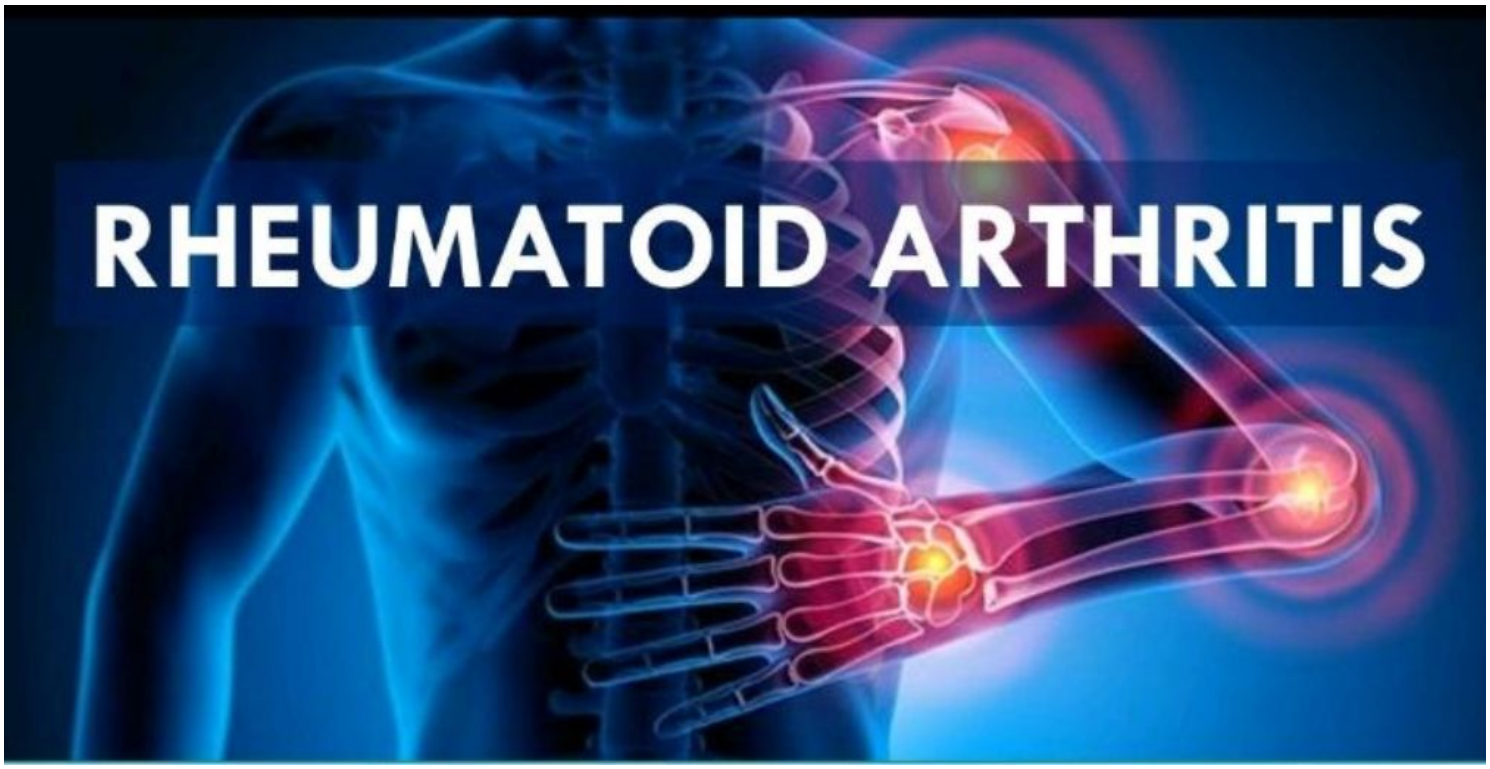
RHEUMATOID ARTHRITIS

RHEUMATOID ARTHRITIS

- **Rheumatoid arthritis (RA)** is **a chronic autoimmune disease**.
- It causes joints to swell and can result in **pain, stiffness, and progressive loss of function.**
- RA often affects pairs of joints (both hands, both feet, etc) and can affect more than one joint, including the small joints in the wrists and hands.
- Over time, other joints can be affected such as shoulders, elbows, knees, feet, and ankles.

- Over time, the inflammation of RA can cause damage to the joints.
- In some patients, this may lead to permanent joint damage.
- As this joint damage progresses, in severe cases, it can cause deformity of the joints and loss of function.
- It may begin to interfere with daily activities, making them more difficult and painful to do
- RA often begins in middle age, but can start at any age.
- RA affects 2 to 3 times as many women than men.

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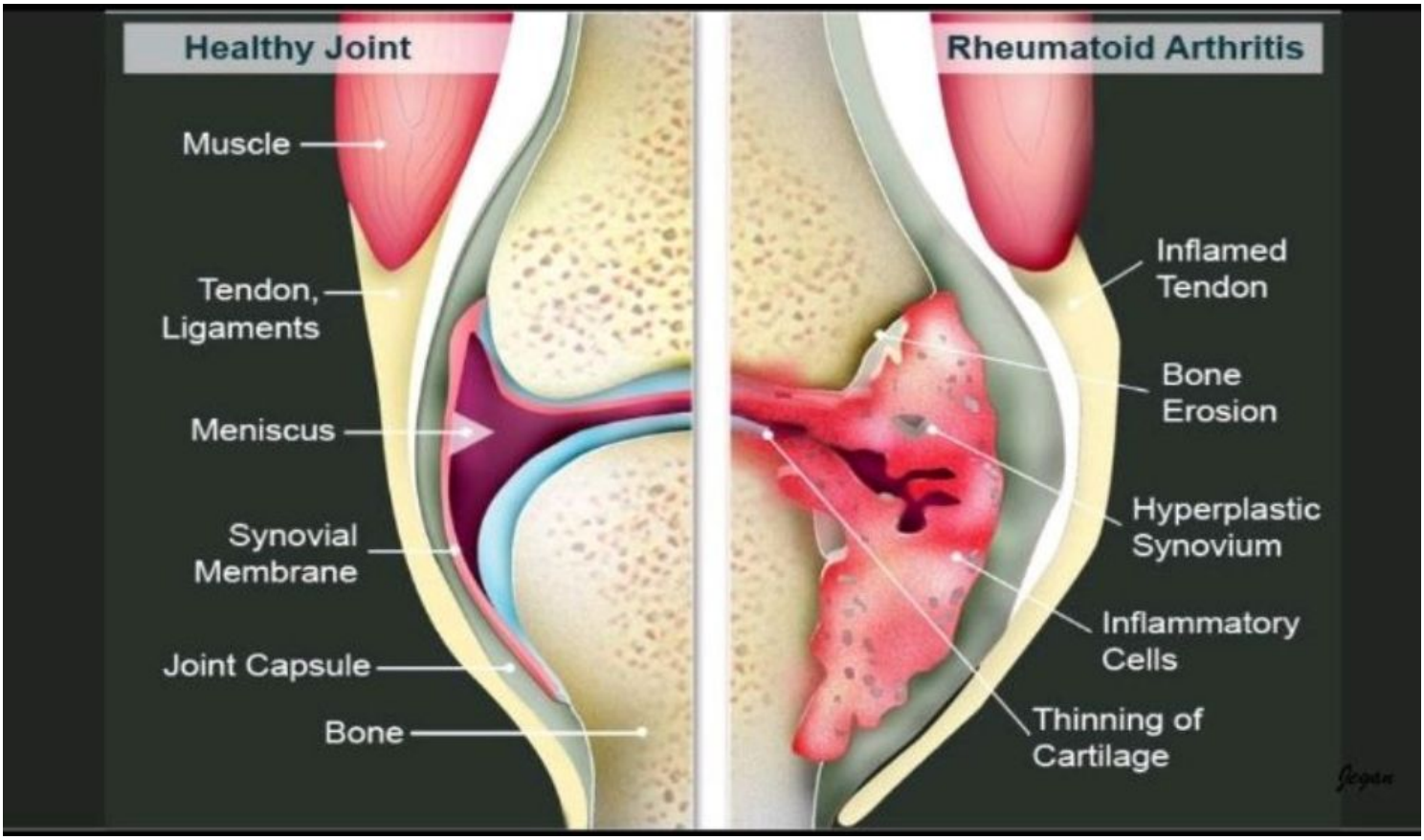
Healthy Joint
Rheumatoid Arthritis
Muscle
Tendon, Ligaments
Meniscus
Synovial Membrane
Joint Capsule
Bone
Inflamed Tendon
Bone Erosion
Hyperplastic Synovium
Inflammatory Cells
Thinning of Cartilage

ETIOLOGY

- ENVIRONMENTAL FACTORS
- GENETIC MARKERS
- ANTIGEN DEPENDENT ACTIVATION OF T LYMPHOCYTES
- ANTI-CITRULLINATED PROTEINS
- TUMOR NECROSIS FACTOR (TNF)
- SYNOVITTIS

- Unknown cause,Believed that it is hereditary.

1. **ENVIRONMENTAL INFLUENCES** : Such as infection, trauma,
2. **GENETIC MARKERS:** HLA-DR4 triggers RA. Such factors are not considered as diagnosis because half of the people who posses this antigen donot develop RA
3. **ANTIGEN DEPENDENT ACTIVTION OF T LYMPHOCYTES:** leads to proliferation of synovial memebrane. Activation of pro inflammatory cells from the bone marrow , cytokinins and auto antibody production.

ETIOLOGY

- ENVIRONMENTAL FACTORS
- GENETIC MARKERS
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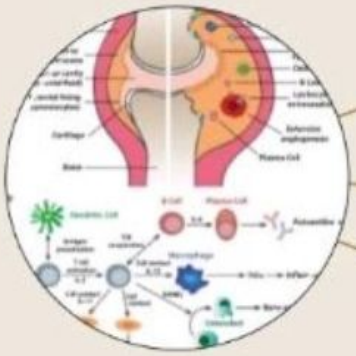
- SYNOVITTIS

4. **ANTI-CITRULLINATED PROTEINS**: these are peptides highly specific for RA
5. **TUMOR NECROSIS FACTOR:** IL-1,IL-6 and growth factors propogate the inflammatory process, and agents found to alter these cytokines reduces pain and deformity.
6. **SYNOVITIS-** hallmark in pathogenesis of RA. Synovium proliferates abnormally ,groeing into the joint space and into the bone forming a PANNUS. The pannus migrates to the articular cartilage and subchondral bone leading to destruction of cartilage, bone tendons and blood vessels.

PREDISPOSING FACTORS

1. **GENDER:** women before the menopause are affected three times more often than men. After the menopause the frequency of onset is similar between the sexes, suggesting an etiological role of male sex hormone. The use of oral contraceptives delay the onset of disease but has no effect on RA
2. **FAMILIAL**: Increased incidence in first degree relatives and high risk in monozygotic twins (15%)than dizygotic twins (3.5%). It affects families for many generations.

PATHOPHYSIOLOGY



TRIGGER

INFLAMMATION

JOINT AND TISSUE DESTRUCTION

PATHOPHYSIOLOGY

I. TRIGGER

- The combination of etiological factors sends a trigger to the body to create antibodies – known as autoantibodies that seek out joint linings.
- These autoantibodies include rheumatoid factor (RF) and anti-cyclic citrullinated peptide antibody (anti-CCP).

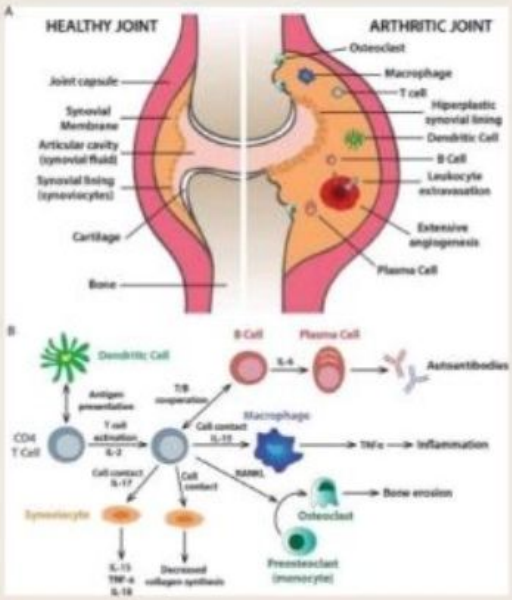
II.INFLAMMATION

- This results in the production of chemicals being released including tumour necrosis factor alpha (TNF-α), Interleukin (IL)-1, IL-6, IL-8, transforming growth factor beta (TGF-β), fibroblast growth factor (FGF) and platelet-derived growth factor (PDGF).
- Increased levels of cytokines are present. Cytokines play a central role in the perpetuation of synovial inflammation.

PATHOPHYSIOLOGY

III.JOINT &TISSUE DESTRUCTION

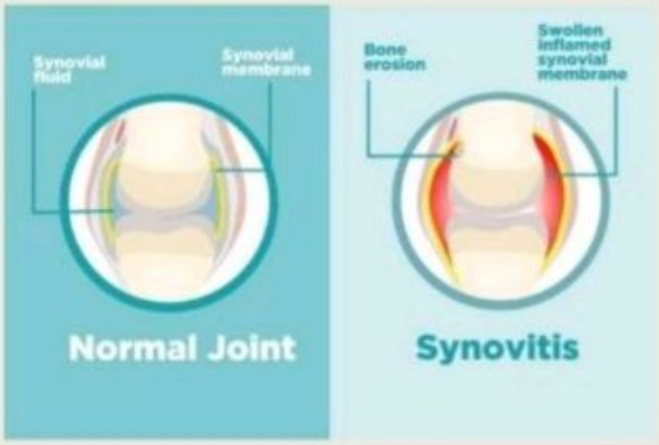
- These chemicals inflame and damage the body's cartilage, bone, tendons, and ligaments which causes **extravasation of leucocytes.**
- **HYPERPLASIA** of the synovial membrane with extensive **angiogenesis.**
- There is an increased number of both **type synoviocytes** and is infiltrated with immune and inflammatory cells: particularly macrophages, B- and T-lymphocytes, plasma cells and dendritic cells.
- The persistence of the chronic inflammatory response in conjunction with ongoing joint destruction (is finding in many patients with RA despite the use of effective anti-inflammatory agents and disease-modifying drugs).



STAGES OF RA

I. SYNOVITIS

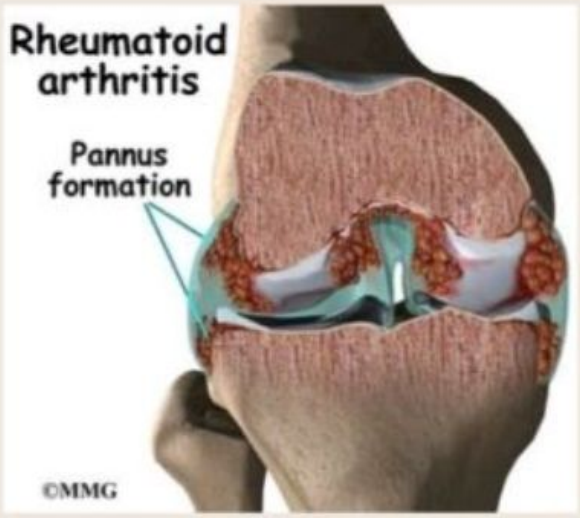
- Stage 1 is early stage RA.
- Many people feel joint pain, stiffness, or swelling. During Stage 1,
- there is inflammation inside the joint.
- The tissue in the joint swells up. With no damage to the bones, but ,synovium, is inflamed.
- Can progress to bone erosion



STAGES OF RA

II. PANNUS FORMATION

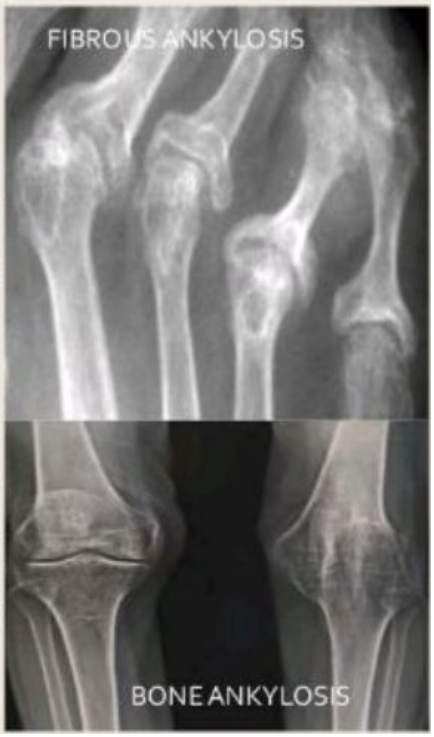
- Moderate stage RA.
- Synovitis causes damage to the joint cartilage. When cartilage is damaged, there will be pain and loss of mobility.
- Range of motion in the joints may become limited.
- Inflammation and exuberant proliferation of the synovium leads to formation of **pannus** and destruction of cartilage, bone, tendons, ligaments, and blood vessels. Basically, the hypertrophied synovium is called **PANNUS**



STAGES OF RA

III. FIBROUS ANKYLOSIS

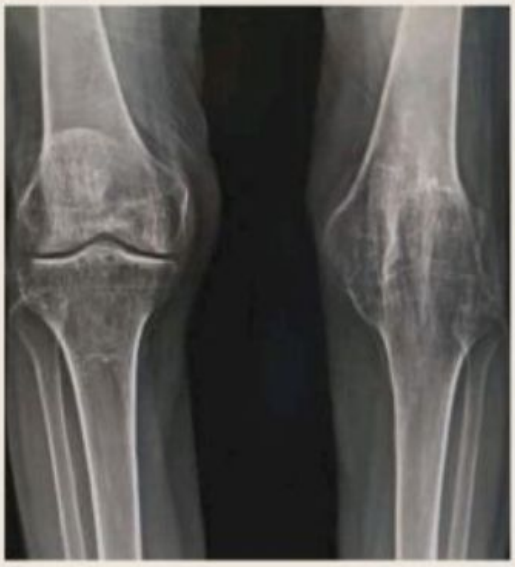
- Stage 3, it is considered severe.
- damage extends not only to the cartilage but to the bones due to increased friction between the bones. Pain and swelling increases causing FIBROUS ANKYLOSIS with bone erosion.
- **Fibrous ankylosis** is a fibrous connective tissue process which results in decreased range of motion. Symptoms present as bony ankylosis, in which osseous tissue fuses two bones together reducing mobility, which is why fibrous ankylosis is also known as false ankylosis.



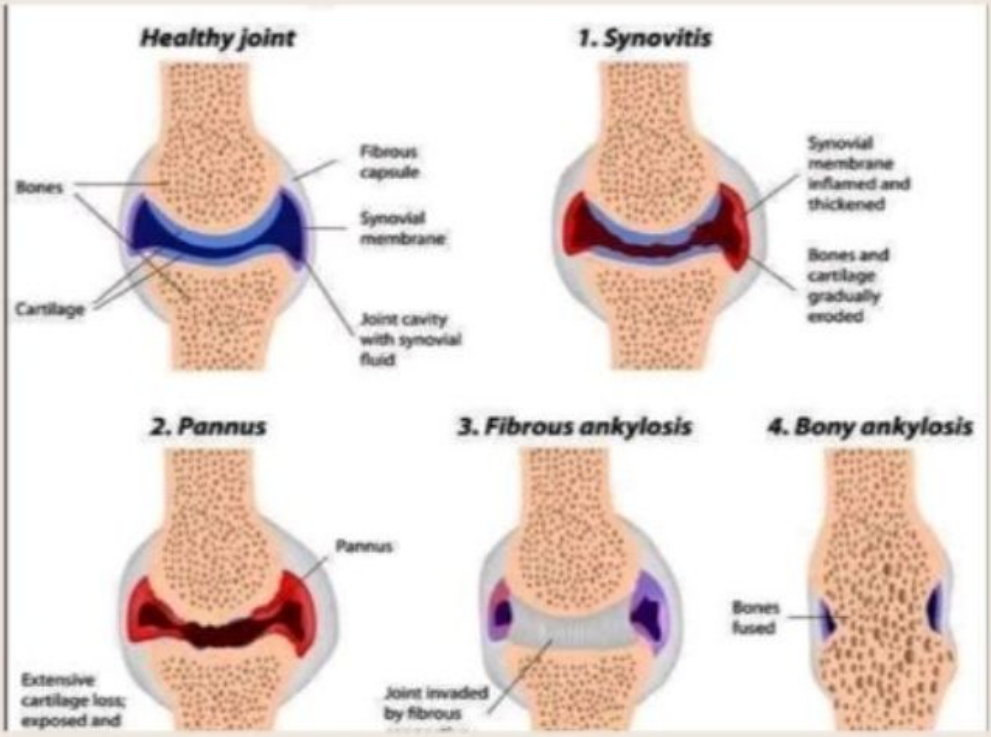
STAGES OF RA

IV. BONY ANKYLOSIS

- At Stage 4, there's no longer inflammation in the joint.
- This is end-stage RA, when joints no longer work.
- In end-stage RA, people may still experience pain, swelling, stiffness, and mobility loss. There may be reduced muscle strength. The joints may become destroyed and the bones fused together (ankylosis).
- **Bony ankylosis is the** union of the bones of a joint by loss of articular cartilage, resulting in complete immobility.

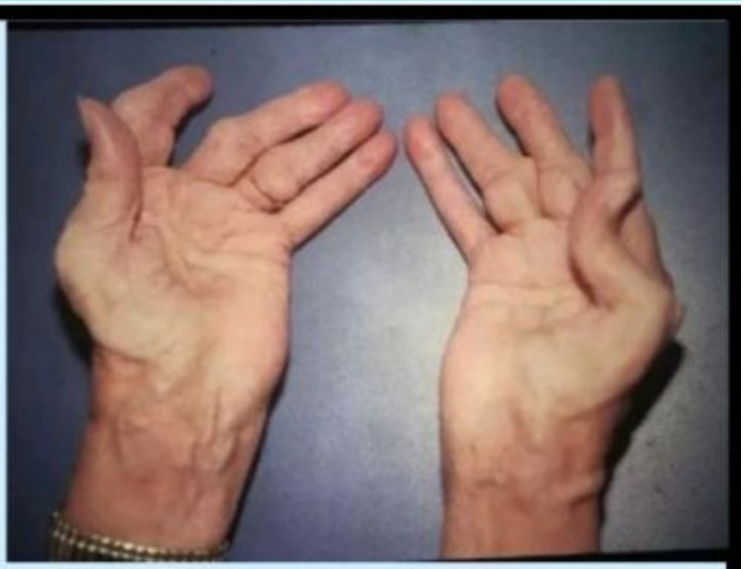


STAGES OF RHEUMATOID ARTHRITIS



SYMPTOMS

- Joint pain
- Joint tenderness
- Joint swelling
- Joint redness
- Joint warmth
- Joint stiffness
- Many joints affected (polyarthritis)
- Joint deformity
- Both sides of the body affected (symmetric)



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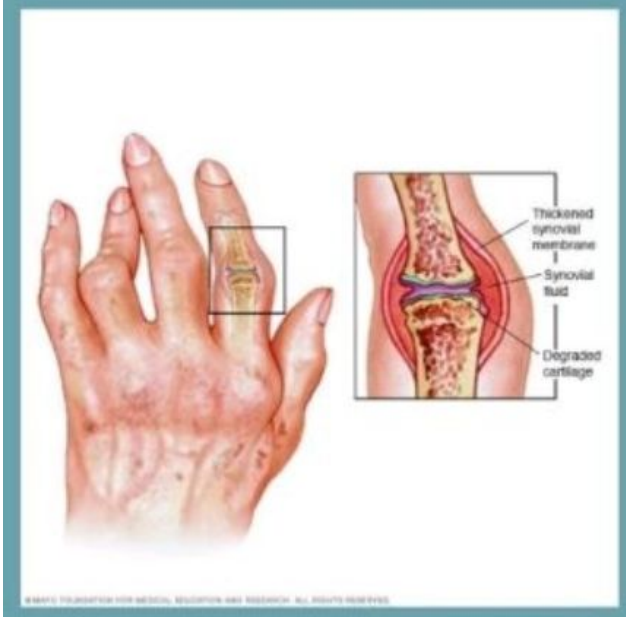
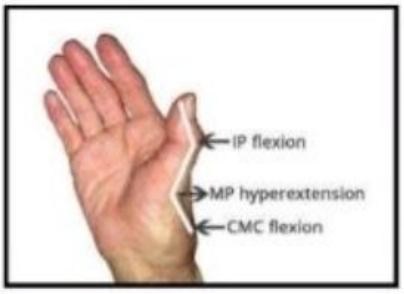
CLINICAL FEATURES

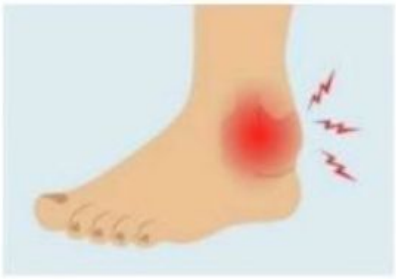
1. JOINT



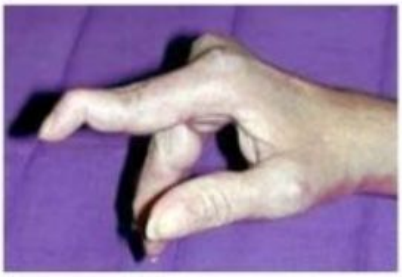
- Early rheumatoid arthritis tends to affect smaller joints first — particularly the joints that attach your fingers to your hands and your toes to your feet later spreads to the wrists, knees, ankles, elbows, hips and shoulders leading to POLYARTHRITIS.
- Swollen, warm, tender and stiff joints limits movements particularly early in the morning on waking or prolonged inactivity.
- The deformities seen are:
  - *Buttonhole deformity*
  - *Subluxation of metacarpophalangeal joint/ULNAR DRIFT*
  - *Z thumb deformity*
  - *Swan neck deformity*
  - *Hammer toe deformity*
  - *Arthritis mutilans*



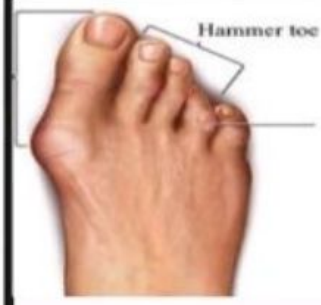
'**Z deformity**' may occur in rheumatoid arthritis. It is seen at the **thumb** and consists of hyperextension of the interphalangeal joint, and fixed flexion and subluxation of the metacarpophalangeal joint



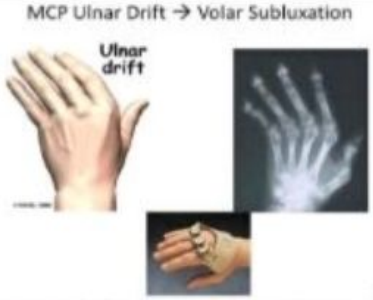
Swollen, red, tender joints



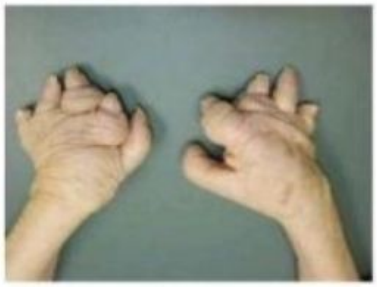
Swan-neck deformity/BOUTONNIERE DEFORMITY/BUTTON HOLE is a bending in (flexion) of the base of the finger, a straightening out (extension) of the middle joint, and a bending in (flexion) of the outermost joint.



A **hammer toe** or **contracted toe** is a deformity of the muscles and ligaments of the proximal interphalangeal joint of the second, third, or fourth toe causing it to be bent, resembling a hammer



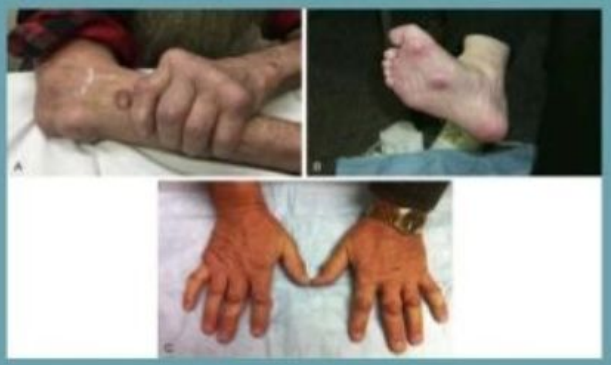
Ulnar deviation, also known as **ulnar drift**, is a hand deformity in which the swelling of the metacarpophalangeal joints causes the fingers to become displaced, tending towards the little finger.



Arthritis mutilans is a rare medical condition involving severe inflammation damaging the joints of the hands and feet, and resulting in deformation and problems with moving the affected areas; it can also affect the spine

CLINICAL FEATURES

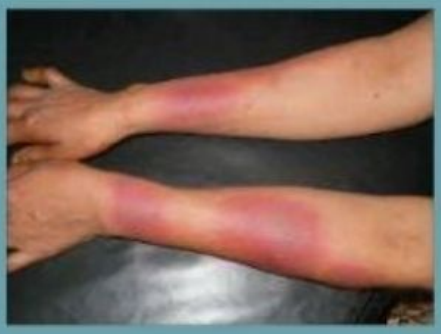
2.SKIN

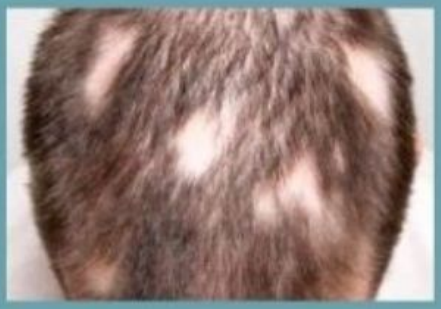


- The rheumatoid nodule or NECROTIZING GANULOMA, which is sometimes in the skin, is the most common non-joint feature .The typical rheumatoid nodule may be a few millimetres to a few centimetres in diameter and is usually found over bony prominences, such as the elbow, the heel, the knuckles, or other areas that sustain repeated mechanical stress.
- Nodules are associated with a positive RF (rheumatoid factor) titer, and severe erosive arthritis.
- Rheumatoid vasculitis can thus commonly present with skin ulceration and vasculitic nerve infarction known as **mononeuritis multiplex**. The most common presentation is due to involvement of small- and medium-sized vessels

CLINICAL FEATURES

2.SKIN





- Sweet syndrome is a rare disorder characterized by fever and the sudden onset of a rash, which consists of multiple tender, red or bluish-red bumps or lesions. These lesions usually occur on the arms, legs, trunk, face or neck. In some cases, additional systems of the body can become involved including the musculoskeletal system such as inflammation of the joints (arthritis).
- Diffuse alopecia areatais seen in RA.