**“100 MOST IMPORANT MEDICAL STUDENT QUESTIONS ON THE INTERNAL MEDICINE WARDS”**

**FOR THE INTERNAL MEDICINE CLERKSHIP**

**UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE**

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**What are the four SIRS criteria and the spectrum of sepsis?**

SIRS: T<96.8 or T>100.4, HR>90, RR>20, WBC<4 or WBC>12

SEPSIS: 2/4 SIRS plus presumed infectious source

SEVERE SEPSIS: sepsis with end organ damage (ex: AKI, transaminitis, lactic acidosis, altered mental status)

SEPTIC SHOCK: hypotensive requiring significant fluid resuscitation or vasopressors.

SEPTIC SHOCK WITH MODS: septic shock with multiorgan dysfunction

**Why do we hold all oral diabetic medications in the hospital and place them on sliding scale insulin?**

Patients cannot get contrast dye for a CT or heart catheterization if they’ve recently taken metformin. For other agents we prefer short acting insulin that can be carefully titrated (especially with frequent NPO restrictions for procedures).

**What drugs are known for causing drug-induced lupus?**

Isoniazid, hydralazine, procainamide.

**How do we define orthostatic hypotension?**

Patient goes from lying to sitting to standing (technically waiting 5 minutes with each change) and drops SBP 20pts or DBP 10pts. Heart rate is not part of the criteria but often used anyway.

**If a patient’s hemoglobin drops, what labs would you send to exclude hemolysis?**

Reticulocyte count first. Then consider haptoglobin, peripheral smear, LDH, PT/PTT, fibrinogen.

**What are Charcot’s Triad and Reynold’s Pentad of cholangitis?**

Charcot: abd pain, jaundice, fever.

Reynold: with septic shock/hypotension and altered mental status.

**What are the electrolyte abnormalities in tumor lysis syndrome?**

LOW Ca, HIGH K/Phos/Uric acid.

**What is the classic cancer associated with each of the following tumor markers (note: many cancers can be tied to each but which is the most commonly associated)?**

**AFP:** hepatocellular and testicular and ovarian cancer

**CA-125:** ovarian cancer

**CA19-9:** pancreatic cancer

**Calcitonin:** medullary thyroid cancer

**Chromogranin:** neuroendocrine

**Synaptophysin:** neuroendocrine

**PSA:** prostate

**What did the AFFIRM trial show about rhythm and rate control in atrial fibrillation?**

There was no survival difference between rate or rhythm controlling in atrial fibrillation.

**What are the black box warnings for antipsychotics and SSRIs?**

Antipsychotics: increased risk of death in the elderly

SSRIs: increased risk of suicidal behavior

**What does the acronym “CRAB” stand for in multiple myeloma?**

Calcium (high), renal failure, anemia, bone lesions.

**What 3 additional products do you need to give a patient who has received four consecutive units of packed red blood cells?**

FFP and platelets (due to dilutional effect from the RBCs) and calcium gluconate (since citrate is used as a preservative in the blood and binds to free calcium in the blood).

**What is the most common culprit organism in the following sickle cell complications?**

**Aplastic crisis:** parvovirus B19

**Osteomyelitis:** Staphylococcus is the most common in both sickle cell and overall. Salmonella is most characteristic in sickle cell.

**In patients without a functioning spleen, what encapsulated bacteria are they most susceptible to?**

Pneumonic #1: SHiN: Strep pneumo, Hemophilus influenzae, Neisseria meningitidis.

Pneumonic #2: SHiNE SKiS: Strep pneumo, Hemophilus influenza, Neisseria meningitidis, E.coli, Salmonella, Klebsiella pneumonia, Group B Strep.

**A kidney stone of what size would be expected to pass on its own?**

Less than 5mm.

**What cause of groin pain in a man must be emergently excluded?**

Testicular torsion (ultrasound).

**When prescribing medications that can affect the QTc interval, what is the clinically significant threshold?**

QTc >500 milliseconds.

 **What medication do you need to make sure a patient hasn’t taken before giving nitroglycerin in the setting of cardiac angina?**

PDE inhibitors (such as Viagra).

**When a patient has been on amiodarone, which three organ function tests should be considered to monitor for toxicity?**

PFTs, LFTs, and TFTs (pulmonary, liver, thyroid).

**What is Virchow’s triad for thrombosis?**

Hypercoagulability, hemodynamic changes leading to reduced blood flow (stasis, turbulence), endothelial injury or vascular trauma.

**What is the antidote for each of the following anticoagulants?**

**Warfarin (Coumadin):** Vitamin K or FFP.

**Heparin**: protamine sulfate.

**What agents make up triple therapy and quadruple therapy in H.pylori?**

Triple therapy: PPI, clarithromycin, amoxicillin.

Quadruple therapy: PPI, bismuth, metronidazole, tetracycline.

**What are the adverse events or side effects of each agent of RIPE therapy for tuberculosis?**

Rifampin: red urine, thrombocytopenia.

Isoniazid: hepatotoxicity, B6 deficiency leading to neuropathy.

Pyrazinamide: hepatotoxicity, rash.

Ethambutol: vision changes (optic neuritis and red-green color blindness)

**What are the visual changes caused by each of the following medications?**

Sildenafil (Viagra): blue discoloration

Digoxin: yellow discoloration

Ethambutol: red-green color blindness.

**Vastly different blood pressures in each arm is concerning for what cardiac emergency?**

Aortic dissection.

**How do you correct for sodium in hyperglycemia?**

For every 100 of glucose above the normal glucose 100, add 1.6 to the sodium.

**For atrial fibrillation, what are the components of the CHADS2 score and the CHA2DS2-VASc score in determining if a patient needs anticoagulation?**

CHADS2: CHF, HTN, Age >75, Diabetes, Stroke/TIA (2 pts).

CHA2DS2-VASc: CHF, HTN, Age (>65=1pt, >75=2pts), Diabetes, Stroke/TIA (2 pts), Vascular disease (PAD, MI), Sex category (female=1pt).

**What conditions/diseases do each of the following radiologic findings suggest?**

**Water bottle heart:** cardiac tamponade.

**Kerley B lines**: interstitial pulmonary edema.

**Rib notching:** aortic coarctation.

**Sentinel loop:** focal area of ileus of the bowel in acute pancreatitis, cholecystitis, or appendicitis.

**Steeple sign:** croup.

**Thumbprint sign:** epiglottitis.

**Perinephric stranding of the kidney:** pyelonephritis.

**Bird’s beak sign:** achalasia.

**Corkscrew sign:** diffuse esophageal spasm.

**Double-barrel esophagus:** esophageal dissection.

**String sign:** narrowing of the terminal ileum in Crohn’s disease.

**Cobblestone sign:** Crohn’s disease.

**Lead pipe sign:** Ulcerative colitis.

**What three complications of aortic stenosis indicate a high mortality rate?**

Heart failure (50% mortality in 2 years), syncope (50% mortality in 3 years), angina (50% mortality in 5 years).

**Which statin is most commonly given for either prior myalgias or liver disease?**

Pravstatin.

**What rise in creatinine is tolerable when starting an ACEI or ARB?**

30% rise in creatinine. If goes much higher, consider renal artery stenosis.

**What is the preferred anticoagulant in a cancer patient with a new DVT/PE?**

Low molecular weight heparin (enoxaparin-Lovenox, dalteparin-Fragmin).

**After adjusting a patient’s levothyroxine dosage, how long do you wait before checking another TSH?**

4-6 weeks given the long halflife.

**What gout medication cannot be given in an acute gout flare?**

Allopurinol.

**What are the three degrees of heart block?**

First degree heart block: PR interval >200.

Second degree heart block:

-Mobitz I: PR longer and longer then a dropped beat

-Mobitz II: no prolongation but has a regularly dropped beat (every 2nd or 3rd)

Third degree heart block: P and QRS happen in regular intervals but separate from each other and can sometimes land on top of each other.

**What is the most common EKG finding in a pulmonary embolism?**

Sinus tachycardia. But the S1Q3T3 is the pathognomonic sign.

**Once a patient is diagnosed with diabetes, what is the goal Hemoglobin A1c?**

Less than 7.0.

**What is the recommended systolic blood pressure goal in an elderly patient?**

Less than 150 mmHg.

**What are the ACC/AHA and the NYHA classifications for congestive heart failure?**

ACC/AHA Stage:

-Stage A: at risk for CHF but no structural changes or signs or symptoms

-Stage B: structural heart disease but no signs of symptoms

-Stage C: symptomatic heart failure

-Stage D: symptomatic despite therapy, considering advanced options

NYHA Functional Class:

-Class 1: no limitation

-Class 2: slight limitation

-Class 3: marked limitation

-Class 4: symptomatic at rest.

**What are the time courses of Heparin-Induced Thrombocytopenia (HIT) Type 1 and 2?**

Type 1: 1-2 days after exposure

Type 2: 4-10 days after exposure.

**What are the components of the 4T score for heparin-induced thrombocytopenia?**

-Degree of thrombocytopenia

-Timing of thrombocytopenia

-Presence of thrombosis

-Other causes of thrombocytopenia.

**Why would you use a fractional excretion of urea instead of sodium in a patient with an acute kidney injury?**

Urea is not affected by recent diuretic usage.

**What are the 7 components of the TIMI score in deciding the risk of a person with symptoms having a true heart attack?**

Age>65, 3 or more CAD risk factors, known CAD with >50% stenosis, aspirin use in last 7 days, severe angina in last 24hrs, elevated enzymes, ST deviation greater than 0.5mm.

**What are the red flag symptoms of a new headache?**

New/different in age 50+, develops within minutes (thunderclap), confusion, unilateral weakness, wakes you up, worse with Valsalva, vision change, neck stiffness, fever, prior HIV/cancer/clot disorder.

**What are the red flag symptoms of back pain?**

Post trauma, bowel/bladder incontinence or retention, saddle anesthesia, reduced anal tone, fever, weight loss, reasons for fracture (osteoporosis, multiple myeloma, steroids), prior cancer.

**What are the classifications of acute kidney injury and the causes within each category?**

PRERENAL: volume depletion, overdiuresis, heart failure, hypotension, HRS, cardiorenal

RENAL: recent contrast, tumor lysis, acute interstitial nephritis from pain meds/ antibiotics/statins-rhabdo, glomerulonephritis, transplant rejection, underdialysis

POSTRENAL: BPH, kidney stones, neurogenic bladder, hydronephrosis.

**What are the stages of CKD (chronic kidney disease)?**

GFR STAGES: G1 (>90), G2 (60-90), G3a (45-60), G3b (30-45), G4 (15-30), G5 <15 or on dialysis.

**Why are women more prone to urinary tract infections than men?**

Shorter length of urethra.

**What does it mean when a surgeon asks for “pre-operative clearance”?**

There is no such thing as pre-operative clearance, only pre-operative risk stratification to determine the risk of death and fatal/non-fatal heart attack or cardiac arrest in the perioperative period. You ask the patient about their cardiopulmonary and anesthesia history. Then based on whether it is an emergent surgery, if they have active cardiac conditions, what their functional status, and if it is a low risk procedure then you may give them an RCRI score (based on risk of surgery, CAD, CHF, stroke, insulin-dependence, CKD with Cr>2) to determine their risk of an adverse cardiac event.

**What are the Wells’ criteria used to determine the risk of pulmonary embolism?**

Clinical signs of DVT, is PE the number one diagnosis, HR>100, recent immobilization or surgery, previous DVT/PE, hemoptysis, malignancy.

**What are the components of a MELD score for liver disease?**

Total bilirubin, INR, creatinine (BIC).

**What are the components of a Child-Pugh score for cirrhosis mortality?**

Bilirubin, albumin, INR, ascites, encephalopathy.

**How do you correct calcium based on albumin?**

Corrected calcium = Serum calcium + 0.8 x (Normal albumin minus pts albumin).

**What are Light’s criteria that suggest a pleural effusion is malignant?**

-Pleural fluid protein / Serum protein >0.5

-Pleural fluid LDH / Serum LDH >0.6

-Pleural fluid LDH > 2/3 of the serum LDH upper limit of normal

**What is the definition of neutropenia?**

Absolute neutrophil count (WBC x percent of neutrophils/bands) under 500 or 1000 but predicted to be under 500 in 48 hours.

**Why is neutropenic fever treated more aggressively than standard fever?**

Patients with neutropenia have a reduced ability to fight disease. Neutropenia can lead to neutropenic ulcers along the GI tract allowing for translocation of gram negative bacteria which can lead to death within hours.

**What is Winter’s formula to determine if the pCO2 reflects compensation in metabolic acidosis?**

pCO2 = 1.5 x (HCO3) + 8 + 2

**What are the components of the Alvarado score for acute appendicitis?**

RLQ tenderness, elevated temperature (>99.1F), rebound tenderness, migration of pain to the RLQ, anorexia, nausea/vomiting, leukocytosis, leukocyte left shift.

**What are the adverse effects of proton pump inhibitors?**

Aspiration pneumonia, C.difficile, hip fractures, osteonecrosis.

**What are the Duke Criteria for infective endocarditis?**

Pathologic Criteria:

-Positive culture of vegetation

-Vegetation or abscess confirmed

Major Clinical Criteria:

-Positive blood cultures commonly associated with endocarditis

-Echocardiogram evidence of endocarditis

Minor Clinical Criteria:

-Predisposing heart condition or IV drug use

-Fever

-Vascular phenomena (emboli, infarcts, Janeway lesions)

-Immunologic phenomena (Osler’s nodes, Roth’s spots, glomerulonephritis)

-Positive blood culture but not meeting major criteria.

**What are the components of Ranson’s Criteria for pancreatitis mortality?**

On admission:

-WBC>16, Age >55, glucose >200, AST > 250, LDH > 350.

48 hours after admission:

-Hct drop > 10% from admission, BUN increase 5mg/dl from admission, Ca<8 within 48hrs, PaO2<60 within 48hrs, base deficit >4 within 48hrs, fluid needs >6L in 48hrs.

**What are the Centor Criteria for estimating the probability that pharyngitis is streptococcal?**

**-**FACE: fever>100.4, absence of cough, cervical lymphadenopathy, exudates on tonsils. Young age adds a point, old age subtracts a point.

**What are the components of the PHQ-9 in determining the degree of depression severity based on symptoms in the last two weeks?**

Depressed feeling and SIGECAPS (sleep disturbance, interest loss/anhedonia, guilt, lack of energy, concentration problems, appetite suppression, psychomotor retardation, suicidal ideation). If any of them are positive ask: “How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?” and add additional points.

**What are the components of the CIWA-Ar score for alcohol withdrawal?**

Nausea, tremor, diaphoresis, anxiety, agitation, tactile disturbances, auditory disturbances, visual disturbances, headache, orientation.

**What is Beck’s triad of tamponade?**

Jugular venous distention, hypotension, muffled heart sounds.

**Why can’t you give FFP to a GI bleeder with an INR 1.4?**

INR of FFP is roughly 1.6 so if the INR of the patient is not at least 1.6 you will be diluting the patient’s blood a higher INR.

**How long does it take for Coumadin to increase a patient’s INR?**

Approximately 2-3 days.

**What are the AEIOUs of emergent dialysis indications?**

Acidosis, electrolytes, intoxication, overload (volume), uremia.

**What are the treatments for hyperkalemia?**

C BIG K DD: calcium gluconate, beta agonist, insulin/glucose, Kayexalate, diuretic, dialysis.

**What five complications of cancer or cancer treatment do steroids (specifically dexamethasone) treat?**

Nausea, poor appetite, bone pain, vasogenic edema from brain metastases, radiation pneumonitis.

**Why would you do an EKG on a nauseous female patient?**

Women often present with atypical symptoms and nausea or increased vagal tone can signal an inferior MI.

**Which CHF medications improve survival?**

ACE inhibitor, beta blocker (specifically bisoprolol, carvedilol, metoprolol succinate), spironolactone (NYHA Class II-IV with EF<35%), isosorbide di- or mono-nitrate with hydralazine (African Americans).

**Which CHF medications reduce hospitalizations or symptoms but don’t affect survival?**

Digoxin, Lasix (furosemide).

**If you suspect a kidney stone what type of CT scan would you perform?**

CT abdomen/pelvis stone protocol (no IV contrast, patient placed in prone position).

**In diabetic ketoacidosis (DKA), when stopping the insulin drip, when do you begin long acting glargine (Lantus)?**

You must give long acting insulin (which takes several hours to reach therapeutic levels) at least 2 hours before shutting off the insulin drip since the half life of insulin in a drip is on the order of minutes.

**What accounts for a patient with rhabdomyolysis having large blood in the urine dipstick but few red blood cells in the microscopy?**

The dipstick is sensing myoglobin from muscle breakdown.

**Why do NSAIDs cause gastritis or ulcers?**

NSAIDs block COX-1 production of prostaglandins that would make mucus and bicarbonate.

**Match the following types of isolation precautions with the organisms suspected.**

Contact (gown and gloves): multi-drug-resistant organisms (ex: MRSA, E.coli resistant to multiple antibiotics).

Contact with Special Handwashing (gown and gloves and bleach wipes): C.difficile.

Droplet (standard masks): rapid respiratory viral panel (influenza, adenovirus, etc).

Airborne (N95 masks): tuberculosis.

**What syndrome causes a delta wave on EKG?**

Wolff-Parkinson-White syndrome

**What is the most feared complication of temporal arteritis?**

Blindness due to occlusion of ophthalmic artery.

**What two medications are known for causing red urine? Hint: one is used in UTIs, one is used in TB.**

Phenazopyridine (Pyridium), rifampin.

**What is the most feared side effect of fluoroquinolones? Hint: often exacerbated by concomitant steroid use.**

Tendon rupture.

**What is the 1 year mortality of a hip/pelvic fracture?**

25% mortality in 1 year.

**What are the 6 H’s and T’s of PEA arrest?**

6H’s: Hypovolemia, Hypoxia, Hypothermia, Hypoglycemia, Hypo/HyperK, Hydrogen (acidosis).

6T’s: Thrombosis, Tachycardia, Trauma, Tension PTX, Tamponade, Toxins.

**What are the appropriate consults, imaging modalities, and treatments in tumor-related cord compression?**

Radiation oncology, neurosurgery. Dexamethasone IV. Pan-spine MRI with contrast.

**How do CURB-65 and PSI help determine if a patient with pneumonia should be admitted to the hospital?**

CURB-65 (confusion, urea>20, RR>30, BP<90/60, age>65) 🡪admit if 2+, CRB-65 (don’t have labs)🡪admit if 1+.

Pneumonia severity index: a more extensive risk stratification with multiple variables.

**If a patient has a hemoglobin drop after a left heart catheterization, what source of bleeding needs to be excluded and how?**

Retroperitoneal bleed due to groin vessel access. Exclude with a CT.

**What level of fibrinogen is diagnostic of disseminated intravascular coagulopathy (DIC) and what is the treatment besides addressing the underlying cause?**

Fibrinogen<100. Give 10 units of cryoglobulin.

**What post-myocardial infarction complication presents with chest pain, fever, and pericardial rub?**

Dressler’s syndrome/pericarditis.

**What are the components of each MEN syndrome?**

MEN 1: pituitary adenoma, pancreatic tumor (mostly gastrinoma), parathyroid hyperplasia.

MEN 2a: parathyroid hyperplasia, pheochromocytoma, medullary thyroid cancer

MEN 2b: pheochromocytoma, medullary thyroid cancer, marfanoid body habitus, mucosal neuromas.

**Which type of pneumonia is associated with alcoholics and “currant jelly sputum”?**

Klebsiella pneumoniae.

**What medication should be considered for patients on chronic steroids during a surgery or during a critical illness?**

Hydrocortisone at stress dose steroid levels due to concern for adrenal insufficiency.

**On a ventilator, which two parameters control oxygenation and which two parameters control ventilation (CO2 and pH)?**

Oxygenation: FiO2 and PEEP

Ventilation: Tidal volume and respiration rate.

**What four therapies can be used for atrial fibrillation with rapid ventricular response?**

Metoprolol IV, diltiazem IV, amiodarone bolus with IV drip, cardioversion.

**What medications need to be started during an NSTEMI/STEMI?**

Oxygen: nasal cannula regardless of hypoxia

Antiplatelet: aspirin, clopidogrel (Plavix)

Anticoagulation: heparin drip

Beta blocker: metoprolol to bring heart rate to 60 (unless concern for cardiogenic shock)

Venodilators: morphine or nitroglycerin sublingual or drip

Statin: high intensity statin

ACE inhibitor: especially with wall motion abnormalities.

**What is permissive hypertension in an acute stroke?**

If a hemorrhagic stroke has been ruled out via CT of the head and tPA will not be given, keep the BP <220/120 with the head of bed flat to maximize brain perfusion for the first 24hrs in an ischemic stroke.

**Why can’t daptomycin be given in a MRSA/VRE pneumonia?**

Daptomycin is inactivated by the surfactant in the lung.

**How do you do a voiding trial for urinary retention?**

Give tamsulosin (Flomax), remove Foley, give them a chance to urinate, then bladder scan for goal<300cc.

**In septic shock resuscitation, what is the most likely cause of iatrogenic kidney failure (from something you did rather than the infection itself)?**

Abdominal hypertension or abdominal compartment syndrome.

**What are the two most common pharmacologic therapies for gastroparesis and what are their adverse effects?**

Metoclopramide (Reglan): QTc prolongation, extrapyramidal symptoms.

Erythromycin: tachyphylaxis (effect wears off in a few weeks).

**NOW YOU’RE READY TO BE A SUPERSTAR ON THE INTERNAL MEDICINE WARDS!**