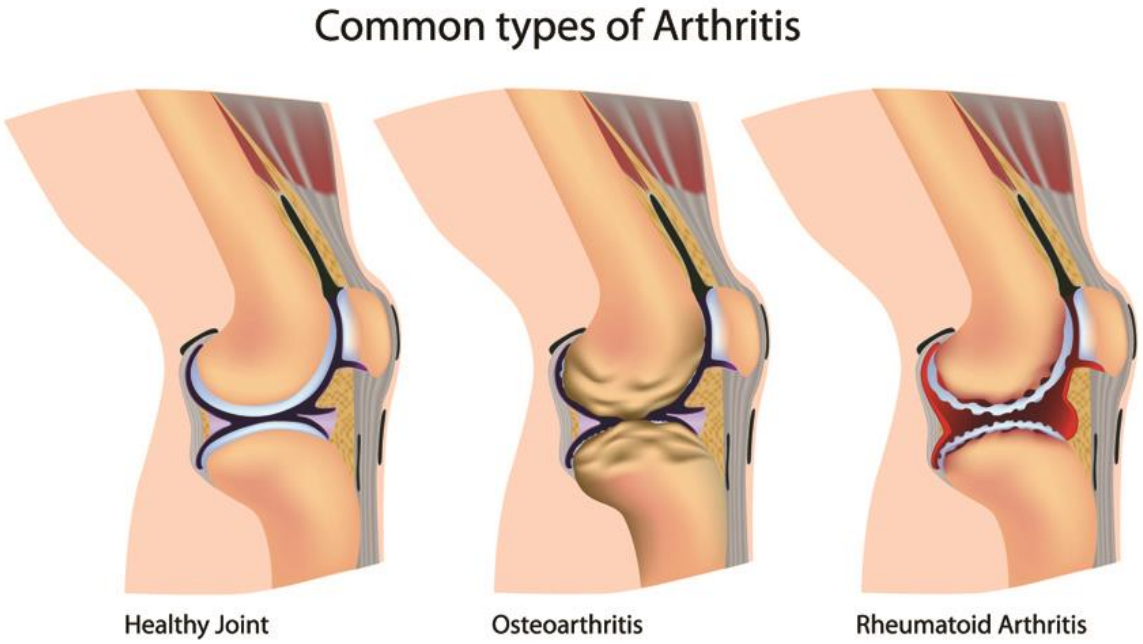
Osteoarthritis and rheumatoid arthritis



Unit: Understanding medical conditions for exercise referral

Osteoarthritis (OA)

- A degenerative joint disease affecting the synovial joints
- Characterized by:
  - focal areas of damage to the articular cartilage
  - re-modelling of underlying bone and the formation of osteophytes - new bone at joint margins
  - mild synovitis

Classification

Primary osteoarthritis	Secondary osteoarthritis
Usually limited to one or a small number of joints	May be limited to a small number of joints if injury-related. In joints throughout body if disease-related
Spine, thumbs, knees and top two sets of finger joints	Wrists, shoulders, ankles, and the middle set of finger joints
No specific inflammatory or metabolic condition known to be associated	Conditions that cause damage to cartilage include: • inherited diseases, e.g. hemochromatosis, hyperparathyroidism, or Wilson's disease • neurologic disorders, resulting in loss of nerve function • congenital diseases that cause imbalance in the joints • bone disorders that affect joints
No history of specific injury or trauma	May be a history of injury to joints (fractures and tears) May be history of trauma to joints (repetitive heavy lifting or kneeling)

Prevalence

- Estimated 8.5 million people in the UK affected by joint pain that may be attributed to osteoarthritis

- Osteoarthritis at individual joint sites (knee, hip and hand) demonstrates age-related prevalence

- Symptomatic osteoarthritis is not an inevitable consequence of ageing

Cost to the nation

- 2 million annual visits to GP
- Consultations for osteoarthritis account for:
  - 15% of all musculoskeletal consultations in those aged 45 +
  - 25% in those aged 75 +
- Incidence of a new GP consultation for knee pain in adults aged 50 + approximately 10% per year
- Over a 1-year period around 114,500 hospital admissions

Presentation

- Pain in the affected joint/s (knee, hip, hand or spine)
- Stiffness in and around the affected joint
- Swelling
- Joint instability or buckling
- Limitation or loss of function

Risk factors

- Genetic factors
- Constitutional factors
  - ageing
  - female gender
  - obesity
- Biomechanical factors
  - joint injury
  - occupational/recreational usage
  - reduced muscle strength
  - joint laxity
  - joint misalignment

Rheumatoid arthritis (RA)

- A chronic and debilitating disease
- Autoimmune – systemic condition
- Characterised by
  - inflammation and swelling of the synovial membrane
  - the formation of pannus tissue (abnormal layer of fibrovascular or granulation tissue) within the joint
  - the eventual deterioration of bone and cartilage
  - causing swelling, pain and deformity within the joint

Classification

American College of Rheumatology (ACR)

Criterion for rheumatoid arthritis
Clients must have four of the following seven criteria:
1. Morning stiffness
2. Swelling in 3 or more joint areas
3. Swelling in hand joints
4. Symmetric joint swelling
5. Erosions or decalcification on x-ray of hand
6. Rheumatoid nodules
7. Abnormal serum rheumatoid factor

Prevalence

- Around 580,000 people in England
- Every year in England
  - 26,000 people diagnosed with RA
  - peak incidence between 40 and 50 years
  - more common in women - 3:1

Cost to the nation

- Within two years of diagnosis, clients usually experience moderate disability
- After 10 years 30% are severely disabled.
- Up to 4 out of every 10 lose their jobs within five years
- Productivity losses estimated at between £3.8 billion and £4.75 billion per year
- National Rheumatoid Arthritis Society estimate closer to £8 billion per year

Pathology

- Initial trigger for RA is unknown
- Large increase in blood flow to the joint (resulting in heat and redness)
- Proliferation of the synovial membrane with an increase in synovial fluid (swelling) and pain
- If the inflammation of the synovial membrane cannot be suppressed it will result in increasing damage to the joint

Presentation

Signs and symptoms include:

- joint inflammation and pain
- joints that are tender to the touch
- red and puffy hands
- firm bumps of tissue under the skin on your arms (rheumatoid nodules)
- fatigue
- morning stiffness that may last for hours
- fever

Risk factors

- **Gender**
  - more common in women
- **Age**
  - most common between the ages of 40 and 60
- **Genetics**
  - can run in families
  - people with specific human leukocyte antigen (HLA) genes have a greater chance of developing
- **Smoking**

Part two

ACCEPTED TREATMENTS

Pharmacological intervention

The goal of medication:

- Osteoarthritis - OA
  - to reduce pain and inflammation with few side effects and maintain joint health and function
- Rheumatoid arthritis - RA
  - the relief of symptoms, especially pain
  - the modification (slowing down) of the disease process

Common medications

Osteoarthritis

- Analgesic
- Non-steroidal anti-inflammatory drugs (NSAIDs)
- COX-2 inhibitors

Rheumatoid arthritis

- Analgesic
- NSAIDs
- Corticosteroids
- COX-2 inhibitors
- Disease-modifying anti-rheumatic drugs (DMARDs)

Side effects may include

Analgesic

- Nausea, vomiting, constipation and drowsiness

NSAIDs

- Gastrointestinal discomfort, nausea and diarrhoea.

Corticosteroids (long term)

- Hyperglycaemia, insulin resistance, diabetes mellitus, osteoporosis, cataract, anxiety, depression, colitis, hypertension

DMARDS

- GI discomfort, sore mouth, skin rash, headaches, low blood cell count

Lifestyle intervention

The objectives of lifestyle interventions are

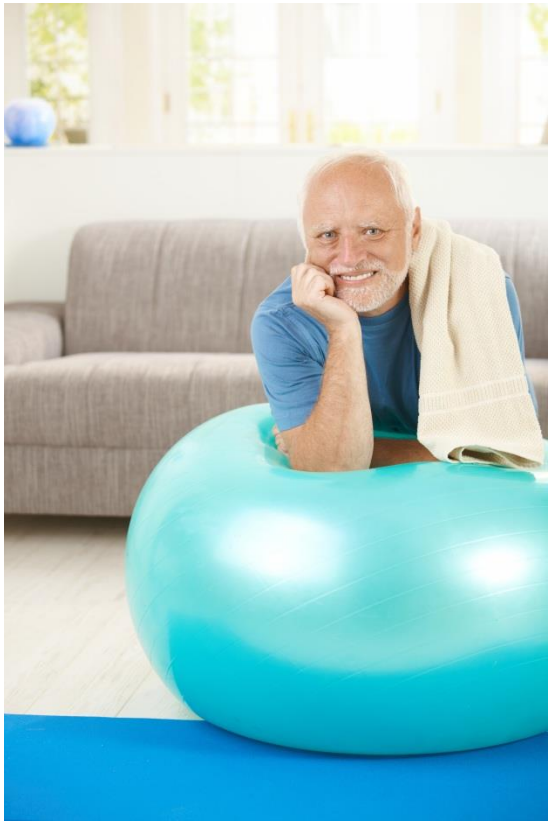
- to maintain joint functioning
- joint protection
- reduce pain and inflammation

Osteoarthritis - OA

- weight management (if overweight)
- exercise to reduce the pain and improve function

Rheumatoid arthritis - RA

- exercise and physical activity
- dietary modification
- physical therapy
- occupational therapy
- podiatry



Part three

EXERCISE GUIDELINES AND CONSIDERATIONS

Benefits

- Reduced joint pain and stiffness
- Improved mobility and flexibility
- Increased muscle strength and reduced de-conditioning
- Increased aerobic fitness and endurance
- Decreased pain
- Reduced disability (maintains independence)
- Elevated mood state (reduced risk of depression)
- Decreased risk of cardiovascular disease

Rationale for exercise

- Historically, exercise programmes restricted to range of movement (ROM) exercises with periods of rest.
- Now recognised inactivity will over time, lead to a loss of muscle strength, joint stability, and functional capacity.
- Both aerobic exercise and resistance training demonstrate significant improvements in both pain and function
- Resistance training
  - may retard the progression of joint damage through strengthening the knee extensors (thereby lessening the load on the lower limbs)
  - has a role in maintaining the health and integrity of articular cartilage.

Exercise recommendations

Mode of exercise	FIT principles
Aerobic	• 60%-80% MHR / 40-60% VO_{2max} /RPE 11-16/20 • 5-10mins per session, building to 20-30mins • 3-5 days per week • Emphasize progression of duration over intensity
Resistance	• 1 or more sets of 2-3 reps , building to 10-12 reps • Low resistance initially • 5-10 mins per session, building up 20-30 mins • 2-3 days/week
Flexibility	• Perform before aerobic/strength exercises • Static stretches hold for 10-30 secs • Active/dynamic stretching also OK if no limitations in mobility
Neuromuscular	• 2-3x/week, or incorporated within a general exercise programme

Exercise considerations

- Low impact aerobic and functional strength exercises during initial phases
- Avoid exercises that involve prolonged one-legged stances, or stop-start
- Muscles should be conditioned before exercise intensity is increased
- Flexibility and joint mobilisation is a key component
- If pain or swelling appears during exercise, the load should be immediately reduced, and exercise stopped; consider a change to non-weight bearing exercise options
- Maximise shock absorption during weight-bearing activities
- Set time goals rather than distance goals to encourage self-management

Exercise considerations

- Avoid prolonged activities in one position
- Avoid quick direction changes
- Avoid any exercise that causes pain and reduce the workload if any swelling occurs.
- Exercise late morning or early afternoon as joints will be less stiff
- Use a mixture of weight-bearing, non weight-bearing and partial weight-bearing to minimise joint stress.
- Chair-based exercises may be appropriate for some groups (e.g. less mobile individuals or those unable to stand for long periods)

Rheumatoid arthritis

- Never exercise during flare up phases
  - this may cause further damage to the joint structures
  - performance of gentle mobility and stretching okay
- During remission phases
  - work on strengthening the muscles around the joint through full range of motion.
- Be considerate to past damage or joint deformity
- Adapt movements to ensure comfort
  - start position, repetitions, range of motion etc

Comorbidities

- Consider
  - Any change in risk stratification?
  - Effects of medications
  - Exercise recommendations for other conditions
  - Further adaptations and modifications?