**AY 2024-2025 Cumulative Academic Summaries**

**Week 1**

Classes of Shock:

|  |  |  |  |  |
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|  | **Distributive** | **Hypovolemic** | **Cardiogenic** | **Obstructive** |
| Etiologies | Sepsis (!!!), Neurogenic, Anaphylaxis | Dehydration, Blood loss | HF, MI, Valvulopathy | Tamponade, PE, PTX |
| CO | ⬆️ | ⬇️ | ⬇️ | ⬇️ |
| SVR | ⬇️ | ⬆️ | ⬆️ | Nl or ⬆️ |
| SvO2 | ⬆️ | ⬇️ | ⬇️ | Nl or ⬇️ |
| POCUS | Small IVC (<2.1 cm)  >50% Respirophasic collapse  Hyperdynamic heart | Small IVC (<2.1 cm)  >50% collapse  Hyperdynamic heart | Plethoric IVC (>2.1 cm)  Minimal collapse  Hypodynamic heart  Pulmonary B-lines | Normal to big IVC  Septal bowing (D Sign)  McConnell’s sign  Pericardial effusion  Absent lung sliding |
| Tx | IVF (30 mL/kg crystalloid), Cx and Abx within 1 hr – septic;  Epinephrine, antihistamines - anaphylactic | IVF (30 mL/kg crystalloid), titrate to MAP or SBP, trend lactate, pressors; treat underlying process (stop the bleed! Avoid cold/acidemia/coagulopathy in Trauma, give TXA, activate MTP, etc) | Optimize Preload (diuresis or RRT),  Inotropy,  Mechanical Support (IABP, Impella)  Transplant | Treat underlying pathology (pericardiocentesis, chest tube, thrombolysis/ectomy, e.g.) |

Approach to Community-Acquired PNA (CAP):

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| Dx:  New lung infiltrate plus clinical evidence of infection (fever, purulent sputum, leukocytosis, or hypoxia) not acquired in the hospital setting  Risk strat:  Pneumonia Severity Index (PSI) – more factors, harder to use readily  CURB-65 – fewer factors, easier to use readily  **C**onfusion present?  B**U**N >19  **R**R >= 30  S**B**P <90 or DBP <= 60  **65**+ yo old |
|  |

Cavitary Lung Lesions:

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| **Broad Differential - CAVITY** | **Infectious Differential – THANKS-ER** |
| **C**ancer  **A**utoimmune  **V**ascular  **I**nfection  **T**rauma  **Y**outh/Congenital | **T**uberculosis/Non-TB mycobateria  **H**istoplasmosis (and Coccidio/Blasto)  **A**spergillus/Anaerobes/Actinomyces  **N**ocardia  **K**lebsiella/GNRs  **S**taph aureus  **E**chinococcus  **R**hodococcus |

Our Case involved:

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| **Coccidiomycosis aka “Valley Fever”** |
| 1. Dimorphic fungus – “Mold in the cold, yeast in the heat”    * *Coccidioides immitis* (from California) and *Coccidioides posadasii* (all other endemic areas – think SW US!) 2. Acquired by inhalation of airborne arthroconidia 3. Refractory community acquired pneumonia is the most common clinical presentation 4. Fluconazole is the first-line treatment for symptomatic infection 5. Extended periods of therapy and surgical resection possible 6. 6-12 weeks fluconazole in immunocompetent with mild/moderate dz; 12-24 weeks of tri-azole therapy in severe dz |

**Ophtho for the Internist:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disease** | **Patient** | **Exam** | **Management** | **Photo** |
| Ocular Trauma | s/p any kind of trauma (MVA, assault, battle injury) to the head/face | Look for open globe, evidence of fracture, slit lamp | CALL OPHTHO  Irrigate chemical injury  Lateral canthotomy for retrobulbar hematoma  Eye shield  CT vs US  Abx (FQ) pain/nausea ctrl  Tetanus shot  Fox eye shield 🡪 |  |
| Macular Degeneration | Older, white, female, tobacco use, light iris color  Dry (80-90%) vs Wet (10-20%) | Dry – drusen, pigment change  Wet – choroidal neo-vascularization | Dry – AREDS2 supp. (AREDS supp has lung ca risk in smokers)  Wet – Anti-VEGF injections  Urgent referral for acute vision loss/distortion |  |
| Diabetic Retinopathy | Long standing patients with diabetes, especially worse glycemic ctrl | Proliferative – new vascularity  May/may not have macular edema or cataracts | Yearly Screen!  T1DM Begin 5 years s/p diagnosis  T2DM Screen at diagnosis | Close-up of an organ  Description automatically generated |
| Posterior Vitreous Detachment vs. Retinal Detachment | PVD – age >50, myopia, prior PVD  RD – age >50, prior RD, FH of RD, myopia, prior eye sx or injury | PVD – linear separation including optic disc  RD – fluid develops under retina, lifting up from choroid, spares optic nerve | Routine referral for sxs >1 week  Urgent referral for sxs <1 week OR curtain/veil, constant blurry vision, hx of driving glass, ocular surg, trauma/DM |  |
| Uveitis | Non-infectious – pts with sarcoid, Bechets, lymphoma, HLA-B7, RA or reactive arthritis  Infectious – Toxo, HSV/VZV/CMV, syphilis, TB, candida | Inflamed uvea (middle layer of eye)  Anterior, Intermediate, posterior, or Pan  Anterior – non-limbic sparing redness, pain | Optometry screening for HLA-B27, plaquenil, or ethambutol pt  Routine uveitis f/u – Ophtho referral annually  Uveitis on immune modulators – Uveitis clinic referral  Acute new/flare – **urgent** ophtho referral |  |

**Week 2**

AKI Criteria and Differential

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| **KDIGO Criteria** | | |
| 1. Increase in SCr by ≥0.3 mg/dL in 48 hours **OR** 2. Increase in SCr to ≥1.5 times baseline in 7 days **OR** 3. Urine output <0.5 mL/kg/hour for six hours | | |
| **PRERENAL**   * Low volume   + Hemorrhage   + Dehydration   + Burns * Low cardiac output   + Heart failure   + Massive PE * Low SVR   + Sepsis   + Cirrhosis   + Anaphylaxis   + Anesthesia | **INTRARENAL**   * Glomerular   + Nephrotic/Nephritic * Tubules/Interstitial insult   + ATN   + Nephrotoxins   + AIN * Vascular   + Vasculitis   + TTP, HUS, HELLP   + Hypertensive emergency | **POSTRENAL**   * Upper tract   + Kidney stones   + Blood clot   + Extrinsic compression * Lower tract   + BPH   + Neurogenic bladder   + Cancer   + Urethral stricture   + Blood clot |
| **Volume status assessment**  **Review Meds & History** | **Urinalysis & Microscopy**  **Review Meds & History** | **Bladder Scan, Renal US**  **Review Meds & History** |

Exertional Rhabdomyolysis:

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| **Suspicion** | Post-exertional myalgias, dark urine, UA with blood but no RBCs (myoglobinuria) |
| **Diagnosis** | Severe myalgias **AND** CK>5x ULN after exercise |
| **Risk Factors** | High intensity exercise unmatched to fitness level  Hot and humid climate  Dietary supplements (stimulants)  Genetics (sickle cell trait, disorders of lipid or glycogen metabolism) |
| **When to Admit (High-Risk Features)** | CK > 20,000 U/L  Possible compartment syndrome  AKI  Metabolic derangement (hyperK, hyperPhos, acidosis)  Sickle cell trait  Limited f/u |
| **Management** | Isotonic IVF targeting 200-300 ml/hr UOP until CK decreasing, Rest |
| **Return to Duty** | Follow USU CHAMP Guidelines! |

Transfusion Thresholds:

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| **American Society of Hematology (ASH) + AABB**   * Hgb ≤ 7 * Hgb ≤ 8 (cardiovascular disease) * Symptomatic anemia | **Joint Trauma System (JTS)**   * HR > 100 or SBP < 100 or no radial pulse * AMS + S/SX of hemorrhagic shock * Penetrating chest/abdomen trauma, junctional injuries, pelvic fracture * AKA or multiple amputations |

Exertional Heat Illnesses:

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|  | **Heat Exhaustion** | **Heat Injury** | **Heat Stroke** |
| **Pathophys** | Inability to maintain CO due to strenuous activity and heat | Thermoregulatory failure leading to gut endotoxin leakage and inflammatory response | Thermoregulatory failure leading to gut endotoxin leakage and inflammatory response |
| **Symptoms** | Profuse sweating, pallor, “prickling”, thirst, dizziness HA, cramps, N/V/D, myalgia | As with exhaustion **Absent** CNS dysfunction | As with exhaustion CNS dysfunction |
| **Vitals** | +/- Tachycardia, hypotension Core body temp often 101-104F | T may be >104F | Tachycardia, Hypotension T > 104F |
| **Labs** | Hypo/ernatremia | Hypo/ernatremia Elevated CK End-organ dysfunction | Hypo/ernatremia Elevated CK End-organ dysfunction |
| **Treatment** | Cease activity, shade or AC  Supinate, elevate legs  Remove excess clothes  Rapidly cool to 101F (rectal)  ED if not improving | Rapidly cool to 102.2F (rectal)  Ice bath or evaporative cool  Transfer to ED  CBC, CMP, CK, UA, Coags  Manage complications | Rapidly cool to 102.2F (rectal)  Ice bath or evaporative cool  Transfer to ED  CBC, CMP, CK, UA, Coags  Manage complications |

Syncope:

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| **Dx: Transient LOC from decreased cerebral perfusion** | | |
|  | | |
| **Eval**  Review history, meds, risk factors, perform CV and neuro exam, EKG  Tilt table testing – reserve for recurrent unexplained syncope  Carotid massage – if history convincing for carotid hypersensitivity | Review history, meds, risk factors, perform CV and neuro exam, EKG  Orthostatic vitals! Laying to standing (HR>30, SBP drop 20, DBP drop 10 = positive)  Neuro c/s for dysautonomia | Review history, meds, risk factors, perform CV and neuro exam, EKG  Zio patch (inpt telemetry)  EP Study  TTE  Ischemic eval  CTPE |
| **Management**  Education, hydration, adjustments with positional changes  Midodrine (IIa)  Counter pressure maneuvers (hand squeeze, leg cross, etc) | Reduce medication doses  Hydration, compression garments, counterpressure maneuvers | Treat underlying disorder  Medication, LHC, PPM, surgery, PE mgmt |

**WEEK 3**

Annuals aren’t so bad! Here’s a cheat sheet of USPSTF Grade A or B Recommendations:

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| **Cancer** | | | |
|  | Age | Frequency | Modality |
| Breast | Pts with breasts 40-74 years | Q2year | Mammogram |
| Cervical | Pts with cervices 21-29 yo\*  Pts with cervices 30-65 yo | Q3year\*  Q3yr Pap  Q5yr HPV or co-test | Pap\*, HPV, or Co-testing |
| Colon | Adults 45 – 75 yo (average risk)  Adults at 40 or 10 yrs prior to first degree relative diagnosis age\* | Q1yr (FIT)  q5yr (VC)  q10yr (OC)\* | FIT, Cologuard, Virtual or Optical Colonoscopy\* |
| Lung | Adults 50-80 yo with 20 pk-yrs, currently smoking or quit within last 15 yrs | Annual | Low-dose lung CT |
| Prostate | Grade C – Pts with prostates 55-60 yo | Annual | PSA |
| **Immunizations** | | | |
|  | Age | Frequency | Modality |
| Pneumococcal | Age >65, OR <65 if comorbidities (DM, Tobacco/EtOH, immunocompromise, eg) | One time  OR 1 year apart -> | PCV-20  OR PCV-15, PPSV23 |
| Meningococcal | All adults (Men B for 19-23), esp with immunocompromise/asplenia | Multiple doses | MenACWY x 1-2  MenB x 2-3 |
| HPV | Age 18-45 | 3 doses | Gardasil (9-valent vax) |
| Tdap | Age 18+ | Q10 years, qPregnancy | Td or Tdap |
| Herpes Zoster | Age >= 50 yo | 2 doses | Shingrix |
| RSV | Age >=60 yo (or 32-36 wk preg. Sep-Jan) | One time | RSV |
| **Infectious Disease Screening** | | | |
|  | Age | Frequency | Modality |
| HIV | Patients 15-65 yo | At least once, then by sexual activity/risk level | HIV Ab immunoassay/p24 Antigen |
| HBV | All adults >18 yo | One time, then by risk level | HBV Surface Antigen and Ab, Anti-HBV Core Ab |
| HCV | Patients 18-79 yo | One time | Anti-HCV Ab |
| Latent TB | At risk adults | One time | TST or Quantiferon |
| STI (Syphilis, GC/CT) | Sexually active adults | Q3-12mo depending on risk level, PrEP Rx, etc | RPR, GC/CT NAAT at receptive sites |
| **Other** | | | |
|  | Age | Frequency | Modality |
| AAA | Males age 65-75 who have smoked >100 cigarettes (= 5 packs) | One time | Abdominal Ultrasound |
| Osteoporosis | Women age >65 yo at average risk  Women <65 yo at high risk (parental frx, steroid use>3mo, Current smoker, heavy EtOH, low BMI) | At least once | DEXA scan |
| Depression & Anxiety | All adults | Annually | PHQ-2  GAD-2 |
| Lipids | Adults age >35 yo | Q10years | Lipid panel |
| Pre-DM and T2DM | Adults 35-70 yo with overweight or obesity | Q3years | Hgb A1c |
| Weight loss | Adults with BMI>=30 | Annually | Behavior/Meds Rx |

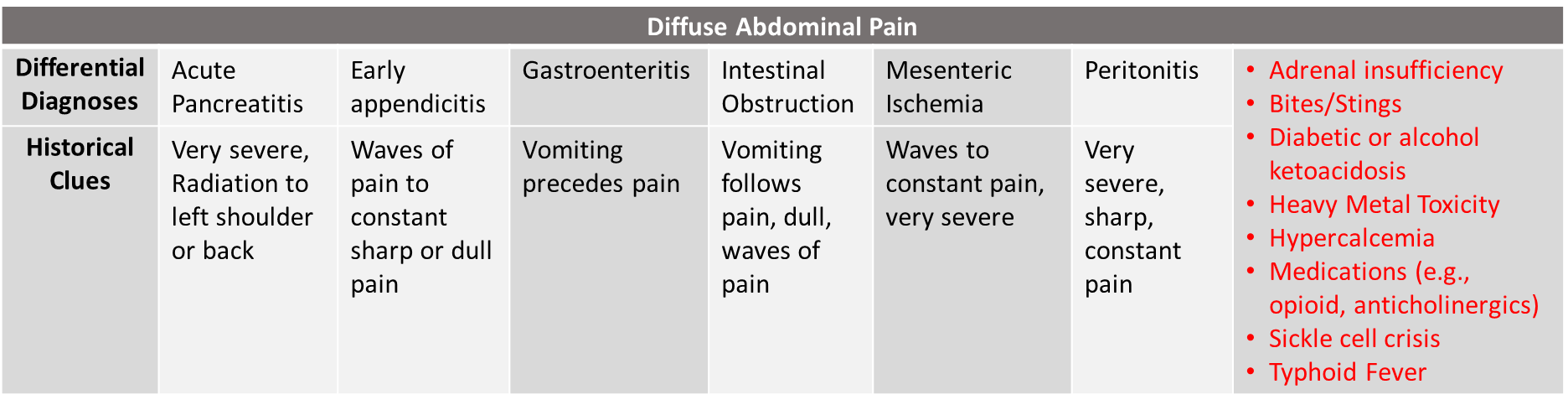
Fatigue Mitigation for the Resident Physician Warrior:

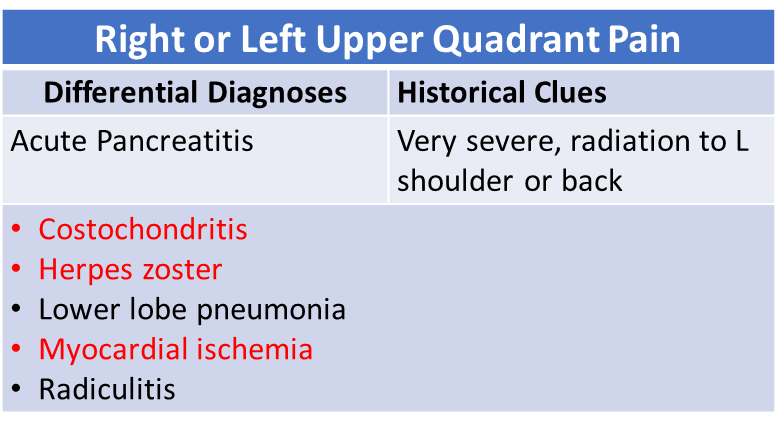
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| **Avg number of needed sleep hours per night** | 7-9 hrs (very few can do well on fewer hrs!) – PRIORITIZE for global health improvements |
| **Fatigue** | Lack of sleep combined with physical & mental exertion  \*Cannot be overcome by motivation, training, or will-power\*  Performance WILL decline (but self-assessment will not change)  Susceptibility is individual & varies |
| **Insufficient sleep leads to:** | Impaired mental effectiveness and alertness (felt after just 1 night of insufficient sleep!), insidious (you may not notice)  Mood and interpersonal dysregulation, executive/hygiene lapses; ACCIDENTS, CASUALTIES, and PSR Events!!; chronic – behavioral health issues (PTSD), weight gain, T2DM, CV disease |
| **Fighting Fatigue**  ONLY effective counter-measures: | **Adequate sleep** (including sleep banking before fatigue periods)  **Napping** (10-20 min optimal to avoid entering deep sleep)  **Caffeine** (200 mg just before a catnap, more effective if no sleep  restriction or recent daily use/tolerance)  **Education** |
| **PSA: Behaviorally-Induced Insufficient Sleep Syndrome** | Avoid staying up later to reclaim “Me Time” where possible, you’ll feel more refreshed and function better if you continue to get your needed avg hours! |
| **Bottom Line** | Don’t become or cause a sleep casualty! The WR Sleep Medicine Clinic is great at helping struggling residents with Insomnia, ISS, BIISS, or OSA (CPAP not necessary!) |

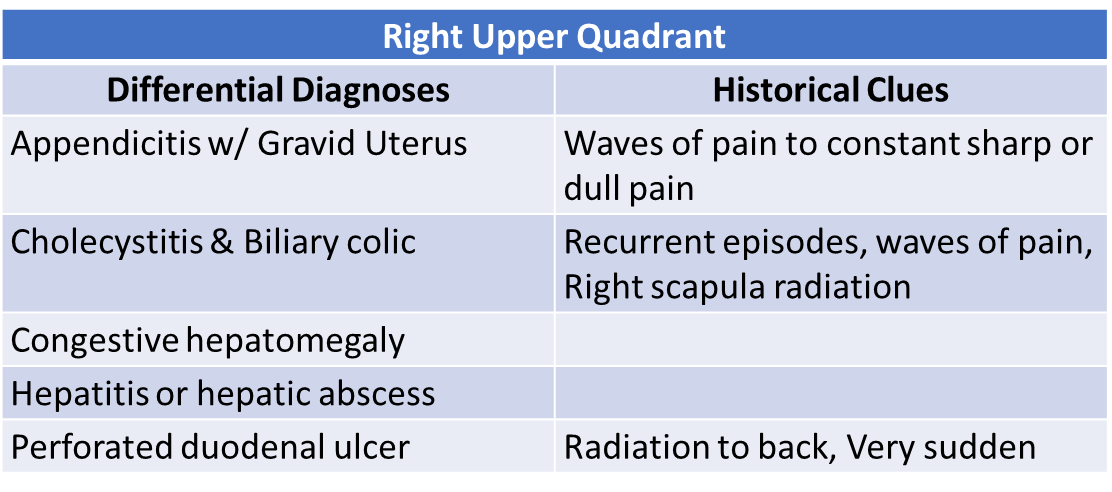
Approach to Abdominal Pain:

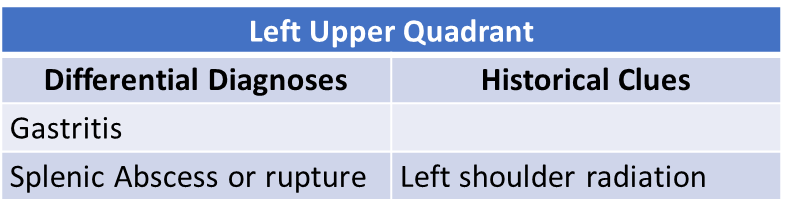
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| **History** | **Physical** | **Labs/Rads** |
| LOCATES  Location/radiation  Other symptoms  Character/Quality  Alleviating/aggravating factors  Timing – onset/duration – chronicity!  Environment at onset  Severity  PMH, PSH, Meds, bowel movement, LMP, sexual history | Inspect – visible discomfort? distension? bruising? Stigmata?  Auscultate – hypoactive/absent BS? Succussion?  Percussion – shifting dullness? Tympany?  Palpation – organomegaly? Guarding/rebound? Murphy’s? McBurney’s point?  Rectal & GU exams | Labs – per history  CBC, BMP, LFT, Lipase, bHCG (acute)  Stool studies? Celiac testing? Fecal calpro?  STI testing?  Add Iron panel (chronic)  Rads – per history  KUB, RUQUS, TVUS, CT A/P |

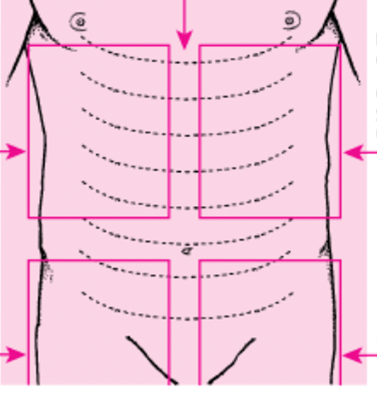
Abdominal Pain Differential (RED = image negative):

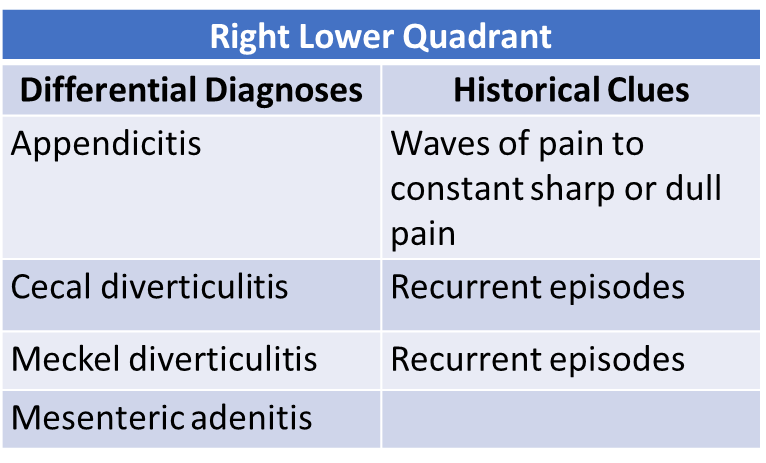


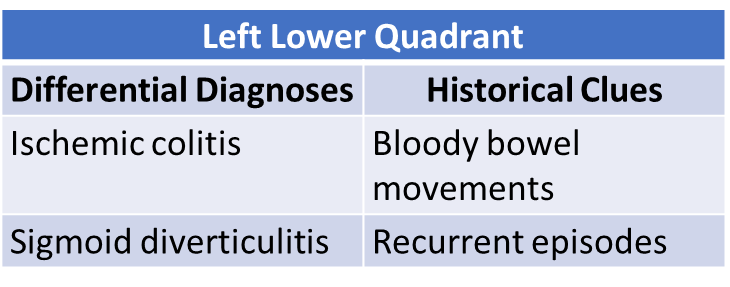


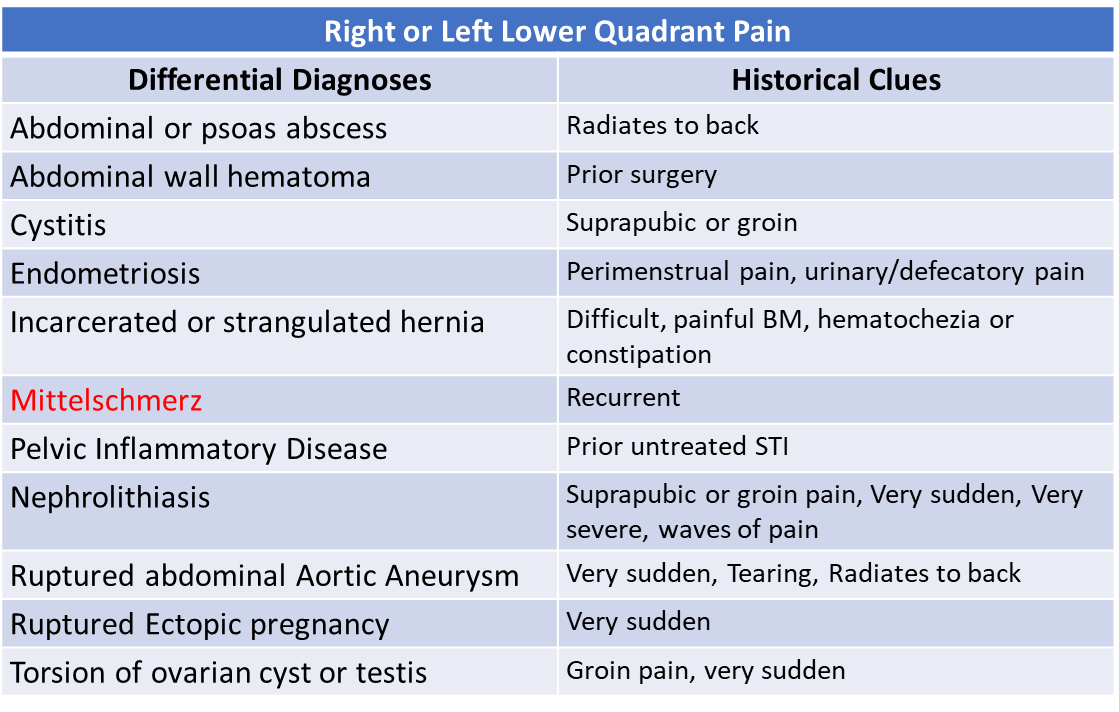












Altered Mental status schema:

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| **MIST** | | | | | |
| **M**etabolic | | **I**nfection | **S**tructural | **T**oxin | Mimic/Distractor |
| Hypo/hypernatremia  Uremia/Renal failure  Hypo/hyperglycemia  Organ dysfunction  Renal or Liver failure  Hypo/Hyperthyroid  Hypercarbic or Hypoxic Resp Failure  Other  Thiamine or B12 deficiency  Urinary retention  Constipation | | Extra-CNS  Pneumonia  UTI  ~Sepsis in general  CNS  Encephalitis | Subdural Hemorrhage | Anti-cholinergic, BZD, or Opiate toxicity  Baclofen W/d  Ketamine tox or w/d | Aphasia  Dysarthria  Rx>Dx:  Can give D50 or naloxone empirically.  Intubate if not protecting airway. |
| **MIST-Negative** | | | | | |
| Dementia | | | Psychiatric | Strategic Stroke | Seizure |
| Rapidly Progressive  Prion dz (Kuru, CJD)  Autoimmune Encephalitis  Vasculitis | Degenerative w/wo delirium  Alzheimers  Vascular dementia | | Catatonia | Brainstem  Thalamus  Non-dominant Parietal Lobe  Frontal Lobe  Superior Sagittal sinus | Non-convulsive status |

A novel hyponatremia algorithm (Use after taking an excellent Med Rec & HPI!):

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| **Step 1** | Is something wrong with brain or beans? | Brain (recent stroke, injury, etc): cerebral salt wasting,  genetic/acquired change in osmostat setpoint  Kidney: diuretic use, eGFR<15 (cannot dilute urine) |
| **Step 2** | What’s the tonicity?  - Calculate Sosm = 2\*Na + BUN/2.8 + Glucose/18 (Nl = 285-300)  - Obtain Uosm, UNa, Sosm | Hypertonic? Consider hyperglycemia  Isotonic? Consider lab artifact due to high triglycerides or  immunoglobulins  Hypotonic? Everything else |
| **Step 3** | Assess volume status | Hypervolemic? CHF, Cirrhosis, or Nephrosis  Hypovolemic? Expect renal reabsorption of salt/fluid, so  CONCENTRATED urine (UOsm >300) with LOW sodium (UNa <20) |
| **Step 4** | Assess causes of euvolemic hypoNa  Obtain TSH, AM cortisol + ACTH + Urate | Low UOsm – Primary polydipsia, Tea/Toast  High Uosm, High UNa – Adrenal insufficiency, Hypothyroidism,  Thiazides, SIADH |

A Good Neuro Exam (Adapted from Emory SOM):

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| **1. Assess mental status:**  Level of Consciousness: Alert, Drowsy, Obtunded, Stuporous, Comatose  Glasgow Coma Scale (GCS): E4, V5, M6 & Richmond Agitation Sedation Scale (RASS)  Attention, Mood, Orientation, Language, Intellectual Function |
| **2. Assess memory** (Recent and Remote-3 objects, corroborated info) |
| **3. Cranial Nerves I-OLFACTORY**: Ask pt. to identify a pleasant (not noxious= pain) but common odor? (Each nostril separately test only when a patient complains of difficulty with taste or smell) |
| **4. Cranial Nerves II-OPTIC**: Test visual acuity   |  |  | | --- | --- | | *Notes:* | -inquire if pt. wears glasses or contacts  -allow patient to hold card at appropriate distance  -test each eye independently in well lit environment | |
| **5. Cranial Nerves II-OPTIC**: Test visual fields by confrontation, central AND peripheral vision   |  |  | | --- | --- | | *Notes:* | -have patient focus on forehead or nose  -test each eye independently- they cover one eye, you don't  -CENTRAL VISION: check each field with finger count (1,2, or 5) in each quadrant  -PERIPHERAL VISION: when first see finger wiggle in outer reaches of each quadrant | |
| 6. Perform funduscopic exam of each eye to assess optic nerve head and vessels |
| **7. Test Extraocular Movements**  *Notes;* Cranial Nerve III, IV and VI-: Test ocular motion and convergence by asking pt. to follow finger or pen light with eyes in H pattern without moving their head? |
| **8. CN II and III**--Test Direct AND Consensual pupillary reaction to light?  *Notes*: Shine light in one eye and look at reaction in that eye and the other one |
| **9. Cranial Nerve V-TRIGEMINAL**: Test for bilateral light touch (gentle finger or cotton ball tap in discrete location, not rub) and/or temp (tuning fork is cold, warm one side)   |  |  | | --- | --- | | *Notes:* | MUST DO ALL THREE: ophthalmic (above eyes), maxillary (on cheeks), mandibular (on sides of chin) divisions | |
| **10. Cranial Nerve VII\_FACIAL**: Test facial muscle strength: (at least 2) Tight eye closure, wrinkle forehead/grimace/show teeth/smile |
| **11. Cranial Nerve VIII-VESTIBULOCOCHLEAR**: Test gross hearing acuity in each ear independently? Whisper (while masking the other ear) or finger rub |
| **12. Cranial Nerve IX, X-GLOSSOPHARYNGEAL,VAGUS**: Ask the patient to open mouth & say Aah and inspect position of uvula & soft palate or swallow |
| **13. Cranial Nerve XI-SPINAL ACCESSORY:** Have patient shrug shoulders and turn head against resistance |
| **14. Cranial Nerve XII-HYPOGLOSSAL**: Have patient stick tongue out and push tongue inside check on each side while examiner tests strength by pushing from outside cheek |
| **15. MOTOR EXAMINATION**: Bilaterally assess for normal bulk and test muscle tone in arms and legs |
| **16. STRENGTH EXAMINATION:** compare (R to L) shoulder abduction/adduction, wrist extension and flexion, hip flexion and extension, foot dorsiflexion and plantar flexion |
| **17. SENSORY**: Test and contralaterally compare sharp vs. dull over the dorsum of the foot and hand WITH PATIENT’S EYES CLOSED  Notes: Examiner should provide standard prior to testing with patient’s eyes open, to insure pt can discern sharp vs. dull |
| **18. SENSORY:** Test and contralaterally compare vibration over great toes WITH PATIENT’S EYES CLOSED |
| **19. SENSORY:** Test joint position sense in big toe WITH PATIENT’S EYES CLOSED   |  |  | | --- | --- | | *Notes:* | -grip toe at most distal joint laterally (not on top and bottom); avoid touching nearby digits  -ask pt. to identify position (up or down) | |
| **20. DEEP TENDON REFLEXES**: Biceps, triceps, and brachioradialis, bilaterally |
| **21. DEEP TENDON REFLEXES**: Knee jerk/Patellar and Ankle jerk/Achilles, bilaterally |
| **22. DEEP TENDON REFLEXES**: Plantar response (Babinski) |
| **23. COORDINATION**: Test finger-to-nose and heel-to-shin |
| **24. COORDINATION**: Test for dysdiadokinesia -rapid alternating movements in UPPER extremities (one hand turning back and front in the other hand) AND LOWER (tap heel on floor repetitively) |
| **25. GAIT AND STATION**: Assess for Romberg (toppling when feet are together and eyes closed)   |  |  | | --- | --- | | *Notes:* | -Stayed close to patient to prevent injury | |
| **26. GAIT AND STATION**: Observe gait (stride length, base (distance between feet), arm swing, turning (lead with head and shoulders), posture Observe gait: toe-walk, heel-walk, tandem-walk (heel to toe tells balance/coord) |

**WEEK 4:**

How to Handle Animal Bites (High yield for Boards!)

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| **Common pathogens (typically mixed aerobe/anaerobe)** | Pasteurella (50% dog bites, 75% cats), Capnocytophaga canimorsus, Eikenella corrodens (clang: human bites), Streptobacillus moniliformis (rats), Oral anaerobes, human skin flora |
| **Immediate Management** | 1. Clinical evaluation (find all wounds, determine depth, necrosis, infxn risk)  2. Irrigation and debridement (cultures prn, wash out all, ID/Ophtho/Surg c/s)  3. Primary (less scar, more infxn) or delayed closure |
| **Indications for Abx** | If clearly infected,  - Abx after cultures taken and wound irrigated  If not infected, indications for abx prophylaxis:  - Moderate/severe wound - MOST cat bites  - Puncture or crush wound - Face/hand/genital/joint involved  - Wound near bone - Wound requiring surgical closure  - Immunocompromised (T2DM, asplenia, e.g.)  - Venous or lymphatic insufficieny present |
| **Abx regimens** | Treatment: Same as PPX but course may extend to 14d or longer per wound severity  Prophylaxis: Augmentin 875/125 mg PO q12h x3-5d (Alt: Doxy/Bactrim/Levoquin + Flagyl or Clinda) \*\* a dose of IV abx ok if c/f severe infection – Talk to ID! |
| **Indications for Primary Closure (Sutures)** | Secondary intention ok for many/most after wound washout! EXCEPT:   1. Non-puncture dog bit 2. Non-infected wound 3. Bite <12 hrs old (<24 hrs on face) 4. Not on hand/foot   **DO NOT CLOSE**: Cat/human bites (?face ok), puncture/crush wounds, clearly infected wounds, bites >12 hours old or >24 hrs on face, hands/feet, immunocompromised pts |
| **Indications for Vax/Immunoglobulins** | Tetanus  - Vax: Give Td in adults with <3 or unknown tetanus vax hx OR if >10 yrs since last and clean/minor wound or if >5 years since last and severe/dirty wound  - IM IG: Given for pts with severe/dirty wounds AND <3 total Tetanus vax; ALL HIV or severe immunodeficiency regardless of tetanus vax hx  Rabies (high concern: bat/bear/beaver/raccoon/fox/otter, medium: cat/cow/dog)  - Vax: Pre-bite risk per occupation, call ID/Immz, post-exposure 3-dose vax  - IG: call ID/Immz, 20 IU/kg body weight into site (remainder IM bc usually 5-10 mL) |

GDMT for HFrEF (LVEF <= 40%)

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| --- | --- | --- |
| Classify | ACC/AHA Stages  **A:** At-risk (HTN, CVD, DM, Obesity, FH, etc)  **B**: No current sxs but structural heart dz, evidence of increased filling pressure, or elevated BNP/trop in absence of alternate diagnosis  **C:** Current or previous HF sxs  **D**: End-Stage (Recurrent hospitalization, having to decrease GDMT) | NYHA Classes  **1:** Structural myocardial changes without limitation to ordinary physical activity  **2**: Symptoms with moderate activity  **3**: Symptoms with mild activity  **4**: Symptoms at rest |
| BB (Class 1 recc) | Metoprolol Succinate (XL) (25 mg daily start, 200 mg daily goal), Carvedilol (3.125 mg BID start, 25-50 mg BID goal), Bisoprolol (1.25 mg daily start, 10 mg daily goal) | |
| RAASi (1) | ARNI (Entresto = sacubitril/valsartan) preferred (24-26 mg BID start, 97-103 mg BID goal)  ARB or ACEi acceptable | |
| SGLT2i (1) | Empagliflozin or Dapagliflozin (10 mg start = goal) | |
| MRA (1) | Spironolactone (12.5-25 mg start, 25-50 mg goal), eplerenone (25 mg start, 50 mg goal) | |
| Bidil (1\*) | Hydralazine-isosorbide dinitrate (1 tab TID start) for NYHA III-IV sxs in African Americans | |
| Diuretic PRN (1) | As needed or daily torsemide/furosemide/bumetanide PO for patients with Stage C-D HF | |
| \*NOTE\* | Having patients on one agent from each class is better than having them on max dose of one agent but not being able to add other agents due to symptoms or HoTN. | |

Resistant HTN:

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| **Definition** | JNC 7 | AHA |
| BP >140/90  On 3 anti-HTN meds INCLUDING diuretic  All drugs at or near max dose | Uncontrolled BP despite 3 meds  OR  BP controlled but requires 4+ meds |
| **Secondary Causes** | Etiology | Test |
| OSA (25-50%)  Primary hyperaldosteronism (8-20%)  Renal artery stenosis (5-34%)  Renal parenchymal disease  Drug or EtOH induced  Thyroid disease  Pheochromocytoma  Cushing’s dz | Polysomnogram (PSG / Sleep Study)  Aldo/renin ratio  Renal artery US, CTA/MRA  -  -  TSH  Plasma metanephrines  O/N Dex suppression, Late-nite salivary cortisol, 24-hr Ur cortisol |

UGIB in a nutshell:

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| **Risk Stratification** | Glasgow-Blatchford Score (GBS) – on MDCalc!   * Identifies risk for needing intervention, appropriateness for OP gmt. * Score 0 = low risk * Score 6+ = high risk (50%)   AIMS65 – on MDCalc! --- identifies risk for mortality – Score 3 (10%), Score 5 (25%) | | |
| **Buckets** | Ulcerative/Erosive | Portal Hypertensive | Vascular Lesions |
| Duodenal or gastric ulcer  Esophagitis  Gastropathy or Duodenopathy | Varices (Esophageal, Gastric, or Ectopic)  Portal HTN Gastropathy | Angiodysplasia / AVM  Dieulafoy’s Lesion  Gastric Antral Vasc Ectasia (GAVE) |
| **Interventions** | Always think ABC first  Obtain type & cross (unstable) vs type & screen  Make patient NPO  Hold anticoagulants; if INR > 2.5, need to reverse; partially or completely hold DAPT  Establish two large-bore Ivs (IO or Cordis/MAC also options)  Maintain SpO2 >94%  Treat hypotension (goal SBP > 90 or MAP > 65) – crystalloid/MTP  Consult GI for endoscopy! Consider CTA  IR or Surgery consult if unstable  IV PPI bolus (80 mg) & then BID (40 mg)  SBP ppx with Rocephin | | |

Hepatic Encephalopathy in brief

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| **Definition** | Reversible impairment of neuropsychiatric function a/w impaired hepatic function and increased ammonia concentration |
| **Risk Factors** | Drugs (BZD, opiate); Increased ammonia, GIB, Dehydration, Vascular occlusion |
| **Classification** |  |
| **Treatment** | Reverse the underlying cause! Ensure adequate hydration, nutrition, falls precautions  Start Lactulose PO or PR (long term therapy) + Rifaximin (at least 3 mo) – Titrate to 2-3 BM per day |

**WEEK 5:**

No cap, Know CAP:

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| **Syndrome** | New lung infiltrate plus clinical evidence of infection (fever, purulent sputum, leukocytosis, or hypoxia) not acquired in the hospital setting |
| **Risk stratification**  **(on MDCalc!)** | Pneumonia Severity Index (PSI) – more factors, harder to use readily (need ABG)  CURB-65 – fewer factors, easier to use readily  **C**onfusion present?  B**U**N >19  **R**R >= 30  S**B**P <90 or DBP <= 60  **65**+ yo old |
| **Bug** | Lobar? Think Strep pneumo  Interstitial? Think viral or atypicals (legionella, mycoplasma, Chlamydophila)  Superinfection? Clang MRSA  Less likely – Fungal (PJP, aspergillus, histo/blasto), Parasite (strongy, toxo) |
| **Drug** | Outpatient CAP (Healthy Adult) \*\*azithro (Zpak) ineffective at WR due to resistance   * Lobar = amoxicillin 1g TID x 5d * Interstitial = doxycycline 100 mg BID x5d   Outpatient CAP (Unhealthy AKA our Adults) \*think chronic lung/heart/liver dz, T2DM, etc   * Augmentin 875/125 mg BID x5-7d !!! * Atypicals: Doxycycline 100 mg BID x5-7d * Respiratory FQ (Levoflox/Moxifloxacin) ok but side effects loom large   Inpatient CAP   * Standard: Ceftriaxone 1g daily IV x5d, Zithromycin 500 mg daily PO x3d * If abscess or empyema: add anaerobe coverage (e.g. Unasyn IV 3g q6h) * *If MRSA risk*: add vancomycin or linezolid (grab a MRSA nares!) * *If Pseudomonal risk*: cefepime IV 2g q8h (or aztreonam if PCN allergy) + Levaquin 750 mg IV q24h |

CAPE COD Trial Summary:

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| **Clinical Question** | Does IV Hydrocortisone reduce mortality in severe CAP? |
| **Population** | *Multicenter RCT conducted in France*  Inclusion Criteria   * Adults with severe CAP * Invasive or NIPPV (PEEP >=5) * HFNC on >=50% FiO2 with P/F ratio <300 * NRB with estimated P/F Ratio <300 * PSI Score >130   Exclusion Criteria   * Septic shock * Influenza, TB, or fungal PNA |
| **Intervention** | 800 pts randomized to hydrocortisone vs placebo  Hydrocortisone delivered as 200 mg infusion daily x4 days  At day 5, steroid taper began if breathing spontaneously, P/F>200, SOFA <= initial SOFA,  AND expected discharge from ICU by hospital day 14  If not meeting ALL above, dose continued for addl 3d (7d total) then tapered |
| **Comparison** | Saline placebo (both groups received standard of care antibiotics) |
| **Outcomes** | Reduced mortality by Day 28 (6.2% death in hydrocort arm vs 11.9 placebo, p=0.006)  Reduced mortality by Day 90 (9.3% in hydrocort arm vs 14.7% placebo)  Reduced intubation rates (HR 0.59, CI 0.40 – 0.86)  No significant difference in Hospital-Acquired infections or GI Bleed |
| **Discussion** | Drop in mortality possibly related to reduced pressor requirements, reduced intubation due to decreased lung inflammation; safe intervention though hyperglycemia was at times persistent |
| **Takeaway** | Consider early steroid initiation in severe CAP requiring IMC/PCU/ICU level care without septic shock, but with elevated CRP and hypoxia, c/f lack of response to abx  **CONTROVERSIAL, NOT CURRENT IDSA GUIDELINE** |

Other studies on steroid use in CAP:

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| In general, meta-analysis shows reduced morbidity but NOT reduced mortality. 2019 IDSA guidelines recommend **against** any steroid use for CAP. |

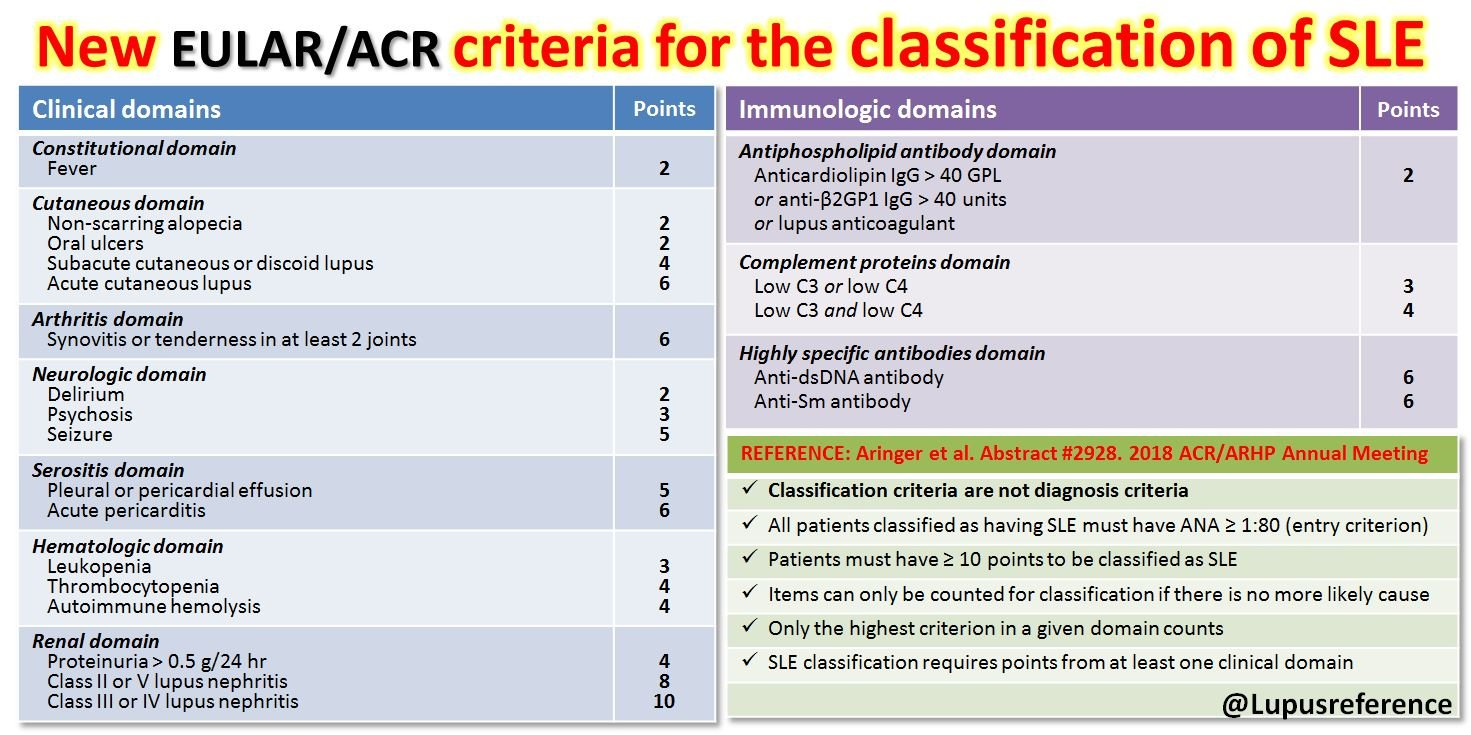
Endocrine Emergencies:

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| **Organ / Derangement** | **Condition** | |
| **Hyperglycemia** | DKA | HHS |
| Hyperglycemia (>250)  Arterial pH <7.3, Bicarb <15  Moderate ketonuria/emia (bHB)  Often T1DM, but can be T2DM  May have faster onset  TX: INSULIN GTT PROTOCOL | Hyperglycemia (>600)  Serum Osm >320  Volume depletion  Less marked acidosis  Often T2DM after recent/protracted illness  TX: INSULIN GTT PROTOCOL |
| **Adrenals** | Pheochromocytoma | Adrenal Crisis |
| May be etiology for recurrent severe HTN  6P’s: Pounding HA, Perspiration, Palpitations/Tachycardia, Paroxysmal HTN panic, pallor  DX: 24hr Ur metanephrines / catecholamines  TX: Surgical resection! Phenoxybenzamine pre-op or Phentolamine in acute HTN crisis (Nicardipine, nitroprusside, etc also) | Shock > Orthostatic HoTN  Severe N/V/D  Dehydration, hypoNa, hyperK, hypoGlyc  Pain in back, abdomen, legs  AMS/LOC, fever/hypothermia  Primary vs Secondary vs Tertiary etiologies  TX: Collect ACTH and Cortisol up front, then give hydrocortisone 100 mg STAT, then q6-8h |
| **Thyroid** | Thyroid Storm (SEVERE HYPER) | Myxedema Coma (SEVERE HYPO) |
| Thermoregulation dysfxn, AMS/Seizure/Psychosis/hyperreflexia, lid lag, Afib/Tachycardia/CHF, Dys/Tachypnea, N/V/D  MANY possible precipitants (infection, trauma, DKA, overreplacement, e.g.)  DX: Burch-Wartofsky score >45  TX: PTU, Propranolol, SSKI, Hydrocortisone | AMS!!, Alopecia, HoTN, delayed reflexes, dry skin, abd distension/ileus, general edema  MANY precipitants (infxn, cold, stroke, meds)  Dx scoring systems available (not in MDCalc)  TX: IV Levothyroxine +- IV T3, Hydrocortisone |
| **Pituitary** | Pituitary Apoplexy | |
| Sx: Sudden onset, severe HA, N/V, photophobia, visual deficit (diplopia, ophthalmoplegia), CN palsy (3rd> 4/5/6), AMS/Seizure, Collapse, sudden death  Dx: MRI (or CT) will confirm, assess pituitary function and basic labs, fluid status  Tx: Get Endo/NSGY/Neuro on board, may need OR, IV steroids, supportive care in ICU | |
| **Parathyroid** | Hypercalcemia | Hypocalcemia |
| Stones, bones, groans, psychiatric overtones! Severe >14  Identify etiology! PTH dependent? Get iCa, 25-OH Vit D, PTH, PTHrp, Mg/Phos  Tx: Dialysis for ESKD/ARF; otherwise - Aggressive IV hydration (diuresis if overload occurs), IV bisphosphonate w/wo calcitonin, denosumab if refractory | Sx: HoTN, Torsades, heart block, bradycardia, anxiety/AMS, paresthesias, seizure, cramps. Post-surgical complication of thyroid/parathyroidectomy  PPX: Oral calcium, calcitriol  Tx: if hypoPTH, PO calcium, calcitriol; if sxs/progression, increase oral doses, 1-2g Ca Gluconate ONLY over 10 min followed by continuous IV infusion; replete other lytes |

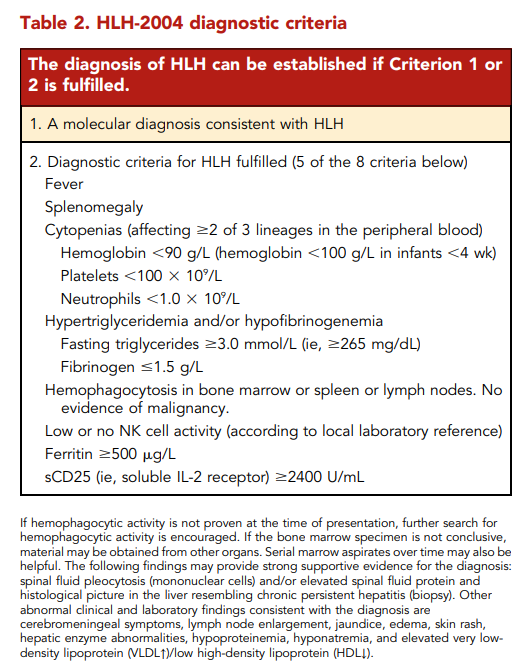
Giving a good presentation (High Yield life skill for all military officers and physicians!)

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| **The SOFTEN Approach** |
| **S** – Smile (warmth, smiling, appearance influence your audience)  **O** – Open stance (gesticulate normally, keeping hands uncrossed/not interlaced)  **F** – Forward lean (NOT grabbing the podium, standing next to it, leaning into your crowd)  **T** – Tone (vary the inflection and volume of your voice)  **E** – Eye contact (scan the audience, hold gaze briefly, use names! keep eyes off visual aide)  **N** – Nodding (both with your head and with providing affirmation of audience responses)  \*Keep ppts slides to 6 lines of text, no more than 6 words per slide  \*Have some audience engaging technique, break, or pause for reflection at least every 15 minutes (e.g. Pair Share) |

Diagnosing Lupus (use the highest score from each domain!):



Diagnosing HLH:



**Week 6**

On Duty Determination:

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| **Duty Determination** | Duty fitness or limitations that are individualized to patient’s branch, duty location, job requirements/MOS/rate, and special duties (flight, dive, e.g.) -- NUANCED |
| **Importance** | Protecting patients and their units from unnecessary harms, provides formal communication between medical and the command/employer |
| **Where can I find more info?** | DoDI 1332.45  DoDI 6130.03  OPNAVINST 1300.20  USA - Guide for Physical Profiling, MOS/Medical Retention Boards, MEB, PEB  USAF - AFI 48-133  USAF - AAM Guide |

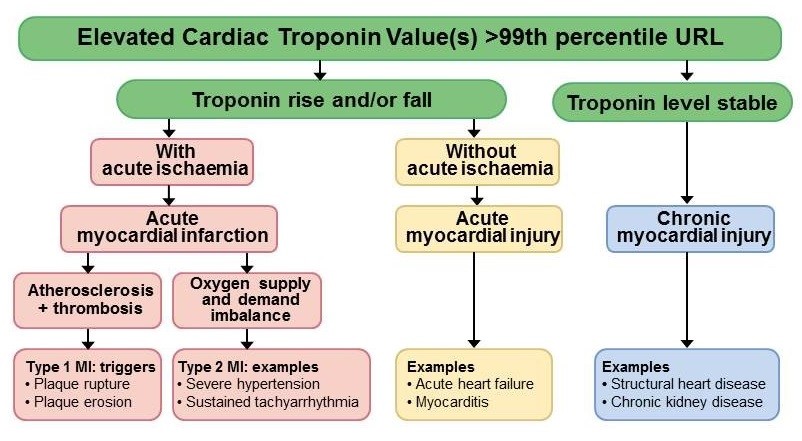
Acute Pancreatitis:

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| **Diagnosis** | **Must have 2 out of 3 of the following:**   * Characteristic epigastric or LUQ pain w/wo radiation to back/flank/chest * Lipase (or amylase) >3x ULN (lipase ULN = 60) * Characteristic imaging findings (US/CT/MRI) |
| **Etiology** | **I GET SMASHED**  **I**diopathic (15-25%)  **G**allstones (40-70%)  **E**thanol aka Alcohol (25-35%)  **T**rauma  **S**teroids  **M**alignancy / Mumps  **A**utoimmune  **S**corpion sting **H**ypertriglyceridemia (5%) or Hypercalcemia  **E**RCP (post-procedural, esp if multiple wire pass)  **D**rugs (Azathioprine, Lasix, sulfa, flagyl, estrogens,5-ASA, valproate, e.g.) |
| **Risk Stratification** | Severity   * Mild (most common) = no organ failure * Moderately Severe = organ failure resolving within 48 hrs * Severe = organ failure > 48hrs (shock, ARF, GIB, ARDS) or Marshall score >= 2   Scoring systems (sensitive, not specific)   * BISAP – can use at 24 hrs and may be more accurate * Ranson’s Criteria – need initial and T+48 hr labs * Apache II – estimates ICU mortality |
| **Treatment** | 1. Supportive care (opiate pain control, anti-emetics) 2. IV Fluids = BOLUS 10 mL/kg up front, then run LR at 1.5 mL/kg/hr **(WATERFALL study)** 3. NPO until vomiting controlled, then start a Low-Fat diet 4. Monitor hemoconcentration (Hct), renal perfusion as surrogate for pancrease (sCr / BUN) at 6-8 hrs after initial resus and daily; consider CRP at 48 hrs 5. Antibiotics ONLY if evidence of necrosis/air or other indication (Pos BCx, PNA, etc) 6. ERCP within 24hrs ONLY if evidence of concurrent cholangitis |
| **Complications** | Necrotizing pancreatitis (worse if under-resuscitated)  Pancreatic pseudocyst, Walled-off necrosis  ARDS |

The iCards team’s favorite consult: Chest pain!

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| **History** | **Less likely cardiac / ischemic** | | **Higher likelihood cardiac/ ischemic** | |
| Sharp, fleeting, pleuritic, positional, tear, ripping  Lasts for seconds | | Central, pressure, squeezing, heaviness, exertional, retrosternal, radiating  Lasts >5 minutes | |
|  | **NSTE-ACS** | | **STEMI** | |
| **On EKG** | Non-specific ST segment changes  ST depressions / T-wave inversion (not geographic!)  If non-diagnostic, repeat in 5-10 minutes or with change in pain! | | Geographic distribution (at least 2 contiguous leads with >=1 mm ST elevation)   * V2-V3 criteria = 1.5 mm in women, 2+ mm in men >40 yo, 2.5+ mm in men <40 yo * Reciprocal depressions expected (PAILS)   New LBBB may be suggestive iso ACS symptoms (Sgarbossa Criteria useful) | |
| **Immediate Treatment** | Call Cardiology  Nitro SL/ODT 0.4 mg q5min x3, then gtt if persists  NO NITRO for SBP<90, HR<50, suspect RV infarct  ASA 325 mg SL (NOT enteric coated)  Plus/minus P2Y12 per your Cards team (Clopidogrel, ticagrelor, prasugrel)  Anticoagulant (Fondaparinux! Or heparin bolus then gtt OR LMWH, weight-based)  Oxygen for SpO2 <90% | | Activate the cath lab / STEMI system  Nitro SL/ODT 0.4 mg q5min x3, then gtt if persists  NO NITRO for SBP<90, HR<50, suspect RV infarct  ASA 325 mg SL (NOT enteric coated)  Plus/minus P2Y12 per your Cards team (Clopidogrel, ticagrelor, prasugrel)  Anticoagulant (heparin bolus then gtt OR LMWH, weight-based)  Oxygen for SpO2 <90% | |
| **When to cath** | Within <2 hours:   * VTach, Shock, refractory angina on max dose nitro   Within 24 hours of presentation   * Elevated Grace (140+) or TIMI (>2) scores * New ST depression * >20% in biomarkers   Within 72 hours   * Moderate risk (Grace 109-140) or (TIMI <=2) | | At PCI-capable hospital:  For STEMI within 24 hrs of symptom onset, 90 minutes from first medical contact   * ED to PCI <30 minutes   At hospital where nearest PCI is >120 min away:  Push tPA within 30 minutes, transfer to PCI center! | |
| **Complications** | Mechanical  LV/RV failure  Ventricular wall rupture  Septal rupture  Papillary muscle rupture  Ventricular aneurysm or pseudoaneurysm | Electrical  VTach, VFib, AVB, Fascicular block | | Inflammatory  Dressler’s syndrome (pericarditis) |
| **Follow-on management** | Beta-blocker  ACEi or ARB if intolerant  Statin (goal LDL <70)  TTE (repeat TTE at 40d for low EF. If EF is still reduced -> ICD) | | | |

Thinking through “Troponinemia” (Please don’t say that… or “transaminitis” 😊)



Acute eosinophilic pneumonia (Common in Military! Kind of weird! Different from Chronic! – ALL board testable!)

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| **Acute eosinophilic PNA** |
| **Etiology:** often a hypersensitivity reaction to inhalation (dust, fireworks, medications, tobacco smoke)   * AKA things common to ADSM (take up/increase smoking on deployment, dust exposure in CENTCOM)   **Diagnosis:**   * Acute, febrile illness < 5-7 days (cough, chest pain, myalgias) * Hypoxic resp failure – resulting in intubation * CXR = patchy opacities, ARDS * BAL eosinophilia > 25% * Absence of parasitic, fungal, drugs, or asthma   **Treatment:**   * Rapid and complete response to corticosteroids |

**Week 7**

**Aortic Stenosis**

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| **Epidemiology** | 2nd most common valvular disease in the US  Prevalent in 5% of adults >65 yo, 12.4% of adults age >75  Age-related calcification most typical, but can occur 2/2 bicuspid or rheumatic disease | | |
| **Presentation** | HF, Angina, Syncope, Fatigue all possible presentations | | |
| **Physical Exam** | “Pulsus parvus et tardus”  Systolic crescendo-decrescendo ejection murmur at RUSB +/- radiation to carotids  Later murmur = more severe  Loss of S2 = likely severe | | |
| **Echo Findings – Gauging severity** | **Mild** – usually Asx  US every 3-5 y | **Moderate** – usually Asx  US every 1-2 y | **Severe** – can be asx  US every 6-12 mo |
| 2.0-2.9 cm2 valve area,  2.0-2.9 m/s jet velocity  <20 mmHg pressure gradient | <1 cm2 valve area,  3.0-3.9 m/s jet velocity  20-39 mmHg pressure gradient | <1 cm2 valve area,  4 m/s jet velocity  40 mmHg pressure gradient |
| **Treatment** | Observation | TAVR | SAVR |
| Decision of who and when to replace / perform valvuloplasty is complex but in general, treat symptomatic patients or asx pts with reduced LVEF | **Most asymptomatic patients** unless Stage C with LVEF<50%, other cardiac surgery  Serial US at frequency per AS severity | Less risk, but may be less durable  ?better in older patients  Anticoagulate! | Higher risk, but may be more durable  Better in younger, more robust patients  Anticoagulate! |

**The Ortho Spine Approach to Back Pain for the PCM (aka you!)**

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| --- | --- | --- | --- | --- |
| **Disease** | **Pathophysiology** | **Symptoms** | **Exam/Imaging** | **Treatment** |
| Cervical Radiculopathy | Nerve root compression  - Disc herniation  - Bone spur (osteophyte)  - Rare: tumor, abscess, e.g. | Pain/numbness/ weakness, Unilateral dermatomal distribution | Abduct, Spurling test  XR to r/o fracture  MRI C-spine | 70% resolve without Surgery  Ladder: NSAIDs, Gabapentin +/- PT > ESI > Surgery (Fusion, Foraminotomy, Artificial Disk) |
| Cervical Myelopathy | Compression of the spinal cord, often from spondylosis (arthritis)  Don’t miss: tumor, trauma, infxn! | Painless!  Dexterity Loss  Balance loss  Bowel/bladder (late)  UMN sxs, hyperreflexia | Hoffman sign  Tandem Gait  Clonus/babinski  XR & MRI | No spontaneous improvement without surgery, do NOT send to PT (neck manipulation bad!)  70-90% have some improvement WITH surgery |
| Lumbar Disc Herniation | Nucleus pulposus herniates (bulge vs extrusion) through annulus, compresses spinal nerve  Don’t miss: cauda equina! | Pain, numbness, weakness, often unilateral | Straight Leg raise  Neuro exam BLE  EMG/NCS not necessary  XR to r/o frx  MRI L-spine | 40% better in 1 mo, 70% better in 3 mo  Isolated back symptoms:  PT or PM&R  Radiating leg symptoms:  2-6 wks: Medical mgmt  6-12wk: MRI, Sx referral, ESI  Weakness: Will see within  1-2 wks, please have MRI  Severe BLE/urinary  retention – ED  Treatment ladder as above |
| Lumbar Spinal Stenosis | Arthritic changes  Compression of thecal sac | Neurogenic claudication sxs (pain relieve by position e.g. leaning over shopping cart)  Proximal pain/cramps | XR and MRI helpful  EMG/NCS not so much | Isolated back symptoms:  PM&R or Pain clinic  Claudicatory symptoms:  Typically slowly progressive  Ortho will see these pts  anytime |
| Spondylo-listhesis | “Slip” of one vertebral body over another causing pain from instability  Antero- top body slides fwd  Retro- top body slide back | Low back pain | Get XR first, MRI helpful | Antero = Surgical  Retro = non-surgical  PM&R |
| Sacroiliac Joint Dysfunction | Abnormal motion (too much or too little) of the SI joint | Low back pain localizing below PSIS, exacerbated by load bearing/impact | FABER, Gaenslen’s, SI Distraction, Fortin’s Finger test  Difficult to dx with rads. MRI to rule out other dx | SIJ Injection = Gold standard dx  NSAIDs, PT, Pelvic Belt, CSI, RFA  Surgery not that effective, exhaust everything else first |

**Distinguishing between meningitis and encephalitis**

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| **Syndrome** | **Community-Acquired Bacterial Meningitis** | **Encephalitis** |
| **Pathophys/Site of Infx** | Inflammation of the meninges/subarachnoid space,  with CSF pleocytosis (>5 wbc, typically far more than this…) | “inflammatory process of the brain in association with clinical evidence of neurologic dysfunction” |
| **Problem Representation**  **🡪Sxs/Signs/Time Course? 🡪Labs?**  **🡪Imaging/other Dxs?** | Acute fever, HA🡪AMS as manifestation of severe dz  Peripheral leukocytosis often  CSF: elevated WBC, L shift, low glucose, elevated protein  Imaging: meningeal enhancement (CT in certain pts…) | Acute/subacute AMS, fever, HA  Plus/minus peripheral leukocytosis  CSF: slightly elevated WBC, lymph predominant commonly (some can have L shift), glucose wnl, protein nl or minimally elevated  Imaging: MRI can show localized disease based on infecting organism or be WNL |
| **Top 3-4 Organisms  (US adults)** | *S pneumonia > N meningitidis*  Older >50/Immunocompromised:  *L monocytogenes* Aerobic GNB | Undiagnosed ~50% of the time  HSV-1 (25%), Enteroviruses (25%), VZV (15%), WNV (10%), EBV (10%)  Acute immune mediated 21%!! |
| **Empiric Drug(s)** | Vanc (trough-based dosing, NOT AUC) + Ceftriaxone 2 gm IV q12H  ADD Dexamethasone 10 mg q6H x 4 days (or until not *S. pneumo*) – hearing protection!  Age>50/immunocomp: ADD Ampicillin 2 g iv q4h  PCN Allergy?? TMP/SMX or Meropenem | Acyclovir 10 mg/kg iv q8h  IBW in obesity!  (or adjusted in class 3 obesity w/ severe disease!) |

**CSF Interpretation (You will need to know this ‘til the day you die pretty much)**

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| **Etiology** | **WBC** | **Predominant Cell Type** | **Glucose** | **Protein** | **Opening Pressure** |
| Viral / Aseptic | 50-100 | Lymphocyte | >45 | <200 | Normal or Slight Elevation |
| Bacterial | 1000-5000 | Neutrophil | <40 | 100-500 | Elevated |
| Tuberculous | 50-300 | Lymphocyte | <45 | 50-300 | Variable |
| Cryptococcal | 20-500 | Lymphocyte | <40 | >45 | Elevated |

**West Nile Virus (the causative pathogen in our case with the wonderful Dr Blyth!)**

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| **Transmission** | Mosquitoes (*Culex spp*), organ transplant, breastfeeding, blood transfusion  Natural reservoir: birds  Worldwide distro! First outbreak in US in 1999 |
| **Clinical Manifestations** | 80% asymptomatic!  20% have West Nile Fever   * ILI -> fever, HA, nausea, morbilliform rash in 25-50%   <1% have Neuroinvasive disease: meningitis (30-40%) or encephalitis (50-60%)   * Risk: >60 yo, HTN, DM, Immunocompromised * Common signs unique to WNV:   Tremor, Parkinsonism, Myoclonus (esp of face and UEs) |
| **Diagnosis** | IgM > PCR (PCR only positive in <60%) |
| **Treatment** | Supportive care |
| **Prognosis** | Mortality 12%, high rates of long-term neuro sequelae (20% ongoing sxs at 18 mos) |

**Week 8**

**Affective Disorders (A spectrum of depressive to hypomanic to manic symptoms outside of normal emotions)**

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| **Adjustment Disorders** | Depressive sxs in response to a specific stressor  Distress out of proportion to severity of the stressor WITH significant functional impact  Does not persist longer than 6 months |
| **Depression (Unipolar)** | Screening Tools:  PHQ-2; if 3 or higher -> PHQ-9 (mild 5-9, moderate 10-14, mod severe 15-19, severe = 20+)  Geriatric Depression Scale (10+ = positive)  Cornell Scale for Depression in Dementia  Must explore Fam Hx, PMH and meds, Social Hx  **S** – Sleep (decreased or increased) **I** – Interest in usual activities decreased (Anhedonia) **G** - Guilt **E** – Energy decreased **C** – Concentration issues **A** – Appetite (decreased or increased) **P** – Psychomotor agitation/slowing **S** – Suicidal ideation  Dx:  >= 5 symptoms from SIGECAPS + hopelessness for >= 2 weeks, causing significant distress NOT attributable to another medical condition (e.g. hypothyroid, anemia, vitamin deficiency, chronic infection, pain, sleep d/o, meds like steroids or BZD) or substance use  Tx:  **Mild = psychotherapy only usually ok**  **Moderate – Severe = Psychotherapy + SSRI or SNRI** (first line; choose based upon comorbidities, prior personal or family response) – Rule out bipolar spectrum FIRST to avoid triggering mania!  **Bupropion** CAN be first line depending on comorbidities (e.g. obesity)  **Mirtazapine**  **Adjunctive therapies** may include TCAs, ASDs, Atypical antipsychotics – refer these refractory cases to BH or Med-Psych Liaison Clinic! |
| **Prolonged Grief Disorder** | Yearning/longing and thoughts of the deceased (death at 12+ months ago)  Dysphoria - Intermittent with triggers  Guilt – centered around deeds done / not done wrt deceased  Psychomotor changes – mild  **Leading to significant distress/impairment** |
| **Bipolar Spectrum** | Screening:  Mood Disorder Questionnaire (7+ predictive); Ask if periods of intense energy, decreased sleep, behavioral changes; Family history? Hx of Postpartum mood disorder?  **D -** Distractibility  **I –** Irritability / Impulsivity  **G -** Grandiosity **F –** Flight of ideas **A –** Activity increased **S –** Sleep (decreased total sleep time without fatigue) **T –** Talkativeness |

**Transfusion Thresholds**

|  |  |
| --- | --- |
| **Packed Red Blood Cells (pRBC) – Recheck at 15-60 min post transfusion** | |
| <7 | Nearly all-comers (reminder: Jehovah’s Witnesses may decline!) |
| <8 | Acute Coronary Syndrome (ACS)  \*\*8-10 may be reasonable |
| <10 | Active bleeding, trauma |
| Sickle Cell\*\* | Simple transfusion OR exchange transfusion during pain crises / Acute Chest / Stroke  Some will offer when <2 g/dL below baseline (Goal: Hgb 9 or Hb S <30%) |
| **Types of pRBC – Recheck at 15-60 min post-transfusion** | |
| Irradiated | Bone Marrow Transplant, Acquired/congenital immunodeficiency, blood donated from 1st/2nd degree relatives |
| Leukoreduced | Chronic transfusion, CMV negative at-risk patients (AIDS, transplant), Potential transplant recipients, prior FNHTR |
| Washed | IgA deficiency, complement-dependent AIHA, continued allergic reactions to pRBC despite anti-histamines |
| **Platelets** | |
| <10K | Always! Risk of spontaneous CNS bleed (less so in ITP) |
| <20K | Febrile |
| <50K | Peri-procedure OR active bleeding |
| <100K | Neurosurgery & Lumbar Puncture (though some will do LP at 50K+) |

**Common Transfusion Reactions**

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| **Febrile Non-Hemolytic Transfusion Reaction (FNHTR)** | Brief, self-limited fever without evidence of hemolysis  Dx of exclusion – need BCx, DAT, re-check compatibility  Tx: Leukoreduced transfusions in future |
| **Acute Febrile Hemolytic Transfusion Reaction** | Patient given wrong ABO/Rh/other antigen-matched blood!  Time: Minutes to Hours  Sxs: Fevers/chills, rigors, dark urine, AKI, “impending doom”  Dx: positive DAT, low haptoglobin, high LDH, bilirubin elevation  Tx: IVF, may need pressors, Renal Replacement, coagulopathy mgmt |
| **Delayed Febrile Hemolytic Transfusion Reaction** | As above  Time: 2d – 1 month  Sxs: fatigue, pallor, jaundice  Dx: positive Ab screen, DAT, high LDH, indirect Bili, low hapto  Tx: Removal of donor from pool, cautious transfusion, may need steroids, IVIG, Rituxan, Epo |
| **Anaphylaxis** | Sx: airway closure, angioedema, hypotension/shock  Risk: IgA deficiency, allergy to a component of the blood product  Tx: Epinephrine, antihistamines, +/- pressors |
| **Transfusion Associated Circulatory Overload (TACO)** | Time: 6-12 hrs post transfusion  Hypoxia & Pulmonary infiltrates & sxs of overload (JVD, elevated BNP e.g.)  Risk: Age>60, CKD, CHF, >1 unit pRBC  Tx: Diuresis! |
| **Transfusion Related Acute Lung Injury** | Time: 6-12 hrs post transfusion  Hypoxia & Pulmonary infiltrates WITHOUT sxs of overload  Risk: Critical illness  Tx: Supportive care |

**Week 9**

**Cardiac POCUS – you WILL use this! Start playing now 😊**

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| **Indication**   * Evaluate/rule out life-threatening conditions quickly at bedside (Trauma, Tamponade, PTX, Shock, Resus, e.g.) | **Limitation**  Time constraints (don’t delay care for perfect views)  Must understand artifacts, potential risks (thermal injury in eye POCUS, e.g.) | **Basic US probe maneuvers**  Slide – to move probe vertically or horizontally on pt skin  Rock – probe moves along long-axis (tail moves side-to side, probe still)  Fan/Tilt – probe moves along short-axis (tail moves up and down, probe still) |
| **View** | **Anatomy Observed** | **Sample Image** |
| 1. **Parasternal Long Axis (PLAX)**   At 3rd or 4th ICS along LSB with probe indicator towards pt R shoulder |  |  |
| 1. **Parasternal Short Axis (PSAX)**   At 3rd or 4th ICS along LSB with probe indicator towards pt L shoulder (turn 90 degree clockwise from PLAX) | Cardiac Ultrasound (Echocardiography) Made Easy: Step-By-Step Guide - POCUS  101 |  |
| 1. **Apical 4 Chamber (A4C)**   At PMI with probe indicator towards pt L shoulder to L side (decubitus positioning can be helpful!) |  |  |
| 1. **Subcostal / subxiphoid**   Below xiphoid with probe indicator towards pt L side |  |  |
| 1. **BONUS – IVC**   Below xiphoid with probe indicator towards head, MUST visualize IVC into RA – consider transhepatic view if subcostal poor |  |  |

**Into the Thought-Metaverse**

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| --- | --- |
| **System 1 – Thinking Fast** | **System 2 – Thinking Slow** |
| **Heuristics AKA mental shortcuts AKA ?intuition –** helpful for quick, often correct decisions based on memorized patterns, but error-prone and bias-laden!  **Availability Risk –** a prior experience leads you to over-screen or over-test for a specific condition  **Representative Risk –** a stereotype or assumption of a patient leads you to under-order or under-treat for them | **Contemplative critical reasoning –** will help you arrive at the correct decision, check your biases, and analyze all available data, but you will sacrifice a lot of time.  **Keeps System 1 in check!** |
| **Illness Scripts – a chance to use lots of System 2 to create System 1 patterns**  **Associated dangers:**  Premature closure or “anchoring”  Blind Obedience – unquestioned deference to authority  Availability – the first thing that comes to mind MUST be right! /s  Confirmation Bias – only looking for evidence to support your first thought & ignoring counterfactuals  Left Digit Bias – difference in care with increase in tens-place age (80 vs 79, e.g.)  Win-Stay/Lose-Shift Heuristic/Bias – deviating from best practices after getting burned or not considering risk in  absence of safety issue  **Risk increases when:** you’re tired, overworked, or under a time crunch!  You’re upset or have negative counter-transference!  You have unchecked implicit or explicit biases!  You’re overloaded by complex patient data / history!  You don’t have all the right info!  Systems (environment, EMR, team culture, poor/no handoff) & personal issues both contribute… | |

**WEEK 10**

**HFpEF – the internist’s heart failure!**

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| **Diagnosis** |
| 1. **Signs/symptoms of HF caused by a structural and/or functional cardiac abnormality**  * With EF >= 50%  1. **Corroborated by at least one evidence of elevated filling pressures**  * Elevated proBNP * Cardiogenic pulmonary or systemic congestion (JVD, peripheral edema, pulmonary edema, e.g.)   **H2FPEF score**  **H2 =** Heavy (BMI>30) = 2pts  On >= 2 antiHTN meds = 1 pt  **F =** Atrial fibrillation = 3 pts  **P =** Pulmonary hypertension (PASP >35 mm HG on Echo) = 1 pt  **E =** Elder age (>60 yo) = 1 pt  **F =** Filling pressure (E/e’ >9 on doppler Echo) = 1 pt  Sum >= 6 points = highly diagnostic of HFpEF |
| **Initial Evaluation** |
|  |
| **GDMT for chronic Mgmt** |
| **PRN Diuretic (Class 1 rec) –** furosemide, bumetanide, torsemide  **SGLT2i (2a) –** empagliflozin, dapagliflozin, canagliflozin  **MRA (2b) –** spironolactone, eplerenone, finerenone  **RAASi (2b)** – ACEi, ARB, or ARNI  **GLP-1… not formally recc’ed but coming soon? –** dulaglutide, liraglutide, semaglutide, tirzepatide, etc |

**Thrombocytopenia in a nutshell (or citrate tube)**

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| **Mild** | **Moderate** | **Severe** |
| 100K-149K | 50K – 99K | 0 – 49K |
| **Increased Destruction** | **Decreased Production** | **Sequestration or Dilution** |
| Immune – ITP, SLE/APLS, RA  Drugs – HIT, antibiotics  MAHA – DIC, TTP, HUS, preeclampsia/HELLP  Shearing – CVVH, bypass, IABP, vasculitis | Infection – HIV, HCV, VZV, CMV, EBV, Tickborne (Ehrlichiosis), Parvo, Sepsis  Nutrition – EtOH, B12 or Folate deficiency  Drugs – Chemotherapy  Neoplasm – MDS, liquid tumors  Other – Cirrhosis, Aplastic anemia | Hypersplenism  Sepsis  Massive transfusion/fluid resuscitation  Hypothermia  Gestational  Platelet clumping artifact |
| **Lab Eval** | | |
| **Can rule out clumping by sending platelet count in a citrate tube**  **\*DO NOT SHOTGUN ALL OF THESE AT ONCE\***  CBC with Diff  BMP + LFT (need the bili differential)  LDH, haptoglobin, DAT, Reticulocyte count  PT/PTT/INR  Fibrinogen, D-dimer (rule out DIC)  HIT Ab, Serotonin Release Assay (SRA)  ANA, Lupus anti-coag, anti-cardiolipin, Anti-B2GP1  Pregnancy test  BMBx if suspicion for infiltrative/malignancy | | |

**Thrombotic Thrombocytopenic Purpura (TTP TBH)**

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| **TTP** |
| **One type of thrombotic microangiopathy = microvascular injury leads to thrombosis in capillaries and arterioles**  **Epi:** 2-6 per million, more common in younger females  **Etiology:** hereditary/congenital deficiency of ADAMTS13 (<5% cases) or autoantibodies against ADAMTS13 (>95% cases) causing large VWF clumps and platelet aggregation  **Symptoms:** Fever (20-30%), Anemia, Thrombocytopenia, AKI (10%), Neurologic dysfunction (70-80% - e.g. AMS, HA, TIA, stroke, Sz), Purpura, GI sxs  **Dx**: ADAMTS13 & high clinical suspicion (the level takes time to result but you cannot delay treatment)   * Use PLASMIC score for risk stratification! Score of 6+ is 72% likely to have severe deficiency   **Tx:** If high suspicion, start Therapeutic plasma exchange and corticosteroids ASAP after ADAMTS13 level is sent   * You will need Nephro & Heme/Onc consults! In the MICU… * Consider Rituximab infusion if ADAMTS13 level <10 * Consider Caplacizumab for severe cases |

**Staph aureus bacteremia (An ID Auto-Consult! But you’ll already know what to do, and they’ll be so impressed)**

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| **Cultural Clues (or Clangs)** |
| Gram positive cocci in clusters  Gold-yellow colonies with Beta-hemolysis pattern on blood agar  Catalase positive, Coagulase positive, beta-lactamase producing, modified PBPs  BCID (a WR godsend) can help identify MRSA early – mecA positivity! |
| **Risk Factors for Bacteremia** |
| Hemodialysis (RR 257.2) and Peritoneal dialysis (RR 150.0)  HIV (RR 23.7), Solid-organ transplant (RR 20.7), Heart disease, cancer  IV drug use (RR 10.1), EtOH use disorder, DM, Stroke, COPD |
| **Complications** |
| **YOU MUST take a thorough history and full-body physical & consult ID !**  **Grab a TTE –** when increased suspicion for IE (cultures not clearing, persistent fever). Prediction scores (VIRSTA eg) can help  **Consider PET/CT** – to eval for other metastatic sites of infection  **Other imaging/diagnostics per suspected site (I&D, spinal MRI, etc)** |
| **Antibiotics (Invasive = IV always)** |
| **MRSA Meds**  (Duration varies with complications: 2 weeks uncomplicated, 4-6 weeks complicated)   * Vancomycin * Daptomycin (monitor weekly CK, don’t use in alveolar-space infection) * Llinezolid or ceftaroline * Long-acting: dalbavancin   **MSSA Meds:**   * Anti-staphylococcal penicillins (nafcillin, oxacillin, e.g.) – NOT vanc * Cefazolin (“ancef yay” – perioperative colleagues everywhere) * Salvage: ertapenem + cefazoline |

**WEEK 11**

**Mastering MS:**

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| **Diagnosis** | Dissemination of demyelinating neurologic symptoms in time and space   * Optic Neuritis (classic herald) – painful eye movement, unilateral visual defect, afferent pupillary defect * Lhermitte sign – electric shock sensation * Upper motor neuron signs (spasticity, hyperreflexia, Babinski) * Ataxia or gait disturbance * Sensory changes * Fatigue * Age of onset 15-50 yo, particularly in females   MRI of brain, C- and T-spines with periventricular white matter changes  Note: CSF testing is NOT required – but may show oligoclonal banding; autoantibody testing may be helpful – refer to Neuro! |
| **Disease Phenotypes** | Activity = clinical relapses or MRI evidence of new/enlarging lesions  Progression = gradual accumulation of neurologic deficits independent of relapses |
| **Pseudorelapse** | Uhthoff Phenomenon – aggravation of chronic symptoms with increased body temperature (infection/illness, exercise, etc) – may present like actual relapse – treat the underlying cause! |

**The Diabetic Foot Exam: Good ones prevent bad feet**

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| **When to screen for neuropathy** | T1DM: 5 years after diagnosis, then annually  T2DM: At time of diagnosis & annually |
| **Necessary Exam Components** | DERM   * Skin thickness, color, sweating, infection, ulceration, calluses   MSK   * Derformity * Muscle wasting   NEURO   * Monofilament test + 1 of the following: * Vibration OR * Pinprick sensation OR * Ankle reflexes OR * Vibration-Perception Threshold (VPT)   VASCULAR   * Pulses * ABI if indicated |
| **What to do if abnormal** | ALL patients with diabetes should receive counseling on foot hygiene/care  Referral/further diagnostics per abnormal issue, low threshold to send to Podiatry |
| **Receiving credit for your work** | Order “Foot Examination Performed 2028F” |

**Framework for Dyspnea (with Pyramid thrown in because we love it)**

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| **Bad Heart** | **Bad Lungs** | **Bad Blood Between Them** |
| **Pericardial effusion**  **ACS**  **Valvular disease**  **CHF** | **Pleural effusion**  **Parenchymal process (PNA, ARDS)**  **Asthma or COPD**  **Vocal cord spasm or tracheal obstruction** | **PE**  **Acidosis** |
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**WEEK 12**

**Nose Goes: Chronic Rhinitis**

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| **Non-allergic** | **Allergic** |
| Often adult onset, vasomotor, temperature, spice, non-allergen irritant mediated, often persists throughout year | Often pediatric onset, aeroallergen triggers with seasonal timing (trees, grasses, weeds) |
|  | |

**Don’t Chug the Soy Sauce: Hypernatremia**

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| **Hypernatremia (Na > 145)** | |
| **Water losses (MOST cases)** | **Intake of salt without water** |
| Water unavailable or loses access to water  Thirst drive is impaired or too altered to drink  Loses water via GI, skin, lung, DI, or diuretic | Salt poisoning  Iatrogenic (3% NS, Na Bicarb, Valproate tox, e.g.) |
| 1. Evaluate water intake 2. Evaluate potential water losses == Obtain Uosm and Sosm    1. If Uosm < Sosm 🡪 urine too dilute 🡪 think diuretic or diabetes insipidus    2. If Usom > Sosm 🡪 urine appropriately concentrating 🡪 probably GI, skin, or mucous membrane loss 3. Evaluate increased salt intake | |
| **Diabetes Insipidus – ADH aka vasopressin ~ desmopressin aka DDAVP**  Increase ADH = Increase water reabsorption = increase urine concentration | |
| **Central**   * ADH deficiency (will concentrate urine with DDAVP) * Brain cannot produce hormone to reabsorb water * **Etiology**: brain trauma/surgery/anoxia/tumor, cerebral hemorrgahe, neurohypophysitis, CNS infxn, Lithium, Toluene, Hereditary or idiopathic * **Treatment:** DDAVP oral or intranasal or subQ first-line; can consider thiazide and/or NSAIDs | **Nephrogenic**   * ADH resistance (will not concentrate urine with DDAVP) * Kidney doesn’t respond to hormone to reabsorb water * **Etiology:** Medication-induced (lithium, Ampho B, ofloxacin), HyperCa (>12), HypoK (<3), renal dz (ADPKD, sickle cell), Hereditary, Chronic AVP-D * **Treatment:** Thiazide + <2g/day Na restriction, consider NSAIDs |

**Sick and Tired of being Sick and Tired: Chronic Fatigue**

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| **Fatigue Definition** |
| Difficulty in initiating or maintaining activity and/or difficulty with concentration, memory, or mood regulation |
| **Acuity** |
| Acute = 1 month or less Subacute = 1-6 months Chronic = 6+ months |
| **Subacute – Chronic Differential (Exhausting but non-exhaustive)** |
|  |
| **Evaluation**  History & Physical   * Duration * Preceding factors (lifestyle or medication changes, stressors, etc) * SOCIAL HISTORY !! including sleep history * Concomitant symptoms (pain, weakness, SOB, DOE) * Medications (psychotropics, antihistamines, BZD, BB, Opiates)   Labs (may add clarity in 5% of cases)   * CBC w/diff * CMP * TSH * CK (if myalgia or weakness present) * HCV Ab (if one-time screening not performed) * HIV (if one-time or risk-related screening not performed)   Diagnostics   * Pursuant to above ddx |
| **Systemic Exertional Intolerance Disease (AKA chronic fatigue syndrome)**  May be comorbid with central sensitization syndromes (fibromyalgia, IBS, interstitial cystitis, e.g.)  Diagnosis of exclusion, essentially  Diagnosis requires ALL three of the following:   1. Substantial reduction in ability to engage in pre-illness activities for >6 mos    1. Is accompanied by fatigue of new or definite onset    2. Not related to ongoing exertion    3. Not substantially relieved by rest 2. Post-exertional malaise 3. Unrefreshing sleep   AND at least one of:   1. Cognitive impairment 2. Orthostatic intolerance |
| **Management**   * Treat the underlying cause! * For SEID:   + Frequent office visits, reassessment & reassurance   + Optimization of medical and psych comorbidities   + No strong evidence for medication therapy   + Pacing strategies for exertion   + Auxiliary modalities: PT, OT, Biofeedback, Massage, Acupuncture, Yoga, Tai Chi |

**CBC in Brief: Anemia Framework**

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| **Definitions** | * ASH Guidelines and DODI 6130.03   + Females: Hb < 12   + Males: Hb < 13.5 * 2024 WHO Guidelines   + Females: Hb < 12   + Males: Hb < 13 |
| **Differential** |  |

**Week 13**

**POCUS for Shock: Set your phased arrays on saving lives!**

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| **Classic Approaches: RUSH & eFAST** |
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| **Nancy Maaty’s approach (follow the patient’s history!)** |
|  |

**Abdominal Pain: Another Approach (not strictly anatomical)**

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**Gastric Masses: Our Case**

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| **Gastric Masses Schema** |
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| **Gastric Adenocarcinoma** |
| **Types:**   * Intestinal-type (most common), and diffuse-type   **Risk Factors:**   * H. pylori infection = primary nongenetic risk factor * Male, ethnicity, geography, diet (smoked, salted, pickled, nitrates, nitrites), Smoking, obesity * Prior stomach surgery, chronic atrophic gastritis, hereditary syndromes (Lynch, FAP, e.g.) * Gastric intestinal metaplasia and dysplasia   **Symptoms:** Most patients are asymptomatic!   * Presenting symptoms in later stages:   + Pain (mild early, then severe as disease progresses)   + Weight loss – secondary to insufficient caloric intake rather than catabolism   + Nausea, Early satiety – 2/2 tumor mass, inability of stomach to distend   + GIB w/wo IDA not uncommon (melena, hematemesis <20% of cases)   **Physical Exam**   * + Uncommon but may include: palpable mass, Virchow’s (supraclavicular) lymph node, ascites, jaundice. |

**Week 14**

**The Right FIT: CRC Screening**

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| **Who** | **Average Risk =** Begin screening at 45 years old (suggested) to 50 years old (recommended) – variety of modalities/frequencies   * CRC or advanced polyps in a second-degree relative does NOT confer elevated risk   **Higher Risk =** Begin screening at 40 years old or 10 years prior to diagnosis of CRC/advanced polyp in first-degree relative (whichever is earlier) – q5year colonoscopy  Consider stopping at 75 years old, especially if multiple comorbidities/lower life expectancy |
| **How** | Tier 1:   * Colonoscopy every 10 years * Fecal immunohistochemical testing (FIT) annually – cheap, easy – necessitates colo if positive   Tier 2:   * Flexible sigmoidoscopy every 5-10 years * Multitarget stool DNA test (AKA Cologuard) every 3 years * CT Colonography every 5 years – requires bowel prep but no sedation – necessitates colo if positive * Colon capsule every 5 years   **Reminder:** abnormal findings will turn CRC screening into polyp surveillance, e.g. and follow a different frequency per GI recommendations |

**Hyponatremia: You can run but you can’t hide from it**

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| **Na < 135** |
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**Pulmonary Emboli**

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| **Diagnosis** |
| CTA Chest (CTPE) – direct visualization of pulmonary arterial embolus   * Preferred first line study for stable patients with reasonable renal fxn or ESKD   V/Q Scan – preferred in pregnancy, CKD4-5 not ESKD; also preferred for CTEPH (Group 4 Pulm HTN) dx   * Only offers probability estimate   Unable to perform CTPE and V/Q Scan inconclusive – serial lower extremity DVUS, pulmonary angiography, MRA, or V/Q SPECT   * If suspicion is high enough, treat empirically |
| **Risk Stratification with treatment pathways** |
| The **Pulmonary Embolism Severity Index (PESI**) can be used to assist with classification  **Low-Risk PE**   * lacks the below features and can be treated outpatient with DOACs in most patients.     Systemic thrombolysis (tPA/TNK) Thrombectomy Catheter-directed thrombolytics ECMO/RVAD  Anticoagulation (heparin gtt)  Intermediate-Risk = Submassive  High-Risk PE = Massive |
| **Anticoagulants**  Unfractionated Heparin   * Drip is appropriate initial mgmt in submassive and part of appropriate mgmt in massive, will not delay IR * Can do weight-based subQ dosing but not commonly done   LMWH (preferred in active cancer or pregnancy or for enteral absorption concerns)   * Enoxaparin (Lovenox) 1 mg/kg subQ q12h   Fondaparinux weight-based  DOAC or Thrombin inhibitor   * Apixaban (Eliquis) 10 mg BID x 7d, then 5 mg BID – preferred – do not dose reduce for sCr or age * Rivaroxaban (xarelto) 15 mg BID x 3 weeks, then 20 mg daily * Dabigatran (pradaxa) 150 mg BID (after 5-10d parenteral AC)   VKA (Warfarin) – other options are available with lower bleeding risk or bridging requirement |
| **Duration of Anticoagulation for PE**   * Provoked (trigger is no longer present): 3 months * Unprovoked: 3 months   + HERDOO2 score: guidance for women with their first unprovoked VTE     - Low risk (score 0-1) can stop after 6 months * Cancer related: secondary prophylaxis as long as the patient has active cancer * Recurrent unprovoked: long-term anticoagulation |

**Adrenal Insufficiency**

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| **Etiology** | | **Tertiary** | **Secondary** | **Primary** |
| **Hypothalamus** | **Pituitary** | **Adrenal** |
| **↓ Production/ ↓ Response** | **↓ Production** | **↓ Production / ↑Metabolism** |
| * Most common = long term steroid use * Space-occupying (Tumors) * Trauma * Infiltrative (infections, granulomatous disease, malignancy, proteins, metals) * Iatrogenic | * Most common = long term steroid use * Congenital/Genetic * Autoimmune * Space-occupying (Tumors) * Trauma * Infiltrative * Vascular (hemorrhage, thrombosis) * Iatrogenic | * Most common = autoimmune (Addison disease) * Congenital/Genetic * Infiltrative (infectious, granulomatous diseases, malignancy, protein, metal) * Vascular (hemorrhage, thrombosis) * Liver disease * Iatrogenic (Surgery, Rads, meds) |
| **Diagnosis** | | Basal (0600 – 0900) Cortisol  Serum (0600 – 0900) < 3 mcg/dL (500 nmol/L)  Salivary < 0.18 mcg/dL (5 nmol/L)  Cosyntropin Stimulation Test  Change in Cortisol < 9 mcg/L – less important  Peak cortisol < 14.5 mcg/L | | |
| Low Plasma ACTH  Normal renin & aldo | | High Plasma ACTH  Elevated renin, Low aldosterone  Low Na, High K |
| Complete history, Medication reconciliation  Targeted laboratory and radiologic diagnostic testing | | |
| **Management** | **Adrenal Crisis** | * 100 mg IV hydrocortisone * Bolus 1 L isotonic saline +/- 5% dextrose (if hypoglycemic) * 200 mg/day hydrocortisone: 50mg Q6H or daily continuous infusion * Then, 100 mg hydrocortisone daily until stable for transition to maintenance oral regimen | | |
| **Sick Day/ Stress Dosed** | Minor: Double or triple hydrocortisone x2-3 days based on the severity of illness  Moderate (ex: admitted with CAP): 50 – 75 mg/day hydrocortisone in divided doses (ex: 25mg Q8H)  Major: 100 mg IV hydrocortisone & 200 mg/day (50mg Q6H or continuous infusion) until stable for PO | | |
| **Chronic** | * 15-20 mg daily hydrocortisone in 2-3 doses (2/3rds in AM) * Females: Consider DHEA 25-50 mg if ↓libido, depression, or persistent fatigue | | * 15-25 mg daily hydrocortisone in 2-3 doses (2/3rds in AM) * 0.05 – 0.01mg fludrocortisone (unless > 40 mg hydrocortisone daily) * Females: Consider DHEA 25-50 mg if ↓libido, depression, fatigue |

**Week 15**

**Joint Base: A primer on spondyloarthropathies**

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| **Inflammatory Arthritis** | | |
| Morning stiffness lasting >1 hr  Improves with activity  Joint swelling, bogginess, erythema, and/or warmth | | |
| **By Joint Involvement** | | |
| One | <6 joints | 6 or more joints |
| Septic Arthritis  Crystalline arthropathies (gout, pseudogout) | Spondyloarthropies:  Clues: asymmetric, often axial, enthesitis, dactylitis  Psoriasis  Ankylosing spondylitis  Reactive arthritis  Unspecified SpA | Rheumatoid arthritis  Systemic rheumatologic diseases: SLE, Systemic Sclerosis, Polymyositis, dermatomyositis, Sarcoidosis, Vasculitides |

**Feel the Burn: GERD and Dyspepsia**

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| **Definitions** | GERD – reflux of gastric contents into the esophagus causing symptoms and/or complications  Functional dyspepsia – bothersome postprandial fullness, early satiety, and epigastric pain or burning occurring 3d/wk for at least 6 mo WITHOUT evidence of structural disease (PseudoGERD) |
| **Epi** | ~30% of adults in western society  Causes: reduced LES pressure, hiatal hernia, increased intra-abdominal pressure (obesity, pregnancy), abnormal esophageal/gastric motility, Zollinger-Ellison syndrome; consider NSAIDs, other meds |
| **Symptoms** | Red Flag (need endoscopy!) – Weight loss, anorexia, GIB, recurrent vomiting, anemia, dysphagia, odynophagia, FH of gastric ca in FDR, New onset age >=60 yo  Typical – retrosternal pyrosis (heartburn), regurgitation, epigastric discomfort   * For typical symptoms only, manometry, barium swallow, laryngoscopy not needed   Atypical esophageal – chest pain, nausea, dysphagia, odynophagia, eructation (belching), globus  Extraesophageal – cough, hoarseness, throat clearing, dysphonia, dental caries, acidic taste |
| **Evaluation** | 60 years or older – Endoscopy (EGD)  <60 years old – h pylori stool antigen testing (2 weeks OFF PPI), 8 week PPI trial for typical sxs   * If PPI trial effective, reduce dose to lowest effective dose * If PPI trial ineffective, evaluate medication timing and compliance before referring for endoscopy. If endoscopy negative, pursue ambulatory reflux monitoring and/or manometry |
| **Treatment** | GERD – 8 week trial of PPI, then as above  Functional dyspepsia – EGD for alarm signs or if 60+ yo, rule out h pylori 🡪 PPI trial 🡪 TCA trial |
| **PPI Risks** | Mild documented increased risk of osteoporosis, hip fracture, CKD, CAP, c diff recurrence or index infection, dementia |

**Acid-Base Evaluation (stealing from my alma mater EUSOM because I like these)**

|  |  |
| --- | --- |
|  | **Text  Description automatically generated with medium confidence** |
| **Toxic Ingestion Eval** | |
| Methanol (paint thinner, windshield wiper fluid)   * Sx: visual blurring, central scotoma, afferent pupillary defect, AMS * Lab: HIGH osmolar gap, HAGMA   Ethylene glycol (Antifreeze)   * Sx: Flank pain, hematuria, oliguria, CN palsies, tetany * Lab: HIGH osmolar gap, HAGMA, renal failure, calcium oxalate crystals in urine (and on kidney biopsy)   Isopropyl alcohol (rubbing alcohol, mouthwash)   * Sx: CNS depression, dysconjugate gaze, absent ciliary reflex * Lab: HIGH osmolar gap, NO anion gap or metabolic acidosis | |

**Pink Ribbon Month: Breast Cancer Basics**

|  |  |
| --- | --- |
| **Epi** | Most common & second deadliest cancer in women (1 in 8 women affected)  Sporadic (90%), genetic mutation like BRCA 1/2 (10%)  Invasive ductal carcinoma most common; hormone positive (ER) majority of cases |
| **Risk Factors** | Older age, prior personal cancer, FDR with breast ca, early menarche, late menopause, OCPs, HRT (longer estrogen exposure), chest wall irradiation <30 years old, obesity, excess EtOH |
| **Exam** | Inspect skin for dimpling, color changes, retraction; evaluate nipple discharge, overall breast symmetry, palpate for lumps/nodules and axillary/supraclavicular LAD |
| **Diagnosis** | If a mass is identified, keep breast cancer top of mind!  Age <30 – obtain US; cysts are aspirated or biopsied, solid masses are biopsied or excised  Age >=30 – obtain diagnostic mammo, followed by US (BiRads 1-3) or biopsy/excision (BiRads 4-5) |
| **Treatment** | Complex, multiD discussion between medical and surgical oncology, patient, GC, etc depending on stage, pt desires, etc. Options include:  Surgery  Hormone therapy (usual duration 5 years)   * For hormone-positive cancers only * Pre-menopause (tamoxifen); post-menopause (aromatase inhibitor OR tamoxifen then AI)   Chemotherapy and/or Immunotherapy |
| **Screening** | Annual mammogram age 45-54, then every 1-2 yrs 55-74 (ACS – average and moderate risk)  Annual breast MRI and mammo, staggered 6 months apart (high risk = >20% lifetime risk)  The GAIL model (Breast Cancer Risk Assessment Tool) – estimate 5 year and ~lifetime risk of developing breast cancer using personal demographic and reproductive info – NOT for BRCA ½   * Can use to guide discussions about chemoprevention, ppx mastectomy, etc… or to refer to Breast Care Center for that |
| **At WR** | Breast Care Center on 3rd floor of America Bldg is a fantastic resource; they will handle more advanced diagnostics, multiD care, prophylactic mastectomy discussions, etc AFTER appropriate initial work-up is done in PCMH  Pink Ticket – available for overdue patients age 50-75 (last mammo 25+ mo ago) – grab at front desk and take to 3rd floor for same-day mammo |

**Week 16:**

**Think FAST (Face, Arms, Speech, Time): The Internist’s Guide to Stroke**

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| --- | --- |
| **Definition** | Persistent focal CNS deficits from CNS vascular injury/cause, including infarction or bleeding |
| **Risk Factors** | DM, cardiac disease, HLD, HTN, Obesity, Smoking/EtOH/drug use, OSA |
| **Subtypes** | Ischemic (Thrombotic vs Embolic vs Hypoperfusive)   * A-fib/flutter, vegetation, HFrEF; atherosclerosis/HLD, dissection, vasospasm, arrest/shock   Hemorrhagic   * Intracerebral (ICH) – HTN, exertion/trauma, coagulopathy, stimulant drugs, AVM * Subarachnoid (SAH) – smoking, HTN, heavy EtOH use, PKD, FH of SAH, stimulant drugs |
| **Symptoms** | Sudden focal deficits:   * facial or extremity weakness/sensory loss; aphasia; ataxia; visual loss (less common vertigo, brainstem symptoms, AMS)   Consider mimics:   * seizure, migraine, functional, stroke recrudescence, hyper/oglycemia, toxins/drugs |
| **Diagnostics** | Code Stroke! 🡪 Identify last known well 🡪 NIHSS + Neuro Exam 🡪 NCHCT + CTA H/N  Labs/Other:   * POC Glucose, BMP (rule out hypoglycemia) * EKG (a-fib or arrhythmia?) * CBC (Plts), Coags (Bleeding risk) |
| **Initial Treatment** | Thrombolytics - (Tenectplase/TNK or alteplase/TPA)   * Within 4.5h from LKW * MUST RULE OUT CONTRAINDICATIONS (Refer to MDCalc) * *Absolute*: acute ICH or SAH, NSGY/TBI/stroke in last 3 mo, BP >185/110, prior ICH, known cerebral AVM or cancer or aneurysm, aortic dissection, active bleeding   Endovascular thrombectomy   * Within 24h from LKW for non-hemorrhagic, large vessel occlusion (LVO), NIHSS 6+ |
| **Subsequent Care**  **(the VA Stroke orderset is solid)** | Admit to telemetry  SLP eval or bedside nursing eval MUST happen before patient eats (NPO otherwise)  PT/OT eval  TTE +/- bubble study (PFO eval)  MRI Brain +/- MRA head/neck  Lipids, A1c, TSH, HIV  High-intensity statin  Hypertension management:   * Permissive hypertension to <220/120 for first 24hr (if no TPA or thrombectomy) * <140/90 within 24h to 48h post-stroke * Outpatient goal <130/80   Dual antiplatelet therapy (aspirin + clopidogrel OR ticagrelor)   * 21 to 90 days   VTE chemoprophylaxis, usually within 24hrs  HTN, DM, Obesity, OSA, smoking, CVD mgmt. and mood disorder screening (PCM f/u) |

**Catch the beat: Rhythm control in atrial fibrillation**

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| **Classifications** | At risk – presence of modifiable/non-modifiable AF risk factors (obesity, OSA, DM, EtOH, male, age)  Pre-AF – structural or electrical evidence that predispose to AF (Large atria, PAC, AT, Aflutter)  Paroxysmal AF – intermittent AF for <=7d from onset  Persistent AF – continuous AF for >7d and requires intervention  Long-standing persistent AF – continuous AF for >12 mo  Successful AF ablation – freedom from AF after percutaneous/surgical intervention  Permanent AF – AF without further attempts at rhythm control |
| **Rhythm vs Rate** | When to choose rhythm control:   * “Everyone deserves a trial of NSR” – ultimately a discussion of patient goals with Cards * Younger, shorter period with A-fib diagnosis, symptomatic   When to choose rate control:   * Older, longer history of A-fib dx (harder to convert to NSR), less or asymptomatic |
| **Electrical Intervention** | Electrical cardioversion – recommended as initial strategy OR after medication conversion fails (I)   * 3 weeks AC before, 4 weeks afterwards – if in afib for >-48 hrs for ALL patients * Perform TEE to rule out LA thrombus if urgent cardioversion needed (unstable) (I)   First-line ablation is effective for symptomatic, paroxysmal A-fib (Class I)   * Favor for younger patients with fewer comorbidities * Better than medication to keep patient in NSR, especially EARLY in disease course * Need AC and rhythm control for at least 3 months afterwards (I) |
| **Rhythm control agent selection** |  |
| **Drug Monitoring** | Amiodarone – effective but toxic   * Thyroid function (baseline, T+3mo, annual); LFT, eye exam, PFT & CXR (baseline, annual)   Dofetilide – can be used for inpatient chemical cardioversion then maintenance   * BMP, Mg/Phos, EKG q3-6 mo   Fleicanide + Propafenone – contraindicated in structural or ischemic heart disease   * Can be used for pill-in-pocket at-home treatment * Must take beta-blocker ~30 min before use * First use should be monitored in ED for hemodynamic stability; if stable, ok for home use |
| **Other considerations** | Don’t forget anticoagulation (stroke ppx) per CHA2D2SVASC risk! (balanced with HAS-BLED)  Obesity management, OSA diagnosis and treatment, Alcohol reduction or cessation  OK to continue caffeine consumption if patient reports caffeine not a symptom trigger |

**Week 17:**

**Pulmonary POCUS**

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**Moving Slow: Bradycardia**

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| **Diagnostics:**   * Obtain BMP, TSH, Trop (if ACS concern) * Dig level PRN * Consider Lyme serology for AVB * TTE * **Complete Med Rec!!** |  |

**Complete Heart Block: Etiologies**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Medications** | **Metabolic** | **Infection** | **Ischemic** | **Inflammatory** | **Other** |
| -Alpha 2 agonists  -Beta-Blockers  -Antiarrhythmics  -Non-DHP CCBs (Verapamil, Diltiazem)  -Antiseizure meds  -Digoxin | -Hypokalemia  -HypoPhos  -Hypoglycemia  -Hyperkalemia | -Lyme  -Syphilis  -Myocarditis  -Chagas  -Viral infections  -IE (+- abscess) | -Inferior (AV node)  -Anterior (Below AV node) | -Rheumatoid arthritis, lupus, systemic sclerosis, polymyositis, dermatomyositis  -Granulomatosis with polyangiitis | -Takotsubo  -Infiltrative disease (amyloidosis, Sarcoid, hemochromatosis)  -Iatrogenic/  Traumatic  -Vagal AV block |

**RHC Data: Gold Standard for Diagnosing Pulmonary Hypertension**

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| **Swan-Ganz / PAC / RHC Tracing**  What you see shows where you are! | | **Normal Intracardiac Pressures:**  RA = Nickel  RV/PA = Quarter  LA/PCWP = Dime  Systemic/LV = Dollar |
|  | **Think of it like Ohm’s Law:**  Resistance = Pressure / Flow or R = V/I  Lung Arterial Resistance = Lung BP gradient / blood flow  Or,  **PVR = Trans-Pulmonary Gradient (TPG) / Cardiac Output (CO)**  Where TPG = mPAP – PCWP  Thus, **PVR = (mPAP – PCWP) / CO**  **PCWP >3 Woods Unit (WU) is PH**  (though truly 2+ WU is very abnormal)  Note: Diagnosis made ideally with patient in euvolemic state.  TTE data like elevated RVSP, PASP, TV regurgitant jet velocity, chamber/valvular changes are suggestive if not diagnostic | |

**Wait, WHO? Pulmonary Hypertension Groups (bold = ABIM testable)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Group 1 - PAH** | **Group 2** | **Group 3** | **Group 4 - CTEPH** | **Group 5** |
| **Causes** | Idiopathic, Heritable, Drug/Toxin, HIV, CTD, Portal HTN, etc | Left Heart Dz, Valvular dz | Pulm dz / Chronic Hypoxia | Prior or Recurrent PE | Other (Sarcoidosis, Sickle Cell, etc) |
| **Evaluate** | HIV, ANA, ANCA, MPO, Scl-70, LFT, RUQUS | TTE | HRCT, PFT, PSG | **V/Q Scan \*NOT CTA\*** | Targeted Labs/Bx |
| **Pre/Post Capillary** | Pre | Pre and/or Post | Pre | Pre | Pre and/or Post |
| **Treat** | Pulm Vasodilators: CCB, **PCA (Ambrisentan) + PDE-5 (Tadalafil)** GC or ERA | Manage primary | Manage primary Inhaled PCA (Tyvaso)  O2 if PaO2 <55 | **GC (Riociguat)**  **Thrombo-endarterectomy** | Manage primary  Pulm vasodilators |

**Week 18**

**Sleepless in Bethesda: Insomnia**

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| **Definition** | **Must meet 6 criteria:**   1. Sleep sxs: difficulty with sleep onset, maintenance, early awakening, etc 2. Leading to: fatigue, impaired attention/concentration, performance, mood disturbance, etc 3. Not explained just by inadequate sleep opportunity or environment 4. Not explained by another sleep, medical, or mental disorder or substance/medication use   5. & 6. Must occur 3x / week for at least 3 months | |
| **Evaluation Includes:** | * **Predisposing factors:** Biology, personality/temperament, adverse childhood events * **Environmental stressors:** Illness, Divorce, Loss, Shift work, Job loss * **Compensatory behaviors:** Earlier bed time, sleeping in, naps, caffeine, sleep aids, decr activity | |
| **Medication Therapy** | **Recommended for Sleep Onset**   * BZRA: Zolpidem (Ambien), Eszopiclone (Lunesta), Zaleplon (Sonata) * MLT-2: Ramelteon * BZD with caution: Temazepam, Triazolam * Dual Orexins: Suvorexant (Belsomra), e.g. * Chronic insomnia requiring BZD, BZRA, antipsychotic x3 mo, waiver for combat AO | **Suggested for Sleep Maintenance**   * Doxepin * BZRA: Ambien, Lunesta, Sonata * BZD with caution: Temazepam, Triazolam * Dual Orexins: Belsomra, e.g. |
| **NOT recommended for Sleep Onset or Maintenance**   * Anticholinergics: Diphenhydramine (Benadryl), hydroxyzine (atarax/visteril) * *Melatonin*, Tiagabine, L-tryptophan, Valerian * Antidepressants: Trazodone * Note: Magnesium products not discussed in guidelines   **Then how do I use melatonin?**   * Warn pt not FDA regulated (OTC products vary WIDELY in active ingredient dose) * Dose at 0.5 – 1 mg taken 4 hrs before bedtime (not good for that 2300 inpatient call!) * Can shift sleep/wake cycle – good or bad depending on pt’s disease * Reasonable to prescribe instead of encouraging OTC use | |
| **CBT-i** | CBT-I is individualized to the pt & takes WORK (must use 4 out of 7 nights) from the pt (decreased sleep up front can be unpleasant)   * Consider contraindications to sleep restriction (high risk job, mania, seizure, untreated OSA, acute illnesses)   Access to CBT-I is limited! (VA, IHW, WR Sleep Medicine, Self-Pay, Telemynd available)  The VA “Insomnia Coach” app is one excellent resource for at-home use | |

**Endo ITE Potpourri**

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| **Syndrome** | **Clinical Findings** | **Etiology** | **Evaluation** |
| Cushing Syndrome | Hypercortisolism:  Mood disturbance, moon facies, osteoporosis, HTN, central obesity, facial plethora, skin wrinkling/bruising/striae/ulcers, amenorrhea, | Excess cortisol  ACTH-dependent: pituitary adenoma, carcinoid tumors  ACTH-independent: adrenal adenoma, exogenous steroids | 1 mg dexamethasone suppression test + 24 hr urine free cortisol OR Late-night salivary cortisol  If 2/3 positive -> ACTH  Low ACTH -> MRI/CT Abdomen for adrenal tumor  Hi ACTH -> High-dose suppression test  HDST neg -> CT pan scan for ectopic ACTH source  HDST pos -> MRI/CT for Cushing’s dz |
| Multiple Endocrine Neoplasia, Type 1 |  | MEN1 gene mutation (though not required for clinical diagnosis)  Pituitary: adenoma (Cushing/Acromegaly), prolactinoma  Parathyroid: adenoma  Pancreatic: gastrinoma, insulinoma, VIPoma, carcinoid | Diagnosis requires 2 or more primary MEN1 tumor types OR 1 MEN1 associated tumor in family members  Genetic testing if suspected as above, multiple pancreatic NETs, FH or PH of other endocrinopathies, or pts <40 with gastrinomas/insulinomas/etc |
| Hypoglycemia in non-T2DM | Whipple’s Triad: Fasting BG < 55, neuroglycopenia, resolution of sxs with PO glucose  OR  Fasting BG < 45 + neuroglycopenia (neuro sxs, e.g. confusion) | Exogenous insulin use  Insulinoma  Diminished PO intake | 72-hour fast in those for whom cause isn’t obvious (protocols vary)  BMP, C-peptide, Insulin, Proinsulin, bHB |
| Euglycemic DKA | HAGMA + elevated bHB + urinary ketones  T1DM or T2DM  Taking an SGLT2i | Increased glycosuria and diuresis + Increased glucagon -> maintained decreased insulin state & increased lipolysis/ketogenesis  Decreased renal ketone clearance  Euglycemia maintained via kidneys | BMP  Beta-Hydroxybutyrate  UA  Med Rec  Managed like usual DKA and discontinuation of SGLT2i (update EMR) |

**Anti-Obesity Meds (Green to highlight our Tricare AOM pathway medications)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Agent (Trade Name)** | **MOA & Route** | **%Total Body Weight Loss** | **Contraindications** | **Caution/Monitor** | **Side Effects** |
| **Phetermine (Apidex-P, Lomaira)**  8mg up to TID  15mg  30mg  37.5mg | NE-releasing agent; CNS stimulant acting on hypothalamus  PO | 5-7% | CVD  Hyperthyroidism  Uncontrolled HTN  Glaucoma  Pregnancy  Agitated state | Anxiety disorder  Seizure history  Primary pHTN  *FDA approved 3 months but can use longer* | HA, insomnia, dry mouth, anxiety, constipation, palpitations |
| **Phentermine+ topiramate (Qsymia)**  3.75/23mg  7.5/46mg  11.25/69mg  15/92mg  *migraines, seizure ppx* | NE-releasing agent; CNS stimulant + GABA receptor agonist  PO | 7.8- 10.9% | Hyperthyroidism  Glaucoma  Recent MAOi use  Pregnancy  GFR <30 | Fetal cleft lip/palate  Suicidal ideation  Depression/anxiety  Increased HR, BP  Cognitive impairment  Kidney stones  ASCVD, HTN  GFR 30-49 | Paresthesia (1/3 pts), word recall issues, dizziness, dysgeusia, insomnia, constipation, dry mouth |
| **Orlistat (Alli, Xenical)**  60mg TID w/ meals  120mg TID w/ meals  *Relieve constipation, esp a/w GLP-1 use* | Lipase inhibitor  PO | 3.3% at 120mg dose | Chronic malabsorption  Cholestasis  Pregnancy | Liver dysfunction  Renal impairment  Malabsorption of fat-soluble vitamins & medications (Vit D)  Kidney stones, IBS-D | Steatorrhea, flatulence with discharge, fecal urgency + incontinence, increased stools |
| **Naltrexone SR/Bupropion SR (Contrave)**  8/90mg 1-4tabs/d  *MDD, TUD, food cravings* | Opiate antagonist + DA and NE reuptake inhibitor  PO | 6.4% | Uncontrolled HTN  Sz disorder  Anorexia or Bulimia  Alcohol w/d  Opioid use d/o  Pregnancy  GFR<30 | Suicidal Ideation  Depression  Anxiety  Concomitant MAOi use  Liver dysfunction  Glaucoma  GFR 30-49 | N/V, HA, constipation, dizziness, insomnia, dry mouth, diarrhea, ↑ BP & HR |
| **Liraglutide**  **(Saxenda)**  0.6-3mg titrate weekly to 3mg daily  *Pre-DM, T2DM, CVD* | GLP1 receptor agonist  SubQ daily | ~8% | PMH or FMH of MEN2 or medullary thyroid cancer  Pregnancy | Pancreatitis  Acute gallbladder disease  Cholelithiasis | fatigue, N/V/D abdominal pain, constipation (hypoglycemia in T2DM pts) |
| **Semaglutide**  **(Wegovy)**  0.25-2.4mg titrate every 4 weeks  *Pre-DM, T2DM, CVD, NAFLD* | GLP1 receptor agonist  SubQ weekly | 12-15% | PMH or FMH of MEN2 or medullary thyroid cancer  Pregnancy | Pancreatitis  Acute gallbladder disease  Cholelithiasis | fatigue, N/V/D, abdominal pain, constipation (hypoglycemia in T2DM pts), sinus tach |
| **Tirzepatide**  **(Zepbound; Mounjaro for T2DM)**  2.5-15mg titrate every 4 weeks by 2.5mg  *T2DM, CVD, NAFLD, less GERD than GLP-1* | GIP + GLP1 receptor agonists  SubQ weekly | 16-25% on avg | PMH or FMH of MEN2 or medullary thyroid cancer  Pregnancy | Pancreatitis  Acute gallbladder disease  Cholelithiasis | fatigue, N/V/D, abdominal pain, constipation, (hypoglycemia in T2DM pts), sinus tach, ↓OCP effectiveness |

**For info on ACS/Chest Pain from Dr Haile’s talk –** see Academic Summary week 6

**Week 19**

**PJP Pneumonia: Respiratory OI Topic 1**

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| **Causative Organism** | *Pneumocystis jirovecii* (previously *carinii*) fungus | |
| **Risk Factors** | **HIV/AIDS (CD4 <200)**  **Chronic Glucocorticoid use (and other immunosuppressives)**  Inherited immune deficiencies, hematopoetic cancers, transplant, severe malnutrition | |
| **Clinical Presentation** | (+) HIV   * Subacute infection (weeks to months) * Fever/night sweats, cough, *progressive* dyspnea, insidious weight loss * Oral thrush | (-) HIV   * Acute; 1 week from symptom onset to respiratory decompensation * Fever, non-productive cough, hypoxemic respiratory failure |
| **Prophylaxis** | Indications:  **CD4 count <200 in HIV**  **20+ mg prednisone daily for 4+ weeks**  Also – Bone marrow or solid organ transplant, ALL, certain meds, GPA on pred/cyclophosphamide | Regimen:  **TMP-SMX** SS or DS tab PO daily (preferred)  Alternate - DS tab PO MWF  If SJS/TEN/other Bactrim contraindication: pentamidine, dapsone, atovaquone |
| **Diagnosis** | Labs  **ABG** with disproportionate hypoxemia  **Positive PCR** from BAL (99% SN, 89% SP) or induced  sputum (99% SN, 82% SP)  **Fungitell** (beta-D-glucan) – SN 91%, SP 79%  If >200, SN 70%, SP 100%! Many false positives  (gauze, HD filters, blood products, e.g.) | Imaging  **CXR**: normal or reticular opacities; PTX possible from pneumatoceles  **Dry CT Chest**: GGOs, patchy/mosaic; can be nodular pattern less commonly |
| **Treatment** | **Start Prednisone 15-30 min before starting anti-PJP therapy TMP SMX 2 DS tabs PO Q8hr x 21 days (or IV if unable to take PO)**  Prednisone 40 mg PO Q12h x 5 days → 40 mg q24h x5 days → 20 mg Q24h x 11 days  Alternatives: Clindamycin + Primaquine OR Atovaquone OR Pentamide  If new HIV – should start HAART within 2 weeks of starting PJP treatment – low IRIS risk | |

**Acute Exacerbation of COPD: Respiratory Topic, non-OI**

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| **Diagnosis** | Cardinal symptoms: Increase in any 2 of dyspnea, cough frequency/severity, or sputum volume/purulence | | | |
| **Triggers** | Infectious (70%, often viral) vs. Other (30%, environmental pollutants, PE, HF, aspiration, MI) | | | |
| **Eval** | CBC w/diff, BMP, Trop, ProBNP, EKG, RVP, CXR +/- CTPE, TTE | | | |
| **Treatment Setting** | OUTPATIENT (80% AECOPD)  No sxs of respiratory failure  No new or atypical exam findings  No serious comorbidities  Adequate response to ED/office management  Sufficient home support | INPATIENT (no AHRF)  RR <=24  No accessory muscle use  No change in mental status  Hypoxia improves with routine supp O2  PaCO2 at baseline | INPATIENT (non-life threatening AHRF)  RR >24  Accessory muscle use  No change in mental status  Hypoxia improves with routine supplemental O2  PaCO2 50-60 mmHg or above baseline | ICU (life-threatening AHRF)  RR>24  Accessory muscle use  Acute AMS  Hypoxia requiring BiPAP, HFNC, MV  PaCO2 above baseline  OR pH <=7.25 |
| **Acute Treatment** | SABA +/- SAMA  Cont home LABA, LAMA  Consider abx if risk factors present or sxs worsening despite appropriate tx  Consider PO steroids x5-7d  Antiviral (Tamiflu, Paxlovid, e.g.) | Bronchodilators (nebulized & inhalers)   * Increase dose / frequency * Combined SABA/SAMA * Add LABA when stable   IV vs PO steroids (5-7 days of PO prednisone 40 mg daily)  Consider antibiotics if bacterial infection suspected  Consider NIV (esp if pH <7.35)  Treat underlying etiologies as able (antivirals, diuresis, e.g.) | | Same as inpatient care  Consider mechanical ventilation if:  Unable to tolerate NIPPV  Post-arrest  Aspiration/vomiting  Hemodynamic instability  Unable to protect airway (AMS, e.g.) |

**Tuberculosis: Respiratory OI Topic 2 – catch the theme?**

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| **Organism** | *Mycobacterium tuberculosis* – a pesky, resilient, virulent bacterium – acid-fast staining with thick walls | |
| **Clinical Presentation**  Hallmarks of active disease include weight loss, cough, night sweats, fever, hemoptysis, fatigue, lymph-adenopathy |  | |
| **Screening** | At risk for new infection: close contacts with TB, homeless shelters, prisons, HCWs, drug use  Increased risk of progressive LTBI: HIV, transplant, chemo, abnormal chest imaging, ESKD on HD, TNF-alpha,  DM, long term glucocorticoids  Mild increase in progressive LTBI: BMI<=20, Pack per day TUD, Solitary nodule, Pts from high-risk countries  TST/PPD: Inactivated TB extract, place at T0, read at T+48-72hr (FP: BCG vax, prior TB, many PPD, NTM exposure)   * If positive -> IGRA   IGRA/Quantiferon/T-spot: Assay measuring IFN-gamma response to antigen (No false positive for BCG vax!)   * If positive -> chest imaging to determine latent or active TB | |
| **Diagnosis** | Latent TB  Persistent immune response to TB (positive PPD or IGRA) WITHOUT evidence of active infection (sxs or rads findings) | Active TB  Reasonable risk factors with Signs/symptoms of known or presumed TB infection Chest imaging or Microbiologic evidence (AFB smear, culture, Gene Xpert NAAT) |
| **Treatment** | Latent TB falls within PCM wheelhouse  INH-RPT weekly x 3 months OR  Rifampin daily x 4 months OR  INH-RIF daily x 3 months (other regimen exist) | Active TB tx does NOT require definitive diagnosis (culture or molecular testing positive for TB) - favored based upon pt factors, lab/imaging findings, clinical suspicion, and public health concerns |
| **Active TB tx Regimens:**  **RIPE**  **Complicated – Consult ID!!**  **\*\*Duration and regimen are dependent upon the presence of cavitary lesions, culture positivity, sputum and radiographic monitoring** |  | |

**Week 20**

**Idiopathic Inflammatory Myopathies: the other “IIMs”**

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| --- | --- | --- | --- | --- |
| **Suspect…** | Objective weakness Muscle pain, fatigue, objective weakness, new rash, elevated LFTs/CK | | | |
| **Evaluation** | First Line labs: BMP, LFT, CK (will correlate to disease activity), LDH, aldolase  Second Line labs: myositis panel with antibodies as below – talk to your rheumatologist  Histology: EMG (may be falsely normal) or skin (esp for dermatomyositis lesions) and/or muscle biopsy (helpful)  ILD evaluation: CT chest & PFT w/DLCO  Swallow eval: MBS  MRI pelvis/thighs – can demonstrate inflammatory process & guide biopsy site, but NOT required for dx | | | |
|  | **Dermatomyositis** | **Polymyositis** | **Necrotizing autoimmune myositis** | **Inclusion body myositis** |
| **Onset** | Subacute | Subacute | Acute/subacute | Insidious! |
| **Pattern** | Proximal, symmetric | Proximal, symmetric | Proximal | Proximal & Distal, asymmetric |
| **CK** | Up to 50x ULN | Up to 50x ULN | >50x ULN | Up to 10x ULN |
| **Auto-Abs** | Anti-MDAS, anti-Mi-2, anti-TIF-1, anti-NXP-2 | Anti-synthetase | Anti-SRP, anti-HMGCR | Anti-NT5c1A |
| **Associated features** | Think occult cancer!!  Periorbital heliotrope rash (w/wo edema), shawl sign (upper back), Gottron’s papules (MCP/PIP/DIP)  May have antisynthetase s/o | Diagnosis of exclusion  Muscle biopsy helpful  May have anti-synthetase s/o | Weakness is SEVERE, usually worsens after offending med discontinued; fewer extramuscular sxs | Finger & forearm involvement. Develops over years, usually steroid-refractory |

**L-Spine Path for the PCM -** See Academic Summary Week 7 😊

**Patient Medical Decision Making**

|  |  |  |
| --- | --- | --- |
|  | **Capacity** | **Competency** |
| **Definition** | A person’s ability to make an informed decision | The mental soundness to make decisions or act |
| **Domain** | Case-by-case decisions  Patients may have capacity on one issue but not another (e.g. lab draws vs. surgical consent) | Global – ALL decisions |
| **Determined by** | YOU! Any physician, not just psych can evaluate  Some consult psych to defer medicolegal risk | Legal system (i.e. a judge)  Typically protracted (e.g. guardianship) |
| **How Determined** | “4 C’s” in the clinical setting  Choice – clearly indicated a preferred tx option  Case Comprehension – pt understands their medical scenario  Consequences – pt knows pro/con of all tx options  Consideration – pt can reason through relevant information | Complex legal proceedings in court   * May include financial decision making, power of attorney, residency, |

**Gout**

|  |  |  |
| --- | --- | --- |
| **Definition** | Impaired metabolism of or excessive purines to process by xanthine oxidase leading to build up and precipitation of monosodium urate crystal deposition in joints, followed by inflammatory phagocytosis | |
| **Risk Factors** | Male sex, CV disease, overweight/obesity, smoking, high meat or alcohol consumption,  Can be precipitated by illness/infection, surgery, MI, diuretic use, etc | |
| **Evaluation** | Uric acid level – crystals begin to precipitate >6.8 in colder peripheral tissues  Arthrocentesis – rule out septic joint; identify intracellular negatively refringent crystals  XR – look for erosions, tophi | |
| **Treatment** | **Acute Flare** | **Chronic** |
|  | Features:  First flare often podagra (50%) or monoarticular (feet)  Subsequent flares can be oligoarticular (variety)  Acute onset (overnight often), will self-resolve within few days without treatment but dz progresses w/ each flare (intercritical phase gets shorter)  Colchicine (first-line)   * Use caution or avoid in CKD, hepatic dysfunction, risk for med-med interactions * Diarrhea may be intolerable   Steroids (PO and/or intrarticular)   * Preferred in older adults, ESKD * Avoid with infection, DM, HF   NSAIDs   * Variety of agents equally effective * Avoid in CKD, PUD, anticoagulation   IL-1 inhibitors (anakinra, canakinumab)   * If no other options   **Can start ULT up front with these if indicated!!** | Lifestyle modifications:   * Guidelines conflicted, but consider modest dietary reduction in seafood, meat, alcohol; weight loss, ?increased dairy intake; non-diuretic anti-HTN switches (e.g. to losartan)   Indications for Urate Lowering Therapy (12349):  1+ Tophus  2+ flares in 1 year  CKD3+  Ne-4-olithiasis  Uric acid >9  ULT - Xanthine oxidase inhibitors (XOI)  Allopurinol – test HLA-B\*5801 for Black/Asian pts to avoid drug-induced hypersensitivity rxns   * Dose reduce in CKD * Prescribe daily colchicine w/ start/dose incr   Febuxostat – ok for ppl with HLA-B\*5801   * Second line due to CV risks   Uricosurics (probenecid) not generally used  Pegloticase an option in refractory dz   * Many develop antibodies limiting efficacy & raising rxn risk   Goal**:** Urate <6 (or Urate <5 if tophi) |

**WEEK 21**

**“I’m not your buddy, guy:” Budd-Chari Syndrome**

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| --- | --- |
| **Pathophys** | Hepatic vein outflow obstruction from  A. Thrombus (majority – hypercoagulable state, APLS, OCPs, polycythemia or MPN) OR  B. Obstructive mass (HCC, RCC, hepatic cyst, aspergilloma, e.g.) |
| **Suspect** | Acute liver failure, acute hepatitis / marked AST/ALT elevation (>1000), or chronic liver disease with risk factors |
| **Diagnosis** | RUQUS with doppler diagnostic in majority of cases  CT or MRI also options (especially to identify mass) |
| **Treatment** | Treat underlying disorder!  Prevent propagation: Anticoagulation = Warfarin (LWMH bridge) – need variceal evaluation first!  Restore patency: directed thrombolysis vs venous stenting  Liver decompression: TIPS or surgical shunt |

**PCM (*P*sychotropi*C* *M*edications) Antidepressants**

|  |  |  |
| --- | --- | --- |
| **Group** | **Relative Benefits** | **Relative Risks** |
| Escitalopram (Lexapro)  Citalopram (Celexa) | Fewer Drug-Drug Interactions  Great first line agents | QTc Prolongation (dose dependent), sexual side effects |
| Fluoxetine (Prozac) | Long half-life = Self-tapering, very well studied, most weight-neutral SSRI | Drug-Drug Interactions, sexual side effects, insomnia |
| Sertraline (Zoloft) | Best studied during pregnancy, drug of choice for post-MI, best for co-morbid anxiety and ADHD | GI side effects, sexual side effects, insomnia |
| Paroxetine (Paxil) | FDA approved for vasomotor symptoms of menopause (but would choose an SNRI instead…) | Sexual dysfunction, weight gain, **discontinuation syndrome – withdrawal!!**  Risk of teratogenicity, Drug-Drug Interactions |
| Duloxetine (Cymbalta)  Venlafaxine (Effexor)  Desvenlafaxine (Pristiq) | Treatment of pain (OA and neuropathic) | GI distress, discontinuation syndrome, sexual dysfunction, Cymbalta & effexor can be very activating, SIADH |
| Bupropion (Wellbutrin) | Helpful for smoking cessation, weight neutral, minimal sexual a/e, can be helpful for ADHD  First-line OR augmentation | Lowers seizure threshold, risk of overdose, contraindicated if history of anorexia, Drug Drug Interactions, Blood Pressure Effects, activating (especially immediate release, may worsen anxiety) |
| Mirtazapine (Remeron) | Dose dependent sedation and weight gain -- First-line OR augment! | Sedation and weight gain |

**Acute ischemic stroke**

See Academic Summary Week 16 😊

**“Can we d/c tele?” Telemetry Monitoring Indications per ACC/AHA**

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| --- | --- | --- |
| **24 Hours** | **48 Hours** | **Indefinite**  **(until resolution or definitive intervention)** |
| Post-pacemaker/ICD/ablation  S/p AICD firing  Chest pain syndrome (excluding very low-risk patients)  Uncontrolled atrial tachyarrhythmia  Initiation of drug known to cause Torsades de Pointes | Acute/subacute HF  ACS (NSTE-ACS, STEMI)  Myocarditis/pericarditis  Syncope of unknown etiology  Post-noncardiac surgery, high-risk  Acute neurologic event (stroke/TIA)  Chest pain (intermediate/high risk) | Post-cardiac arrest  Temporary pacing  High-grade AV block  Post-cardiac surgery, high risk  Arrythmias (incl LQTS & WPW)  Intensive care unit  New-onset bradyarrhythmia  Overdose of pro-arrhythmic agent  Severe HypoK or HypoMag  \*\*Consider: severe sepsis, severe EtOH w/d |

**Elevated LAEs on LFT**

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| --- | --- | --- | --- | --- |
| **Markers of Liver Injury** | | | **Markers of Liver Function** | |
| AST, ALT, Alk Phos, GGT, Bilirubin | | | Albumin, Platelets, INR, Clotting Factors | |
| **Initial Evaluation: R-factor** | | | | |
| **Hepatocellular (R ≥ 5)** | | **Mixed (2 < R < 5)** | | **Cholestatic (R ≤ 2)** |
| Alcohol-associated, Viral,  or Autoimmune hepatitis;  Wilson disease, Alpha-1-antitrypsin,  Hemochromatosis, Budd Chiari, MASLD | | Drug-induced liver injury, viral hepatitis, AIH | | Ductal obstruction (Choledocholithiasis, biliary stricture, pancreaticobiliary tumor)  Primary biliary cholangitis (PBC)  Primary sclerosing cholangitis (PSC) |
| **Isolated Alk Phos Hi**  **ULN = 105** |  | | | |
| **Isolated Bili Elevation** |  | | | |
| **AST/ALT**  **ULN = 35** |  | | | |

**Hepatitis B Infection**

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| --- | --- |
| **Virus** | Double stranded DNA para-retrovirus – has reverse transcriptase replication! |
| **Risk Factors** | Vertical transmission (pregnancy – highest risk!) Incarceration  High-risk sexual activity Unvaxxed Starting immunosuppression  Blood borne (IVDU, transfusion, percutaneous) Hemodialysis |
| **Presentation** | Acute infection – may be asymptomatic or present as acute hepatitis (few will have ALF)  May be spontaneously cleared or be chronic infection  Chronic HBV == risk factor for cirrhosis and hepatocellular carcinoma == 6 months persistent HBsAg positivity |
| **Chronic HBV Phases** |  |
| **Screening** | ALL adults x1 and in first trimester of each pregnancy – HbsAg, HBsAb, HBcAb IgG |
| **Treatment** | Entecavir or tenofovir (first-line)  - Indications: acute liver failure, immune-active or reactivation phases, cirrhosis, select immunosuppression, pregnant patients in 3rd trimester with VL greater than 200,000 U/mL |
| **Prophylaxis** | Oral antiviral therapy for patients who are:  A. HBsAg-positive or isolated HBcAb–positive AND  B. Receiving B-cell–depleting tx (e.g., rituximab), prednisone (≥10 mg x4 wks), or anthracyclines PLUS/MINUS  C. Receiving TNF-α or TKIs (consider) |

**HBV Serology Mastery**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |
| **Status** | **HBsAg** | **HBsAb** | **HBcAb IgG** | **HBeAg** | **HBeAb** | **HBV DNA PCR** |
| **Susceptible** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Immunized** | **-** | **+** | **-** | **-** | **-** | **-** |
| **Early Infection** | **+** | **-** | **-** | **+** | **-** | **↑↑↑** |
| **Window period (infection)** | **-** | **-** | **+** | **+/-** | **+** | **↑↑** |
| **Cleared infection** | **-** | **+** | **+** | **-** | **+** | **-** |
| **Chronic infection** | **+** | **-** | **+** | **+/-** | **+** | **↑↑** |

**Slow your belly roll: Gastroparesis**

|  |  |
| --- | --- |
| **Definition** | Objectively delayed gastric emptying of solids in the absence of mechanical obstruction  Associated with N/V, early satiety, eructation, bloating, upper abdominal pain |
| **Etiology** |  |
| **Diagnosis** | 1. Exclude mechanical obstruction  - Upper endoscopy  - CTE or MRE (small bowel mass, SMA s/o)  2. Gastric scintigraphy (preferred) or 13C breath test  - Stop gastric motility-affecting agents 48h prior; test should last 3-4 hrs  - BG <275 during testing  - >10% retained food at 4 hours = diagnostic on emptying study! (>60% at 2 hours suggestive) |
| **Treatment** | * + Correct nutritional deficiencies, hydration, maintain glycemic control   + Small, frequent, low-fat, low-fiber meals   + Metoclopramide at lowest effective dose (FDA) – watch for extrapyramidal symptoms   + Erythromycin for flare/short-term use |

**WEEK 22**

**Allergy Mythology**

|  |  |  |  |
| --- | --- | --- | --- |
| **Myth** | **Truth** | **Impact** | **Recommendations** |
| Severe egg allergies preclude routine flu vax | While there is some egg protein in most flu vaccines, it is still safe for these pts to get the flu vax – no incr risk of anaphylaxis | Preventable influenza hospitalizations and deaths – risk likely higher among those egg allergic pts with comorbid asthma | All eligible patients should get annual flu shot – no need to screen for egg allergy |
| Shellfish allergy == iodinated contrast allergy | Shellfish allergen is not present in contrast media. Iodine allergy is not real. Betadine allergy IS real but due to povidone component. | Delayed diagnosis and treatment of conditions that require use of IV contrast media (e.g. CTPE, stroke, LHC in MI) | It’s ok to use iodinated contrast media in pts with shellfish allergy if no allergy to contrast. Don’t say “iodine allergy” for contrast media all |
| You can’t use any beta-lactam antibiotics if pt has a documented PCN allergy | Virtually every patient reporting a history of or who is skin test positive to penicillins may receive a cephalosporin antibiotic as a replacement with the exception of those showing R1 side-chain similarity – even this may be very conservative! | Surgical site infection  C diff infection  MICU admission  Resistant Organism  Costs associated with certain antibiotics | For the FEW pts with anaphylaxis to PCN, a non-cross reactive cephalosporin can be given without prior testing – check the R groups!  Remove system-generated warnings in the EMR! |
| “Anaphylaxis treatment consists of Benadryl and steroids” | It's epinephrine. First-line. Up front.  Antihistamines can help for cutaneous symptoms & are second-line agents. Steroids lack evidence for clinical benefit. | Far fewer than expected patients (~50%) receive epinephrine first line or at all – especially in the field. This is suboptimal care. | Get comfortable with EpiPen use and teaching for your pts.  Institute an anaphylaxis orderset with IM epi in your ED! |
| “Toxic mold in my house is giving me vague constitutional symptoms!” | Causal association remains weak and unproven for inhaled mycotoxins in homes. AIT can target proven mold allergies but data is not robust. Hypersensitivity pneumonitis and ABPA are valid. | Unnecessary consumer and healthcare spending on mold removal and investigation as causal agent of symptoms | We do not have enough information to say that common households molds cause these symptoms. |

**Burnin’ Up: The Basics of Burn Management**

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| **Burn Depth Definition** | |
|  | |
| **Indications for Burn Center Care / Consult**   * Full thickness burns, Partial thickness burns >= 10% TBSA * Any deep partial or full thickness burns involving the face/hands/genitals/feets/perineum/joints * Other comorbidities or concomitant trauma * Poorly controlled pain * Inhalational injury * Chemical or electrical injury (incl. lightning)   **Indications for Intubation**   * Persistent cough, stridor, hoarseness, or wheezing * Deep facial or circumferential neck burns * Nares w/inflammation or singed hair * Carbonaceous sputum/burnt matter/blisters in oropharynx * Altered mental status * Respiratory distress, Hypoxia/hypercapnia * Elevated carbon monoxide/cyanide levels   **Classifying Burns:**  Mild – outpatient or ED care  Moderate – inpatient but not burn center  Severe - Any burn that requires burn center mgmt.  **Managing a Severe Burn:**   1. Overall stabilization (pressors, airway, trauma/bleed, etc) 2. Fluid Resuscitation – Parkland Formula 2mL/kg of body weight x %TBSA given IV (half in 8hrs, half over next 16hrs) 3. Early surgical management 24-72h (excision, grafting, etc) 4. WOCN / dressing mgmt for non-op wounds 5. VTE PPX, enteral nutrition, pain control! 6. Abx only for those with proven infection or sepsis | **Estimating %TBSA Burned – Rule of 9’s** |

**Week 23**

**Exposed: Occupational Lung Diseases**

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| **Taking an Exposure History** | | | |
| 1. **Work History**  * Open ended questions of duty descriptions & activity changes, length of time – for EACH job  1. **Risk of Exposure**  * Work área description; ventilation, visible dust/vapors/gas/fumes, PPE required/provided/worn, SDS data  1. **Temporal Relationship**  * New projects, changes at work; symptom association with being at work vs home; others at work with sxs?  1. **Non-occupational exposure assessment**  * Home location, age, length of time living there; humidity/ventilation/vapors/molds/pets/hobbies/travel | | | |
| **Disease** | **Exposure** | **Imaging** | **Association** |
| Asbestosis | Construction, buildings prior to 70s, ship building | Nodular Pleural based masses and plaques; effusion | Mesothelioma, Small cell and non-small cell lung CA |
| Silicosis | “Earth Crust” Disturbances. Cutting, grinding, (sand)blasting, hydraulic fracking for natural gases | Ground-glass, nodular, interstitial, and/or fibrotic infiltrates. Pleural effusions less common. | Fibrotic Lung Disease  Acute to Chronic course  Simple vs complicated |
| Anthracosis (Coal) | Coal mining, with or without Silica | Honeycombing & groundglass with silica, nodular opacities without silica. Pleural Effusions not seen | Pulmonary Fibrosis without silica, Rapidly progressing ILD with silica. |
| Cobalt | Hard metal dust & Cobalt Processing. Diamond polishing, Clean energy -> batteries = cobalt cathodes for lithium-ion batteries. Vital to DOD: Munitions, Aerospace alloys, Batteries, Magnets | Nodular & reticular opacities, cystic spaces, pleural effusions uncommon | Pneumoconiosis, Giant Cell Interstitial Pneumonitis |
| Berylliosis | Aerospace, automotive, nuclear, weapon systems, laser/xray, telecommunication industries | Parenchymal nodules, GGOs in early stages -> hilar lymphadenopathy, interstitial pulmonary fibrosis, and pleural thickening in later stages | Up to 6% of presumed sarcoid is berylliosis  Can be diagnosed with serum or BAL beryllium lymphocyte proliferation test (BLPT) |

**Cushing Syndrome** – in brief in Week 18

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| --- | --- |
| **Suspicious Sxs:**  Truncal obesity  Buffalo hump  Moon facies  Acne  DM or Hyperglycemia (polyuria/dipsia)  Purple striae  Impaired wound healing  Easy bruising  Facial plethora  **1. Confirm hypercortisolism**  **↓** |  |
| **2. Assess ACTH dependence ↓** |
| **3. Localize Lesion** |

**Lower GI Bleeding –** See Week 4 for UGIB in a Nutshell 😊

|  |  |  |
| --- | --- | --- |
| **Hematochezia DDX** | **Evaluation** | **Treatment** |
| Hemorrhoids/Fissure (most common minor cause)  Diverticulosis (often self-limited)  Arteriovenous malformation  Colorectal polyp or cancer  Infectious colitis  Inflammatory bowel disease  Ischemic colitis  Angiodysplasia & Dieulafoy  Aorto-enteric fistula  Anastomotic dehiscence  Post-polypectomy  Brisk UGIB (15% of hematochezia) | History: - AC or AntiPlt meds?   * Recent surgery or endoscopy? * UGIB risk factors (melena, N/V, liver disease) * Pain, prandial association, # episodes, travel   VS: Hemodynamic stability?  Exam: melena, hematochezia, DRE, stigmata of cirrhosis, etc  CTA – unstable after initial resus OR have ongoing rapid bleeding  Colo – HDS, no rapid bleed – finds source in 2/3rd of pts  EGD – usually second line but can be first if high suspicion for UGI source | Maintain large bore PIVs  RBC/Plt Transfusions as indicated  Hold non-ASA NSAIDs, AC, APT, etc  Correct coagulopathies  Hemodynamically stable:   * Colonoscopy if no rapid bleed * CTA or RBC scan if colo neg or cannot tolerate colo   Hemodynamically unstable:   * Resuscitate * IR and Surgery consults * CTA to identify lesion -- Embolize * UGIB if CTA unrevealing * Colonoscopy thereafter |

**Week 25**

**Acute Liver Failure vs Cirrhosis**

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| **Acute Liver Failure** | **Cirrhosis** |
| 1. Duration of ≤26 weeks without prior chronic liver dz 2. Elevated LAE, jaundice, thrombocytopenia, etc 3. INR ≥1.5 4. Hepatic encephalopathy | Chronic fibrosis of liver parenchyma (imaging or biopsy)  Sxs: organomegaly, caput medusae, gynecomastia, testicular atrophy, palmar erythema, spider angiomata, jaundice, fetor hepaticus, parotid hypertrophy, contractures, edema, soft BP   1. Compensated    1. Asymptomatic or vague constitutional sxs 2. Decompensated    1. Ascites, SBP, HE, Varices, Portal HTN, HRS, HPS, HCC |
| **ALF Etiologies** | **Cirrhosis Etiologies** |
| DILI (APAP, antimicrobials, anti-TB, supplements, MDMA)  Viral hepatitis (A, B +- D, E)  HSV, CMV, VZV, EBV  AIH, Wilson’s  Malignancy, ischemia, Budd-Chiari, HH  AFLP, HELLP | Medications (Amio, MTX, INH)  HBV, HCV  Schistosomiasis, Tick-borne illness  AIH, PBC, PSC, IGG4, Wilson’s, HH, A1AT  EtOH, MASLD  Right-sided CHF, HHT, Sarcoid |

**Hepatorenal syndrome**

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| **Diagnosis** |
| **Management** |

**Enteric Infections (Infectious Diarrhea): A New Approach**

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| **First Line Diagnoses (consider in all)** | **Immunocompromised?** | | **Returning Traveler?** |
| **Rotavirus, Norovirus\***  **ETEC\***  **C. Diff\***  **Salmonella\***  **Campylobacter\***  **Shigella\***  **Yersinia\***  **STEC/EHEC\***  +/-Giardia | **Cryptosporidium\***  **Cyclospora\***  **Cystoisospora\***  Microsporidia  Mycobacterial Avium Complex  **CMV colitis\***  RED = Often presents as bloody diarrhea | | **Malaria\***  **S. Typhi\***  **Entamoeba Histolytica\***  **Giardia\***  **Vibrio cholera\***  **Vibrio sp.\***  **BOLD\*** = High yield for boards |
| **When Should I use antibiotics?**   * Walter Reed Sanford Guide   + Age <1 or >50 years   + Immunocompromised   + iHD   + Vascular aneurysms, grafts, prosthetic joints   + Hemoglobinopathy   + Hospitalized + Fever + 9-10 stools/day | | **What antibiotic should I use?**  - Campy: Azithromycin (most common Rx for travelers), FQ second line  - Salmonella: FQ (if no intl travel)  - Shigella: FQ (2nd line azithromycin or ceftriaxone)  - ETEC: FQ  - Yersinia: FQ (ceftriaxone + gentamicin for severe)  **Loperamide** is commonly co-prescribed for travelers (despite predominant bacterial etiology), but is **generally NOT recommended for bacterial diarrhea** (incl C diff). | |

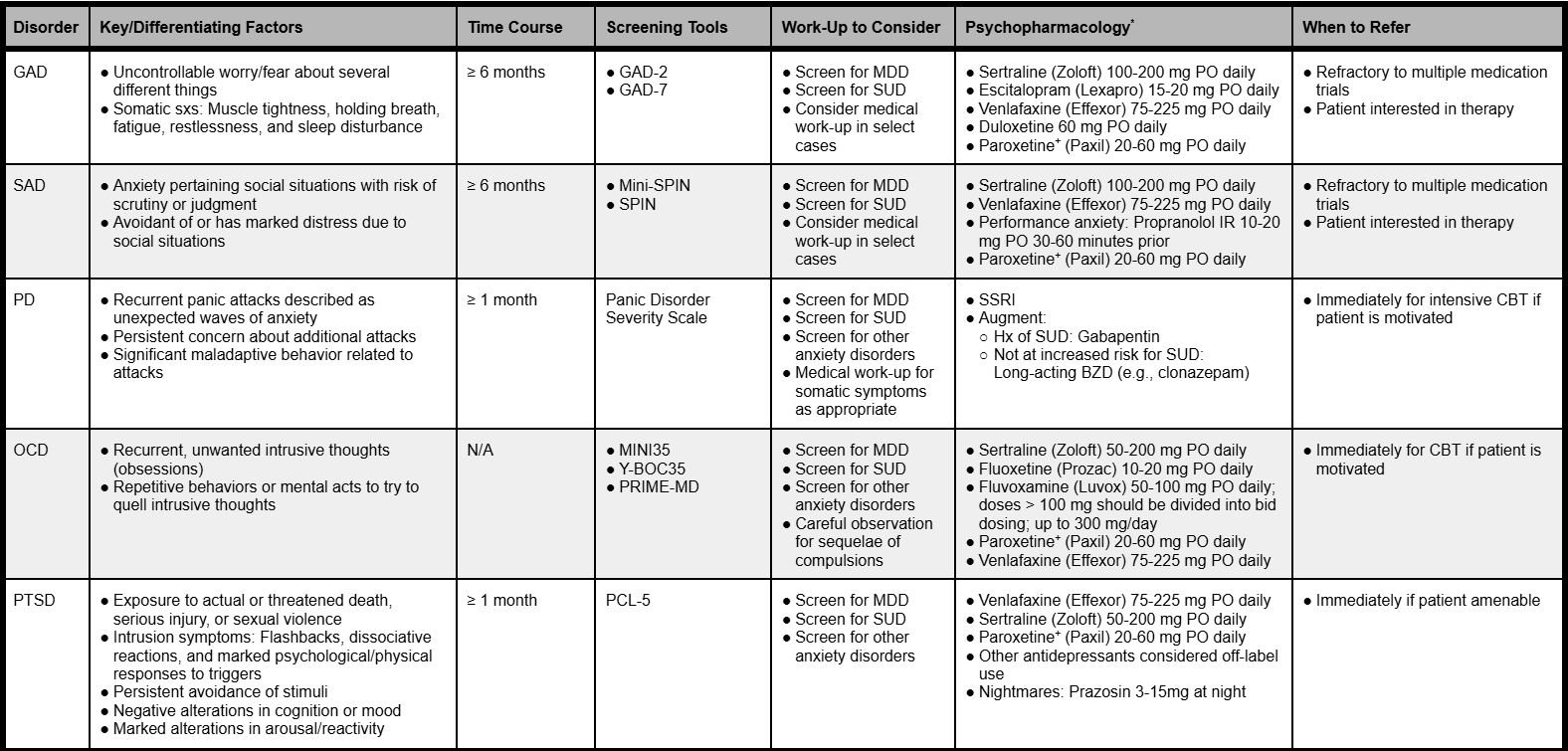
**Week 28**

**Not CSI but SCI: Acute Spinal Cord Injuries**

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| **Spinal Cord Injuries** | |
| **Cervical (50%) > Thoracic (35%) > Lumbar (15%)**  Most commonly from trauma (GLF, MVA, etc)  Deaths from SCI usually from:  cardiopulmonary failure (C3-C5) vs Paradoxical breathing (like flail chest but 2/2 loss of innervation to intercostals) | |
| **Neurogenic Shock** | **Spinal Shock** |
| Distributive shock sub-type   * Loss of sympathetic tone (unopposed parasympathetic) == hoTN + bradycardia   May follow injury to T6 or above  Onset can be immediate, will resolve over hours to days | Transient, reversible depression of spinal cord function below the level of injury  Areflexia, loss of muscle tone below injured level  Can occur after injury to ANY level of the spinal cord  Onset can be immediate, will resolve over weeks to months |
| **Management** | **Management** |
| Rule out / treat other causes of shock  Volume resuscitation  Vasopressors (levo vs. epi) with MAP goal >85 mmHg  Avoid bradycardia-inducing agents (phenylephrine, precedex, propofol even)  Monitor for vagal hyperactivity (give atropine) | Address any co-morbid Neurogenic shock, trauma, etc  Will follow four phases (Day 0-1, 1-3, Week 1-4, Month 1-12)  Reflexes will gradually return with PT  During last phase, notable spasticitiy, hyperreflexia, muscle tonicity, and autonomic dysreflexia may occur  Treat the dysreflexia as below |
| **AUTONOMIC DYSREFLEXIA** | |
| Severe sympathetic response to a **noxious stimulus**  Loss of control over sympathetic NS (usually high SCI above T6)  Often **weeks to months after initial SCI**  Can lead to real, true hypertensive emergencies!! | 1. Remove the irritant (bowel, bladder, wound, bandage, eg) 2. Put pt in reverse Trendelenburg 3. Short-acting vasodilator (nitro paste, CCB, hydral, alpha-1) 4. Pain control |

**Week 29**

**Anxiety Disorders for the PCM**

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**Wily Worms: Helminth Infection Sampler**

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| --- | --- | --- | --- | --- |
| **Condition** | **Agent** | **Transmission** | **Manifestations** | **Treatment** |
| **Strongyloidosis** | *Strongyloides stercoralis* – a nematode | Skin -> travel to lungs -> auto-aspirated into GI tract | Asx up to 50%  GI: epigastric pain, pyrosis, occ diarrhea/constipation, early satiety  Pulm: wheeze, transient infiltrates  Skin: urticaria, larva currens  Labs: peripheral eosinophilia | Dx: Stool O/P low sensitivity, Serologies can vary in efficacy, PCR  Tx: Ivermectin 0.2 mg/kg/d x 2 days  2nd line – Albendazole 400 mg daily x 3-7d |
| Hyperinfection Syndrome | *Strongyloides stercoralis* | Immunocompromise (steroids, TNF-a, HTLV-1, Ca, malnutrition) with large burden of parasites | GI: N/V/D, abdominal pain, intestinal erosions  Pulm: diffuse infiltrates, SOB, cough, hemoptysis, pneumonitis, edema  Neuro: GNR polymicrobial meningitis  System: GNR sepsis/shock  +/- peripheral Eos | DX: Stool O/P usually more sensitive than in chronic  TX: Decrease immunosuppression,  Ivermectin 0.2 mg/kg/day until stool O/P neg x 2 weeks  PREVENT: Check PCR and tx if Pos  OR empirically tx |
| **Cutaneous Larva Migrans** | Dog/Cat Hookworms  *Ancylostoma caninum*  *Anyclostoma braziliense*  *Uncinaria stenocephala* | Infected animal feces -> soil or floor -> direct entry into skin (can’t get thru basement membrane) | Creeping (<1-2 cm per day) serpiginous eruption under skin, usually 2-8 weeks after exposure; pruritius; | Often self-limited  Topical thiabendazole 10-15% BID-TID x5-10d  Severe infestation: albendazole 400 mg daily x3-5d OR ivermectin 12 mg PO one time |
| **Enterobiasis (Pinworms)** | *Enterobius vermicularis* | Humans only host  Enter humans through fecal-oral transmit -> lay eggs around anus at night, very itchy -> fecal-oral continues | Asymptomatic OR  perianal itching  Appendicitis is rare | Dx: Early AM “scotch tape test” – before shower/BM  Tx: OTC pyrantel pamoate x1  OR mebendazole 100 mg PO x1  OR albendazole 400 mg PO x1  Repeat in 2 weeks!  Treat all members of household; trim fingernails, wash hands, wash bedclothes |
| **Neurocysticercosis** | *Taenia solium* | Consumption of infected raw/undercooked pig meat; humans pass infection via stool to pigs | Seizure (common!), hydrocephalus, HA, focal neuro déficits | Dx: Head imaging with cysts containing scolex, perilesional edema (active), or scattered calcifications (chronic) – bx for definitive; serologies supportive  Tx: **Steroids** if diffuse edema  If ICP normal:  1-2 cysts -> albendazole  >2 cysts -> alb + praziquantel  May need NSGY intervention +/- long courses of steroids/antihelminthics if extra-parenchymal |

**Inflammatory Bowel Disease**

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| --- | --- | --- |
|  | **Ulcerative Colitis** | **Crohn Disease** |
| **Clinical Manifestations** | Diarrhea, tenesmus, urgency hematochezia, weight loss, fever | Abdominal pain, diarrhea, Inflammatory masses, fever, weight loss, intestinal strictures and fistulas |
| **Extraintestinal Manifestations** | Peripheral arthritis, spondylitis, sacroiliitis, ILD, PSC (UC)  Oral aphthous ulcers, uveitis, iritis, episcleritis  Pyoderma gangrenosum, erythema nodosum | |
| **Workup and Diagnosis** | CBC, CMP, ESR, CRP  Stool: *C. difficile* toxin, *Shigella, Salmonella, Campylobacter, Escherichia*, O&P, Fecal calpro  Quantiferon gold, chronic hepatitis panel, TPMT (pre-medication eval)  OC +/- MRE/CTE for CD | |
| **Histologic Features** | Contiguous mucosal inflammation from the colorectum, clearly demarcated | Asymmetric transmural inflammation (cobblestone) that skips areas from mouth to anus, Granulomas |
| **Treatment** | Mild: Oral/topical 5-ASA, steroid PR/enema, Multimatrix budesonide  Moderate: As above, plus AZA/6-mercaptopurine, oral glucocorticoids, Biologics (TNF-a, IL-23, etc), small molecules  Severe: PO/IV steroids, cyclosporine, biologics, small molecules (updacitinib, tofacitinib), surgery | Mild: sulfasalazine for colitis, budesonide for IC disease  Moderate: PO/IV steroids, AZA/6-mercaptopurine, MTX, biologics (TNF-a, IL-23, etc), small molecule (Upadacitinib)  Severe: PO/IV steroids, biologics (TNF-a, IL-23, etc), small molecule (Upadacitinib) |
| **General Health Considerations** | CRC Screening: Colonoscopy 8 years after dx, q1-5 years thereafter; Colo for UC screen at time of PSC dx  Vax: influenza, COVID-19, pneumonia, HAV/HBV, HPV +/-Shingrix; avoid live vaccines (MMR, varicella, FluMist) if on anti-TNF  Smoking cessation, Avoid NSAIDs and opioids, DEXA if on >7.5mg of prednisone >3 months | |

**Week 30**

**The Right Line @ The Right Time**

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**Abnormal Uterine Bleeding (AUB)**

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| **Definition** | Excessive menstrual bleeding in terms of flow, frequency, or duration | |
| **Etiology** | **STRUCTURAL**  **P –** polyp  **A –** adenomyosis  **L –** leiomyomata (fibroids)  **M –** malignancy/hyperplasia | **NON-STRUCTURAL**  **C –** coagulopathy (vWF)  **O –** ovarian dysfunction  **E -** endometrium  **I –** iatrogenic (IUD)  **N –** non-specified (scars) |
| **Timing** | **OVULATORY**  Occurs regularly but flow is excessive   * Think Thyroid, bleeding disorders, structural abnormalities | **NON-OVULATORY**  Irregular flow and cycle duration  Common just after menarche or perimenopause   * Think PCOS, Thyroid, Prolactinemia, CKD, Meds (anti-psychotics, chemo, SERMs) |
| **Evaluation** | **Good medical, gynecologic, menstrual history & thorough physical (including pelvic/bimanual)!**  Labs: Urinary pregnancy test and CBC for ALL; consider PT/PTT/INR, TSH, Iron group, Prolactin/FSH/LH  Imaging: TVUS (best look at structural abnormalities, uterine stripe & adnexa)  Procedures: Endometrial biopsy (first-line AUB >45 yo OR <45 but with endometrial ca risk factors =  obesity, hx of unopposed estrogen, genetic syndromes) | |
| **Treatment** | **Address underlying cause (surgical removal of structural issue, PCOS mgmt, etc)**  For those desiring contraception: OCPs or levonorgestrel IUD (NOT copper)  For those wishing to maintain fertility: medroxyprogesterone acetate  NSAIDs or TXA for bleeding control  GNRH or IV estrogens for acute/severe bleeding -> ablation, embolization, hysterectomy if refractory | |

**Premenstrual dysphoric disorder (PMDD)**

|  |  |
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| **Diagnosis** | 1. At least one primary symptom\* plus four additional symptoms:   * Mood swings\* * Irritability or anger\* * Hopelessness or depressed mood\* * Anxiety\* * Appetite change * Anhedonia * Fatigue * Poor concentration * Feelings of loss of control * Sleep disturbance * Physical symptoms: breast pain, bloating, myalgias, weight gain   2. Symptoms typically develop the week before cycles, remit within a week after, and occur with most cycles during a given year |
| **Treatment** | * Mild   + Exercise, relaxation, chasteberry * Moderate – Severe   + SSRI (Prozac, Zoloft) - Continuous, Sx-onset, or Luteal dosing   + OCP – good for comorbid AUB, contraception, etc   Some may benefit from CBT; GNRH agonist, acupuncture also options if refractory |

**Targeted Temperature Management after ROSC: A Review**

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|  | **TTM1 (2013)** | **TTM2 (2021)** |
| **Premise** | Prior trials (HACA) in 2002 had shown survival and neurologic benefit with therapeutic hypothermia aka TTM to 32-34C for patients with out-of-hospital VF or pulseless VT arrest 🡪 became standard of care.  TTM has complications (decr CO, infxn, electrolyte issues, sedation needs) & is based on small trials.  These studies re-evaluated TTM. | |
| **Purpose** | Compared outcomes between post-arrest temperature targets of 33C (mild hypothermia) and 36C (normothermia) | Compared therapeutic hypothermia (33C) to targeted normothermia (<37.8C) |
| **Population** | 939 patients at 36 sites in Australia, Europe who were comatose after out-of-hospital cardiac arrest | 1,861 patients at 61 sites in Australia, Europe, US who were comatose post-arrest |
| **Findings** | No significant difference in mortality or composite of mortality/poor neuro recovery at 6 months | No significant difference in mortalityat 6 months between groups. Neuro outcomes similar |
| **Takeaway** | Cooling to 33C was not associated with reduced all-cause mortality or improved neuro outcomes compared to goal of 36C | **Therapeutic hypothermia is not superior to targeted normothermia for neuroprotection of comatose post-arrest patients** |

**Week 31**

**Don’t Go Breakin’ My Heart: Takotsubo Cardiomyopathy**

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| **Disease** | Stress-induced cardiomyopathy (SCM; or apical ballooning syndrome) leading to reduced LV systolic function in the absence of obstructive CAD, pheochromocytoma, or myocarditis.   * May present with chest pain/SOB/syncope on the spectrum from ADHF to cardiogenic shock | |
| **Epi.** | Predominantly affects older females; may represent 1-3% of all STEMIs  Usually precipitated by stressful physical/emotional event (e.g. spousal death, surprise) | |
| **Eval** | Troponin: Elevated  EKG: Non-specific or ischemic-appearing (STE)  TTE: **“Octopus Pot” appearance** == apical  dyskinesia/ballooning with normal base  motion. Wall motion abnormalities not  following a coronary artery territory. **↓LVEF**  LHC**:** pts often get ischemia eval to rule out ACS  CMR: may help distinguish b/w myocarditis, infiltrative  disease as SCM often lacks late gad enhancement) |  |
| **Tx** | Supportive physical/mental health care; as per presentation (ADHF, cardiogenic shock) => GDMT   * If LV outflow obstruction present, treat similar to HOCM   Repeat TTE in 3-6 months to evaluate EF recovery (most regain normal function within wks to mos)  Recurrence rate 1-2% per year | |

**Streptococcal Toxic Shock Syndrome**

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| **Definition** | Dysregulated immune response to invasive streptococcal infection (Group A > C, G, B), usually skin/soft tissue,  but can arise from PNA, septic arthritis, peritonitis, GYN infections, etc | |
| **Epi** | Rare (2.3 cases per 100K) but occurs 10-30% of patients with invasive Group A *Strep* (GAS) == *strep pyogenes* | |
| **Risk Factors** | Malignancy, minor trauma, HIV, DM, homelessness, IVDU, immunosuppression, postpartum (48-72h) | |
| **Pathophys** | Pathologic response to exotoxin or superantigen (usually from GAS but can be from others) =>  TNF-a, IL-1, IL-6 release => massive cytokine storm, capillary leak, multisystem organ failure | |
| **When to Suspect** | Rapidly evolving pathology requiring rapid recognition:   * Necrotizing fasciitis * Refractory hypotension * Multisystem organ failure (ARF, DIC, ALF, ARDS, e.g.) * Skin/soft tissue source with pain out-of-proportion to exam (20%) * Blanching erythematous rash (macular and/or bullous) – classic strawberry tongue is rare |  |
| **DDx** | Infectious: Staphylococcal Toxic Shock (think retained gauze/packings/tampons), Typhoid, GNR sepsis,  Rocky Mountain Spotted Fever, Leptospirosis, meningococcemia  Non-infectious: Kawasaki disease, Heat stroke | |
| **Treatment** | 1. Aggressive sepsis management 2. Start empiric broad spectrum antibiotics (vanc/zosyn, e.g.) + **CLINDAMYCIN** (toxin-binding)  * Narrow broad-spectrum antibiotics per sensitivities  1. Surgical debridement of focal nidi (e.g. nec fasc) == survival benefit! 2. IVIG 1 g/kg on day 1 and 0.5 g/kg on days 2 and 3 == another toxin-binder with evidence in Strep TSS | |

**Week 32**

**Advanced Heart Failure (an excellent rotation at WHC!)**

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| **Indicators** | “I NEED HELP” mnemonic ~ essentially EF<35% with recurrent HF exacerbations and hospitalizations despite escalating diuretics, intolerance or de-escalation of GDMT, or need for inotropes == ACC Stage D | |
| **Specialty Care** | Refer to HF specialist EARLY (Class I) | |
| **Inotropes** | Palliative for patients not candidates for advanced therapies OR Bridge to Therapy  Dobutamine (B1 agonist - faster/shorter acting – better at first in ICU – arrhythmia, tachycardia, HTN)  Milrinone (PDE3i – slower/longer acting – good for home therapy – C/I in renal dysfxn - arrhythmia, hoTN, HA)  \*\* side note: no significant difference in outcomes in cardiogenic shock between these agents (Mathew, et al, 2021) | |
| **Therapy** | Heart Transplantation (Class I)  Younger <65-70. Extensive work-up for candidacy is institution-specific but may include end-organ function labs, RHC, RUQUS w/doppler, PFT, UTD immunizations and cancer screenings, & much more. No TUD or substance use; need good social support and medical adherence  ~4000 transplants / yr (roughly half of eligible pts)  Complications include CMV/infection, rejection, drug AE (HTN, DM, skin ca, etc)  Mean survival of 11 years post-transplant | Durable Mechanical Circulatory Support (Class I)  Left Ventricular Assist Device (LVAD) most common  Bridge to Transplant or Transplant Candidacy vs. Destination Therapy (depends on comorbidities). Similar evaluation as transplant pre-MCS insertion.  Need anticoagulation and continued GDMT.  Less functional due to external wires/driveline, carrying around the VAD battery pack, etc  Complications include stroke, skin or pump infection, pump thrombosis, arrhythmia, and GIB  Mean survival around 5 years post-VAD |

**Acute Myeloid Leukemia**

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| **Definition** | Malignant clonal proliferation of myeloid cells, invading bone marrow | | |
| **Signs** | Pancytopenia   * Anemia: fatigue, dyspnea, weakness * Neutropenia: fever, infection (low ANC despite high WBC) * Thrombocytopenia: petechiae, bruising, bleeding (epistaxis, gingival, etc)   Hyperuricemia or other signs of TLS  Lymphadenopathy  Hepatosplenomegaly | |  |
| **Evaluation** | Peripheral smear with myeloblasts, but may be absent (Auer Rods == APML / APL, often younger pts)  BMBx with >20% myeloblasts, Flow cytometry, karyotype; HLA typing for HSCT candidates  Molecular genetic testing allows for risk stratification and targeted therapies | | |
| **Complications**  DIC, ICH, etc also worth knowing. | Leukostasis: accumulation of leukemic cells (usually WBC 50K+) in microvasculature  Sxs: HA, vision changes, seizure, hypoxia, encephalopathy, stroke, CXR infiltrates | Tumor Lysis Syndrome: metabolic abnormalities from rapid cell death (spontaneous or 2/2 chemo)  -> intracellular ions flood extracellular compartment -> hyperK, hyperPhos, hypoCa, hyperuricemia (Pikachuuuu)  Sxs: N/V/D, seizure, arrhythma, cramps, tetany | |
| **Treatment** | Favorable/Intermediate-Risk Groups: 7+3 == cytarabine x 7d, daunorubicin x3 days (additional agents per  molecular targets)  High-Risk Groups: Hematopoietic stem cell transplantation  Curable in 35-40% of healthy pts <60 yo; Cure rate ~5-15% for pts 60+ yo with comorbidities  For Acute Promyelocytic Anemia (APL/APML): all-trans retinoic acid (ATRA) – immediately!  To avoid significant bleeding risk from fibrinolysis & DIC | | |

**Nephrotic Syndrome**

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| **Diagnosis** | Podocyte disruption leading to massive proteinuria  Diagnostic hallmarks = **CAPE**:   * + **C**holesterol HIGH   + **A**lbumin LOW (<2.5-3 g/dL)   + **P**rotein excretion in the urine (>3.5g per 24h OR Spot UPCR >3500 mg/g)   + **E**dema (peripheral, periorbital > pulmonary) | | | | | | |
| **Pathophys** | Complex, many theories (overfill, underfill, etc). In a nutshell, some damage occurs to glomerulus, triggering:  Urinary protein loss & hypermetabolism 🡪 Hypoalbuminemia & Decr oncotic pressure 🡪 Renal Na retention 🡪  Interstitial edema 🡪 hypovolemia  Simultaneous compensatory hepatic protein synthesis 🡪 Hyperlipidemia & lipiduria; Hypercoagulability | | | | | | |
| **Etiologies** | **Minimal Change Disease** | **Membranous Nephropathy** | **Focal Segmental Glomerulosclerosis** | **Diabetic Nephropathy** | | **Renal Amyloidosis** | **Nephritic Overlap** |
| Most common cause in children.  Idiopathic or 2/2 NSAIDs, Hodgkins | 2nd most common cause in adults  Primary (**PLA2R**) or Secondary (NSAIDs, Gold; HBV, HCV, syphilis), SLE, solid tumors. HIGH clot risk! | Most common cause in adults.  Idiopathic or 2ndary to HIV, Sickle Cell Dz, IVDU | Chronic, uncontrolled DM    Often comorbid w/ ocular/neural dz | | 1o (plasma cell dyscrasia)  2o (infxn, inflammation)  e.g. MM, RA, TB | Lupus Nephritis,  IgA Nephropathy,  Membrano-proliferative nephropathy |
| **Evaluation** | All patients:   * PMH, medications, PSH, social hx + physical exam * BMP, LFT, CBC, Coags (AKI = worse prognosis) * Lipids (Tchol into 300s on avg) * Urinalysis with micro (proteinuria, fatty casts – Maltese Cross) * 24hr Urine Protein and/or Spot UPCR * Renal biopsy (unless etiology evident or PLA2R positive) * Cancer screenings | | | | Consider:   * PLA2R (~100% SP for 1o MN) * HIV, Chronic hepatitis * RPR * ANA, dsDNA, complement * SPEP/UPEP * ESR/CRP * Talk to Nephro! :) | | |
| **Management** | * **Treat underlying cause!** * **Hyperlipidemia (ramped up hepatic synthesis 2/2 hypoalbuminemia)**   + High intensity statin, lifestyle intervention * **Hypercoagulability (Loss of Protein C/S, ATIII + Hemoconcentration + HLD)**   + LMWH or warfarin for all low-bleeding risk patients (or intermediate risk if if albumin <2) * **Infection risk (IgG loss)**   + Pneumovax! * **Proteinuria + BP Control**   + ACEi or ARB x 6-12 mo   + Refractory: Steroids/CYC, Calcineurin inhibitors, or Rituximab   + Increased dietary protein intake   + Proteinuria control == ESKD prevention * **Edema**   + TZD or Loop diuretics (TZD may reduce proteinuria) | | | | | | |

**Week 33**

**Going Bump in the Night: Parasomnias & Hypersomnia**

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|  | **Parasomnia** | | **Hypersomnia** |
| **Define** | **Abnormal sleep behavior or disturbances** | | **Excessive sleepiness** |
| **Type** | Slow Wave (NREM) | REM Sleep |  |
| **Disorders** | **Sleep eating; sleep sexual activities, confusional arousal; bruxism**  **Somnambulism**   * Sleep-walking, which may last several minutes, with little or no recollection upon awakening * First 3rd of sleep   **Night terror / Sleep terrors**   * Frantic movement, screaming followed by intense anxiety/arousal * First 3rd of sleep * Abrupt partial arousal from delta-wave sleep without later recollection * Often pediatric, many outgrow   **Periodic Limb Movement Disorder (PLMD)**   * Sleep-related myoclonus, jerking during sleep (usually NREM) * May occur due to hyperactive motor pathways, often from UMN lesion | **Sleep paralysis**  **REM Sleep Behavior Disorder (RBD)**   * Loss of usual atonia leading to “dream enactment” * Repeated loud, emotional vocalization & gross motor movement during sleep * Alert, oriented upon arousal   **Nightmare disorder**  - Repeated, dysphoric, vivid dreams often related to survival, well-being, security – with recollection!  - Second half of sleep cycle  - No movement or vocalization  - Leads to mood disturbance, sleep resistance, and/or negative impact personal or family functioning | **Narcolepsy**  Features of REM sleep intruding upon wakefulness and vice versa (possibly due to hypocretin/orexin deficiency)  -Type 1: cataplexy present  -Type 2: cataplexy absent  Often presents as excessive daytime sleepiness (EDS); also a/w sleep paralysis, cataplexy (muscle atonia with intense emotion), and hypnagogic/ hypnopompic hallucinations  **Idiopathic hypersomnia**  **Kleine-Levin syndrome**   * Relapsing/remitting episodes with cognitive disturbances (apathy, derealization, e.g.) |
| **Risk Factors** | Often younger demographic  Poor quality sleep (deprivation, OSA, alcohol, e.g.), sedative-hypnotics, fever | RBD often older; EtOH w/d, anti-depressants,  Neurogenerative disease (Alpha synucleinopathies) a/w RBD | Narcolepsy: Genetic - DQB1\*0602 haplotype, prior infection (GAS, flu), certain structural or inflammatory dz |
| **Eval** | Eval of medical (cardiac, thyroid, diabetes), neurologic (epilepsy, Parkinsonian dz), or psych comorbidities (MDD, PTSD) – may include brain imaging  Sleep history (determining usual patterns)  Medications and recreational drug use (SSRI, TCA, SNRI, MAOi, BZD, BZRA, etc)  Refer to Sleep, Neuropsych, etc!  Sleep diary (patient/family track bedtime, sleep latency, events, etc)  Gold standard = polysomnography (PSG, aka sleep study) – evaluates sleep architecture and underlying medical conditions (arrhythmia, epilepsy, OSA, etc) | | Eval of all comorbidities  Sleep history (rule out chronic deprivation)  Med history (eval sedative impacts)  PSG (must rule out OSA)  Multiple sleep latency test (MSLT) |
| **Mgmt** | Manage any underlying medical or neuropsychiatric disease. Targeted therapy (relaxation skills, coping skills, mind-body therapy) may help  Sleepwalking: bedroom & home safety, BZD  PLMD: clonazepam, melatonin, or valproate  Night terror: avoid meds unless treating a secondary cause (MDD, PTSD) | RBD: Manage any neurodegenerative process, educated pt and bedpartner on bedroom safety (de-clutter, no weapons, lower bed ht). Consider MLT receptor agonist  Nightmare Disorder: treat underlying disorders, stress mgmt., imagery rehearsal therapy, prazosin for PTSD | Lifestyle modifications: sleep hygiene, scheduled naps, EtOH and sedative avoidance, work/activity restrictions while uncontrolled.  Meds: modafinil 1st line, sodium oxybate (cataplexy); pitolisant (EDS+Cataplexy), solriamfetol (EDS); stimulants |

Note: Exploding head syndrome, sleep enuresis, and sleep hallucinations are categorized as “other” parasomnias

**Week 34**

**Underwater Uh-Oh: Swimming-Induced Pulmonary Edema (SIPE)**

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| **Syndrome** | Dyspnea and cough after water immersion |
| **Pathophys** |  |
| **Risk Factors** | Open-water swimming (triathlon, SCUBA, military special ops) – prevalence ~1-2% of triathletes and SF  Personal: History of SIPE!! Age>50, F>M, Underlying cardiac history  Environmental: Cold water (any depth), intense exertion, tight wetsuit, overhydration, poor warm-up |
| **Clinical Findings** | Rhonchi / rales on exam; eval for concomitant exercise-induced bronchospasm  Pulmonary edema on CXR and/or POCUS |
| **Treatment** | Removal from cold/wet environment (incl wetsuit removal, re-warming). Generally good prognosis.  Incentive Spirometry. Maintain SpO2 >92%; consider NIPPV. |

**Immune Thrombocytopenic Purpura (ITP)** – See Week 10 for general thrombocytopenia buckets & work-up

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| **Cause** | Autoantibodies to platelet surface membranes leading to platelet destruction |
| **Etiology** | Primary (idiopathic)  Secondary – autoimmune (SLE, APS), immunodeficiency (CVID, IgA), malignant (CLL), infectious (HIV, Hep C, H pylori, CMV), meds (MMR vax, Gold, PD-1 inhibitors, etc), & many more! |
| **Findings** | Petechiae, purpura, ecchymoses, fatigue, frequent epistaxis/bleeding, +/- splenomegaly  Generally risk of severe bleeding is low; but risk increases with prior bleed, Plt<10K, and age >60 yrs old |
| **Diagnosis** | Diagnosis of Exclusion: defined as isolated thrombocytopenia with Plt < 100K without other cytopenia or cause  Eval should include peripheral smear, HIV, HCV, LFT for all; further work-up per secondary etiology suspected  Platelet autoantibody testing is NOT recommended |
| **Treatment** | Inpatient: New dx AND plt<20K, regardless of sx/bleeding Outpatient: Plt>20K without bleeding  Platelet transfusion: <10K for all; <20K with fever, <50K peri-procedure or active bleed  Critical bleed: intracranial/spinal/ocular/RP/pericardial/IM Severe: Hgb falls 2+ g/dL or requires 2+ units  First-Line (can be used together, especially in critical bleeding)   * Glucocorticoids – pts who are asymptomatic but plt <20-30K OR have minor bleeding with Plt <50K * IVIG – Severe thrombocytopenia and life-threatening bleeding   Second-line   * Splenectomy, rituximab, thrombopoietin receptor agonists - for refractory or relapse |

**Fixing the Fixed-Volume Box: Intracranial Hemorrhage**

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| **Type** | **Cause** | **Treatment** | **Image** |
| **Epidural Hematoma** | Middle meningeal artery rupture  Head trauma near pterion with brief LOC.  “Lucid interval” then rapid deterioration | Sz ppx if GCS<=10  Surgery if:   * Volume >30 cc or >15 mm thick * >5 mm midline shift * GCS <9 * Anisocoria |  |
| **Subdural Hematoma** | Bridging vein rupture  Trauma, intracranial hypotension (LP, HD, epidural anesthesia),  Structural (post-surgical, cerebral AVM, tumor)  Acute, subacute, chronic! | Sz ppx if GCS<=10  Surgery if:   * Width > 10 mm, * >5 mm midline shift * GCS <9 or neuro deterioration   Chronic can be drained, too. |  |
| **Subarachnoid Hemorrhage**  “Thunderclap HA”  Reduced LOC  Seizure  Photophobia  Nuchal rigidity | Aneurysmal: Berry aneurysm rupture   * Fisher grade 1-4 based on thickness and intraventricular hemorrhage * Grade I – V surgical risk based on sx severity   Trauma: blunt / penetrating | No seizure prophylaxis  Maintain normovolemia, Hgb >9, O2>95%, optimal ICP (reduce pain and strain from N/V or BM)  Permissive HTN (SBP <160)  Nimodipine x21d (vasospasm ppx)  **Early clip vs coil** |  |
| **Intraparenchymal Hemorrhage** | Primary: **HTN, cerebral amyloid angiopathy**  Secondary: coagulopathy, AVF, cavernous malformation, tumor, aneurysm, cerebral venous thrombosis, moyamoya, vasculitis, hemorrhagic conversion | ICH Score for risk stratification  Specific tx related to etiology (reverse AC, control SBP <140, etc)  Surgery if:   * Volume >20 cc * >5 mm midline shift * Cisternal compression * Neuro deterioration * Refractory intracranial HTN | Lobar hemorrhage | MedLink Neurology |

**Week 36**

**An Alternate Look at Hepatitis B Serologies –** See Academic Summary Week 21 for more HBV info 😊

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|  | **HBsAg** | **Anti-HBs** | **Anti-HBc** | **HBeAg** | **Anti-HBe** | **HBV DNA** | **ALT** |
| **Susceptible** | - | - | - | - | - | - | Normal |
| **Immunized** | - | + | - | - | - | - | Normal |
| **Acute infection** | | | | | | | |
| **Early** | + | - | IgM | + | - | + | Elevated |
| **Window** | - | - | IgM/IgG | - | - | + | Elevated |
| **Recovery** |  | + | IgG |  | + | +/- | Normal |
| **Resolved Infection** | | | | | | | |
| **Resolved** | - | + | IgG | - | - | - | Normal |
| **Chronic Infection Phases** | | | | | | | |
| **Immune tolerant** | + | - | +IgG | + | - | High DNA | Nl or mild elevation |
| **Immune active** | + | - | +IgG | +/- | - | HBeAg + higher levels of DNA | Elevated |
| **Inactive chronic** | + | - | +IgG | - | +(or -) | Low DNA | Normal |
| **+Occult HBV** | | | | | | | |
| **Occult HBV** | - | +/- | Usually + | - | +/- | Liver | Normal |

**Sample Screening Tools for SDOH**

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| --- | --- |
| **Financial Burdens** | Comprehensive Score for Financial Toxicity – Functional Assessment of Chronic Illness Therapy (COST-FACIT)   * 11-question survey |
| **Housing Insecurity** | Housing Stability and Crisis Response (HSCR) – VA-developed tool, evaluates last 2 months and next 2 mo   * 2-question survey |
| **Low Health Literacy** | Short Assessment of Health Literacy (SAHL) – language-specific versions available   * 18-question test   Brief Health Literacy Screen (BHLS)   * 3-question survey |
| **Social Isolation** | Patient-Reported Outcomes Measurement Information System (PROMIS) – Social Isolation   * Multiple versions, including a 4-question short form |

**Thyroid Nodules & Thyroid Cancer**

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| **Thyroid Nodule Evaluation** | | |
|  | | |
| **Nodule Types** | Benign (90-95%)  Adenomatoid nodules (85%)  Adenomas (10-15%) Cysts (<1%) | Malignant (5-10%)  Papillary (80-85%) Follcular/Hürthle Cell (10%)  Medullary (2-3%) Anaplastic (1%) – aggressive!  Lymphoma or Met (<1% each) |
| **Thyroid Cancer Risk Factors** | Moderate Suspicion  Age <20 or >70 yo Male  Prior head/neck irradiation >4 cm size  Compressive symptoms (dysphagia, dysphonia, hoarseness, SOB, cough) | High Suspicion  Family Hx (MTC or MEN) Rapid growth  Firm, Hard, or Fixed Vocal cord paresis  Cervical LAD Distant metastasis  Focal uptake of FDG PET Female (3:1) for PTC |
| **Treatment** | Total or Partial Thyroidectomy  Mainstay of treatment!!  Total preferred unless unilateral, small, without spread  Risks: post-op hypocalcemia (parathyroid injury/removal -> hungry bone), SOB or vocal change from RLN injury | Radioactive Iodine (I131) Ablation  NOT always indicated  Only for Iodine utilizing cancers (follicular, papillary)  Use: post-op remnant ablation OR adjuvant therapy with intermediate or high risk of recurrence (extrathyroid extension, lymph node involvement, aggressive subtype, etc)  Contraindication: pregnancy, breastfeeding  Risks: radiation thyroiditis, neck edema, tumor bleed, Nausea (Also many post-treatment restrictions on contact/travel/etc!!) |

**Weeks 37-41**

**Hypertensive Emergency**

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| **Evaluation:**  *Looking for Neuro, CV, or Renal emergency*   * Labs: BMP, LFT, Troponin, UPT * Imaging: NCHCT, +/- CTA as indicated   **Therapeutics:**   * Vasodilators * Nicardipine (CCB) – titratable drip, good in Stroke * Nitroglycerin, sodium nitroprusside - ADHF * Enalaprilat (ACEi) * Hydralazine – can cause profound BP drops, rebound tachycardia, also not for ACS! * Adrenergic Inhibitors * Labetalol – good for floor, pregnancy * Esmolol – good in Ao dissection * Phentolamine - cocaine, +/-pheochromocytoma   **Treatment Goals:**   * 1st hour (Decrease MAP 10-20% - <180/120) * Next 23 hrs (Decr MAP another 5-15% - <160/110) * **Exceptions**: Aortic dissection, eclampsia, pheochromocytoma, acute ischemic stroke (reduce to SBP <140 in first hour; reduce SBP <120 in 20 minutes for dissection; permissive HTN to 220/110 in acute ischemic stroke unless giving tPA) |

**Sepsis & Septic Shock**

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| **Definition** | Life-threatening organ dysfunction caused by dysregulated host response to infection |
| **Diagnosis** | **Requires suspected infectious source**  **SIRS** (preferred) = sepsis if meets 2/4   * Temp <36 or >38C, HR>90, WBC <4 or >12 (or >10% bands), RR >20 (or PaCO2 <32)   **qSOFA** (less sensitive, more specific/worse prognosis) = sepsis if meets 2/3   * GCS <15 (AMS), RR ≥22, SBP ≤100 |
| **Management** | **Golden Hour Bundle**   * IVF: 30 mL/kg crystalloid (LR>NS) within 3 hours   + Lactate-guided resuscitation helpful (can also use BP, POCUS, cap refill, etc to monitor) * Evaluation: Identify source, causative organism, and look for end-organ dysfunction   + BCx (before abx), CXR, UA/UCx, Lactate (>4 = severe), skin exam, BMP, LFT   + Cross-sectional imaging, TTE, LP, etc pursuant to clinical picture   + MUST obtain source control!! (e.g. surgery for nec/fasc, drainage of empyema, etc) * Antibiotics: Administer broad-spectrum coverage within 1 hour!   + Give GNR coverage FIRST (zosyn / cefepime >> vanc) * Vasopressors: For septic shock refractory to initial IVF resuscitation (can administer via PIV for brief period for all EXCEPT vasopressin due to skin necrosis without antidote)   + Norepinephrine (first line) – start here then adjust pressors per patient’s needs/comorbidities   + Vasopressin (second-line) – non-titratable (start at 0.03-0.04 unit/min)   + Stress-dose steroids (e.g. hydrocortisone IV) - reasonable after second pressor   + Epinephrine (third) – may be better iso significant cardiac dysfunction |

**Seizure**

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| **Seizure Classifications** | **New Onset Seizure Evaluation** |
| Provoked   * MIST (Metabolic, Infectious, Structural, Toxin/Med)   Unprovoked   * Epilepsy (≥2 unprovoked sz >24 hr apart OR 1 unprovoked seizure with high risk of recurrence\*\*) * Seizure of uncertain significance (doesn’t meet above)   Focal (Origin in single cerebral hemisphere)   * Aware v Impaired; Motor v non-motor   Generalized (origin in bilateral brain network, impaired)   * Motor v non-motor, ±status epilepticus (≥5 min sz activity or recurrent seizure w/o return to baseline)   \*\*High-Risk features   * Occurs ≥1 mo after stroke * Brain lesion present * Epileptiform EEG spikes   Rule out Mimics:   * Syncope, Migraines (especially basilar), Psychogenic non-epiletic seizures (PNES), Focal dystonia, Spasticity |  |
| **Differentiating Seizure Mimics** | **Seizure Management** |
|  | Evaluation: EEG, NCHCT then MRI, refer all seizures to Neurology!  Treatment: Treat provoking factors if provoked, give ASD if provoking factors not easily addressed, otherwise: |

**Lambert-Eaton Myasthenic Syndrome**

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| **Definition** | Autoimmune neuromyopathic disorder with Ab against voltage-gated calcium channels, blocking Ach release and thus preventing muscular contraction in response to neural stimulus -> weakness |
| **Syndrome** | Epi: Rare! More often middle-aged adults (earlier in those without cancer)  Similar presentation to MG, but weakness that improves with exercise  Other sxs: swallow dysfunction, ptosis, hyporeflexia, dry mouth |
| **Evaluation** | EMG with augmented motor response to rapid repetitive stimulation  Positive serum VGCC Ab (90% of patients) – you will likely get Anti-AchR Ab as well to r/o MG  Routine + symptom-driven malignancy work-up |
| **Treatment** | **Identify and treat underlying malignancy!**  If not paraneoplastic 🡪 immunosuppressants, IVIG, or plasmapheresis  Amifampridine (symptomatic relief) |
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**Paraneoplastic Syndromes associated with Lung Cancers**

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**Medical Genetics**

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| **When to Refer to Genetic Counseling** |
| * If you are suspicious of a heritable disease, based on:   + Strong family history (3-2-1-1 Rule = ≥3 family members, in 2 generations, 1 FDR of the other 2, ≥1 before 50 yo)   + Birth defects or developmental delay   + Cancer   + Concern for potential genetic risk for offspring   + Reproductive health concerns |

**Neurocognitive disorders**

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| **Alzheimer’s** | **Frontotemporal Dementia** | **Dementia with Lewy Bodies** | **Vascular Dementia** |
| Pathophysiology | | | |
| Abnormal amyloid plaque and tau tangle deposition | Tau and TDP-43 protein accumulation within frontal and temporal lobes | Alpha-synuclein protein (Lewy Bodies) deposition | Recurrent cerebrovascular injury, clot, ischemia; prior stroke / TIA; comorbid CV disease, smoking |
| Symptoms | | | |
| Impaired memory as early sx; minimal motor impact until moderate severity | Behavioral-variant type (uninhibited, compulsive, inappropriate, and criminal behaviors with poor insight – slight Male predominant); Language-variant subtype (word-finding difficulty predominates) | Dementia and motor symptoms develop within 1-2 years of each other.  REM sleep behavior disorder, Visual hallucinations, sever delusions, falls, orthostatic hypotension, Parkinsonism | Step-wise decrement in function/cognition, early gait impairment & mood changes; a/w emotional lability, apathy, severe cognitive slowing, pronounced gait disorder and repeated falls much earlier than cognitive decline level |
| Evaluation | | | |
| Rule out Mimics! Particularly depression (AKA pseudodementia), using the GDS-15 screener 🡪 tx and follow-up; delirium also  Obtain thorough history: memory/cognitive domain decline (getting lost, word-finding difficulty, etc), substance use,  ADL/IADL completion, work/education history, other sxs (falls, incontinence, AH/VH, etc)  Neuropsych screening: SLUMS or MOCA 🡪 may refer for formal Neuropsych evaluation  Consider sleep study if DLB is suspected  Labs: B12, TSH; consider folate, HIV, RPR, iCal if clinically indicated  Imaging: NCHCT (brief rule out for SDH, hemorrhage, etc); routine MRI brain | | | |
| Treatments | | | |
| **Targeting cognition**  Acetylcholinesterase inhibitors (donepezil, rivastigmine, galantamine)   * Reasonable to trial for most pts * Benefit is modest * Risk of N/V, loss of appetite, diarrhea, bradycardia, withdrawal syndromes   Memantine (targets NMDA)   * Added on to cholinesterase inhibitor with moderate Alzheimers OR for those with ACHEi intolerance * No benefit in FTD or vascular subtypes   Lecanemab (Leqembi)   * mAB targeting amyloid plaque clearance * Expensive | | **Neuropsychiatric symptom relief**   * Agitation, aggression, delusions, AH/VH, paranoia   Non-pharm: Assess safety, create structured routines, reassurance, sleep-wake cycle maintenance, pain management  Pharm: atypical antipsychotics (quetiapine, olanzapine) with attempt to taper within 4 months of starting   * Caution with QTc prolongation, DLB (high risk for adverse rxn)   SSRIs may have some benefit for behavioral-type FTD | |

**Measles!**

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| **Virus** | Single-stranded, enveloped RNA paromyxovirus (Genus: morbillivirus == morbilliform rash!)  Viral transmission via respiratory mucosa or conjunctivae, then spreads via lymphatic tissues |
| **Presentation** | * + **Incubation (6 – 21 days)**   + **Prodrome (2-4 days, up to 8) = symptom onset**     - Fever, malases, anorexia 🡪 conjunctivitis, cough, coryza (rhinorrhea), Koplik spots     - Symptoms intensify a few days before the rash appears   + **Exanthem (2-4 days after fever onset, lasts 3-5 days)**     - Diffuse maculopapular, blanching erythematous rash     - Starts on face, spreads cephalocaudally and centrifugally   + **Recovery**     - Cough may persist 1-2 weeks     - Fever beyond day 3-4 suggest complication     - Skin may desquamate     - Lifelong immunity (usually) |
| **Complications**  Develop in 30% | * **Death** (1-3 per 1000 cases) * Pneumonia * Encephalitis (1 in 1000) * Subacute sclerosing panencephalitis (SSPE)   + Cognitive decline, chorioretinitis, blindness, gait/myoclonus issues, vegetative states – multi-staged dz   + 1 in 1000 children   + Usually infants <2 yo   + Can develop between 7-10 years from initial infection * Many others exist (GI, immune suppression, etc) but are less common |
| **Testing** | * **If suspicion is high based on sxs/exposure** 🡪 **Isolate patient**   + Airborne precautions! * **Call ID + Prev Med (301-400-0075)** * **Confirm lack of immunity** (born after 1957, no documented MMR vax or titers) * **Oropharyngeal PCR swab >> IgM serologies** * Collect   + Swab ideally within 3 days of rash onset   + Serologies after 3 days increases IgM sensitivity |
| **Treatment** | * **Vitamin A** - ALL children; adults if hospitalized   + May reduce severity and complication risk incl mortality   + Oral administration x2d   + Age >=12 mo – 200,000 international units daily * **Ribavirin**   + For use in measles pneumonia and the immunosuppressed   + 15-20 mg/kg per day PO divided in 2 doses (5-7d suggested) * **Else, supportive care** |

**Adrenal Masses**

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| Adrenal Mass etiology 🡪 4% pheo, 4% carcinoma, 2% other malignancy, otherwise benign   * 5-15% are functional (adenoma, aldosteronoma, pheo) * 5-10% are malignant (carcinoma, pheo) * Adrenal Incidentalomas are common! 85% of all adrenal tumors, found in 6% of all adults * ALL adenomas ≥1cm should be evaluated   Evaluation consists of 2 steps:   1. Is this cancer?    1. Need good Hx (weight loss, prior cancer, lymphoma, virilization) + dedicated CT scan w/wo contrast    2. ≥10 HU density, irregular shape/content, size ≥4cm, ≥1 cm annual growth = incr risk of cancer 2. Is this secreting excess hormones?    1. Need good Hx (episodic palpitations/panic/pallor, cushingoid sxs, virilization) + labwork + CT scan    2. Pheo – plasma fractionated metaphrines (24hr urine metanephrines later) – NOT catecholamines       1. TCA, dopaminergics, amphetamines, reserpine, withdrawal, EtOH can alter levels    3. Cortical adenoma – 1 mg ON DST, Plasma aldosterone concentration, Plasma Renin activity    4. Adrenocortical carcinoma – DHEA-S, testosterone, androstenedione, BMP, hyperaldo eval |
| Plasma fractionated metanephrines  \*\*Remember, evaluate cortisol secretion in ALL patients with an adrenal mass – use 1 mg dex suppression test! |

**Rhinosinusitis**

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| **Definitions** | Rhinitis: inflammation of nasal passages causing sneezing, rhinorrhea, congestion, itching  Rhinosinusitis (aka Sinusitis): inflammation of nasal passages & sinuses causing facial pressure/pain, HA, anosmia | |
| **Acute (<4 weeks)** | | **Chronic (>12 weeks)** |
| Largely viral or bacterial; mucosal edema, turbinate hypertrophy; rhinorrhea or discharge  Antibiotics if:   1. >10 days of symptoms, 2. Severe symptoms (T>102.2F, purulent discharge or facial pain ≥3 days), or 3. Onset after improving viral illness (double sickening)  * Augmentin or amoxicillin (doxy or levaquin if PCN allergy) | | Has 2 of: nasal drainage (anterior or posterior), nasal blockage or congestion, facial pain/pressure/fullness, reduction or loss of smell  Evidence of mucosal inflammation (CT or endoscope)  Classified by presence or absence of nasal polyposis (20-33% have polyps)  Tx: Intranasal saline spray or irrigation (use before other sprays)  Intranasal corticosteroid (2 mo); can use steroids for polyp blockage   * Refer to allergy/ENT if no benefit from initial therapy |

**Post-TBI Hypopituitarism**

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| **Epi** | Direct and indirect insults to the pituitary gland/stalk (infarct, hypotension, ischemia, shearing forces, etc)  Risk increases with: diffuse brain swelling, prolonged ICU admission, incr ICP, hypotension, hypoxia,  basal skull fracture, increased age, blast injury  Acute: Anterior hormone dysfxn (GH and LH/FSH most common) as high as 53-78%  Posterior hormone dysfxn – DI in 3-51%, SIADH in 3-37%  Chronic hypopituitarism: 13-56% at 3-6 months, 5-76% at >12 months | |
| **Symptoms** | ACTH Deficiency:   * + Weakness, fatigue, muscle and joint pain   + Hyponatremia   + Hypoglycemia   + Hypotension (especially if co-existing DI)   GH Deficiency:   * + Increased fat mass   + Lower BMD of L-spine (? Fracture risk)   + Poor quality of life   + Dyslipidemia   + Increased inflammatory markers   + Higher CAC scores   + Increased mortality   Prolactin: Inability to lactate | TSH Deficiency:   * + Fatigue   + Cold intolerance   + Decreased appetite   + Constipation   + Facial puffiness/edema   + Dry Skin   + Bradycardia   + Delayed relaxation phase of the DTRs   + Anemia   Gonadotropin Deficiency:   * + Women: Amenorrhea, hot flashes, vaginal dryness, low libido, infertility, decreased BMD   + Men: Infertility, low libido, decreased energy, decreased muscle mass/strength, decreased sexual hair, decreased BMD |
| **Screening** | Current recommendations:   * + Serum cortisol levels monitored for the first 7 days post-TBI   + Screening for ACTH and TSH deficiencies:     - Patient is hospitalized for >24hrs     - CT head shows abnormality (brain swelling, diffuse axonal injury, basal skull fracture, epidural/subdural hematoma, cranial vault fractures)     - Signs or symptoms of hypopituitarism     - In general, most agree to treat for AI if clinical suspicion   + DI should be considered with hypernatremia and hypotonic polyuria | |
| Screening tests (performed at 0900):  Men:  BMP, TSH and FT4, Cortisol, LH, FSH, Testosterone, SHBG, albumin  Women:  BMP, TSH and FT4, Cortisol  AND  LH, FSH, estradiol (if premenopausal with new cycle irregularity)  OR  FSH (postmenopausal) | |

**Oncologic Emergencies**

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| **Emergency** | **Associated Cancers/ Txs** | **Key Risk Factors** | **Expected Timeline** | **Management (Key Points)** |
| Febrile Neutropenia | Hematologic malignancies, chemotherapy | ANC <500, recent chemo, hx of MRSA, lines, PNA, unstable, SSTI | Within days of neutropenia onset after chemo (usually days 7-14) | Prompt empiric antibiotics (cefepime±vanc), infectious work-up per sxs, consider ID consult |
| Hypercalcemia of malignancy | PTHrP-producing tumors of the Lung; Osteolytic lesions; Prostate, Breast, Vit D activation, Lymphoma | Small cell lung Ca, Bone mets, dehydration, high tumor burden | Gradual or acute onset; often in late-stage disease | IV NS, bisphosphonates, calcitonin, possible denosumab, treat malignancy (surgery/chemo) |
| Tumor Lysis Syndrome (TLS) | High-grade lymphoma, AML, usually after cytotoxic therapy (rarely in solid tumors) | High LDH, bulky tumors, high cell turnover | Usually with 12-72 hours of chemo OR spontaneously in high-risk tumors | PiKaChU mnemonic! Aggressive hydration and electrolyte management; Rasburicase if urate>7.5 (can’t use with G6PDD), ICU, HD/CRRT if severe |
| Spinal Cord Compression | Any cancer with vertebral mets (Breast, Prostate, Lung, Myeloma) | Bone mets to spin, rapidly growing tumors | Subacute to acute; days to weeks from met progression | Dexamethasone, MRI spine, urgent radiation or surgical decompression, NSGY + RadOnc consult |
| Acute Promyelocytic Leukemia (APL) | AML-M3 subtype, t(15:17), PML:RARα | Low: ≤10 WBC, >40 Plt  Int: ≤10 WBC, ≤40 Plt  High Risk: >10 WBC | High risk of early mortality 2/2 bleed or DIC, infection, differentiation syndrome | ATRA immediately!! Molecular/cytogenetics ASAP, supportive care, manage DIC |
| Malignant Bowel Obstruction | GI and GYN cancers with peritoneal mets | Peritoneal carcinomatosis, obstruction risk, prior surgeries (adhesions) | Subacute; varies by tumor burden and progression | Bowel rest, NGT decompression, steroids (for ovarian), surgical or palliative approach |
| Immune-related Adverse Events (irAEs) | Checkpoint inhibitors (e.g. PD-1/PD-L1, CTLA-4 blockers), can affect any system but most often colon, liver, lung | Autoimmune disease history, multi-agent immunotherapy | Typically weeks after starting immunotherapy | Grade-based management: steroids for Grade 2+, hold immunotherapy, eval per affected body system |
| Cytokine Release Syndrome (CRS) & Immune Effector Cell-Associated Neurotoxicity Syndrome (ICANS) | CAR-T therapy (esp CD19 targeted), biospecific T-cell engagers (BiTE) | High tumor burden, early post-infusion (day 1-3) | Hours to few days after CAR-T | IL-6 blockade (tocilizumab), steroids if severe, ICU admission if unstable or in respiratory failure |
| Leukostasis | AML, ALL, CML blast crisis (WBC >100k) – may present with stroke or other vasoocclusive sxs (HA, SOB, chest pain, AKI) | High blast count, AML M4/M5 subtype, poor perfusion (baseline vascular disease) | Acute; can present rapidly with high WBC | Hydroxyurea, leukapheresis if symptomatic, avoid RBC transfusion, start chemo |
| DIC | APL, metastatic cancers – low fibrinogen! | APL, trauma, infection, severe sepsis | Acute; usually during critical illness or initiation of APL therapy | Treat underlying cause! Supportive transfusion (plt, FFP, cryo), avoid antifibrinolytics |
| SIADH | Small cell lung cancer, head/neck cancers, ectopic ADH secretion | Ectopic ADH, CNS disease, cytotoxic chemo (vincristine, Cyclophosphamide) | Subacute; typically within days of ectopic ADH or drug effect | Fluid restriction; hypertonic saline if sxs, tolvaptan if refractory; treat malignancy |
| Superior Vena Cava (SVC) Syndrome | Lung cancer, lymphoma, tumor mets to mediastinum | Central venous compression, tumor bulk, thrombosis | Subacute; can present over days to weeks | CT venography, prioritize biopsy, Tx chemo/RT, stent with IR, consider steroids |