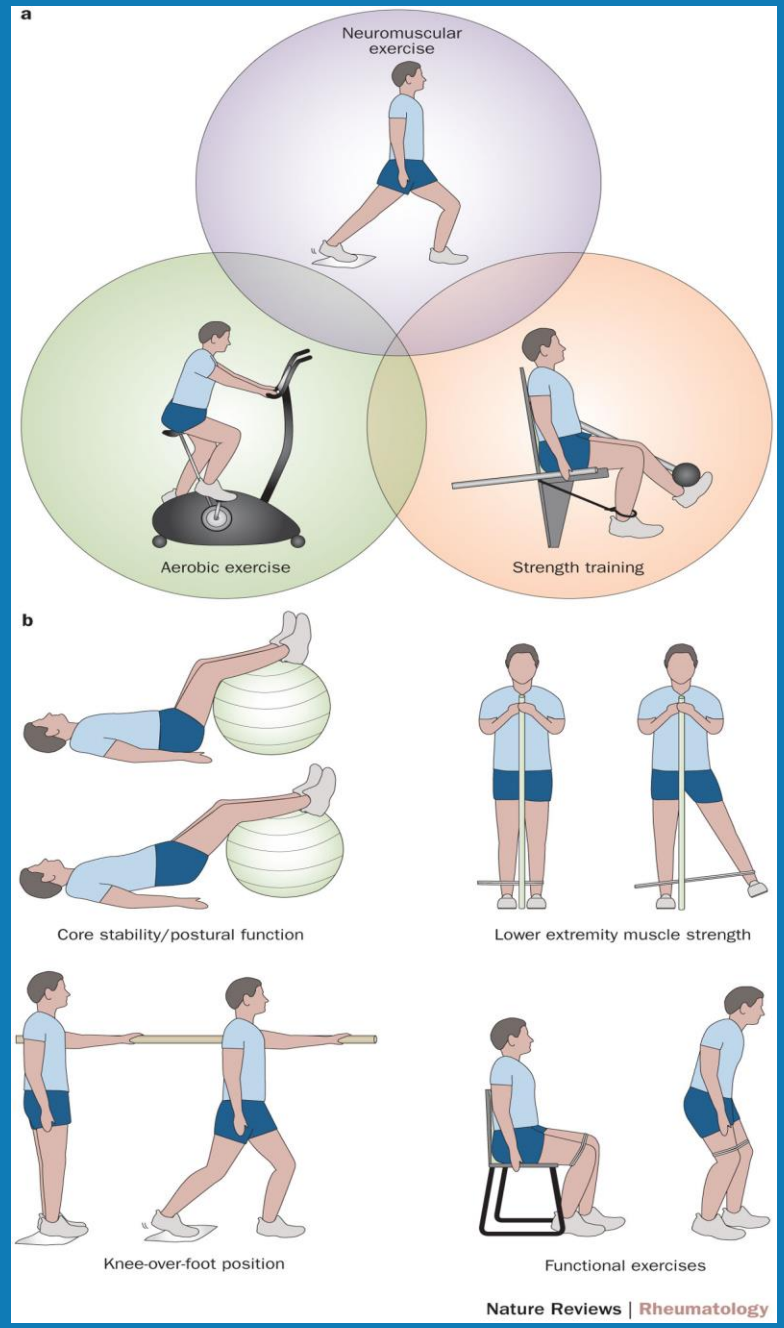
“What exercises do you recommend for me?”

Anything you can do and brings you joy!!!

- Research has also shown that exercise is and that low to moderate-intensity exercise is not harmful for articular cartilage in people with knee OA.
- Physical therapists and your secret weapon when designing and optimizing an exercise program.
- Aerobic fitness training (eg, walking, cycling, rowing, and deep-water running) and lower limb strengthening exercises.
- High impact on the joints such as running or jumping are usually discouraged further especially in cases of more advanced OA.
- Scarce evidence demonstrating an association between running and progression of knee OA.
- For runners a load management, optimized for rest days, running surface, distance and speed, and footwear, as well as building up muscle strength might be the key.
- Stretching or flexibility exercises, particularly of the hamstrings to avoid or minimize flexion contracture of the knee, should not be the sole exercise component.



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“My friends do aqua therapy can I do that?”

- Aquatic exercise also has clinically relevant effects on knee pain, function, and stiffness.
- Particularly useful for patients with severe pain and/or poor physical function due to its better tolerance and lower potential to cause adverse events
- Several locations in Los Angeles

Mind-body interventions

- A limited number of large trials investigating the long-term effects of Tai Chi, has shown to be as effective as a standard exercise program after 12 weeks in terms of knee pain, physical function, and reduction in analgesic use, in addition to having greater improvement in depression.
- Moreover, Tai Chi improves balance and is associated with a reduced falls risk in older patients with knee OA.
- There is less evidence for yoga. A systematic review showed limited low-quality evidence that it improves pain, physical function, and stiffness (compared with exercise and nonexercise controls).

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Bracing

- Knee bracing in osteoarthritis includes unloader-type braces that shift the load away from the involved knee compartment.

- This may be useful in the setting where either the lateral or medial compartment of the knee is involved, such as in a valgus or varus deformity

Pharmacological measures

- Drug therapy is the first-line treatment for patients with symptomatic OA.
- Choice of NSAIDs: physician preference, patient acceptability, and cost.
- Duration of treatment: effectiveness, adverse effects, and past medical history.
- There is strong evidence for NSAID use based on the AAOS guidelines.

- **Topical NSAIDs** (Diclofenac): Less systemic side effects. Evidence shows comparable to the effect obtained with oral formulations and slightly better than that observed with topical placebo

- **Topical capsaicin** For mild OA localized to the knee or a few other joints in whom other treatments are ineffective or contraindicated. It's derived from hot chili peppers with the potential to alleviate pain through the down-regulation of the TRPV1 receptor activity on nociceptive sensory neurons and the depletion of substance P.

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"My cousin in Florida gets all kind of injections!!! Can I get some of those?"

Intra-articular therapies

- **Corticosteroids**

- Kenalog (IR) regular CSI approved for all plans

- Zilretta ** (ER) not approved by all insurance – more expensive

- **Hyaluronans last 6 months**

- Hyaluronic Acid (Monovisc, Dulorane) very expensive not covered by all plans ~ 1200 USD

- **Platelet-rich plasma not covered ~ 900 USD**

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Intraarticular glucocorticoids injections

- Intra-articular corticosteroid injections may be useful for symptomatic knee OA, especially where there is a considerable inflammatory component. The delivery of the corticosteroid directly into the knee may reduce local inflammation associated with OA and minimize systemic effects.
- At our MSK clinic our patients get CSI at ~ 4 months or more intervals
- Serial injections (every 3 months) are discouraged due to potential negative effects on the progression of cartilage damage in knee OA patients.
- Evidence shows that patients who received CSI every 12 weeks for 2 years of intra-articular triamcinolone injections were found to have significantly greater cartilage volume loss measured by magnetic resonance imaging (MRI)
- Intraarticular glucocorticoid injections appear to be less effective for pain relief compared with physical therapy. (PT is the key!)

Hyaluronic Acid injections

- HA is a glycosaminoglycan found in the human body and it is an important component of synovial fluid and articular cartilage.
- HA breaks down during the process of OA and contributes to the loss of articular cartilage as well as stiffness and pain.
- Local delivery of HA into the joint acts as a lubricant and may help increase the natural production of HA in the joint.
- Depending on the brand of HA, it can either be produced from avian cells or bacterial cells in the laboratory and therefore must be used with caution in those with avian allergies.
- While this is a prevalent treatment option, it is not highly supported in the literature, and there is strong evidence against its use based on the AAOS guidelines.
- The evidence from large, double-blinded, and high-quality trials indicates that intra-articular HA has a small, clinically irrelevant benefit over intra-articular placebo.

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Platelet-rich plasm

- Investigational use not a lot of evidence for the benefit of platelet-rich plasma (PRP) injection in patients with knee OA.

- Some studies have not shown that PRP improved pain or function compared with hyaluronic acid, intra-articular steroid, or saline.

- Initial studies had suggested benefit of PRP for knee OA symptoms, methodologic flaws, heterogeneity, and high risk of bias raised concerns that the effect could be related to confounding variables.

Supplements

Curcumin and *Boswellia serrata*

- Small studies have suggested that these agents may have anti-inflammatory and analgesic properties.
- Curcumin is poorly absorbed by the GI tract; curcumin supplements formulated to enhance absorption and bioavailability are usually preferred (eg, combinations of curcumin with piperine or bioperine, a constituent of black pepper).
- Although the reduction in pain measures were statistically significant, the clinical importance is uncertain. Measures of effusion-synovitis volume on MRI were similar between the two groups, as were adverse events. Larger trials are needed to determine the clinical relevance of these findings.
- Findings from a meta-analysis of seven randomized trials comparing *Boswellia serrata* extract with placebo in patients with OA suggested that *Boswellia serrata* extract may help relieve pain, stiffness, and function.
- However, the quality of the trials included in the analysis was low, with unclear risk of bias in several studies

Glucosamine and chondroitin

- Not recommended by professional organizations.
- Do not discourage their use for patients who are keen to take them, especially if symptomatic benefit is achieved with their use.
- In general, there have been conflicting results from randomized trials evaluating the efficacy of glucosamine and chondroitin in knee OA.
- A strong placebo effect has been demonstrated in the studies involving these dietary supplements.
- Limitations of the study include the small size and potentially inadequate dosing of chondroitin and glucosamine.

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Surgical

- Failed conservative management
- Mechanical symptoms (locking, buckling)

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