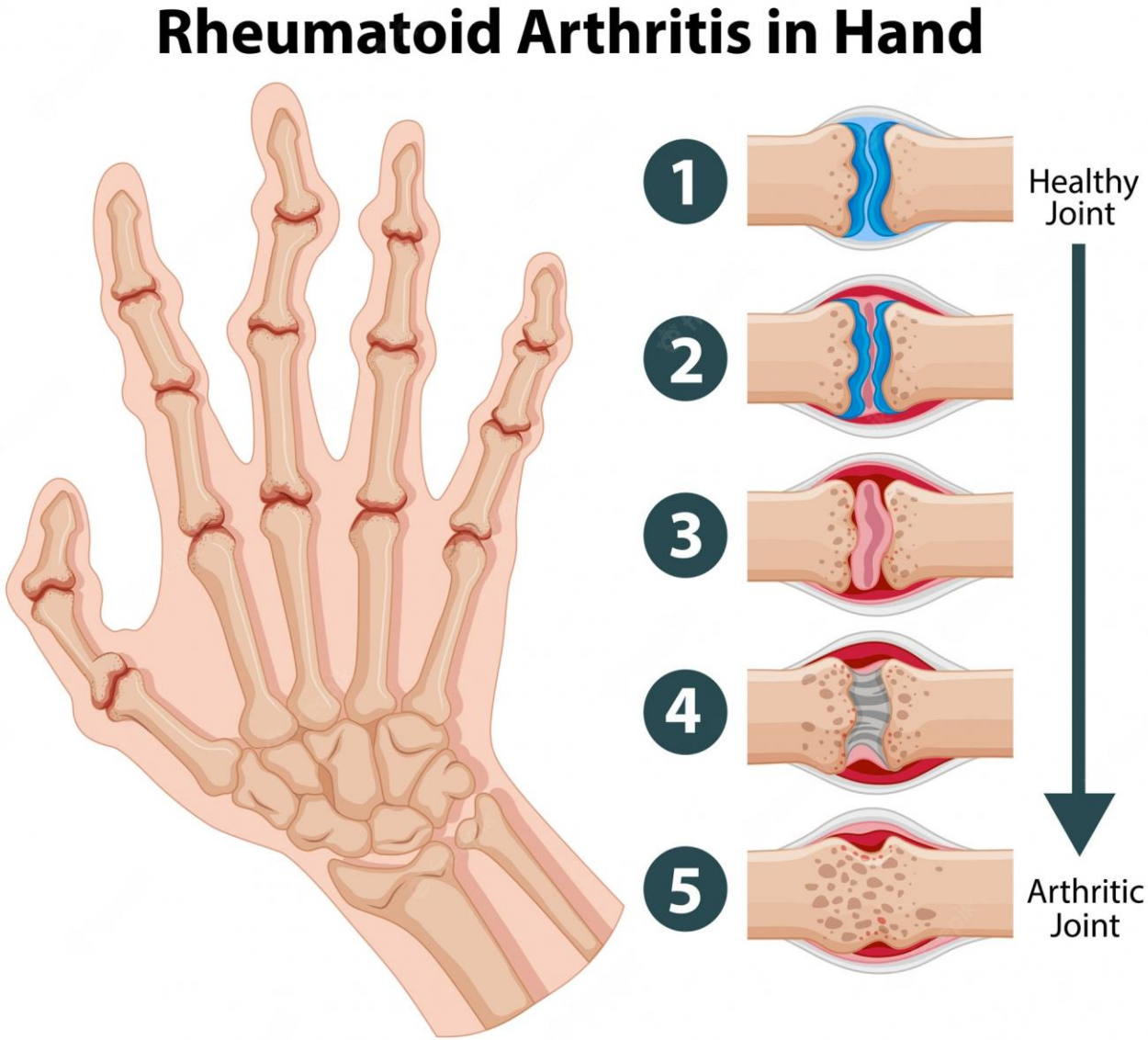
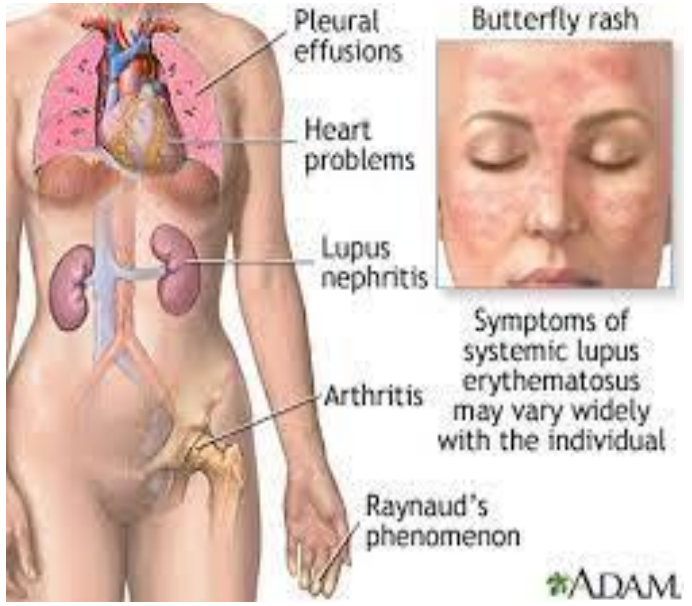
Rheumatologic and Connective tissue disorders



PROF. ABBAS AY TAHER

A connective tissue disease or **disorder** is one that affects the **elastin and collag**en proteins within connective tissues.
Connective tissues are responsible for joining different body parts and structures together.
To date, more than 200 connective tissue diseases have been identified. A few of the most well-known and defined connective tissue diseases are scleroderma, rheumatoid arthritis, systemic lupus erythematosus, granulomatosis with polyangiitis, mixed connective tissue disease, and undifferentiated connective tissue disease.



lupus erythematosus

When healthy, our immune system protects the body from germs and cancers. With lupus, the immune system misfires and attacks "self", the patient's own tissues, in a process called autoimmunity or "loss of self-tolerance".
In lupus as the attack goes on, all the branches of the immune system join the fight. This leads to significant and intense inflammation. The cause of lupus is unknown, as well as what drives its diverse presentation. We know that multiple factors are required, including: the "right" genetic makeup, environmental exposures and organ specific characteristics. People with lupus may also have an impaired process for clearing old and damaged cells from the body, which in turn provides continuous stimuli to the immune system and leads to abnormal immune response

There are three types:

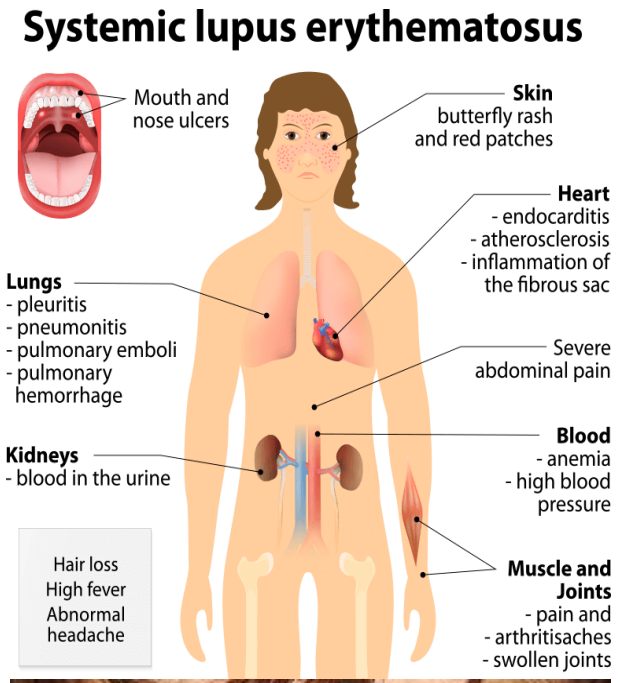
- **Acute cutaneous lupus.**
- **Chronic cutaneous lupus erythematosus, or discoid lupus erythematosus (DLE)**
- **Subacute cutaneous lupus erythematosus.**

Facts about lupus

Lupus occurs ten times more often in women than in men.
Lupus can affect children; in fact, 20% of patients with lupus are children.
Treatment depends on the organs involved.
Involvement of the kidneys or/and the brain is the most serious manifestation of lupus.
•Sun exposure can lead to lupus flares

Systemic Lupus Erythematosus

Systemic lupus erythematosus (SLE) is defined as a chronic disease that affects multiple tissues and organs such as skin, joints, heart, lungs, kidneys, blood cells, and brain. SLE has a wide range of symptoms, and their severity can range from mild to moderate and is patient dependent.
Many people with SLE experience bouts of flare-ups and periods of remission throughout their lives.
Some of the more common **signs and symptoms patients experience** is a butterfly-shaped rash across the cheeks and bridge of the nose, photosensitivity, fatigue, chest pain, Raynaud's syndrome, and joint pain or stiffness. Many times, lupus affects women in their reproductive years, but it can be seen in men and children as well



Scleroderma

Scleroderma is defined as a **group of connective tissue diseases that causes "hardening and tightening of connective tissue and skin."**

Women more frequently than men.

The two main types of scleroderma are categorized as **localized** and **systemic.**

Localized scleroderma is described as being confined to the **skin only** and can resolve on its **own without treatment.**

Systemic scleroderma can be characterized as **either diffuse** or **limited**.

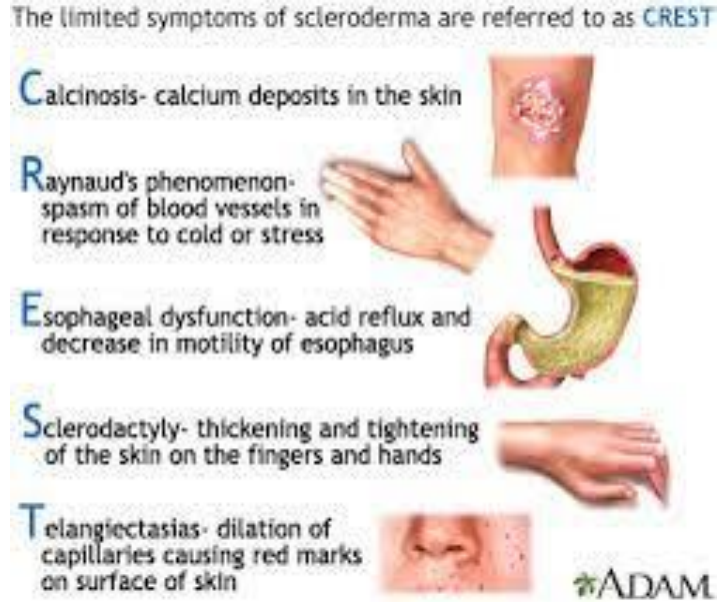
Limited scleroderma is also known by the **acronym CREST Syndrome**.

The "c" stands for calcinosis, which causes **calcium deposits to form within the skin**. The "r" is for Raynaud's phenomenon, and the **"E" is for esophageal dysmotility**.

The "s" stands for sclerodactyly, which is the tightening of the skin on the fingers, and the "t" is for telangiectasias, which causes red spots to appear in the skin due to dilated blood vessels

These patients often **suffer from Sjogren's syndrome** as well, **which causes dry eyes and mouth.**

Some of the most common signs and symptoms of scleroderma are **Raynaud's phenomenon**, which causes blood flow to the fingers and/or toes to be reduced, resulting in a color change to the extremities. This phenomenon often happens after being exposed to cold temperatures.



It can lead to swelling of the fingers and toes, numbness and pain, and, in extreme cases, gangrene.
Tightening and swelling of the skin is also a common symptom of scleroderma.

Rheumatoid Arthritis

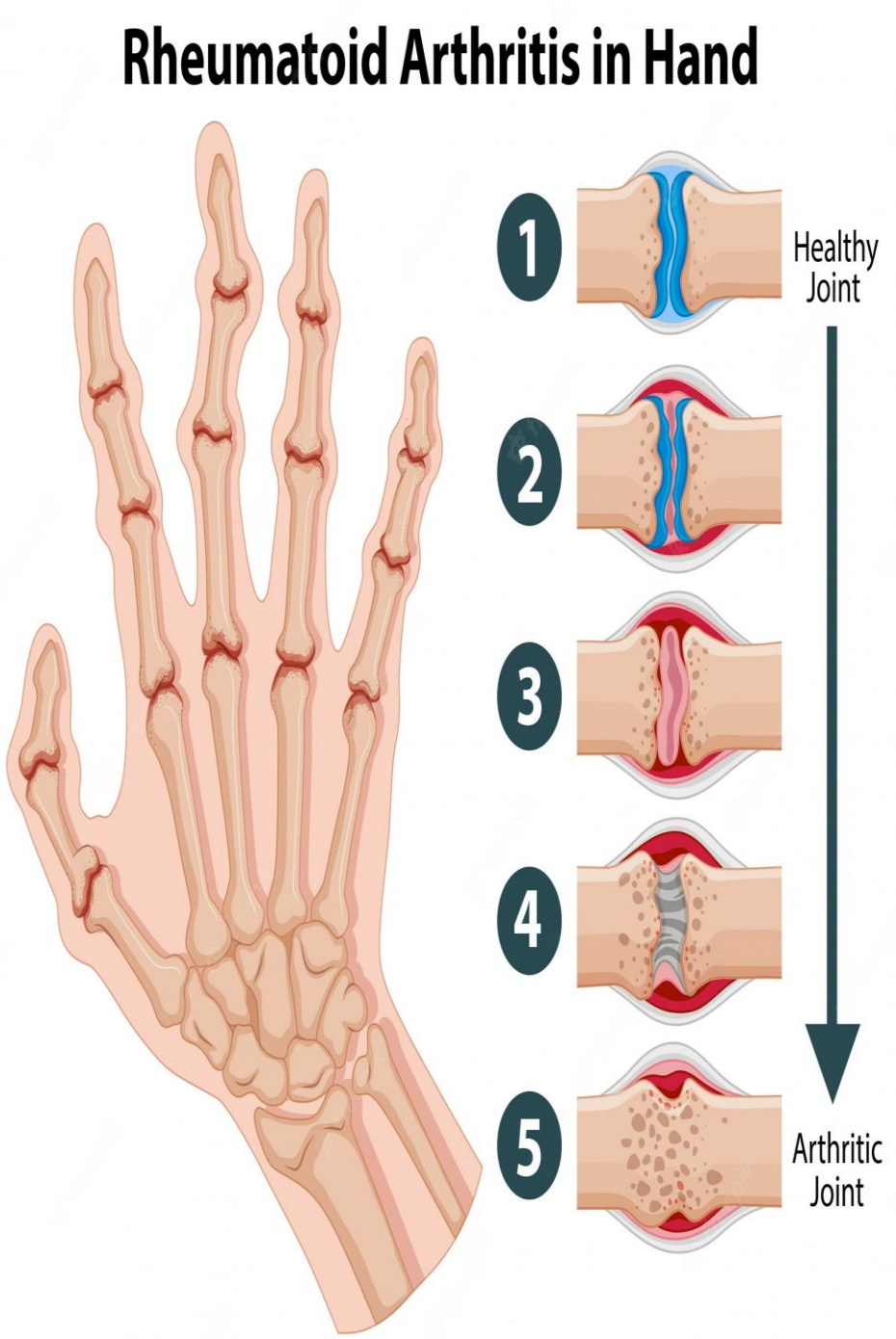
Rheumatoid arthritis (RA) is an **autoimmune disorder** that attacks the **synovium of the joints** as well as the skin, eyes, heart, lungs, and blood vessels,
arthritis.
Females are three times more likely to receive a diagnosis of RA than their male counterparts.
Rheumatoid arthritis is completely different to **osteoarthritis** which affects most of us as we **get older**.
Rheumatoid arthritis can affect **people of any age including very young children** and it is a condition where the immune system which usually protects us from infections, **starts to attack the joints causing pain**, **stiffness and swelling.**

It is very important to **diagnose rheumatoid arthritis** as soon as possible because there are very effective treatments and if the symptoms are ignored or not treated properly, joint damage can happen very quickly.
If rheumatoid arthritis is treated as soon as possible after the symptoms start, **joint damage** and **disability** can often be prevented.
Most hospital rheumatology departments now have rapid access early arthritis clinics to see people with suspected rheumatoid arthritis as soon as possible, so that treatment can start straight away and joint damage can be prevented

The most common symptoms of RA include **tenderness and pain of the joints** with or **without warmth and redness**, **stiffness** of the joints that arise first thing in the morning, as well as fever and fatigue.

Many times, the small joints of the hands and feet are affected first, and as the disease progresses, it can affect larger joints throughout the body. It is common for the same joints on both sides of the body to be involved

Diagnosing RA is based upon many factors, including a complete health history, physical examination, imaging, and blood tests that check for certain antibodies and inflammation markers that are linked to RA.



If left untreated, RA that affects the **synovium of the joints** can harm the bones as well as lead to impairment of the joints.

Because RA is considered a degenerative disease and can lead to life-alternating complications, quick and aggressive treatment is usually recommended.As with scleroderma, these patients are at high risk for developing Sjogren's syndrome. RA patients are at an increased risk for developing lymphoma, so close monitoring and follow-up with their physician is imperative

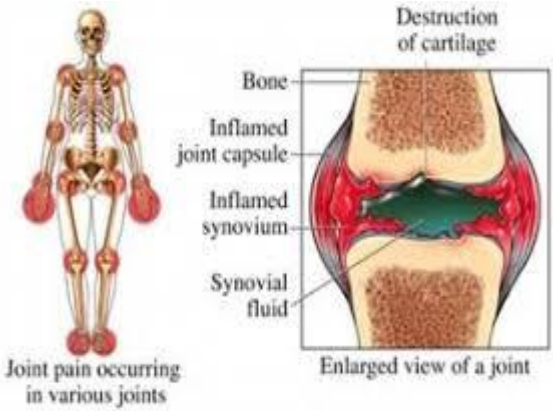
Causes rheumatoid arthritis?

Rheumatoid arthritis is an autoimmune condition, which means it's caused by the immune system attacking healthy body tissue. However, it's not yet known what triggers this.

The immune system normally makes antibodies that attack bacteria and viruses, helping to fight infection.

If the have rheumatoid arthritis, the immune system mistakenly sends **antibodies to the lining** of the joint.

This causes the thin layer of cells (synovium) covering your joints to become sore and inflamed, releasing chemicals that damage nearby: **bones, cartilage-** the stretchy connective tissue between bones, **tendons-**the tissue that connects bone to muscle, ligaments -the tissue that connects bone and cartilage



If rheumatoid arthritis is not treated, these chemicals gradually cause the joint to lose its shape and alignment. Eventually, it can destroy the joint completely.

Various theories of why the immune system attacks the joints have been suggested, such as an infection being a trigger, but none of these theories has been proven.

Possible risk factors:

There are several things that may increase the risk of developing rheumatoid arthritis, including:

•**The patient's genes** – there's some evidence that rheumatoid arthritis can run in families, although the risk of inheriting it is thought to be low as genes are only thought to play a small role in the condition

•**hormones** – rheumatoid arthritis is more common in women than men, which may be because of the effects of the hormone oestrogen, although this link has not been proven

•smoking – some evidence suggests that people who smoke have an increased risk of developing rheumatoid arthritis

a

b

Sign and symptoms of RA

The main symptoms of rheumatoid arthritis are joint pain, swelling and stiffness. It may also cause more general symptoms, and inflammation in other parts of the body.

The symptoms of rheumatoid arthritis often develop gradually over several weeks, but some cases can progress quickly over a number of days.

The symptoms vary from person to person. They may come and go, or change over time. You may experience flares when your condition deteriorates and your symptoms become worse.

Symptoms affecting the joints

Rheumatoid arthritis mainly affects the joints. It can cause problems in any joint in the body, although the small joints in the hands and feet are often the first to be affected.

Rheumatoid arthritis typically affects the joints symmetrically (both sides of the body at the same time and to the same extent), but this is not always the case.

Pain

The joint pain associated with rheumatoid arthritis is usually a throbbing and aching pain. It is often worse in the mornings and after a period of inactivity.

Stiffness

Joints affected by rheumatoid arthritis can feel stiff. For example, if your hands are affected, you may not be able to fully bend your fingers or form a fist.

Like joint pain, the stiffness is often worse in the morning or after a period of inactivity.

Morning stiffness that is a symptom of another type of arthritis, called osteoarthritis, usually wears off within 30 minutes of getting up, but morning stiffness in rheumatoid arthritis often lasts longer than this.

Swelling, warmth and redness

The lining of joints affected by rheumatoid arthritis become inflamed, which can cause the joints to swell, and become hot and tender to touch.

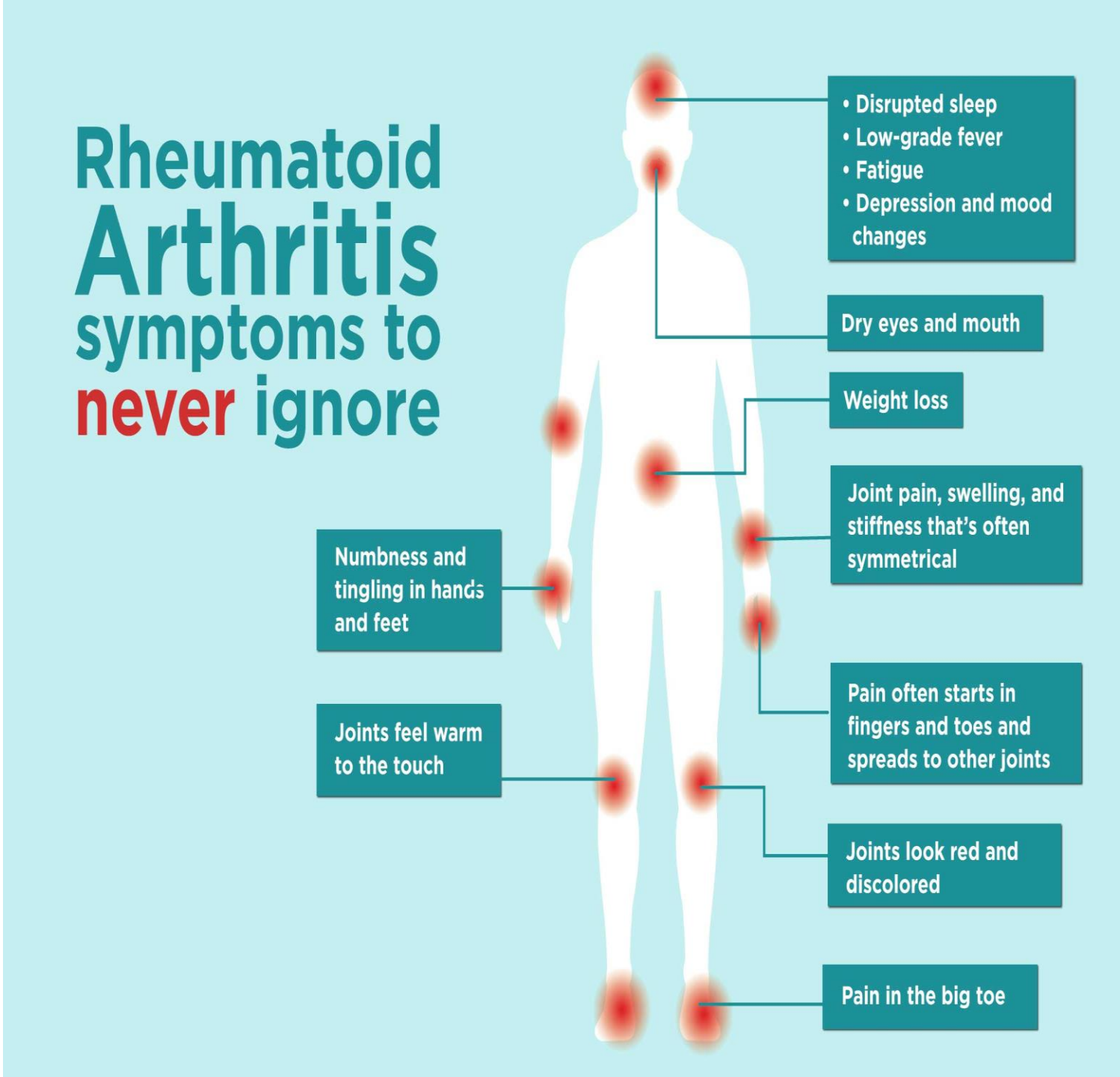
In some people, firm swellings called rheumatoid nodules can also develop under the skin around affected joints.

Additional symptoms

As well as problems affecting the joints, some people with rheumatoid arthritis have more general symptoms, such as:

- tiredness and a lack of energy
- a high temperature
- sweating
- a poor appetite
- weight loss

The inflammation that's part of rheumatoid arthritis can also sometimes cause problems in other areas of the body, such as**:** dry eyes – if the eyes are affected ,**chest pain** – if the heart or lungs are affected



Diagnosis

Rheumatoid arthritis can be difficult to diagnose because many conditions cause joint stiffness and inflammation and there's no definitive test for the condition.

Blood tests

No blood test can definitively prove or rule out **a diagnosis of rheumatoid arthritis**, but several tests can show indications of the condition. Some of the main blood tests used include:

•**erythrocyte sedimentation rate (ESR)** – which can help assess levels of inflammation in the body

C-reactive protein (CRP) – another test that can help measure inflammation levels**full blood count** – this test can be used to help rule out other possible causes of your symptoms as well as provide an indicator your general health

The full blood count test can also be used to check the anaemia. **Anaemia means the blood is unable to carry enough oxygen because of a lack of blood cells.** Anaemia is common in people with rheumatoid arthritis, although having anaemia does not prove you have rheumatoid arthritis.

Rheumatoid factor and anti-CCP antibodies:

One blood test measures **levels of rheumatoid factors in the blood**. Rheumatoid factors **are proteins that the immune system** produces when it **attacks health tissue.**

About half of all people with rheumatoid arthritis **have high levels of rheumatoid factors** in their blood when the disease starts, but about **1 in 20 people without rheumatoid arthritis also test positive.**

A related blood test known as **anti-cyclic citrullinated peptide (anti-CCP) test** is also available. **Anti-CCPs are antibodies** also produced by the immune system. People who test positive for **anti-CCP** are very likely to develop rheumatoid arthritis, but not everybody with rheumatoid arthritis has this antibody.

Those who test positive for both **rheumatoid factor and anti-CCP** may be more likely to have severe rheumatoid arthritis requiring higher levels of treatment.

Joint scans

Scans may be done to check for **joint inflammation and damage.** These can help tell the difference **between types** of **arthritis** and can be used to **monitor how the condition is progressing over time.** Scans that may be done to diagnose and monitor rheumatoid arthritis include: **X-rays , MRI scans** (where strong magnetic fields and radio waves are used to produce detailed images of your joints).

Treatment:

Treatments for rheumatoid arthritis can help reduce inflammation in the joints, relieve pain, prevent or slow down joint damage, reduce disability and enable you to be as active as possible.

Although there's no cure for rheumatoid arthritis, early treatment and support (including medicine, lifestyle changes, supportive treatments and surgery) can reduce the risk of joint damage and limit the impact of the condition.

Your treatment will usually involve care from your GP and several different specialists.

There are medicines available to help stop rheumatoid arthritis from getting worse and reduce your risk of further problems.

These are often divided into main 2 types: disease-modifying anti-rheumatic drugs (DMARDs) and biological treatments.

Disease-modifying anti-rheumatic drugs (DMARDs)

If you've been diagnosed with rheumatoid arthritis, you'll usually be offered a combination of DMARD tablets as part of your initial treatment.

These medicines ease the symptoms of the condition and slow down its progression. **DMARDs** work by blocking the effects of the chemicals released when your immune system attacks your joints, which could otherwise cause further damage to nearby bones, tendons, ligaments and cartilage.
The DMARDs that may be used include: methotrexate ,leflunomide ,hydroxychloroquine, sulfasalazine
Methotrexate is usually the first medicine given for rheumatoid arthritis, often **with another DMARD** and **a short course of steroids (corticosteroids) to relieve any pain**.
These may be combined with biological treatments.
Common side effects of methotrexate include:feeling sick ,loss of appetite ,a sore mouth diarrhoea ,headaches, hair loss
The medicine can also affect the blood cells and liver, so patient should have regular **blood tests** to monitor this.
Less commonly, **methotrexate can affect the lungs**, so may have a chest **X-ray and possibly a breathing test when patient start taking i**t. This is to provide a comparison if you develop **shortness of breath** or a persistent dry **cough** while taking it. But most people tolerate methotrexate well.
It can take a few months to notice a DMARD working. It's important to keep taking the medicine, even if patient do not notice it working at the beginning. Patient may have to **try 2 or 3 types** of DMARD before patient find the one that's most suitable for patient. If suitable DMARD, patient usually have to take the medicine long term.

Biological treatments

Biological treatments, such as **adalimumab, etanercept** and **infliximab**, are a newer form of treatment for **rheumatoid arthritis.**
They're usually taken in combination with **methotrexate** or **another DMARD**, and are usually only used if DMARDs have not been effective on their own.

Biological medicines are given by injection. They work by stopping particular chemicals in your blood from activating your immune system to attack your joints.

Side effects from biological treatments are usually mild but include: skin reactions at the site of the injections

•infections, feeling sick, a high temperature headaches

Some people may also be at risk of getting more serious problems, including the reactivation of infections such as tuberculosis (TB) if they have had them in the past.

JAK inhibitors

JAK inhibitors are a new type of medicine available for adults with severe rheumatoid arthritis.

They are **offered to people who cannot take** DMARDs or **biologicals**, or **tried them but found they were not effective.** This medicine is usually **used in combination with methotrexate**.

JAK inhibitors can also be taken on their own by adults who cannot take methotrexate.

Medicine to relieve pain

In addition to the medicines used to control the progression of rheumatoid arthritis, patients may also need to take medicine specifically to relieve pain.

Painkillers

In some cases, patient may be advised to use painkillers, **such as paracetamol** or a combination of **paracetamol** and codeine (co-codamol), to relieve the pain associated with **rheumatoid arthritis.**

These medicines do not treat the inflammation in your joints, but they may be helpful in relieving pain.

For example, they may be recommended while you're waiting to see a specialist or when your symptoms are particularly bad (flare-ups).

Non-steroidal anti-inflammatory drugs (NSAIDs)

In addition to, or instead of, the painkillers mentioned above, your doctor may prescribe a non-steroidal anti-inflammatory drug (NSAID).
This may be a traditional NSAID, such as ibuprofen, naproxen or diclofenac. Or a COX-2 inhibitor, such as **celecoxib** or **etoricoxib.**
These medicines can help relieve pain while also **reducing inflammation** in the joints, although they will not stop rheumatoid arthritis getting worse over time.
NSAID patient should take, and the **benefits** and **risks associated with it**.
Although uncommon, taking NSAIDs can increase the risk of **serious stomach problems**, such as **internal bleeding.**
This is because the medicines can **break down the lining that protects the stomach against damage from stomach acids**.
such as a proton pump inhibitor (PPI).

Steroids

Steroids are powerful medicines that can help reduce pain, stiffness and inflammation. **They can be given as:**
•a tablet (for example, prednisolone)
•an injection directly into a painful joint
•an injection into a muscle (to help lots of joints)
They're usually used to provide **short-term pain relief** – for example, while you're waiting for DMARD medicines to take effect or during a flare-up. **Steroids are usually only taken** for a short time because long-term use can have serious side effects, such as: **weight gain, osteoporosis** (weakening of the bones) , easy bruising ,muscle weakness
•thinning of the skin

Oral manifestation:

Oral health complications due to RA and its treatments can cause additional problems for patients. A recent study found that approximately 30% of RA patients were taking additional analgesics specifically for oral pain.Due to their immunosuppressive effects, RA medications can promote periodontitis, candidiasis and oral ulceration aided by a lack of saliva.

The three main oral conditions associated with RA

Periodontal disease

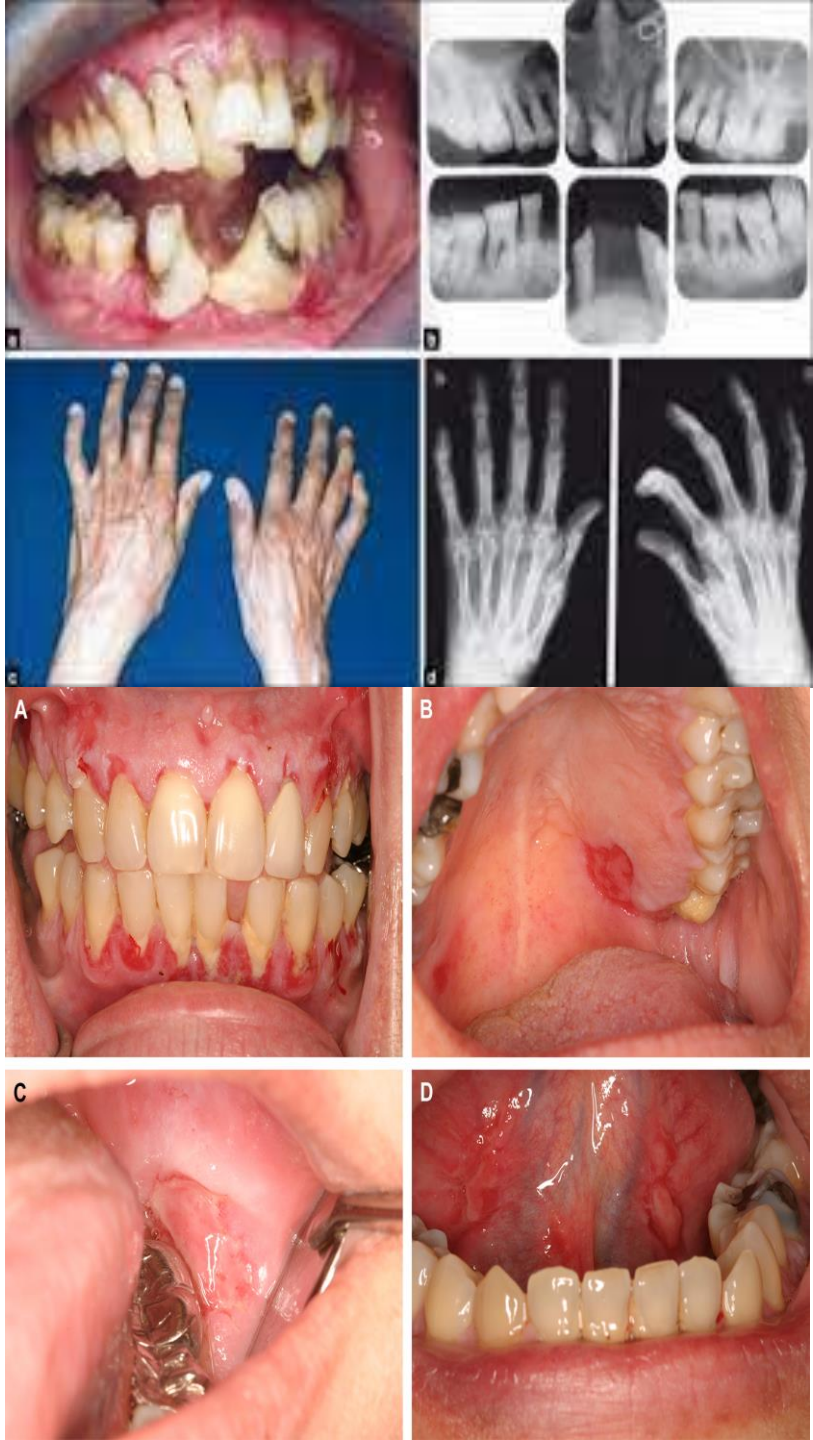
Periodontal disease (PD) is a chronic inflammatory condition which leads to destruction of the periodontal ligament and alveolar bone, and can result in tooth loss.

PD is caused by the presence of pathogenic gram-negative anaerobic bacteria within the biofilm attached to the sub-gingival tooth surface.

Porphyromonas gingivalis (Pg) is the main pathogen in PD.Its virulence combined with an intense host immune response is thought to contribute to the severity of the disease.

People with RA are almost twice as **likely to have PD than** those without.

RA patients with severe PD have significantly higher DAS-28 scores than those with moderate or no periodontitis, and PD is associated with increased radiographic joint damage.



These data strongly suggest an association between RA and PD/tooth loss.

This association is independent of common risk factors such as smoking, alcohol intake, socioeconomic background and poor oral hygiene.

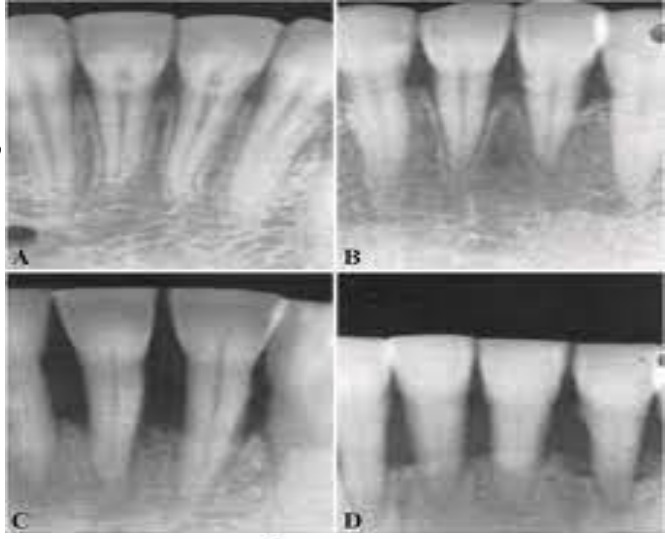
RA and PD are both chronic inflammatory diseases. Both conditions feature excessive destruction of collagen-rich tissues: in RA these are bone, cartilage and other periarticular tissues; in PD these are alveolar bone, periodontal ligament and gingiva.

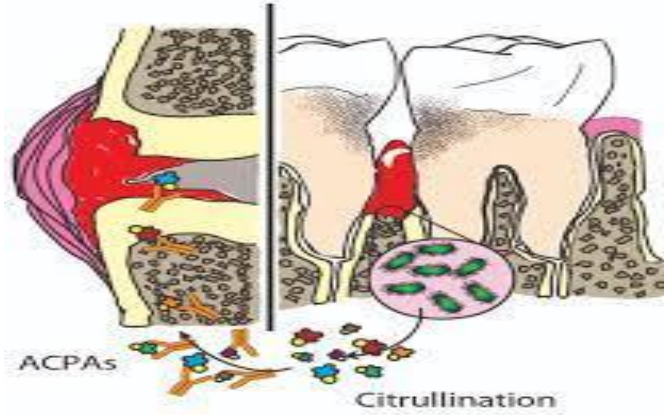
Alveolar bone loss in PD results from the activation of osteoclasts and is very similar to bone erosion in RA, which is caused by cytokine-driven osteoclast activation.

PD may be involved in the initiation and/or maintenance of systemic inflammation in RA.The level of Pg antibodies has been found to positively **correlate with levels of ACPA in circulation in RA**.Pg is the only bacterium known to express a PAD enzyme, which can cause the citrullination of bacterial and host proteins.

This is thought to cause the body to produce ACPA, which drives the autoimmune response in RA.
PAD enzymes, citrullinated proteins and ACPA have all been found in inflamed gingiva.

Antibodies to the periodontal pathogens Pg and *Prevotella intermedia* have been found in the serum and synovial fluid of patients whose RA is active.





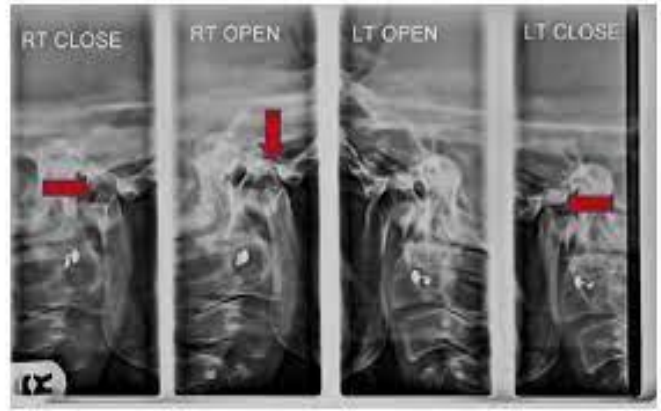
Effective control of PD for RA patients is important to reduce both local and systemic inflammation, and the likelihood of bacteraemia.

Persistent periodontitis can also reduce the effectiveness of TNF inhibitors.

Short-term clinical trials have demonstrated that non-surgical periodontal therapy in RA patients with PD can decrease RA disease activity and systemic inflammation.

Reduction in disease activity may be due to less inflammatory products, bacteria and endotoxins in the bloodstream after periodontal treatment, thereby reducing the exposure of joints to these products.

Longer-term clinical trials are currently in progress to find out whether non-surgical periodontal treatment can lead to an improvement in clinical outcomes and quality of life for patients with active RA.A recent systematic review also highlighted the importance of smoking cessation, which results in improved outcomes for non-surgical periodontal therapy.

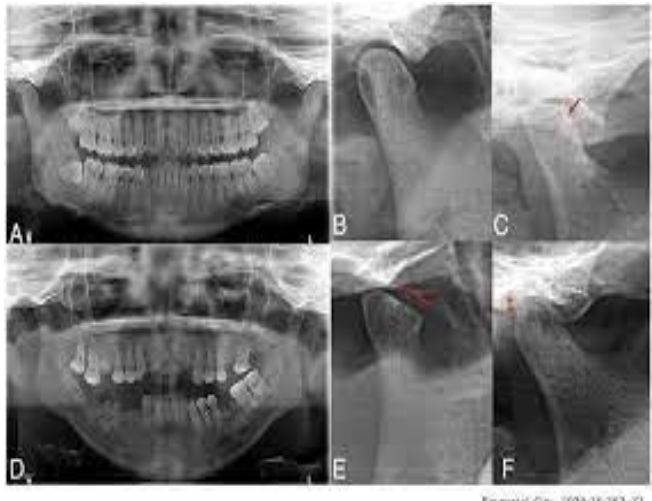


Temporomandibular dysfunction:

The temporomandibular joint (TMJ) is used up to 2,000 times a day for chewing and speaking, making it one of the most frequently used synovial joints in the body.

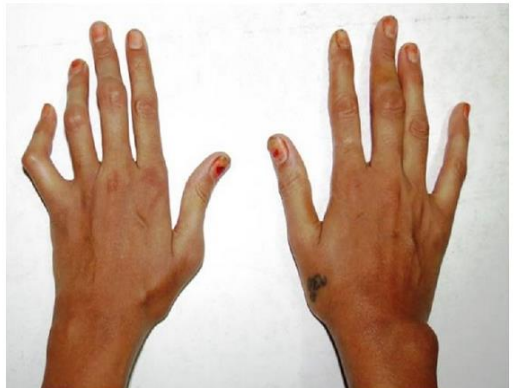
People with RA have a higher frequency and greater severity of temporomandibular dysfunction (TMD) than the normal population.

The estimated prevalence of TMJ symptoms in adults with RA is between 5–86% (depending on diagnostic criteria, assessment methods and the population studied) with clinical involvement of the TMJ seen in about 50% of cases.



RA patients with TMD may present with pain, difficulty with opening the mouth, ‘locking’ of the jaw, tenderness of the TMJ/masticatory muscles, and joint sounds.
The most frequent joint sound is clicking, followed by crepitus (which indicates TMJ degeneration but may be seen less often due to improved RA medication).
It is thought that pain in TMD is associated with RA disease activity, and impairment in the range of motion and function of the TMJ are more likely due to degeneration of the joint.
Patients may also report associated symptoms such as ear pain/stuffiness, tinnitus, dizziness, headache and neck pain.

It is important to note that the TMJ may already be affected by RA in patients who do not yet report TMD symptoms.

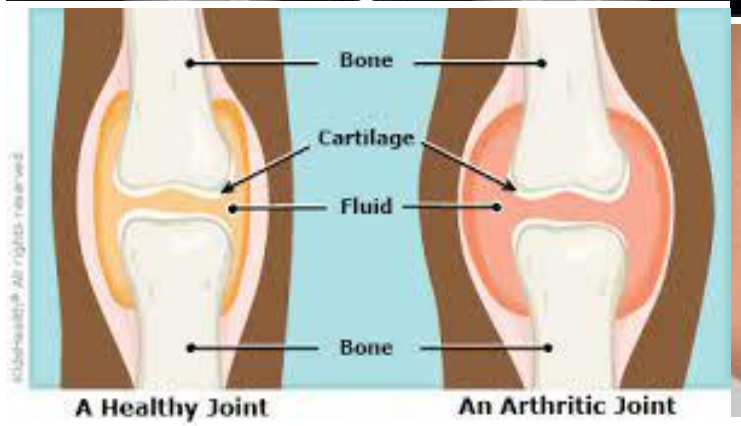


Clinical signs of TMJ involvement include **swelling**, **reduced range of motion** and/or **deviation of the mandible to the affected side**.
Imaging shows condylar resorption with a resultant shortening of the mandibular ramus-condyle unit and possibly a reduced joint space.
Cone-beam computed tomography (CBCT) imaging is best for showing the extent of condylar damage from RA, particularly in the early stages, and involves a lower radiation dose than conventional CT scans.
There is a positive correlation between the duration and severity of RA, and the degree of TMJ involvement.Ankylosis of the TMJ is uncommon and occurs late in the disease course.If ankylosis or collapse of the TMJ occurs, joint replacement may become necessary.

This has been shown to have good long-term outcomes for patients with inflammatory arthritis.

TMD management in RA needs to involve the patient's rheumatologist and an oral and maxillofacial surgeon with an interest in TMJ diseases.

Juvenile idiopathic arthritis (JIA), also known as juvenile rheumatoid arthritis, The reported prevalence of TMJ arthritis in JIA ranges from 17 to 87%.
Restricted mouth opening is the most frequent clinical finding (28% of patients) followed by masticatory muscle tenderness, deviation of the mandible on opening, TMJ tenderness and joint sounds.



TMJ arthritis in children can cause a disturbance of mandibular growth and evident alterations in craniofacial morphology and occlusion; features typically seen include an increased profile convexity, a steeper mandibular plane angle, mandibular micrognathia and retrognathia.
Inflammation occurs during the active phase of JIA, which ultimately causes resorption of the condyles.
Damage to the condyles may be present early on in JIA and progress, even when clinical symptoms and signs are absent.
The current gold standard method of imaging in JIA to detect early arthritic changes in the TMJ is magnetic resonance imaging (MRI) with contrast.

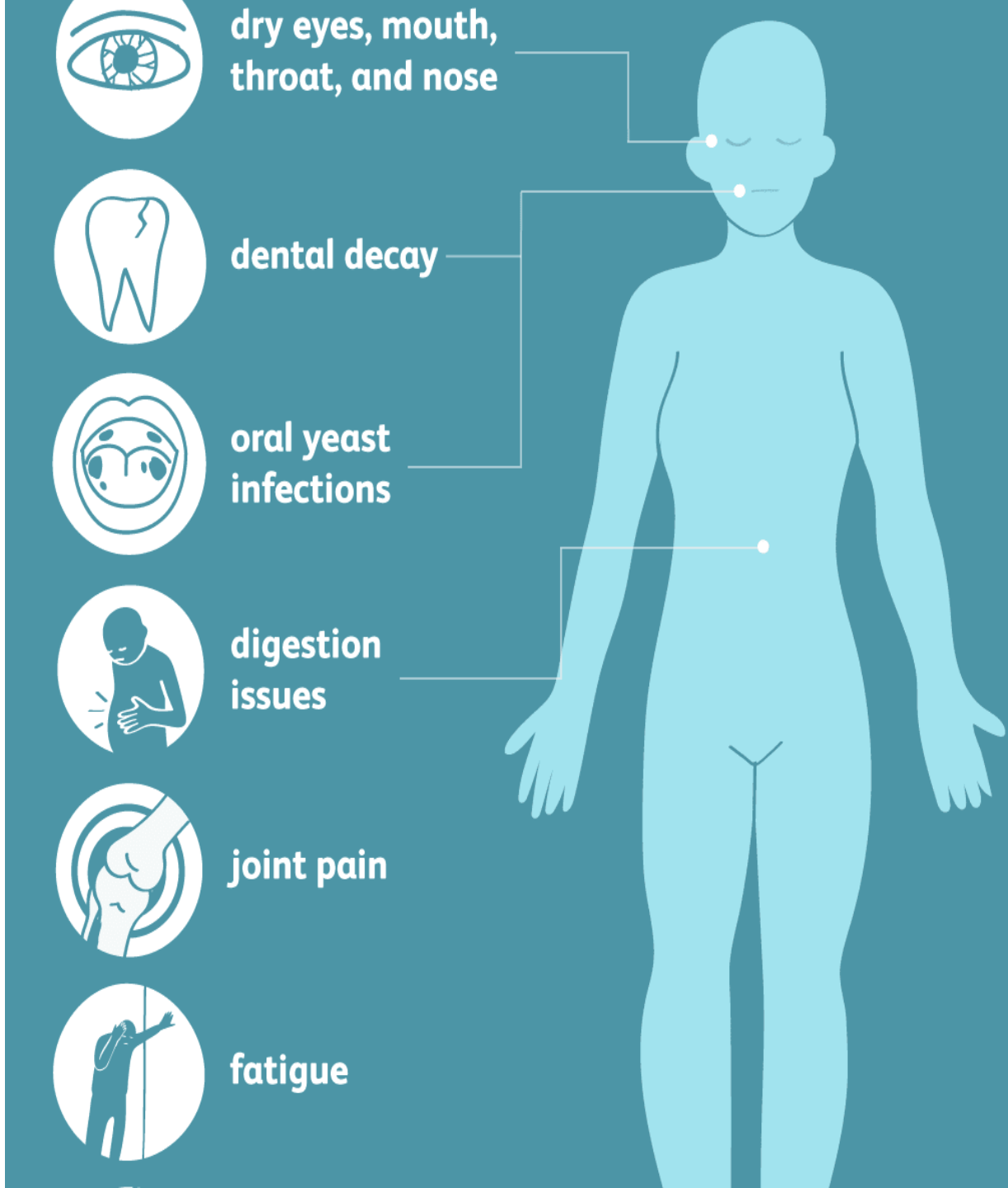
Patients with JIA should have regular imaging of the TMJ and evaluation by an orthodontist, even in the absence of TMD signs and symptoms.
Lastly, it is important to note that some patients with RA/JIA will have TMD that is unrelated to their inflammatory arthritis.

Salivary gland dysfunction

Sjögren's syndrome (SS)

Sjögren's syndrome (SS) is a chronic autoimmune condition that is characterised by the sicca symptoms xerophthalmia and xerostomia, caused by inflammation leading to dysfunction of the lacrimal and salivary glands.
It can occur alone (primary form) or secondary to other systemic autoimmune diseases such as RA.

The estimated prevalence of sicca symptoms in RA patients ranges between 30–50%.
RA patients with SS have reduced salivary flow and altered saliva composition (due to destruction and dysfunction of the salivary glands).



This reduces the buffering and antimicrobial properties of saliva causing an increased likelihood of caries.

The subjective experience of xerostomia in SS is not dependent on the total quantity of saliva (salivary flow) but rather the quantity and quality of specific components within it (called mucins) which affect its ability to retain water.

Up to 70% of salivary mucins are produced by the minor salivary glands and overall they produce 10% of saliva.

Therefore, currently available treatments aimed solely at increasing salivary flow may not be sufficient to provide relief for SS patients.

Xerostomia can affect the oral cavity in many ways .

Besides SS, a dry mouth can also be caused by medications taken by RA patients

It is important to note that xerostomia may be reported by patients before obvious **signs of hyposalivation** are visible in the mouth.

Oral signs and symptoms of Sjögren's Syndrome[7]

Signs	Symptoms
Enlarged parotid glands	Soreness
Absence of saliva pooling in floor of mouth	Burning
Dry/cracked oral mucosa and lips	Loss of/altered taste sensation
Mouth sores	Difficulty with eating
Increased caries incidence (especially cervical)	Difficulty with swallowing
Increased dental erosion	Difficulty with speaking
Erythematous cobblestoned/ fissured tongue	Pain from denture-induced irritation
Atrophy of filiform papillae	
Coated tongue ('black hairy tongue')	
Candidosis	
Halitosis	
Difficulty with denture retention	

Dental management

Most RA patients can be successfully managed at the dental practice with some minor adjustments for suggestions.

Chronic inflammation of the cervical spine in RA can result in neck instability, which can cause neurological symptoms and in rare cases be fatal.

It is therefore important that a patient's head and neck are well supported during dental treatment. Suspected cervical instability should also be discussed with the patient's rheumatologist.

Due to pain, impaired hand function and fatigue, RA patients may find it difficult and lack the motivation to follow a good oral hygiene regime (leading to further unfavourable outcomes).

Good oral hygiene is the cornerstone for dental management of these patients, and aids should be recommended to making brushing and interdental cleaning easier for this population with poor grip and dexterity. Resources on suitable aids and adaptations are available.for a summary of management of common RA-associated dental problems. *If a patient is having recurrent problems due to their RA or medication, please discuss this with their rheumatologist*

Table 4 Summary of suggested management for RA-associated dental problems[74,75,77,88,90,91,93–95,97–100]

Dental problem	Management
Periodontal disease	More frequent dental/hygiene visits
	Regular scaling and root planing (no adjuncts necessary)
	Oral hygiene instruction – recommend electric toothbrushes and interdental cleaning aids with wider handles
	Smoking cessation advice and support
	Refer to a periodontist if necessary
Temporomandibular dysfunction	Jaw rest
	Warm compress application
	Physiotherapy
	Soft food diet
	Short-term NSAID use (topical or systemic)
	Occlusal splint (soft or hard) wear at night time
	Biobehavioural therapy
	Elimination of unhelpful habits for example, nail biting, wide yawning
	Discuss with patient's rheumatologist/GP if TMJ arthritis suspected
	Refer to oral & maxillofacial surgery and orthodontics (for children) if necessary
Salivary gland dysfunction	More frequent dental visits
	Medication review
	Advise to keep hydrated with regular sipping of water
	Smoking cessation advice
	Chew sugar-free gum or lozenges regularly (if no TMJ problems)
	Oral hygiene instruction
	Pit and fissure seal teeth
	Fluoride varnish, prescription-strength toothpaste or mouthwash
	Use of non-fluoride remineralising agents for example, calcium phosphate rinse
	Chlorhexidine varnish, gel or mouth rinse
	Advise to reduce sugar/acid intake and frequency
	Salivary replacement (gels, mouth rinses, toothpastes, lozenges)
	Advise patient to use a humidifier, particularly when sleeping
	Discuss with patient's rheumatologist/GP
	Prescribe salivary stimulants for example, pilocarpine
	Refer to oral medicine if necessary
	Refer to GP/rheumatologist if an undiagnosed underlying rheumatic disease is suspected
Oral candidosis/ angular cheilitis	Prescribe topical or systemic antifungals
	Discourage denture wear at night
	Encourage good denture hygiene
Oral ulceration	Check patient is taking medication (especially methotrexate) at the prescribed dose and interval
	Prescribe benzydamine mouthwash/oromucosal spray
	Urgent referral to oral medicine if ulcers are longstanding (>3 weeks) or suspicious

NSAID = Non-steroidal anti-inflammatory drug; GP = General medical practitioner; TMJ = Temporomandibular joint.

Dental management of patients with prosthetic joint

Replacing arthritic joints with prosthetic joints is one of the great advances of modern medicine, with 2.9 million joints replaced annually worldwide.

Periprosthetic joint infection (PJI) is a leading cause of **arthroplasty failure**.

Early infections, **within 3 months of joint replacement**, are considered the result of wound contamination at the time **of the surgical procedure**.

Early infection rates in the 1950s were approximately 12%, but antibiotic prophylaxis before joint replacement and lamina airflow operating rooms have reduced this to 1% to 2%, and refocused attention on late PJIs (LPJIs), which occur 3 months or longer after joint replacement operations.

Prosthetic joint infection (PJI) is **a tremendous burden for individual patients as well as the global health care industry**.

While a small minority of joint arthroplasties will become infected,

appropriate recognition and management are critical to preserve or restore adequate **function** and **prevent excess morbidity**.

The continuing use of antibiotic prophylaxis represents a large and unnecessary financial burden on individuals and the health care system as well as an unnecessary risk to patients, from **adverse drug reactions**, and **society**, **owing to the potential development of antibiotic resistant bacteria**, and **should cease**.
Maintenance of good oral hygiene may be **important in preventing the small number of LPJIs in which oral bacteria are implicated**.

The ADA Clinical Recommendation:

In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.
For patients with a **history of complications associated with their joint replacement surgery** who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered **after consultation with the patient and orthopedic surgeon.**
To assess a patient's medical status, a complete health history is always recommended when making final decisions regarding the need for antibiotic prophylaxis.

Clinical Reasoning for the Recommendation:

- There is evidence that dental procedures are not associated with prosthetic joint implant infections.
- There is evidence that antibiotics provided before oral care **do not prevent prosthetic joint implant infections**.
- There are potential harms of antibiotics including risk for anaphylaxis, antibiotic resistance, and opportunistic infections like **Clostridium difficile.**
- The benefits of antibiotic prophylaxis may not exceed the harms for most patients.
- **The individual patient's circumstances and preferences should be considered when deciding whether to prescribe prophylactic antibiotics prior to dental procedures.**

THANK YOU