

Academic Half Day Guide for Preceptors

ITE High-Yield Review Questions

1. A 72-year-old man comes to your office after passing out. He has a 3/6 systolic ejection murmur in the LUSB. He has delayed and diminished carotid upstrokes and a delayed PMI. His echo shows aortic stenosis and a valve area of 0.9 cm². Which of the following do you recommend?
 - a) **Referral for consideration of valve replacement**
 - b) Referral for consideration of valve repair
 - c) Serial ECHOs twice annually
 - d) Antibiotic prophylaxis for dental procedures

This question was nice enough to give us an echo, but we knew it was AS from symptoms and exam (murmur, delayed pulses). For Stenosis, treat for Symptoms.

For aortic stenosis – syncope, angina, heart failure (LVEF <50%). Severe AS is defined as a valve area less than one cm squared, aortic velocity over 4 m/s, or mean transvalvular gradient >40 mmHg.

For mitral valve stenosis, treat for Symptoms. Mitral valve gets more complicated, but in general: Severe, symptomatic MS (orthopnea, HF, dyspnea, etc), percutaneous mitral valve balloon commissurotomy > mitral valve surgery. They will also need rheumatic fever prophylaxis (PCN q28 days), management of afib, management of heart failure (particularly diuretics and beta blockers to slow HR), and prevention of thromboembolism (usually VKA if they have afib, LA thrombus present or previous embolism).

2. A 46-year-old woman comes to you to discuss her recent ECHO done in follow up of rheumatic mitral regurgitation. She has a holosystolic murmur that radiates to the axilla. Her ejection fraction is 55%. Which of the following do you recommend?
 - a) Referral for consideration of valve replacement
 - b) **Referral for consideration of valve repair**
 - c) Serial ECHOs twice annually
 - d) Antibiotic prophylaxis for dental procedures

For Regurgitation, follow the Rules. For MR: symptoms, LVEF 30-60%, LVESD >40, development of pHTN (since this will likely get worse unless MV is repaired and surgical risk dramatically increases once pHTN worsens). Typically surgical mitral valve repair is recommended over replacement. If it is too high risk surgically, can do transcatheter surgical repair.

Antibiotic prophylaxis is NOT recommended for those undergoing dental/surgical procedures (in the absence of a prosthetic valve or hx of IE). If there is a history of rheumatic heart disease, long-term rheumatic fever prophylaxis is recommended.

3. A 21-year-old comes to the office for evaluation of syncope while playing basketball. He is found to have a 3/6 harsh systolic ejection murmur at the base of the heart that decreases with squatting and increases with Valsalva. Which is the most likely diagnosis?

- a) WPW
- b) Ventricular Septal Defect
- c) Atrial septal defect
- d) Hypertrophic Obstructive Cardiomyopathy**
- e) Aortic stenosis

I always remember that AS gets louder when more blood passes through it (and quieter as less blood passes through it), but HOCM does the opposite (because a full LV opens that dynamic obstruction). So, things that increase your venous return (like squatting), decrease a HOCM murmur. Things that decrease your venous return (like Valsalva), increase HOCM murmur. Below is a picture I found online.

	Venous Return / Preload		Afterload		Drugs	
	Increase	Decrease	Increase	Decrease	Diuretic	ACEIs
	(Leg raise / Squat)	(Valsalva / Standing)	(Handgrip)	(Amyl Nitrate)		
MS, AS	↑	↓	↓(AS)	↑(AS)	Yes, but better	
					AS (Replace)	×
			Negligible Effect in (MS)		MS(Ballon)	
MR, AR	↑	↓	↑	↓	✓	✓
VSD	↑	↓	↑	↓	✓	✓
HOCM	↓	↑	↓	↑	×	×
MVP	↓	↑	↓	↑	×	×

4. You are called to the bedside of a patient with the below rhythm strip. They have a blood pressure of 120/80 and only complain of palpitations. Which of the following do you recommend?

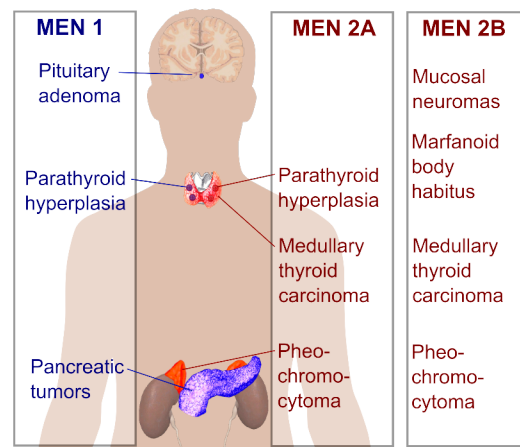


- a) Direct current cardioversion
- b) Diltiazem IV bolus
- c) Metoprolol IV bolus
- d) Amiodarone IV bolus and infusion**
- e) Verapamil IV bolus

This is likely stable VT. Patients with sustained monomorphic VT who are hemodynamically unstable, severely symptomatic, or become pulseless need to ride the lightning. Initial treatment with antiarrhythmics is NOT indicated for unstable VT. For stable VT, pharmacologic cardioversion is first line therapy with amio, lidocaine, or procainamide.

5. A 32-year-old man presents to clinic with recurrent kidney stones. He also has high blood pressure with intermittent episodes of headache and flushing. His mother and maternal aunt have a history of thyroid cancer. What is the diagnosis?

- a) MEN1
- b) MEN2a**
- c) MEN2b



6. A 20-year-old woman with T1DM presents to the ED with DKA. She has a glucose of 500 with anion gap metabolic acidosis. Normal saline & an insulin drip are initiated. Two hours later the following metabolic panel is obtained:

Na 140, K 4.8, Cl 100, CO₂ 16, BUN 30, Cr 1.3, Glucose 180

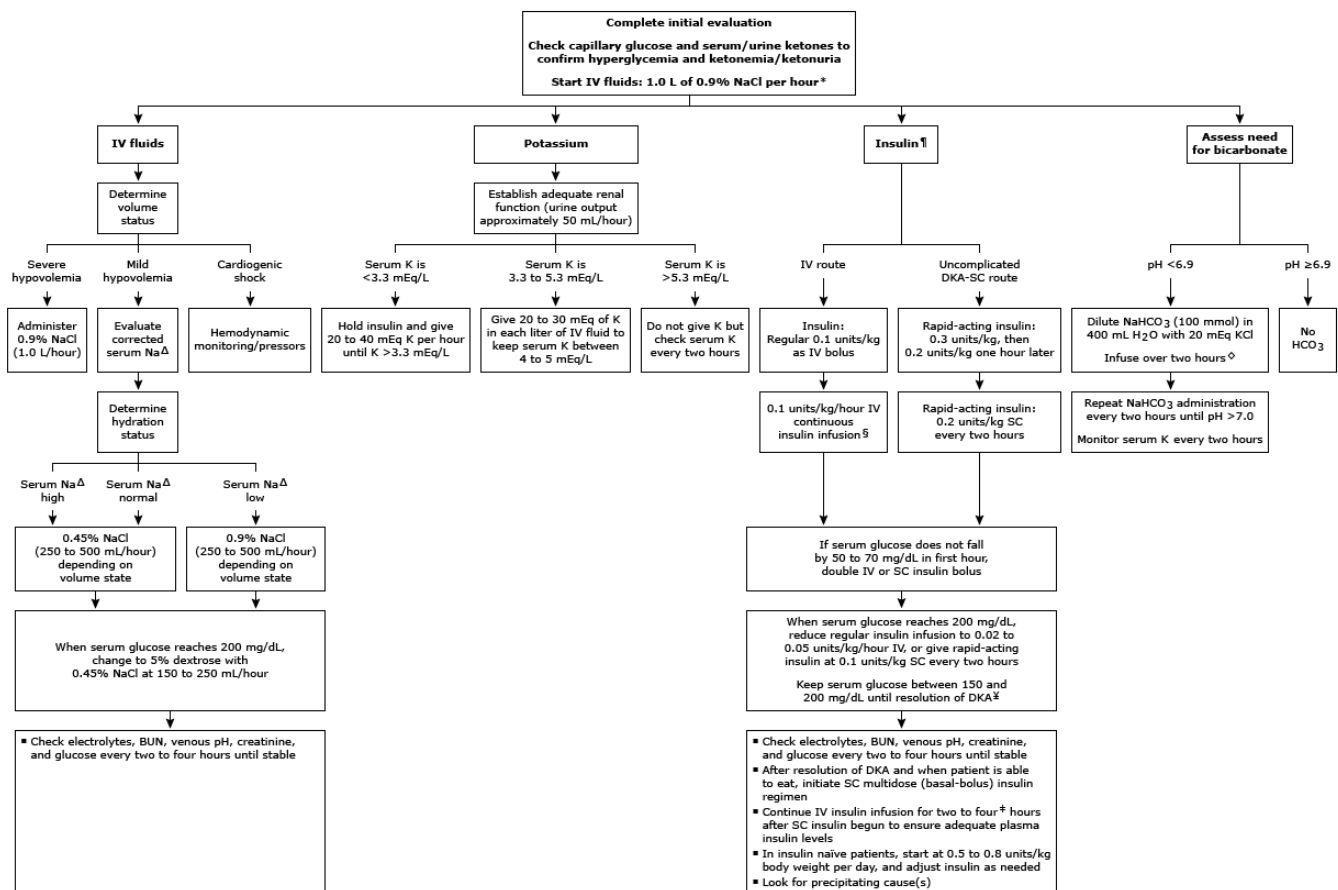
VBG pH 7.32 and pCO₂ 28

What is the next step in management?

- Continue current therapy & repeat BMP in 4 hours
- Stop the insulin drip & begin long acting insulin
- Change normal saline to half-normal saline with dextrose & potassium and continue insulin drip.**
- Stop normal saline & start fluids with dextrose

Bonus: What's the patient's acid base status?

AGMA with concomitant resp acidosis



7. A diagnostic paracentesis is performed on a woman with new onset abdominal distention. Which of the following is the most likely diagnosis?

Serum		Ascitic Fluid	
AST	68 U/L	WBC	89/cu mm
ALT	52 U/L	Diff	10% seg, 80% lymph
Albumin	3.2 g/dL	Protein	3.0 mg/dL
		Albumin	1.8 g/dL

- a) Ascites due to alcoholic cirrhosis
- b) Tuberculous ascites
- c) Ovarian cancer
- d) Ascites due to cardiac disease**

Portal hypertension if SAAG > 1.1

Total Protein	SAAG ≥1.1 g/dL	SAAG <1.1 g/dL
< 2.5 g/dL	Cirrhosis	Nephrotic syndrome, myxedema
≥2.5 g/dL	Cardiac Ascites, Budd-Chiari Syndrome	Infections, malignancy, pancreatic ascites

Few pearls:

- <1g protein indicates high risk SBP
- >2.5 g low risk SBP (usually seen in portal hypertension from Budd-Chiari or Cardiac causes).
- If you see >250 neutrophils = SBP. Could also be secondary peritonitis if clinical history fits (or if more than one organism grows)

8. You are evaluating a 32 year old woman for hypertension and hypokalemia. Elevated blood pressure was initially discovered by her gynecologist. Her oral contraceptives were discontinued but her blood pressure remained elevated. Your evaluation reveals a blood pressure of 158/98 in bilateral arms. Her BMI is 21. She has no abdominal bruits, and has no edema. There is no hirsutism present. Renal duplex ultrasound shows normal vascular flow. In the next several visits her blood pressure improves with the use of lisinopril and amlodipine. She takes no other medications or supplements. She denies headaches and flushing. Her serum sodium is 145 mEq/dL, her potassium is 3.1 mEq/dL and her bicarbonate is 27 mg/dL. Which of the following is most likely to be seen in this case?
- a) Elevated 24 hour urine cortisol
 - b) Elevated serum aldosterone, plasma renin ratio**
 - c) Elevated 24 hour urine metanephrines
 - d) Elevated plasma renin level

Main clues here are hypokalemia, metabolic alkalosis, slight hypernatremia, and elevated BP in young nonobese person. However, clinically, more than ½ of patients with primary hyperaldosteronism will have normal K, and thus, all patients with secondary hypertension should be screened.

Bonus: who should you suspect secondary hypertension in?

Suspect secondary hypertension in refractory disease (3 or more drugs including a thiazide), acute rise in previously stable disease, <30 in non-obese and negative FH, HTN urgency/emergency (ie severe HTN), and onset of HTN prior to puberty.

Elevated BMI, headaches, fatigue	OSA
Paroxysmal HTN, diaphoresis	Pheochromocytoma
Elevated BMI, proximal muscle wasting, bruises	Cushing's syndrome
Faint femoral pulses	Coarctation of the aorta
Cancer therapy class of meds	VEGF inhibitors

9. A 26-year-old woman comes to your office for evaluation of tea colored urine. She has a history of SLE that has been quiescent while taking hydroxychloroquine for joint predominant symptoms. She complains of a sore throat and myalgia that began one day prior to the tea colored urine. She denies fever, rash, oral ulcers, hair change and arthralgia. She is taking no other medication and has no other medical disease. She has a temperature of 99.8 F and a blood pressure of 155/95. Her urine shows 2+ protein and RBC casts. Her serum creatinine is 1.1 mg/dL. Serum complement levels are normal. Which of the following is the most likely diagnosis?

- a) Post-strep glomerulonephritis
- b) IgA nephropathy**
- c) Lupus nephritis
- d) Membranoproliferative glomerulonephritis

IgA nephropathy typically occurs with a viral URI. Contrast this with post strep GN that occurs weeks after strep throat.

Low serum C3 and/or C4 levels	Normal serum C3/C4 levels
Lupus nephritis	IgA nephropathy
Infection-related GN	ANCA-associated GN
MPGN	Anti-GBM Ab disease
Cryoglobulinemic GN	

10. A 21-year-old college student develops diarrhea while on Spring break in Mexico. She has watery diarrhea with cramping but has no blood in the stool. Which of the following is the most likely?

- a) Salmonella sp.
- b) Shigella sp.
- c) Enterotoxigenic E. Coli**
- d) Campylobacter sp

Acute Diarrhea

Food poisoning 1-6 hours after eating	Staph (from preformed toxins), B cereus (re-heated rice)
Gas, bloating, flatulence, exposure to water	Giardia
AIDS, high volume stool, AFB+	Cryptosporidium
Returning traveler, non-bloody diarrhea	ETEC
Cruise ship, non-bloody diarrhea	Norwalk virus
Undercooked chicken, pain, bloody diarrhea	Salmonella
AIDP, bloody diarrhea	Campylobacter
Sick kid, bloody diarrhea	Shigella
Erythema nodosum, arthritis, bloody diarrhea	IBD

Question 10 Continued

Chronic Diarrhea

Prior Roux-en-Y, now with gas, bloating, water diarrhea	Small intestinal bacterial overgrowth (blind loop)
Lower abdominal pain, alternating bowel habits	IBS
Chronic diarrhea + itchy papules on elbows	Celiac with dermatitis herpetiformis
Steatorrhea, epigastric abdominal pain	Chronic pancreatitis
Old person with normal endoscopic appearance	Microscopic colitis
+hydrogen breath test	Lactose intolerance
Hx cholecystectomy	Post chole diarrhea
<100 cm TI removed	Bile salt diarrhea
>100 cm TI removed	Fat malabsorption
Fe, Folate, Vit D def	Celiac

11. A 26-year-old woman is on the ventilator for acute respiratory failure secondary to asthma exacerbation. The ventilator starts alarming for very high peak inspiratory pressures. An inspiratory hold reveals an elevated plateau pressure as well. What is the diagnosis?
- A. Mucus plug
 - B. Bronchospasm
 - C. Tension pneumothorax**
 - D. Biting on the tube

When you have an elevated PIP only, this is an issue with resistance, because when you hold the breath (plateau pressure), the compliance of the lung is okay. Thus, you have an issue with things that cause resistance in the airway like mucus plugging, bronchospasms, and kinked endotracheal tube. When you have an elevated PIP + elevated plateau pressure, you have an issue with lung compliance! Issues with lung compliance include pneumothorax, pulmonary edema, pneumonia, atelectasis, and right mainstem intubation.

Normal plateau pressures	Increased plateau pressures
Mucus plugging	Pneumothorax
Bronchospasm	Pulmonary edema
Biting endotracheal tube	Pneumonia
	Atelectasis
	Right mainstem intubation

12. A 25-year-old man is evaluated for 2 months of joint pain. He currently complains of swelling in his right wrist, left knee and left second toe but is recovering from similar symptoms in his right shoulder and right knee. He awakens each morning with stiffness in the affected joints and back ache. He has taken ibuprofen 600 mg TID with little effect. He has no significant past medical history and denies rash, ocular symptoms, fever, or night sweats. He is afebrile and has synovial swelling and warmth in his right wrist and left knee. There is pain with passive range of motion. His left second toe is cylindrically swollen from base to tip and is tender. Which of the following information is needed in making this man's diagnosis?

- a) Anti-CCP antibody
- b) Antecedent diagnosis of *Chlamydia urethritis***
- c) Recent tick exposure
- d) Anti-streptolysin O titer

Arthritis pearls:

- **Monoarthritis:** think septic joint, gout, hemarthrosis, simple trauma
- **Oligoarthritis:**
 - **Migratory seronegative spondyloarthropathy.** This has negative abs, +HLA B27, sacroiliitis, enthesopathy, and iritis. Examples of seronegative spondyls: ankylosing spondylitis – young male, aortic insuff, bamboo spine. Psoriatic arthritis: sausage digits, can be very destructive to joints. IBD: Erythema nodosum, abdominal pain, etc. Reactive: chlamydia or recent diarrheal illness.
 - **Other oligoarthritis:** gonococcal, rheumatic fever, Still's disease (salmon colored rash, fever, arthritis, high ferritin), Whipples, and Lyme disease.
- **Polyarthritis:** RA (symmetric, small joints, hands, erosions, AM stiffness, >6 weeks), SLE (symmetric, deforming, but NOT destructive, need ACR criteria)

13. A 58-year-old man presents for SOB and DOE. Physical exam shows decreased breath sounds at the right base with dullness to percussion. He also has palmar erythema, spider angiomas and gynecomastia. His cardiac exam is normal.

Pleural Fluid		Serum	
LDH	110 mg/dL	LDH	340 mg/dL
Total Protein	1.2 mg/dL	Total Protein	6.8 mg/dL

Which of the following is the most likely cause of his pleural effusion?

- a) Pleural tuberculosis
- b) Parapneumonic effusion
- c) Adenocarcinoma of the lung
- d) Hepatic hydrothorax**
- e) Pulmonary embolism

Transudate or exudate? Light's Criteria is one of the following: pleural protein/serum protein >0.5, pleural LDH/serum LDH >0.6, and pleural LDH > 2/3 ULN serum LDH.

Lymphocytic predominant	TB or cancer
Purulent	Empyema
>Hct (over 50% peripheral crit)	Hemothorax (cancer, PE?)
pH <7.2, +gram stain	Complicated parapneumonic effusion
Glucose <60	Infection, RA, TB, cancer, lupus pleurisy
High amylase	Esophageal rupture, pancreatic pseudocyst, acute pancreatitis
High triglycerides	Chylothorax (blocked/ruptured thoracic duct)
Adenosine deaminase	TB
Neutrophils > 50,000	Complicated parapneumonic effusion or empyema

14. A 46-year-old male presents with right flank pain that started 3 hours ago. Sharp, severe with radiation to right testicle. History is significant for chronic diarrhea from Crohn's disease with 2-3 BMs daily. Labs show Na 138, K 3.9, Cl 106, Bicarb 21. UA sp grav 1.025, pH 5.5, moderate blood, no protein, LE's, or nitrites. CT demonstrates 6 mm stone at right ureteral pelvic junction. Which of the following is the most likely?

- a) **Ca oxalate**
- b) Ca phosphate
- c) Cystine
- d) Struvite
- e) Uric acid

Patient volume depleted from diarrhea and metabolic acidosis increased risk of developing kidney stone. With hx of Crohns, likely Ca oxalate due to fat malabsorption (a common occurrence in IBD), Ca will bind to fat in the gut and allow increased oxalate absorption. Additionally, metabolic acidosis increases calcium loss from bone and decreases citrate excretion. Citrate is the major inhibitor of calcium crystallization in the urine.

Stone type	Risk factors	Stone appearance	Treatment
Calcium oxalate	Hypercalciuria, hyperoxaluria, hypocitraturia	Envelope shaped	Increase fluids, decrease sodium intake, thiazides, low oxalate diet, potassium citrate or bicarbonate
Calcium phosphate	Elevated urine pH, distal RTA, hyperparathyroidism, topiramate	Enveloped shaped	Increase fluids, decrease sodium intake, thiazides, treat hyperparathyroidism, potassium citrate or bicarbonate
Uric acid	Low urine pH, metabolic syndrome, gout, hyperuricosuria	Radiolucent, rhomboid shaped	Increase fluids, potassium citrate or bicarbonate, allopurinol
Struvite	Chronic UTI with urea splitting organisms	Staghorn or coffin lid	Treat infection. Urologic intervention?
Cystine	Cystinuria (auto recessive, young age onset), low urine pH	Hexagonal green/yellow crystals, large and branched	Increase fluids, potassium citrate or bicarbonate, acetazolamide, penicillamine, and tiopronin

15. 29-year-old woman comes to your office for evaluation of excess hair growth and amenorrhea. She has not had a menstrual period in six months and has noted increasing growth of thick dark hair on her upper lip and abdomen. Her menstrual periods have been regular since onset at age 11. She is on no medications or supplements. Her blood pressure is 118/78. The rest of her physical exam is significant for a receding temporal hairline, excessive terminal hair growth on the upper lip, between her breasts and on the low abdomen. Her pelvic exam is normal except for clitoromegaly.

DHEA-S	820 µg/dL
Testosterone	11 ng/dL
LH	10 mIU/mL
FSH	12 mIU/mL
Glucose	78 mg/dL

Which of the following is the appropriate next test?

- a) **CT scan of the adrenal glands**
- b) Measurement of 17-OH progesterone levels before and after dexamethasone suppression
- c) Transvaginal pelvic ultrasound
- d) Karyotype analysis
- e) 24 hour urinary cortisol

Virilization vs Hirsutism

Virilization is male habitus. This includes male pattern balding, deepening voice, clitoromegaly. This is due to testosterone (either ovarian or exogenous) or DHEA-S (adrenal origin).

Hirsutism is excess terminal hair without virilization. Examples include PCOS, delayed CAH, medication (minoxidil).

This patient has virilization, which is supported by clitoromegaly and highly elevated DHEA-S. This is suggestive of adrenal production, and we should obtain imaging of her adrenal glands to further evaluate for adenomas.