

Evidence-based guidelines for the nonpharmacological treatment of osteoarthritis of the hip and knee

Education about osteoarthritis, guidance regarding weight loss and exercise, and timely referrals should all be part of early intervention.

ABSTRACT: Osteoarthritis is the most common form of arthritis and can lead to significant pain and disability. Treatment of osteoarthritis of the knee and hip should aim to reduce joint pain and stiffness, maintain or improve mobility, and optimize patient functioning and quality of life while limiting the progression of joint damage. A recent expert review of the management of osteoarthritis by the Osteoarthritis Research Society International supports a combination of nonpharmacological and pharmacological strategies. The review also indicates that patient education is critical in the early stages of care, and that weight loss and exercise are key to any nonpharmacological treatment. The guidelines are expanded for practical implementation of evidence-based, conservative management of hip and knee osteoarthritis.

In order to develop patient-focused evidence-based recommendations for the management of hip and knee osteoarthritis, the Osteoarthritis Research Society International (OARSI) convened a panel of 16 experts from four medical disciplines: primary care, rheumatology, orthopaedics, and evidence-based medicine. Panel members reviewed existing guidelines for the management of hip and knee osteoarthritis, a highly prevalent cause of pain and disability,¹ along with data published from 1945 to January 2006.²

Treatments were evaluated for efficacy, safety, and cost-effectiveness. Panel members also considered each treatment in terms of patient tolerance, acceptability, likely adherence, and further logistic issues involved in its administration.³ A subjective “strength of recommendation” (SOR) overall numeric rating (0 to 100 mm on a visual analog scale) was provided for each management strategy based on the individual scoring by each of the 16 panel members. Mean and standard errors of the mean for each SOR were calculated and presented with confidence intervals. Of the 25 treatments suggested, 20 involved nonsurgical options.³

The majority of evidence considered by the panel pertains to knee osteoarthritis, as reflected in this narrative review. The hip and knee joints are very different in structure, loading, and movement. Certainly the treatment effect of a modality described for one joint may not be the same for the other joint. Clarification regarding the nature of supporting evidence has been made below whenever possible. We also outline the OARSI recommendations and provide additional practical suggestions for implementing evidence-based, conservative management of hip and knee OA.

OARSI recommendations

All patients with hip and knee OA should be given information access and education about the objectives of treatment and the importance of changes in lifestyle, exercise, pacing

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of activities, weight reduction, and other measures to unload the damaged joint(s). The initial focus should be on self-help and patient-driven treatments rather than on passive therapies delivered by health professionals. Subsequently emphasis should be placed on encouraging adherence to the regimen of non-pharmacological therapy. SOR: 97% (95% CI 95–99)²

In patients with knee OA and mild/moderate varus or valgus instability, a knee brace can reduce pain, improve stability and diminish the risk of falling.

Patient education regarding osteoarthritis pathogenesis, clinical course, and treatment is needed to promote behavioral modifications and improve symptoms. However, such complex interventions can be time-consuming and difficult to provide during a single visit. Consequently, systematic conservative OA management programs are not routinely offered to patients, as less than half of those with obesity and OA are advised to lose weight.⁴

In a recent study, patients with mild to moderate OA received standardized educational content over the course of three encounters with a physician (days 0, 15, and 30) versus usual care (also involving three encounters).⁵ In the treatment group, the first visit focused on informing the patient about the disease and outlining treatment. The second visit focused on standardized exercise, and the third visit on weight loss instructions. Compared with usual care, this program

led to better scores for weight loss, physical activity, and pain after 4 months.⁵

Patients with hip and knee OA, who are overweight, should be encouraged to lose weight and maintain their weight at a lower level. SOR: 96% (95% CI 92–100)²

The entire OARSI panel recommended encouraging patients to main-

tain a healthy body weight.² Patients with knee OA who commenced a low-energy diet reported improved pain, stiffness, and functional status after 8 weeks of intervention.^{2,6,7} For each kilogram of body weight lost, the knee experiences a 4 kg reduction in load per step and a 4800 kg reduction in compressive load for each kilometre walked.⁷

Patients with symptomatic hip and knee OA may benefit from referral to a physical therapist for evaluation and instruction in appropriate exercises to reduce pain and improve functional capacity. This evaluation may result in provision of assistive devices such as canes and walkers, as appropriate. SOR: 89% (95% CI 82–96)²

A global assessment of a patient's medical and functional issues is necessary when prescribing therapy for osteoarthritis. Physiotherapists play an essential role in managing hip and knee osteoarthritis by helping to in-

crease patient activity levels. Physical medicine and rehabilitation specialists also play an essential role. They are trained in all nonsurgical treatment options and can longitudinally support patients faced with complex disease, pain, disability, and resource challenges.

General exercise strategy

There are two major barriers to the uptake of routine exercise in the osteoarthritis population: (1) failure on the part of medical practitioners to properly recommend exercise to patients or make appropriate referrals to exercise professionals and (2) failure of patients to comply with prescribed exercise programs.⁸ A survey of osteoarthritis patients in Canada revealed only one-third had been advised to exercise for their OA; however, 73% had tried exercising in the past.⁹

A dose-response relationship between compliance and exercise effects has been demonstrated in knee OA, indicating the importance of patient adherence.¹⁰ Compliance can be improved through professional disease education and exercise presentation.¹¹ Initial physiotherapist-supervised classes have been shown to be beneficial as a supplement to longer-term home exercises for both pain and functioning.¹² In general, physicians should encourage patients to undertake exercises patients enjoy.

Pool exercise

Patients with hip and knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises. For patients with symptomatic hip OA, exercises in water can be effective. SOR: 96% (95% CI 93–99)²

Archimedes recognized that “any object, wholly or partly immersed in a fluid, is buoyed up by a force equal to

the weight of the fluid displaced by the object.” The depth of water can be a useful gauge, and patients with severe symptoms may progress to more shallow water. Additionally, patients may find other aspects of the water therapeutic, such as the temperature, added constituents, or pressure from jets.

The effectiveness of active aquatic exercise for the treatment for osteoarthritis was recently assessed in a Cochrane review that included six studies of patients with both hip and knee OA and knee OA only.¹³ Immediately after an exercise period, significant improvements in function, quality of life, and mental health were found in patients with both hip and knee OA, along with pain reduction in the knee OA group. The rate of patient withdrawal was relatively low (20% to 28%) and reports of adverse events (such as increased pain or drug consumption) were absent.¹⁴

Strengthening exercises

Muscle weakness is a common impairment among patients with knee osteoarthritis.^{15,16} A longitudinal study suggests that quadriceps weakness precedes the onset of knee osteoarthritis and hence could increase the risk of disease development.^{17,18} Quadriceps strengthening, when combined with general strength, flexibility, and functional exercises, has been shown to improve OA symptoms.¹⁹ There is, however, limited evidence to suggest that stronger muscles can prevent disease progression.¹⁵

Any loss of muscle strength may be associated with pain, anxiety, lack of motivation, effusion, muscle atrophy, and altered joint mechanics.¹⁵ Exploring a patient’s physical and emotional barriers to exercise can help guide behavioral change and promote long-term adherence to exercise.

Walking aids can reduce pain in

patients with hip and knee OA. Patients should be given instruction in the optimal use of a cane or crutch in the contralateral hand. Frames or wheeled walkers are often preferable for those with bilateral disease. SOR: 90% (95% CI 84–96)²

Canes are a practical, affordable means to off-load the affected joint, improve balance, assist in muscular compensation, and, hopefully, reduce pain symptoms. Patients should be instructed to hold the cane in the contralateral hand and take steps with the affected limb and cane in tandem. The total length of the cane should equal the distance from the upper border of the greater trochanter to the base of the heel. The patient should be able to stand with the cane with level shoulders and elbow flexion at 20 to 30 degrees. Lastly, patients should ascend stairs with the good leg (“moving up is good”) and descend stairs with the affected leg and cane together.²⁰

Walkers are typically prescribed for patients who require maximum assistance with balance. This includes the elderly, the fearful, and the uncoordinated. The patient must have good grasp and arm strength bilaterally, although forearm supports are available. Unfortunately, patients can become dependent on walkers and therefore their use should be reserved for rehabilitation, severe disease, or other select circumstances.²⁰

In patients with knee OA and mild/moderate varus or valgus instability, a knee brace can reduce pain, improve stability and diminish the risk of falling. SOR: 76% (95% CI 69–83)²

Braces and orthoses are defined as “any medical device added to a person’s body to support, align, position, immobilize, prevent or correct deformity, assist weak muscles, or improve function.”²¹ A knee brace may reduce both the muscular contraction needed to stabilize the affected knee, and the

bone-on-bone weight-bearing distribution within the joint itself.¹⁵

Osteoarthritis of the knee often involves the medial compartment, a situation thought to be the result of the natural “bowing” or varus moment present during normal human gait. Alternatively, isolated lateral compartment OA can result from a valgus knee alignment. While multiple high-quality studies are lacking, knee “off-loader” braces have demonstrated improved pain scores and walking tolerance at 1 year, particularly in the medial compartment OA group.²² Compliance can be inconsistent, particularly in the context of obesity where effective fitting can be challenging.

Every patient with hip or knee OA should receive advice concerning appropriate footwear. In patients with knee OA insoles can reduce pain and improve ambulation. Lateral wedged insoles can be of symptomatic benefit for some patients with medial tibiofemoral compartment OA. SOR: 77% (95% CI 66–68)²

While the degree of observed lateral thrust and compressive forces experienced at the knee may be reduced by lateral wedged insoles, the primary role of these insoles should be to improve pain symptoms.²³ Two prospective RCTs of patients with medial femorotibial OA showed reduced NSAID use and better compliance in the treatment group using the lateral wedged shoe insert.^{24,25} Orthotics should be smaller (between 8 and 12 mm) and ideally a patient’s tolerance, including gait pattern, should be noted within the first 2 weeks of use.²³

The clinical status of patients with hip or knee OA can be improved if patients are contacted regularly by phone. SOR: 66% (95% CI 57–75)²

Regular phone contact with a trained nonclinical professional may help improve a patient’s pain symptoms.²⁶ Self-management strategies

for knee and hip OA that provide patients with opportunity for education and treatment are also deemed effective ways to improve pain and disability.²⁷ In British Columbia, the Vancouver Coastal Health Osteoarthritis Service Integration System (OASIS) team consists of nurse clinicians, physiotherapists, occupational therapists, and dietitians, and is designed to support OA patients (physician referral is required).²⁸ The BC Ministry of Health Services web site provides other provincial resource options.²⁹

In some studies, real acupuncture is shown to be better than sham acupuncture for treating pain, suggesting that acupuncture can be an effective treatment for knee osteoarthritis.

Some thermal modalities may be effective for relieving symptoms in hip and knee OA. SOR: 64% (95% CI 60–80)²

There is no strong evidence supporting the use of thermal modalities; however, these are still included in the majority of guidelines for OA management.³ Thermal modalities are likely still included in most OA treatment guidelines because they are accessible, affordable, and often the patient's first-line choice for managing acute pain. Heat may be applied in the form of warm water, heat packs, or wax therapy, and may serve as an adjunct during stretching or perhaps during painful episodes. Cryotherapy typically involves ice packs—a practical consideration for acute episodes of inflammation and pain.

TENS can help with short-term pain control in some patients with hip or knee OA. SOR: 58% (95% CI 45–72)²

Transcutaneous electrical nerve stimulation is typically provided by physiotherapists, although patients can purchase their own devices. In contrast to electrical muscle stimulation, TENS primarily blocks pain transmission. TENS has been well studied in knee osteoarthritis, and in some patients can provide clinically significant pain relief, particularly over the short-term (first 2 to 4 weeks of ther-

apy).^{30,31} While no serious side effects have been reported,³¹ conditions involving skin breakdown and pacemaker implantation are contraindications.

Acupuncture may be of symptomatic benefit in patients with knee OA. SOR: 59% (95% CI 47–71)²

In some studies, real acupuncture is shown to be better than sham acupuncture for treating pain,^{3,32} suggesting that acupuncture can be an effective treatment for knee osteoarthritis. A recent study showed that acupuncture alone was helpful with pain at 2 and 6 weeks, while adding it to advice and exercise recommendations delivered by a physiotherapist provided no additional benefit.³³ As with other alternative therapies, the utility of acupuncture in a manage-

ment plan will depend on patient familiarity, preference, and treatment response.

Conclusions

The OARSI guidelines describe numerous useful strategies for the treatment of hip and knee osteoarthritis. While the literature will continue to grow in this field, these recommendations provide clinicians with a number of practical options for managing their unique patients. Generally speaking, treatments receiving lower SOR scores require further research to clarify ideal candidate patients and to help refine each therapy. Overall, the OARSI guidelines show that early intervention for OA should include disease education, guidance on weight loss and exercise, and timely referrals. A global patient assessment will help to shape a comprehensive approach to care, and hopefully reduce the need for medications or surgery.

Competing interests

None declared.

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