



Exercise: knee osteoarthritis

Intervention

Exercise is recommended as a core treatment for osteoarthritis in all clinical guidelines regardless of patient age, pain levels or disease severity.

Regular land- or water-based therapeutic exercise for adults with knee osteoarthritis (OA). Exercise programs may be delivered face to face or via the internet.

Indication

Adults with knee OA. The aim is to reduce the pain and improve the physical function of the knee.

Precautions

- Confirm the patient has appropriate footwear for exercising.
- Emphasise the need to perform the exercise correctly and at medium speed, to minimise the risk of injury.
- Ensure safety: advise the patient to use a chair or bench for support when exercising in standing positions.

Contraindications

There are few contraindications; however, comorbidities, such as cardiovascular disease, asthma and diabetes should be considered.

Adverse effects

Adverse effects are generally infrequent, mild and transient. They include increased pain, exercise-related injury, falls and fall-related injury.

Availability

Exercise is readily available. It can be performed at home, in a group setting or at a local gym. Exercise is effective whether it is individual or group-based.

Exercise is usually optimised when a home-based program is initially and subsequently periodically individually supervised. Discussing the planned regimen with a health practitioner before commencement and periodically subsequently encourages patient adherence.

While there is evidence that ongoing contact with a health practitioner is beneficial, this may not need to be in person. Internet delivered exercise programs show good uptake and adherence. Internet delivery includes teleconferencing (eg Skype™) with a physiotherapist or using internet based programs/apps. Some programs also have a pain coping skills component.



Description

A range of exercise types have been found to be moderately effective for adults with knee OA (refer to Figure 1).

Evidence suggests that a combination of strength, aerobic and flexibility exercise is most likely to improve pain and physical function outcomes in adults with knee OA.

There is limited evidence about the 'dosage' of exercise (frequency, duration, intensity) required for effective management of knee OA. Outcomes do not appear to be related to exercise intensity or to the duration of the exercise sessions.

General tips for types and dosage of exercises

	Strength	Flexibility	Aerobic
Tips	<p>Include quadriceps, hip abductor, hamstring and calf muscle strengthening exercises.</p> <p>Perform exercises in functional ways, such as chair raises, step-ups, step-downs, squats, heel raises and bridging where appropriate</p>	<p>Where appropriate, prescribe exercises to target increased range of movement in the knee and hip, and flexibility of the associated muscles.</p>	<p>Perform regular bouts of aerobic physical activity (e.g. walking, cycling or water exercise), aiming for decreased sedentary time and increased active time.</p>
How often?	<p>Regularly, at least 3 times per week, and maintained in order to gain longer-term benefits.</p>	<p>Regularly, at least 3 times per week, and maintained in order to gain longer-term benefits.</p>	<p>At least 30 minutes of moderate intensity aerobic exercise on most days.</p> <p>The 30 minutes can be done in bouts of at least 10 minutes.</p>
Exercise intensity	<p>8–12 repetitions in 1 set. Repeat 2–3 times with 1–2 minutes rest between sets.</p> <p>To get stronger safely, the exercise should feel like it was 'hard' or 'very hard' rather than 'easy' or 'extremely hard'.</p>	<p>Each stretch should be held 15–30 seconds and repeated 2–4 times.</p>	<p>Moderate intensity means working 'somewhat hard' (ie puffing but still able to talk).</p>

The **Consumer resource** section contains links to specific knee exercises for patients that can be done at home.



Tips

The exercise program should be individualised, taking into account the patient's age, severity of OA, mobility, comorbidities and exercise preferences.

- Physiotherapists or exercise physiologists can provide advice about a training program. Consider a referral under the Enhanced Primary Care (EPC) Program so that eligible patients can receive a Medicare rebate.
- Internet based programs may be useful and cost effective alternatives for patients who cannot or choose not to access physiotherapy. These may also offer help with pain coping skills.
- Feeling some discomfort or pain during exercise is normal; however, revise the exercise regimen if:
 - the pain is excessive
 - the pain remains elevated for more than 2 hours after exercise
 - there is increased joint swelling the next day.
- Encourage overweight patients to lose weight. This may help alleviate the symptoms of their knee OA by reducing the load on their knees.
- A graded approach to exercise, starting with 2–3 simple exercises and progressing to more challenging exercises may improve uptake and patient adherence.

Grading

NHMRC Level 1 evidence

References

- Uthman OA, van de Windt DA, Jordan JL et al. Exercise for lower limb osteoarthritis: systematic review incorporating trial sequential analysis and network meta-analysis. *BMJ* 2013;347: f5555 DOI: 10.1136/bmj.f5555.
- Fransen M, McConnell S. Exercise for osteoarthritis of the knee (Review). *Cochrane Database Syst Rev* 2008;4:CD004376. DOI: 10.1002/14651858. CD004376.pub2.
- Juhl C, Christensen R, Roos EM et al. Impact of exercise type and dose on pain and disability in knee osteoarthritis: a systematic review and meta-regression analysis of randomized controlled trials. *Arthritis Rheumatol*, 2014;66(3): 622–36. DOI: 10.1002/art.38290.
- Bennell KL, Nelligan R, Dobson F, et al. Effectiveness of an Internet-Delivered Exercise and Pain-Coping Skills Training Intervention for Persons with Chronic Knee Pain: A Randomized Trial. *Ann Intern Med*. 2017;166(7):453–62. DOI: 10.7326/M16-1714.



Consumer resources

The knee strengthening exercises, in the link below, describes basic knee strengthening exercises that patients can be at home. A simple graded approach to exercise has been provided. These exercises have been provided and reproduced with permission from Professor Kim Bennell, Centre for Health Exercise and Sports Medicine, Department of Physiotherapy, University of Melbourne.

www.racgp.org.au/your-practice/guidelines/handi/interventions/exercise-for-knee-osteoarthritis#downloads

There is ample information on the internet about knee exercises but it is not possible to assess the quality of all the information available. The following are reputable sites where patients can access further information:

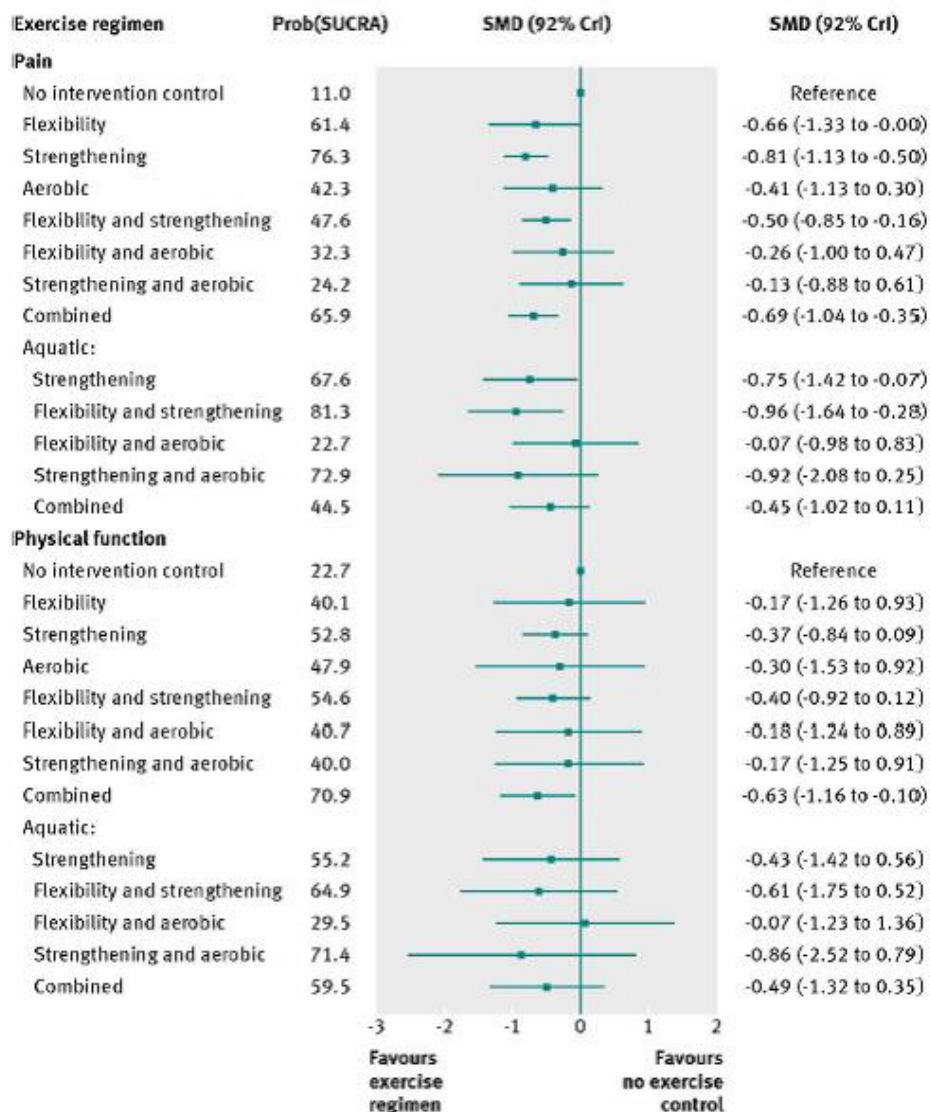
- The American Academy of Orthopaedic Surgeons OrthoInfo website orthoinfo.aaos.org/topic.cfm?topic=A00564 and downloadable PDF for conditioning the knees following injury or surgery orthoinfo.aaos.org/PDFs/Rehab_Knee_6.pdf
- The WebMD website includes a slide show of various patient exercises. www.webmd.com/osteoarthritis/joint-injections-13/slideshow-knee-exercises
- The Arthritis Research UK has downloadable patient exercises. www.arthritisresearchuk.org/arthritis-information/conditions/osteoarthritis-of-the-knee/knee-pain-exercises.aspx
- Arthritis Australia's MyJointPain website provides evidence-based self- management advice for patients about managing OA in general. <https://www.myjointpain.org.au/>



Figure 1: Forest plot of pain and physical function outcomes with exercise in lower limb osteoarthritis (mainly knee osteoarthritis)*

Uthman OA, van der Windt DA, Jordan JL et al. BMJ 2013; 347. Fig 2. Exercise for lower limb osteoarthritis: systematic review incorporating trial sequential analysis and network meta-analysis. P. 13. Reproduced with permission from the British Medical Journal. Available at www.bmj.com/content/347/bmj.f5555.

Reference = no exercise



*44/60 randomised controlled trials were in knee OA.

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