Common Rheumatology Medications			
Medication	**Indication**	**MOA**	**SE**
Hydroxychloroquine	JDMS, SLE, Sjogren's	Alters pH of lysosomes, decreasing immune recognition of autoantigens	Retinopathy, N/V, alopecia, hemolytic anemia in G6PD deficiency
Azathioprine	DM/PM, SLE, vasculitis	Antimetabolite	Bruising, myelosupp, lymphoproliferative d/o
Methotrexate	RA, JIA, Psoriatic arthritis, JDM, vasculitis	Dihydrofolate reductase inhibitor	Hepatotoxicity, Stomatitis, Pancytopenias, ILD, Alopecia, Fever
Sulfasalazine	RA, JIA, UC, Crohn's	TNF and IL-1 suppressor	Hepatotoxicity, SJS, Stomatitis, Hemolytic anemia
Leflunomide	RA, JIA, Psor. arthritis	Pyrimidine synthesis inhibitor	Hepatotoxcity, Cytopenias
Abatacept, Rituximab, Tocilizumab	RA, SLE neph, GPA, MPA, RA	Non-TNF biologics	Increased infections due to Immunosuppression, HA, N/V, HTN, infusion reaction, fever, rash, PML
Adalimumab, Etanercept, Infliximab	RA, JIA, Psoriatic arthritis, AS psoriasis, IBD, vasculitis (TA, DADA2)	TNF inhibitors	Infection, Reactivation of TB, Demyelination, CHF, Malignancy
Cyclophosphamide	Vasculitis, scleroderma, ILD	Alkylating agent	Immunosuppression, Hemorrhagic cystitis, Cancer (esp skin, bladder)

Vasculitis				
Vasculitides by Vessel Size				
	Age	**Symptoms/Signs**	**Biopsy/Labs**	**Treatment**
Large Vessel				
Temporal (Giant Cell) Arteritis	• Only age > 40 yo • Carotid arteries	• Unilat. Headache • Jaw claudication • Polymyalgia rheumatica	• Elevated ESR • Granulomatous • inflammation	• High-dose steroids • anti-IL6 biologics
Takayasu's arteritis	• Asian Females • Aortic arch	• Pulseless Disease" • Fever, night sweat, arthritis, weight loss, fatigue	Elevated ESR	Steroids
Medium Vessel				
Polyarteritis nodosa	• Young adults • Immune complex	• Constitutional symptoms • Renal failure, acute MI, bloody diarrhea, peripheral neuropathy.	Transmural fibrinoid necrosis	• Steroids • anti-TNF biologics • Anti-metabolites

Vasculitis

Vasculitides by Vessel Size

	Age	Symptoms/Signs	Biopsy/Labs	Treatment
Medium Vessel				
Kawasaki Disease	Children (higher in Asian pop.)	• **CRASH**: Conjunctivitis, Rash, Adenitis, Strawberry tongue, Hand/foot swelling • Coronary artery aneurysms.	• Complete: clinical • Incomplete: clinical + labs (see below) • Cardiac echo	• IVIG • Aspirin • Steroids
Buerger's Disease (Thromboangiitis obliterans)	Heavy smokers	• Claudication • Gangrene • Autoamputation of digits	Segmental thrombosing vasculitis	Smoking cessation
Small Vessel				
Microscopic polyangitis	• Penicillin use • Strep infections • SLE	• Glomerulonephritis • Palpable purpura • Skin, lung, brain, GI, kidney	• p-ANCA • No granulomas	• Steroids • Cyclophos • Rituximab
Granulomatosis w/ Polyangitis (Wegener's)	• Necrotizing vasculitis • Affects lung/kidney	• Hemoptysis • Hematuria, RBC casts • Chronic sinusitis, ear infections, mastoiditis	• c-ANCA • Necrotizing granulomas in lung/ airway • Necrotizing glomerulonephritis	• MTX • Steroids • RTX/CYC +PD steroids • Pheresis (severe)
Eosinophilic granulomatosis w/ polyangiitis (Churg-Strauss)	Affects heart, GI, and kidneys	• Palpable purpura • Asthma • Sinusitis • Periph. Neuropathy	• p-ANCA • Eosinophilia • No granulomas	• HD pred • Cyclophos • Mepolizumab
Henoch-Schonliein Purpura (HSP)	• Most common vasculitis in children • IgA mediated	• Palpable purpura • Arthritis/arthralgias • Abdominal pain • Melena • Renal disease (IgA nephro)	• Urinalysis • Renal/skin biopsy • Abd U/S: intussusception	• Supportive • NSAIDs • Hydration • Steroids • (abd. pain)

Henoch-Schonlein Purpura

Etiology	• No clear etiology • Frequently preceded by upper respiratory infections (esp streptococcus, staphylococcus, and parainfluenza) or immunizations
Pathophysiology	• Deposition of IgA-containing immune complexes in vessel walls of affected organs and in kidney mesangium activates alternative complement pathway (w/ deposition of C3) • HSP nephritis and IgA nephropathy are histologically identical

Vasculitides continued on next page →

Henoch-Schonlein Purpura

Clinical Manifestations	• Palpable purpura: symmetrically over dependent areas (elbows, feet, buttocks)
	  ▪ Present in all cases, but may not be presenting symptom
	• Arthralgias/arthritis: oligoarticular, large lower extremity joints (knees, hips, ankles)
	  ▪ Occurs in ¾ of cases
	• Abdominal pain: diffuse pain, worse after meals, often w/ nausea or vomiting
	  ▪ Occurs in 2/3 of cases
	  ▪ 3-4% of HSP patients develop intussusception
	• Renal disease: hematuria is most common, but proteinuria/hypertension may be seen
	  ▪ Occurs is 20-50% of cases
	  ▪ Usually delayed 1-2 weeks after onset
	  ▪ <15% children have long-term kidney damage, <1% develop renal failure

Diagnosis	• Palpable purpura (w/o thrombocytopenia or coagulopathy), and ≥1 of the following:
	  ▪ Abdominal pain
	  ▪ Arthritis/arthralgias
	  ▪ Biopsy w/ leukocytoclastic vasculitis (skin) or glomerulonephritis w/ IgA deposition (renal)
	• Urinalysis: helps determine the presence of renal involvement
	• CBC: platelets should be normal/elevated (versus alternative etiologies of petechiae/purpura)
	• IgA level is NOT helpful in determining diagnosis
	• Imaging: Abdominal ultrasound: if concerned for intussusception

Treatment	• HSP is self-limited • Main-stay of treatment is supportive care (hydration, pain control) • NSAIDs are recommended for joint symptoms • Corticosteroids for severe or persistent abdominal pain or purpura • Reduces symptoms, not disease duration so must taper steroids slowly • Minimum course 4-6 weeks • Severe renal involvement associated w/ combination of hematuria and proteinuria • Biopsy-proven crescentic glomerulonephritis on biopsy necessitates immunosuppression • Steroids, cyclophosphamide, azathioprine, rituximab • Follow-up as outpatient w/ screening for urinary abnormalities and elevated blood pressure (to evaluate for progressive renal involvement)

Kawasaki Disease

Epidemiology	• Acute, self-limited systemic vasculitis of medium-sized arteries in infants/children • Average age of onset ~ 2 years w/ 80% occurring in those < 4 years old • Incidence in US: 17-18/100,000, M:F = 1.6:1 • Incidence doubled for Asian Americans, highest incidence in Japan • Increased rates in winter & spring
Pathophysiology	• May be related to infectious triggers • Vasculitis begins as a neutrophilic infiltrate; plasma cells producing IgA in vessel walls
Clinical Manifestations	Classical criteria = fever ≥ 5 days w/ ≥ 4/5 classical criteria, w/o alternative diagnosis

Conjunctivitis	Bilateral bulbar conjunctival injection (non-exudative & limb sparing)
Rash	Polymorphous rash
Adenopathy	Cervical lymphadenopathy (≥1 lymph node, > 1.5 cm in diameter).
Serositis	Injected/fissured lips, injected pharynx, or strawberry tongue.
Hand/Feet	Erythema of palms/soles, edema of hands/feet (acute), periungual desquamation (convalescent)

Kawasaki Disease

Complete KD	Fever ≥ 5 days and ≥ 4 principal clinical features OR fever ≥ 4 days and 5 clinical features	
Incomplete KD	• Fever ≥ 4 days plus ≥ 2 cardinal features, elevated ESR/CRP, ≥ 3 supplemental labs • Supplemental labs: Anemia for age / ALT > 50 units/L Platelet count ≥ 450,000 after 7th day of fever / WBC > 15,000/mm3 UA w/ > 10 WBC per hpf (sterile pyuria) / Albumin < 3.0 g/dL • Must have abnormal echo to make the diagnosis	
Other Clinical Findings	**Neuro**	Irritability, hearing loss, facial nerve palsy
	Cardiac	Coronary artery aneurysms, depressed myocardial function, pericardial effusion, prolonged PR interval ▪ Risk factors for CA aneurysms include: male, <1 y/o, prolonged fever, elevated CRP, low platelets, low albumin levels on diagnosis
	GI	Pain, vomiting/diarrhea, hepatitis, acute acalculous distention of the gallbladder
	MSK	Arthritis, arthralgias (pleocytosis of synovial fluid)
	GU	Urethritis/meatitis, hydrocele
Diagnostic Studies	Echocardiogram w/i 24 hours (abnormal echo= coronary artery Z score ≥ 2.5)	
Treatments	• IVIG (2g/kg) infused over 12 hours→ repeat, if febrile, 36 hours after first infusion. ▪ Aspirin: high dose (30-50 mg/kg/d divided QID) until afebrile x 48 hours ▪ Then low dose (3-5 mg/kg/d). (consider starting w/ low dose for age ≤ 6 mo) • Corticosteroids: trials indicate that steroids may be effective as primary/rescue therapy. • Repeat echo post-treatment, either before or after discharge, to observe improvement • Patients w/ severe CA dilation may need long-term anticoagulation therapy • Under study: infliximab, cyclosporine, other immunomodulatory agents	

Polyarteritis Nodosa

Epidemiology	• Vasculitis w/ aneurysms affecting small and medium muscular arteries, w/ transmural inflammation, sparing veins • Can have systemic or cutaneous forms • Rarely caused by loss-of-function mutation in adenosine deaminase 2
Symptoms	• Systemic: fever, weight loss, fatigue • Multisystem involvement (see diagnostic criteria)
Diagnosis/ Clinical symptoms of Cutaneous PAN (not formalized)	• Subcutaneous nodular, painful, non-purpuric lesions, +/- livedo reticularis, w/o systemic involvement (but can have elevated acute phase reactants, myalgia, arthralgia, non-erosive arthritis) • Tissue biopsy with necrotizing non-granulomatous vasculitis • Labs: Negative ANCA; may see + ASO (up to ⅓ of cases are triggered by a strep infection)

Vasculitides continued on next page →