PRINCIPLES OF RHEUMATOLOGY DIAGNOSIS

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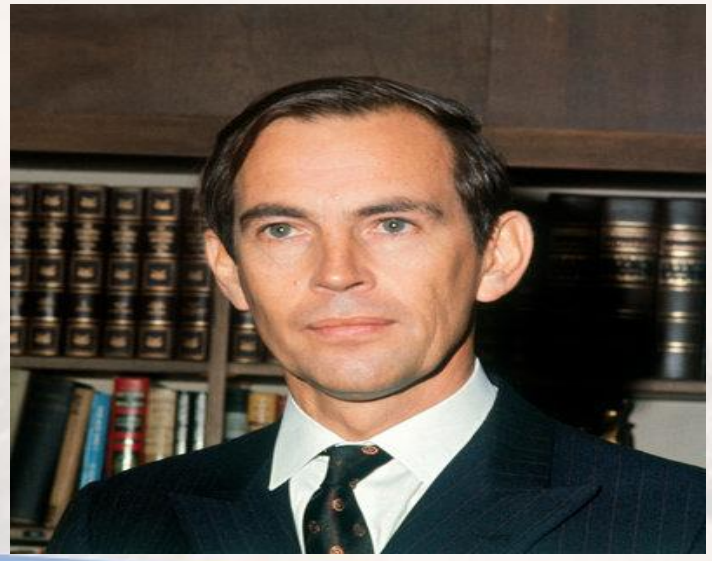
Definition:

<u>Rheumatologic (or Rheumatic) Disease:</u>
diseases characterized by pain and inflammation
in joints and connective tissues, often referred to
as “collagen-vascular diseases”.




York to meet John Lennon...and the world changed forever.
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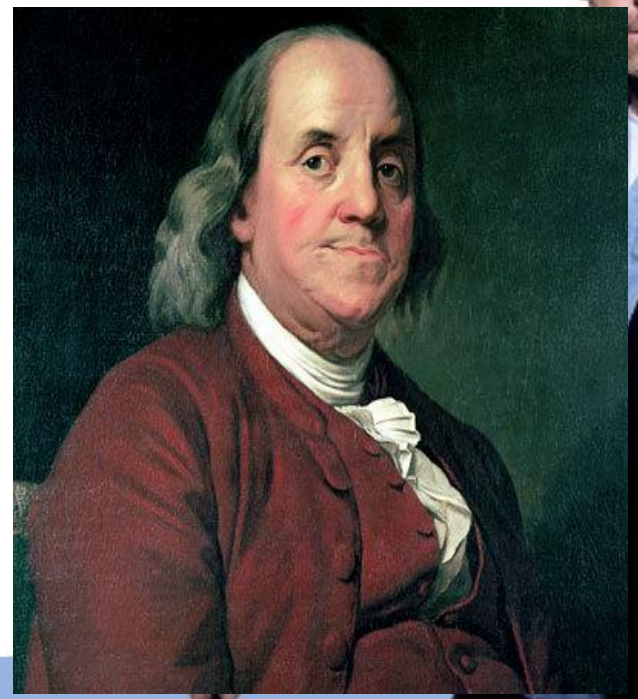


Rheumatic diseases

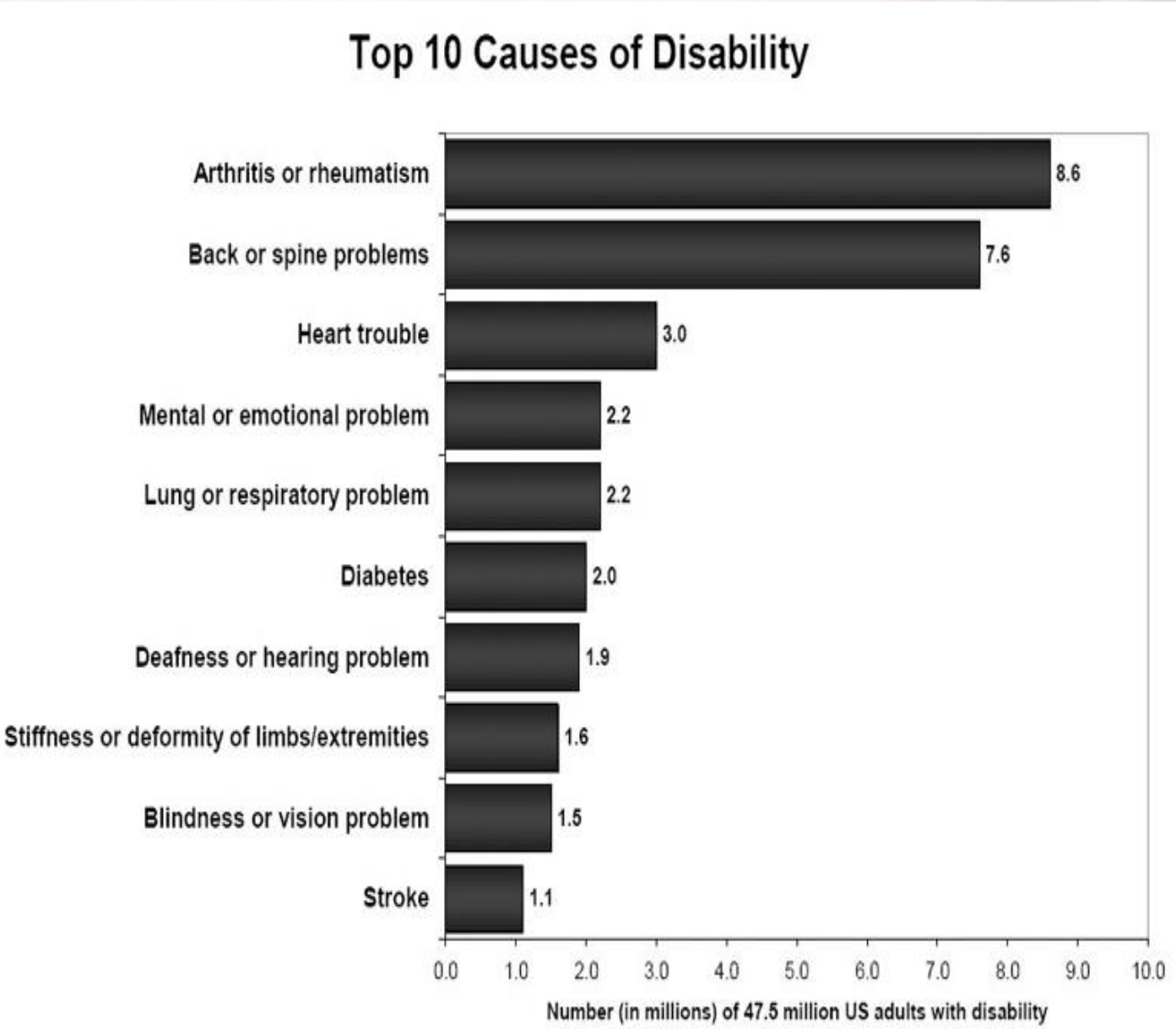
Rheumatoid Arthritis & its varients:
Sjogren's disease,
Felty disease,
Palindromic Rheumatism

Connective tissue diseases
SLE
Scleroderma
Polymyositis
Dermatomyositis

Seronegative Arthropathies
Ankylosing Spondylitis
Psoriatic arthropathy
Reactive arthritis (Reiter)
IBD associated arthropathies

Mechanical /Degenerative
Osteoarthritis
Disc prolapse
Spondylolisthesis

Others:
Crystal induced (Gout)
Endocrine associated
Blood disorders associated
Malignancy associated



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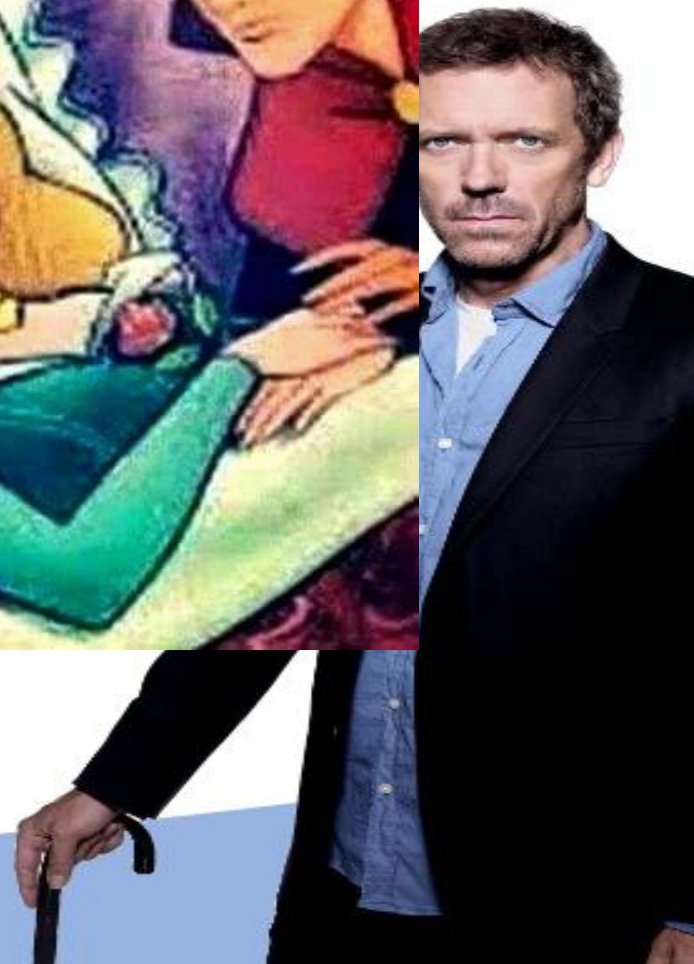
OUTLINE

- Introduction
- Approach to the patient with a musculoskeletal complaint
- Approach to the patient with a connective tissue disease
- Take home message



Descriptive Terms

- Synovitis
- Bursitis
- Arthralgia
- Arthritis
- Monoarthritis
- Oligo/pauci-arthritis
- Polyarthritis

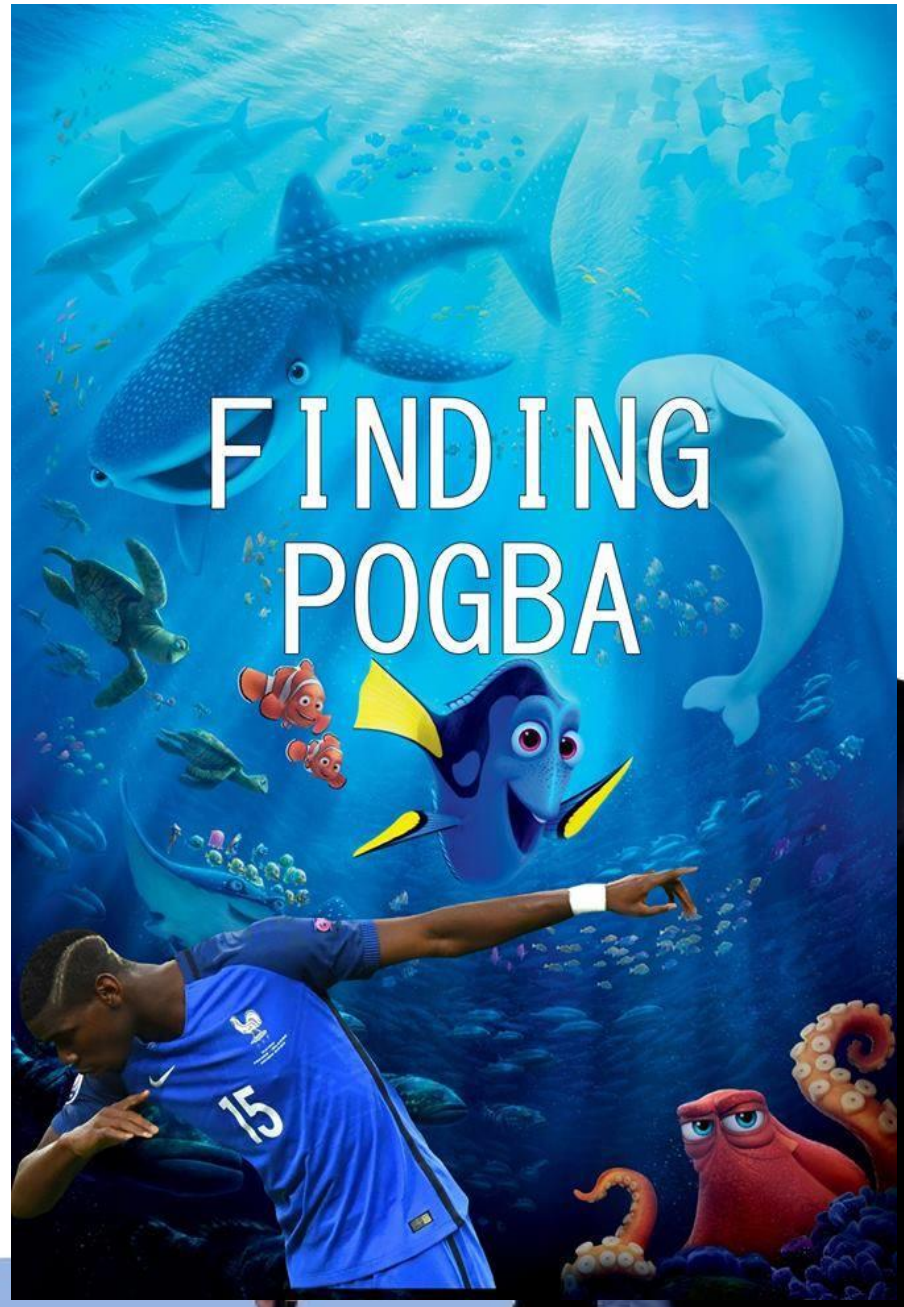
- Tendonitis/Tendinosis
- Tenosynovitis
- Enthesitis
- Myalgia
- Myositis
- Osteoporosis
- Early morning stiffness

- Small vs large joint involvement
- Symmetrical vs asymmetrical disease
- Axial disease vs peripheral joint involvement
- Juvenile arthritis: onset < 16 years

MUSCULOSKELETAL COMPLAINT EVALUATION OF PATIENTS WITH MUSCULOSKELETAL COMPLAINTS

Goals

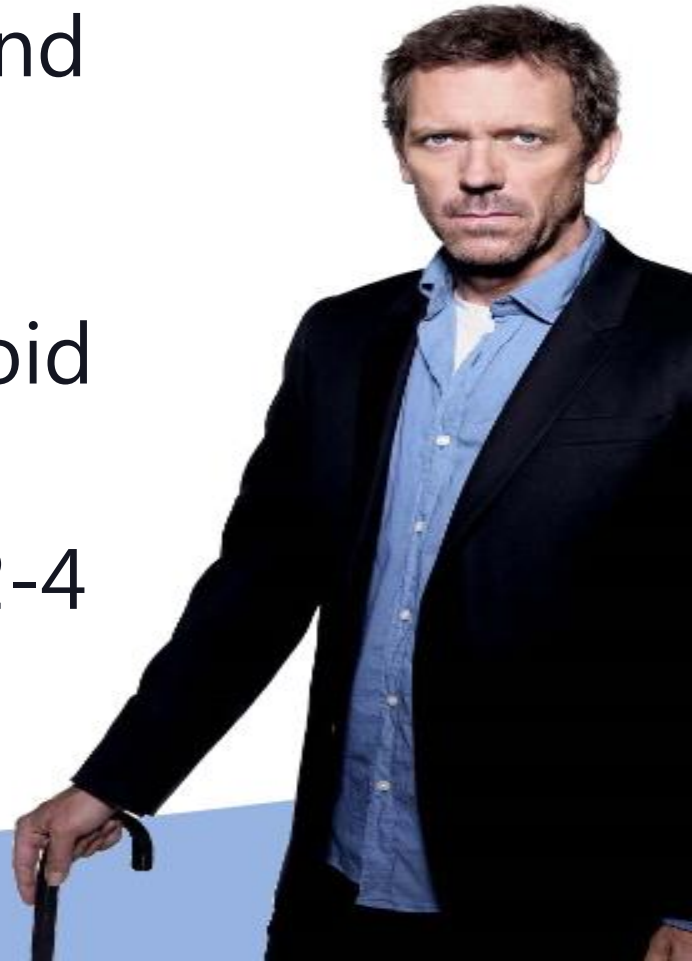
- Accurate diagnosis
- Timely provision of therapy
- Avoidance of unnecessary diagnostic testing



Case 1

- CC: Arthralgia in hands and feet HPI: 50 yr WW presents with 6 weeks of arthralgia in hands and feet. Swelling over MCP's, PIP's. Has tried naproxen with partial relief ROS, PMH, PSH, Social HX: Negative FH: mother with rheumatoid arthritis

Exam: Tenderness & synovitis of wrists, R MCP 2-4 and B PIP 3



History.. Age

- <30= Systemic lupus erythromatosus, Ankylosis spodylitis, Reactive Arthritis, JIA.
- 30-50= Rheumatoid arthritis, Systemic sclerosis, Gout.
- >50= OA, Pseudogout, Polymyalgia rheumatica
- Any Age group= Psoriatic arthritis, Enteropathic arthritis

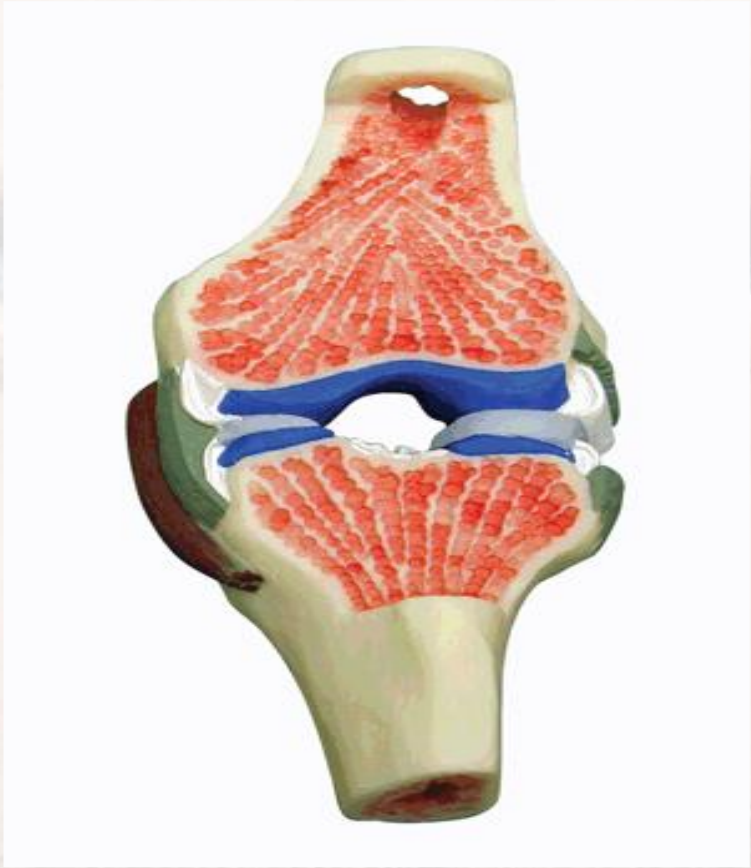
History.. Sex

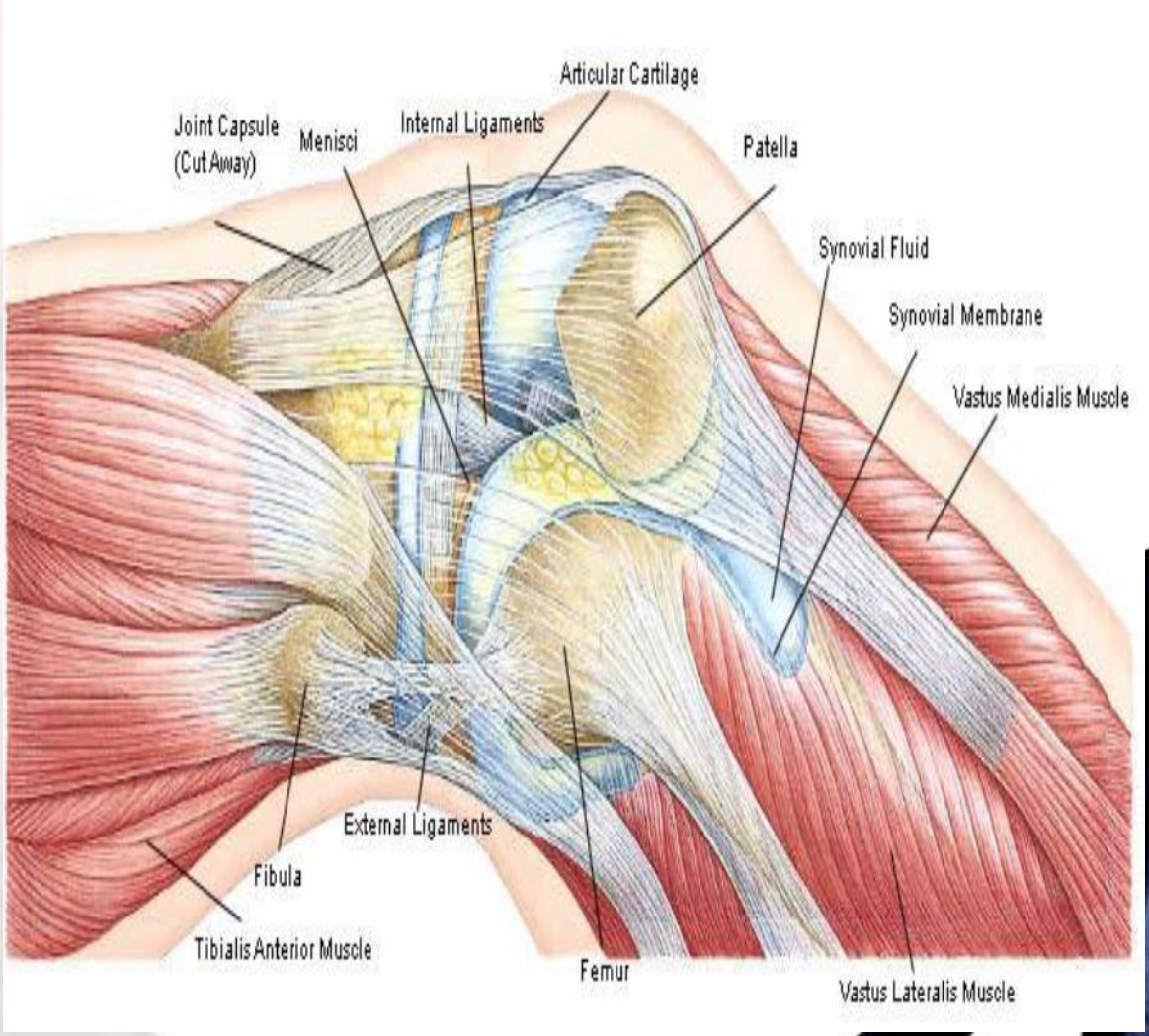
- >Female:
- SLE, RA, OA, Systemic sclerosis, Ankylosis spodylitis, PMR.
- Male=Female:
- Psoriatic arthritis, Enteropathic arthritis Pseudogout.
- >Male:
- Gout, Reactive Arthritis

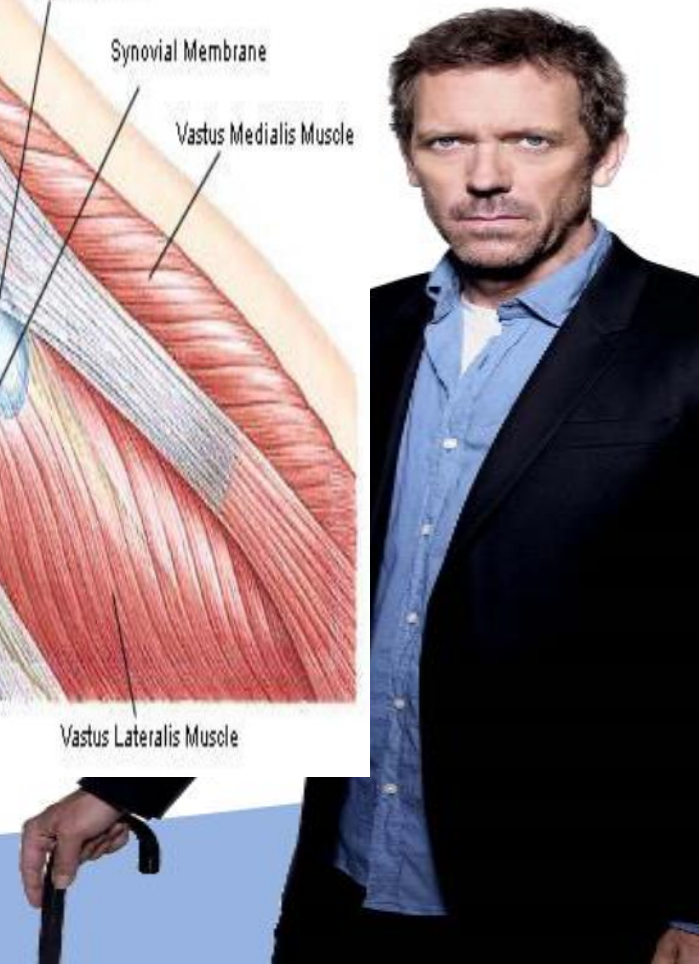
SITE...

- Symmetrical= RA, SLE, Systemic sclerosis
- Asymmetrical=OA
- Large joints=OA
- DIP= OA, Psoriatic arthritis
- MCP, PIP= RA, SLE
- 1st MTP= Gout, OA
- Spine= OA, Ankylosis spodylitis, Psoriatic arthritis, Reactive arthritis
- Shoulder= PMR

DIAGNOSTIC APPROACH Articular Vs. Non Articular







History and physical exam pearls:

- Articular: Pain is diffuse and deep
- Pain with active and passive range of motion
- Swelling
- Crepitation, locking, instability or deformity

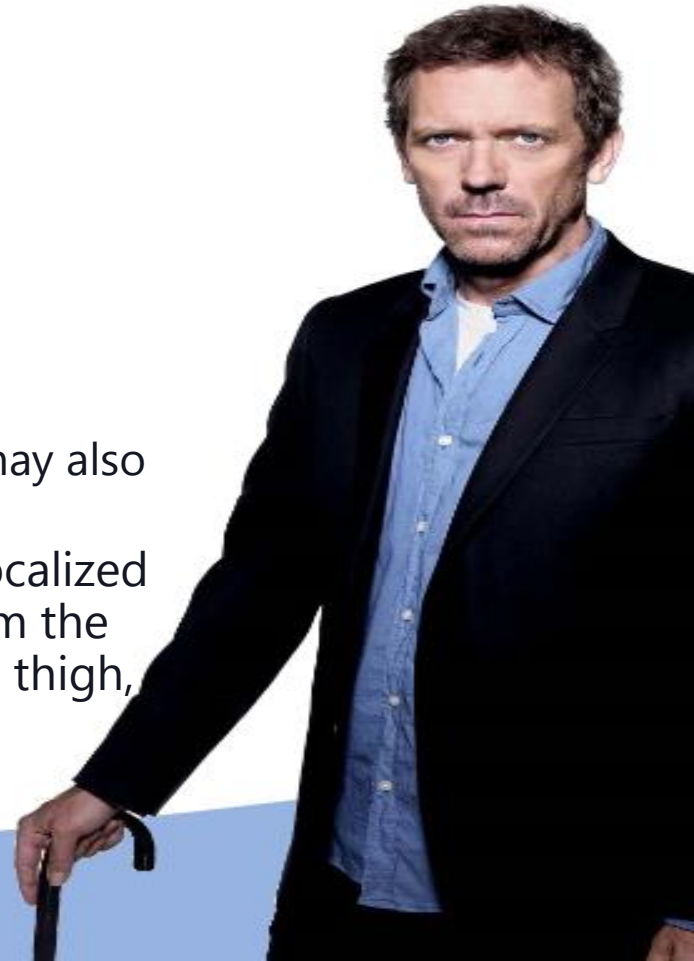
History and physical exam pearls:

- Non articular: Pain with active but not passive ROM Tenderness in adjacent structures Other physical findings in remote areas

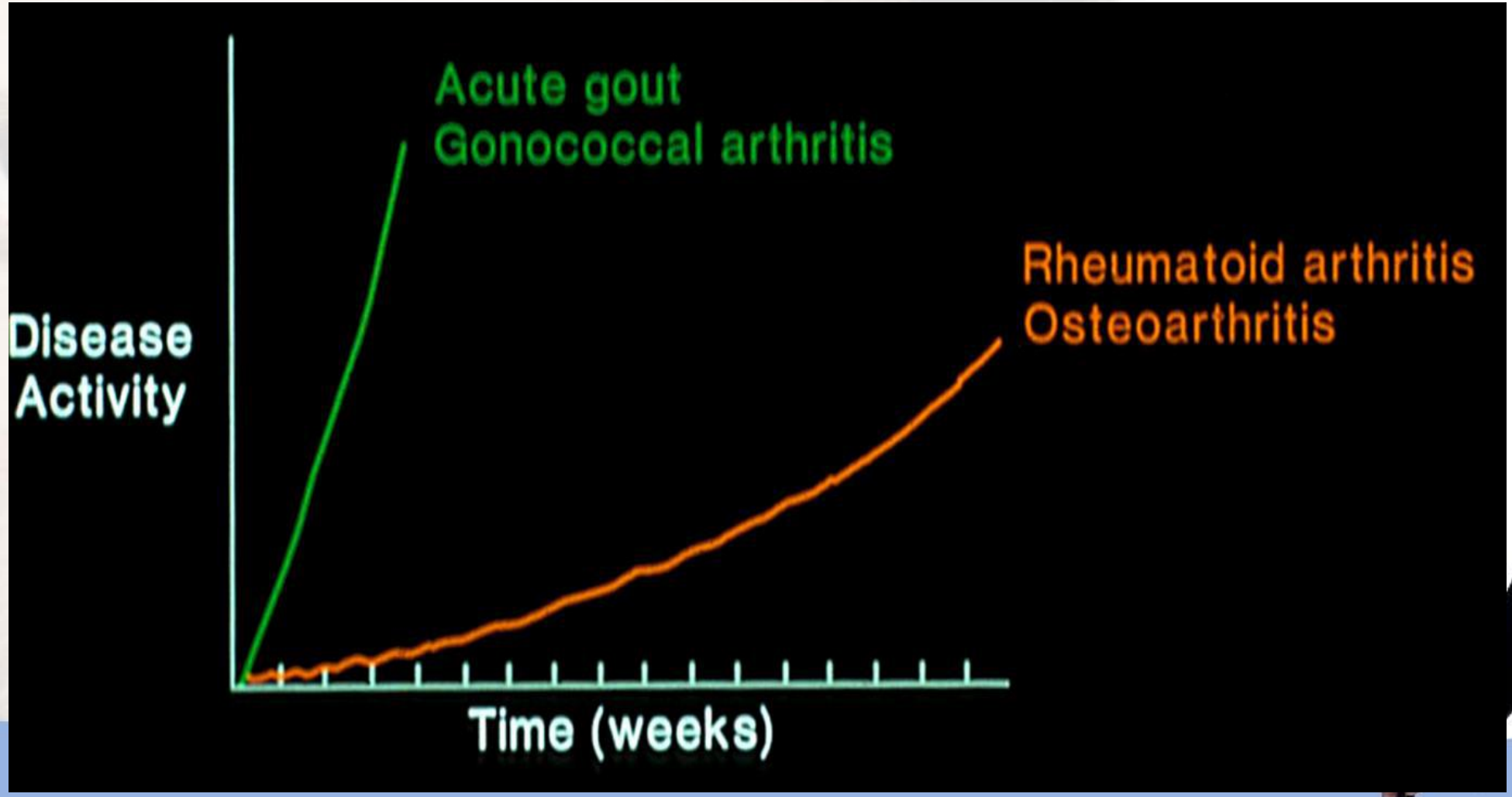
Evaluation
I - History

Symptoms of joint disease

- **Pain**
  - **Inflammatory joint disease**
    - present both at rest and with motion.
    - It is worse at the beginning than at the end of usage.
  - **Non-inflammatory joint disease**(ie, degenerative, traumatic, or mechanical)
    - Occurs mainly or only during motion
    - Improves quickly with rest.
    - Patients with advanced degenerative disease of the hips, spine, or knees may also have pain at rest and at night.
  - Pain that arises from small peripheral joints tends to be more accurately localized than pain arising from larger proximal joints. For example, pain arising from the hip joint may be felt in the groin or buttocks, in the anterior portion of the thigh, or in the knee.

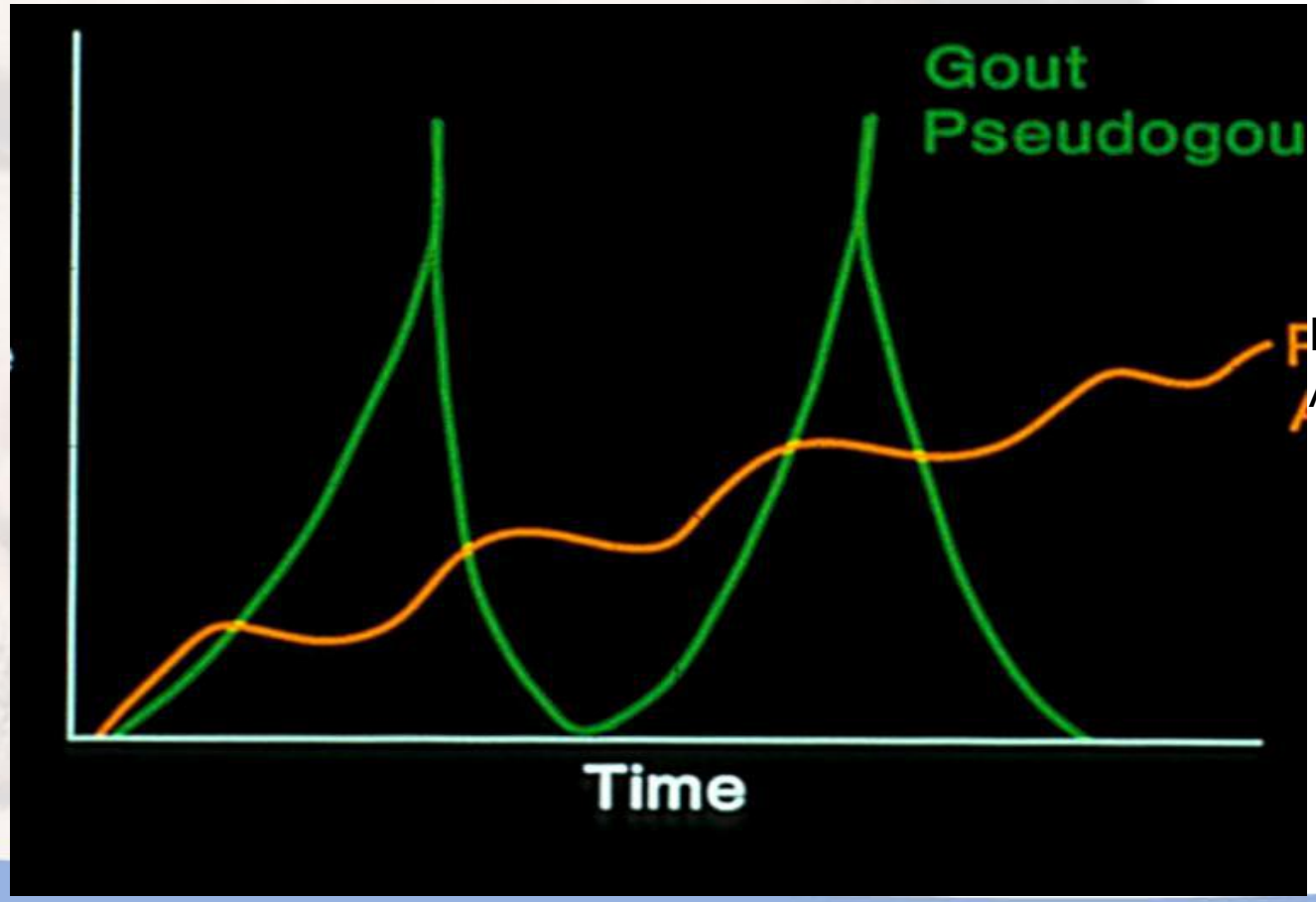


Acute Vs. Insidious onset



Persistent Vs. Episodic

Disease activity



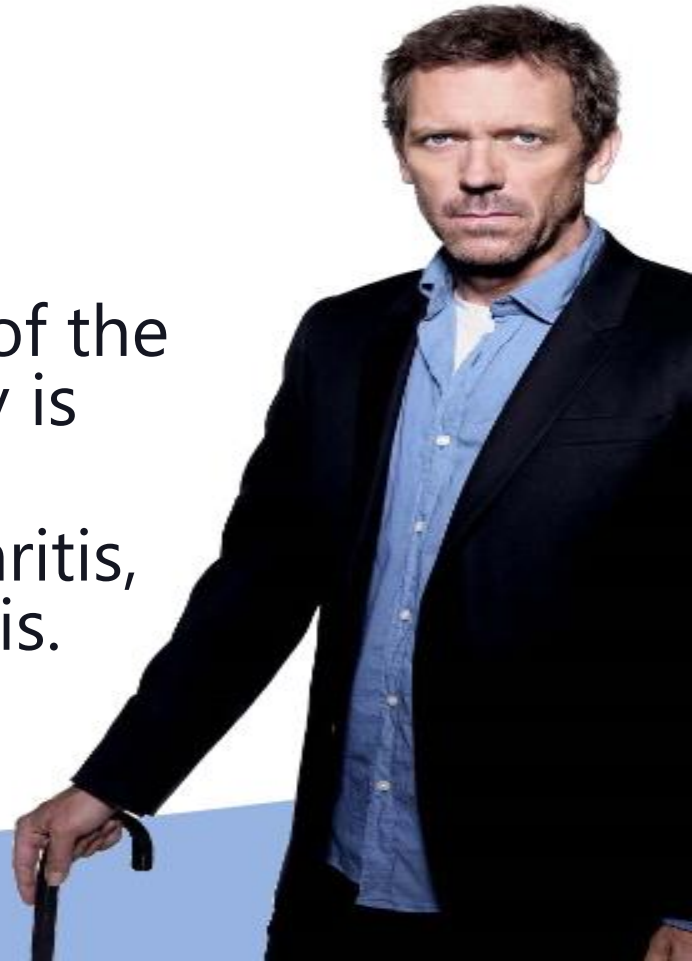
Rheumatoid arthritis
Ankylosing spondylitis

Number of joints involved

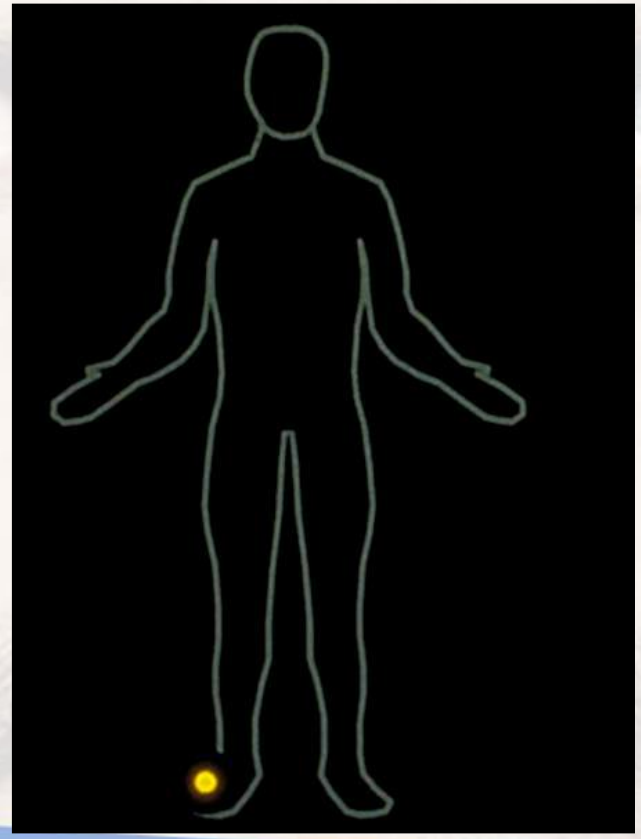
- Monoarticular: 1 joint involved
- Oligoarticular: 2-4 joints involved
- Polyarticular: >4 joints involved

Symmetry of joint involvement

- Symmetric arthritis is characterized by involvement of the same joints on each side of the body. This symmetry is typical of RA and SLE.
- Asymmetric arthritis is characteristic of psoriatic arthritis, reactive arthritis (Reiter syndrome), and Lyme arthritis.

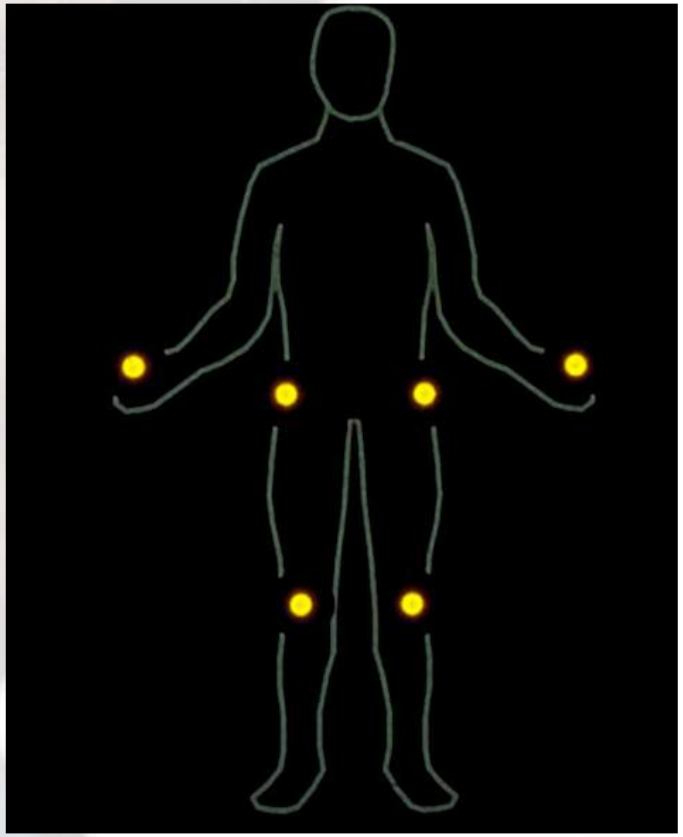


Monoarticular



crystal disease

Polyarticular Infection



RA, psoriatic arthritis

- **Distribution of affected joints**
  - The distal interphalangeal joints of the fingers are usually involved in psoriatic arthritis, gout, or osteoarthritis but are usually spared in RA.
  - Joints of the lumbar spine are typically involved in ankylosing spondylitis but are spared in RA.

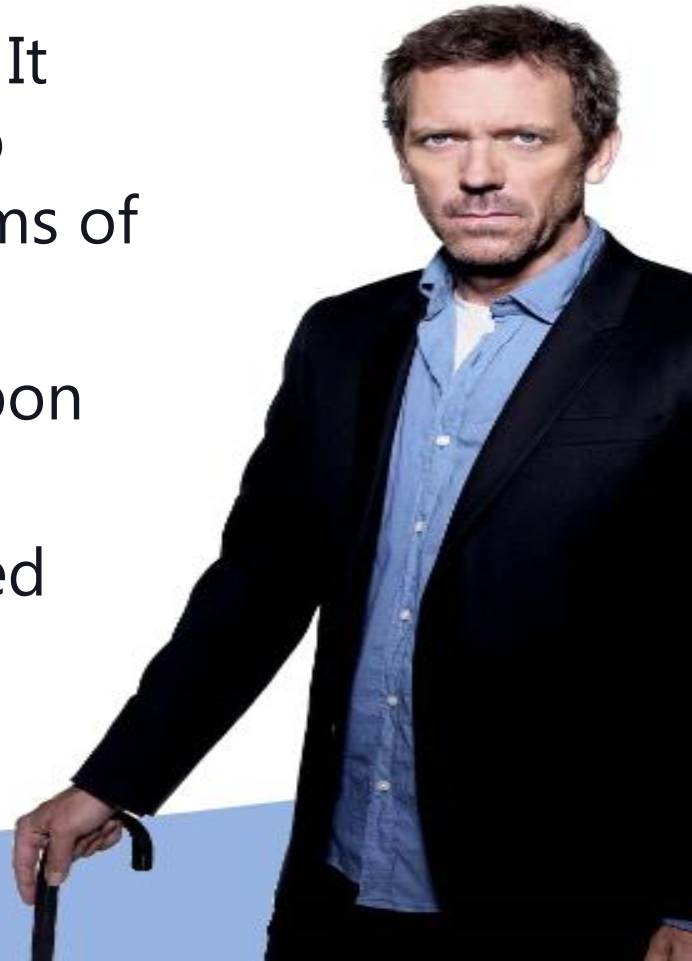
- **Distinctive types of musculoskeletal involvement**
  - Spondyloarthropathy involves entheses, leading to heel pain (inflammation at the insertions of the Achilles tendon and/or plantar fascia), dactylitis (sausage digits), tendonitis, and back pain (sacroiliitis and vertebral disc insertions).
  - Gout commonly involves tendon sheaths and bursae, resulting in superficial inflammation.

I - History

Symptoms of joint disease

❑ Stiffness

- Stiffness is a perceived sensation of tightness when attempting to move joints after a period of inactivity. It typically subsides over time. Its duration may serve to distinguish inflammatory from non-inflammatory forms of joint disease.
- With inflammatory arthritis, the stiffness is present upon waking and typically lasts 30-60 minutes or longer.
- With noninflammatory arthritis, stiffness is experienced briefly (eg, 15 min) upon waking in the morning or following periods of inactivity.



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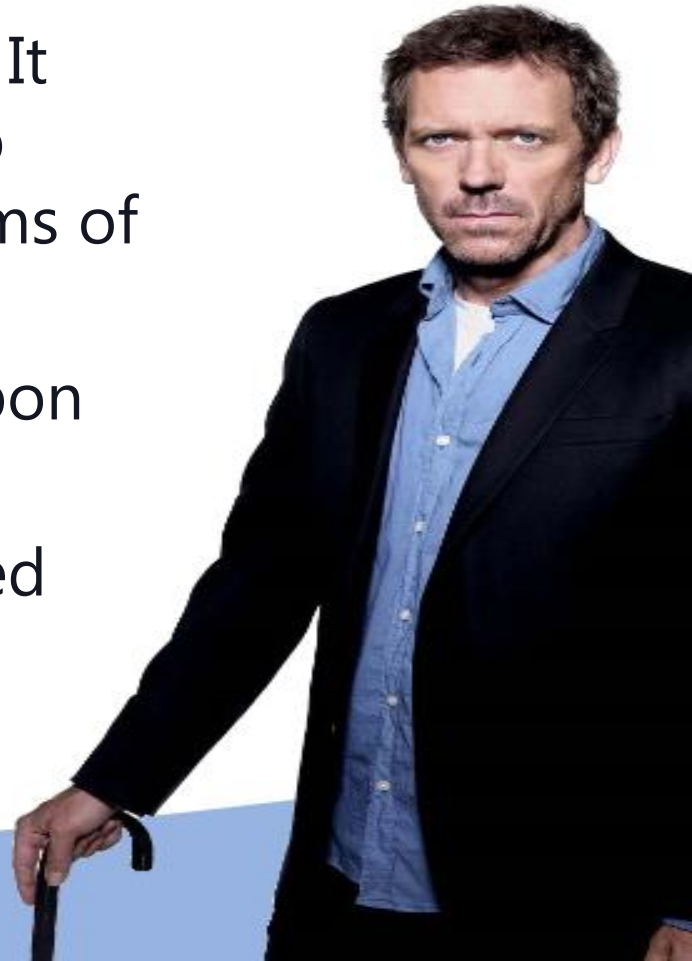


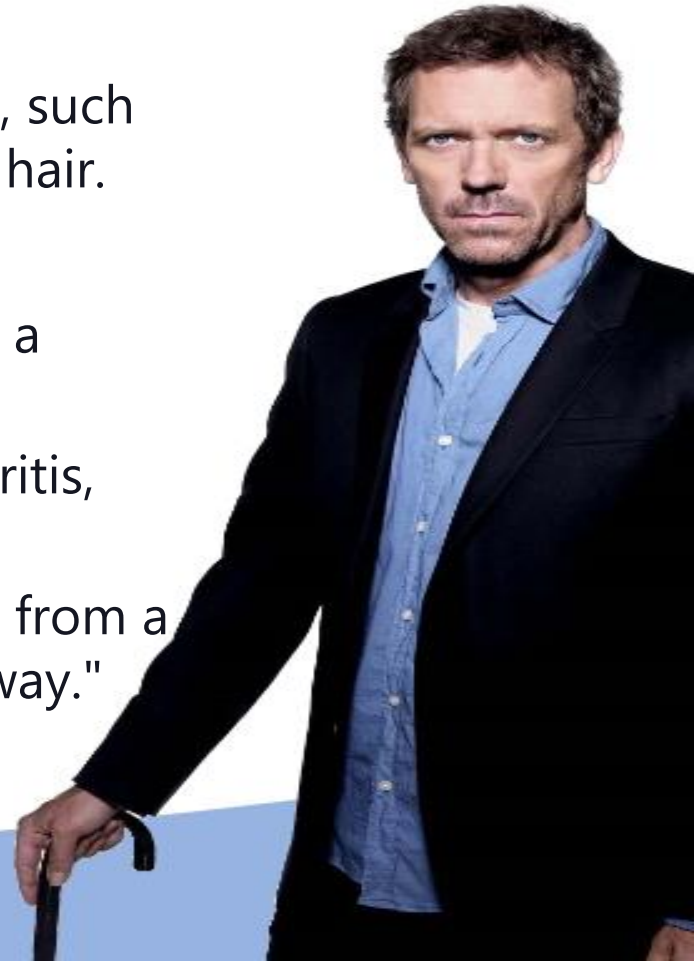
I - History

Symptoms of joint disease

- **Swelling**
  - With inflammatory arthritis, joint swelling is related to synovial hypertrophy, synovial effusion, and/or inflammation of periarticular structures. The degree of swelling often varies over time.
  - With noninflammatory arthritis, the formation of osteophytes leads to bony swelling. Patients may report gnarled fingers or knobby knees. Mild degrees of soft tissue swelling do occur and are related to synovial cysts, thickening, or effusions.

History

- **Limitation of motion**
  - Loss of joint motion may be due to structural damage, inflammation, or contracture of surrounding soft tissues.
  - Patients may report restrictions on their activities of daily living, such as fastening a bra, cutting toenails, climbing stairs, or combing hair.
- **Weakness**
  - Muscle strength is often diminished around an arthritic joint as a result of disuse atrophy.
  - Weakness with pain suggests a musculoskeletal cause (eg, arthritis, tendonitis) rather than a pure myopathic or neurogenic cause.
  - Manifestations include decreased grip strength, difficulty rising from a chair or climbing stairs, and the sensation that a leg is "giving way."



MUSCULOSKELETAL COMPLAINT

Systemic Vs. Localized

RA, SLE

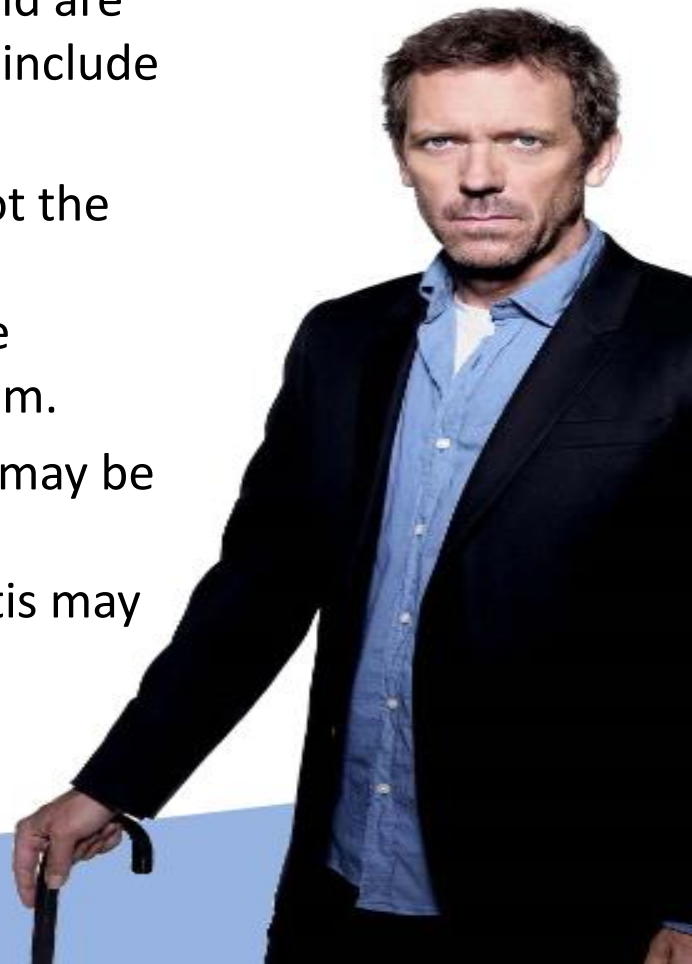
Osteoarthritis

History

Extra-articular symptoms

- **Fatigue**
  - Fatigue is usually synonymous with exhaustion and depletion of energy in patients with arthritis.
  - With inflammatory polyarthritis, the fatigue is usually noted in the afternoon or early evening.
  - With psychogenic disorders, the fatigue is often noted upon arising in the morning and is related to anxiety, muscle tension, and poor sleep.

- **Constitutional symptoms** suggest an underlying systemic disorder and are not expected in patients with degenerative joint disease. These may include fatigue, malaise, and weight loss.
- **Skin lesions** may be present. Physical examination of the skin, but not the joints, may indicate the specific diagnosis of a number of rheumatic diseases. Examples include SLE, dermatomyositis, scleroderma, Lyme disease, psoriasis, Henoch-Schönlein purpura, and erythema nodosum.
- **Ocular symptoms or signs** are also possible. Episcleritis and scleritis may be associated with RA or Wegener granulomatosis, anterior uveitis with ankylosing spondylitis, and iridocyclitis with juvenile RA. Conjunctivitis may be caused by reactive arthritis



History and Physical exam Pearls

Inflammatory

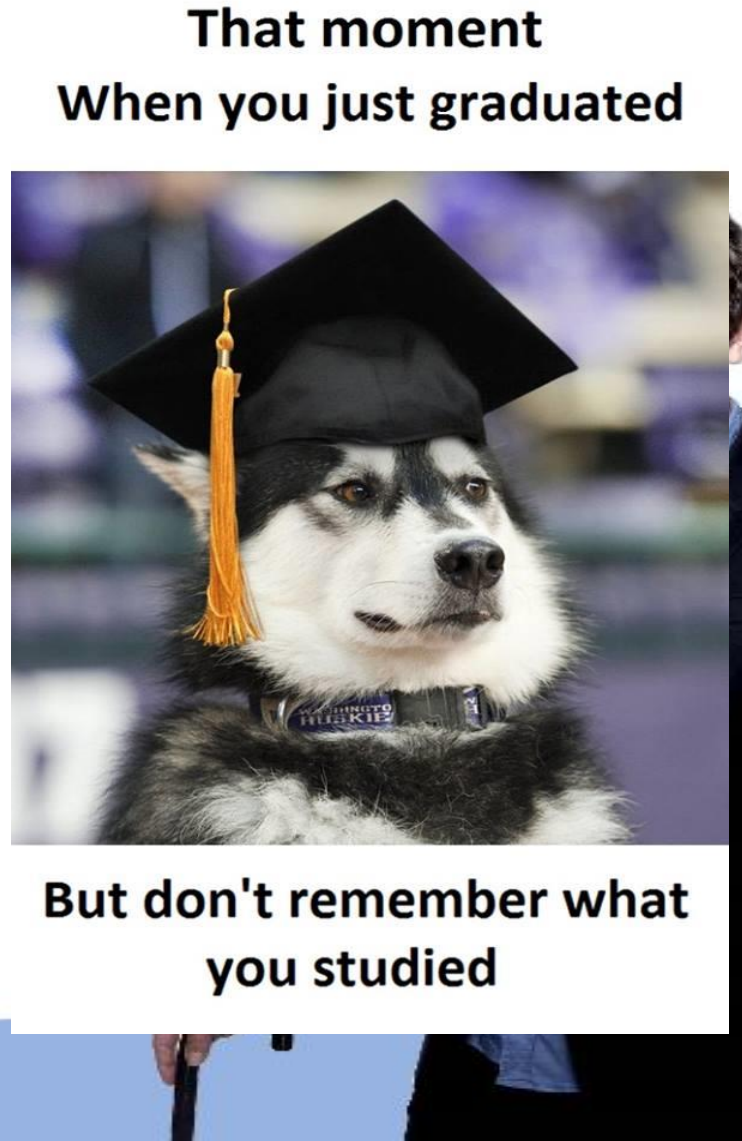
- Erythema
- Warmth Pain
- Swelling
- Tenosynovitis
- Stiffness after prolonged rest Fatigue

Non-Inflammatory

- Pain without swelling
- Gel phenomenon
- Pain is aggravated with activity

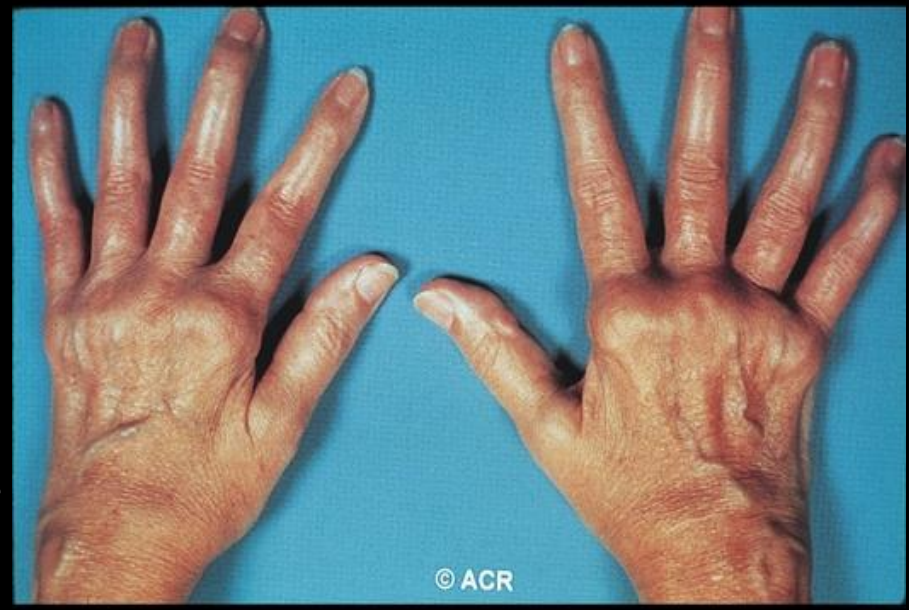
Physical Examination

- General
  - general condition, fever, pulse, BP
- Articular or extra-articular
- Joint Inflammation
  - swollen, red, , tender, hot
- Functional impairment
  - passive and active movement
  - Crepitus during active or passive range of motion
  - Instability
  - Joint Deformity (flexion, subluxation, dislocation)



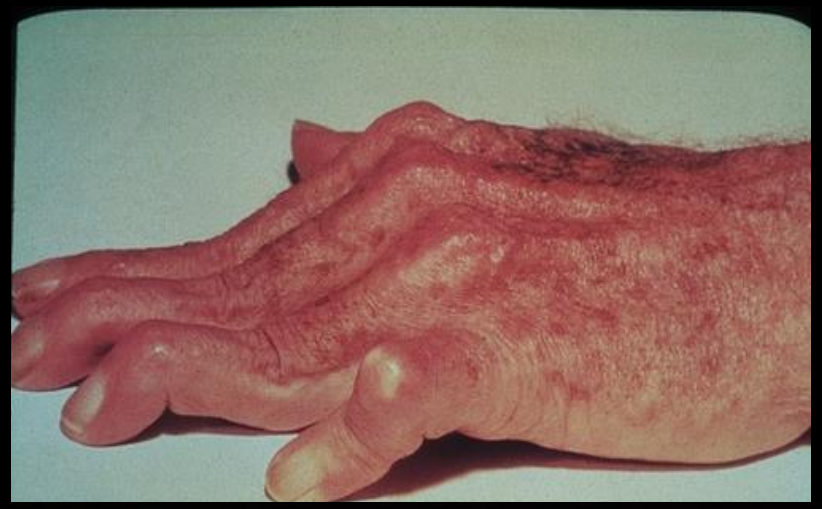
Know It When You See It

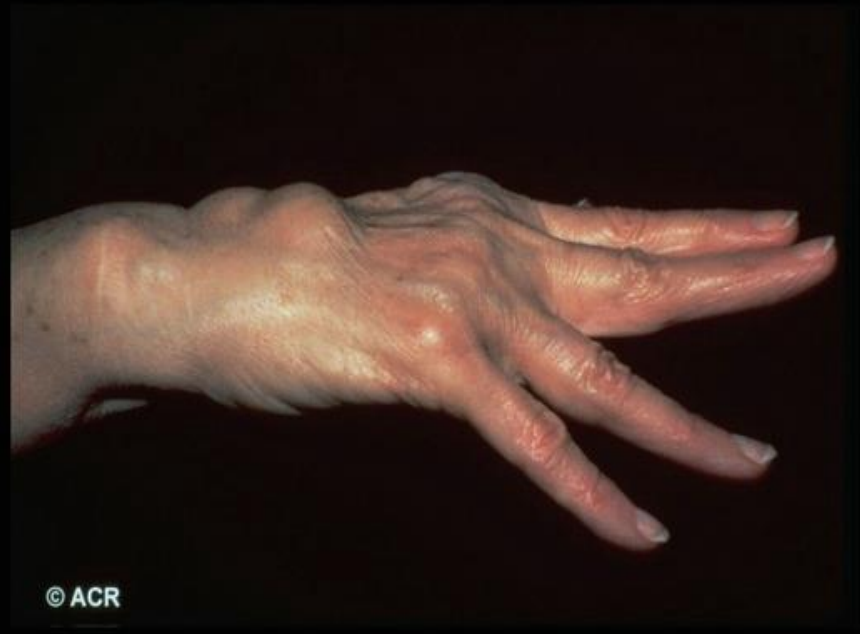
- Soft synovial swelling
- Synovitis and volar subluxation at the MCP joints
- Synovitis of the wrists
- Synovitis of the PIP joints with early swan neck deformities

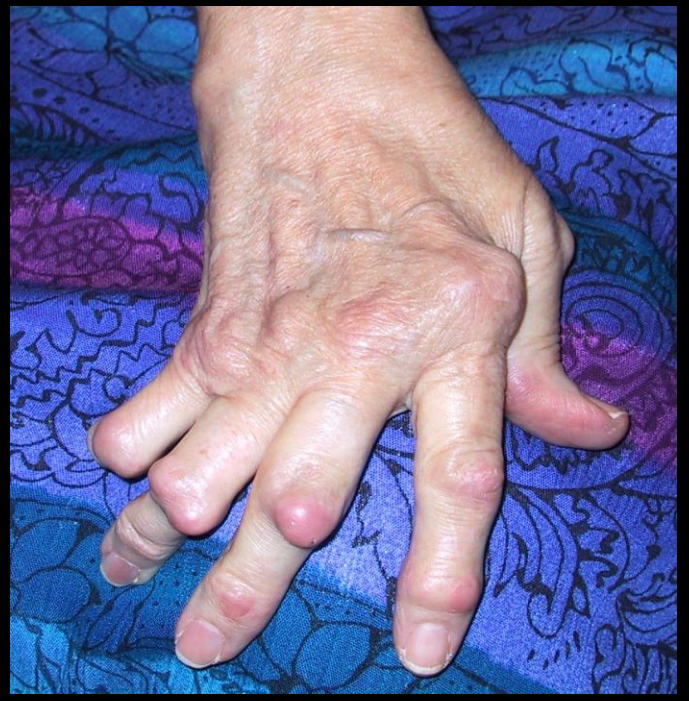


Rheumatoid arthritis

Rheumatoid Arthritis: Late Stages





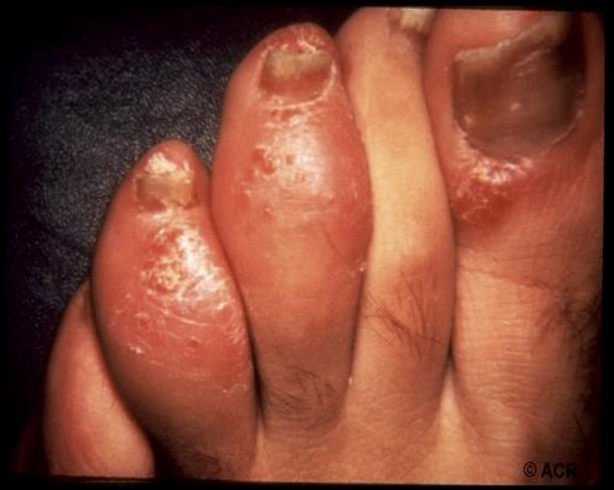


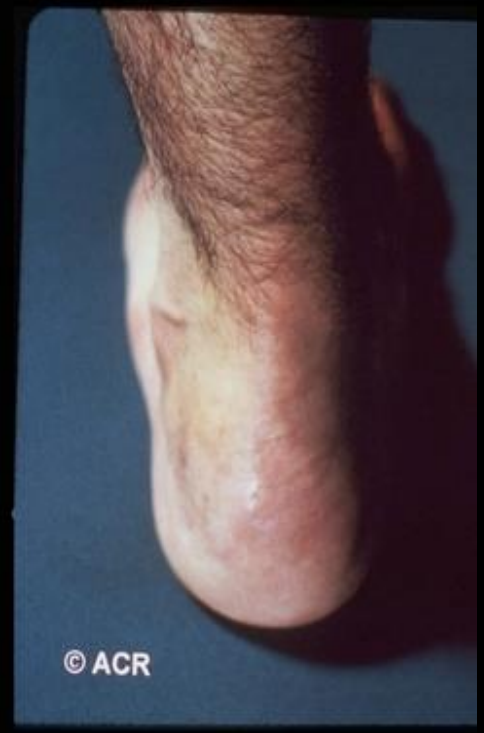
- Deformities
- Nodules
- Tendon Rupture

Know It When You See It

Often associated with:

- Inflammatory eye disease
- Balanitis, oral ulceration, or keratoderma
- Enthesopathy
- Sacroiliitis





Seronegative asymmetric arthritis

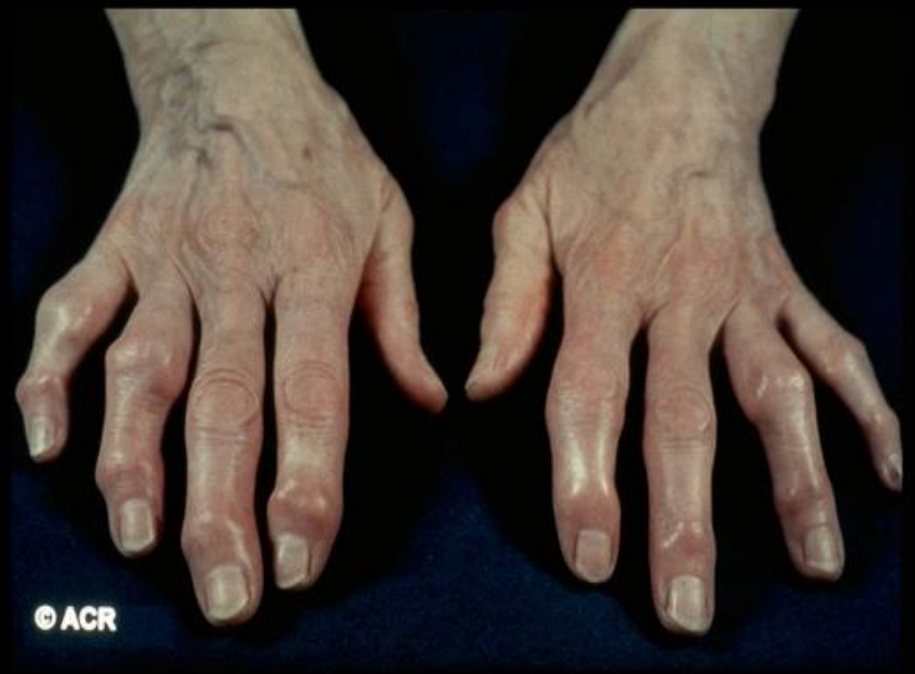
Know It When You See It

- Inflammation of the DIP joints
- Sausage fingers
- Joint involvement shows radial pattern
- Nail changes
- Psoriatic patches
- Arthritis may start before the skin

Psoriatic arthritis

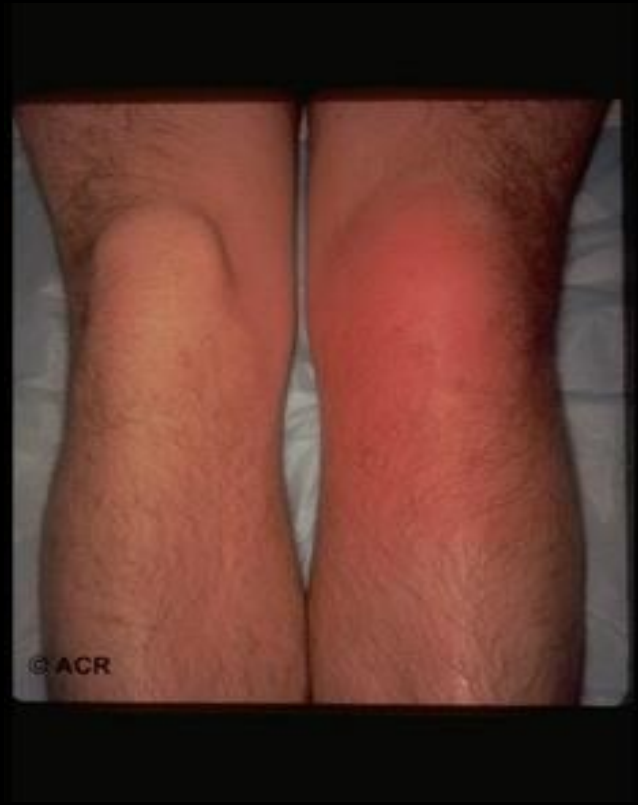
Know It When You See It

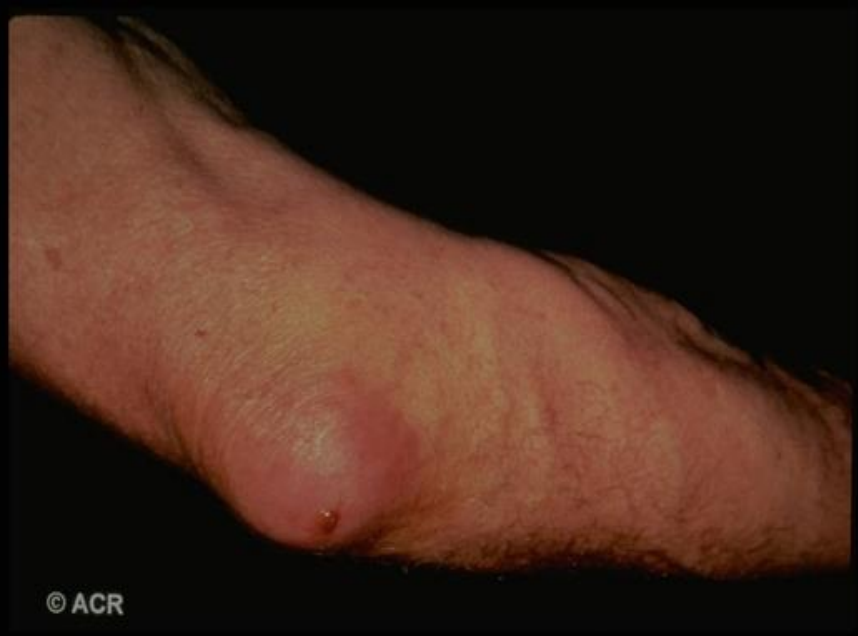
- Hard bony enlargements
- Heberden's nodes at the DIP joints
- Bouchard's nodes at the PIP joints
- Often have "squared" first CMC joint due to osteophytes at that joint



Osteoarthritis

Know It When You See It



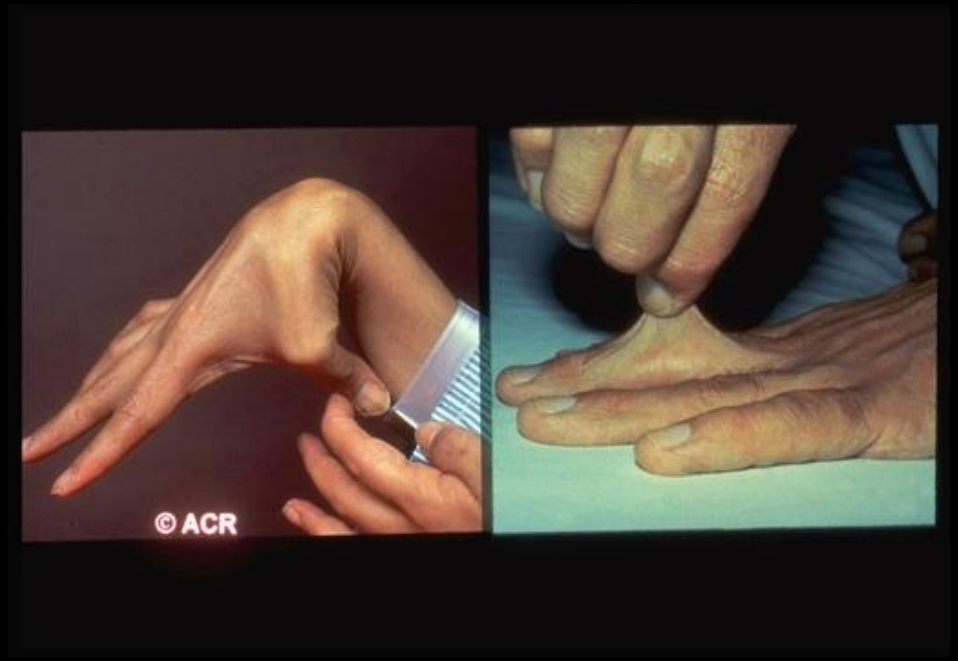


Infection

- Tap if joint/bursa infection suspected
- Do not tap through cellulitis

Know It When You See It

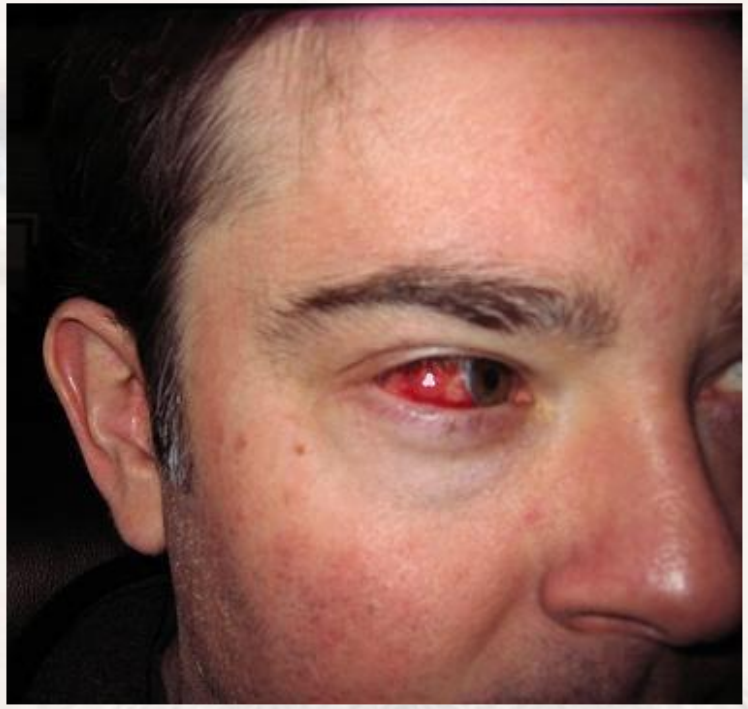
- A true connective-tissue disease
- Left: Hypermobility of joints. Can touch thumb to volar surface of forearm
- Right: Hyperelasticity of skin
- Associated with vascular abnormalities

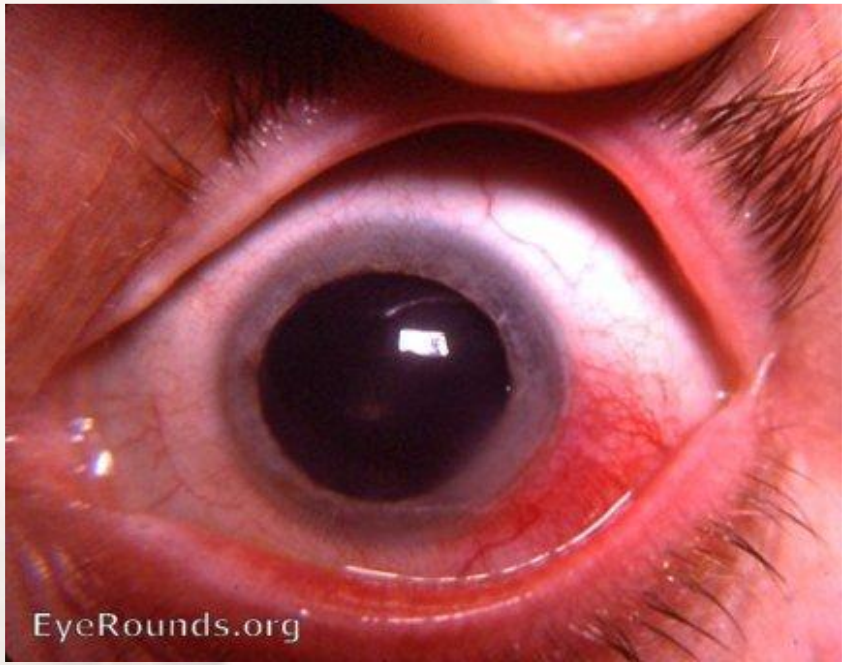


Ehlers-Danlos syndrome

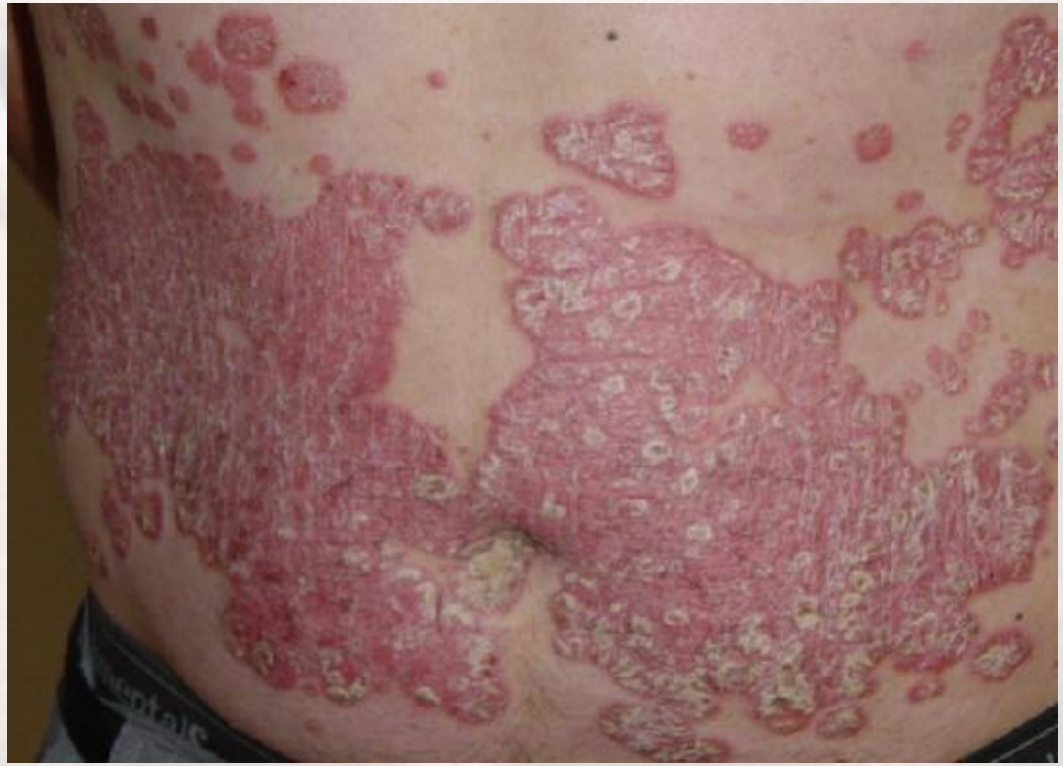
- Physical exam:
- Look for clues in other organs that may lead to a diagnosis

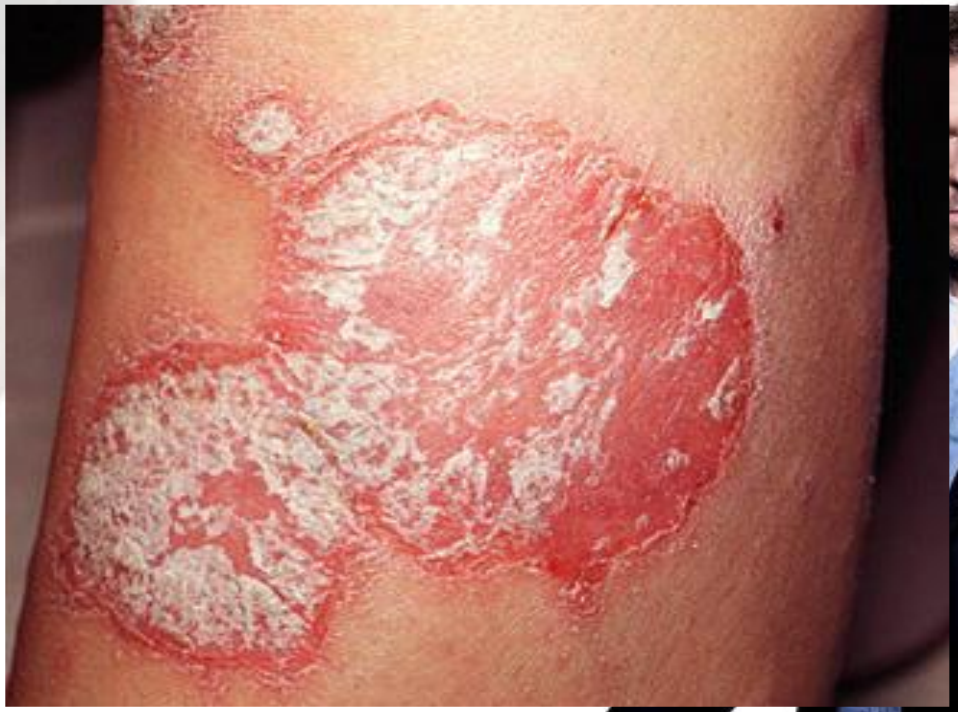
Rheumatoid arthritis



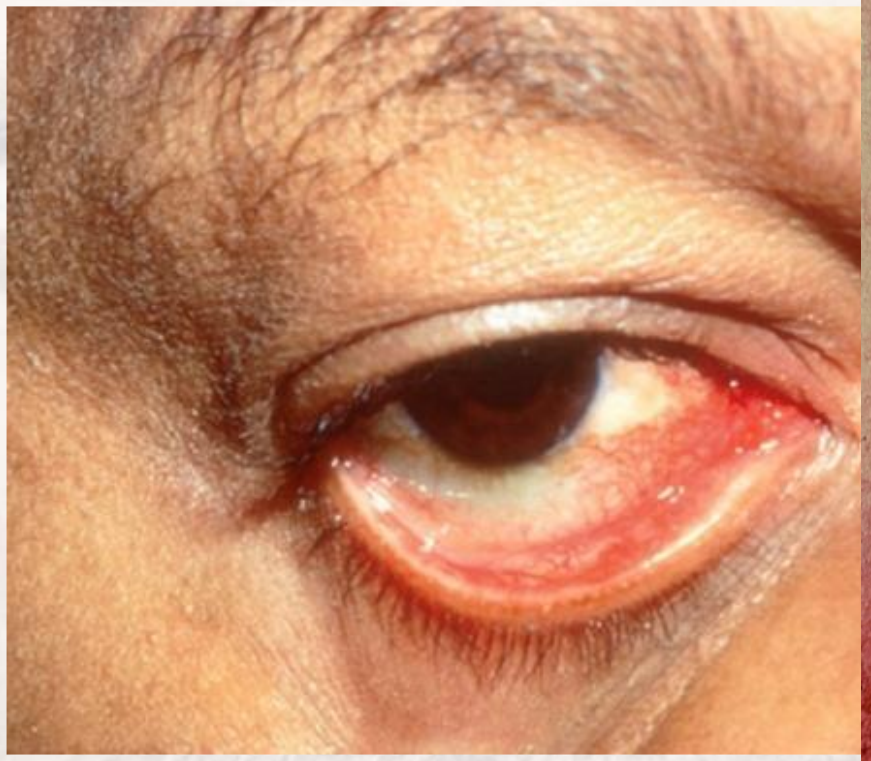


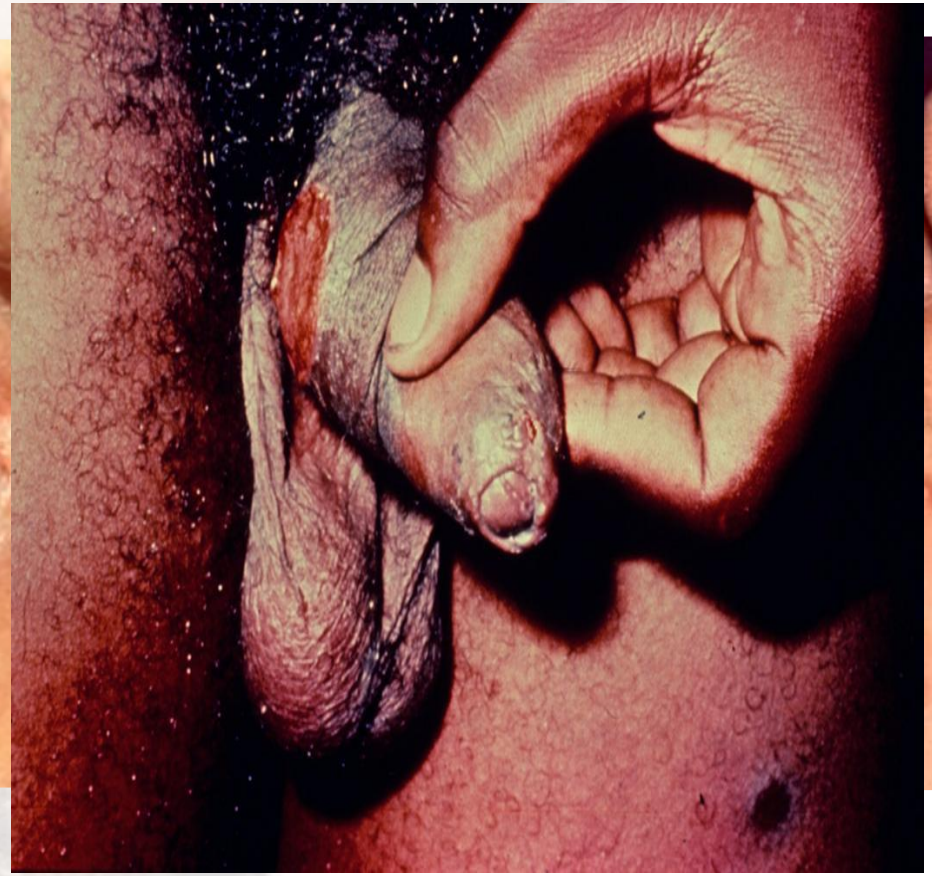
Psoriasis

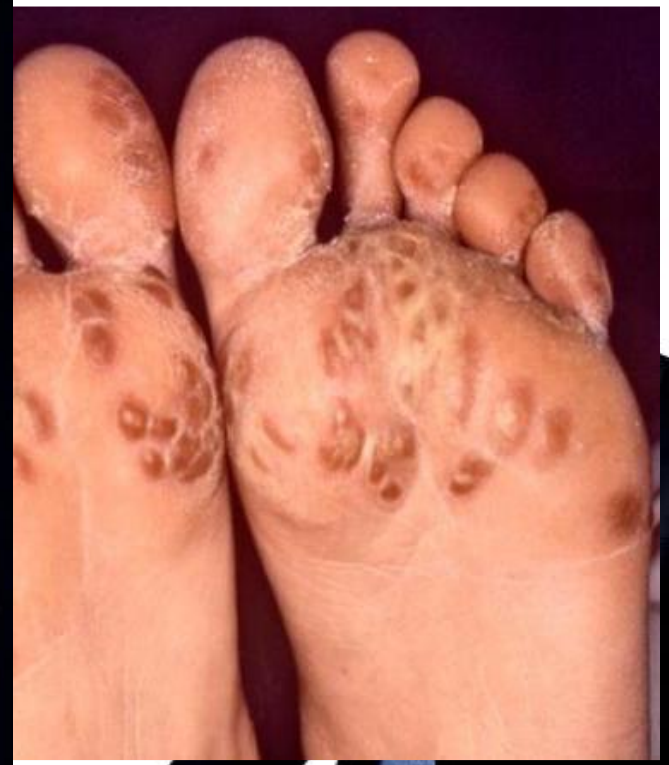




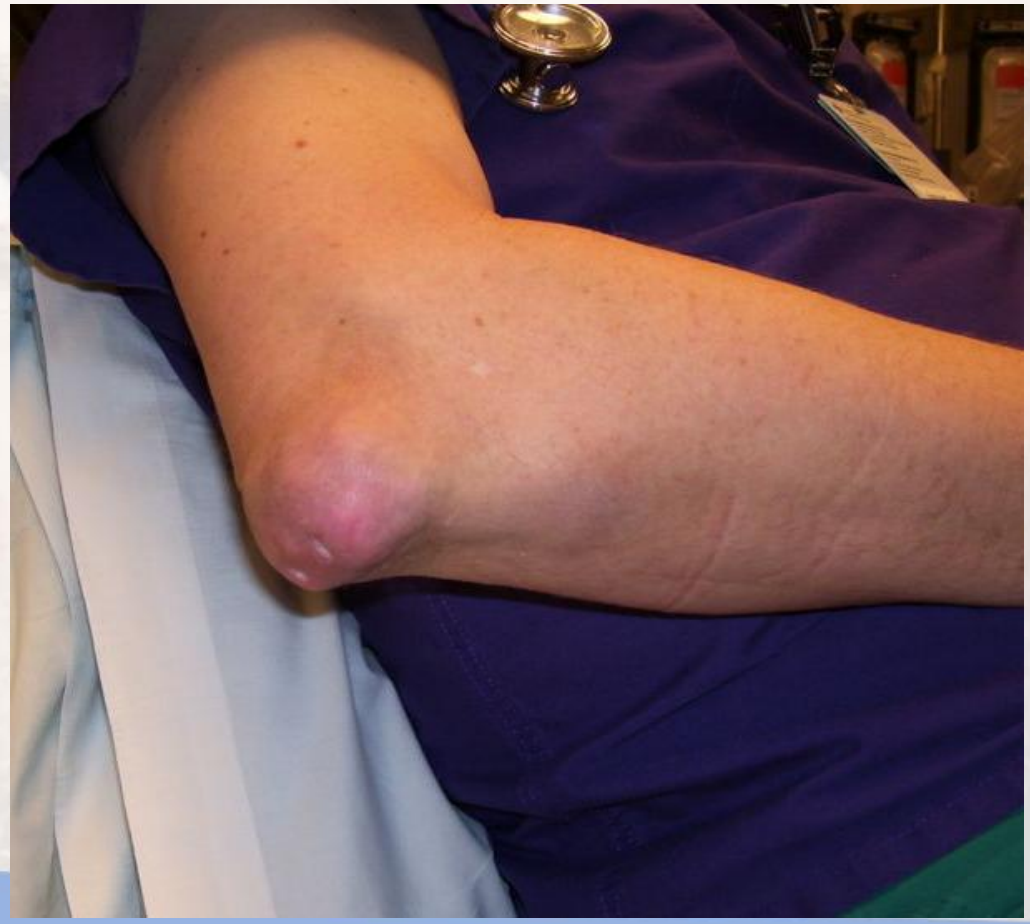
Gonoccocal arthritis

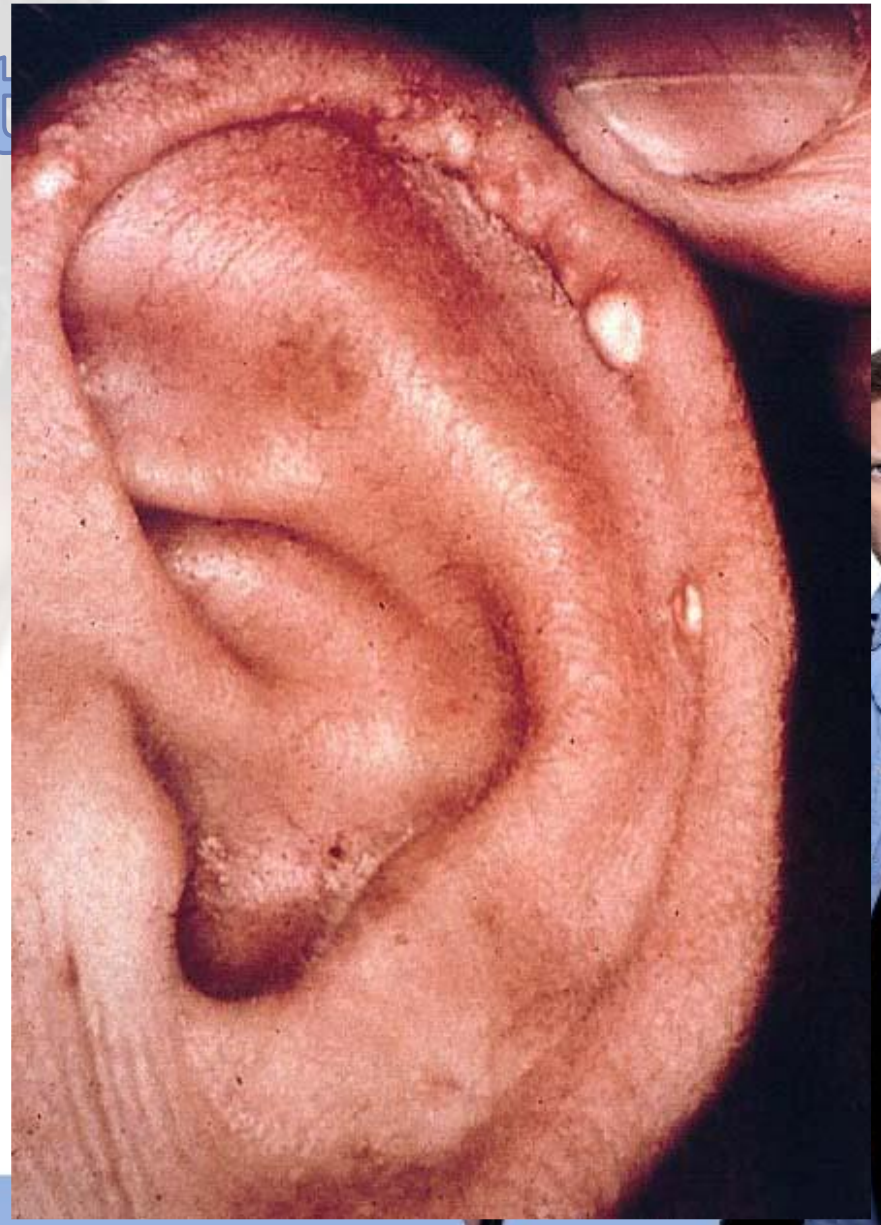






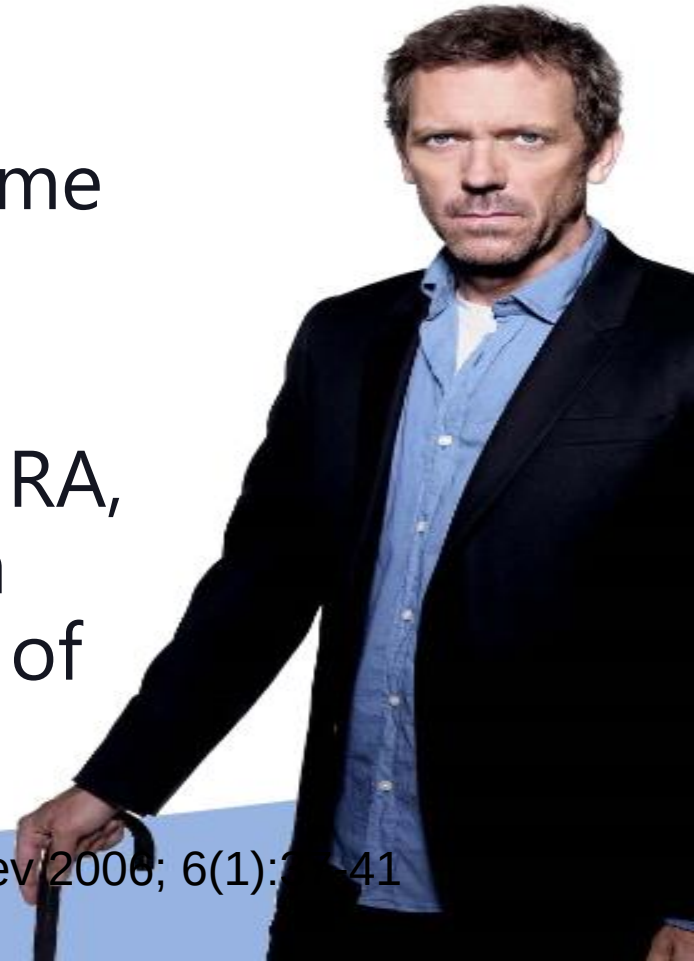
Gout



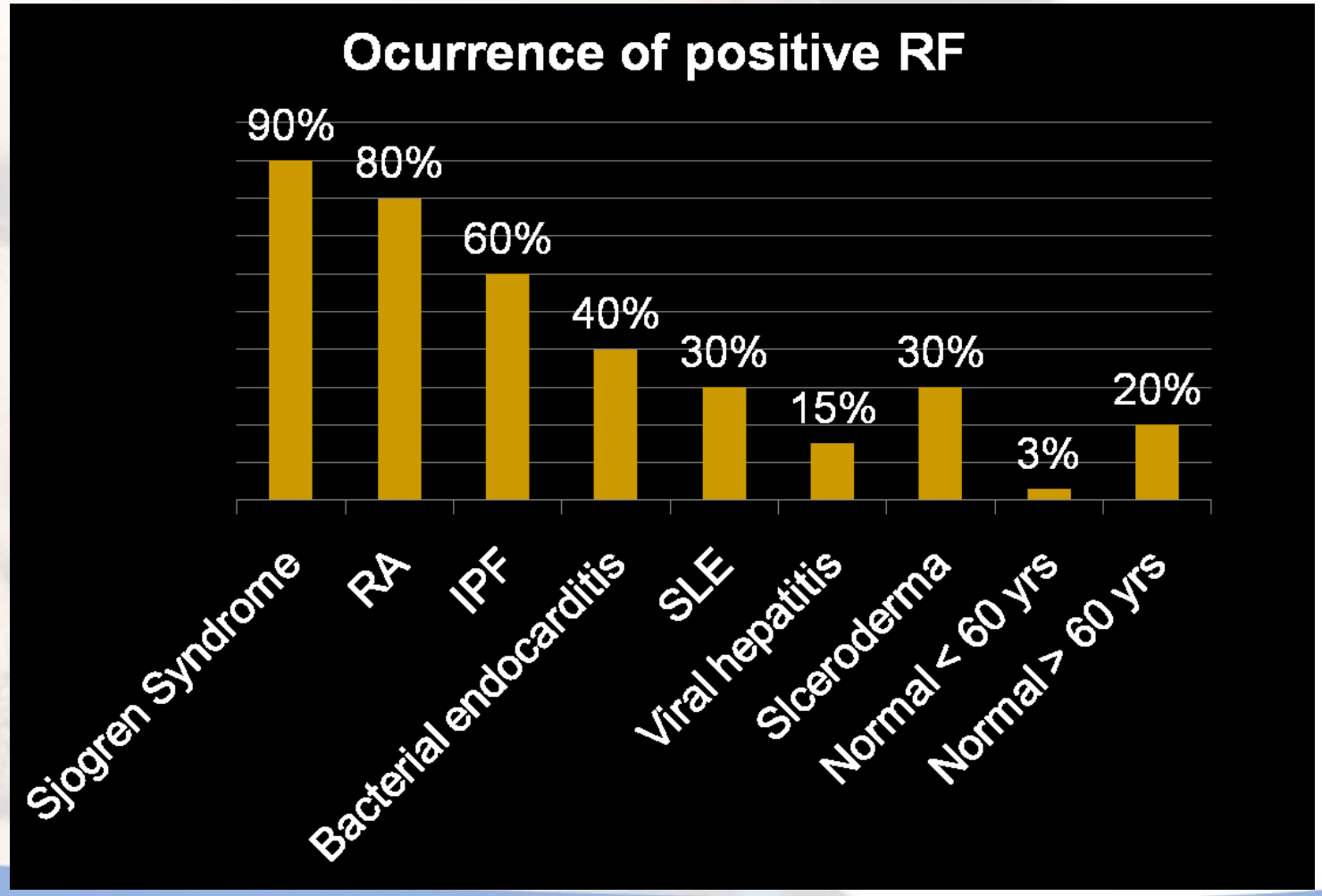


DIAGNOSTIC APPROACH

- Laboratories:
- CBC: Anemia, thrombocytosis Inflammation Neutropenia, thrombocytopenia Felty's syndrome Hemolysis, thrombocytopenia SLE
- Elevated ESR, CRP inflammation
- CCP antibodies: Positive in 40% of RF negative RA, CCP is far more specific for RA than RF is, but a negative result does not exclude the diagnosis of RA



Van Venrooij WJ, Autoimmun Rev 2006; 6(1):1[illegible]41


Ocurrence of positive RF
90%
80%
60%
40%
30%
15%
30%
3%
20%
Sjogren Syndrome
RA
IPF
Bacterial endocarditis
SLE
Viral hepatitis
Slceroderma
Normal < 60 yrs
Normal > 60 yrs

Synovial fluid analysis

condition	Appearance	WBC count	PMN%	Other
Normal	Clear/straw	< 200	< 25%	
Trauma	Clear/bloody	< 2000	< 25%	
OA	Clear/slightly cloudy	< 2000	< 25%	Occasional cartilage fragments
Infection	Cloudy/purulent	> 50000	> 80%	Organisms on gram stain
RA	Cloudy/light yellow	< 10000	75%	Occasional cholesterol crystals
Gout	Cloudy/white or yellow	> 10000	75%	MSU crystals
Pseudogout	Cloudy/white or yellow	> 10000	75%	CPPD crystals

Patient History

Evaluation of pain
Site, severity, characteristics,
relieving factors, aggravating factors

Temporal variation of symptoms
Morning – inactivity stiffness
Evening – activity stiffness
Nocturnal pain

Past and associated illness
e.g. non-gonococcal urethritis,
inflammatory bowel disease, psoriasis

Drug treatment
e.g. with diuretic therapy,
latrogenic arthritis,
response to antirheumatic agents

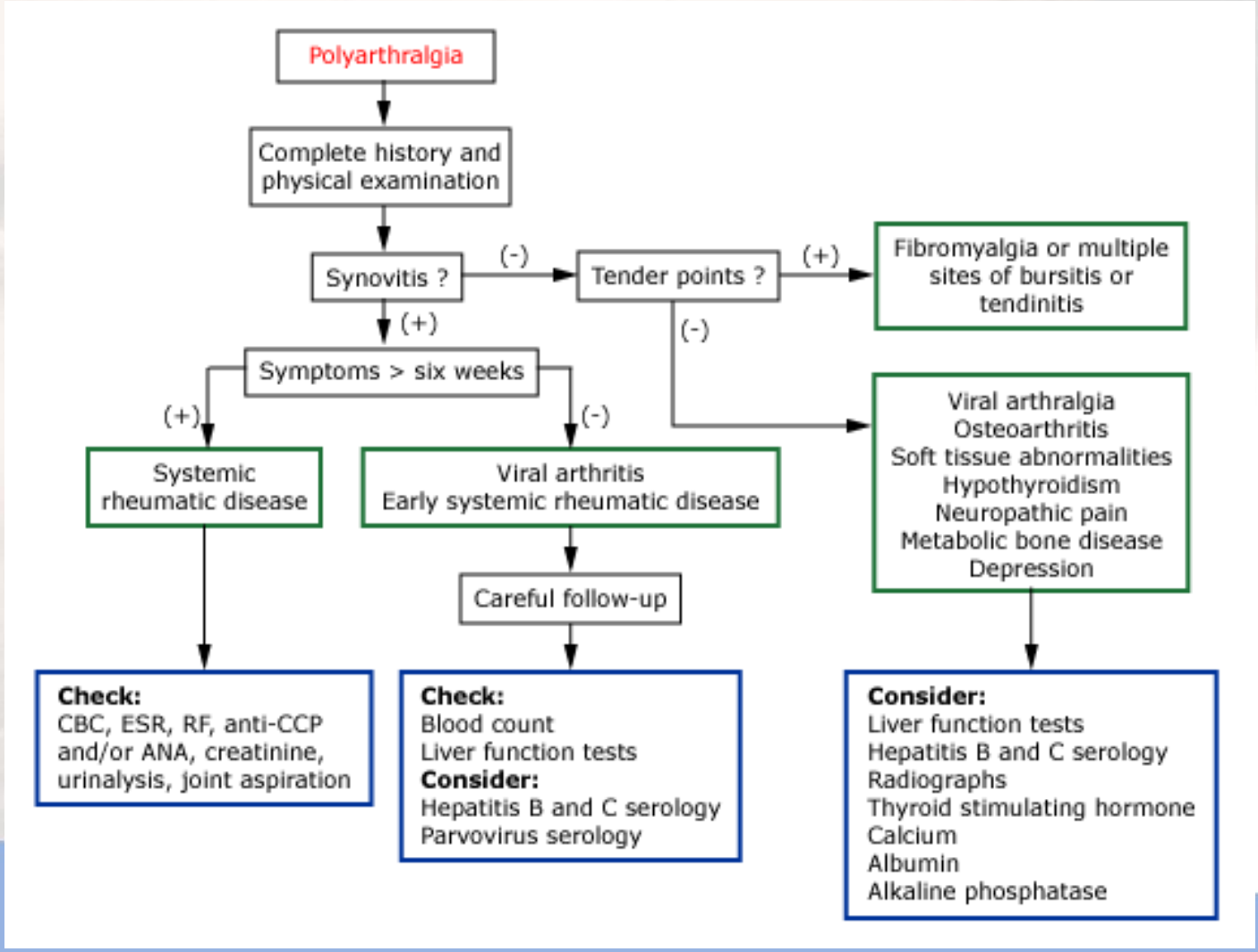
Degree of disability
Assessment of ability to
carry out daily activities

Family history
Arthritis,
chronic backache
and/or associated disease

Predisposing factors
e.g. trauma, excessive use

Duration and onset of symptoms
Acute or insidious onset,
duration of symptoms

Summary…

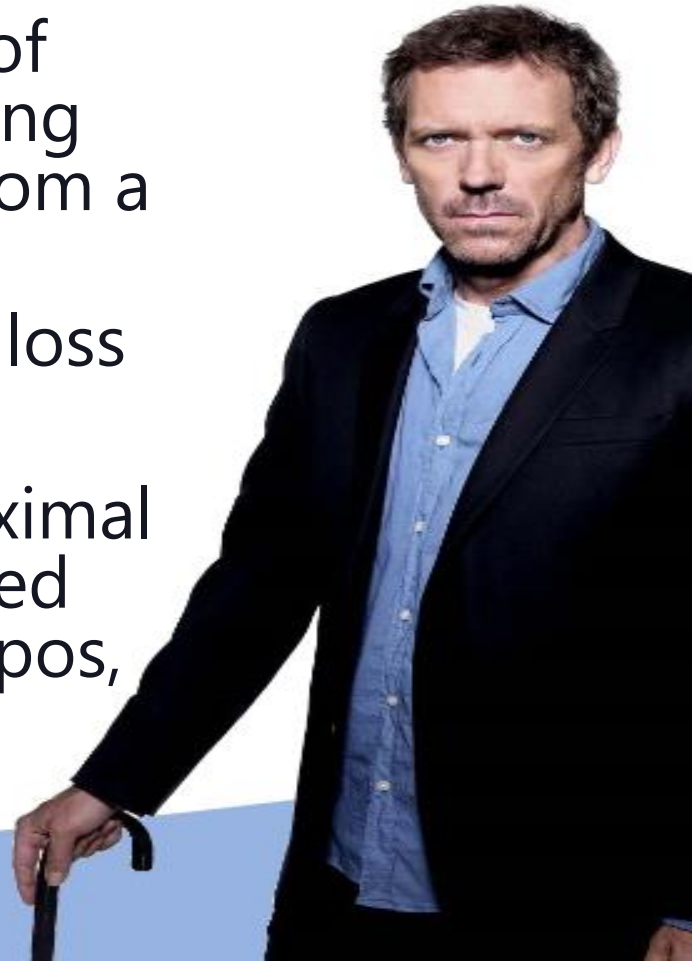

Polyarthralgia
Complete history and physical examination
Synovitis ?
(-)
Tender points ?
(+)
Fibromyalgia or multiple sites of bursitis or tendinitis
(+)
(-)
Symptoms > six weeks
(+)
(-)
Systemic rheumatic disease
Viral arthritis
Early systemic rheumatic disease
Careful follow-up
Viral arthralgia
Osteoarthritis
Soft tissue abnormalities
Hypothyroidism
Neuropathic pain
Metabolic bone disease
Depression
Check:
CBC, ESR, RF, anti-CCP and/or ANA, creatinine, urinalysis, joint aspiration
Check:
Blood count
Liver function tests
Consider:
Hepatitis B and C serology
Parvovirus serology
Consider:
Liver function tests
Hepatitis B and C serology
Radiographs
Thyroid stimulating hormone
Calcium
Albumin
Alkaline phosphatase


"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?'

CONNECTIVE TISSUE DISEASE
Diagnostic approach:

CC: Arthralgia and muscle weakness

- HPI: 46 yr African lady who presents with 6 months of arthralgia in shoulders, hands, knees and feet. Swelling wrists, and PIP's. She also has difficulty getting up from a chair, and combing her hair.
- ROS: Easy bruisability, Raynaud's phenomenon, hair loss
- PMH, PSH, social history and family history: NC
- PE: Diffuse hair loss, TJC 26, SJC 9. Weakness in proximal arms, legs and neck flexors Labs: Leukopenia, elevated AST, CPK 1000, aldolase 12, UA: nl, ANA 1:640, RNP pos, C3 120, C4 8



History pearls:

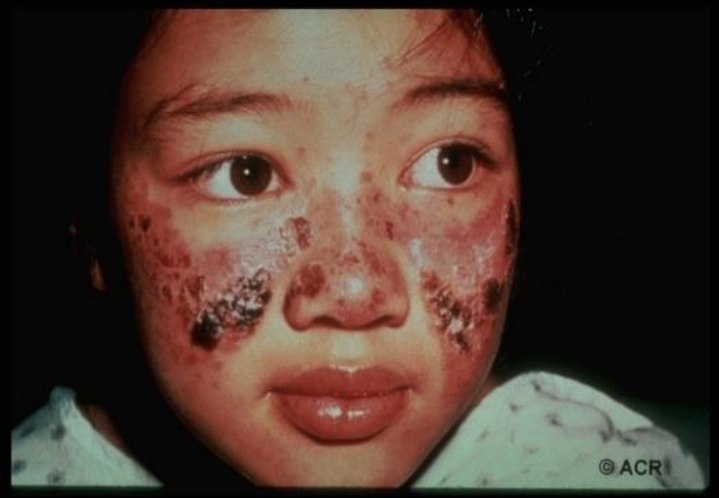
- Multisystem organ involvement is common
- Constitutional: Fatigue, fever, weight loss
- Eyes: Sicca(dryness), redness, pain
- ENT: Sicca, oral/nasal ulcers, dysphagia, sore throat
- Heart: Chest pain, orthopnea, PND
- Lungs: Pleuritic pain, dyspnea, cough
- Abdomen: GERD, bowel changes, GIB
- Joints: Pain, swelling, stiffness

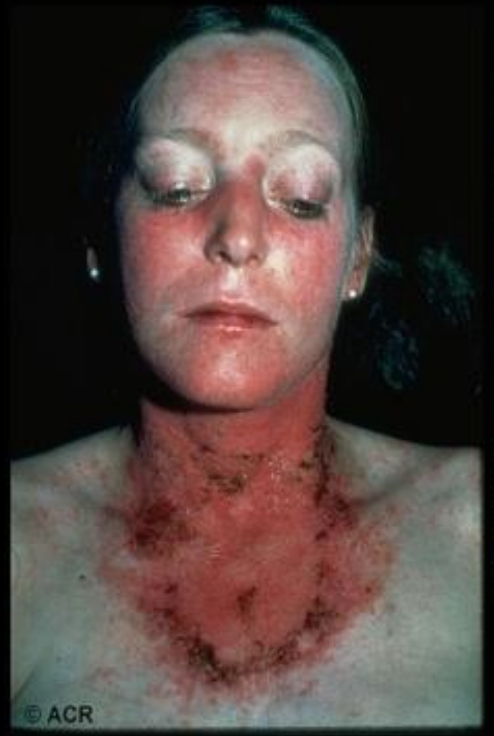
- Skin: Photosensitivity, hair loss, rashes, Raynaud’s, nail changes
- Neurological: Neuropathy, muscle weakness, mental status changes, headache, seizures
- Psychiatric: Depression, psychosis
- GU: genital ulcers

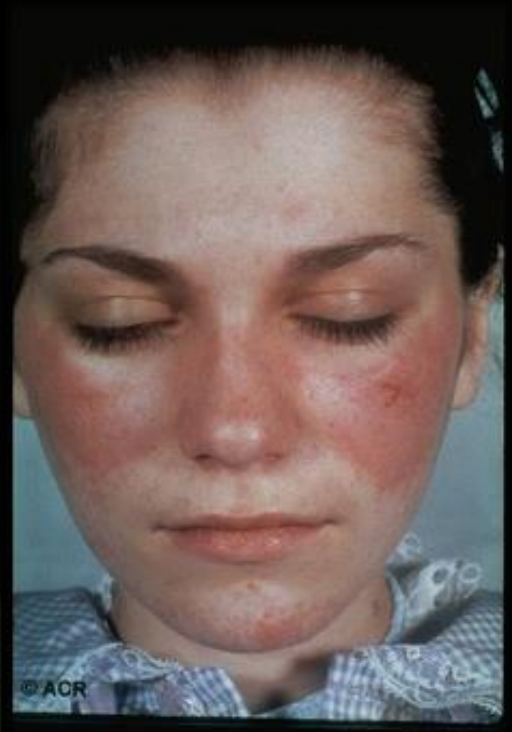
- Physical exam pearls:
- Head to toe examination

Know It When You See It

- “Butterfly”/Malar rash
- Involves cheeks, spares nasolabial fold



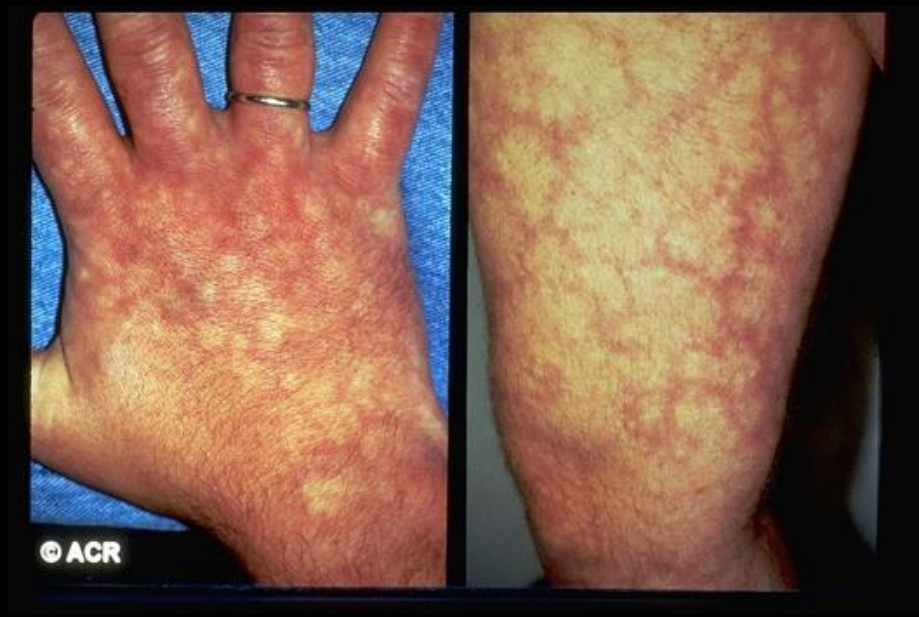




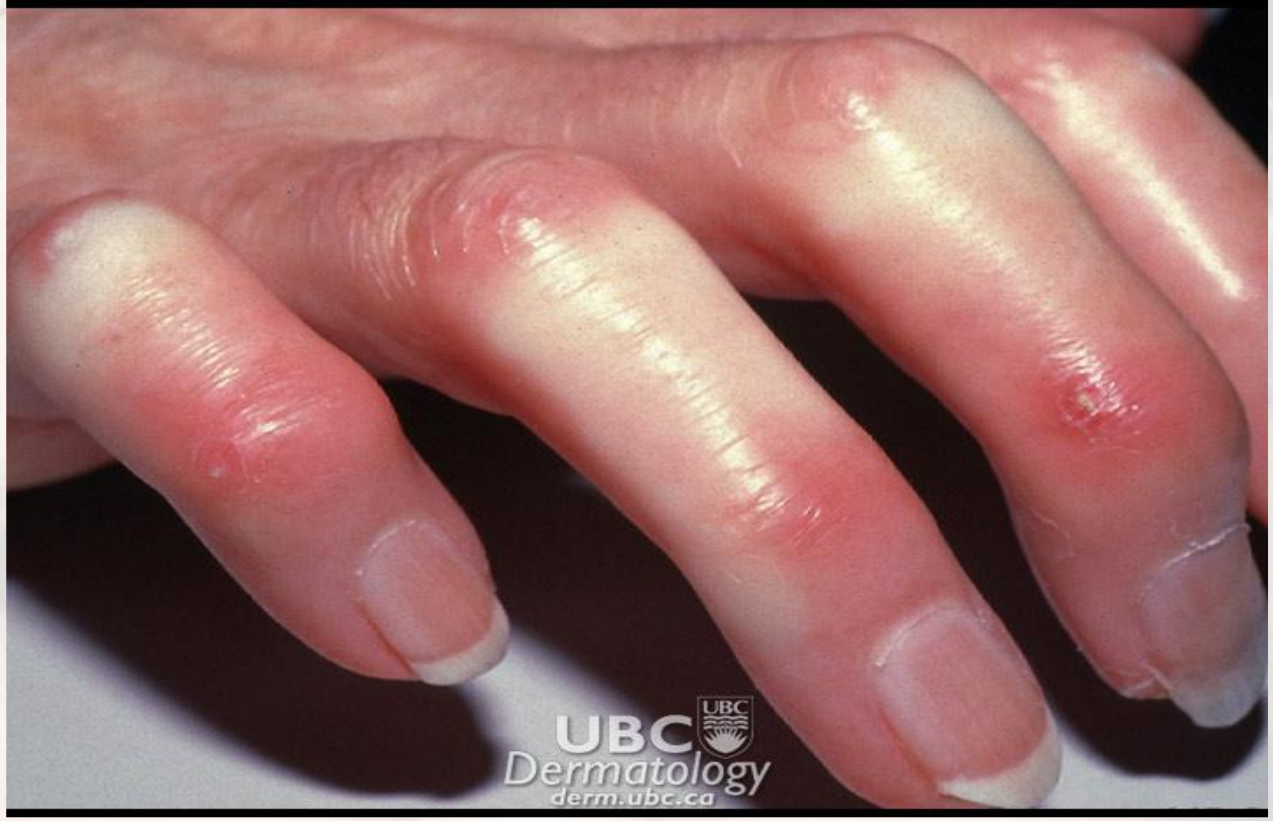
Systemic lupus erythematosus

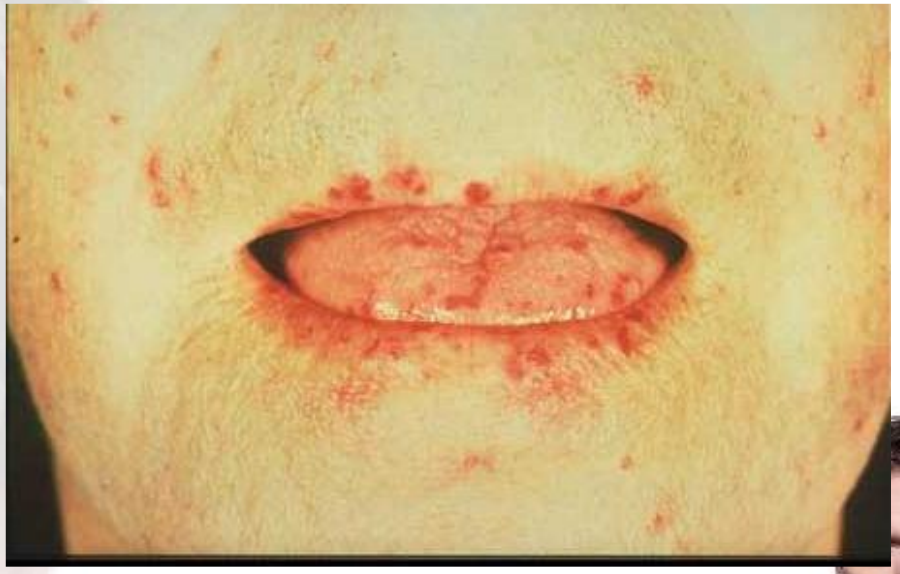
Know It When You See It

- Appears in a broad-based interrupted pattern in systemic vasculitis, including SLE
- May occur as a fine, connected, lacy pattern in normals

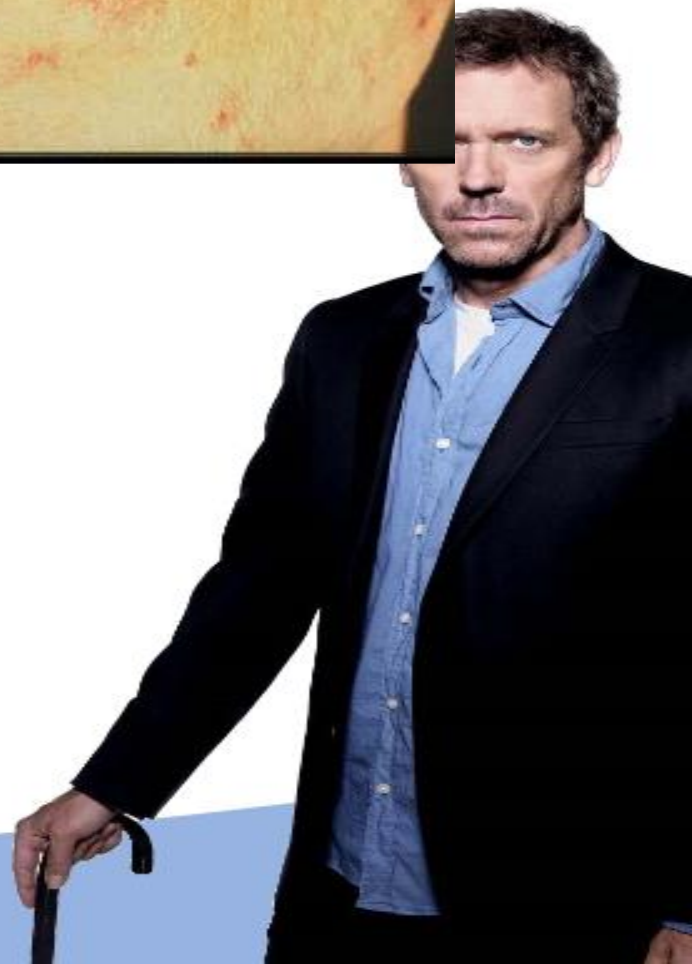


Livedo reticularis



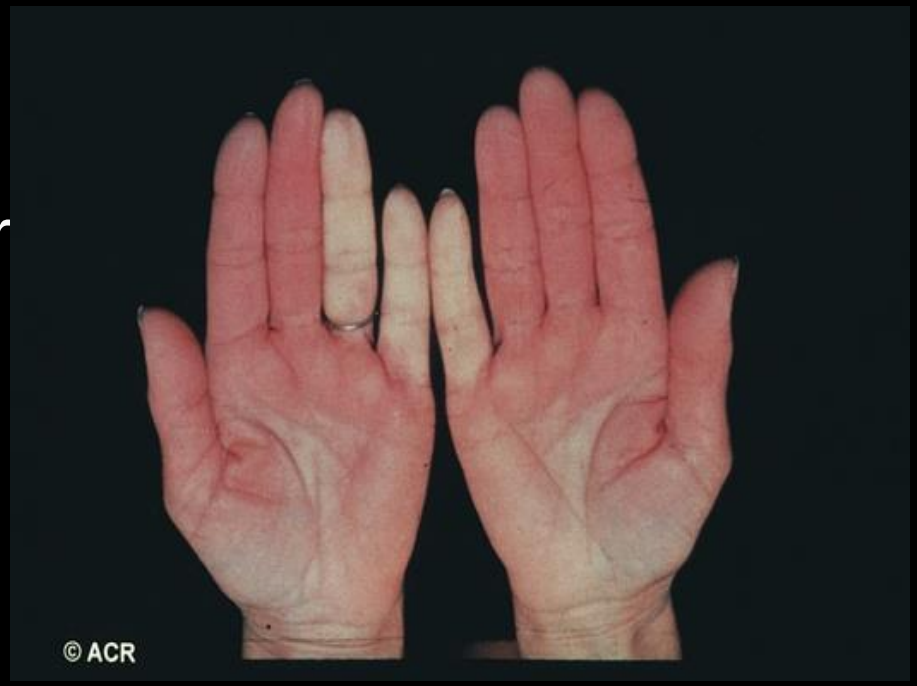


Systemic sclerosis

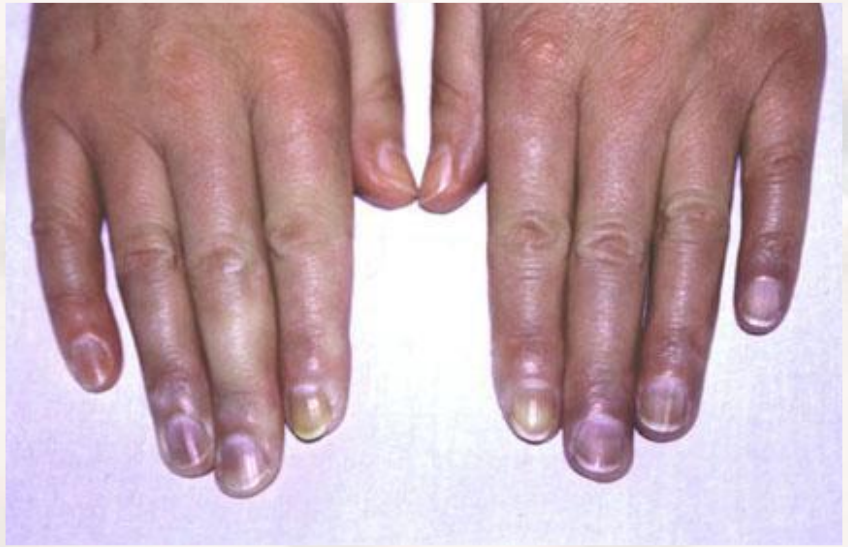


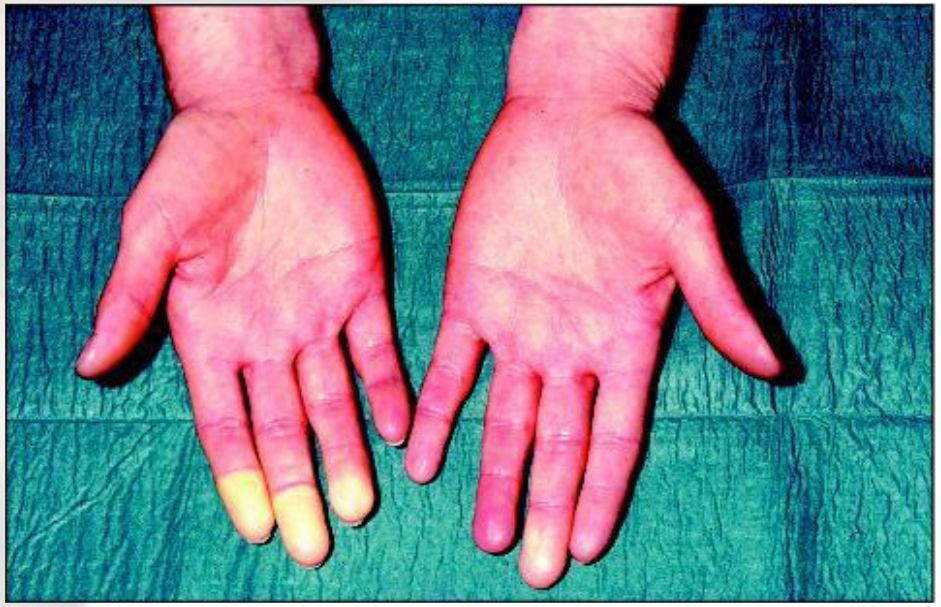
Know It When You See It

- Can be 1º or 2º
- Stress/cold can trigger
- Keep extremities and body warm



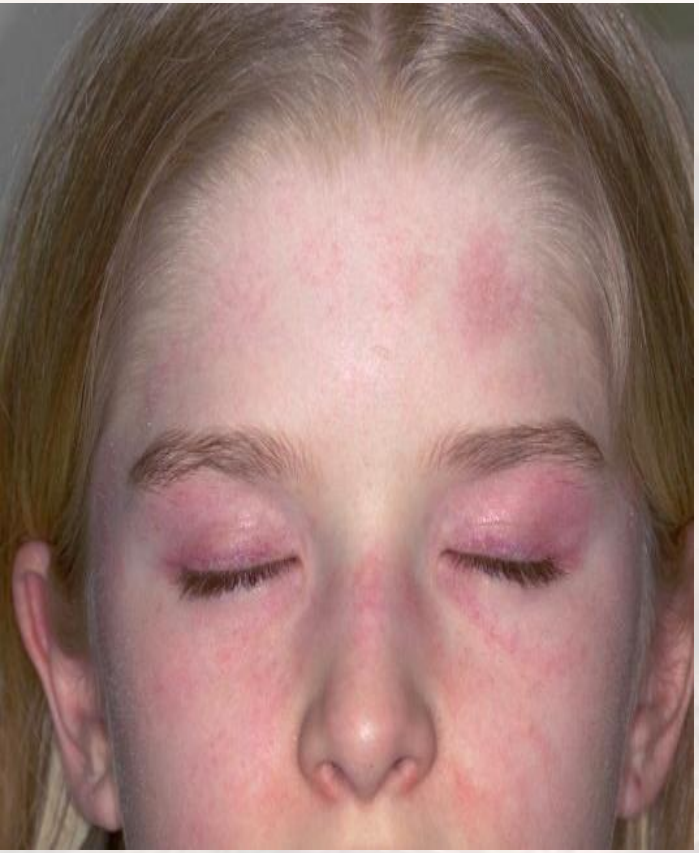
Raynaud's phenomenon

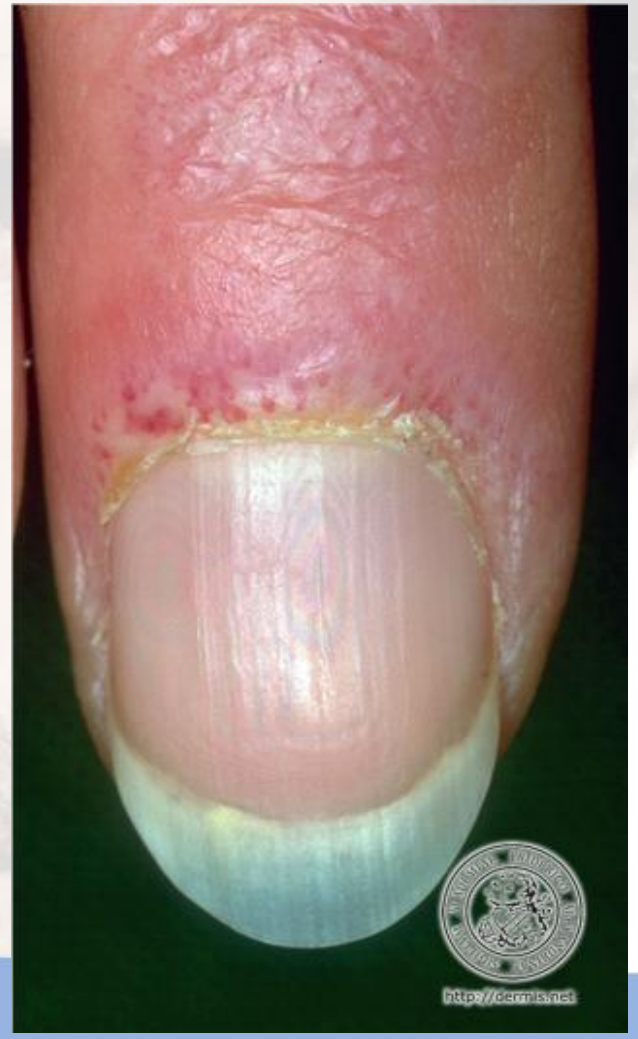


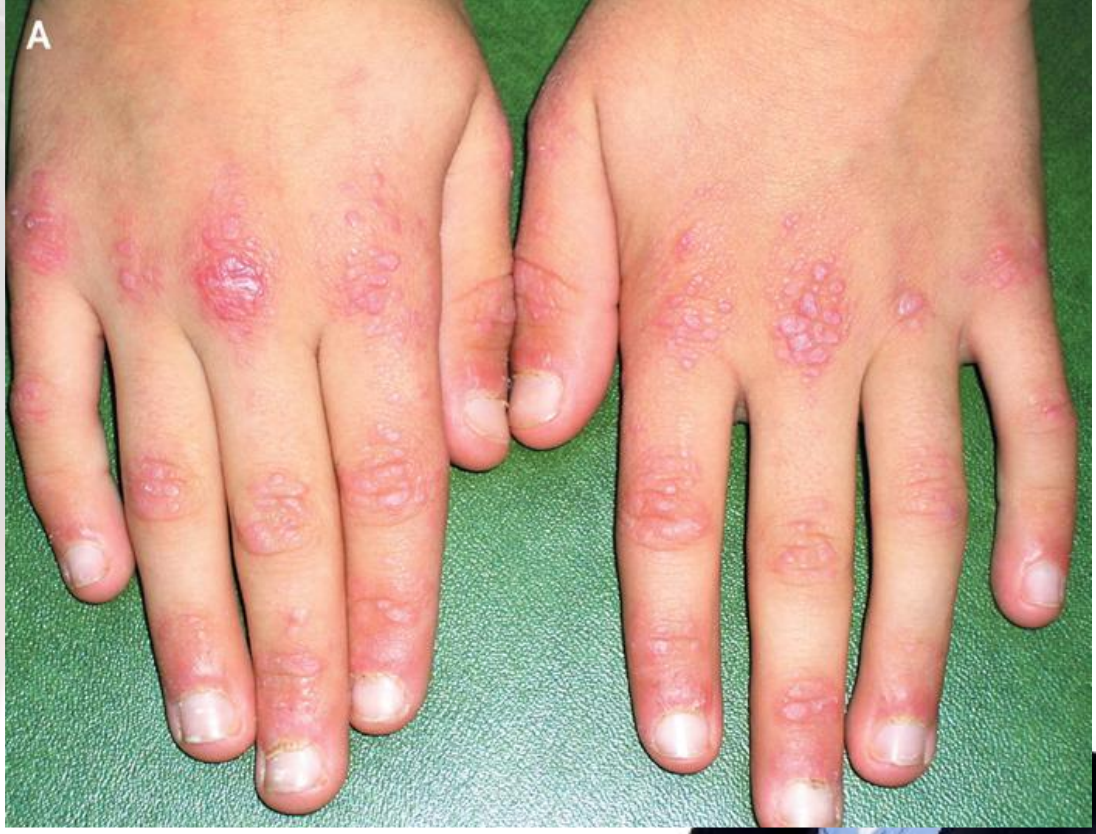


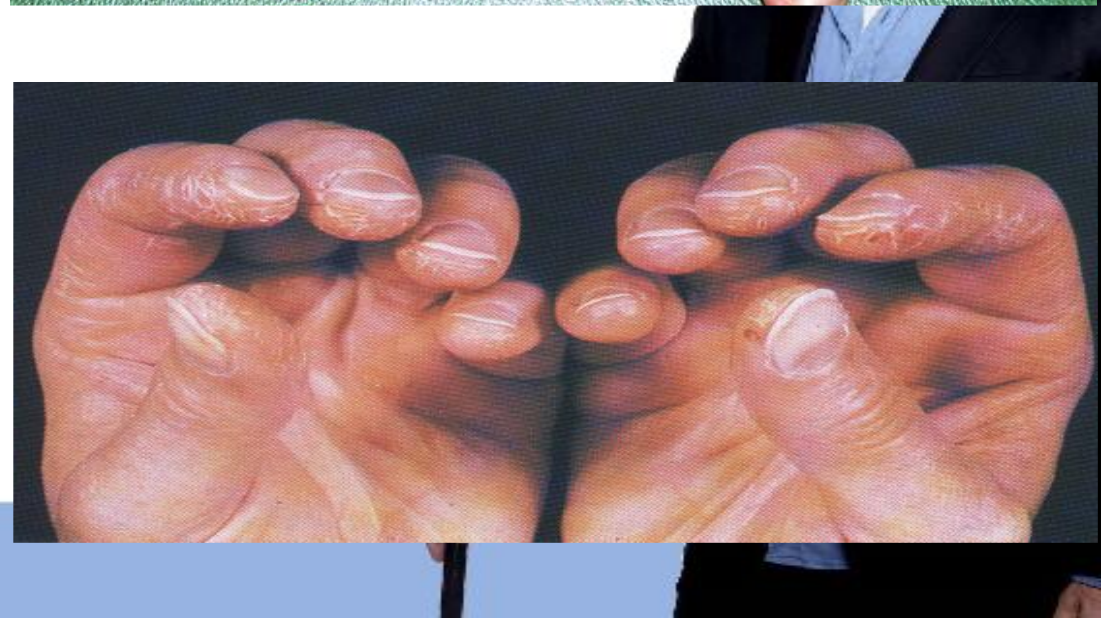
Systemic sclerosis, SLE

Dermatomyositis





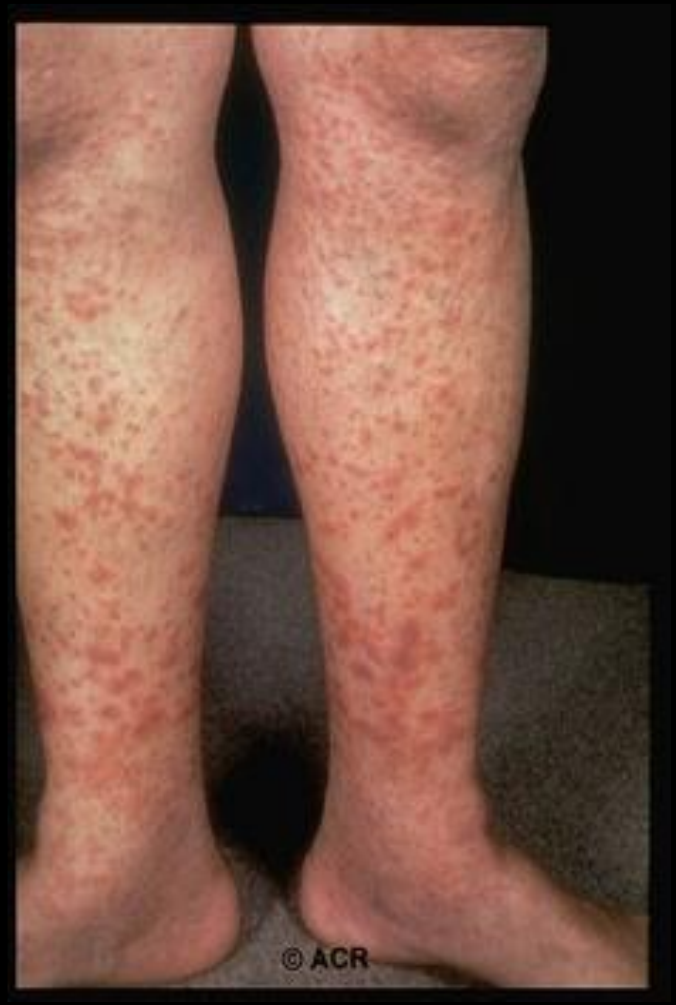




Know It When You See It

- Characteristic of dermal vasculitis

Palpable purpura



CONNECTIVE TISSUE DISEASE

	Systemic lupus erythematosus	Sjögren's syndrome	Systemic sclerosis	Idiopathic inflammatory myositis
Constitutional signs and symptoms (eg, fever, fatigue, and weight loss)	Common	Fatigue (severe)	Less prominent primary symptoms	Common, mainly fatigue, usually without fever
Arthritis or arthralgia	Common, typically nonerosive	Common, nonerosive	Arthralgia common, synovitis rare	Polyarticular, and mild, erosive, and deforming with anti-Jo-1
Muscle symptoms	Myalgia, myositis (1–4%)	Myalgia	Myalgia, disuse atrophy, myositis (rare)	Substantial weakness, occasional pain
Mucocutaneous manifestations	Malar, discoid rashes, photosensitivity, mouth ulcers	Dryness, oral infections, hypergammaglobulinaemia purpura	Skin fibrosis, sclerodactyly, calcinosis, telangiectasia†	Rashes with dermatomyositis (eg, Gottron's papules, heliotropic rash eyes, V signs, and shawl signs)
Raynaud's syndrome	Yes (about 20% of patients)	Yes	Frequent, severe	Yes
Sicca syndrome	10–20% of patients	Prominent mouth and eyes	Occasional	<10% of patients
Cardiovascular disease	Pericarditis, early cardiovascular disease, and Libman-Sacks endocarditis	Uncommon	Right heart failure and secondary pulmonary hypertension	Arrhythmias, valvular heart disease, and ischaemia
Pulmonary symptoms	Serositis, pulmonary embolism, interstitial lung disease, pulmonary hypertension, shrinking lung	Chronic cough and lymphoproliferative disorders	Interstitial lung diseas and pulmonary hypertension (10–50% of patients)	Dry cough, shortness of breath, respiratory muscle weakness, interstitial lung disease, pulmonary hypertension, and bronchiolitis obliterans organising pneumonia
Gastrointestinal symptoms	Mesenteric vasculitis	Dysphagia and primary biliary cirrhosis	Oesophageal dysfunction, gastro-oesophageal reflux disease, diarrhoea, and faecal incontinence	Dysphagia most common, gastro-oesophageal reflux disease
Renal symptoms	Yes (30–50% of patients), glomerulonephritis	Interstitial lymphocytic nephritis, distal tubular acidosis, and interstitial cystitis	Renal crisis (diffuse systemic sclerosis), more common mild dysfunction	Very rare
Neurological symptoms	Headache, mood, cognitive disorders (20–30% of patients), other more severe and rare	CNS, peripheral nervous system, autonomic nervous system; Adie's pupil, orthostatic intolerance	Very infrequent, includes cranial neuropathies	CNS very uncommon
Haematological symptoms	Common, decreased white cell count, platelets, and haemoglobin	Decreased white cell count, anaemia (<10% of patients)	Anaemia secondary to gastrointestinal blood loss	Very rare

*Clinical features of systemic vasculitides in table 2. †Dependent on whether disease subtype is limited or diffuse.

Goldblatt F. Lancet 2013; 382: 797

CONNECTIVE TISSUE DISEASE
Diagnostic approach

Laboratories:

- CBC: Hemolysis, thrombocytopenia, leukopenia, lymphopenia
- CMP: Renal insufficiency, elevated LFT's, hypokalemia
- Urinalysis: Hematuria, proteinuria, active sediment, inability to acidify the urine

Laboratories:

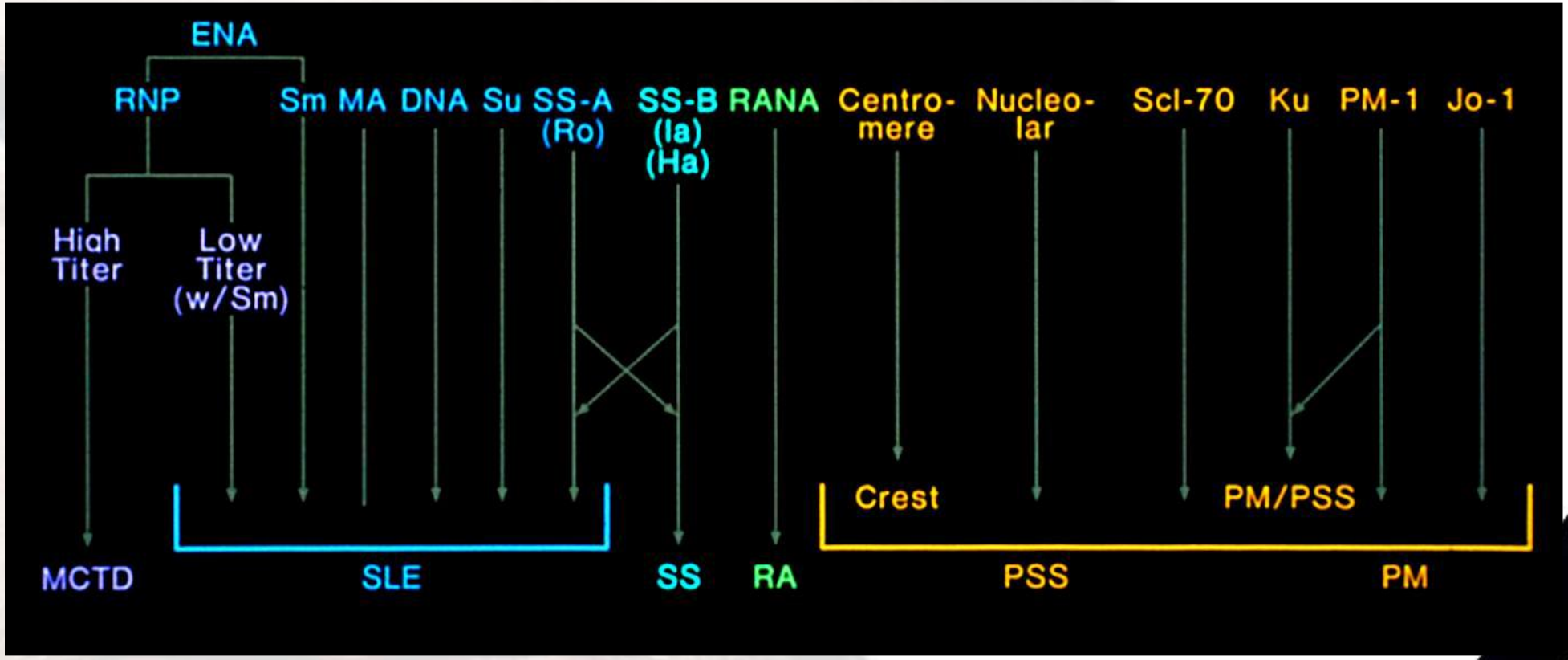
- ANA: Antibodies against nuclear specificities (e.g. DNA, snRNP)
- ANA can be seen in the normal population:

≥ 1:40: 20-30%
≥ 1:80: 10-12%
≥ 1:160: 5%
≥ 1:320: 3%

- In clinical use, ANA is insufficient to establish or refute a diagnoses
- ANA results add weight to diagnoses that throughout the evaluation should rely heavily on other clinical information

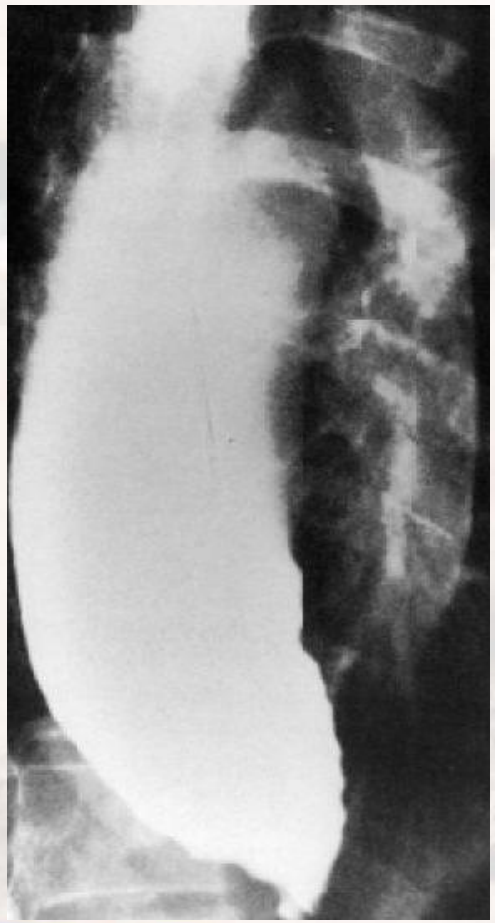
Kelley's Rheumatology Textbook- 8th Ed. (200

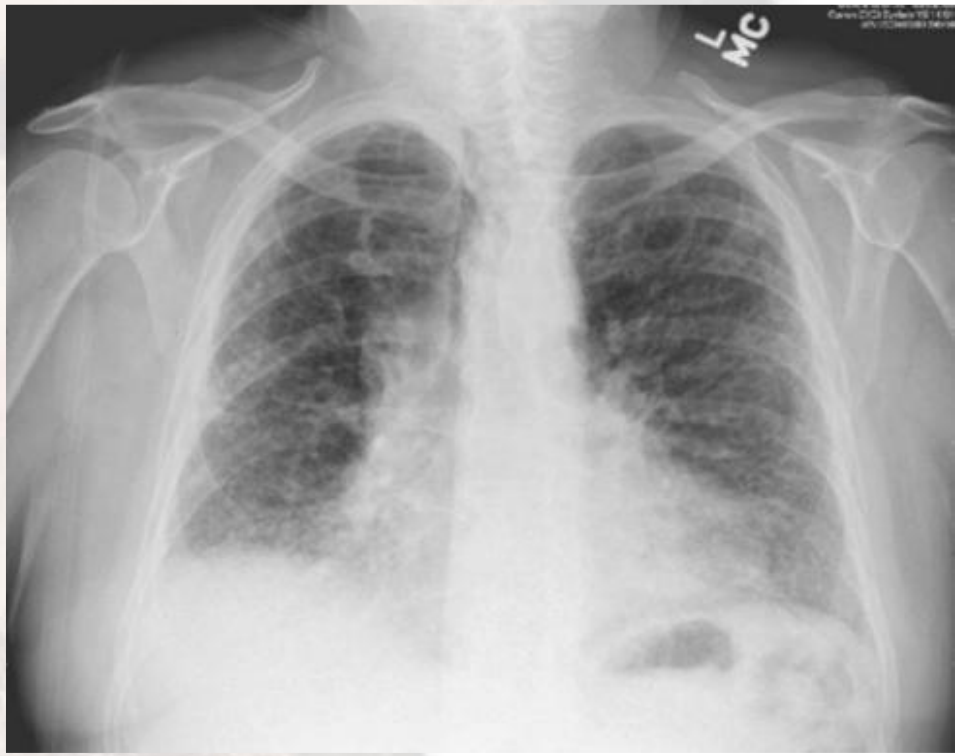
CT disease Diagnostic approach: Laboratories:

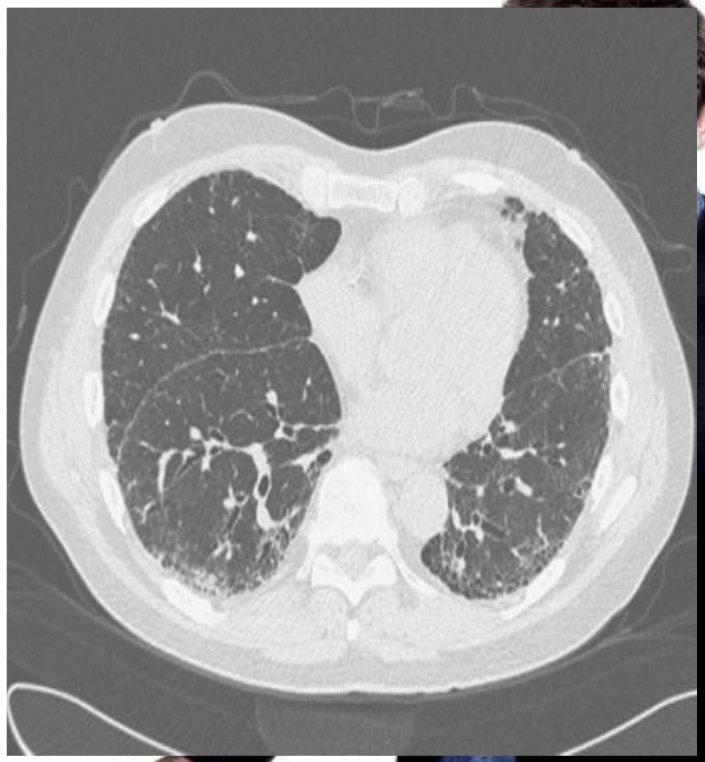


Imaging studies:

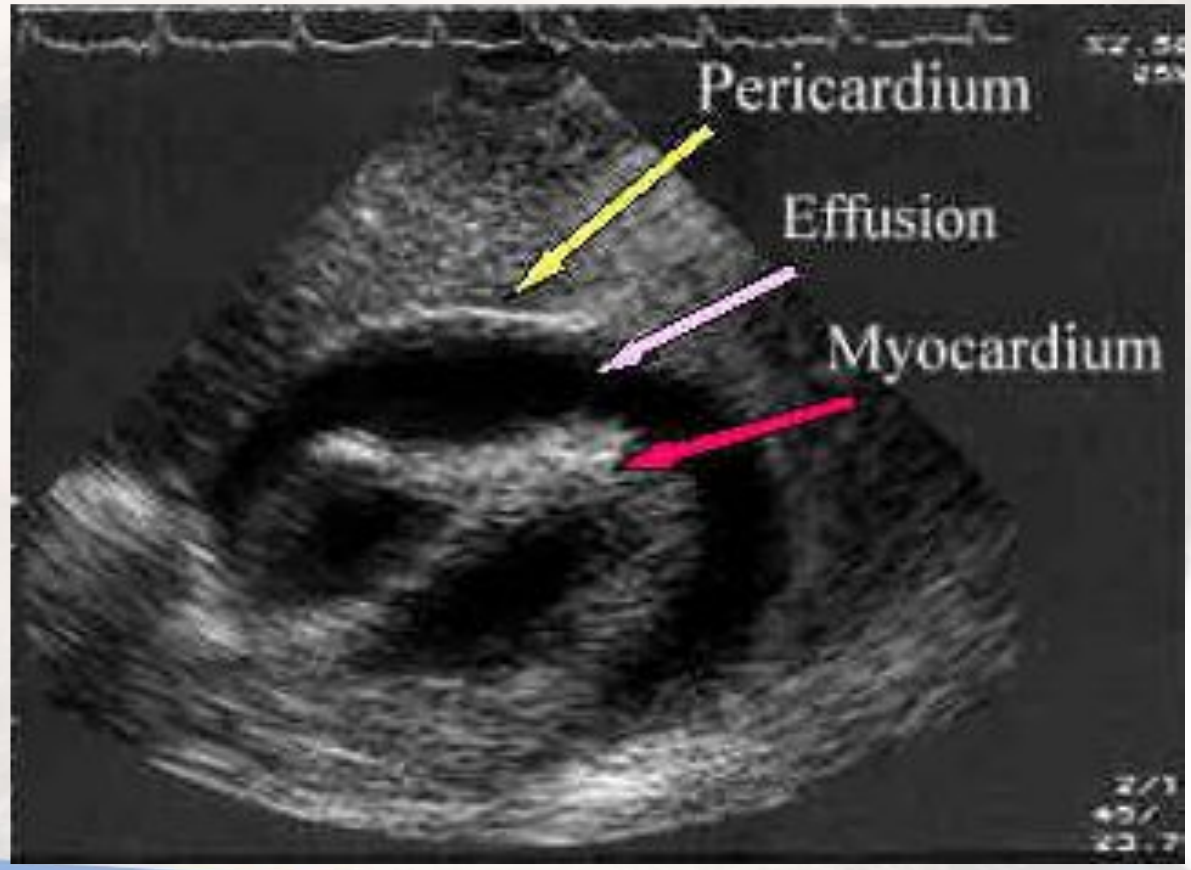
Systemic sclerosis







Imaging studies: SLE



TAKE HOME MESSAGES

• A full history and physical exam can lead to a diagnosis 80-90% of the time

• In patients with a musculoskeletal symptom characterize the pain: Is it articular?, how many joints are involved?, is it inflammatory?, is it a systemic process?, What is the duration of symptoms?

• ANAs and rheumatoid factor can be positive in multiple conditions and even in the normal population. Think of the pre-test probability for a connective tissue disease before ordering it


72-10 WITH RING
@parktyson
73-9 WITHOUT RING