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**Introduction and Overview**

- Currently there is no cure for either condition.
- The goals of treatment include relief of pain, restoration or maintenance of joint function, and prevention of joint damage.
- These goals are achieved with both pharmacologic and nonpharmacologic

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**Medication**

- Medication can be non-prescriptive (over the counter purchases) or prescriptive (from a general practitioner).
- Note that prescription charges in the UK, vary from country to country



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### Medication for OA

- The most common treatment for OA is 'pain-killing' medication followed by anti-inflammatory medication (oral and topical).
- The British National Formulary (2020) recommends the following advice for GPs:
  - For pain relief, paracetamol should be used first.
  - A topical NSAID may also be considered, particularly for OA in the knee or hand.
  - An oral NSAID can be substituted for, or used in addition to, paracetamol.
  - Non-drug measures, such as weight [WRIGHT Foundation: body fat] reduction and exercise should also be considered.
  - Glucosamine sulphate is not recommended for the treatment of OA.

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### Medication for OA

Names	Desired effect	Potential side effects relating to exercise
Non-opioid analgesics e.g., Paracetamol e.g., Panadol OA®	Reduced perception of pain**	N/A
Non-steroidal anti-inflammatory drug (NSAID) e.g., Ibuprofen e.g., Arthrofen®	Reduced inflammation and reduced perception of pain**	Nausea, diarrhoea, dizziness, drowsiness
Cyclo-oxygenase-2 selective inhibitors* e.g., Celecoxib e.g., Celebrex®	Reduced inflammation and reduced perception of pain**	Nausea, diarrhoea, dizziness, drowsiness

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### Medication for RA

- Pain-relieving and anti-inflammatory drugs are used.
- Drugs are also used to influence the rheumatic disease process itself, known as disease-modifying anti-rheumatic drugs (DMARDs).
- Corticosteroids



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### Medication for RA

Names	Desired effect	Potential side effects relating to exercise
Disease-modifying anti-rheumatic drugs (DMARDs) e.g., Sulfasalazine e.g., Sulazine EC®	Suppression of the rheumatic disease process	GI disturbances, dizziness, dyspnoea
Corticosteroids e.g., Prednisolone e.g., Deltascortril Enteric®	Reduced inflammation	GI disturbances; osteoporosis and diabetes mellitus (long-term)

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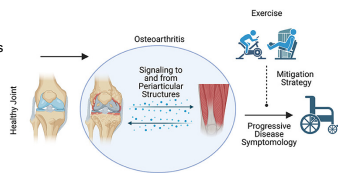
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### Implications to Exercise Prescription

- Reduced perception of pain
- Gastrointestinal (GI) disturbances
- Dizziness
- Dyspnoea



pp. 41-43

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### Braces, Splints, Supports, Gloves and Orthoses

- Arthritis affects a person's ability to complete everyday tasks and chores, work-based activities and exercise.
- Weakened muscles around damaged joints reduces strength and endurance, especially grip strength in osteoarthritis (OA), and particularly.

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## Knee Braces



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## Splints



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## Supports



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**Gloves**



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**Orthoses**



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**Additional Advice**

- Carry bags on forearms.
- Take frequent breaks to rest hands briefly.
- Use padding to enlarge the grip on things such as a pen, knife, toothbrush or spanner.
- Avoid lifting heavy objects with wrists bent downwards.
- Avoid twisting or over-straightening fingers.
- When lifting objects, reduce the strain or pull on the shoulders by keeping the elbow bent and in front of the body, and keeping the palm facing the ceiling when reaching up.

pp. 12-13

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### Surgical Interventions for OA

- Most joints in the body can be treated surgically in some form or another.
- There are two main surgical treatments for osteoarthritis (OA):
  - Conservative treatments, where the damaged cartilage is left in place.
  - Radical treatments, where the cartilage is replaced by an artificial endoprosthesis

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### Joint Replacement (Arthroplasty)

- Joint arthroplasty is most commonly done to replace hip and knee joints.
- High rate of success, with rapid recovery and long-term stability.
- 65,000 hip replacements and 70,000 knee replacements performed in the UK each year (NHS, 2018).

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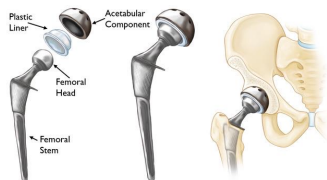
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### Arthroplasty [Hip]



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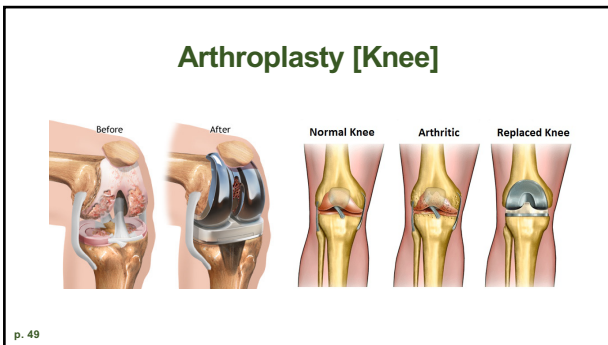
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### Nonpharmacologic Treatment for Osteoarthritis of the Knee

Treatment	Comments
Exercise	
Resistance training	Avoid if joint pain worsens. Progressive training is most effective. Exercises in a pool or partial-weight-bearing exercises are often tolerated better than equivalent full-weight-bearing exercises.
Aerobic	
Unloading	
Cane or crutch	A cane should be held contralateral to the affected knee with the hand at the level of the greater trochanter of the hip. The cane and the affected leg should contact the ground at the same time.
Weight loss	
Realignment	
Braces and patellar taping	Indicated when malalignment is noted on examination and pain is unresponsive to other medical treatments. Braces or taping can cause skin irritation and can impede the return of blood flow from the distal leg.
Shoe inserts	
Acupuncture	Reduces pain on average only moderately after several sessions.

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### Arthroscopic Surgery

- Arthroscopic surgery involves a small joint incision (a keyhole) through which a camera and surgical tools are inserted.
- Recovery typically takes between 2 to 6 weeks, with 1 to 2 weeks off work, depending on the speed of recovery and the demands of the job.

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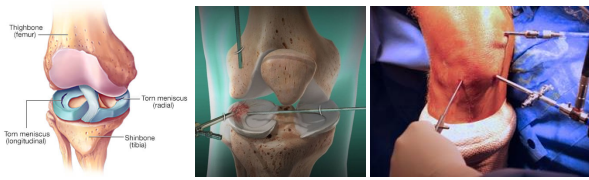
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### Arthroscopic Surgery



The diagram on the left shows a knee joint with labels: Thighbone (Femur), Tibia, Tom meniscus (radial), Tom meniscus (longitudinal), and Shinbone (Tibia). The middle image is a 3D anatomical model of a knee joint. The right image is a photograph of a knee joint during arthroscopic surgery, showing surgical instruments and a small incision.

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### Arthroscopic Surgery??

- A recent review by Siemieniuk et al. (2017) made a strong recommendation against the use of arthroscopy in nearly all patients with degenerative knee disease.
- There should be no specific implications for post-surgery exercise referral, assuming the patient has been cleared to exercise by the referring medical professional.



A photograph showing the knee joint of a patient after arthroscopic surgery. There are several small, red, circular surgical scars on the skin around the knee.

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### Have a Break



A photograph showing the knee joint of a patient after arthroscopic surgery. There are several small, red, circular surgical scars on the skin around the knee.

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### Nutritional Advice and Supplementation

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### Nutritional Advice and Supplementation

- Exercise instructors are allowed to educate a referred client in the conceptual understanding of healthy living, such as healthy eating, without having any further training/qualifications in nutrition/dietetics.
- First and foremost, all clients need to eat healthily, regardless of their age, background, medical profile/health status.
- No diet will cure arthritis.



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### Micronutrients

- Sufficient intake of calcium and vitamin D ensures healthy bones and reduces the risk of osteoporosis, which is especially important for patients taking corticosteroid medication.
- Iron is important for the prevention of anaemia, which is relatively common in patients with arthritis, caused by side effects of certain medication (i.e., NSAIDs).
- Omega-3 fatty acids, which are derived from oily fish and certain seed oils, and Omega-6 fatty acids derived from other seed oils: Reducing inflammation (Akbar et al., 2017).

pp. 53-54

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### Plant-based Diets

- Several recent studies have shown that diets rich in vegetables, fruits, and fibre are associated with lower body mass, have anti-inflammatory properties, and help reduce pain and inflammation in patients with RA (see review by Alwarth et al., 2019).
- Interestingly, following a plant-based diet may eliminate certain 'trigger' foods for RA, such as food high in animal fats, including milk, eggs, dairy, and processed meats.
- Acai berries and turmeric

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### Supplementation

- Vitamin and mineral supplementation.
- Glucosamine sulphate and chondroitin.



pp. 54-55

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### Other Therapeutic Treatments

- In addition to pharmaceutical interventions, joint supports, and surgery, there are other therapeutic treatments available for patients with arthritis.
- This section explores the main types of therapeutic treatments and highlights any implications to exercise prescription.

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### Heat and Cold Therapies

- Application of heat, either superficial or deep, is an effective modality for the relief of joint pain and stiffness caused by rheumatoid arthritis (RA).
- Cold is preferable for treatment of an acutely inflamed joint.
- There are no direct implications to exercise prescription.
- Joint stiffness

pp. 57-58

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### Occupational Therapy (OT)

- OT can be extremely useful for patients with arthritis, to help them achieve the following:
  - Using joints efficiently without placing stress on them.
  - Decreasing tension on joints with proper use of splints.
  - Coping with daily life through adaptations to the patient's environment and the use of a variety of aids.

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### Physical and Emotional Integration

- Cognitive behavioural therapy
- Relaxation therapy
- Acupuncture
- Massage therapy

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