Rheumatological disease can present with a wide range of symptoms and be associated with symptoms and signs affecting any body organ or system. It is important to establish the cause of the symptoms quickly - both for acute conditions (especially to provide early treatment for septic arthritis) and for chronic conditions (eg, to enable the benefit of early treatment of rheumatoid arthritis). Rheumatological disease may cause severe functional difficulties as well as pain and so a thorough functional assessment is essential.

There are separate articles on Knee Assessment, Shoulder Examination, and Examination of the Spine.

**History**

**Symptoms**

- Ask about the site of pain and stiffness. Is there a pattern? Stiffness may be due to mechanical dysfunction or local inflammation of a joint, or a combination of both.
- What is the distribution and timing of symptoms? How is the patient affected?
- **Osteoarthritis:** Morning stiffness is common; pain is typically worse at the end of the day and after activity, and may be relieved by rest.
- Pain in inflammatory arthritis (eg, **rheumatoid arthritis**) tends to be worse after rest, particularly in the mornings, and is often accompanied by stiffness. Symptoms tend to be bilateral in inflammatory arthritis with smaller joints, such as those of the hands and feet, being affected first. The pain tends to improve with activity.
- Rheumatic disease affecting joints often causes referred pain - eg, **cervical spondylosis** presenting as shoulder pain.
- An elderly patient complaining of severe pain in both shoulders or stiffness of the pelvic girdle in the early morning suggests **polymyalgia rheumatica**.

- **Loss of function:**
  - This is often caused by a combination of muscle weakness, pain, mechanical factors such as tendon and joint impairment and damage to the nerve supply.
  - From the patient's point of view, they may describe a joint as 'giving way' or simply 'feeling weak'.
  - It may be useful to gain some idea of the patient's disabilities by asking about mobility, including stairs, personal care such as feeding, washing and dressing, shopping and cooking.

**Other relevant history**

- Prodromal symptoms and events:
  - Acute rheumatic disease may follow events such as upper respiratory tract infections, diarrhoea, genitourinary infection, insect bites (eg, **Lyme disease**) and vaccinations.

- **Medication:**
  - Some drugs (eg, hydralazine) are a potential cause of joint problems.
  - A good response to non-steroidal anti-inflammatory drugs (NSAIDs) may be indicative of inflammatory arthritis - eg, rheumatoid arthritis.

- Past history:
  - Ask if there have there been any previous attacks of the symptoms diagnosed in the past.
  - Ask if there is any other relevant past history - eg, psoriasis, inflammatory bowel disease or any history or risk of sexually transmitted infection.

- Family history: eg, inflammatory arthritis, psoriasis.

- Mental health:
  - Many ill effects are aggravated by anxiety or depression.
  - Disability, pain and social isolation may well lead to depression.

- Social support:
  - The patient may need social support, especially if living alone, socially isolated and with no close carer.

**Examination**

**General**

- Look at the whole patient. Check the temperature. If the patient appears ill, consider septic arthritis.
Note whether there is any asymmetry of colour, deformity, swelling, function or muscle wasting. When checking individual joints look for heat, swelling, deformity and limitation of movement from pain or contracture.

Joint swelling may be due to inflammation of the synovial lining, increase in synovial fluid, hypertrophy of the bone or swelling of the structures surrounding the joint.

General examination may reveal associated features such as skin or eye involvement, or disorders of the respiratory, cardiovascular, abdominal or neurological systems.

Check both passive and active range of joint movements.

**Upper limbs**

- Shoulder examination: test glenohumeral, acromioclavicular and sternoclavicular joints by placing both hands down by the sides with elbows straight in full extension, then placing both hands behind head and pushing elbows back.
- To detect swelling or deformity of the hands, examine them palms down with fingers straight.
- Assess pronation, supination and grip, and dexterity by placing the tip of each finger on the tip of the thumb.
- Pain experienced when second to fifth metacarpals are squeezed suggests synovitis.

**Lower limbs**

- With the patient in a standing position: observe the patient to check for deformity of the upper leg, lower leg or foot. Check that the quadriceps bulk is normal.
- Gait: observe the patient walking, turning, and walking back. Look for smoothness and symmetry of the arm, leg, and pelvic movements, ability to turn quickly, and length of stride.
- Knee assessment and hip examination: with the patient on on the couch, flex each hip and knee while holding the knee to check movement and for knee crepitus. Check for internal and external rotation of the hip.
- Examine each knee for joint effusion:
  - Stroke upwards over the medial side of the knee and downwards over the lateral side.
  - Patellar tap sign:
    - Spread the thumb and index finger and place web space about six inches above knee joint.
    - Press down and distally (pushing fluid from the suprapatellar pouch into the knee joint).
    - Then press down on the patella, noting any lag before the patella hits the femur and bulging to the side as fluid is displaced, indicating an effusion is present.
- Check the feet for synovitis by squeezing across the metatarsals. Examine for callosities, deformities and high or low arch.

**Spine**

- Neck and back examination are dealt with in the separate article Examination of the Spine.
- With the patient standing, check from behind to detect lateral spinal curvature, difference in level of the iliac crests and asymmetry of the paraspinal muscles.
- From the side, check for anteroposterior curvature.
- Tenderness over the mid-point of the supraspinatus tendons indicates the need to check for fibromyalgia.
- Assess all movements of the neck and lower back: check lateral flexion of the cervical spine by asking the patient to place his or her ear on the tip of the shoulder on each side.
- Check lumbar spine and hip flexion by asking the patient to touch their toes with the knees straight.

**Hand and foot deformities**

- The characteristic features of the hands in patients with rheumatoid arthritis are subluxation of the metacarpophalangeal joints, radial deviation of the wrist joint and ulnar deviation of the fingers.
- Swan-neck deformity (proximal interphalangeal joint hyperextension with concurrent distal interphalangeal joint flexion) occurs in patients with rheumatoid arthritis, but may also follow trauma or be congenital.
Boutonnière deformity (flexion of the proximal interphalangeal joint accompanied by hyperextension of the distal interphalangeal joint) can result from tendon laceration, dislocation, fracture, osteoarthritis or rheumatoid arthritis.

Heberden's nodes are hard swellings caused by formation of calcific spurs of the articular cartilage which can develop in the distal interphalangeal joints of patients with osteoarthritis.

Bouchard's nodes are hard swellings caused by formation of calcific spurs of the articular cartilage which can develop in the proximal interphalangeal joints of fingers or toes of patients with osteoarthritis. Bouchard's nodes are much less common than Heberden's nodes.

Mallet finger (flexion deformity of the distal interphalangeal joint preventing extension) results from an extensor tendon rupture or an avulsion fracture of the distal phalanx.

Dupuytren's contracture is a progressive contracture of the palmar fascial bands, causing flexion deformities of the fingers. Dupuytren's contracture is more common in men and increases after age 45. The cause is unknown but it is more common in patients with diabetes, alcoholism or epilepsy.

Rheumatoid nodules are subcutaneous soft tissue swellings most often seen in patients with rheumatoid arthritis, but also with other diseases - eg, rheumatic fever, connective tissue diseases, sarcoidosis, Weber-Christian disease, gout and xanthomatosis.

Extra-articular findings

- Rheumatoid nodules are the most common extra-articular feature of rheumatoid arthritis and are present in up to 30% of patients. \(^1\)
- In rheumatoid arthritis the nodules are usually located between the skin and a bony prominence (especially the elbow).  
- Rheumatoid nodules may be freely mobile or attached to deep tissues.
- Skin rash:
  - Intermittent rashes appear with rheumatic fever, rheumatoid arthritis, chronic juvenile idiopathic arthritis, and connective tissue diseases such as systemic lupus erythematosus (SLE).
  - Check for psoriasis, which may be hidden from view.
  - Circinate balanitis in Reiter's syndrome may be asymptomatic and is not always admitted, so a specific examination is therefore important.
  - Oral ulceration may be a feature of Reiter's syndrome and Behçet's disease as well as connective tissue disorders.
  - Sjögren's syndrome will cause a dry mouth (xerostomia).
- Raynaud's syndrome: usually bilateral and affects fingers more often than toes.
- Diarrhoea:
  - Transient mild diarrhoea may precipitate a reactive arthritis.
  - It may also be indicative of enteropathic arthritis secondary to ulcerative colitis, Crohn's disease, coeliac disease or Whipple's disease.
- Urethritis: may indicate Reiter's syndrome.
- Red, gritty eyes:
  - Conjunctivitis or uveitis may occur in Reiter's syndrome.
  - Uveitis may occur in other spondyloarthropathies.
  - Episcleritis (painless), scleritis (painful), and keratoconjunctivitis sicca may occur in rheumatoid and related diseases.

- Cardiorespiratory:
  - See separate article on Rheumatoid Arthritis and the Lung.
  - Episodes of pericardial or pleuritic chest pain may indicate connective tissue disease.
  - Musculoskeletal chest pain is a common feature of the spondyloarthropathies.
  - Breathlessness may indicate associated pulmonary fibrosis or a cardiac defect such as aortic regurgitation in the spondyloarthropathies.

- Neurological:
  - Peripheral neuropathies - eg, entrapment neuropathy (eg, carpal tunnel syndrome) - may be an early feature of inflammatory synovitis.
  - Migraine, depression, dementia or stroke may point to SLE, vasculitis or antiphospholipid syndrome.

- Systemic symptoms: weight loss, fever and anorexia are present in many types of inflammatory arthritis.
Investigations

Blood tests
- **FBC:**
  - Anaemia may be due to chronic disease but be careful to consider blood loss from gastric irritation secondary to NSAIDs or other causes of anaemia.[2]
  - White cells: possible changes include neutrophilia in septic arthritis, eosinophilia in polyarteritis nodosa, neutropenia in Felty's syndrome and leukopenia in SLE.
  - Platelets may be increased in rheumatoid arthritis and may be decreased in SLE.
- Acute phase proteins: ESR and CRP are nonspecific indicators of inflammatory activity.
- Uric acid: may be raised in gout.
- Renal function: may be renal dysfunction in chronic disease such as gout or connective tissue disorders.
- Autoantibodies: rheumatoid factor may support the diagnosis of rheumatoid arthritis. An antibody to a substance called cyclic citrullinated peptide (CCP) has been found to be more specific than rheumatoid factor in rheumatoid arthritis and may be more sensitive in erosive disease.[4]
- Antinuclear antibodies may suggest SLE or other connective tissue disorders.
- Human leukocyte antigen (HLA) B27: increased positivity in ankylosing spondylitis and other spondyloarthropathies.[5]
- Serology (eg, HIV), may be appropriate.

Other investigations
- Urine: proteinuria may be due to nephrotic syndrome associated with connective tissue disease.
- Synovial fluid:
  - White cell count raised in infection.
  - Gram stain (tuberculosis), culture and sensitivities.
  - Crystal identification: urate, calcium pyrophosphate.
- Imaging:
  - X-rays: may show distinctive changes, such as in rheumatoid arthritis, and osteoarthritis. CXR may be indicated for lung involvement in rheumatoid arthritis, SLE, vasculitis and tuberculosis.
  - Ultrasound: soft tissue abnormalities - eg, synovial cysts.
  - CT scan, MRI: much greater information of bone, joint and soft tissue.
- Arthroscopy:
  - Direct view of joint and synovial fluid.
  - Potential for biopsy and therapeutic procedures.

When to refer urgently
- Patients in whom septic arthritis is suspected - these should be seen immediately.
- Children with a limp - to exclude septic arthritis, non-accidental injury, slipped capital femoral epiphysis.
- Patients with polyarticular joint symptoms need urgent referral to a rheumatologist without waiting for radiography results.[3]

Further reading & references
- The assessment of pain in older people; British Pain Society (2007)
- Arthritis Research UK
- British Society for Rheumatology

5. McVeigh CM, Cairns AP; Diagnosis and management of ankylosing spondylitis. BMJ. 2006 Sep 16;333(7568):581-5.

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