

# Introduction to Rheumatology

Prof Ally

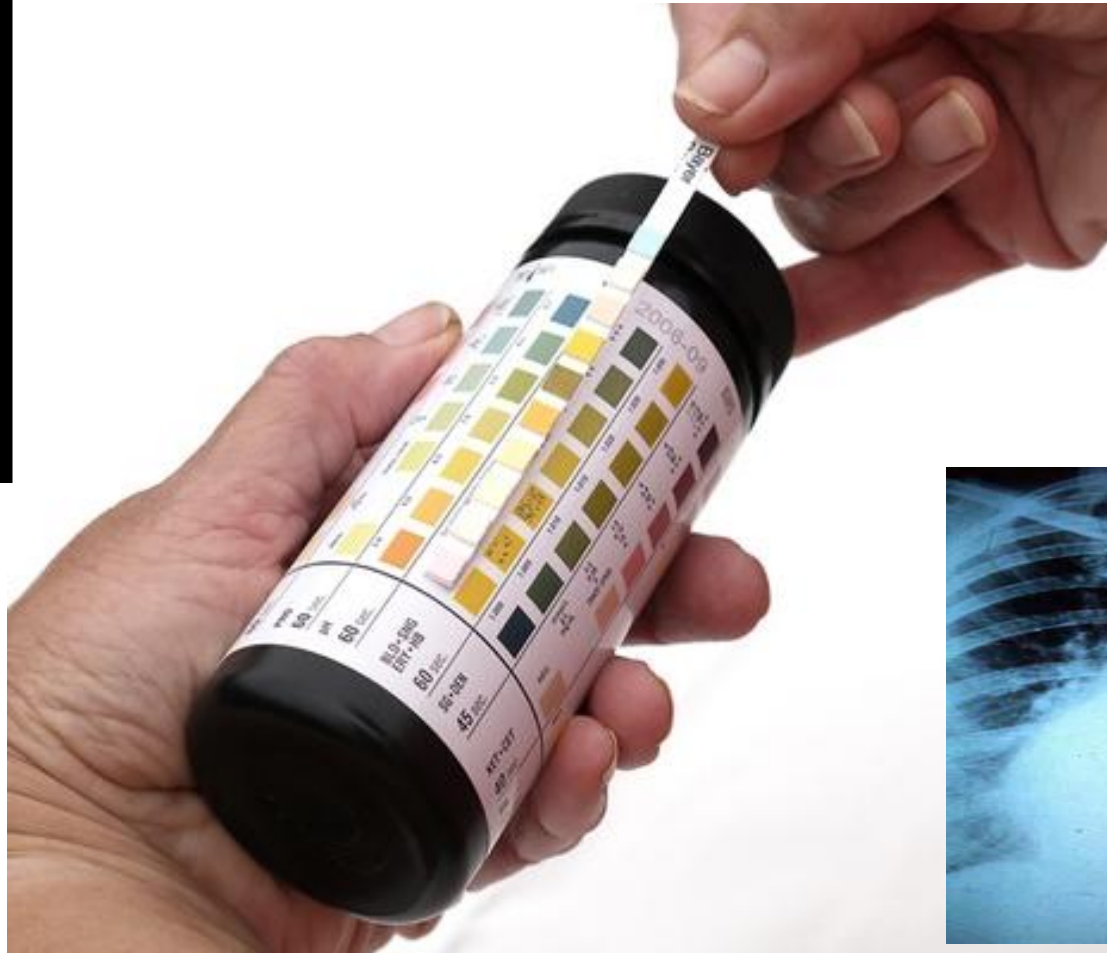
2012

# Spectrum of disorders

- Localised soft tissue

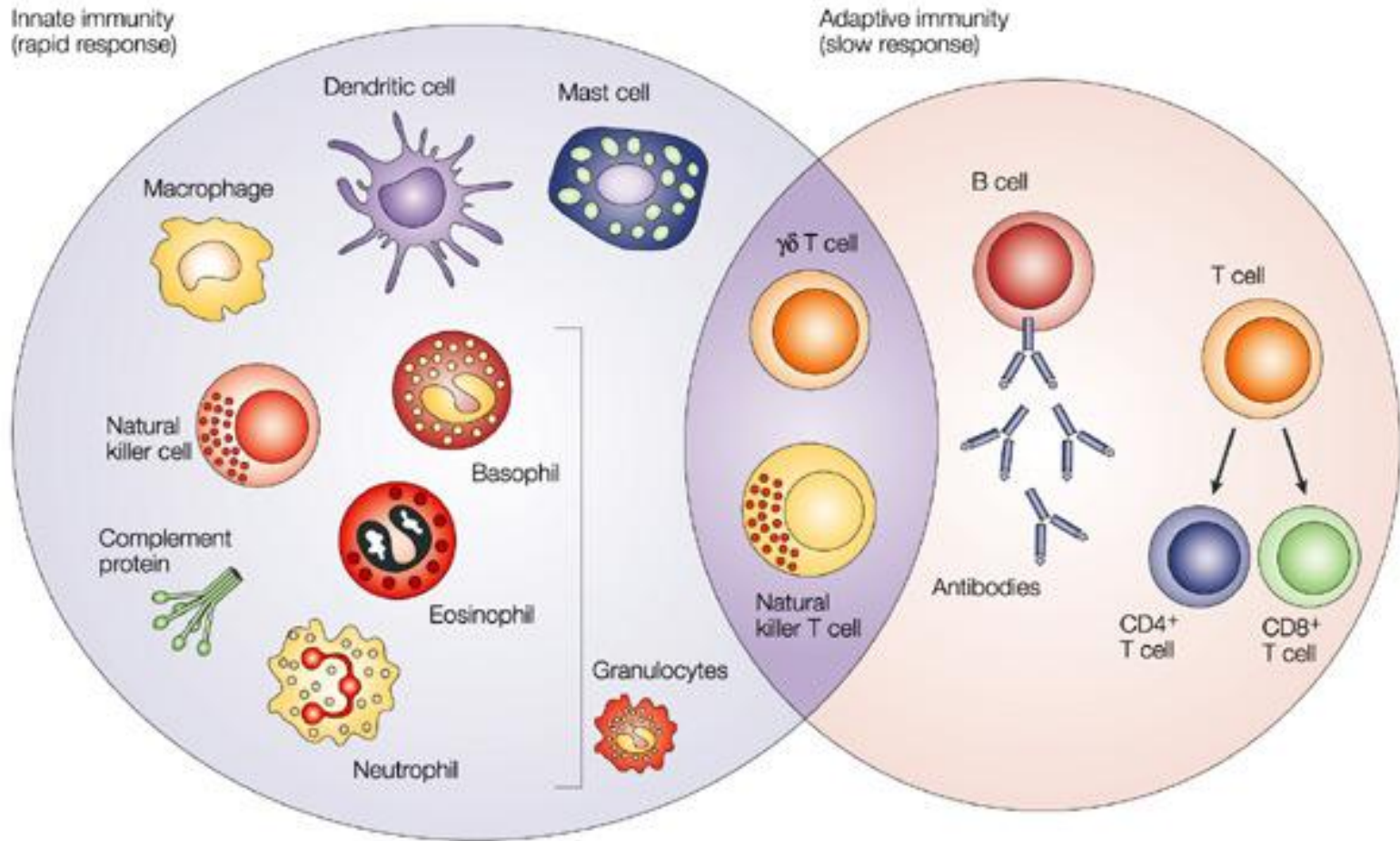


# Multisystem disease

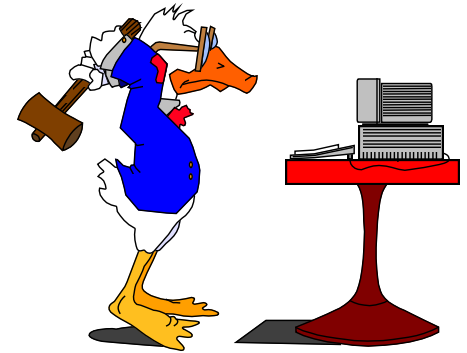




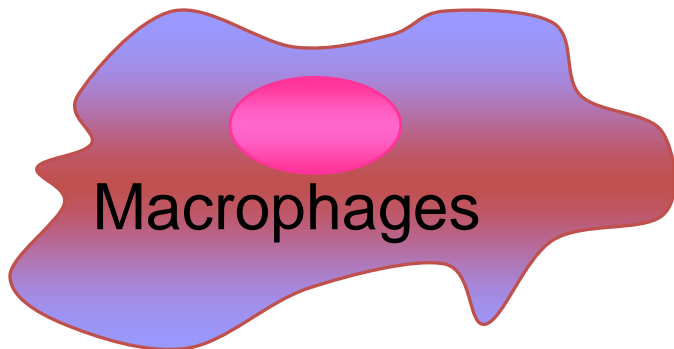
# Immune response



# Autoimmune pathogenesis



- Lack of tolerance (genetic, hormonal factors)
- Triggered by
  - Infection → Changing antigenicity of infected tissue (now a target)
    - Molecular **mimicry** (eg. Rheumatic fever)
  - -malignancy
  - Other environmental factors (smoking)
  - Unknown



Macrophages

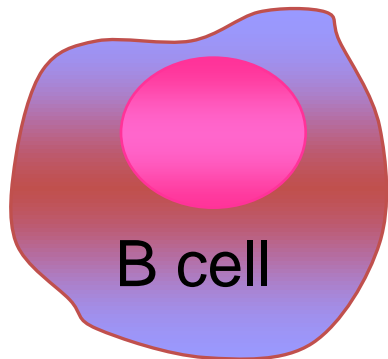
Increases proliferation and cytokine production



Endothelial Cells

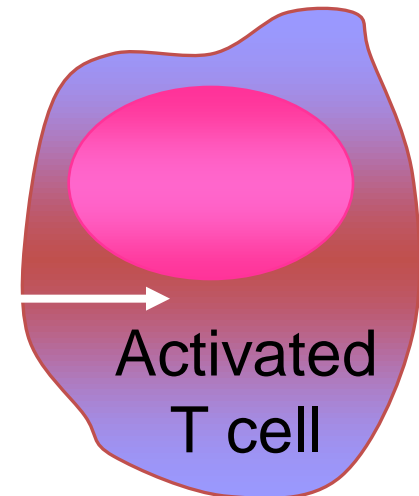
Expression of ICAM-1, VCAM-1, ELAM-1, IL-8

**TNF**



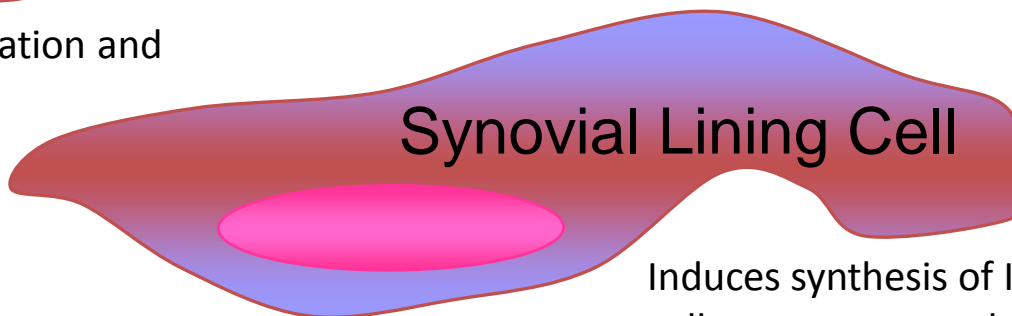
B cell

Increases proliferation and differentiation



Activated T cell

Enhances proliferation, increases IL-2 receptor

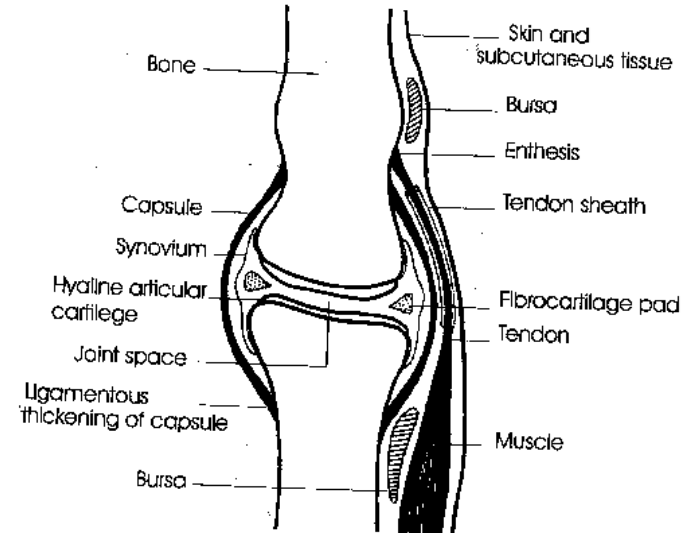


Synovial Lining Cell

Induces synthesis of IL-1, GM-CSF, Stromelysin, collagenase prostaglandins

# pathology

- Musculoskeletal
- Connective tissue
- Skin
- Vessels
- organs





# Symptoms

- Locking – implies mechanical factors eg trigger finger
- Clicking – benign
- Cracking/crepitus- cartilage irregularity
- Constitutional (fever,sweats,weight loss)

# pain

- Acute- gout
- subacute - pseudogout
- Chronic – osteoarthritis
- Intermittent
- Referred – shoulder pain, knee pain
- Neuralgic- dermatomal
- Diffuse pain – tender points fibromyalgia

# Systemetic inquiry

- Mucocutaneous
- Oral genital ulceration
- Recent infections urethritis, colitis
- Bloody diarrhea
- Eye
- Psoriasis
- malignancy

## inflammatory

- Morning stiffness
- Mid day fatigue
- Soft tissue swelling/  
effusion



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## degenerative

- Stiffness less than 15 min
- Pain increases with activity



# Inflammatory Arthritis

Monoarthritis

Polyarthritis

Gout

\*Symmetrical

Asymmetrical with spinal involvement

RA

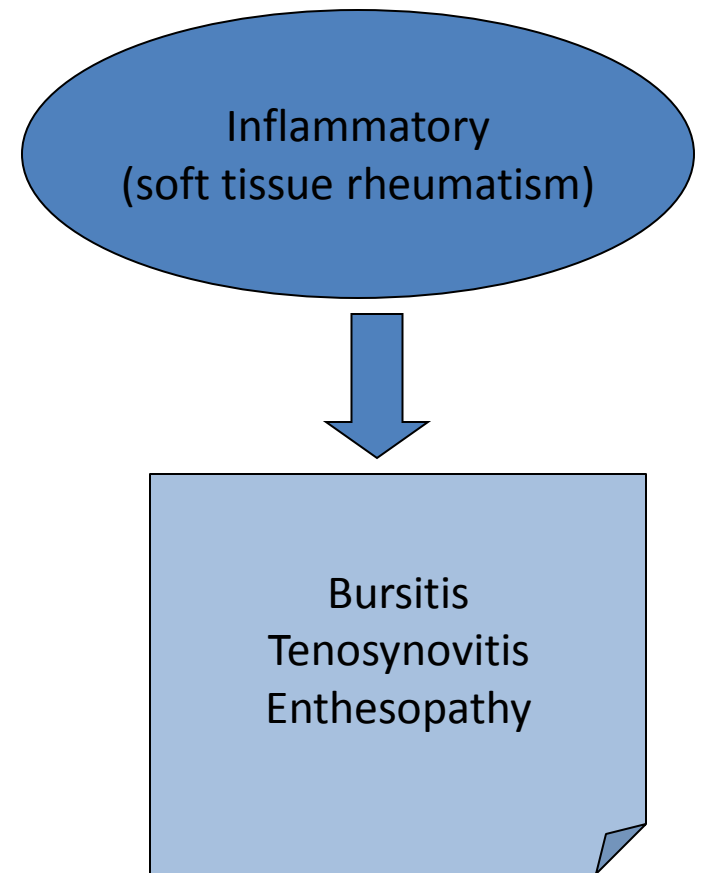
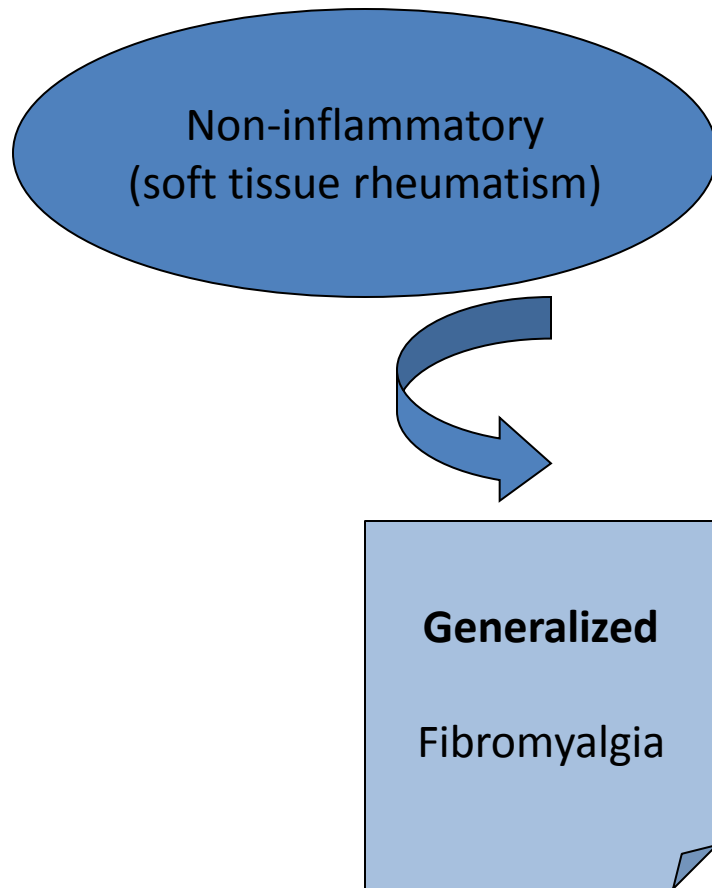
SERO -ve Spondyloarthropathy



# SOFT TISSUE

- Involvement of structures outside the synovial lining e.g. bursae, muscles, tendons, joint capsule etc.
- Pain often localized along the side of the joint or along anatomic structures, or in relation to muscles or soft tissue

# Soft tissues Muscles/tendons



# Structure-lesion relationship

- Structure

- Tendon and tendon sheaths

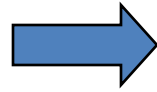
- Tenoperiosteal junction

- Bursae

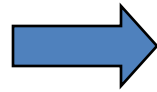
- Fasciae

- Ligament

- Lesions

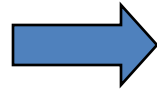


- Tendinitis, rupture, peritendinitis, degeneration, tenosynovitis



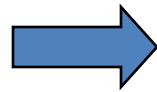
- Enthesopathies, apophysitis

- Bursitis- acute and chronic



- Fasciitis, Dupuytren's contracture

- Sprain and tear





# Causes of soft tissue rheumatism

- Trauma
  - Acute
  - Chronic
- Due to underlying arthritis
- Periarticular calcific deposits
- Microcrystal deposits
- Anxiety
- Depression

# Classification of soft tissue rheumatism

- Localized

- bursitis

- Ganglion

- Muscle-tendon  
junction syndromes

- Enthesitis

- Tenosynovitis

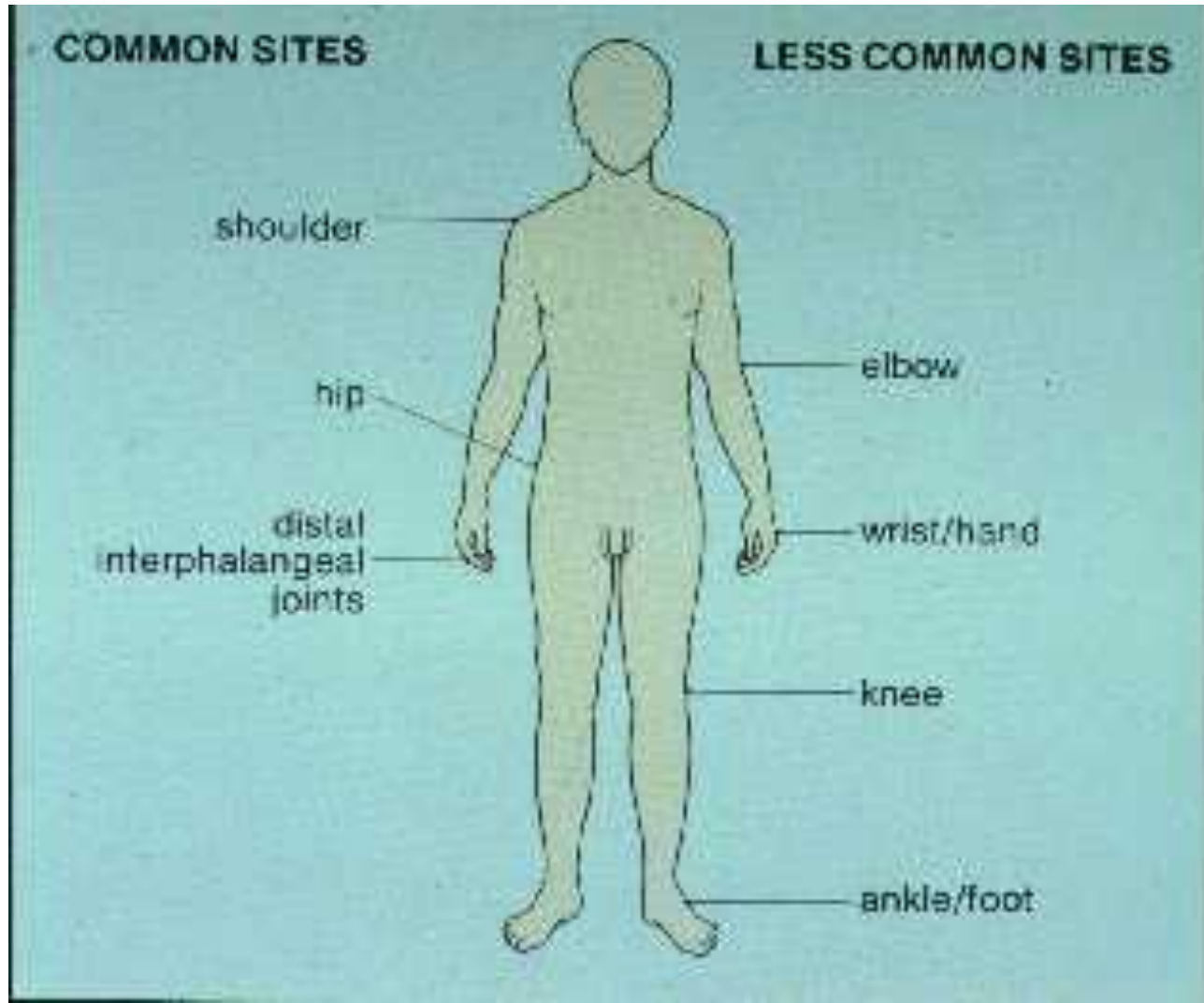
- Calcific periarthrititis

- Faciitis

- Referred pain  
Syndrome

- Nerve entrapment  
syndromes

# Common sites of involvement of calcific periarthritis



# Bursae

- Flattened sacs of synovial membrane containing a thin film of synovial fluid acting as a lubricant
- Occurs in areas where skin, tendons, muscles or ligaments move in relation to other structures
- Inflammation results in fluid collection and symptoms

# *Bursitis*

- Localized pain and swelling
- Associated conditions
  - RA
  - Gout
  - Infections
  - Repetitive trauma

# Tendons

- Composed of collagen
- Attach muscle onto bone
- May have a tendon sheath – also contains thin film of synovial fluid

# Tendinous Lesions

- Tendinitis - Inflammatory reaction
- Causes
  - Overuse / strain
  - Gout
  - RA
  - TB
  - WR
  - Steroids
  - Immobilisation
  - Incorrect training

# Tendinous Lesions

- Acute Lesions
  - Initial repair takes 3 weeks
  - After 6 weeks tensile strength reasonable
  - Scar may remain painful for long periods especially if not enough time allowed for healing



# *Tenosynovitis*

- Inflammation of synovial tendon sheath
- Causes
  - Part of a systemic disorder, e.g. RA
  - Infections
    - Gonococcus infections
    - TB
    - Leprosy

# Tenosynovitis

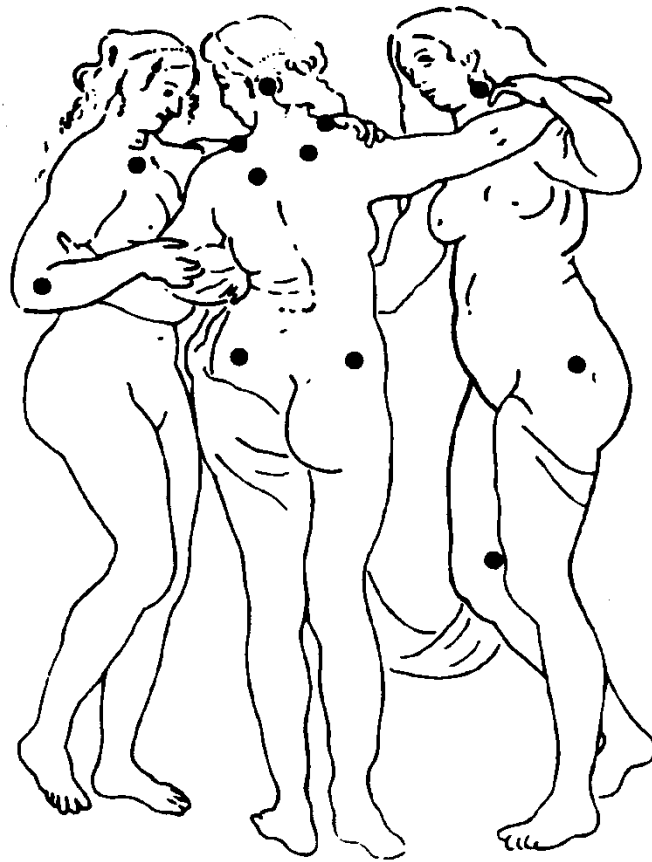
- Tendon sheath inflammation
- Usually around ankle / wrist
- During movement get pain
- Fine crepitus is palpable and swelling is present

# *Enthesitis*

- Inflammation at site of insertion of a tendon into the bone
- Very characteristic of seronegative spondyloarthropathy e.g. Reiter's syndrome
- Other causes
  - Gout
  - Sports injuries

# Generalized Soft tissue rheumatism

# FIBROMYALGIA



Rubens (The Three Graces)

# Definition

- Chronic musculoskeletal syndrome
- Characterized
  - diffuse pain
  - tender points
- No synovitis or myositis

# PHYSICAL EXAMINATION

- Unrevealing
- Laboratory and Radiological negative

# EPIDEMIOLOGY

- Eighty to ninety percent of patients are women
- Peak age is 30–50 years



# Clinical features

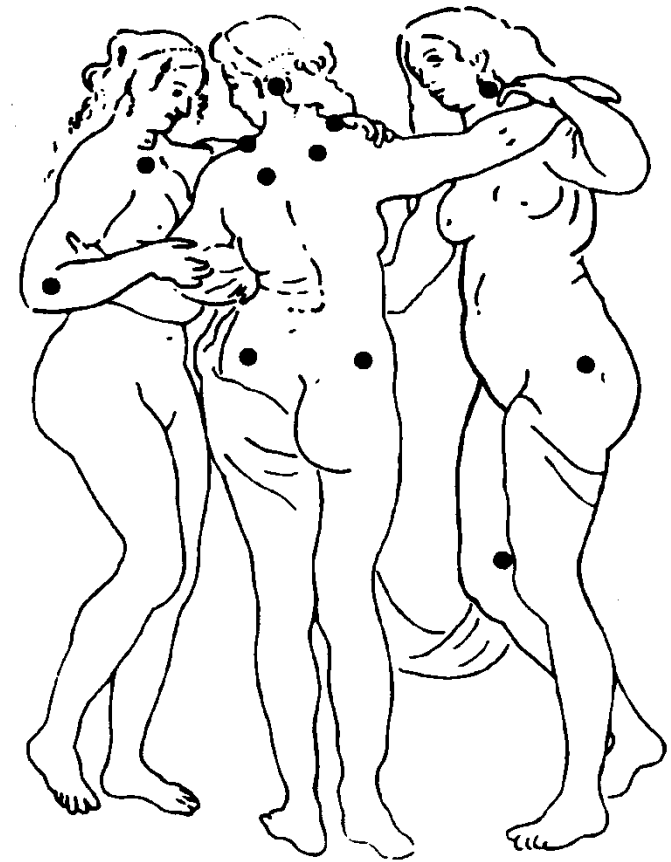
- Generalized chronic musculoskeletal pain
- Diffuse tenderness at discrete anatomic locations termed tender points

# Other features

- Diagnostic utility but not essential for classification of fibromyalgia
  - Fatigue
  - Sleep disturbances
  - Headaches
  - Irritable bowel syndrome
  - Paresthesias
  - Raynaud's-like symptoms
  - Depression and anxiety

# Diagnosis

- ACR criteria
  - Widespread pain
  - >11/18 tender points are painful



Rubens (The Three Graces)

# Differential diagnosis

- Important never to miss more common causes of general aches and pains
- Dangerous to make the diagnosis of primary fibromyalgia without thorough examination

# Differential diagnosis

- SLE or Sjögren's syndrome/CTD
  - Raynaud's phenomenon and dry eyes and dry mouth 20–35% of patients with fibromyalgia
  - Positive antinuclear antibody tests in 10–20%

# Differential diagnosis

- Polymyalgia rheumatica
  - tender points have not been consistently reported
  - elevated ESR
  - respond extremely well to modest doses of corticosteroids

# Differential diagnosis

- Inflammatory myositis and metabolic myopathies
  - muscle weakness
  - fatigue and may be associated
  - diffuse pain
  - histopathologic findings on muscle biopsy

# Differential diagnosis

- Hypothyroidism

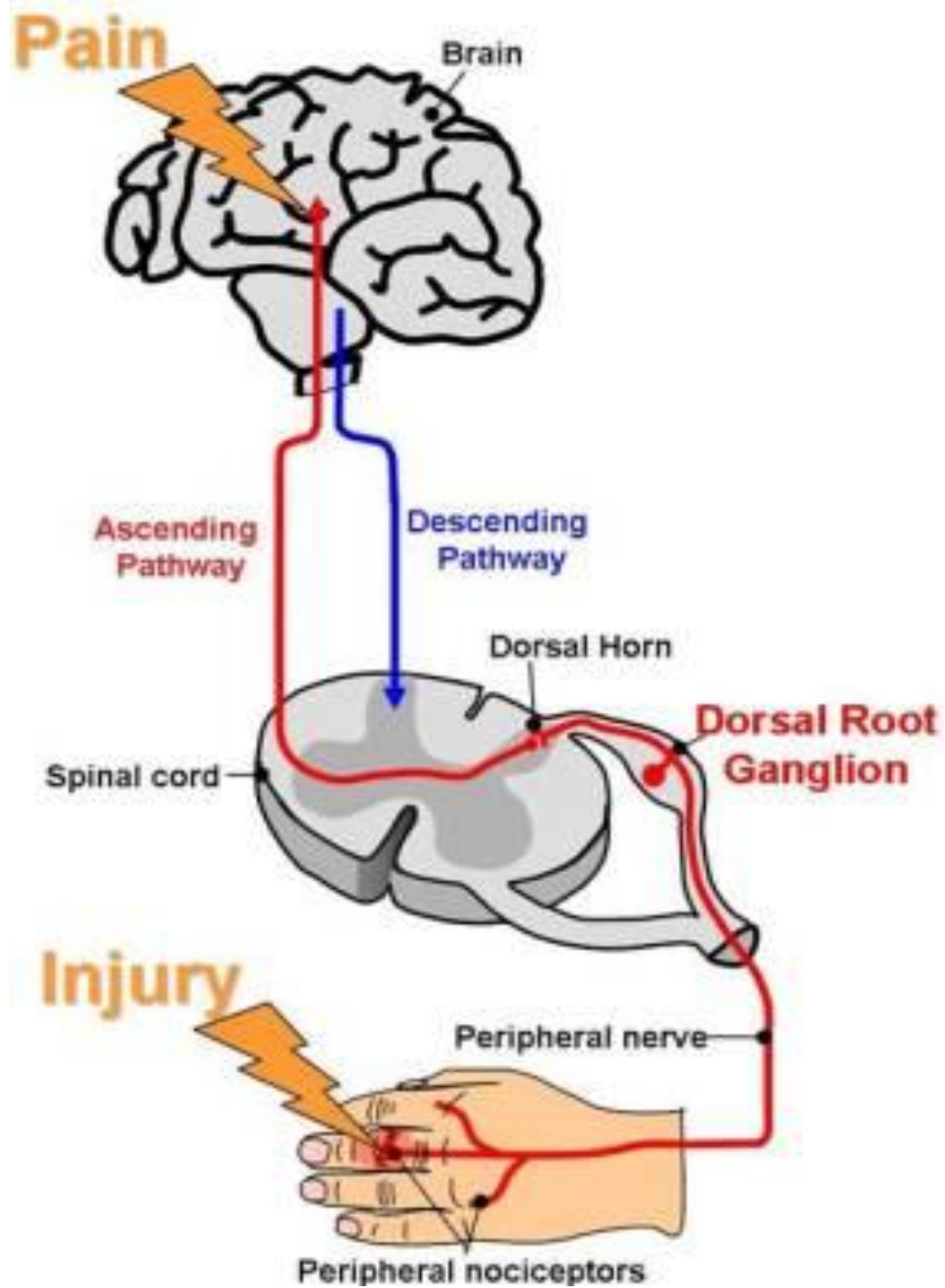
- fibromyalgia as a presenting manifestation of hypothyroidism
- correcting the thyroid abnormality does not ameliorate the fibromyalgia



# Related conditions in fibromyalgia

- Closely related conditions
  - depression
  - irritable bowel syndrome
  - migraine
  - chronic fatigue syndrome (CFS)

?Possible role of serotonin



# Supraspinal Influences on Nociceptive Processing

## *Facilitation*

- Substance P
- Glutamate and EAA
- Serotonin (5HT<sub>2a, 3a</sub>)
- Neurotensin
- Nerve growth factor
- CCK

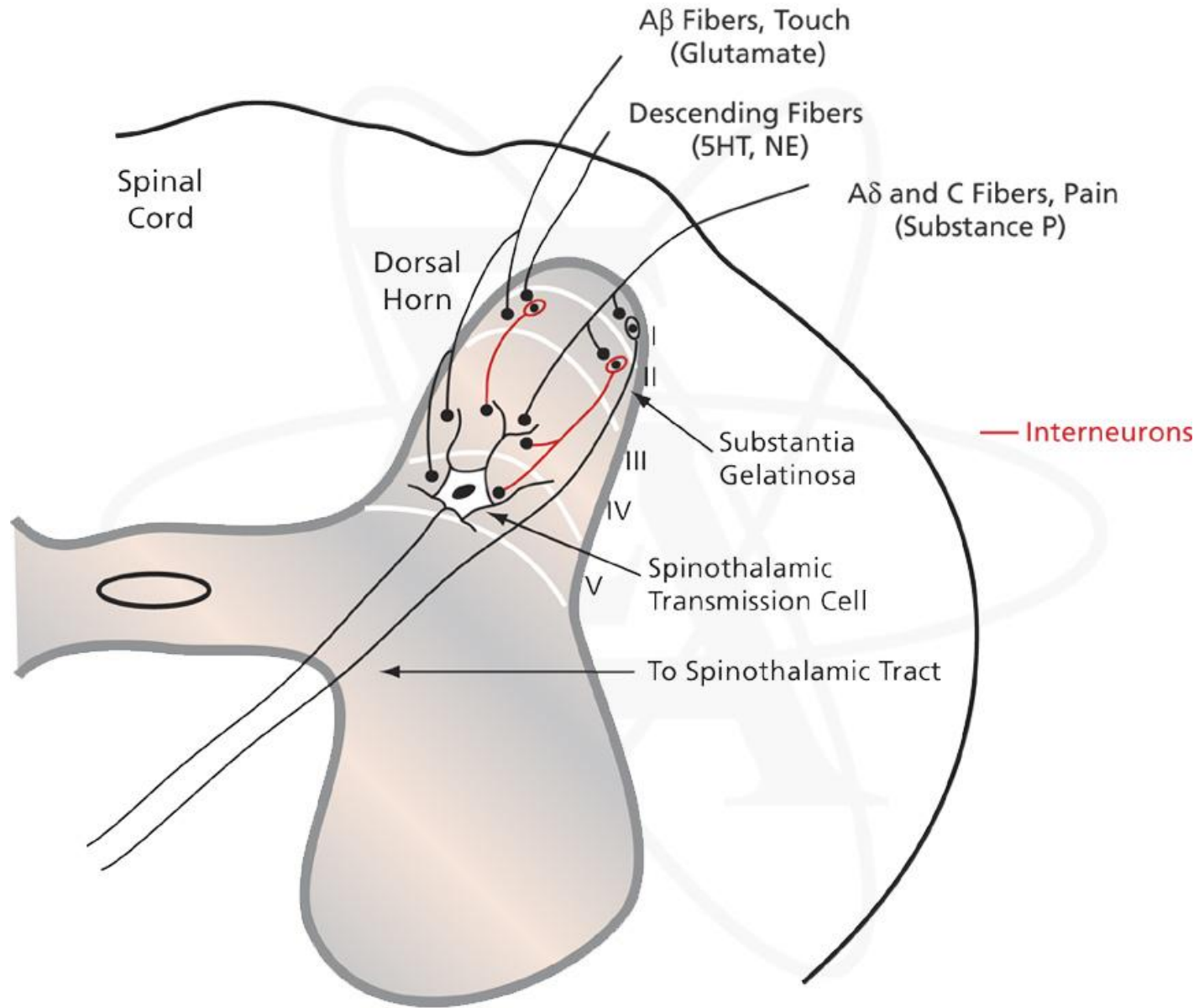


## *Inhibition*

- Descending anti-nociceptive pathways
- ■ Norepinephrine – serotonin (5HT<sub>1a,b</sub>)
- Opioids
- GABA
- Cannabinoids
- Adenosine

# Modulation of Pain Transmission

SIGMA-ALDRICH



# Which Endogenous Analgesic System(s) are Attenuated in FM?

## Opioids

- Normal or high levels of CSF enkephalins<sup>1</sup>
- Never been administered in RCT but most feel that opioids are ineffective or marginally effective

## Noradrenergic/Serotonergic

- Low levels of biogenic monoamines in CSF in FM<sup>2</sup>
- Nearly any class of drug that raises *both* serotonin and norepinephrine has demonstrated efficacy in FM

1. Baraniuk et al. *BMC Musculoskelet Disord.* 2004;5:48.

2. Russell et al. *Arthritis Rheum.* 1992;35:550-556.

# Supraspinal Influences on Nociceptive Processing

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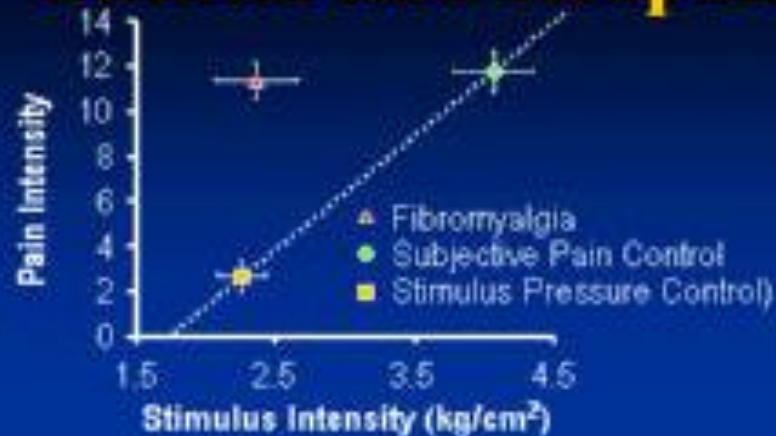
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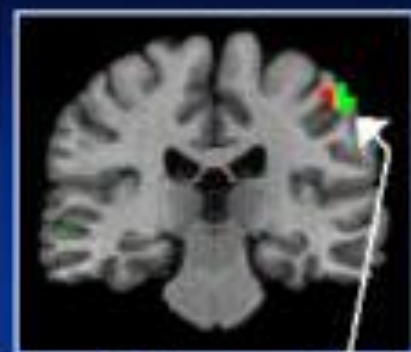
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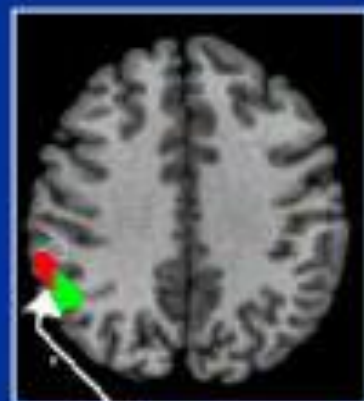
# Stimuli and Responses During Pain Scans



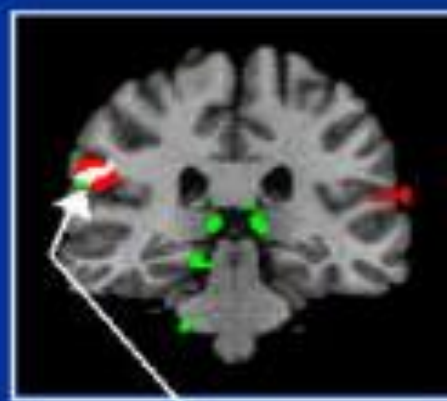
SI



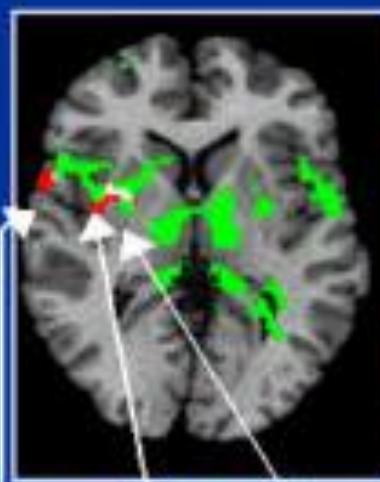
SI (decrease)



IPL



SII



STG, Insula, Putamen



Cerebellum

STG=superior temporal gyrus, SI=primary somatosensory cortex,  
SII=secondary somatosensory cortex, IPL=inferior parietal lobule.

Gracely. *Arthritis Rheum*. 2002;46:1333-1343.