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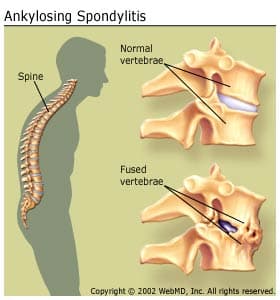
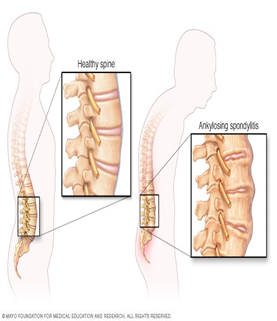
**Ministry of Higher Education & Scientific Research 4th class (Lecture 3)**

**Al-Rasheed university College Clinical immunology**

**Department of medical laboratory 2022 / 2023 techniques**

**Ankylosing Spondylitis**

[Ankylosing spondylitis](https://www.webmd.com/arthritis/what-is-ankylosing-spondylitis) (AS) is a rare type of [arthritis](https://www.webmd.com/arthritis/default.htm) that causes [pain](https://www.webmd.com/pain-management/default.htm) and stiffness in the [spine](https://www.webmd.com/back-pain/rm-quiz-spine-quiz). Usually starts in the lower back, in the sacroiliac joints, where the spine connects to the pelvis. It can spread up to the neck or damage joints in other parts of the body. Also it can affect places where the tendons and ligaments attach to bones. It can even cause the vertebrae to fuse together. This fusing makes the spine less flexible and can result in a hunched-forward posture. Occasionally other joints such as the shoulders or hips are involved. If ribs are affected, it can be difficult to breathe deeply. Eye and [bowel](https://en.wikipedia.org/wiki/Gastrointestinal_tract) problems may also occur. "Ankylosis" means fused bones or other hard tissue. "Spondylitis" means [inflammation](https://www.webmd.com/arthritis/about-inflammation) in the spinal bones, or vertebrae. Severe cases can leave the spine hunched.

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**Etiology**

Although the cause of ankylosing spondylitis **is unknown**, but probable etiological factors are believed to involve the followings:

\*genetic predisposition**-** percentage of people with AS share the genetic marker HLA-B27**.**

\*Bacteria’s: *Klebsiella pneumonia* and some other *Enterobacterias.*

**Ankylosing Spondylitis Symptoms (Clinical criteria): Skeletal:**

\*Axial arthritis (e.g., sacroillitis and spondylitis)

\*Arthritis of girdle joints (hips and shoulders).

\* Limited range of motion of the lumber spine in both forward and lateral bending (a rigid spine that curves forward).

\*Peripheral arthritis uncommon.

* + \* Low back pain and stiffness that’s worse in the morning or after sitting for a long time and gets better for more than three month with exercise.

\* Tiredness and Swelling in the joints.

\*Limitation of chest expansion relative to normal values correlated for age and sex (Trouble taking deep breaths).

\*Others: enthesitis, osteoporosis, vertebral, fractures, spondylodiscitis, pseudoarthrosis.

{Enthesitis: is painful inflammation where a bone is joined to a tendon (a tough cord of tissue that connects muscles to bones) or a ligament (a band of tissue that connects bones to bones)}.

**Extra-skeletal:**

\*Acute anterior uveitis.

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\* Cardiovascular involvement. \*pulmonary involvement. \*cauda equine syndrome. \* Enteric mucosal lesions. \* Amyloidosis, miscellaneous.

**\***Eye inflammatory: casing redness, eye pain, vision loss, floaters and photophobia.

**\***Fatigue and sometimes nausea:Fatigue is a common symptom of untreated AS. It can make the subject feel tired and lacking in energy.

**Radiological criteria:**

**\***Sacroilitis grade ≥ 2bilaterally.

\*\*Sacroilitis grade 3 to 4 unilaterally.

**Ankylosing spondylitis pathogenesis (Pathophysiology)**

* Genetic predisposing factor (HAL-B27) with CD4+ and CD8 T lymphocytes and macrophages cells.
* Tumour necrosis factor-α (TNT-α) , IL-1 and transforming growth factor-β (TGF-β) are also important in the inflammatory process of AS by leading to fibrosis and ossification at sites of enthesitis.
* Extra-articular involvement can include acute anterior uveitis and aortitis. Acute anterior uveitis occurs in 25-30% of patients and generally is unilateral.
* **Symptoms** include pain, lacrimation, photophobia, and blurred vision.

\*Cardiac involvement including aortic insufficiency and conduction

defects is generally a late finding and is rare.

\*Pulmonary involvement is secondary to inflammation of the costovertebral and costotransverse joints, which limits chest-wall range of motion (ROM). Pulmonary fibrosis is generally an

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asymptomatic incidental radiographic finding.

\*Neurologic deficits are secondary to spinal fracture or cauda equina syndrome resulting from spinal stenosis.

\*Spinal fracture is most common in the cervical spine

**Diagnosis**

Ankylosing spondylitis (AS) can be difficult to diagnose because the

condition develops slowly and there's no definitive test.

-The first thing; look for symptoms (Evaluation of the patient's symptoms).

- Physical examination

**Blood tests:** To check for signs of inflammation. Inflammation in the spine and joints is a main symptom of the condition.

* CRP, ESR increase in the blood concentration.
* CBC,ANA, RA test.
* Urine test look for abnormalities of the kidney.

**Further tests (Radiology)**

Imaging tests may include: An [X-ray](https://www.nhs.uk/conditions/x-ray/)

* A [MRI scan](https://www.nhs.uk/conditions/mri-scan/)
* An [ultrasound scan](https://www.nhs.uk/conditions/ultrasound-scan/)

**Genetic testing**

A genetic blood test may sometimes be carried out to see if the patient carry the HLA-B27 gene, which is found in most people with AS. This can contribute towards a diagnosis of AS, (some people have the gene without ever developing AS).

(HLA-B27 is a specific protein (termed a human leukocyte antigen or HLA) that is found on cell surfaces. The term HLA-B27 is also used to refer to the gene those codes for the HLA-B27 protein. The HLA-B27 test determines the presence or absence of HLA-B27 protein on the surface of a person's white blood cells).

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**Differential diagnosis of** **Ankylosing Spondylitis (AS)**

- Kidney diseases produce back pain.

- Venereal diseases.

- Signs and symptoms of other spondyloarthropathies.

- Diarrhea (Dysentery) or reactive arthritis or Reiter's syndrome.

- Ulcerative colitis, Crohn's disease.

**Treatment**

There’s no cure for AS. But [medication](https://www.webmd.com/drugs/index-drugs.aspx) and [exercise](https://www.webmd.com/fitness-exercise/default.htm) can ease pain and help keep the patient's back strong. Treatment can also help delay or prevent the process of the spine joining up (fusing) and stiffening. In most cases treatment involves a combination of:

* exercise
* [physiotherapy](https://www.nhs.uk/conditions/physiotherapy/)
* Medicine

**Physiotherapy and exercise**

Types of physiotherapy recommended for AS include:

* a group exercise programme
* an individual exercise programme massage
* hydrotherapy

**Non-steroidal anti-inflammatory drugs (NSAIDs)**

Examples of NSAIDs include:

* [ibuprofen](https://www.nhs.uk/medicines/ibuprofen-for-adults/), [naproxen](https://www.nhs.uk/medicines/naproxen/), [diclofenac](https://www.nhs.uk/medicines/diclofenac/).

**Paracetamol**

Paracetamol rarely causes side effects and can be used in women

who are pregnant or breastfeeding. However, paracetamol may not be suitable for people with liver problems or those dependent on alcohol.

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**Codeine**

Is a stronger type of painkiller? Codeine can cause side effects,

Including:

* feeling sick
* being sick
* [constipation](https://www.nhs.uk/conditions/constipation/)
* Drowsiness
* Biological treatments
* Anti-TNF medicine

In rare cases anti-TNF medicine can interfere with the immune system, increasing the risk of developing potentially serious infections.

* Corticosteroids

[Corticosteroids](https://www.nhs.uk/conditions/steroids/) have a powerful anti-inflammatory effect and can be taken as tablets or injections by people with AS.

Corticosteroids can cause a number of side effects, such as:

* infection in response to the injection
* the skin around the injection may change color (depigmentation)
* the surrounding tissue may waste away
* a tendon near the joint may burst (rupture)

**Surgery**

Most people with AS will not need surgery. However, joint replacement surgery may be recommended to improve pain and movement in the

affected joint if the joint has become severely damaged.

For example, if the hip joints are affected, a [hip replacement](https://www.nhs.uk/conditions/hip-replacement/) may be carried out.

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