

This is the way

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Rheumatology
Stritch School of Medicine
Academic year 2024-2025



Housekeeping

- Disclosures: none
- Goals:
 - Understand, patterns > memorize
 - Learn long term



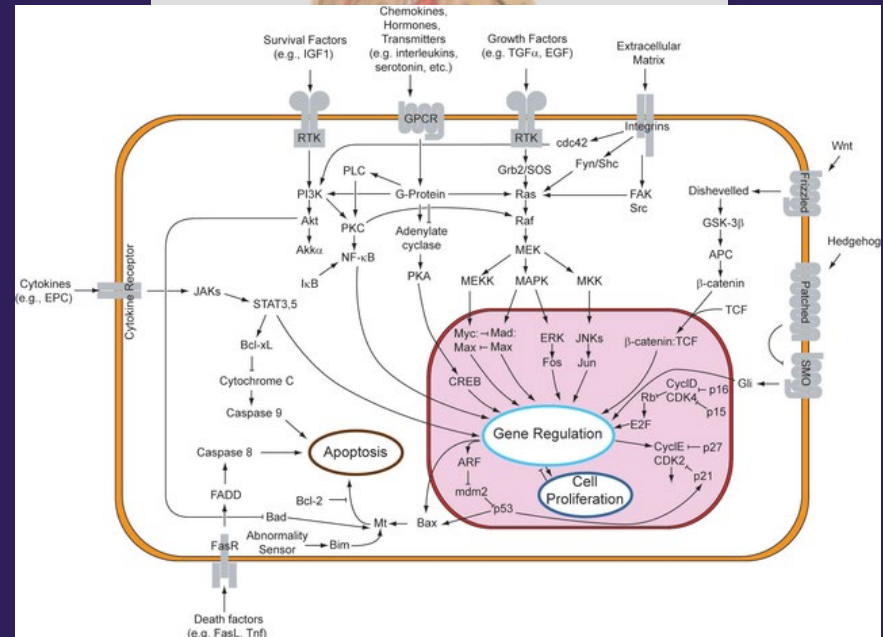
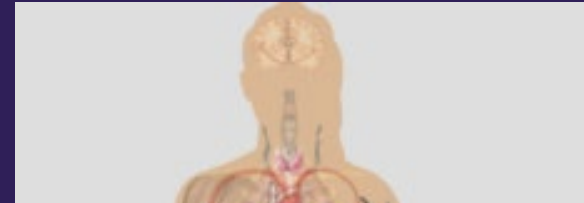
Rheumatology is complex....
but soo interesting



FUN FACTS ABOUT DR. OSLER 1845–1924

What is rheumatology?

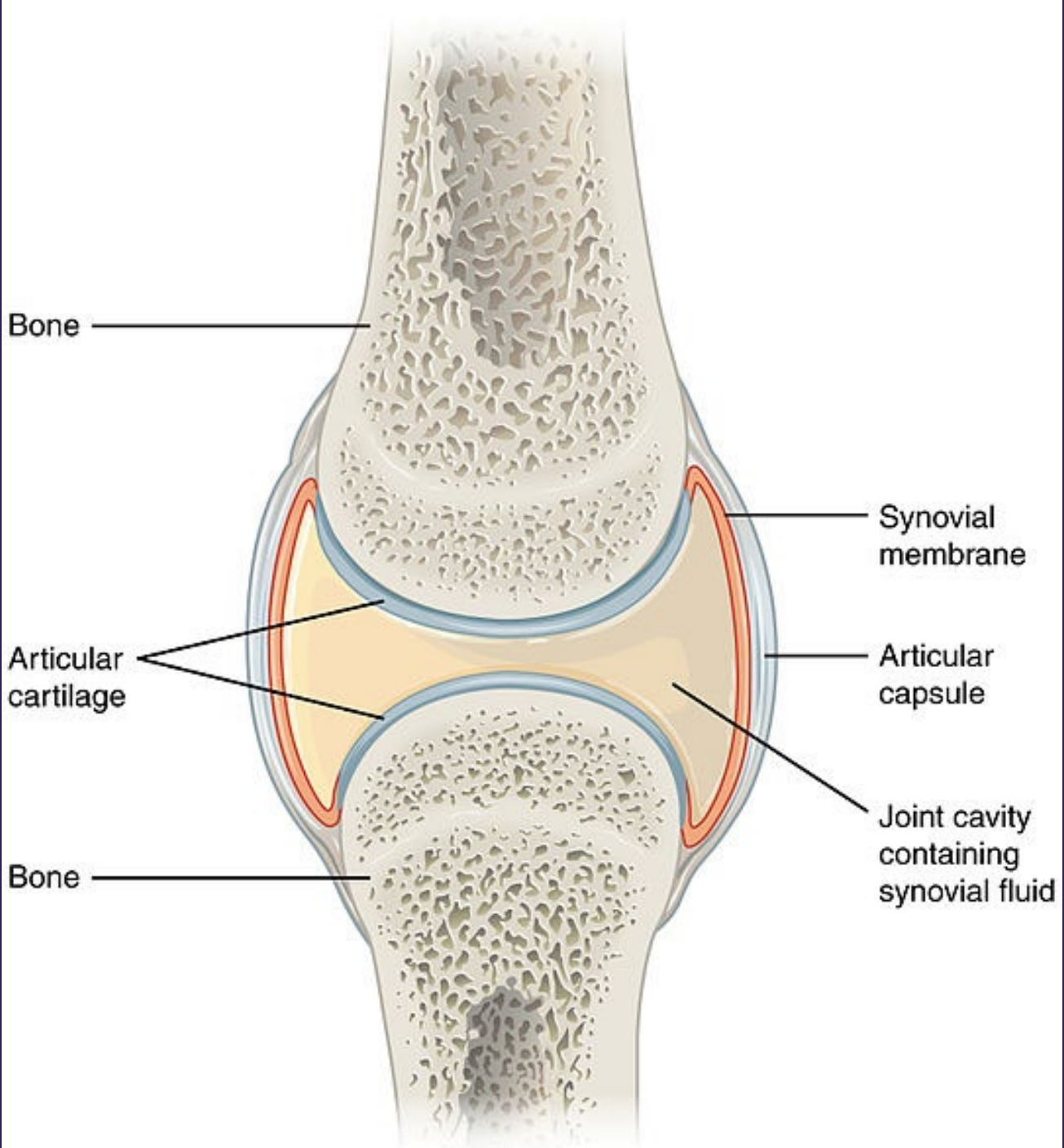
- What we tell patients
- What we tell ourselves
- You can't handle the truth
 - Treatment risk of infection and cancer
 - Fibromyalgia is NOT a rheumatological disease
- Very very RARE

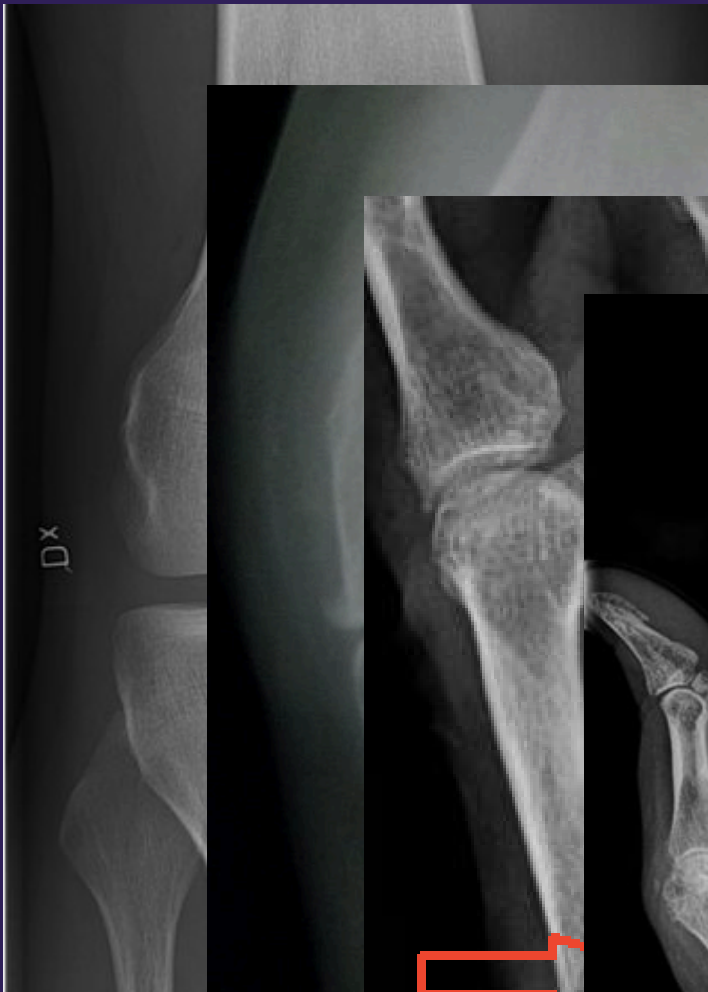


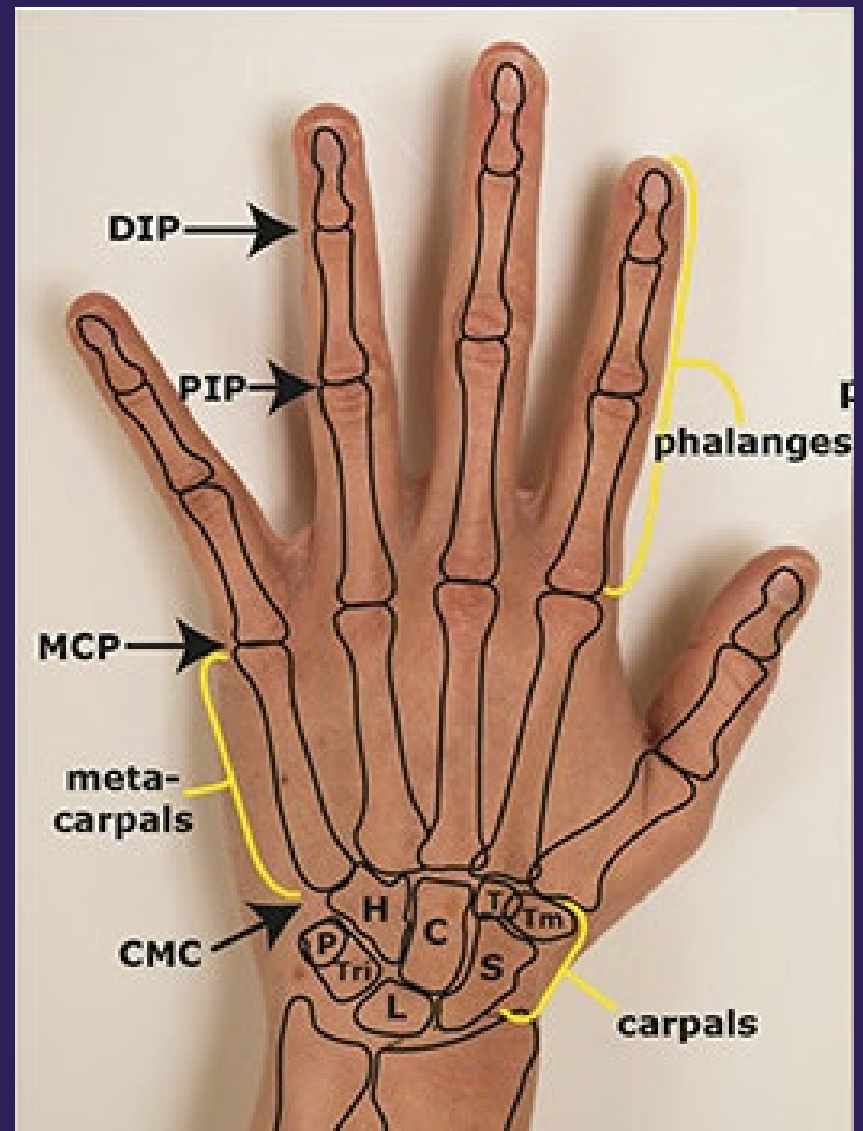
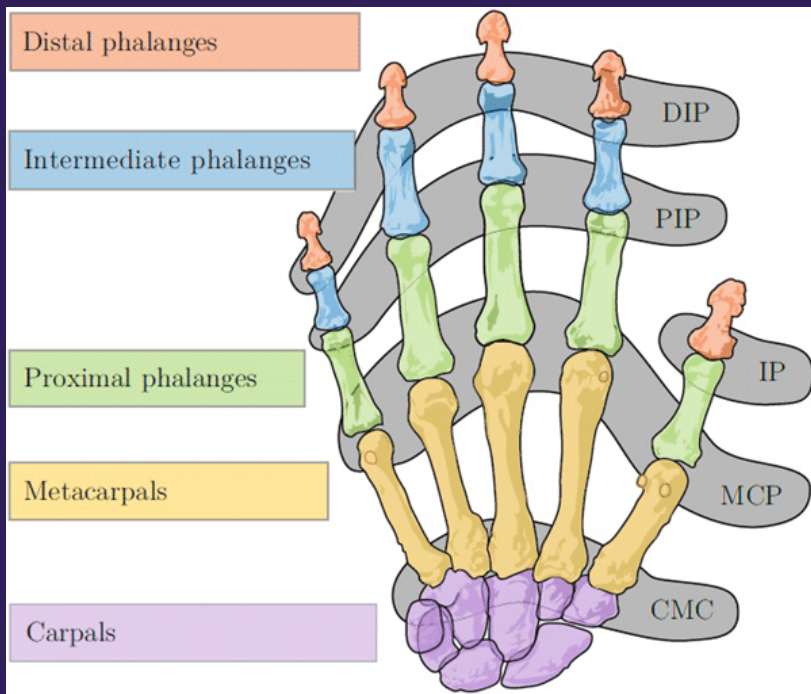
“When I see an arthritis patient
walk in the front door, my
tendency is to walk out the
back door”

- Dr Osler

Probably hated rheumatology







Joint inflammation

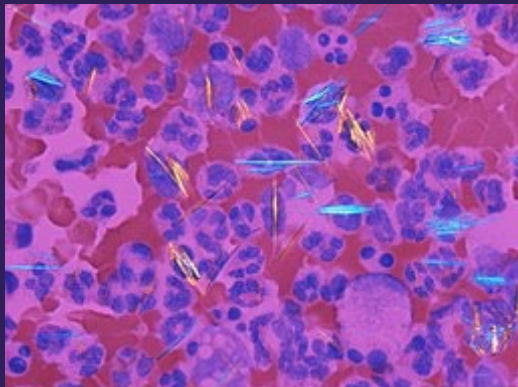
SYNOVITIS

| Clinical pattern |
|--------------------------------------|
| Monoarticular (1) |
| Oligoarticular (≤ 4) |
| Polyarticular symmetric (>4) |
| Polyarticular non symmetric (>4) |
| Spine |

| Monoarticular (1) | Pearls |
|-----------------------------------|--|
| Gout | Male, very intense, podagra, urate crystals, neg birefringent |
| Pseudogout (CPP arthritis) | Older, knee, wrist, metab dz, CPP crystals , pos birefringent |
| Septic | Always aspirate, STD (college kids vs little kids on E coast) |



Gout, in big toe, uric acid crystal



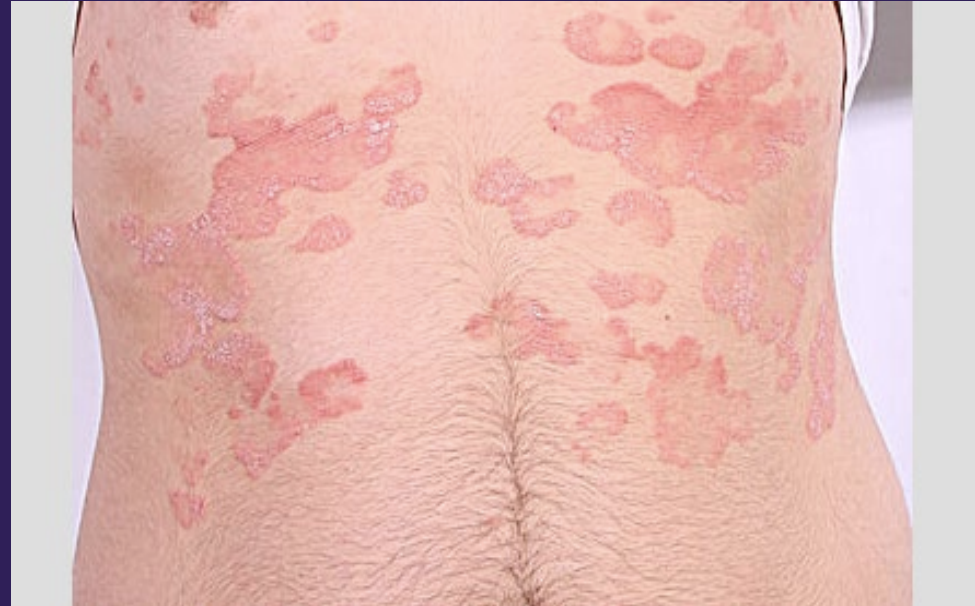
Pseudogout in knee, CPPD crystal



| Oligo (≤ 4)/polyarthritis | Pearls |
|----------------------------------|--------------------------------------|
| Psoriatic | Dactylitis, psoriasis, nail pits |
| Osteoarthritis | Mechanical, older age, mother nature |



Dactylitis of 2nd and 3rd fingers



Psoriasis

| | |
|-----------------------------|---|
| Polyarticular symmetric (4) | Pearls |
| Rheumatoid arthritis | Female, smokers, swan neck, boutonniere, am stiffness |
| Lupus | Jaccoud's is reducible |



Swan-neck & Boutonniere deformities



Jaccoud's arthropathy

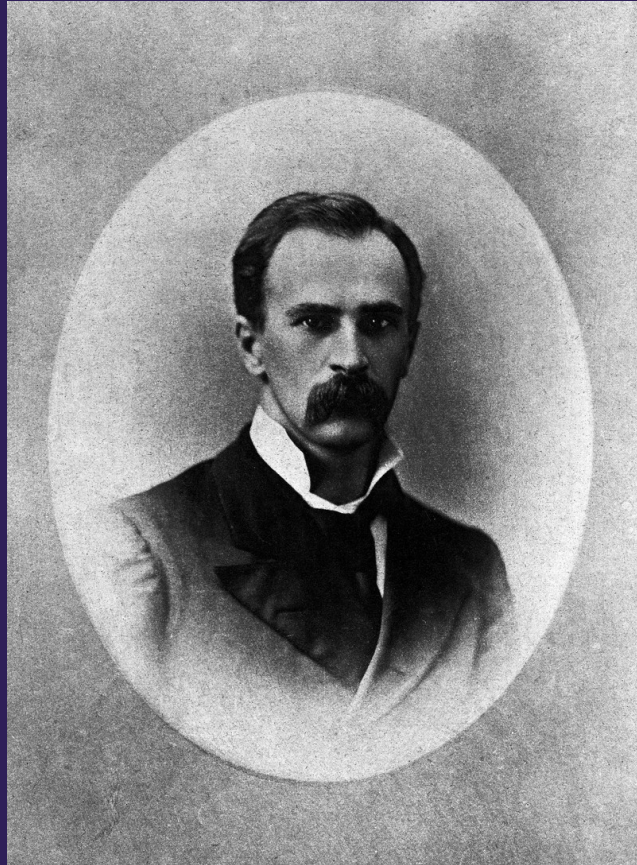


Ulnar subluxation

| Spine | Pearls |
|--|--|
| Ankylosing spondylitis | Night time back pain, activity helps, enthesitis |
| Spondyloarthropathies (IBD, psoriatic, reactive) | GI sx, rash, infection |



| Clinical pattern | Differential diagnosis | Pearls |
|----------------------------------|--|---|
| Monoarticular (1) | Gout | Male, very intense, podagra |
| | Pseudogout (CPP arthritis) | Older, knee, wrist, metab dz |
| | Septic | Always aspirate, STD |
| Oligo (≤ 4)/polyarthritis | Psoriatic | Dactylitis, psoriasis, nail pits |
| | Osteoarthritis | Mechanical |
| Polyarticular symmetric (4) | Rheumatoid arthritis | Female, smokers, swan neck, boutonniere, am stiffness |
| | Lupus | Jaccoud's is reducible |
| Polyarticular non symmetric | Sarcoid ** | Non erosive, ankles, ocular |
| Spine | Ankylosing spondylitis | Night time back pain, activity helps, enthesitis |
| | Spondyloarthropathies (IBD, psoriatic, reactive) | GI sx, rash, infection |



**Became a minister but then studied
medicine in Europe**

Weakness and/or Pain

Clinical pattern

Proximal weakness

Proximal and distal weakness

Shoulder and hip girdle pain

Proximal weakness

Esophageal dysmotility

ILD

Raynaud's

Dermatomyositis

(photosensitive)

CANCER

Heliotrope rash, V-sign rash, Shawl-sign rash

Gottron's papules

Nailfold abnormalities



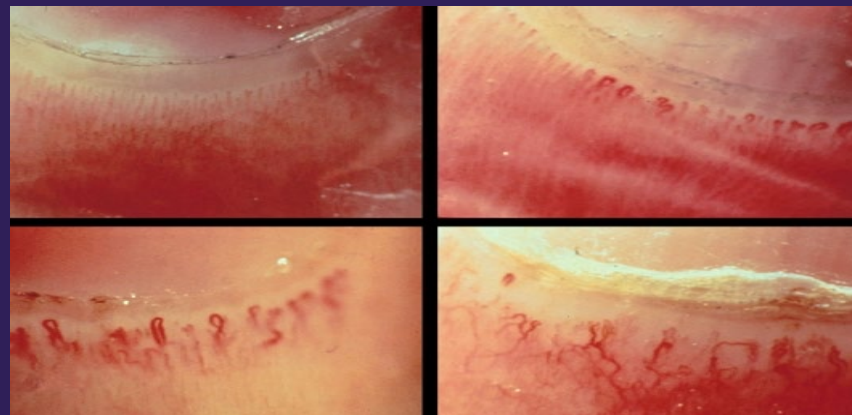
Gottron's papules



Heliotropic rash



V sign
(vs
Shawl
sign)



Nailfold
capillary
dilation

ACR
Medscape
Wikimedia
commons

Proximal weakness

Esophageal dysmotility

ILD

Raynaud's

Polymyositis

Basically everything that's not dermatomyositis



Mechanic's hands



Raynaud's

PAIN (Not weakness)

Shoulder and hip girdle pain

Polymyalgia rheumatica

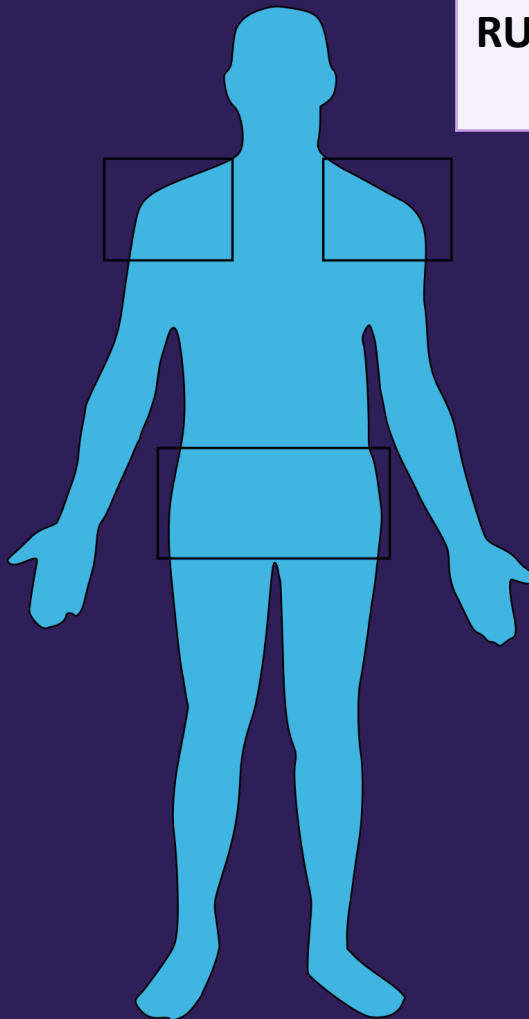
Older woman (above age 50)

Difficulty with:

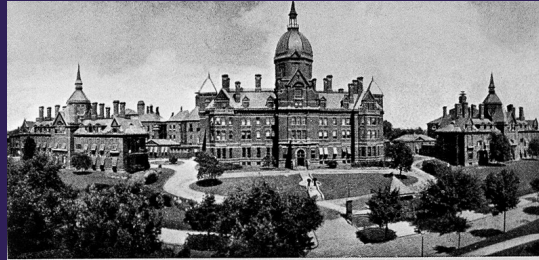
- Combing hair**
- Shaving**
- Putting on clothes**
- Rising from toilet**
- Feels 100 years old**

Some also get Giant Cell Arteritis

RULE OUT CANCER!



| Clinical pattern | Differential diagnosis | Pearls |
|---|--|---|
| Proximal weakness ILD Esophageal dysmotility Raynaud's | Dermatomyositis Polymyositis Immune mediated ** necrotizing myopathies Antisynthetase | CANCER Heliotrope rash Gottron's papules V-sign rash Shawl-sign rash Nailfold abnormalities Progresses despite d/c statin until gets rhm meds ILD Bad Raynaud's Mechanic's hands Arthritis |
| Proximal and distal weakness | Inclusion body myositis ** | Older man Progressive over years |
| Shoulder and hip girdle pain | Polymyalgia rheumatica | Older woman (above age 50), paraneoplastic |



THE JOHNS HOPKINS HOSPITAL



THE FIRST GROUP OF HOPKINS INTERNES WITH 'THE CHIEF'

Circa April 1890

*Back row: A.A. Ghriskey, J.M.T. Finney, A.C. Abbott, Hunter Robb, G.S. Clarke,
W.H. Baltzell.*

Second row: H. Toulmin, W. Osler, J.A. Scott, H.A. Lafleur, W.H. Farr.

Below: F.J. Brockway, D.M. Reese.

One of the founders of John Hopkins in
Baltimore (even though he was from
Canada)

Skin lesions



| Clinical pattern |
|-------------------|
| Photosensitive |
| Photoresponsive |
| Ulcers |
| Skin thickening |
| Nodules & purpura |

| Photosensitive | Pearls |
|--------------------------------------|---|
| SLE Cutaneous lupus | Malar Subacute cutaneous Discoid |
| Dermatomyositis | Stay awake people |



Malar



Discoid



Subacute
cutaneous

Photoresponsive

Pearls

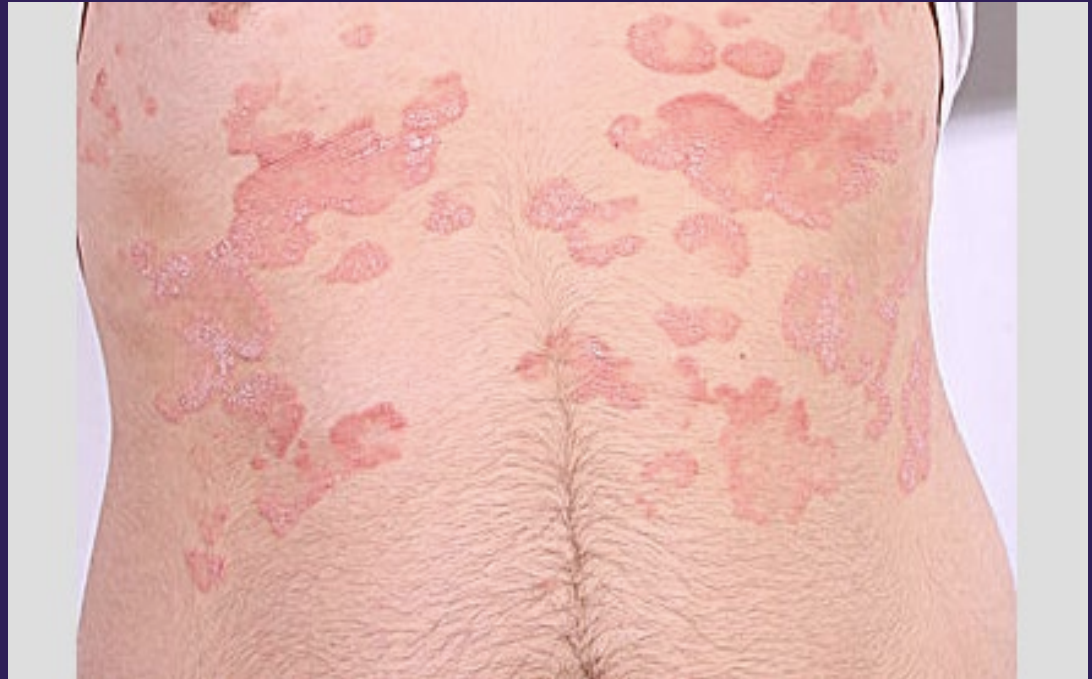
Psoriatic arthritis

Psoriasis

Nail pits (more arthritis)



Nail pitting



Psoriasis

Medscape

Wikimedia commons

| Ulcerations | Pearls |
|-----------------|------------------------------|
| Behcet's | Oral and GU ulcers (painful) |
| Lupus | Oral ulcers (painless) |
| Rheumatoid, IBD | Pyoderma gangrenosum |



Lupus

Behcet's



Pyoderma gangrenosum



| Skin thickening | Pearls | Fun fact |
|-------------------------|---|--|
| Systemic sclerosis | Sclerosis diffuse Raynaud's | AVOID HIGH DOSE STEROIDS bc it can lead to renal crisis Interstitial lung dz |
| CREST (aka limited ScL) | Calcinosis Raynaud's Esophageal dysmotility/GERD Sclerosis limited peripheral Telangiectasias | Pulmonary HTN risk Cardiac echo |



Sclerosis



Raynaud's (again)



Telangiectasia

Nodules & purpura

| | |
|-----------------------------------|---------------------------|
| Rheumatoid arthritis | Rheumatoid nodules |
| Vasculitis | Palpable purpura |
| Panniculitis, Sarcoid, IBD | Erythema nodosum |



Erythema nodosum



Palpable purpura

| Clinical pattern | Differential diagnosis | Pearls |
|---------------------------------|----------------------------|---|
| Photosensitive | SLE Cutaneous lupus | Malar Subacute cutaneous Discoid |
| | Dermatomyositis | |
| Photoresponsive & nails | Psoriatic arthritis | Psoriasis Nail pits (more arthritis) |
| Skin thickening | Systemic sclerosis | Raynaud's Sclerosis, renal crisis |
| | CREST | Pulm HTN telangiectasias |
| Nodules & purpura | Rheumatoid arthritis ** | Rheumatoid nodules |
| | Vasculitis | Palpable purpura |
| | Panniculitis, Sarcoid, IBD | Erythema nodosum |
| Ulcerations | Behcet's | Oral and GU ulcers |
| | Lupus | Oral ulcers |
| | Rheumatoid, IBD | Pyoderma gangrenosum |
| Bulls eye with central clearing | Lyme ** | Erythema chronicum migrans |



**Created residency, clinical rotations
starting in medical school and IN HOUSE
CALL**

Vasculitis

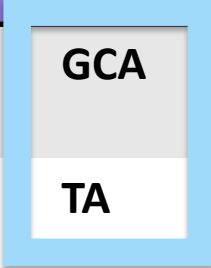
| Artery size | Clinical pattern |
|-------------------------|---|
| Large | Headaches Pulses missing Discordant blood pressures |
| Medium | Foot drop Renal failure |
| Small | Epistaxis Hemoptysis Hematuria Purpura |
| Variable | Dz itself can affect any size vessel |
| Other (RA, SLE) | Don't really fit a pattern based on size |
| Constitutional symptoms | Aspirin → decreases thrombotic stuff |

| Artery size | Disease | Abbreviation | Pearls |
|-------------|----------------------|--------------|--|
| Large | Giant cell arteritis | GCA | Older with PMR sx & headaches (temporal arteritis TA → visual loss) |



Temporal arteritis

| Artery size | Disease | Abbreviation | Pearls |
|-------------|---|--------------|--|
| Large | Giant cell arteritis | GCA | Older with PMR sx & headaches |
| | Takayasu's arteritis | TA | Younger female version of GCA |
| Medium | Polyarteritis nodosa | PAN | Stumbling Peter Pan loves peanut Butter & eats until his stomach hurts (man, midlife crisis, testicular pain, abd pain, foot drop & hep B) |
| Small | Granulomatosis with polyangiitis | GPA | Upper respiratory & renal |
| | Eosinophilic granulomatosis with polyangiitis | EGPA | Asthma with foot drop & CHF |
| | Microscopic polyangiitis | MPA | Problems peeing, breathing and feeling (profoundly kidney, lung & nerve) |
| | Cryoglobulinemia | Cryo | Palp purpura, renal, & nerve I Cancer (Me for monoclonal IgM) II Hepatitis C III Connective tissue dz |
| Variable | Behcet's | | Uveitis, oral/GU lesions & strokes |



Odds & Ends

Clinical presentation

Pulmonary renal syndrome

Strokes in young folks (<50)

Skinnylicious

| Clinical presentation | Disease | Pearl |
|------------------------------|------------------------------------|---|
| Pulmonary renal syndrome | SLE, anti-GBM, GPA | Hemoptysis & hematuria |
| Strokes in young folks (<50) | Antiphospholipid antibody syndrome | Mult miscarriages Pregnancy loss later on |
| Dry eyes, dry mouth | Sjogren's | "diet" version of lupus Primary or secondary r/o NHL especially w/ salivary gland swollen |



Levido reticularis



Lymphoma in salivary gland

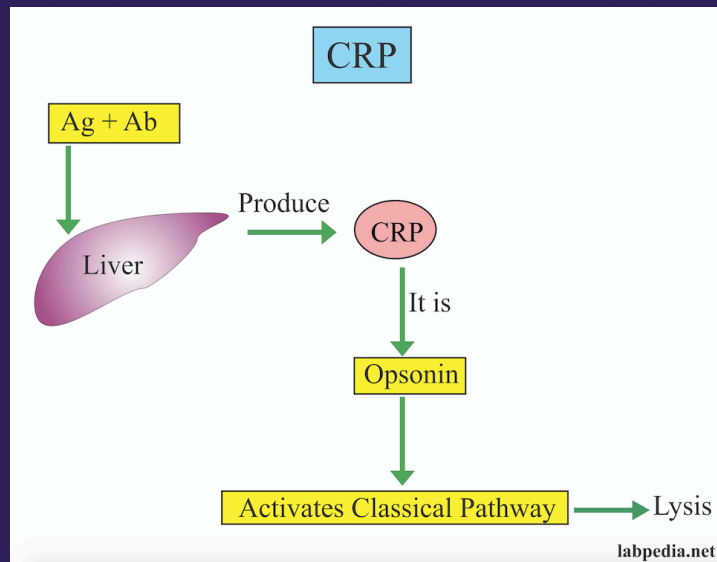
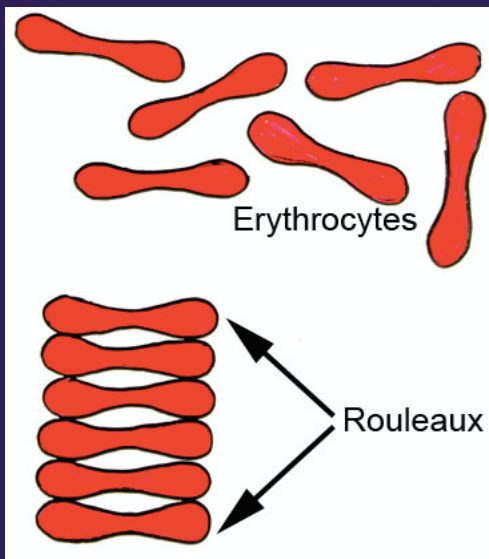


Never too old to learn in medicine
(Also never too old to get burned in medicine...)

Testing should ONLY CONFIRM diagnosis, not make it

| Categories of testing |
|-------------------------------|
| Measure inflammation directly |
| Antibodies |
| Fluid cell count |
| Crystals |

| Acute phase reactants | Source | Increased in | Decreased in | Calculation |
|-----------------------|--------------|--|---|---|
| Sedimentation rate | Falling RBCs | Older age Anemia Renal dz Diabetes Obesity Inflammation Cancers Low albumin Trauma | Abnormal RBC High WBC CHF Cachexia Low fibrinogen | $M = \text{age}/2$ $W = (\text{age} + 10)/2$ |
| C reactive protein | Liver | Obesity | | $M = \text{age}/5$ $W = (\text{age} + 30)/5$ |

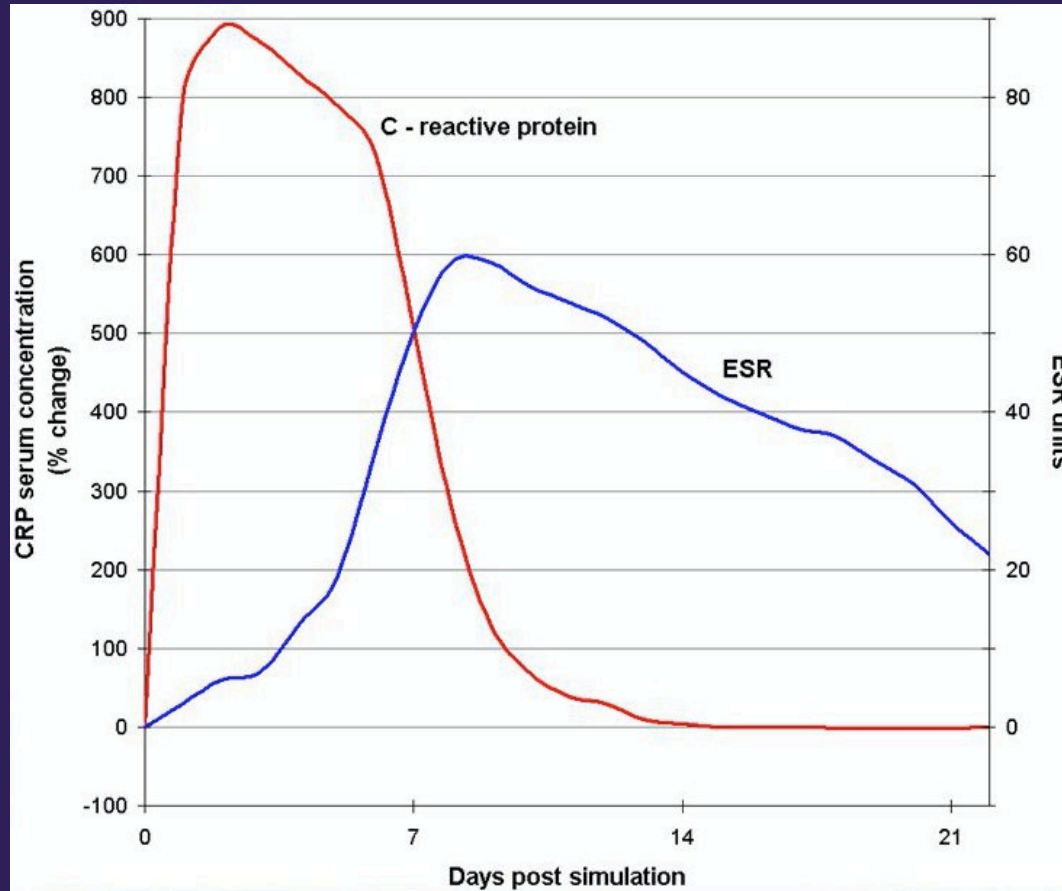


labpedia.net

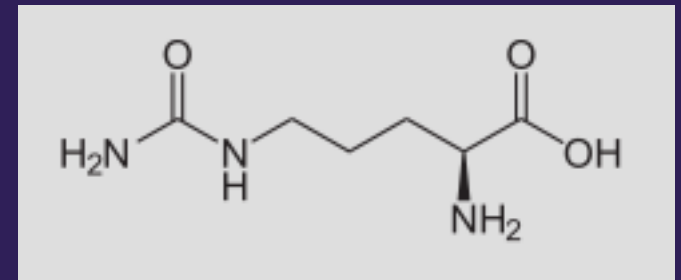
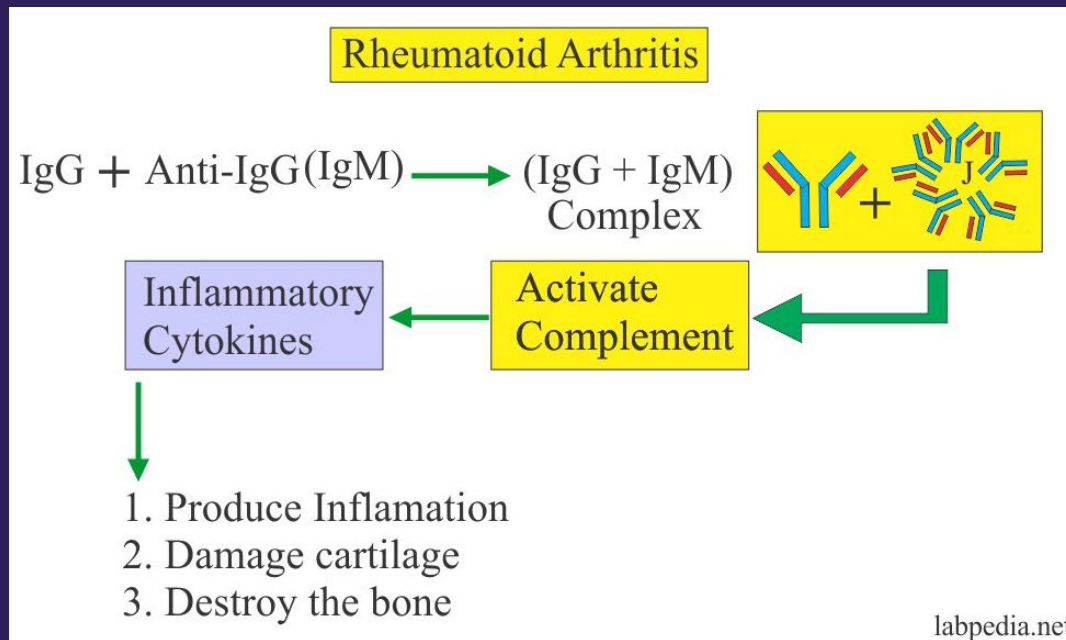
Don't be a hater; order a REGULAR CRP!



CRP more accurately reflects inflammation

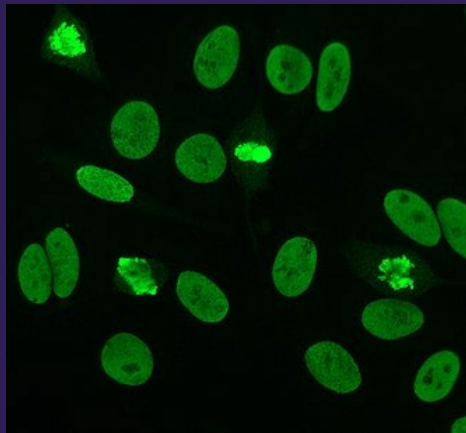


| RA markers | Source | Increased by | Uses |
|------------|---|---|--|
| RF | Antibody against Fc portion IgG | Age Sjogren's Cryoglobulinemia Chronic lung and liver infections (Tb, hepatitis) | Generic test for RA |
| CCP | Antibody against cyclic citrullinated peptide | RA Smoking | Very specific Get more joint deformities |

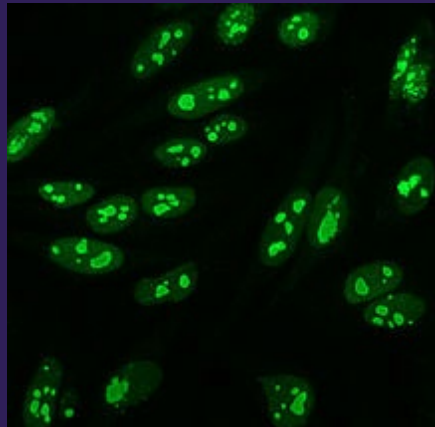


Anti nuclear antigens

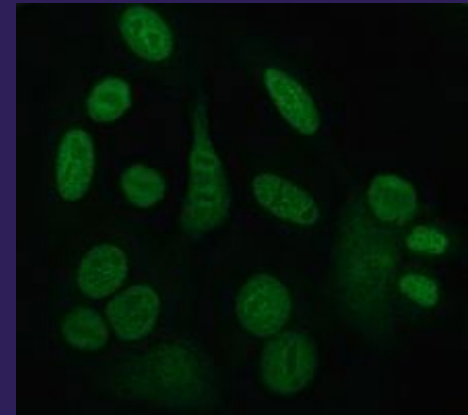
(America's sweetheart)



Homogenous



Nucleolar

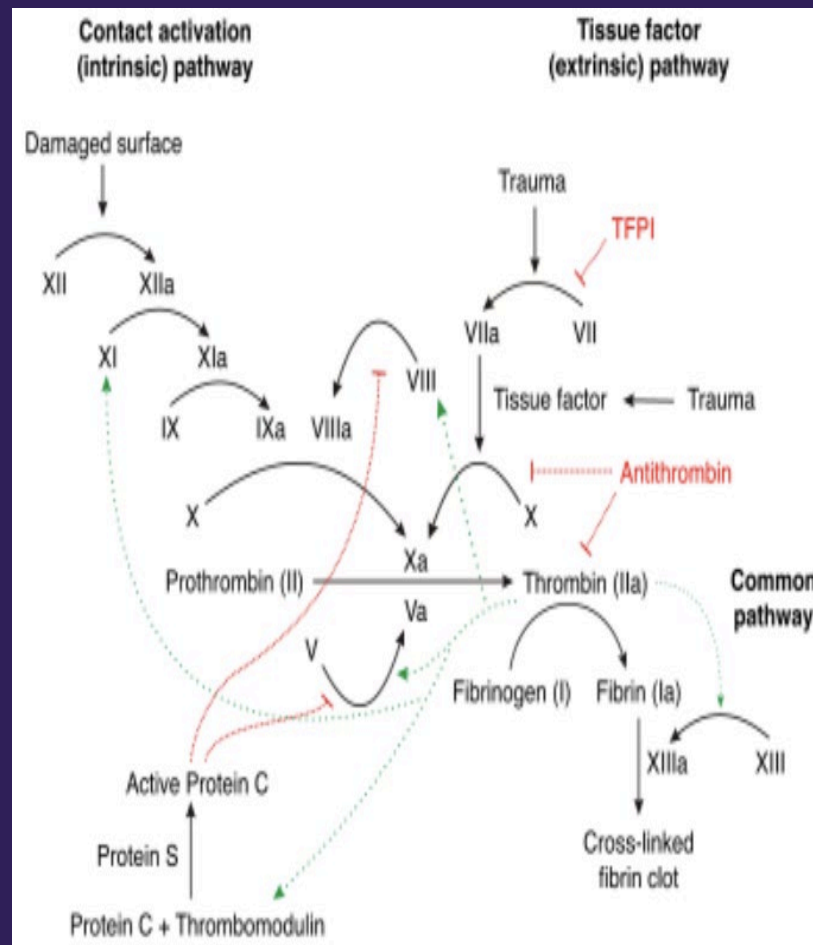


Speckled

| Lupus tests | Types | Increased by | Uses | Fun fact |
|-------------|---|---|---|--|
| ANA | Anti nuclear antigen antibody Different patterns | Age Infections Drugs Thyroid dz White women | Screening tool in SYMPTOMATIC pt Dilution > 1:160, centromere most significant | 99% of lupus have + ANA BUT only 15% of those w/ + ANA have lupus |
| ENA | Extractable nuclear antigen antibody | Smith (Lupus) RNP (MCTD) | Smith only in lupus but low sensitivity | |
| | Subtypes assoc with specific CTD | SSA (skin) | Check in ALL pregnant patients with rheum autoimm dz | |
| | | SSA/SSB (Sjo, neonatal, CHB) | | |
| | | ScL 70 (Systemic scleroderma w/ILD) | Anti RNA polymerase III w/ renal crisis & more skin dz & cancer risk | These antibodies also can be seen in breast cancer |
| | | Anti-Centromere (lim scleroderma w/ pHTN) | | |
| | | dsDNA (renal) | dsDNA CAN correleate with nephritis | |

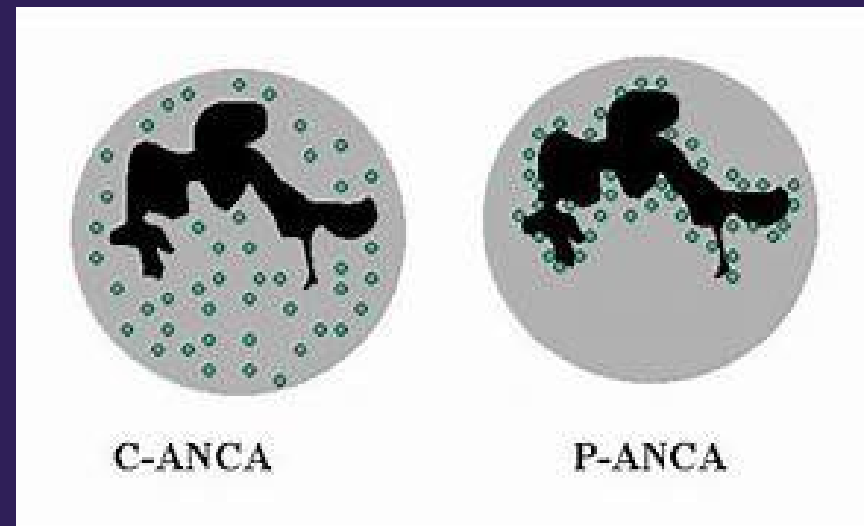
Anti phospholipids (aPL)

| Why do you hate me?? | |
|------------------------------------|--|
| Antiphospholipid antibody syndrome | Hypercoagulable autoimmune dz due to antiphospholipid antibodies |
| aPL | Attack inhibitors of coagulation OR activates coagulation |
| Diagnosis | Thrombosis AND positive labs at least 12 weeks apart |
| Antibody tests | aCL IgG, IgM B2GP IgG, IgM |
| Mixing studies | LAC |
| Treatment | Anticoagulation |

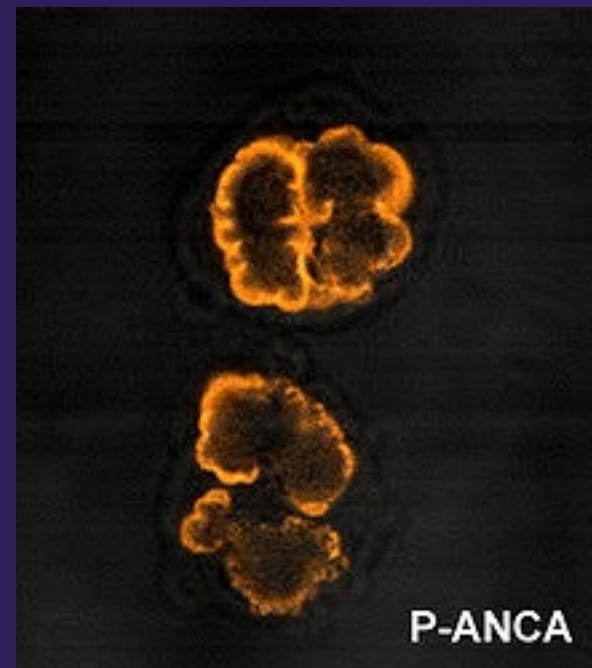
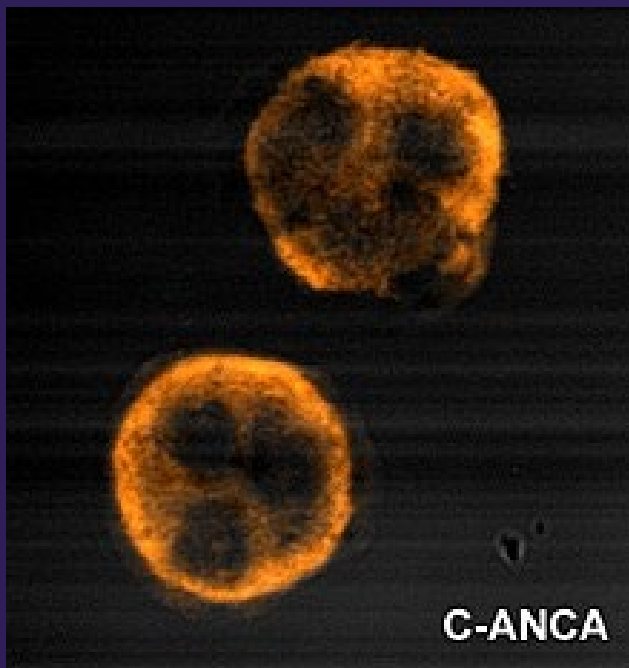


Anti neutrophilic cytoplasmic antibodies (ANCA)

- Ab targets in neutrophils
→ → neutrophil activation, vessel wall destruction
- Specific target → vasculitis
- “Atypical pattern” → non rheumatological dz
- Confirmed by ELISA
https://youtu.be/alQT_soh_V0?si=5HKYKYyi8DKJBr9F



| ANCA | What is it? | Increased in | Fun Fact |
|--------|--|--|-----------------------------------|
| c-ANCA | Ab to neutrophils' cytoplasm usually targetting PR-3 | GPA (vasculitis) | |
| p-ANCA | Ab to material around neutrophils' nucleus usually targeting MPO | EGPA & MPA (vasculitis) IBD Liver dz Drugs Infection | Cocaine turns EVERYTHING positive |



HLA B27

- *Associated* with certain types of autoimmune diseases (AS, IBD, PsA, ReA)
- In 90% of Ankylosing spondylitis
- BUT also in 6-10% of normal population

Gentlemen, I have a confession to make. Half of what we have taught you is in error, and furthermore we cannot tell you which half it is

William Osler

Synovial fluid analysis

- Even a drop is helpful
- Send fluid for cell count with differential, gram stain, culture, crystals
- Look at fluid YOURSELF

| | WBC/mm ³ | Color | Viscosity |
|--------------------------|---------------------|-----------------|-----------|
| Normal | < 150 | Colorless/Straw | High |
| Noninflammatory | < 3,000 | Straw/Yellow | High |
| Inflammatory | > 3,000 | Yellow | Low |
| Septic (purulent) | > 50,000 | Pus/Mixed | Mixed |
| Hemorrhagic | Similar to blood | Red | Low |

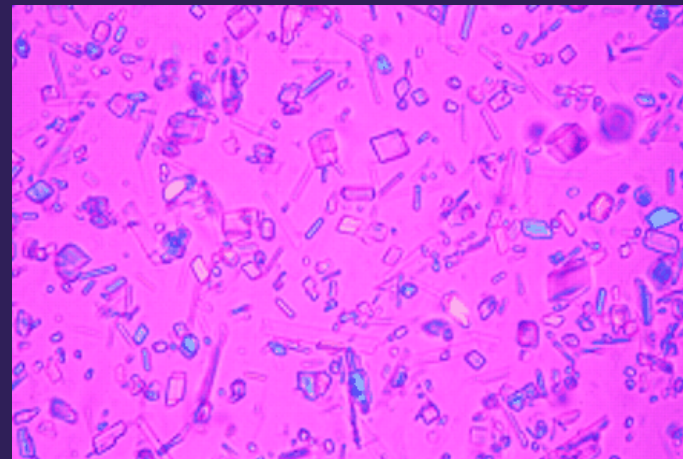


"The value of experience is not in seeing much, but in seeing wisely."

William Osler



Gout
Yellow monosodium urate
Negative birefringent
Needle shaped



Pseudogout (CPPD)
Blue calcium pyrophosphate
Positive birefringent
Rhomboid shape

How we treat EVERYTHING in rheumatology

| Mild | Moderate | Severe |
|-------------------------------------|---|--|
| Beginning of "something" | Definite disease | Very very sick |
| Rash Arthralgias | 1-2 organ systems | More than 3 organ systems |
| Nsaids +/- Low dose steroids | Steroids + Steroid sparing agent | Steroids IV + Something very expensive and IV |

FIND ANY UNDERLYING CAUSES AND TREAT THEM! (infections, cancer, hormones, etc...)

- Basic 4 approaches to treatment
 - Intracellular
 - Block cellular activation/differentiation
 - Intercellular
 - Back end approach
- Buy time with steroids

BUT Monoarticular arthritis is different

| Disease | Treatment | Specifics |
|-------------------|---|--|
| Gout | Aspirate & inject with intra-articular steroids +/- Meds | NSAIDS Colchicine Steroids Uricosurics (probenecid) Xanthine oxidase inhibitors (allopurinol, febuxostat) |
| Pseudogout | Aspirate & inject with intra-articular steroids | NSAIDS Colchicine Steroids |
| Septic | Serial aspirations Surgery | Prolonged antibiotics |

Cases

Clinical

- Drug rep vs the truck driver
- Volleyball player vs every old person in Elgin
- Ron's twin from Harry Potter vs the man whose now ex wife (yay) hates me
- Every old person in Elgin vs the retired engineer

Labs/tests

- Labs in v anxious tree hugger vs Max's mom
- Gold lid implant vs an extra in Lord of the Rings
- Crystals and treatment in the retired nurse with the crazy aunt vs Italian seamstress

“A good H&P is the most accurate and cheapest test you can do”

| History | Physical |
|-------------------------------|--|
| Synovitis | Joint 2x size of normal, warm, tender |
| Morning stiffness | At least 1 hour; set morning alarms earlier |
| Inflammatory back pain | Wake up at night and get better with exercise |
| Photosensitive rashes | Worse with sun exposure |
| Raynaud's | Color changes |
| Constitutional sx | Look ill (pay attention to grooming) |

Know where to send the patient...

| Problem | Rheum | Ortho |
|---|-------------------|--|
| Infected joint | | Aspirate, surgery, iv antibiotics |
| Mechanical issue | | Image, phys tx, surgery |
| Polyarticular synovitis | RA | |
| Morning stiffness | RA | |
| Photosensitive rashes with synovitis | Lupus | |
| Recurrent symptoms | Arthritis | |
| Muscle weakness/atrophy | Myositis | |
| Constitutional symptoms | Vasculitis | |



Donated his brain to science

Questions, concerns,
deep thoughts?

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Bonus material

(you're welcome)

What I wish my superiors had taught me about rashes...(sigh)

- Macular (flat) vs plaque (raised)
- Nodule (big bump) vs papule (tiny bumps)
- Fluid vs non fluid filled
- Color
- Clear borders vs unclear borders
- Photosensitive vs photoreceptive vs nothing

Pediatric rheumatology

- Juvenile idiopathic arthritis
- Juvenile systemic connective tissue disease
- Kawasaki disease

- Systemic JIA just like Adult Onset Still's Disease with the quotidian fevers, rash, arthritis

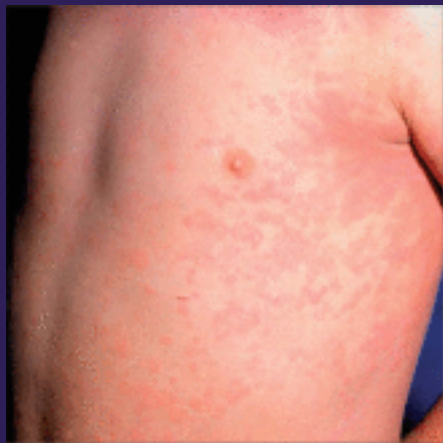
Kids are just like little adults except...

- JIA girl named ANA who can't see u bc uveitis
- SLE in kids is worse and in kidneys
- Don't get cancers with dermatomyositis
- Henoch Schonlein Purpura most common small vessel vasculitis in small Henry
- Localized scleroderma more common and responds to meds in little people
- Get a unique vasculitis (Kawasaki's disease) that give aneurysms around the Koronaries

3 rashes in kids v specific in rheum



Erythema
marginatum
in ARF



Salmon macules
in systemic JIA



Purpura in HSP