

# Introduction to SPA



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King Khalid University Hospital



- Introduction
- SpA disease information
- Pathogenesis
- Clinical features



Miss diagnosed

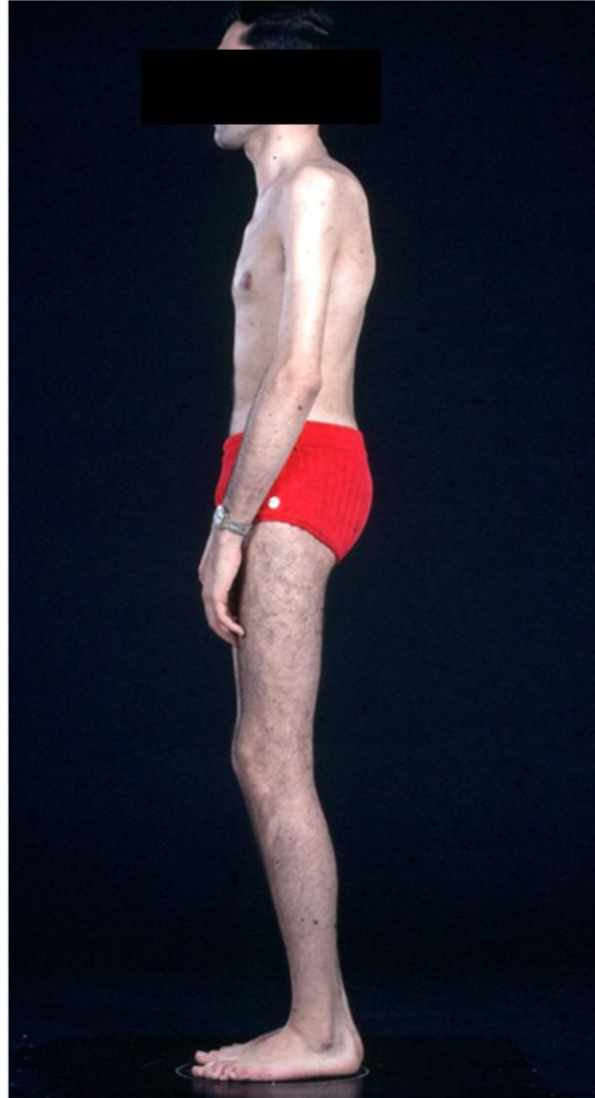
We must (early diagnose)



**As many women as men suffer from ankylosing spondylitis. Early treatment can reduce pain and long-term consequences, such as blindness, heart problems or a hunched back. PHOTO: ASSESSMENT OF SPONDYLOARTHRITIS INTERNATIONAL SOCIETY**

# AS Patient with Disappearance of the Lordosis of the Lumbar Spine

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# Final Stage of AS with Severe Kyphosis of Thoracic and Cervical Spine

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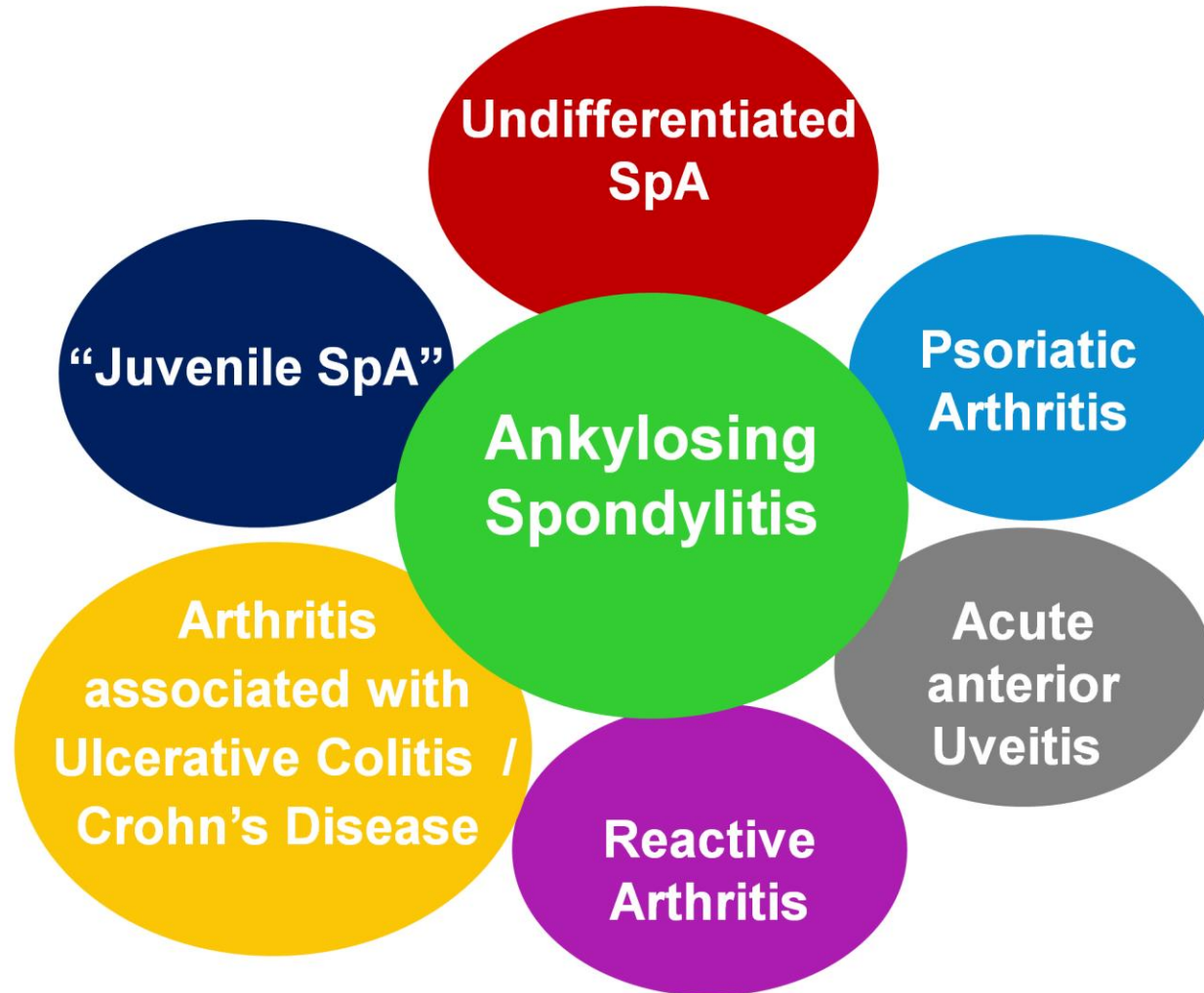
Unable to look ahead while walking  
(,patient cannot see the sun')





# Spondyloarthritides (SpA)

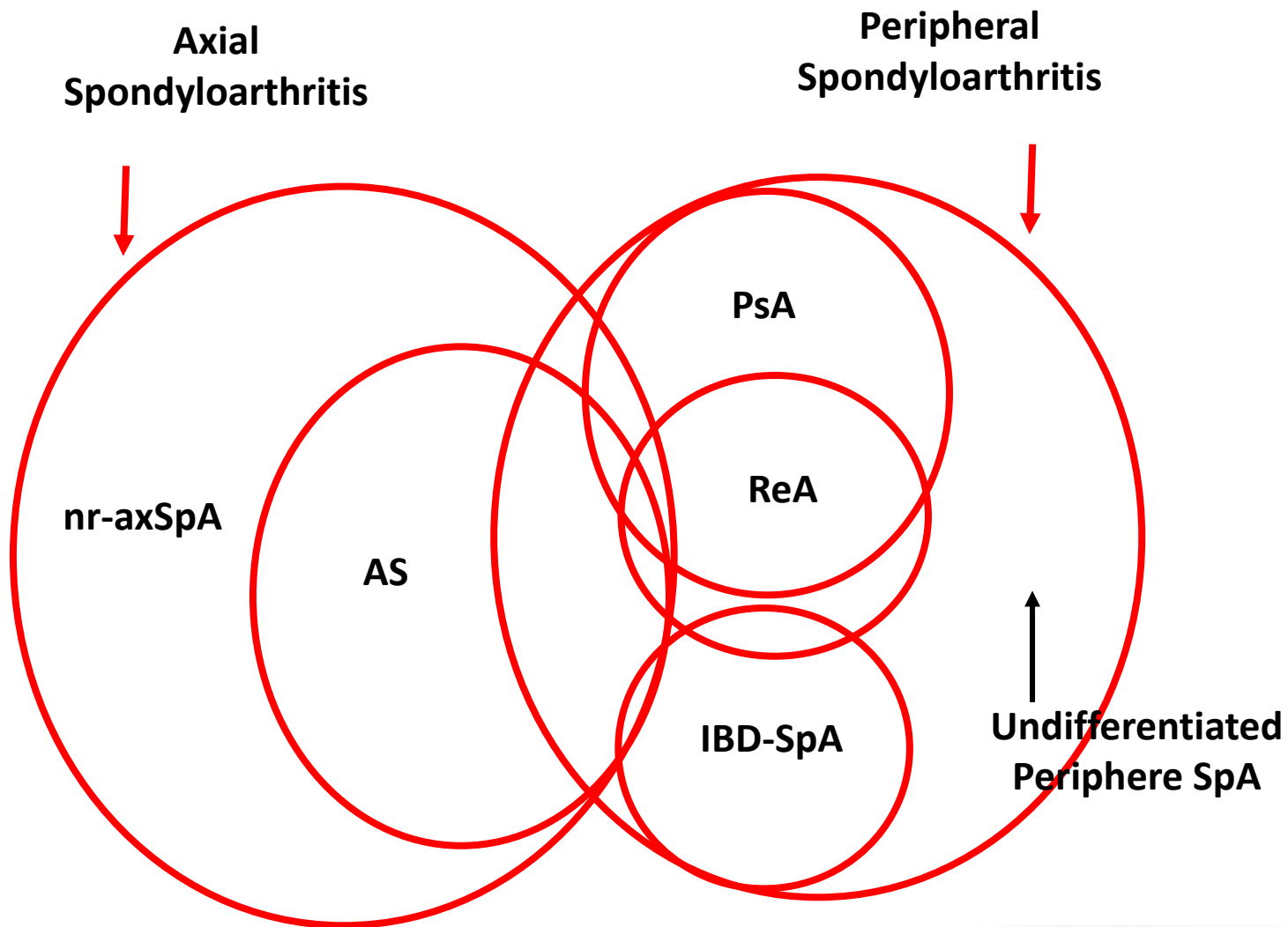
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**Complex  
disease**

## 2 Broad Overlapping Categories



# Reactive Arthritis

- Preceding enteric infection (i.e. diarrhea)
  - Salmonella of various serovars
  - Shigella, especially *Shigella flexneri*, but also *Shigella dysenteriae* and *sonnei*
  - Yersinia including *Yersinia enterocolitica* 0:3 and 0:9 and *Yersinia pseudotuberculosis*
  - Campylobacter especially *Campylobacter jejuni*
  - *Clostridium difficile*
- Preceding genitourinary infection (i.e. urethritis)
  - *Chlamydia trachomatis*

# Back Pain

- ❖ **80% of the population will experience back pain during their lifetime.**
- ❖ **More than 85% cannot attribute it to a specific disease or spinal abnormality.**
- ❖ **Up to one third (1/3) of patients report persistent back pain of at least moderate intensity 1 year after an acute episode.**



## Low Back Pain is caused by a specific disorder:

- Compression fracture
- Symptomatic herniated disc
- Spinal stenosis
- **Ankylosing spondylitis (3%)**
- Cancer
- Spinal infection



Physician role is to recognize non-mechanical cause



# AS is progressive disease

Progressive deformity due to AS  
over a period of 36 years



Little H, Swinson DR, Cruickshank B. *Am J Med.* 1976;60:279-285.  
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# Modified New York Criteria for Ankylosing Spondylitis (1984)

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## **1. Clinical criteria:**

a. Low back pain and stiffness for more than 3 months which improves with exercise, but is not relieved by rest.

b. Limitation of motion of the lumbar spine in both the sagittal and frontal planes.

c. Limitation of chest expansion relative to normal values correlated for age and sex.

## **2. Radiological criterion:**

Sacroiliitis grade  $\geq 2$  bilaterally or grade 3-4 unilaterally

**Definite ankylosing spondylitis if the radiological criterion is associated with at least 1 clinical criterion.**



# Ankylosing Spondylitis - Prevalence

Country	AS Prevalence	HLA-B27 Prevalence
US <sup>1, 2</sup>	0.52%	6%
The Netherlands <sup>3</sup>	0.1%	8%
Germany <sup>4</sup>	0.55%	9%
Norway <sup>5</sup>	1.1 – 1.4%	14%
Haida Indians <sup>6</sup>	6.1%	50%

<sup>1</sup>Helmick CG et al. Arthritis Rheum 2008;58:15-25; <sup>2</sup> Reveille JD et al. Arthritis Rheum 2012;64:1407-11;  
<sup>3</sup>van der Linden S et al. Arthritis Rheum.1984;27:241-9; <sup>4</sup>Braun J et al. Arthritis Rheum 2005;52:4049-50;  
<sup>5</sup>Gran T et al. Ann Rheum Dis 1985;44:359-67; <sup>6</sup>Gofton JP et al. Ann Rheum Dis 1966;25:525-7



# **The Prevalence of HLA-B27 in the Normal Population and in Patients with Axial Spondyloarthritis in Saudi Arabia**

Mohammed A. Omair<sup>1</sup>, Fatima K. Alduraibi<sup>2</sup>, Mohamed K. Bedaiwi<sup>1</sup>, Sultana Abdulaziz<sup>3</sup>, Waleed Husain<sup>4</sup>, Maha Eldessougi<sup>5</sup>, Mahmoud Aljurf<sup>6</sup>, Hind Alhumaidan<sup>7</sup>, Hana Alkhabbaz<sup>8</sup>, Ibrahim Alahmadi<sup>9</sup>, Maha A. Omair<sup>10</sup>, Salman Al Saleh<sup>2</sup> and Moheeb Alawwami<sup>11</sup>

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# ASAS Classification Criteria for Axial Spondyloarthritis (SpA)

In patients with  $\geq 3$  months back pain and age at onset  $< 45$  years

**Sacroiliitis on imaging\***  
**plus**  
 **$\geq 1$  SpA feature#**

OR

**HLA-B27**  
**plus**  
 **$\geq 2$  other SpA features#**

#SpA features

- inflammatory back pain
- arthritis
- enthesitis (heel)
- uveitis
- dactylitis
- psoriasis
- Crohn's/colitis
- good response to NSAIDs
- family history for SpA
- HLA-B27
- elevated CRP

\*Sacroiliitis on imaging

- active (acute) inflammation on MRI highly suggestive of sacroiliitis associated with SpA
- definite radiographic sacroiliitis according to mod NY criteria

n=649 patients with back pain;  
Sensitivity: 82.9%, Specificity: 84.4%  
Imaging alone: Sensitivity: 66.2%, Specificity: 97.3%



# ASAS Classification Criteria for Spondyloarthritis (SpA)

In patients with  $\geq 3$  months back pain and age at onset  $< 45$  years

**Sacroiliitis on imaging plus  $\geq 1$  SpA feature**

OR

**HLA-B27 plus  $\geq 2$  other SpA features**

SpA features

- inflammatory back pain (IBP)
- arthritis
- enthesitis (heel)
- uveitis
- dactylitis
- psoriasis
- Crohn's/colitis
- good response to NSAIDs
- family history for SpA
- HLA-B27
- elevated CRP

In patients with peripheral symptoms ONLY

**Arthritis or enthesitis or dactylitis plus**

$\geq 1$  SpA feature

- uveitis
- psoriasis
- Crohn's/colitis
- preceding infection
- HLA-B27
- sacroiliitis on imaging

OR

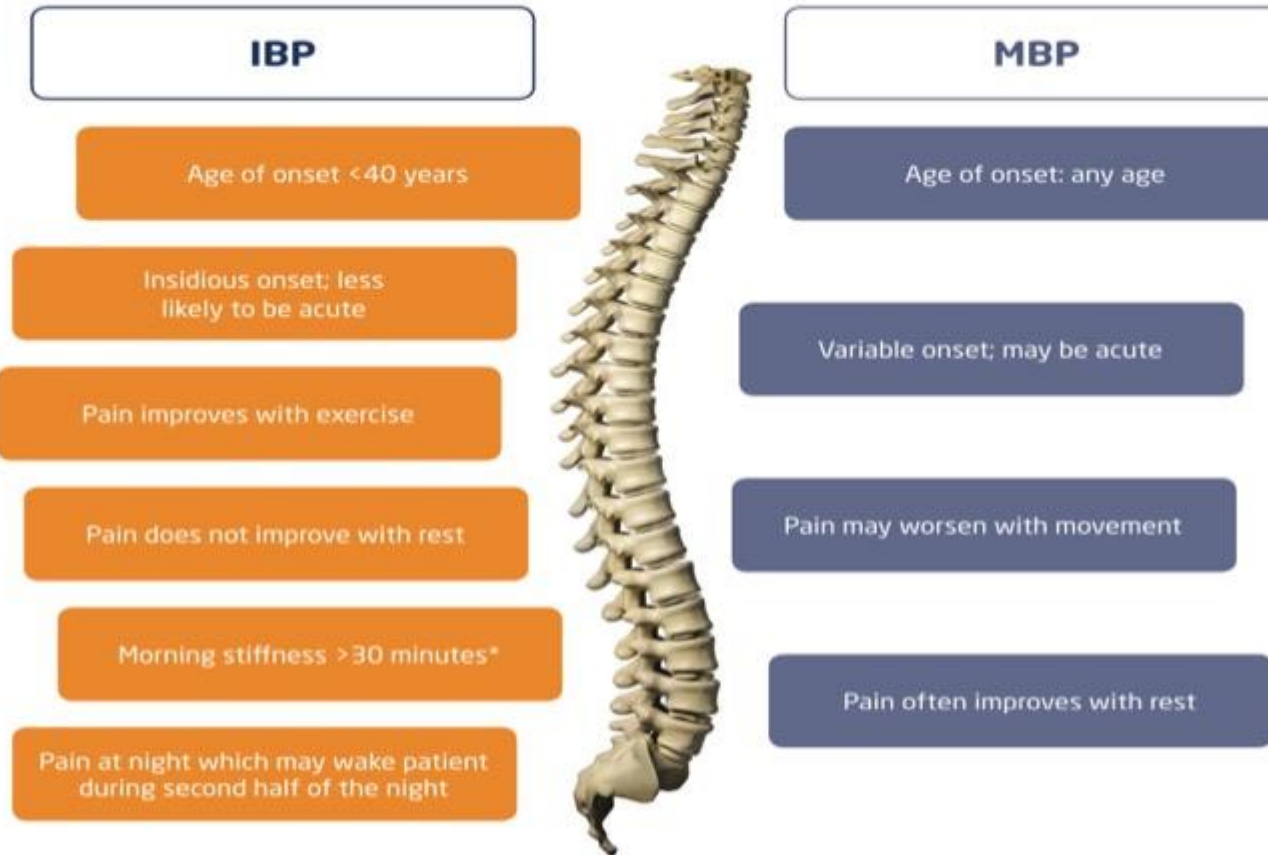
$\geq 2$  other SpA features

- arthritis
- enthesitis
- dactylitis
- IBP ever
- family history for SpA

Sensitivity: 79.5%, Specificity: 83.3%; n=975

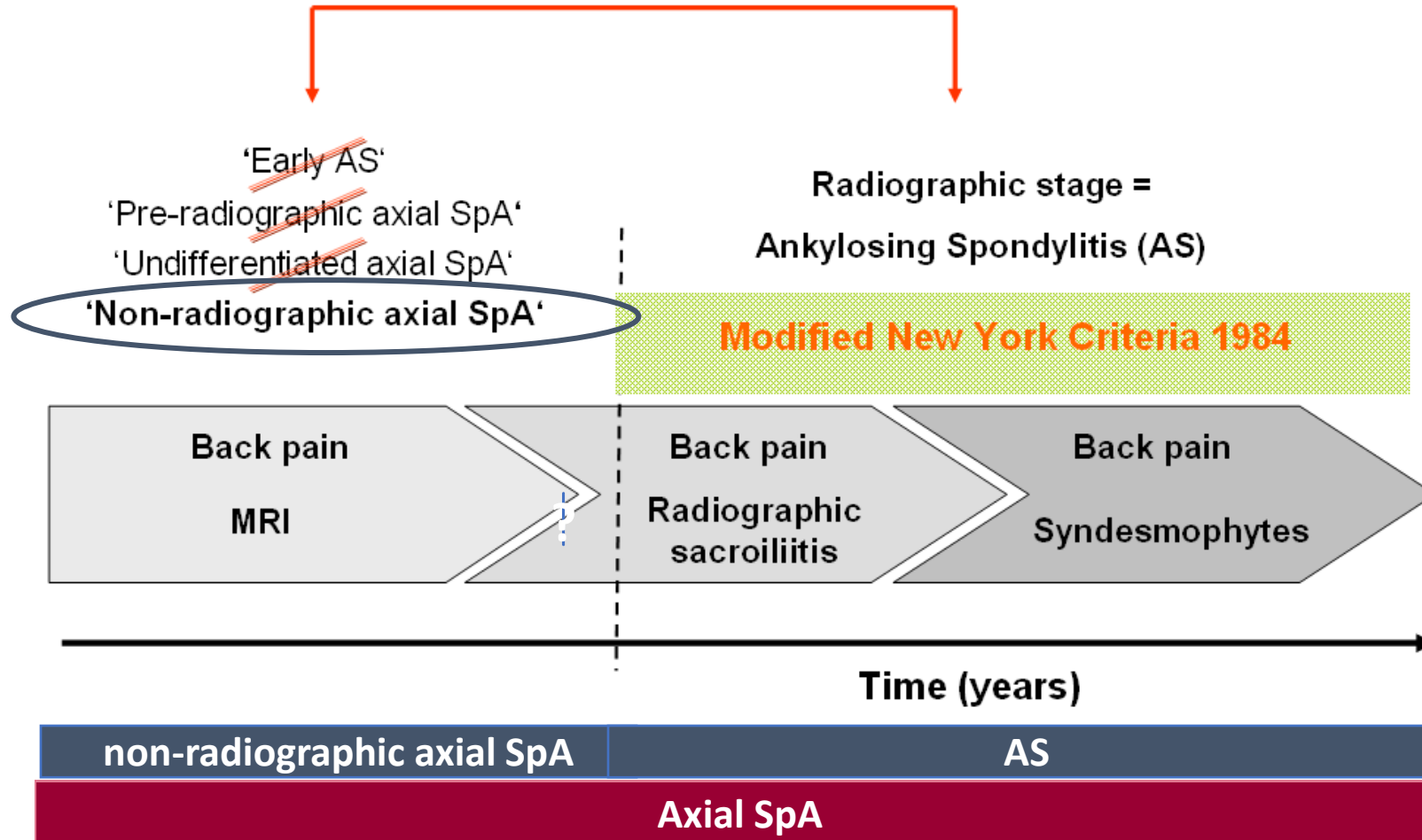
# Back Pain

## Comparison of inflammatory back pain (IBP) and chronic mechanical back pain (MBP)



This Back in Focus resource was developed in collaboration with Claire Harris, Susan Gurden, Dr Jane Martindale, Claire Je ries and organized and funded by AbbVie.  
Date of Preparation: August 2015 Job Code: AXHUR150732

# Axial Spondyloarthritis





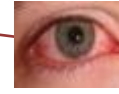


# Extra-articular Manifestations



## Uveitis

25-40% of patients affected



## Uveitis

25% of patients affected

## Psoriasis

16% of patients affected



## Axial Disease

40% of patients affected

## Inflammatory bowel Disease (IBD)

10% of patients affected (UC & CD)



## Nail Psoriasis

80-90% of patients affected at some point

## Dactylitis

21.5% of patients affected



## Synovial joint involvement

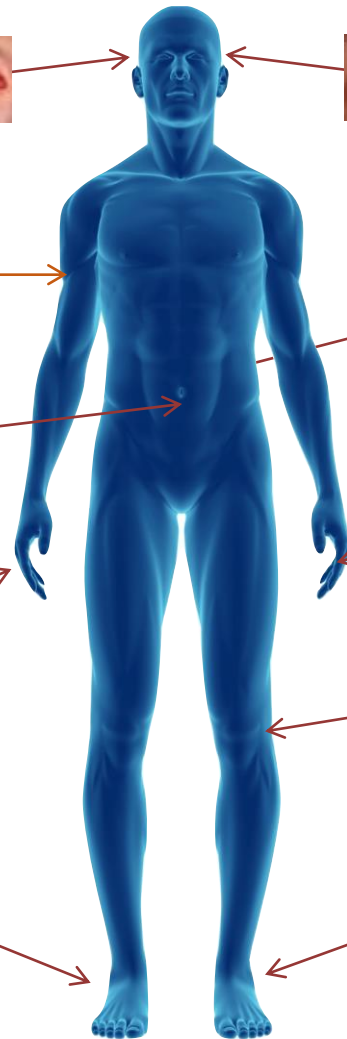
## Enthesitis

25-58% of patients affected



## Enthesitis

20% of patients affected



- $M > F$  OR
- $F > M$

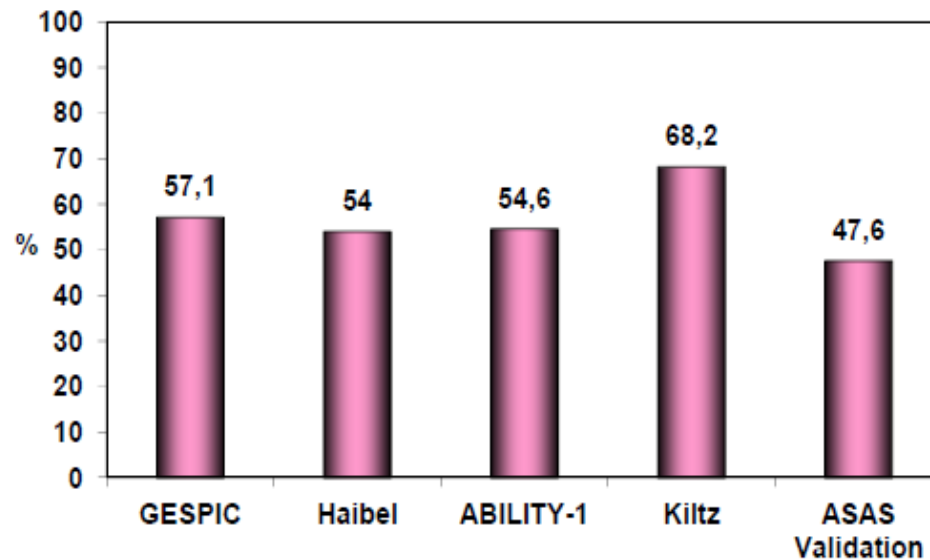




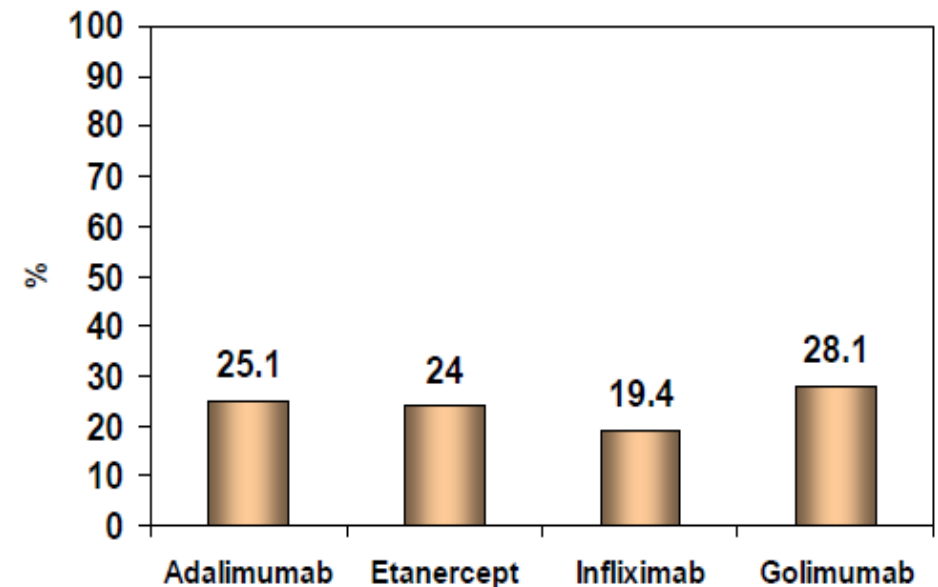
## Axial SpA affects both males and females

- Female gender generally >50% of non-radiographic axial SpA cohort
- Male gender more common in AS study populations

Proportion of females in non-radiographic axial SpA study cohorts



Proportion of females in AS study cohorts



\*GESPIC combines patients with primarily axial and primarily peripheral symptoms

# Pathogenesis of spondyloarthritis

# Pathogenic mechanisms of new bone formation

- Genetic influences
- Microbes effects
- Biomechanical stress

# Pathogenic mechanisms of new bone formation

- The cause of AS is **not completely understood**
- Theory → **genetic mechanisms** → major role in to AS.
- **Genome-wide studies** have **NOT** revealed strong insights on the pathogenesis of new bone formation in AS



# Genetic influences

- The major gene product associated with AS and the other forms of SpA is **human leukocyte antigen (HLA)-B27**.
- (HLA)-B27 gene was recognized in 1973.
- HLA-B27 is present in about 80 to 95 percent of patients with AS in most ethnic groups.
- 6 percent of the general population.
- Fewer than 5 %of HLA-B27 carriers in the general population develop disease

# Genetic influences

- Many genes **other than HLA-B27**.
- First-, second-, and third-degree relatives of patients with AS have markedly increased risks of developing the disease (relative risks of 94, 25, and 4, respectively)

# Arthritogenic peptide hypothesis

- HLA-B27-transgenic rats
- Microinjection of fertilized 1-cell rat eggs with DNA fragments containing both HLA-B\*2705.
- Spontaneously developed several SpA-like disease manifestations, beginning at age 10 weeks



# Arthritogenic peptide hypothesis

- The most common and persistent manifestation:
  - Diarrhea
  - Arthritis of the hind limbs
  - Dystrophy of the nails
  - Hyperkeratosis of the tail





SIJ MRI

# Axial-SpA Features



Neck Stiffness



Eye inflammation

Inflammatory Back Pain (IBP)



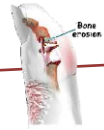
Crohn's/ Colitis

Good response to NSAIDs



Psoriasis

Alternative Buttock Pain



Peripheral Arthritis

X-Ray - Sacroiliitis



Dactylitis

- Age at onset < 45 years
- Family History of SpA
- Elevated CRP levels
- +ve HLA-B27



Enthesitis



# ASAS Inflammatory Back Pain Criteria by Experts (Chronic Back Pain; n=648)

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- age at onset < 40 years
- insidious onset
- improvement with exercise
- no improvement with rest
- pain at night (with improvement upon getting up)

Sensitivity: 79.6%; Specificity: 72.4%

**Inflammatory back pain present if at least 4 out of 5 parameters are fulfilled.**

# Acute Arthritis of the Right Knee in a Patient with Peripheral Spondyloarthritis

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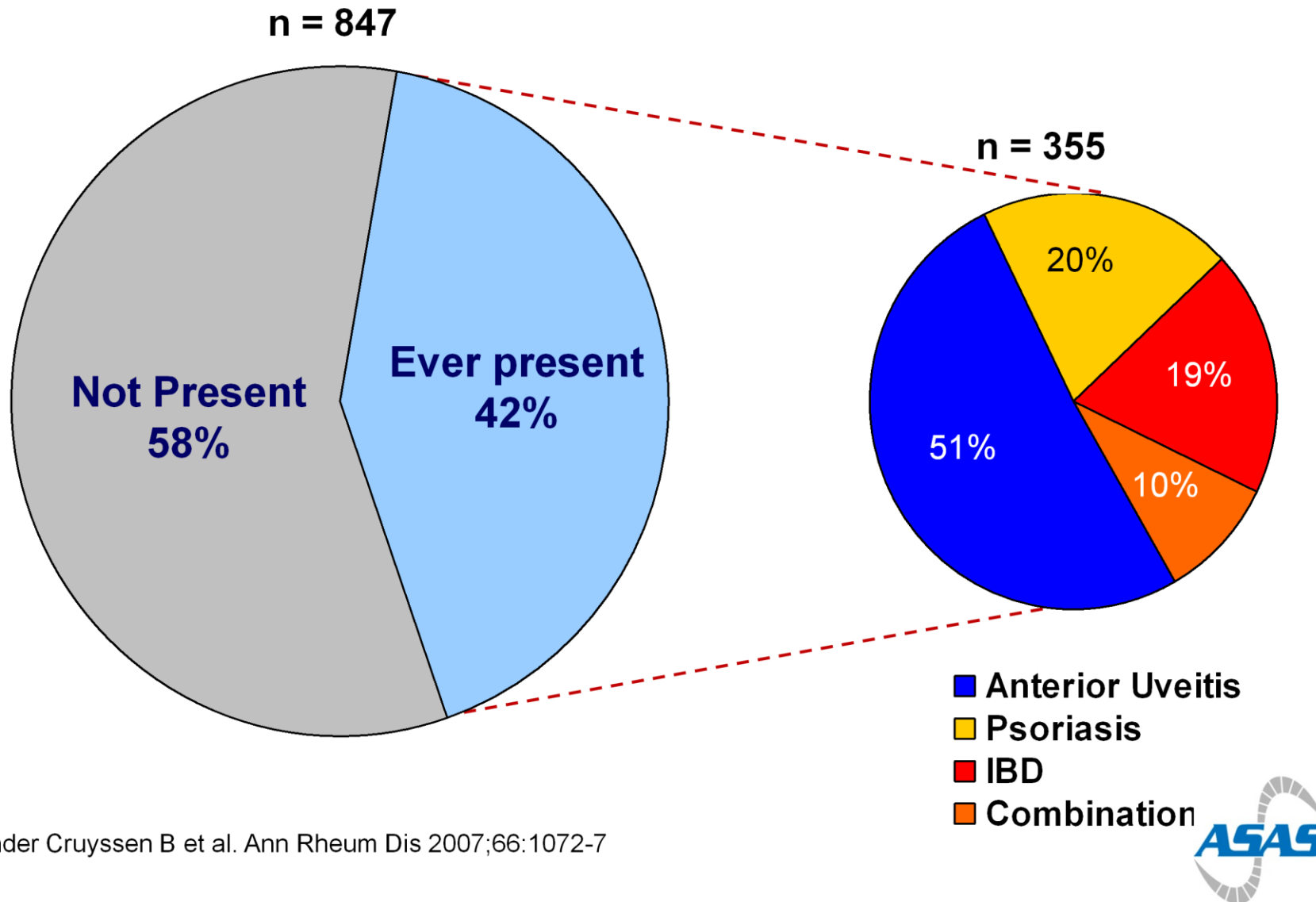
# Peripheral arthritis

- Predominantly involves the lower extremities.
- Arthritis is frequently asymmetrical and often affects only one to three joints.
- The severity ranges from mild to disabling .
- The presence of asymmetrical oligoarthritis is very suggestive of SpA, but its absence would not be helpful in excluding this possibility.

# Arthritis associated with inflammatory bowel disease

- Peripheral arthritis
  - Type I arthropathy:
    - Acute, Pauciarticular
    - The knee is the joint most commonly affected
    - early in the course of the bowel disease
    - self-limiting, Nonerosive
    - may occur prior to the onset of IBD → flares of the bowel disease.
  - Type II arthropathy
    - polyarticular disease
    - (MCP) joints being particularly involved
    - Episodes of exacerbations and remissions may continue for years
    - Articular involvement rarely precedes the diagnosis of IBD
    - Joint symptoms may occur prior to the onset of IBD symptoms, and this form of arthritis is often associated with flares of the bowel disease.

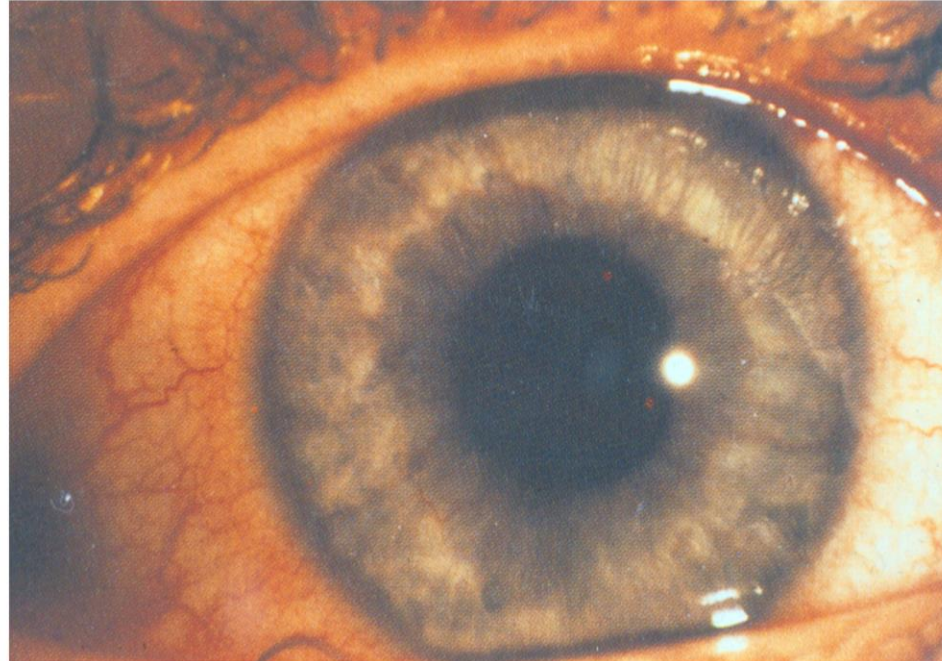
# Extra-Articular Manifestations in Ankylosing Spondylitis



# Eye: Acute Anterior Uveitis in Spondyloarthritis

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- Acute onset
- Unilateral
- Anterior
- Spontaneous remission
- Recurrent
- Related to HLA B27



# Enthesitis (Insertion of Achilles Tendon at Calcaneus) Right Heel

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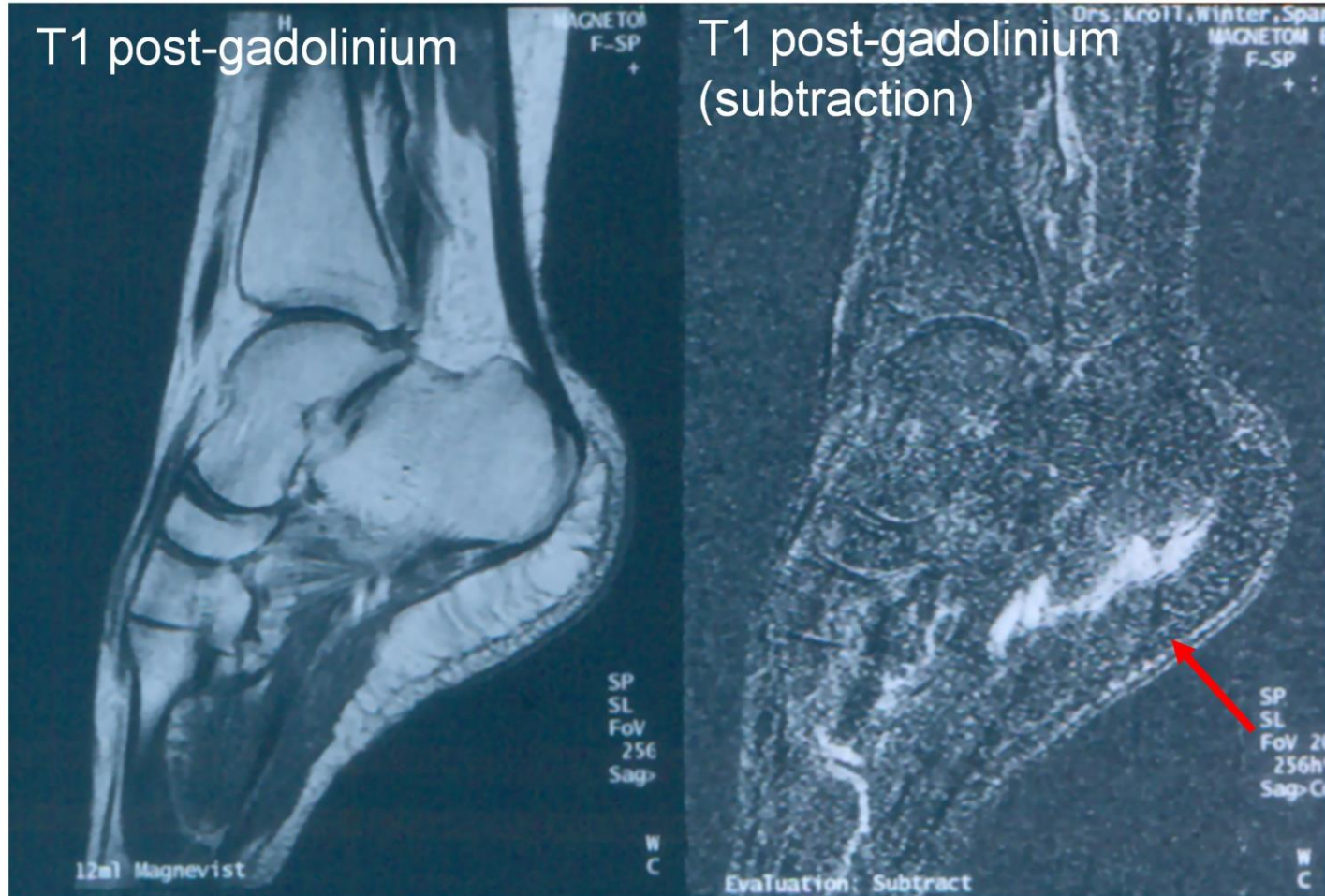


# Enthesitis

- Relatively specific to SpA
- The most common → at the insertion of the Achilles tendon
- Plantar fascia ligament into the calcaneus
- severe pain and tenderness



# Enthesitis of the Plantar Fascia by MRI





# Enthesitis as a Manifestation of Spondyloarthritis by Scintigraphy

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Acute Inflammation of both heels and of the MTP-joints I+II of the left foot as shown by scintigraphy

Right heel: Achilles tendon enthesitis

Left heel: Fascia plantaris enthesitis

# Dactylitis



\* Psoriasis plaque lesions

# Dactylitis

- known sausage toe or sausage finger
  - Psoriatic arthritis
  - Occasionally reactive arthritis
- Unlike synovitis, in which swelling is confined to the joints, with dactylitis, the entire digit is swollen.
- Dactylitis is not specific for SpA and may also be seen
  - tuberculosis
  - syphilis
  - sarcoidosis
  - sickle cell disease
  - tophaceous gout

# Skin Manifestations in Spondyloarthritis

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- Psoriasis
- Erythema nodosum
- Pyoderma gangrenosum
- Keratoderma blenorrhagicum

# Psoriasis

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Typical psoriasis with scaly patches and plaques



## Mild Nail Changes in Patient with Psoriasis

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# Moderate to Severe Nail Changes in Patient with Psoriasis

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# Psoriasis

- Psoriasis is associated with all forms of SpA.
- Psoriasis is present in up to approximately 10 percent of patients with AS.



# Erythema Nodosum

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# Pyoderma Gangrenosum

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## Palatal erosion in reactive arthritis

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A sharply demarcated erosion of the hard palate is shown. This is among the more common of the oral manifestations of reactive arthritis.

*Copyright © 2017 American College of Rheumatology. Used with permission.*

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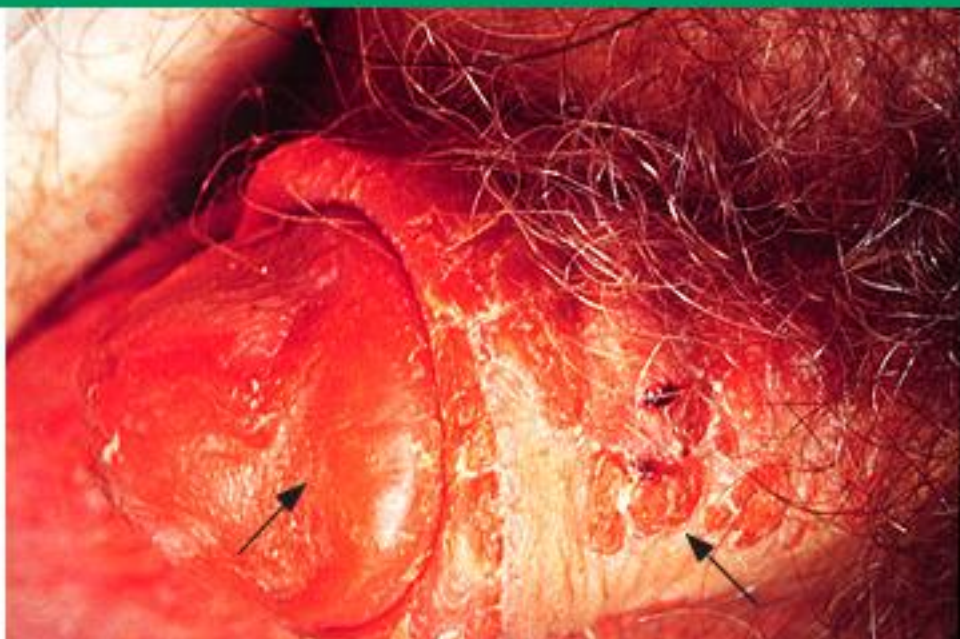
# Keratoderma Blenorrhagicum

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## Circinate balanitis

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Circinate balanitis characterized by shallow ulcers on the glans penis and the shaft of the penis (arrows). The lesions are generally asymptomatic.

*Courtesy of Professor Victor Newcomer, UCLA.*

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# SpA LAB

- **HLA-B27**
  - 90 percent of patients with ankylosing spondylitis
  - 50 to 70 percent of patients with other forms of SpA
  - a positive HLA-B27 by itself is not diagnostic of SpA
- **Acute phase response**
  - Erythrocyte sedimentation rate (ESR) and levels of C-reactive protein (CRP)
  - increased in between 35 and 50 percent of patients with axial SpA
  - Elevated levels of CRP are also a predictor of **radiographic progression** and for a good response to tumor necrosis factor (TNF)-blocker therapy



# Grading of Radiographic Sacroiliitis (1966)

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- **Grade 0**      **normal**
- **Grade 1**      **suspicious changes**
- **Grade 2**      **minimal abnormality – small localized areas with erosion or sclerosis, without alteration in the joint width**
- **Grade 3**      **unequivocal abnormality – moderate or advanced sacroiliitis with one or more of: erosions, evidence of sclerosis, widening, narrowing, or partial ankylosis**
- **Grade 4**      **severe abnormality – total ankylosis**

## Sacroiliitis Grade 0 (Normal)

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## Sacroiliitis Grade 2 Right, Grade 1 Left

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## Sacroiliitis Grade 3 Bilaterally

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# Sacroiliitis Grade 4 Bilaterally

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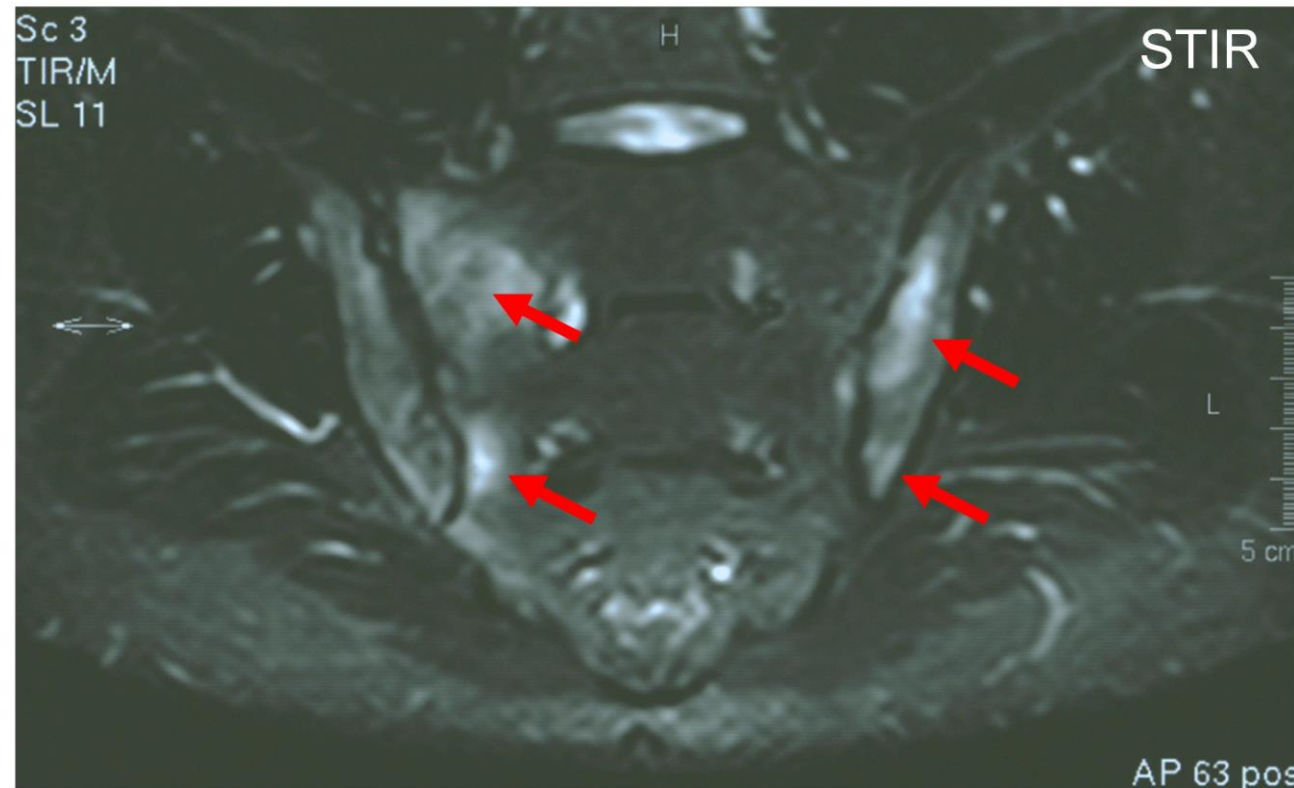
# Early (limited) Sacroiliits

(Bone Marrow Edema)



# Definition of Positive MRI-SI Joint

- subchondral bone marrow edema
- acute (bilateral) sacroiliitis



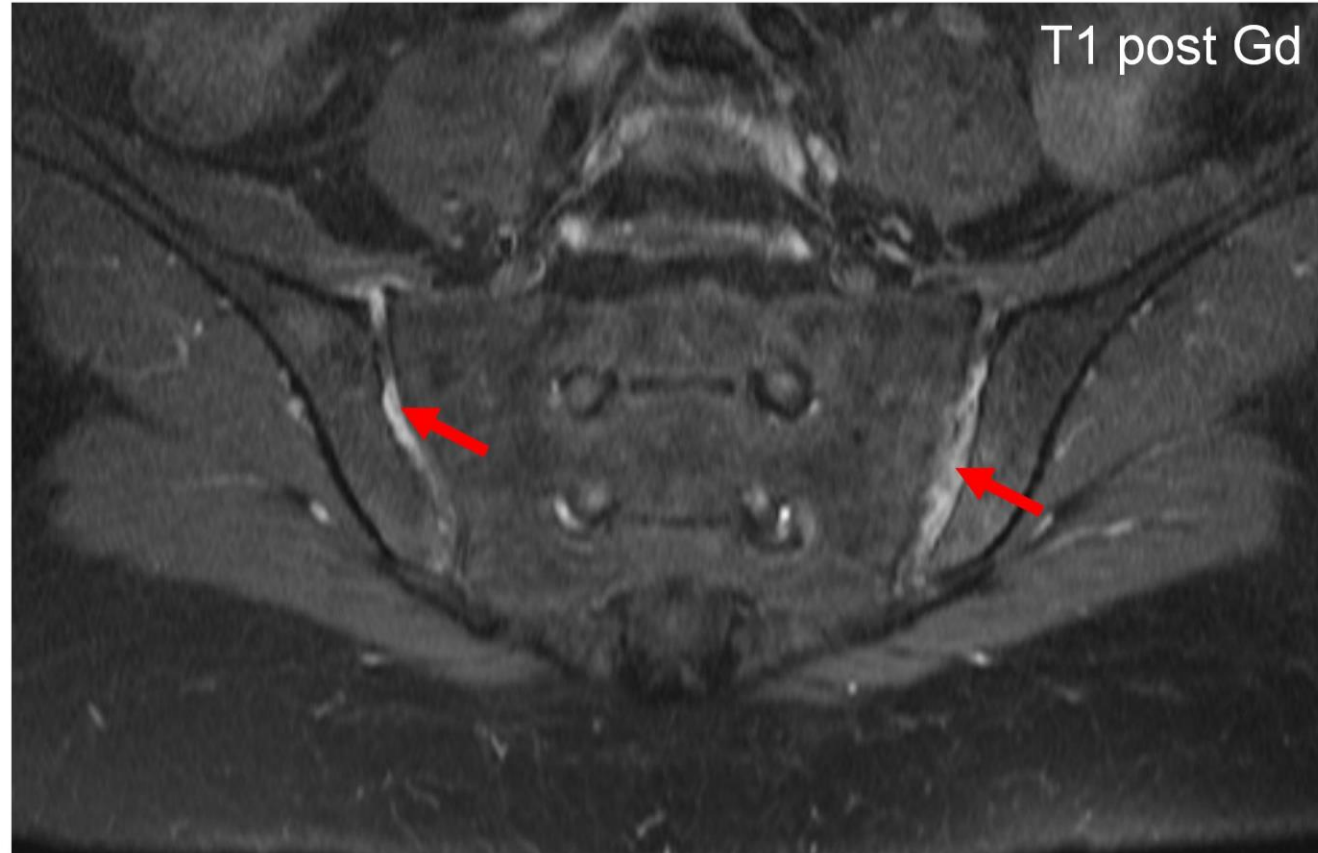
# Bone Marrow Edema (BME) / Osteitis

Bone marrow edema may be associated with structural changes such as erosions.



# Synovitis of Sacroiliac Joint

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# Aims and Outcomes of Therapy in Ankylosing Spondylitis

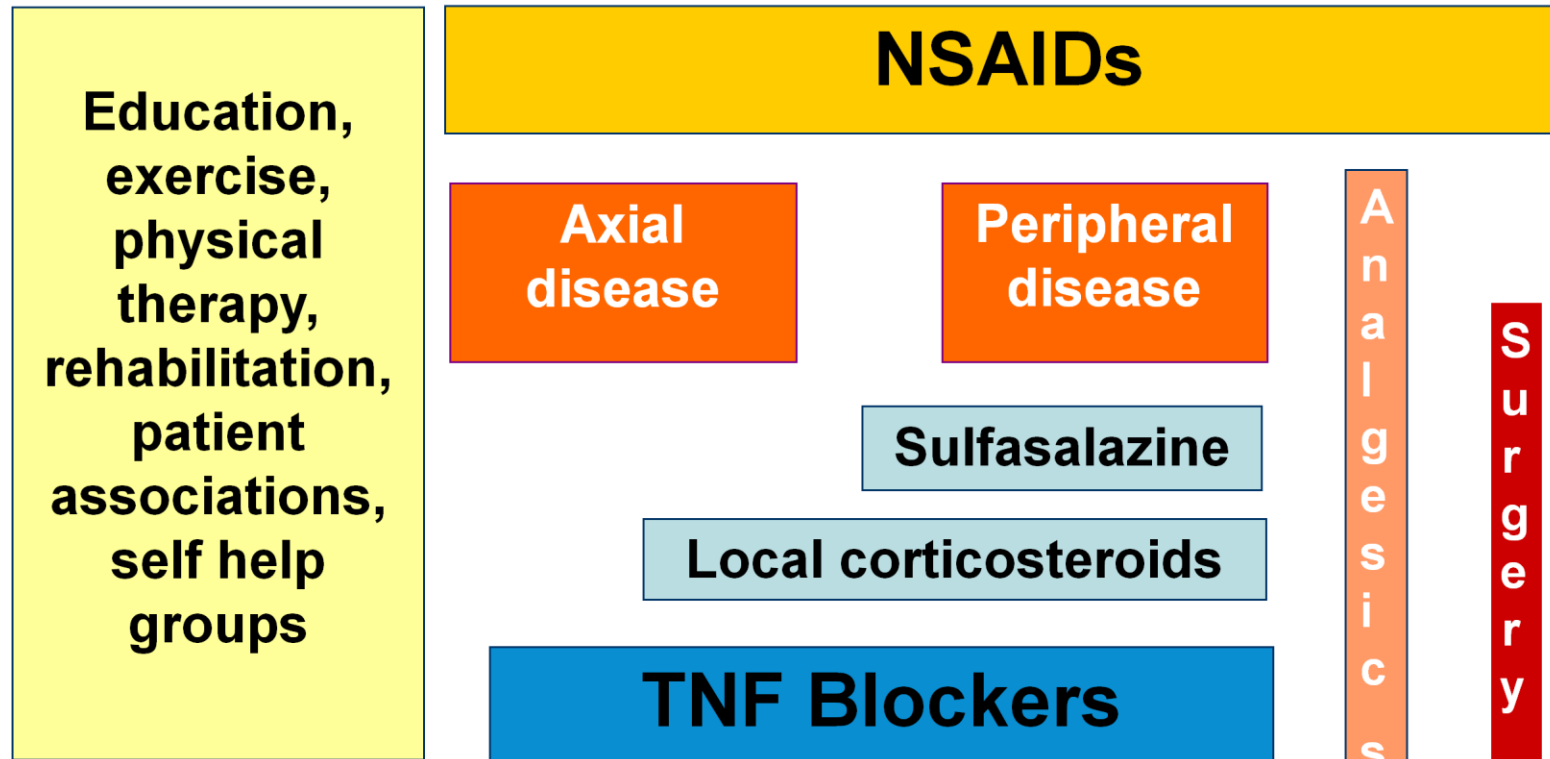
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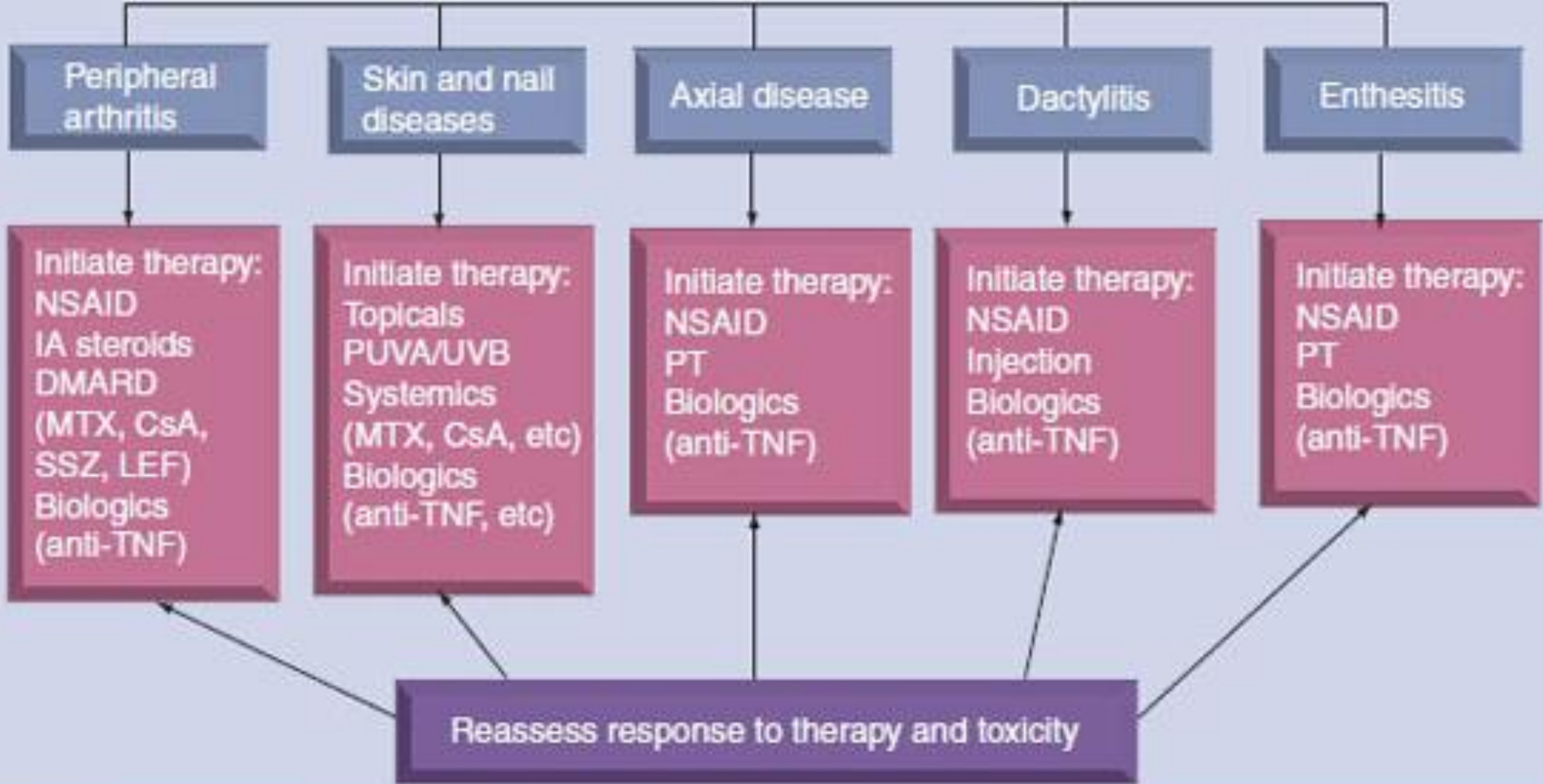
- **Signs and symptoms**
  - disease activity
  - pain
  - morning stiffness
  - fatigue
- **Function**
  - spinal mobility
  - activity and participation
  - productivity
- **Structural damage**
  - osteoproliferative and osteodestructive changes in the axial skeleton and peripheral joints and entheses
- **Quality of life**
- **Socioeconomic factors**
  - paid work, sick leave, presenteeism and absenteeism, retirement





# ASAS/EULAR Recommendations for the Management of Ankylosing Spondylitis





Thanks