

Listen to your patient, he is telling you the diagnosis

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Rheumatology
Stritch School of Medicine
Academic year 2021-2222



Housekeeping

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



Rheumatology is complex....
but soo interesting

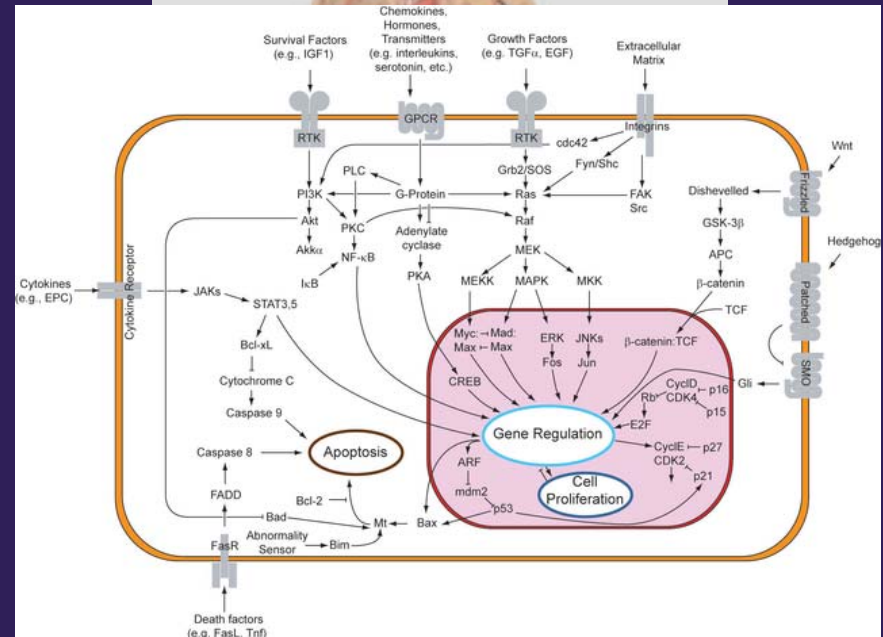


FUN FACTS ABOUT DR. OSLER 1845–1924

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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



How we treat EVERYTHING in rheumatology

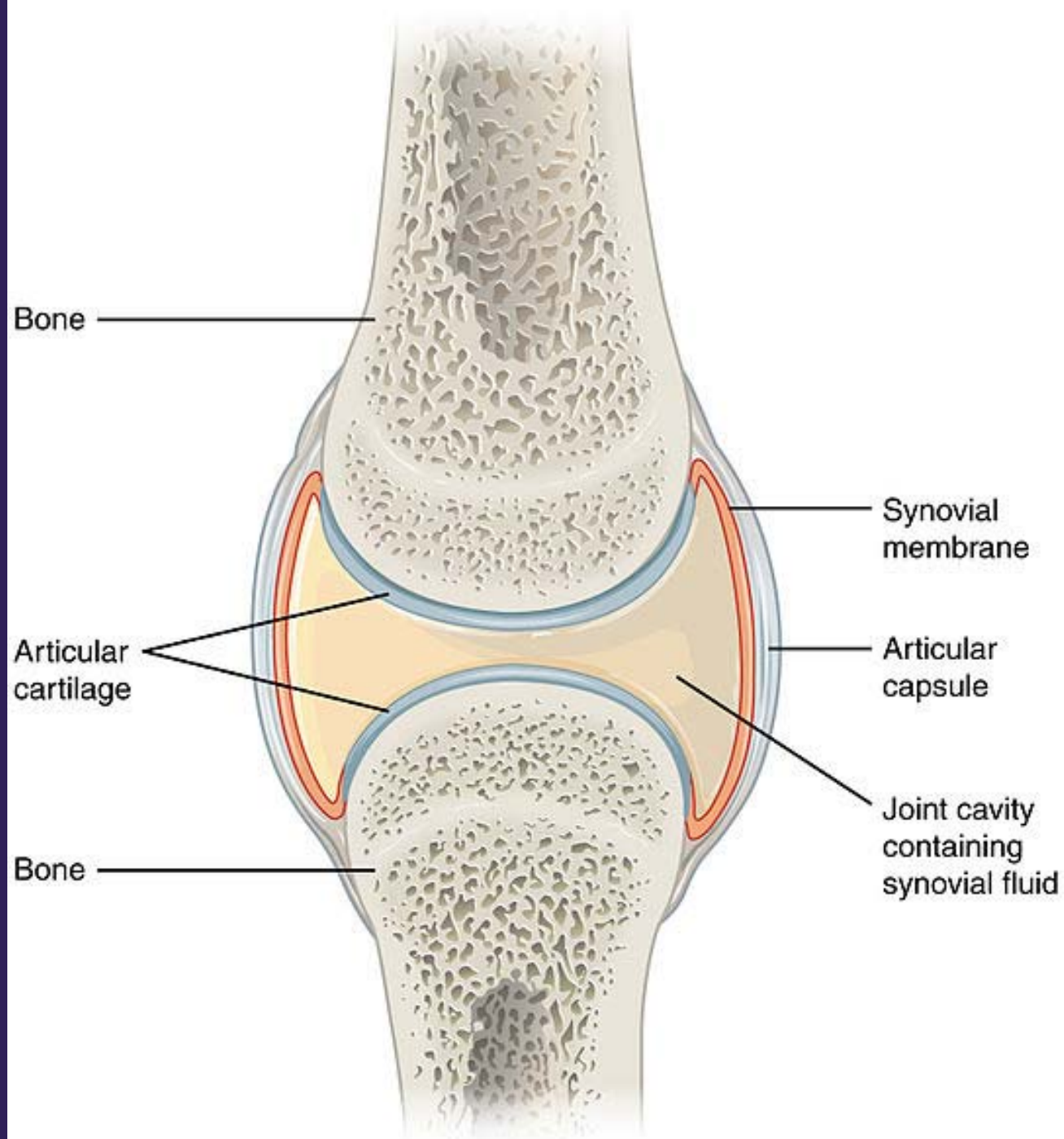
Mild	Moderate	Severe
Beginning of "something"	Definite disease	Very very sick
Rash Arthralgias	1-2 organ systems	More than 3 organ systems
Nsaids +/- Low dose steroids	Steroids + Steroid sparing agent	Steroids IV + Something very expensive and IV
FIND ANY UNDERLYING CAUSES AND TREAT THEM! (infections, cancer, hormones, etc...)		

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

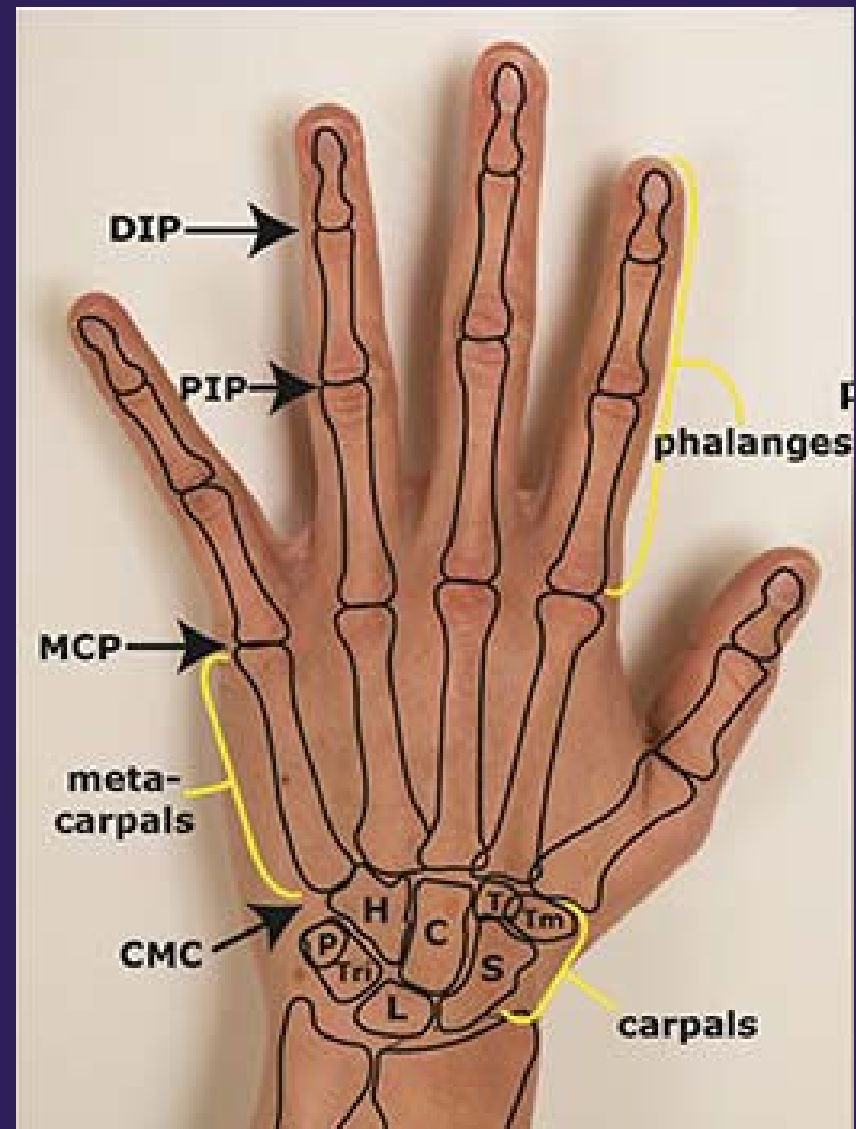
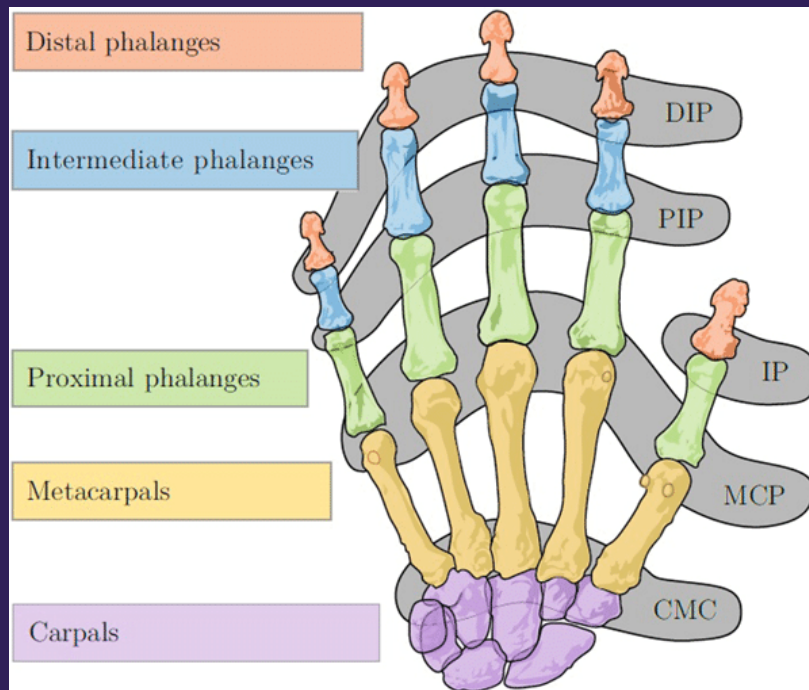
“When I see an arthritis patient
walk in the front door, my
tendency is to walk out the
back door”

- Dr Osler

Probably hated rheumatology







Joint inflammation

SYNOVITIS

Clinical pattern

Monoarticular (1)

Oligoarticular (≤ 4)

Polyarticular symmetric (>4)

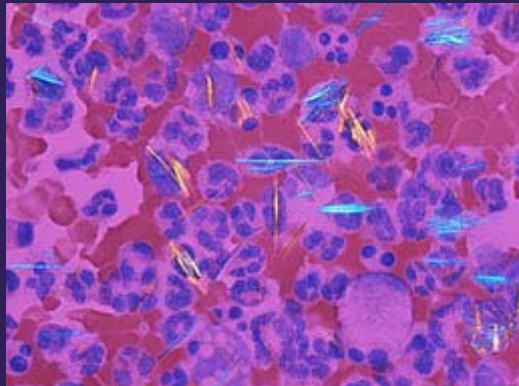
Polyarticular non symmetric (>4)

Spine

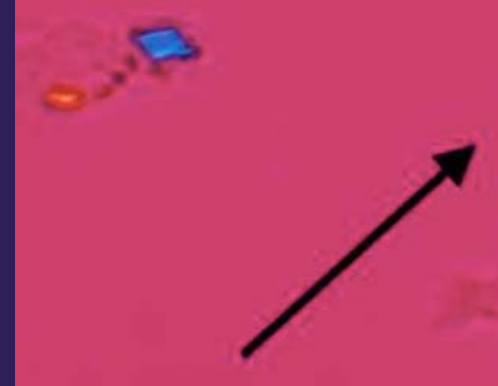
Monoarticular (1)	Pearls
Gout	Male, very intense, podagra, urate crystals, neg birefringent
Pseudogout (CPP arthritis)	Older, knee, wrist, metab dz, CPP crystals , pos birefringent
Septic	Always aspirate, STD



Gout, in big toe, uric acid crystal



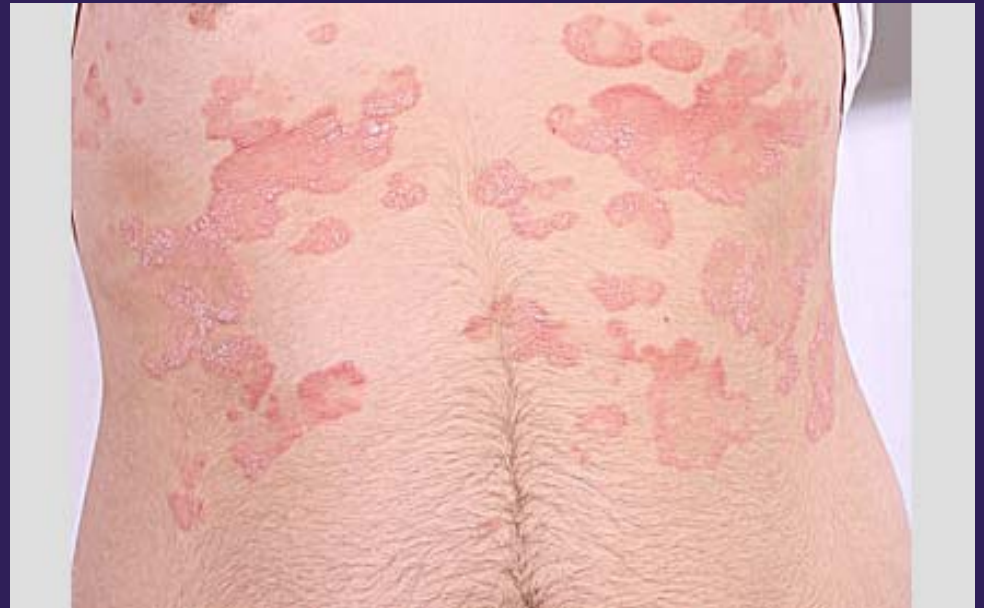
Pseudogout in knee, CPPD crystal



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



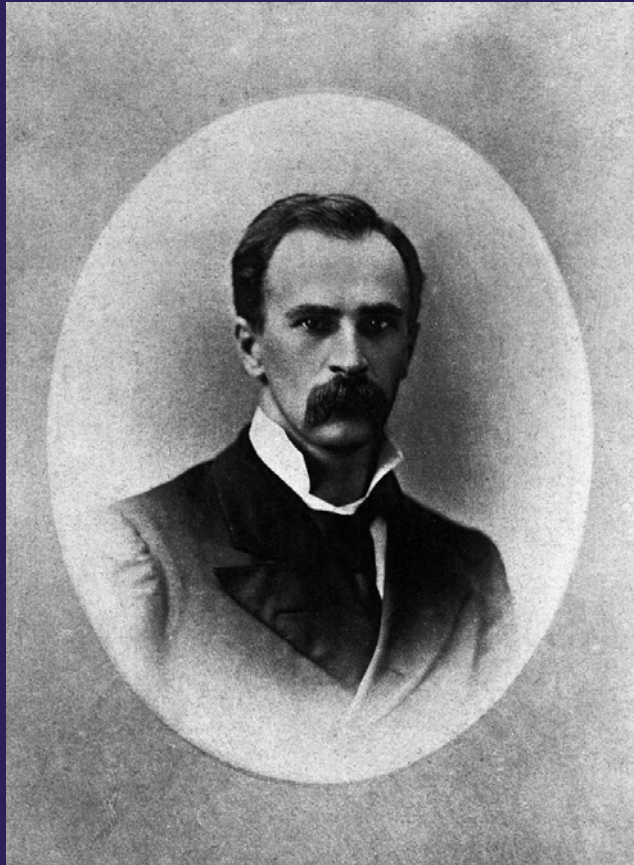
Ulnar
subluxation

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



Wikimedia commons

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	ILD Esophageal dysmotility Raynaud's
Dermatomyositis (photosensitive)	CANCER Heliotrope rash, V-sign rash, Shawl-sign rash Gottron's papules Nailfold abnormalities



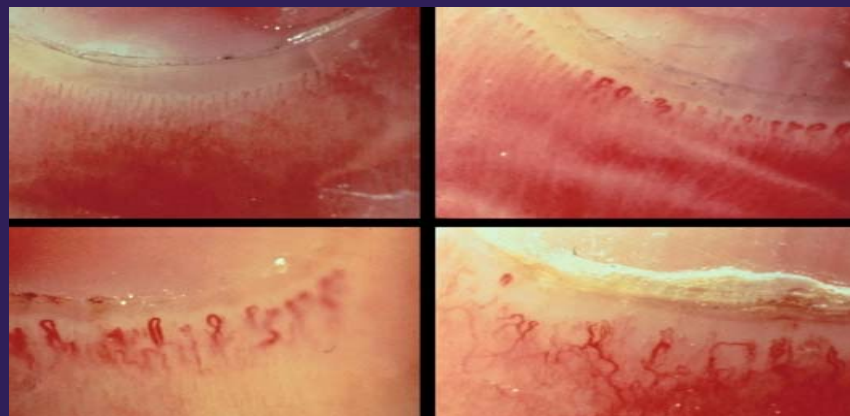
Gottron's papules



Heliotropic rash



V sign
(vs
Shawl
sign)



Nailfold
capillary
dilation

ACR
Medscape
Wikimedia
commons

Proximal weakness

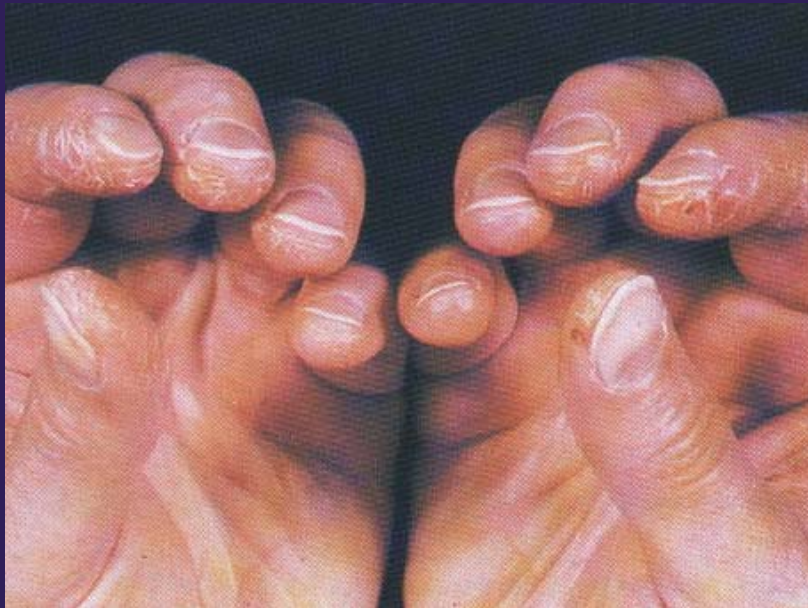
ILD

Esophageal dysmotility

Raynaud's

Polymyositis

Basically everything that's not dermatomyositis



Mechanic's hands



Raynaud's

MSU

Wikimedia commons

PAIN (Not weakness)

Shoulder and hip girdle pain

Polymyalgia rheumatica

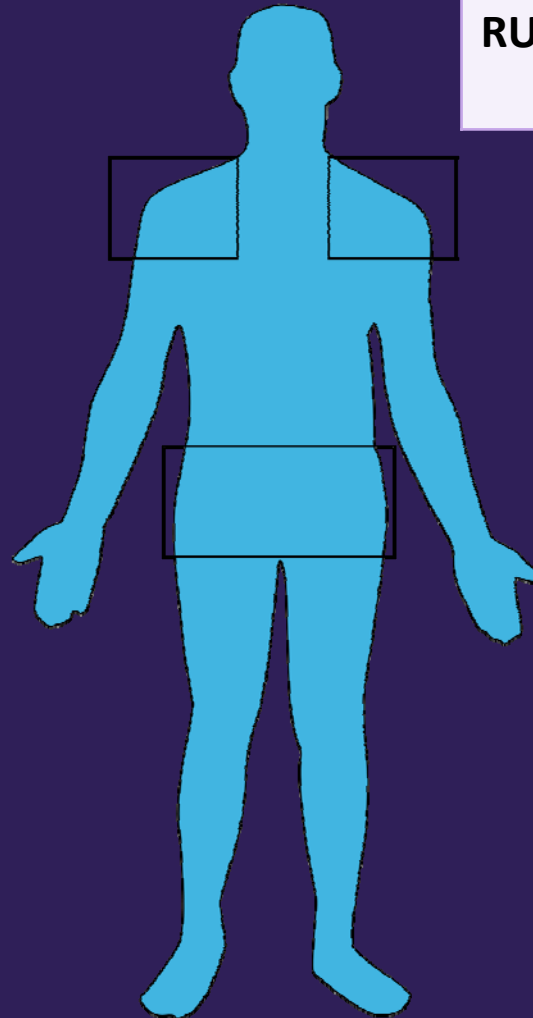
Older woman (above age 50)

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	CANCER Heliotrope rash Gottron's papules V-sign rash Shawl-sign rash Nailfold abnormalities
	Polymyositis	
	Immune mediated ** necrotizing myopathies	Progresses despite d/c statin until gets rhm meds
	Antisynthetase	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. Ghiskey, 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

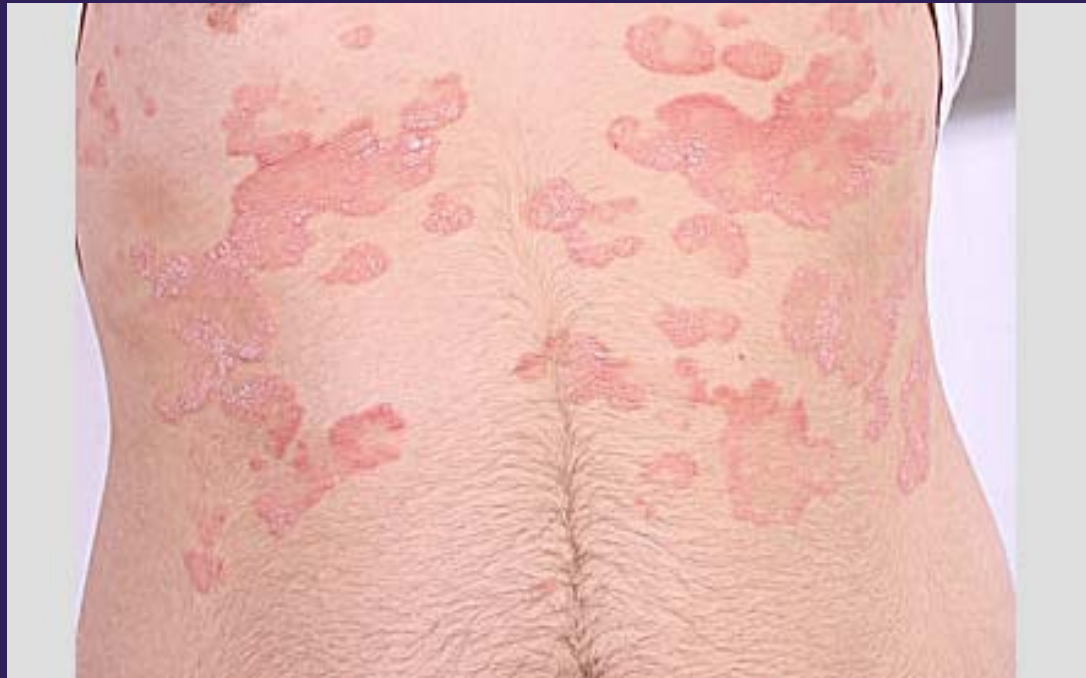
Pearls

Psoriatic arthritis

Psoriasis
Nail pits (more arthritis)



Nail pitting

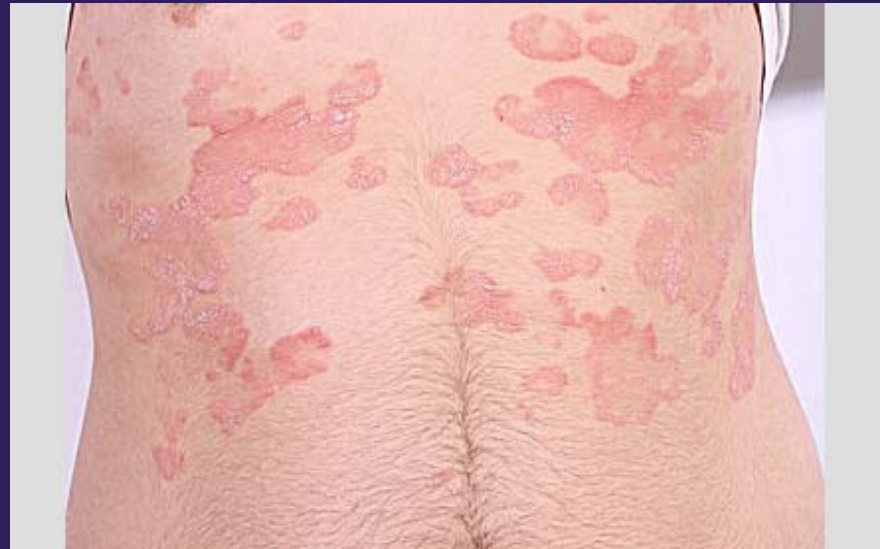


Psoriasis

Skin lesions		Pearls	
Photosensitive		SLE, DM	
Photoresponsive		PsA	



Lupus



Psoriasis

Healthtap.com

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	Renal crisis: tx w/ ACE inhibitor & AVOID HIGH DOSE STEROIDS 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

Mayo clinic
Thefreedictionary.com
Wikimedia commons

Nodules & purpura

Rheumatoid arthritis

Rheumatoid nodules

Vasculitis

Palpable purpura

Panniculitis, Sarcoid, IBD

Erythema nodosum



Erythema nodosum

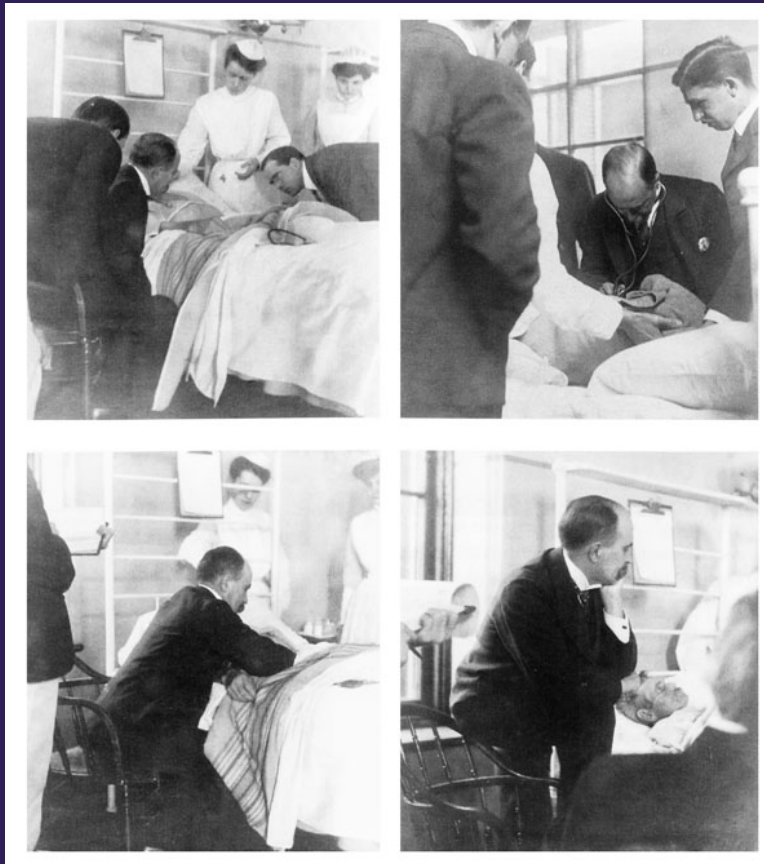


Palpable purpura

WikEM

Wikimedia commons

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

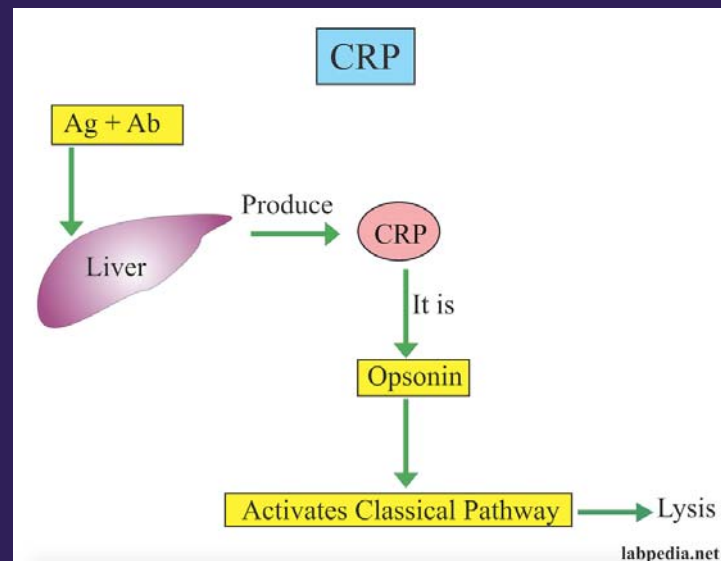
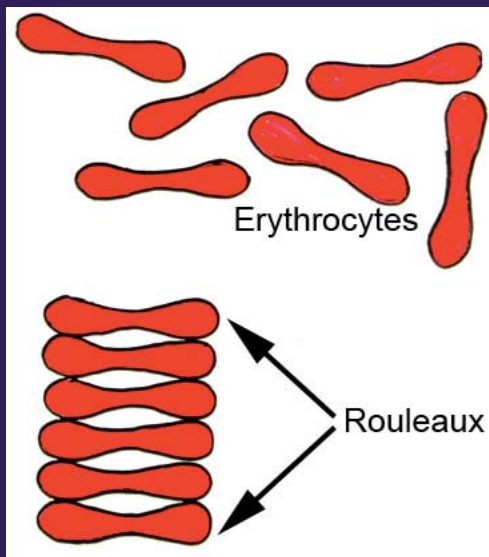


Never too old to learn in medicine
(Also never too old to get burned in medicine...)

Testing should ONLY CONFIRM diagnosis, not make it

Categories of testing
Measure inflammation directly
Antibodies
Fluid cell count
Crystals

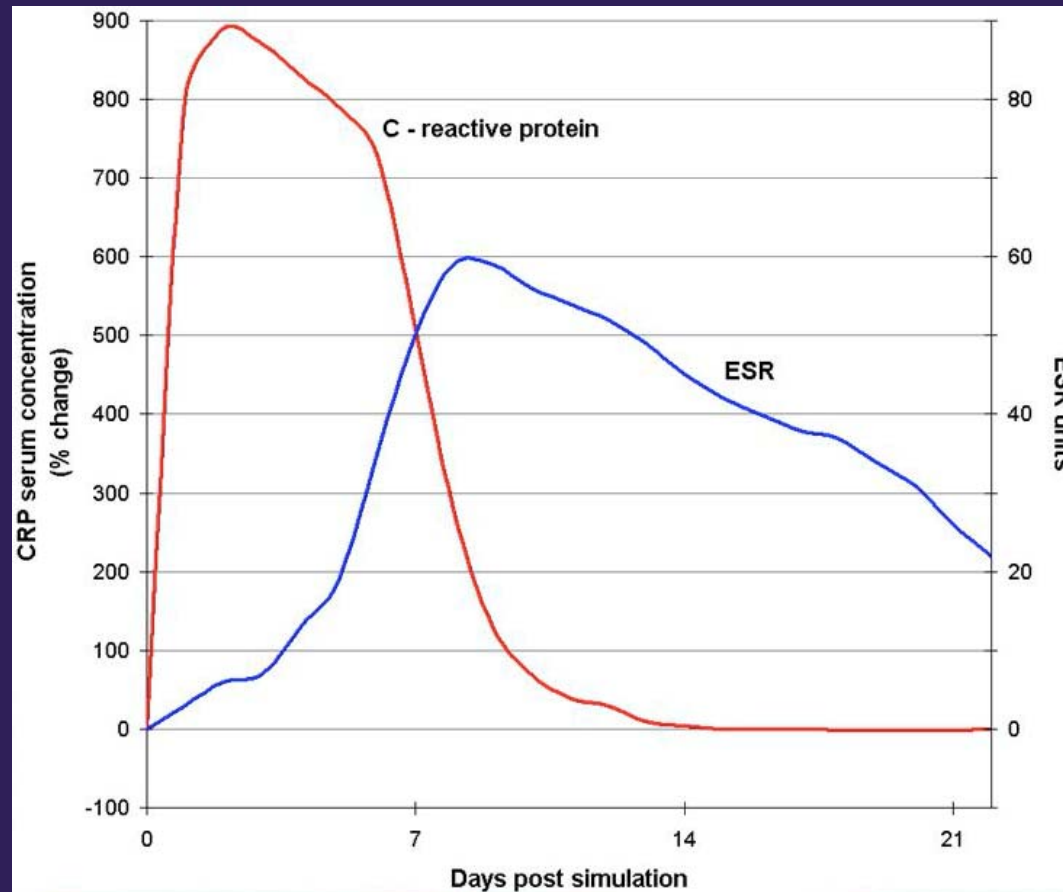
Acute phase reactants	Source	Increased in	Decreased in	Calculation
Sedimentation rate	Falling RBCs	Older age Anemia Renal dz Diabetes Obesity Inflammation Cancers Low albumin Trauma	Abnormal RBC High WBC CHF Cachexia Low fibrinogen	$M = \text{age}/2$ $W = (\text{age} + 10)/2$
C reactive protein	Liver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



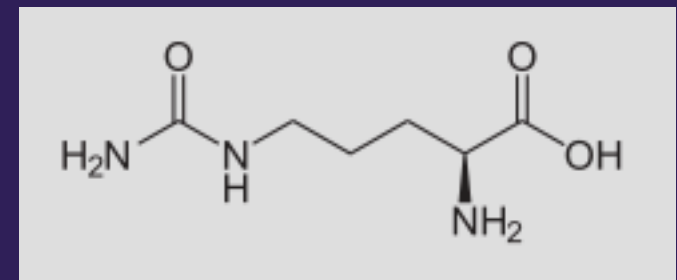
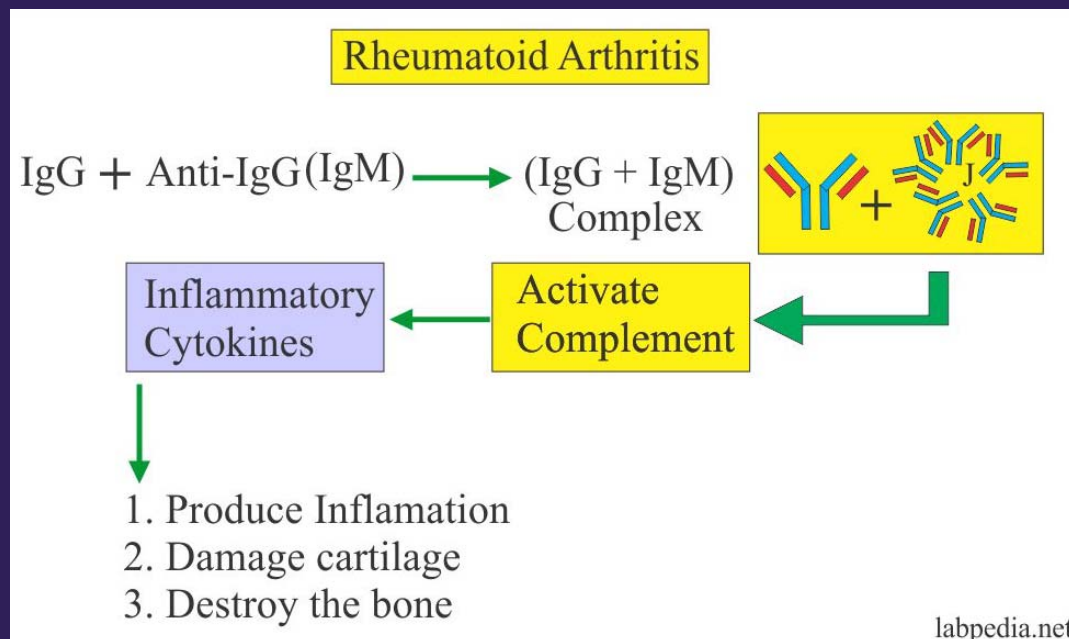
Don't be a hater; order REGULAR CRP!



CRP more accurately reflects inflammation

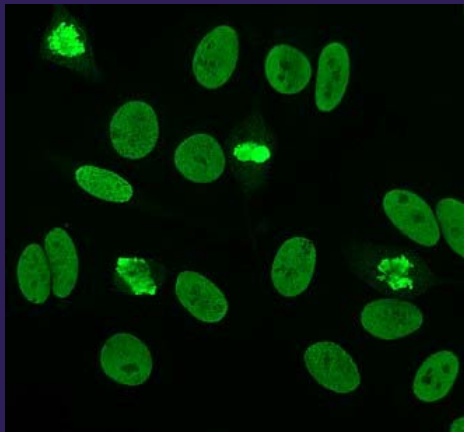


RA markers	Source	Increased by	Uses
RF	Antibody against Fc portion IgG	Age Sjogren's Cryoglobulinemia Chronic lung and liver infections (Tb, hepatitis)	Generic test for RA
CCP	Antibody against cyclic citrullinated peptide	RA Smoking	Very specific Poor prognosis

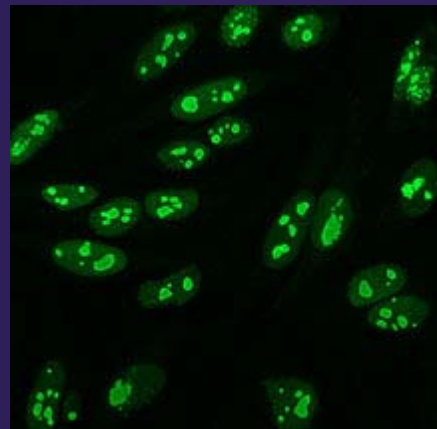


Anti nuclear antigens

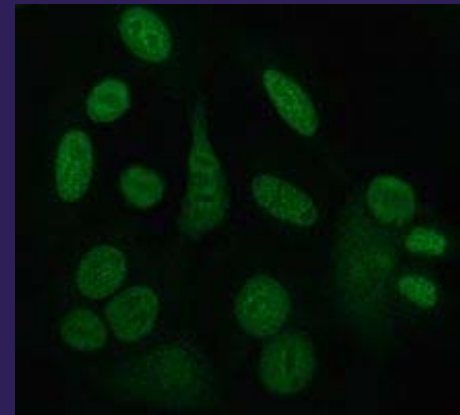
(America's sweetheart)



Homogenous



Nucleolar



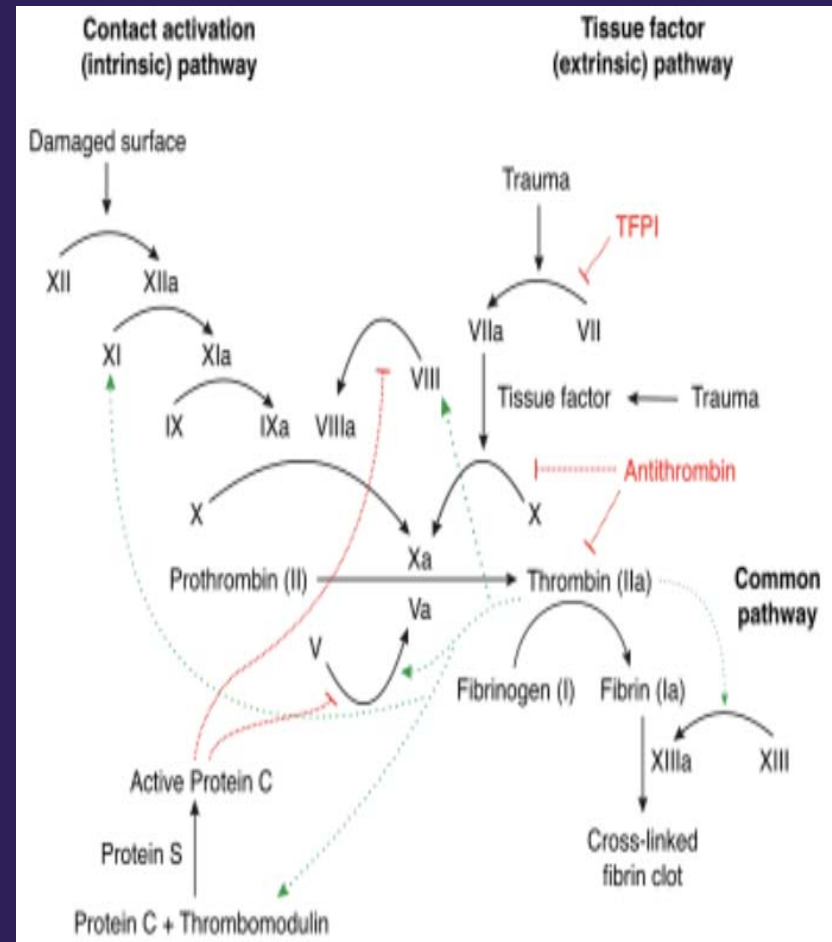
Speckled

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 + 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)

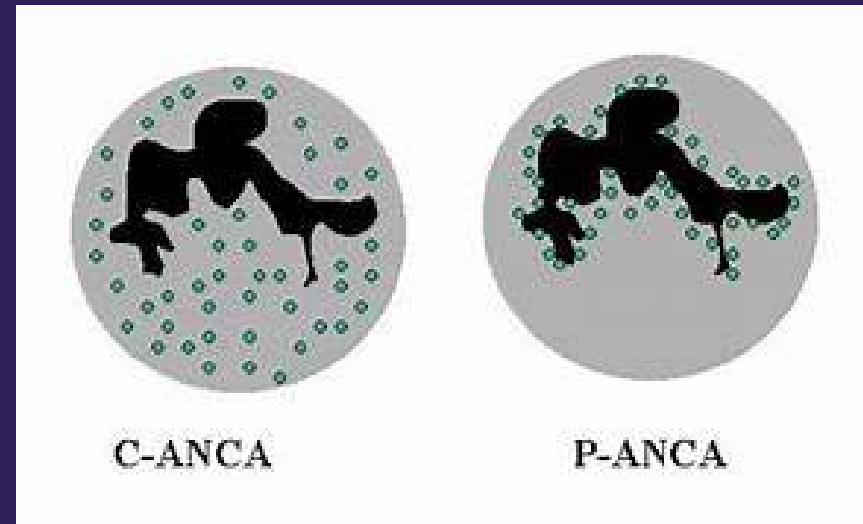
Why do you hate me??

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

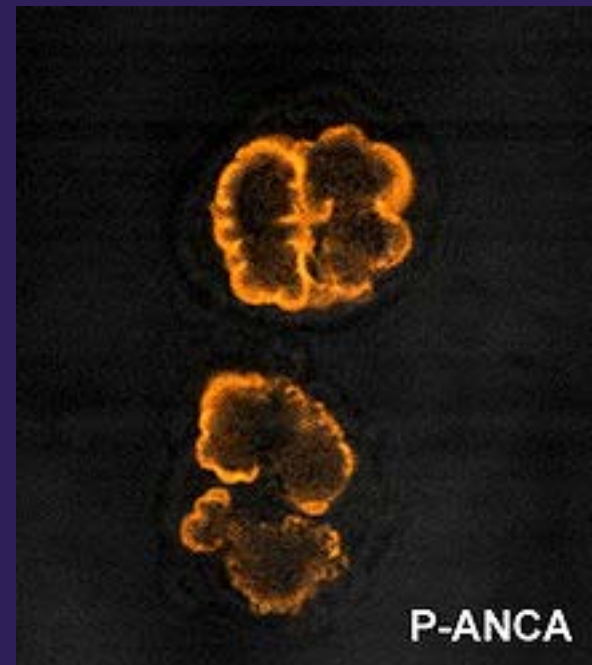
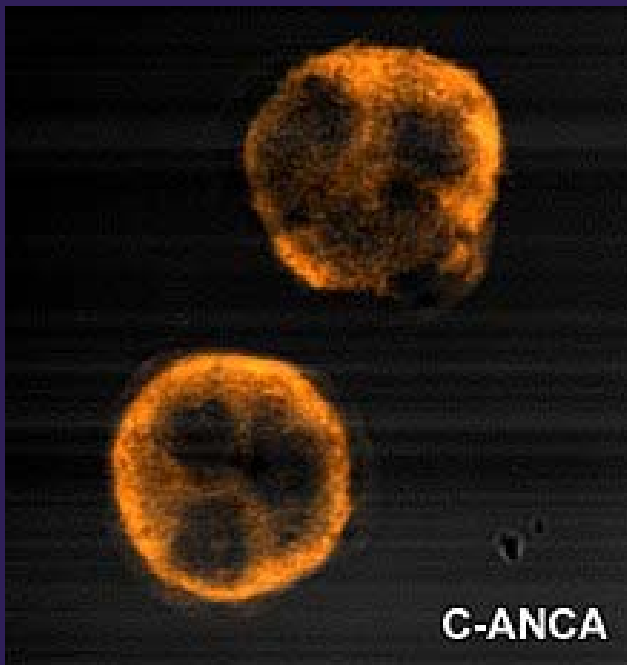


Anti neutrophilic cytoplasmic antibodies (ANCA)

- Ab targets in neutrophils → → neutrophil activation, vessel wall destruction
- Specific target → vasculitis
- “Atypical pattern” → non rheumatological dz
- Confirmed by ELISA



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

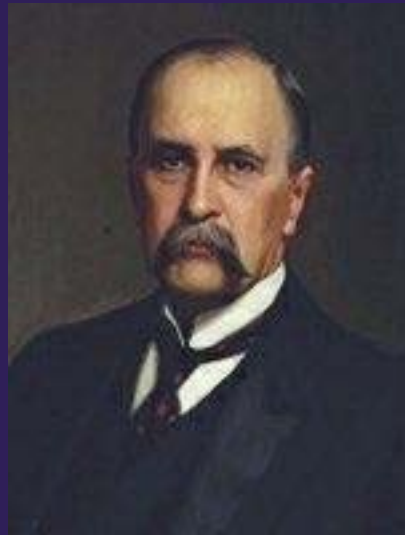
Gentlemen, I have a confession to make. Half of what we have taught you is in error, and furthermore we cannot tell you which half it is

William Ocker

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

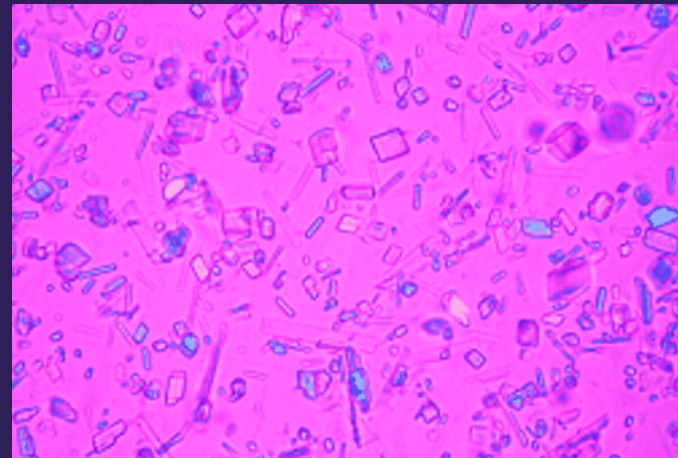


*"The value of
experience is not in
seeing much, but in
seeing wisely."*

William Osler



Gout
Yellow monosodium urate
Negative birefringent
Needle shaped



Pseudogout (CPPD)
Blue calcium pyrophosphate
Positive birefringent
Rhomboid shape

Treatment of Monoarticular arthritis

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 wife 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



Donated his brain to science

The Wistar Institute

Review

Questions, concerns,
deep thoughts?

Shaiba.ansariali@gmail.com

Bonus material

(you're welcome)

“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	

Odds & Ends

Clinical presentation

Pulmonary renal syndrome

**Tumor like swellings or
fibrosis**

Vaso occlusive

Strokes in young folks (<50)

Cauliflower ear, saddle nose

Clinical presentation	Disease	Pearl
Pulmonary renal syndrome	Lupus	Think younger female GPA
Tumor like swellings or fibrosis	IgG4 diseases	Feels big and dangerous; retroperitoneal fibrosis
Vaso occlusive	Thromboangiitis obliterans (TO) (aka Buerger's dz)	Young smoker eating a hamBurger but can't hold it bc his fingers are falling off



IgG4 swelling of
salivary gland



TO

Clinical presentation	Disease	Pearl
Strokes in young folks (<50)	Antiphospholipid antibody syndrome	Mult miscarriages Pregnancy loss later on
Cauliflower ear, saddle nose	Relapsing polychondritis	Inflammation of cartilage: aortitis, aortic valve and tracheal problems (MDS)
Dry eyes, dry mouth	Sjogren's	"diet" version of lupus Primary or secondary



Saddle nose (again)



Cauliflower ear

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 and responds to IL-1 and IL-6 inhibition

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 anuerysms around the Koronaries

3 rashes in kids v specific in rheum



EM in ARF



Salmon macules
in systemic JIA



Purpura in HSP

Severity	Drugs	Theory		Fun Fact
Mild	NSAIDS	Inhib cyclooxygenase and prevents prostaglandin & thromboxanes synth		
	Hydroxychloroquine (plaquenil)	Blocks dendritic cells from presenting stuff to immune sys		Eye prob in only 1/5000
	Sulfasalazine	Blocks prostaglandin production		Azospermia
Moderate	Methotrexate	Intracellular blockade so cell can't function		Good oldie but teratogenic
	Leflunomide (arava)			Lasts in body 18 mos
	Azathioprine (imuran)			Doesn't cross placenta in active form
	Apremilast (otezla)	Phosphodiesterase inhibitor (what?)		Diarrhea & suicide
	Cyclosporine (neoral)	Calcineurin inhib blocks intracellular cell function		Good for kidney
	Tacrolimus (prograf)			Good for lung dz
	Mycophenolate (cellcept)			Good for kidney & lung dz in SLE

Severity	Drugs	Theory	Fun fact
Moderate to severe	Tofacitinib (xeljanz) Baricitinib (Olmiant) Upadacitinib (rinvoq)	Jak kinase inhib	“Oral biologic”
	Entanercept (enbrel) Adalimumab (humira) Infliximab (remicade) Golimumab (simponi) Certolizumab (cimzia)	Blocks TNF signal between T cells	Used in RA, PsA & IBD
	Abatacept (orencia)	Blocks co stimulatory mhc on T	Used only in RA
	Anakinra (kineret) Canakinumab (ilaris)	Blocks IL-1 signals between cells	Periodic fever syndromes
	Sarilumab (keczara)	Blocks IL-6 so “can’t call other cells”	
	Ustekinumab (stelara)	Blocks IL12/23 cytokine betw T cells	Used in PsA
	Secukinumab (cosentyx) Ixekizumab (taltz)	Blocks IL 17 cytokine betw T cells	Used in PsA
	Guselkumab (tremfya)	Blocks IL-23 cytokine betw T cells	Used in PsA

Severity	Drugs	Theory	Fun fact
Severe	Rituximab (rituxan)	Prevents CD20 B cells into maturing into Godless antibody producers	Good in small ves vasculitis & SLE
	Tocilizumab (actemra)	Blocks IL-6 signals between cells	Good in large ves vasculitis
	Belimumab (benlysta)	Inhibitor to B cell stimulator (BLyS)	SLE \$\$\$
	Cytosan	Alkylates DNA of cells (twinsies w mustard gas)	Bad oldie
	IVIG	Binds “bad” antibodies and removes them and gives “good” ab back	Good in infected autoimm dz
	Pharesis	Just removes EVERYTHING so removes “bad” antibodies and immune complexes AND MEDS	Do BEFORE the other crazy expensive meds

Severity	Drugs	Theory	Fun fact
Misc	Colchicine (colcrys)	Prevents wbc from “walking”	Myopathy with statins
	Allopurinol	Blocks xanthine oxidase enz so uric acid doesn't build up	AVOID in Han Chinese w HLA-B5701
	Febuxostat (uloric)		Heart prob
	Pegloticase (krystexxa)		For bad gout but wears off & can't use in G6PD deficiency & get deathly anaphylaxis rxn but otherwise perfect

Disease	Gender/age/race	Incidence	Prevalence
Gout	M / older		3.9 % of adults
CPPD	F / older	1.3 / 1000 adults	
OA	F/ older/ whites		60 % above age 65
Septic		4-10/ 100,000	
Lyme		10/ 100,000 in usa	
Sarcoid	Blacks	5-40/ 100,000	
Lupus	F /young/blacks, hispanics	1-10/ 100,000	
RA	F / age 35-50	3/ 100,000	1 %
AS	M/ teens/whites		1 %
PsA	Whites		.025 %
SLE CLE	F /young/blacks, hispanics	1-10/ 100,000	
ScL	F/blacks	20/ 1,000,000	
APLAS		5/ 100,000	

Disease	Gender/age/race	Incidence	Prevalence
DM (bimodal)	F/above 50s	8 / 1,000,000	
PM	F/above 20s/blacks	4 / 1,000,000	
NAM		0.16/ 1,000,000	
Antisynthetase		0.1 / 1,000,000	
IBM	M/above 50s		35/ 1,000,000
PMR	F/above 50/whites	63/ 100,000	
GCA	M/above 50/whites	17/ 100,000	
TA	F/younger/asian	2.6/ 1,000,000	
PAN	M	1/ 1,000,000	3/ 1,000,000
GPA	M/whites	10/ 1,000,000	
EGPA	M/above 50s	2.5/ 100,000	
MPA	M/age 50s/whites	2.5/ 100,000	
Cryo	F/above 42		1/ 100,000
Behcet's	M/above 20s/MidE		13-400/ 100,000
IgG4	M/above 50s	3/ 1,000,000	
TO	M/in 20s		12.6-20/ 100,000