

Hands On

Practical advice on management of rheumatic disease



AN EXERCISE IN KNEE PAIN SELF-MANAGEMENT

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Throughout our lives our knee joints put up with a lot of (ab)use. About 25% of people over the age of 55 years complain of chronic knee pain – usually diagnosed as osteoarthritis (OA)¹ – and for 10% the pain is disabling.²

Most healthcare professionals and the lay public regard chronic knee pain as an inevitable, incurable consequence of ageing. As a result, management of knee pain focuses on symptomatic relief through prolonged use of painkillers, until after years of increasing pain and disability the joint may be surgically replaced – assuming people want surgery and do not have common co-morbidities that preclude surgery. Few people are advised to exercise and increase their physical activity, despite this being recommended in guidelines for the management of knee OA^{3,4} that are based on evidence from research showing that exercise reduces knee pain.^{5,6}

This article briefly explains the rationale behind physical activity/exercise in managing knee pain and provides simple advice and a few exercises that can be passed on to patients to encourage them to begin exercising and increase their level of physical activity. As healthcare professionals it is our duty to convey this information to people with knee pain; not to do so is **professional negligence**.

Intuitively people appreciate movement is good for joints – it's what they were made to do. What concerns and confuses people is their experience that physical activity brings on joint pain, while rest eases it. In the absence of adequate education and advice, people interpret this as movement wearing out the joint and surmise that reducing activity will prolong the life of their joints. In fact, inactivity is bad for joints, causing muscle weakness, osteoporosis and joint stiffness. Weak muscles tire easily, producing a clumsy, uneven, jarring gait that over time may initiate knee pain and damage and reduce function and independence.⁷ Therefore, maintaining strong, well-conditioned thigh muscles is vital for healthy knee joints: strong muscles are a necessity, not a luxury.

This is good news because of all the tissues affected by arthritis – bones, cartilage, muscles and ligaments – muscles are the easiest to alter. Regular physical activity and exercise maintain muscle condition, reduce pain and disability, improve function and protect against further joint damage.⁷ In addition, physical activity produces many other physiological, psychological and social health benefits, such as improved cardiovascular function, self-confidence, self-esteem and social interaction.⁸ And there's even better news – achieving these health benefits:

- **does not require joining a gym** – exercise is equally effective whether performed in supervised exercise classes or at home alone, so people can choose where they exercise.
- **does not require expensive equipment** – *walking* is an excellent form of exercise that can involve walks in the park, shopping, enjoyable day trips; *gardening* is a great form of physical activity that can be adapted so that less strain is placed on the knees; *swimming* is particularly helpful for joint pain, popular, and now more widely available through community-run classes designed for the over-50s. The important thing is that the activities should be enjoyable, cheap and easily available or they will soon be abandoned.
- **does not require long bouts of exhausting, strenuous exercise**, so there is no need to 'go for the burn'. Thirty minutes of physical activity *accumulated through the day* (e.g. one 30-minute brisk walk or three 10-minute brisk walks) brings health benefits. However, the benefits from physical activity are 'dose-related', so doing some physical activity regularly is better than doing none at all and, within reason, the more one does the better.

There is no escaping the fact that acquiring tangible health benefits from exercise requires effort, will-power and determination, and retaining these benefits requires continued effort. Nevertheless, by increasing physical activity people can help themselves to significantly reduce their knee pain and the disability this causes.

References

1. Bedson J, McCarney R, Croft P. Labelling chronic illness in primary care: a good or a bad thing? Br J Gen Pract 2004;54(509):932-8.
2. Peat G, McCarney R, Croft P. Knee pain and osteoarthritis in older adults: a review of community burden and current use of primary health care. Ann Rheum Dis 2001;60(2):91-7.
3. Recommendations for the medical management of osteoarthritis of the hip and knee: 2000 update. American College of Rheumatology Subcommittee on Osteoarthritis Guidelines. Arthritis Rheum 2000;43(9):1905-15.
4. Jordan KM, Arden NK, Doherty M et al. EULAR Recommendations 2003: an evidence based approach to the management of knee osteoarthritis. Report of a Task Force of the Standing Committee for International Clinical Studies Including Therapeutic Trials (ESCISIT). Ann Rheum Dis 2003;62(12):1145-55.
5. Minor MA. Exercise in the treatment of osteoarthritis. Rheum Dis Clin North Am 1999;25(2):397-415,viii.
6. Franssen M, McConnell S, Bell M. Therapeutic exercise for people with osteoarthritis of the hip or knee: a systematic review. J Rheumatol 2002;29(8):1737-45.
7. Hurley MV. The role of muscle weakness in the pathogenesis of osteoarthritis. Rheum Dis Clin North Am 1999;25(2):283-98,vi.
8. Hurley MV, Mitchell HL, Walsh N. In osteoarthritis, the psychosocial benefits of exercise are as important as physiological improvements. Exerc Sport Sci Rev 2003;31(3):138-43.

COMMENT

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Joints and muscles are designed to move and each component of our joints (cartilage, bone, muscles, tendons, ligaments) requires regular daily movement to stay healthy. When a joint is painful or has osteoarthritis (joint damage) it is even more important that the joint keeps moving.

Two types of exercise can reduce pain and improve disability due to knee pain, whether or not the pain relates to knee osteoarthritis. Firstly, specific exercises that strengthen the thigh muscles. These not only help reduce pain but also improve balance, reduce the tendency to fall over, and improve performance in daily activities such as walking and getting on and off a chair. Secondly, activity such as fast walking, arm swinging or movement to music that is sufficient to increase the pulse rate and make you slightly breathless and sweaty –

so-called ‘aerobic’ activity. This has many health benefits but is very good at reducing knee pain, improving sleep and helping overweight people on a diet to lose weight.

Both types of exercise are extremely safe and can be done at home without special equipment. They are advised for everyone with knee pain or knee osteoarthritis. Other lifestyle factors that reduce knee pain and improve the way our legs work include: (1) weight loss, if overweight or obese; (2) sensible shoes with thick soft soles and no raised heel; and (3) ‘pacing’ of activities through the day (breaking a long task into smaller parts with regular breaks in between). Such lifestyle changes are completely within our own control and do much more to improve the long-term outcome of knee pain and arthritis than any type of tablet or medicine.

This issue of ‘Hands On’ and the accompanying ‘Information and Exercise Sheet’ can be downloaded as html or a PDF file from the Arthritis Research Campaign website (www.arc.org.uk/about_arth/rdr5.htm and follow the links).

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KNEE PAIN

A word of advice

Controlled physical activity/exercise has many health benefits and few dangers, and very few people are too old or infirm to benefit, but you need to remember the following:

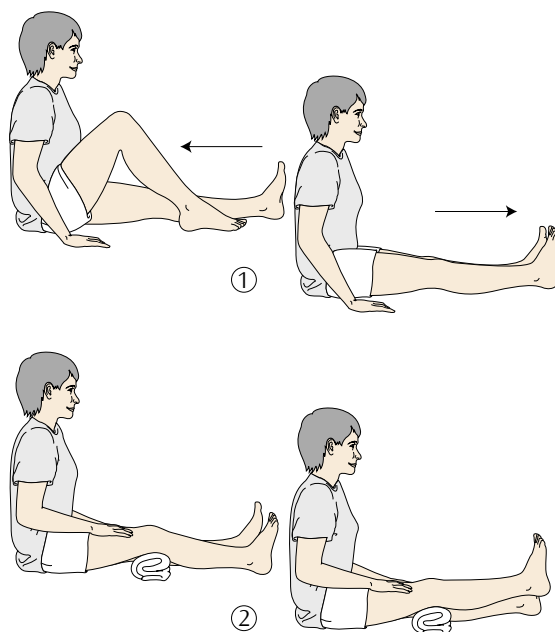
- Always ensure you are **stable and safe** when doing any exercise.
- Start a new exercise **slowly and cautiously**.
- **Progress slowly**, gradually increasing the time, frequency and intensity of exercising and doing a little more each week.
- **Set yourself realistic, achievable goals**, deciding exactly *what* activity you will do and *when, where* and *for how long* you will do it, and then **focus on fulfilling these goals**. When you've reached your targets, set yourself a more challenging, but still achievable, goal. To help you reach your targets make a 'public declaration' – tell your family and friends and get their support and encouragement.
- **Work hard** within your capabilities but near your maximum.
- **Exercise is not a cure** for knee pain. You are likely to continue to have (unexplainable) episodes of pain; during these times you should **rest** and reduce activity until the pain subsides.
- If an activity causes **prolonged pain, discomfort or swelling** lasting for more than a couple of days or that wakes you at night, rest for a couple of days. As the pain settles **resume exercising gently**, gradually building up the exercises as before but leaving out any specific activities that caused pain or adding them cautiously.
- **Blood, sweat and tears are NOT essential – or desirable.**

Exercises

Start with 'low impact exercises' (non-weight-bearing, i.e. sitting or lying on the floor, sofa or bed) and build toward weight-bearing exercises and functional activities, e.g. walking.

Simple exercises to increase movement or begin working the muscles

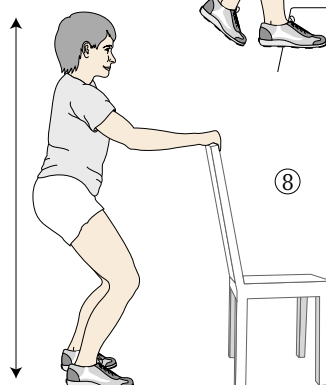
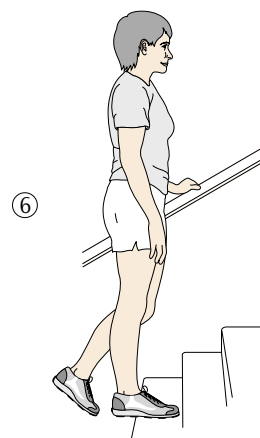
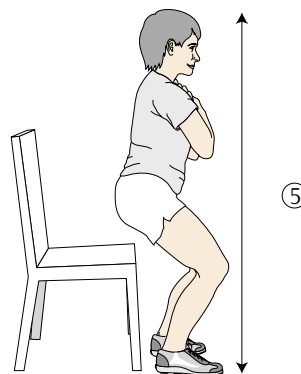
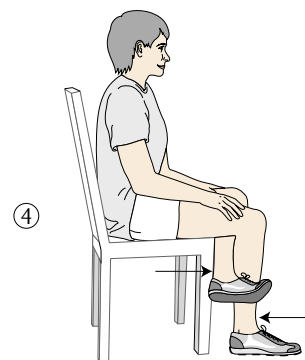
1. Sit on the floor, sofa or bed with your legs outstretched. Keeping your foot on the floor (or sofa/bed), slowly bend one knee until you feel the knee being comfortably stretched without hurting; hold for 3–4 seconds. Straighten your leg as far as you can; hold for 5 seconds. Repeat until you have done 10 bends. Repeat the exercise with the other leg.
2. Sitting on the floor, sofa or bed with your legs outstretched, place a rolled-up towel under one knee. Push down on the towel as if straightening your knee, then pull your toes and foot towards you so that you feel your calf muscles stretch and so that your heel lifts off the floor (or sofa/bed). Hold for 5 seconds, relax for 5 seconds, then repeat until you have done 10 contractions. Repeat the exercise with the other leg.
3. If you have a set of pedals or static exercise bike, adjust the pedals so that your knee is straight at the lowest position of a revolution. Cycle without any resistance at a comfortable pace for 2 minutes, increasing the time as you improve.



Exercises to strengthen your thigh muscles

Start by trying to do the following exercises twice a week, then build up gradually so you are doing them every other day and then finally every day.

4. Sitting on a chair, cross one leg behind the other. Push forward with the back leg as if to straighten it, but prevent this happening by pushing back with the front leg. Push as hard as possible for 5 seconds, then relax completely for 3 seconds, repeat, and after 6 contractions rest for 1 minute. Repeat this procedure until you have done 4 sets of 6 contractions (24 contractions in total). Repeat the exercise with the other leg in front.
5. Sitting on a chair, fold your arms, slowly stand up and then slowly sit down, ensuring each 'sit-stand' is slow and controlled. Do 'sit-stands' for 1 minute, count the number you do and write this in a notebook. Over a period of weeks try to increase the number of 'sit-stands' you can do in 1 minute. As you improve, try the 'sit-stands' from progressively lower chairs or the bottom two steps of a staircase.
6. Place your right foot on the bottom step of the stairs, using the banisters for support. Keeping this leg on the step, step up and down with the left leg. Count and record the number of step-ups you perform in 1 minute. Rest for 1 minute, then repeat the exercise keeping your left leg on the step. As the number of step-ups you can perform per minute increases, increase the height of the step (ensuring you are stable and safe) to a maximum of about 45 cms (18 inches).
7. If you have a static exercise bike with variable resistance, over a period of weeks increase the resistance you are pedalling against to improve your strength and stamina.
8. Holding onto a stable object (e.g. a chair or table), squat down slowly, keeping your back straight and bending both knees, then straighten your knees. Do not squat down too far for the first couple of weeks. As you feel improvement and the exercise gets easier you can squat a little further, but only until your knees are bent to 90° – never squat down fully.
9. Tie the elastic inner tube of a bicycle tyre (or a commercial product, e.g. the Thera-Band™ resistive exercise band, available from: 4 Mobility Ltd. Phone: 0800 085 2350. www.4mobility.co.uk) to an immovable object (e.g. the leg of your bed or the chair you will sit on) and loop it around your right foot with your knee bent. Sitting on the chair or the edge of your bed **slowly** straighten your knee, stretching out the band. Hold your leg straight for 5 seconds, then **control the band** as it slowly bends your knee back to the starting position. Do this for about 1–2 minutes. Repeat the exercise with the band around your left foot. As you improve, you can do the exercise for longer and/or the resistance can be increased by making the loop smaller or using a stiffer band.



Walking

Most days try and get out for a walk, gradually increasing the distance you walk over several weeks. Don't be worried about using a stick or having frequent rests to relieve the stress on your joints.