Rheumatoid arthritis (RA) is a common condition which affects around 3% of women and 1% of men over their lifetimes. It is a multisystem inflammatory disease primarily affecting synovium (joint lining) and the adjacent tissues. It can also cause inflammation in other tissues in the body. It usually presents in patients in the fourth and fifth decade of life but it can present in individuals at any age.

**Signs and Symptoms**

RA predominantly affects joints, with extra-articular manifestations being present in only a quarter of patients. In the earlier stages of the disease joints present with synovitis - inflammation of the lining of the joint and tendon sheath. This presents clinically as warm, swollen, painful and stiff joints. Morning stiffness lasting more than an hour is particularly recognised as a feature. The morning stiffness of osteoarthritis is usually less significant and last less than an hour.

RA usually affects joints in a symmetrical pattern though this is not universal.

The classification criteria are than at least four of seven criteria must be met and that the first four criteria must have been present for at least 6 weeks:

1. Morning Stiffness for at least 1 hour.
2. Three or more joints affected.
3. At least one joint in the hand or wrist.
4. Symmetrical involvement of at least one joint.
5. Presence of Rheumatoid Nodules.
6. High serum rheumatoid factor.
7. Consistent radiographic changes or erosions of PA hand or wrist x-rays.

Patients with RA often have involvement of the small joints of the hands. As the disease progresses the joint becomes eroded and deformed leading to impaired function and movement. The classical deformities present in RA (but which are also seen in other arthritic diseases including OA) are ulnar deviation at the metacarpophalangeal (MCP) joints, the boutonniere and swan neck deformities in the fingers and the Z deformity in the thumb.

**Rheumatoid Nodules**

Rheumatoid nodules occur over bony prominences at sites of recurrent mechanical stress. They are commonly seen at the olecranon, calcaneum and the MCP joints. They vary in size from a few millimeters to a few centimeters in diameter. They are associated with underlying erosions.

**Extra-articular Features**

The lungs are often affected by rheumatoid arthritis with fibrosis being the most common sequelae. However, the condition is often treated with methotrexate which can also give rise to the condition. Patients can also develop pleural effusions as a consequence of RA.

Patients with RA have a higher risk of atherosclerosis and so a more likely to have a myocardial infarction or stroke. It can also cause pericardial effusions though this is uncommon.

In the eyes it can cause keratoconjunctivitis sicca (dry eyes) and scleritis or episcleritis (painful erythematous eyes).
Other extra-articular features which may be seen include Sjogren’s syndrome (dry mouth and eyes), skin ulceration, peripheral neuropathy, splinter haemorrhage (vasculitis) and Felty's syndrome (enlarged spleen).

**Lab Tests**

When trying to diagnose a patient with RA there are a standard set of lab tests which should be performed. The blood tests which are deranged include:

- **FBC**: there may be elevation in WCC and Platelets (in acute inflammatory phase). Look also for a normocytic anaemia.
- **ESR**: usually elevated
- **Rheumatoid Factor**: usually shows abnormal elevation (actual figure differs by control population)
- **Positive antinuclear test in some patients**
- **Synovial fluid**: elevated WCC (neutrophils)

**Radiological Findings**

Early radiological findings of hand RA are soft tissue swelling around the PIPJs and MCPJs. The DIPJs are usually spared, in comparison to OA where this is the most common site of disease. There is uniform joint space narrowing and juxta-articular osteopaenia, although this can become more diffuse as the disease progresses.

Erosions initially form at the ‘bare area’ of the joint where the hyaline cartilage ends, leaving an unprotected intra-articular area. Proliferative synovium erodes into this area to create marginal erosions. The marginal erosions shown in the x-ray below. Note also the localised osteopaenia and uniform joint space narrowing especially at the PIPJs.
As the disease progresses, the classic rheumatoid deformities appear. These include the swan neck deformity (hyperflexed DIPJ and hyperextended PIPJ) as shown below.

![Image](image1.png)

The Boutonnieres deformity (hyperflexed PIPJ and hyperextended DIPJ) is shown below.

![Image](image2.png)

The other deformities which classically develop are ulnar deviation at the MCPJs, Z-shaped thumb (flexion at MCPJ, extension at IPJ) and in later disease, bony subluxation. In very severe disease there is ankylosis (fusion) across the joint, leading to severe and fixed deformities.

The x-ray below shows typical ulnar deviation of the fingers.
The x-ray below shows subluxation at all 5 MCPJs, with a Boutonnière’s deformity of the 5th finger.