373. **Sudden cardiac death:** death within 1 hour; severe atherosclerotic CAD but no thrombus; **die of ventricular** arrhythmia
374. **Angina: exertional** (severe atherosclerotic CAD; ST depression on stress ECG; pain relieved by stopping exercise or taking nitroglycerin); **Prinzmetal** (vasoconstriction from release of TXA_2 from platelet thrombi; atherosclerotic CAD not primary cause of disease; ST elevation on stress ECG); **unstable angina** (angina at rest; severe atherosclerotic CAD; infarct waiting to happen)
375. **Restrictive cardiomyopathy:** cannot fill properly; glycogen (Pompe's glycogenosis), iron (iron overload), amyloid (senile amyloidosis; prealbumin), endocardial fibroelastosis in child
376. **Pericardial effusion:** neck vein distention with inspiration (Kussmaul sign), pulsus paradoxus (drop in blood pressure on inspiration), muffled heart sounds, hypotension; all pressures in all chambers are increased but the cardiac output is decreased; echocardiogram first step and pericardiocentesis is treatment
377. **Constrictive pericarditis:** TB most common cause worldwide; heart cannot completely fill; pericardial knock when ventricles hit thickened pericardium
378. **Hypersensitivity pneumonitis: farmer's lung** (inhalation of thermophilic actinomycetes), **silo filler's** (inhalation of nitrogen dioxide fumes), **byssinosis** (Monday morning blues; patient works in a textile factory and has contact with cotton, linen, hemp)
379. **Hamman Rich lung:** honeycomb lung; end-stage of alveolitis syndromes (interstitial pneumonitis syndromes)
380. **Bronchiectasis:** CF most common cause; obstruction and infection; bronchi extend to lung periphery; cough up cupfuls of foul smelling sputum; other causes: TB (most common worldwide), Kartagener syndrome (absent dynein arm in cilia, situs inversus)
381. **Atelectasis:** most common cause of fever 24 hours after surgery; elevated diaphragm
382. **Choanal atresia:** baby breaks away from breast and cyanosis is relieved by crying
383. **Nasal polyps:** allergic, aspirin (patient with headache develops asthma), cystic fibrosis (child with polyps)
384. **Pulmonary hypertension**: increased P2; PH leads to RVH (cor pulmonale if PH is of primary origin or due to primary lung disease not heart disease); chronic hypoxemia (vasoconstricts pulmonary vessels and vasodilates peripheral vessels), loss of pulmonary vasculature (COPD, restrictive lung diseases), left to right shunts with eventual volume overload of right heart, mitral stenosis with backup of blood into pulmonary veins; gross: atherosclerosis of pulmonary arteries, smooth muscle hypertrophy of pulmonary vessels, angiomatoid lesions; primary PH mainly in young women
385. **ARDS:** non-cardiogenic pulmonary edema from neutrophil related injury; endotoxic shock most common cause; intrapulmonary shunting most important abnormality; separate from cardiogenic pulmonary edema by pulmonary capillary wedge pressure (measure of LV end-diastolic pressure; decreased in ARDS, increased in cardiogenic shock)
386. **Lung cancer:** squamous/small cell centrally located; adenocarcinomas peripherally located
387. **Dysphagia for solids not liquids:** think obstruction--strictures, Plummer-Vinson, esophageal cancer
388. **Dysphagia for solids and liquids:** think peristalsis problem--PSS, CREST syndrome, polymyositis, achalasia
389. **Leukoplakic lesions in mouth or genital area:** biopsy to rule out squamous dysplasia/cancer
390. **Smokeless tobacco:** verrucoid squamous cancer in the mouth
391. **Squamous cancer in mouth:** lateral border of tongue followed by lower lip; upper lip is a basal cell
392. **Hairy leukoplakia of tongue:** EBV glossitis, predates onset of AIDS
393. **Oral pigmentation:** PJ syndrome, Addison's disease, Pb poisoning in adult
394. **Gum hyperplasia:** phenytoin, pregnancy, scurvy, acute monocytic leukemia
395. **Leiomyoma:** most common benign tumor in women (uterus location), most common tumor of GI tract (most commonly in stomach)
396. **Extranodal lymphoma:** most commonly in stomach (most are high grade immunoblastic lymphomas), next in Peyer's patches; *H. pylori* associated with low grade lymphomas
397. **Bowel obstruction:** adhesions from previous surgery (if no history of previous surgery, pick indirect inguinal hernia)
398. **Intussusception:** child, colicky abdominal pain, bloody diarrhea, terminal ileum into cecum
399. **Carcinoid tumor:** yellow tumor on tip of appendix most common overall site; terminal ileum most common sight for tumor that metastasizes to liver to produce the carcinoid syndrome
400. **Colorectal cancer:** left side obstructs and right side bleeds
401. **Sigmoid colon most common site for:** cancer in GI tract, diverticular disease, polyps
402. **Hematochezia:** diverticulosis followed by angiodysplasia (cecum; elderly patient)
403. **Budd-Chiari syndrome:** hepatic vein thrombosis (PRV most common cause); liver congested, ascites, portal hypertension
404. **AAT deficiency:** PAS positive globules in hepatocytes in children; panacinar emphysema in adults (lower lobes)
405. **Extrahepatic biliary atresia:** bile duct proliferation in triads, radioactive dye cannot get into the small intestine, jaundice in first week of life

406. **Drug effects in the liver:**

Morphologic Pattern	Chemical/Drug
Acute hepatitis	Isoniazid (10-20% liver damage, toxic metabolite acetylhydrazine), salicylates, halothane (symptoms after 1 week, fever precedes jaundice, metabolites formed from P450 system), methyldopa (positive Coombs test), phenytoin, ketoconazole.
Chronic active hepatitis (CAH)	Methyldopa, acetaminophen, aspirin, isoniazid, nitrofurantoin, halothane.
Zonal necrosis	**Zone I:** yellow phosphorous poisoning, ferrous sulfate poisoning. **Zone III:** carbon tetrachloride poisoning (CCl_3 free radical), acetaminophen (free radical formed, acetylcysteine therapy replaces glutathione to neutralize free radicals), Amanita poisoning.
Intrahepatic cholestasis	**Non-inflammatory:** oral contraceptives (estrogen responsible, interferes with intrahepatic bile excretion), anabolic steroids. **Inflammatory:** erythromycin estolate, amoxicillin-clavulanic acid, chlorpromazine, thiazides.
Fatty change	**Single droplet (nucleus peripherally displaced):** ethanol, corticosteroids, amiodarone (looks like alcoholic hepatitis including Mallory bodies and progression to cirrhosis). **Microvesicular (droplets without nucleus displacement):** tetracycline, valproic acid.
Fibrosis	Methotrexate, hypervitaminosis A.
Vascular lesions	**Budd-Chiari syndrome:** oral contraceptives **Peliosis hepatis:** oral contraceptives, anabolic steroids. **Angiosarcoma:** vinyl chloride, arsenic, Thorotrast.
Tumors or tumor-like conditions	**Nodular hyperplasia:** azathioprine, anticancer agents. **Benign tumors (hepatic adenoma):** oral contraceptives. **Malignant tumors (hepatocellular carcinoma):** oral contraceptives.
Granulomatous hepatitis	Allopurinol, hydralazine, sulfonamides, phenylbutazone.

407. **Wilson's disease:** AR; defect in copper secretion into bile; chronic liver disease; low ceruloplasmin levels, hence low total copper but increased free copper; KF ring in eye; lenticular degeneration (chorea; rigidity)
408. **Primary biliary cirrhosis:** female; early presentation with pruritus (bile salt deposition in skin), increased alkaline phosphatase, no jaundice until late; granulomatous destruction of bile ducts in triads; increased anti-mitochondrial antibodies and IgM; association with Sjögren syndrome and renal tubular acidosis
409. **Sclerosing pericholangitis:** complication of ulcerative colitis; jaundice; ERCP for diagnosis
410. **Hydatid cysts in liver:** sheepherder (Basque, Greek) with liver cysts; anaphylactic shock; dog is definitive host, sheepherder is intermediate host
411. **Pipestem cirrhosis:** *Schistosoma mansoni* (sharp lateral spine), adults lay eggs in portal vein tributaries producing fibrosis; ascites and portal hypertension
412. **Stone in common bile duct:** most common cause of obstructive jaundice
413. **Granulomatous hepatitis:** think TB if infective and sarcoid if non-infective
414. **Ischemic ATN:** prerenal azotemia most common cause; affects multiple parts of the nephron; basement membrane disrupted; pigmented renal tubular casts
415. **Nephrotoxic ATN:** aminoglycosides and IVP dyes most common cause; hits proximal tubule only
416. **Renal papillary necrosis:** analgesic abuse (acetaminophen + aspirin), diabetes mellitus, sickle cell trait/disease, acute pyelonephritis
417. **Hydronephrosis:** most commonly due to a renal stone
418. **Renal stone:** calcium oxalate most common stone; colicky flank pain with radiation into groin; hematuria; flat plates identifies most stones (calcium); hypercalciuria most common metabolic abnormality; hydrochlorothiazide increases calcium reabsorption in nephron; uric acid stone non-visualized
419. **Epididymitis:** <35: GC, *Chlamydia*; >35: *E. coli*, *Pseudomonas*
420. **Varicocele:** left side; bag of worms; cause of infertility; spermatic vein comes off the left renal vein
421. **Prostatic hyperplasia**: transitional zone around the urethra; testosterone and estrogen mediated; prostate cancer is in peripheral zone (outside and detected by rectal exam), hence dribbling, urinary retention is more likely benign than malignant; PSA does not distinguish hyperplasia from cancer
422. **Testicular cancers:** seminoma most common (cryptorchid relationship; most radiosensitive; para-aortic lymph node metastasis), choriocarcinoma most malignant (increased β-hCG), yolk sac tumor most common in children (endodermal sinus tumor; Schiller Duval bodies; increased AFP), malignant lymphoma most common in elderly man (metastatic)
423. **Malignant hypertension:** background of essential hypertension and benign nephrosclerosis; gross: flea bitten kidney; micro: necrotizing arteriolitis, fibrinoid necrosis in glomerular capillaries, onion skinning of arterioles (hyperplastic arteriolosclerosis)
424. **Vulvar Paget's disease:** intraepithelial adenocarcinoma
425. **Koilocytosis:** HPV effect in squamous cells; pyknotic nucleus surrounded by a clear halo
426. **IUD:** Actinomycosis with sulfur granules; actinomycosis also for draining sinus from the jaw
427. **Endometritis:** plasma cells present; group B streptococcus
428. **Adenomyosis:** glands and stroma in myometrium; not endometriosis

429. **Endometriosis:** glands and stroma outside confines of the uterus; reverse menses; most common cause of secondary dysmenorrhea; ovaries most often involved (chocolate cysts); laparoscope most common for diagnosis and treatment; only in reproductive life
430. **Leiomyosarcoma:** most common uterine sarcoma
431. **Cervical polyp:** non-neoplastic; hangs out of cervical os; postcoital bleeding
432. **Endometrial polyp:** no malignant potential; menorrhagia
433. **Cervical cancer:** death due to renal failure from extension into the retroperitoneum and blockage of ureters
434. **Ectopic pregnancy:** due to previous PID; rupture is most common cause of death in early pregnancy; β-hCG initial test; vaginal ultrasound to check for amniotic sac; unclotted blood in pouch of Douglas
435. **Rectal pouch of Douglas:** anterior to rectum and posterior to uterus; can palpate with rectal exam; induration in young woman = endometrial implants; induration in elderly woman = seeding from primary ovarian cancer; unclotted blood = ruptured ectopic; pus = PID
436. **Follicular cyst:** most common overall ovarian mass
437. **Surface derived ovarian tumors: benign:** serous cystadenoma (most common overall benign tumor), Brenner's tumor (Walthard's rests); **malignant:** serous cystadenocarcinoma (most common primary cancer of ovary; most common bilateral ovarian tumor; psammoma bodies), mucinous cystadenocarcinoma (largest ovarian tumor; most often associated with pseudomyxoma peritonei), endometrioid carcinoma (greatest association with endometriosis)
438. **Germ cell tumors of ovary:** cystic teratoma most common (undergoes torsion; struma ovarii = component of thyroid tissue; teeth and bone seen on x-ray); dysgerminoma most common malignant tumor (Turner syndrome relationship; female counterpart of male seminoma with cryptorchid testis), yolk sac tumor most common tumor in girl (increased AFP)
439. **Sex cord stromal tumors:** fibroma most common (benign tumor; Meig syndrome: fibroma, ascites, right sided pleural effusion), granulosa cell tumor (feminizing tumor; low grade malignancy; Call Exner bodies), Sertoli Leydig cell tumor (benign; masculinizing tumor; alias androblastoma and arrhenoblastoma), Leydig cell tumor (benign; masculinizing tumor; alias hilar cell tumor; crystals of Reinke), gonadoblastoma (germ cell and sex cord stromal; calcifies; association with Turner's)
440. **Krukenberg tumor:** metastatic gastric cancer to both ovaries; signet ring cells
441. **Hydatidiform moles:** complete mole (46 XX, both chromosomes of paternal origin, most often associated with choriocarcinoma; grape-like mass; preeclampsia in first trimester; uterus too large for gestational age; increased β-hCG), partial mole (trisomy; embryo present; does not transform into choriocarcinoma)
442. **Gestationally derived choriocarcinoma:** syncytiotrophoblast (synthesizes hCG and human placental lactogen) and cytotrophoblast; not chorionic villi; metastasizes to lungs; responds dramatically to methotrexate
443. **Function of β-hCG:** LH analogue that maintains the corpus luteum of pregnancy for 8-10 weeks, then placenta takes over
444. **Twin placenta:** monochorionic = identical twins whether monoamniotic (Siamese twins, fetal to fetal transfusion, tangle in umbilical cord) or diamniotic; dichorionic = fraternal or identical twins
445. **Abruptio placenta:** painful bleeding; retroplacental hemorrhage; maternal hypertension or cocaine abuse
446. **Placenta previa:** painless bleeding; implantation over cervical os
447. **Two umbilical arteries and one vein (oxygenated blood):** single artery has an increased incidence of congenital anomalies
448. **Lecithin/Sphingomyelin ratio:** >2/1 in amniotic fluid indicates adequate pulmonary surfactant
449. **Urine estriol:** derived from fetal adrenal, placenta, maternal liver; low levels indicate fetal, placental or maternal problem
450. **Human placental lactogen:** growth hormone of pregnancy; anti-insulin activity
451. **Amniotic fluid:** fetal urine; alkaline pH; swallowed and recycled by the fetus
452. **Dysfunctional uterine bleeding:** bleeding not secondary to an anatomic cause; hormonal imbalance; anovulatory bleeding most common cause of bleeding after menarche; ovulatory types: inadequate luteal phase and irregular shedding
453. **Ovulation:** increase in temperature; subnuclear vacuoles; presence of secretory endometrium on day 21
454. **Implantation on day 21:** 3 days in the tube and 2 days in the uterus
455. **Primary amenorrhea (no menses by 16 years of age):** no bleeding post progesterone challenge means there is no estrogen primed uterus or there is an end-organ defect; hypothalamic/ pituitary defect: decreased FSH/LH (anorexia nervosa, weight loss syndrome, pituitary tumor); ovarian defect: increased FSH/LH (probable Turner's syndrome), end-organ defect: normal FSH/LH; most cases are normal constitutional delays with good secondary sex characteristics and withdrawal bleeding; think Turner's if there are poor secondary sex characteristics, high gonadotropins, and no withdrawal bleeding; check for imperforate hymen/absent vagina if good secondary sex characteristics and no bleeding with progesterone challenge
456. **Secondary amenorrhea (no menses for 3 months):** pregnancy most common cause; same classification as above; Asherman syndrome: stratum basalis removed owing to repeated dilatation and curettage (end-organ defect; normal gonadotropins)
457. **Cervical Pap smear:** must be endocervical cells (gold standard) indicating proper sampling of the endocervical canal where dysplasia occurs; superficial squamous cells = estrogen, intermediate squamous cells = progesterone,

parabasal cells = unstimulated squamous cells; normal female: 70% superficial and 30% intermediate; pregnancy/prepubertal: 100% intermediates; atrophic: predominantly parabasals

458. **Lewis antibodies:** naturally occurring antibodies with no clinical significance; no risk of hemolytic disease of newborn (HDN)
459. **Duffy antigens:** uncommon in Blacks; surface receptor for *P. vivax*, hence protection against malaria
460. **I antigens:** anti-I is a cold agglutinin (IgM) seen in M. pneumoniae infections; anti-i (IgM) is seen in infectious mononucleosis
461. **Blood group O:** universal donor; no antigens on surface and cannot be destroyed; must receive O blood, increased incidence of duodenal ulcers, have 3 antibodies (anti-A IgM, anti-B IgM, anti-A,B IgG [can cross the placenta])
462. **Blood group AB:** universal recipient; no antibodies to destroy transfused RBCs
463. **Blood group A:** has anti-B IgM; increased incidence of gastric cancer
464. **Blood group B:** has anti-A IgM
465. **Rh positive:** means the patient has D antigen; other Rh antigens: C, c, E, e, d does not exist
466. **Major crossmatch:** patient serum against donor RBCs to see if there are any patient antibodies that react against donor RBCs; if compatible, it does not guarantee that infused RBCs will not be destroyed or that the patient will not develop antibodies against other donor RBC antigens
467. **HIV risk post-transfusion:** 1:676,000 risk per unit
468. **HBV risk post-transfusion:** 1:200,000 risk per unit
469. **HCV risk post-transfusion:** 1:3300 risk per unit
470. **Risk of HIV positivity post-accidental needle stick:** 1:300 (most common way of becoming HIV positive in medical personnel)
471. **Fresh frozen plasma:** contains all coagulation factors; only for multiple factor deficiencies; risk of hepatitis
472. **Packed RBCs:** high hematocrit; contains some plasma; transfuse only if patient is symptomatic and does not respond to medical therapy; risk of hepatitis
473. **Platelet transfusion:** only if patient is symptomatic; risk of hepatitis
474. **Cryoprecipitate:** all factor VIII molecules, fibrinogen, factor XIII, fibronectin; hepatitis risk
475. **Rh immune globulin:** anti-D from pooled human donors (passive immunization); does not cross the placenta; give to pregnant women who do not have anti-D to protect during each pregnancy; give if baby is Rh positive and mother does not have anti-D (give within 3 days); amount of Rh immune globulin to give is based on Kleihauer-Betke test performed on maternal blood that detects the amount of fetal-maternal bleed (fetal RBCs resistant to alkali and acid); no hepatitis risk
476. **Rh HDN:** mother Rh negative and baby Rh positive; first pregnancy with Rh + baby has no effect on baby but mother could be exposed to fetal RBCs with D antigen during delivery and develop antibodies (purpose of Rh immune globulin is to prevent this); if subsequent pregnancies have Rh + babies, maternal anti-D IgG antibodies cross placenta → attach to fetal RBCs → RBCs extravascularly removed by fetal macrophages in the spleen → unconjugated bilirubin (UCB) is end-product of hemolysis → fetus develops anemia (chance of heart failure and hydrops fetalis) and mother's liver takes care of the UCB → bilirubin pigment can be detected in amniotic fluid (optical wavelength of 450) and mapped on a Liley graph to determine severity of hemolysis → at delivery, baby cannot handle UCB load and is often exchange transfused to prevent kernicterus, remove UCB, remove antibodies, correct anemia
477. **Febrile transfusion reaction:** patient has anti-HLA antibodies against HLA antigens on donor leukocytes causing release of pyrogens from destroyed donor leukocytes; type II hypersensitivity
478. **Allergic transfusion reaction:** patient develops hives against proteins in donor unit; type I hypersensitivity
479. **Hemolytic transfusion reaction:** ABO incompatibility (patient receives wrong blood type; e.g., patient A [has anti-B IgM] and donor blood is B; anti-B IgM attaches to B positive donor cells → activates complement system → intravascular hemolysis; type II hypersensitivity reaction); patient has undetected antibodies that react against donor RBC antigens (extravascular hemolysis; jaundice, drop in Hb, positive direct Coombs; type II hypersensitivity)
480. **Factors preventing small vessel bleeding:** heparin (enhances antithrombin III [ATIII], which neutralizes most serine protease coagulation factors--prothrombin, X, IX, XII, XI, thrombin), PGI_2 (synthesized by endothelial cells, vasodilator, inhibits platelet aggregation), protein C and S (inactivate factors V and VIII, enhance fibrinolysis), tissue plasminogen activator (release of plasmin, which destroys coagulation factors and clots)
481. **Factors acting as procoagulants in small vessel injury:** thromboxane A_2 (synthesized by platelets, vasoconstrictor, enhances platelet aggregation; cyclooxygenase blocked by aspirin and NSAIDS), von Willebrand factor (VIII:VWF; synthesized by endothelial cells and megakaryocytes, platelet adhesion factor [platelets have receptors for VIII:VWF]), extrinsic and intrinsic coagulation system
482. **Normal events with vessel injury:** vessel injury → activation of factor VII in the extrinsic coagulation system by tissue thromboplastin and activation of factor XII in the intrinsic system by exposed collagen → platelets stick to VIII:VWF via their receptors (platelet adhesion) → stimulus for platelet release of ADP from dense bodies causing platelet aggregation and synthesis of TXA_2 → temporary platelet plug with fibrinogen draped over it (fibrinogen

receptors on platelets) stops bleeding → thrombin generated by coagulation pathway stimulation converts fibrinogen into fibrin and forms a stable platelet plug → plasmin destroys the plug and reestablishes blood flow

483. **Bleeding time:** detects platelet abnormalities up to the formation of the temporary hemostatic plug (thrombocytopenia; no VIII:VWF for platelet adhesion; patient on aspirin and no TXA_2 for aggregation [most common cause])
484. **Ristocetin cofactor assay:** best test for VIII:VWF (von Willebrand factor, which is synthesized by endothelial cells and megakaryocytes and is necessary for platelet adhesion [platelets have receptors])
485. **Prothrombin time (PT):** detects extrinsic coagulation system factors down to formation of a clot--VII (extrinsic system) → X → V → II (prothrombin) → I (fibrinogen) → clot; international normalized ratio (for patients on warfarin) standardizes the test throughout the world so all test results are the same regardless of the reagent used; PT is best test for liver synthetic function
486. **Partial thromboplastin time (PTT):** detects intrinsic coagulation system factors (XII, XI, IX, VIII) down to formation of a clot--XII → XI → IX → VIII → X → V → II (prothrombin) → I (fibrinogen) → clot; used to follow heparin therapy and factor deficiencies
487. **Factor VII deficiency:** prolonged PT and normal PTT
488. **Factor VIII deficiency (hemophilia A: decreased VIII:coagulant, normal VIII: antigen and VIII:VWF):** normal PT and prolonged PTT
489. **Factor X deficiency:** prolonged PT and PTT
490. **Patient on heparin:** prolonged PT and PTT but PTT is the better test to follow patients; if overanticoagulated give protamine sulfate
491. **Patient on warfarin (blocks vitamin Ks ability to γ-carboxylate factors II, VII, IX, X, protein C and S by blocking epoxide reductase, which normally keeps vitamin K in its active K1 state):** prolonged PT and PTT but PT is better test for following patients; if overanticoagulated and seriously bleeding give fresh frozen plasma and IM vitamin K; if bleeding not serious, give IM vitamin K
492. **Patient with VWD (all factor VIII components decreased: VIII:coagulant, VIII:antigen, VIII:VWF):** prolonged bleeding time, normal PT, prolonged PTT
493. **Patient with antibody against factor VIII:coagulant (circulating anticoagulant, inhibitor) and prolonged PTT:** normal PT and prolonged PTT; after mixing 0.5 cc of normal plasma with 0.5 cc of patient plasma, the PTT is repeated and is still prolonged because antibodies inhibited VIII:coagulant in the normal plasma as well; a true factor VIII:coagulant deficiency would have correction of the PTT after adding normal plasma
494. **Fibrinolytic system tests:** fibrin (ogen) split products (X, Y, D, E fragments) after plasmin breakdown of fibrinogen or a fibrin clot; D-dimers, which measures cross-linked fibrin monomers in a fibrin clot
495. **DIC:** intravascular consumption of clotting factors (fibrinogen, V, VIII, prothrombin, platelets) with diffuse oozing of blood from all breaks in the skin; causes: endotoxic shock, infections, snake envenomation, amniotic fluid embolism); prolonged PT and PTT, low fibrinogen, **increased split products and D-dimer (these are the best tests for DIC),** thrombocytopenia, schistocytes (RBCs hit fibrin clots); treat the underlying disease causing DIC; use blood components to keep the patient alive; heparin blocks thrombin, hence preventing clots and consumption of coagulation factors
496. **Hereditary thrombosis syndromes:** venous thrombosis and pulmonary emboli; ATIII deficiency (no prolongation of PTT after starting heparin), protein C and S deficiency
497. **Heparin:** prevents venous clot formation; does not dissolve the clot; can be used in pregnancy; can produce thrombocytopenia
498. **Warfarin:** blocks epoxide reductase (normally keeps vitamin K in its active K1 state); previously γ-carboxylated vitamin K dependent factors must disappear before patient is fully anticoagulated (reason why heparin is given along with warfarin); VII and protein C have the shortest half-life (6 hours) and prothrombin the longest (3 days); hemorrhagic skin necrosis: patient with heterozygote protein C deficiency and 50% factor level, when put on warfarin will have 0% protein C levels in 6 hours causing thrombosis of vessels in the skin before the patient is fully anticoagulated
499. **Henoch-Schoenlein's purpura:** most common immunocomplex (IgA-anti-IgA) vasculitis in children; URI followed by palpable purpura (sign of small vessel vasculitis), polyarthritis, hematuria (glomerulonephritis), GI bleed
500. **Thromboangiitis obliterans (Buerger's):** smoker's vasculitis; thrombosis of digital vessels with gangrene; quit smoking
501. **Kawasaki's disease:** most common cause of childhood myocardial infarction; coronary artery vasculitis + mucous membrane inflammation and skin desquamation at tips of fingers
502. **Polyarteritis nodosa:** immunocomplex vasculitis of muscular arteries; HBsAG in ~30%; vessels in different stages of healing; aneurysm formation; renal infarction; p-ANCA antibodies; diagnose with arteriography
503. **Takayasu's arteritis:** pulseless disease in Asian female; granulomatous vasculitis of aortic arch vessels; blindness; strokes
504. **HbAIc:** best test to following glycemic control over the last 4-8 weeks in diabetes
505. **Aseptic necrosis:** Legg-Perthe (femoral head; child under 10), femoral fracture in elderly (most common cause), scaphoid bone in wrist, corticosteroids (femoral head), HbSS (femoral head)
506. **Osgood Schlatters:** inflammation of proximal tibial apophysis at insertion of patellar tendon; active boys
507. **Hypoglycemia:** most commonly due to insulin overdose in a type I diabetic

508. **Bell's palsy:** droopy face; cannot close eye; association with HSV-1

509. **Islet cell tumors:**

Islet Cell Tumor	Comments
Insulinoma	**Definition: benign tumor arising from the β islet cells that produces fasting hypoglycemia. 80% have MEN I syndrome. Most common islet cell tumor (70%). They secrete excess insulin and C-peptides** producing a **fasting hypoglycemia** (insulin inhibits gluconeogenesis). **Clinical: neuroglycopenia** (brain without glucose) from fasting hypoglycemia (forgetfulness, mental status abnormalities). **Laboratory: hypoglycemia in the presence of an increased insulin and C-peptide level (best test for endogenous insulin release).** **Differential: factitious hypoglycemia** from surreptitious injection of insulin. **Increased serum insulin and hypoglycemia (similar to insulinoma) but decreased C-peptide,** owing to suppression of endogenous insulin release by hypoglycemia.
Gastrinoma (Zollinger-Ellison Syndrome)	**Definition: malignant islet cell tumor arising from G cells producing an excess of gastrin leading to hyperacidity and peptic ulcer disease.** Duodenum second most common location. **Association with MEN I syndrome. Most cases have single ulcers in the usual locations for peptic ulcers.** Multiple ulcers can also occur. Any ulcer in an unusual site is suspect for ZE. **Clinical:** abdominal pain from PUD, diarrhea (malabsorption, since the enzymes cannot work in an acid pH). **Laboratory: basal acid output (BAO) is best screening test (markedly increased BAO). Intravenous secretin test is confirmatory (see paradoxical increase in gastrin).** Serum gastrin levels usually >600 pg/ml. **Other causes hypergastrinemia:** H2 blockers (decreased acid, increases gastrin), atrophic gastritis involving the body and fundus (type A; achlorhydria, decreases acid which stimulates gastrin), pyloric obstruction (antral distention is a potent stimulus for gastrin) and duodenal ulcer (high gastrin levels).
Glucagonoma	**Definition: malignant tumor of islet cells (α cells) with excess secretion of glucagon.** **Clinical: diabetes mellitus** (glucagon is gluconeogenic). Characteristic rash called **necrolytic migratory erythema.**
Somatostatinoma	**Definition: malignant tumor of islet cells (δ cells) secreting excess somatostatin.** **Clinical: achlorhydria** (inhibits gastrin), **cholelithiasis** (inhibits cholecystokinin), **diabetes mellitus** (inhibits gastric inhibitory peptide, which normally stimulates insulin release) and **steatorrhea** (inhibits secretin and cholecystokinin).
VIPoma or pancreatic cholera or Verner Morrison syndrome	**Definition: malignant tumor of islets with excessive secretion of vasoactive intestinal peptide.** **Clinical: severe secretory diarrhea** (VIP acts by stimulating cAMP similar to toxin in cholera and toxigenic *E. coli*). **Laboratory:** hypokalemia and normal gap metabolic acidosis (lose bicarbonate and potassium in stool) and achlorhydria.

510. **Myotonic dystrophy:** AD; triplet repeat mutation; most common adult dystrophy; cannot release hand grip; **balding,** cataracts, heart disease, hypogonadism

511. **Alcohol and CNS/PNS:** Wernicke-Korsakoff, cerebellar atrophy, cerebral atrophy, central pontine myelinolysis (too rapid infusing of sodium in hyponatremia), peripheral neuropathy

512. **Guillain-Barré:** autoimmune demyelination of peripheral nerves primarily affecting motor fibers; follows URI; ascending paralysis (LMN symptoms); increased CSF protein, no increase in cells

513. **Menetrier disease:** increased endolymph; dizziness, vertigo, hearing loss, horizontal nystagmus

514. **Benign positional vertigo:** most common cause recurrent vertigo; no hearing loss or tinnitus; nystagmus; dislocation of otoliths

515. **Multiple sclerosis:** most common demyelinating disease; association with HSV-6 and HLA-Dr2; scanning speech (sound drunk), intention tremor, nystagmus; paresthesias and muscle weakness; plaques commonly periventricular; cerebellar ataxia; internuclear ophthalmoplegia; increased CSF protein and slight increase in lymphocytes

516. **Parkinson's:** depigmentation substantia nigra; decrease in dopamine; Lewy bodies in neurons; rigidity: bradykinesia, cogwheeling; resting tremor (pill rolling); festinating gait; blank stare; MPTP association, drugs (chlorpromazine)

517. **Oligodendroglioma:** adult; frontal lobes; benign tumor that calcifies

518. **Calcium/PTH disorders:**

Disorder	Calcium	Phosphorous	Parathormone
Hypercalcemia			
Primary HPTH	Increased	Decreased	**Increased**
Malignancy (PTH-like peptide)	Increased	Decreased	**Decreased**
Hypocalcemia			
Primary Hypoparathyroidism	Decreased	Increased	**Decreased**
Pseudohypoparathyroidism	Decreased	Increased	Normal to Increased
Secondary HPTH (Malabsorption)	Decreased	**Decreased**	**Increased**
Secondary HPTH (Renal Failure)	Decreased	**Increased**	**Increased**
Hypoalbuminemia	**Decreased (normal ionized calcium)**	Normal	**Normal**
Alkalosis	**Normal (decreased ionized calcium)**	Normal	**Increased**

519. **Kidneys with irregular white patches on the cortical surface:** pale infarcts from embolization from the left heart

520. **Concentric hypertrophy of left ventricle:** increased afterload; essential hypertension most common cause; aortic stenosis; not mitral stenosis (no hypertrophy, since blood is not getting into the LV)

521. **Hypertrophy and dilatation of left ventricle:** volume overload due to aortic or mitral valve insufficiency, left to right shunts with increased return to left heart, aortic valve ring dilatation (dissection, aortitis)

Anatomy Questions:

NOTE: Suggest using these high yield facts along with those in First AID for boards

1. **Gap junction:** dye passes from one cell to the next
2. **Derivation of adrenal medulla:** neural crest origin; neuroblasts develop into ganglia; know the layers of the adrenal gland from outside in: cortex: glomerulosa, fasciculata, reticularis: medulla
3. **Tibial nerve function:** plantar flexion of toes; injury: loss of plantar flexion, foot dorsiflexed and everted (calcaneovalgocavus), sensory loss on sole of foot
4. **Composition of aortic valve (also pulmonic valve):** lined by endothelium and have abundant fibroelastic tissue plus a dense collagenous core; avascular. MV and TV have a loose connective tissue core which is increased in mitral/tricuspid valve prolapse (myxomatous degeneration)
5. **Break humerus, wrist drop:** radial nerve injury
6. **Post-radical mastectomy--winged scapula:** indicates injury to the long thoracic nerve; paralysis of the serratus anterior muscle
7. **Patient with a nosebleed and rhinorrhea: fracture of cribriform plate in ethmoid sinus**
8. **Medial longitudinal fasciculus demyelination in MS:** internuclear ophthalmoplegia
9. **Parathyroid derivation:** third and fourth pharyngeal pouches
10. **Aortic arch derivatives:** review in embryology book or First Aid for Boards
11. **Phase of meiosis eggs are in before and after ovulation:** before: meiosis I is arrested in prophase until ovulation; meiosis II is arrested in metaphase after fertilization
12. **What runs along the radial artery:** median nerve
13. **Artery affected in femoral neck fracture:** medial femoral circumflex artery
14. **EM of egg:** where does sperm penetrate (zona pellucida)
15. **Where is metaphase II completed:** in uterus
16. **Types of collagen:** I (bone, tendon, skin; greatest tensile strength), III (initial collagen of wound repair; replaced by type I [collagenase with Zn as a cofactor]), IV (basement membrane), X (epiphyseal plate; picture of bone on the exam and had to label where X was located)
17. **Wallerian degeneration:** Schwann cells begin to proliferate and form a tube that will serve to guide axon sprouts in the regeneration process; regeneration of the nerve occurs by the outgrowth of multiple axon sprouts from the proximal surviving segment of the axon; sprouts are directed distally (growth rate of 1-3 mm/day) down the tube established by the proliferating Schwann cells; sprouts are remyelinated and reestablish continuity with the motor end plate of the muscle.
18. **Circle of Willis diagram:** name arteries
19. **Kidney CT**
20. **CT liver:** show where the hepatic vein drains into the inferior vena cava
21. **Nerve injured in midshaft humerus fracture:** median nerve
22. **Know the layers of the gastric mucosa**
23. **Oligodendrocytes:** myelinate in the CNS, while Schwann cells myelinate in the PNS
24. **Stage of eggs post-partum:** meiosis I arrested in prophase
25. **Eye closed cannot open and eye deviated down and out:** oculomotor nerve palsy; **eye down and in:** trochlear nerve palsy
26. **Child with a popsicle stick in his mouth falls down causing the popsicle stick to hit the back of his throat and develops ptosis and meiosis of the right eye:** injury to the cervical sympathetic ganglion
27. **Vertical diplopia is associated with:** cranial nerve IV palsy
28. **Patient with headache and physical findings of mydriasis in the right eye in association with mild lid lag, and deviation of the eye down and out:** an aneurysm compressing cranial nerve III (headache is the giveaway for aneurysm)
29. **Patient with a recent history of bacterial meningitis has horizontal diplopia in the left eye, which is worse on gaze to the left:** cranial nerve VI palsy (lateral rectus weakness from VI nerve palsy)
30. **Patient with bilateral lateral rectus muscle weakness:** increase in intracranial pressure (classic sign; papilledema usually present)
31. **Paralysis of upward gaze in an infant:** hydrocephalus secondary to stenosis of the aqueduct of Sylvius (this is called Parinaud's syndrome)
32. **Multiple ocular motor nerve disorders:** diabetes mellitus (common cranial nerve palsies from osmotic damage to nerves)
33. **Weakness of the quadriceps muscle and an absent knee jerk reflex:** herniated L3 - L4 disk
34. **Pain in the hip and lateral quadriceps, numbness of the anterolateral leg and the webbed space between the great toe, weakness of dorsiflexion of the foot, and normal knee and ankle jerk reflexes:** herniated L4 - L5 disk (note the normal DTRs)
35. **Numbness along the lateral and posterior aspect of the calf and plantar aspect of the foot, and an absent ankle jerk reflex:** herniated L5 - S1 disk
36. **Young child falls on his outstretched arm and has pain in the middle and lateral portion of his clavicle; upper extremity remains in abduction, extension, and internal rotation:** nerve injured is C5-C6 (Erb-Duchenne

syndrome, or superior brachial plexus injury due to a clavicular fracture; these are also the most common fractures in newborns; C8-T1 are inferior brachial plexus injures or Klumpke's syndrome)

37. **Patient has paralysis of the oculomotor nerve after a head injury:** uncal herniation with compression of the IIIrd nerve (ptosis of eye, mydriasis)
38. **Numbness of the thenar aspect of the hand:** median nerve (carpal tunnel)
39. **Wrist bone with greatest incidence of aseptic necrosis:** navicular bone (scaphoid)
40. **Supracondylar fracture:** injury to brachial artery and median nerve; danger of ischemic contractures in forearm muscle (Volkmann's ischemic contracture)
41. **Know the fetal circulation:** ductus venosus and umbilical vein have the highest oxygen content
42. **EM of alveolus with macrophage, type II pneumocytes (lamellar bodies [surfactant])**
43. **EM of small bowel with microvilli on the surface**
44. **Histologic section of seminiferous tubule:** identify cell that makes sex hormone binding globulin (Sertoli cell)
45. **Know the bands in skeletal muscle:** A band has myosin ATPase
46. **Respiratory bronchiole:** last airway structure with cilia
47. **Terminal bronchioles:** cilia but no goblet cells; site of obstruction in asthma, CF, chronic bronchitis
48. **EM:** know normal organelles in a cell--see picture in First AID for Boards
49. **Know normal structures CT exams of the chest, abdomen, leg, arm, CNS**
50. **Voice hoarseness post thyroid surgery:** injury to laryngeal nerve
51. **MRI of orbit:** find superior oblique muscle
52. **MRI of abdomen:** identify splenic artery above the pancreas
53. **Chest x-ray:** fluid in the costophrenic sulcus in CHF
54. **Barium study of small intestine:** need to know how to separate from large bowel; superior mesenteric artery supplies small bowel
55. **X-ray showing enlargement of the posterior heart:** enlarged left atrium in a patient with mitral stenosis
56. **Neuroanatomy:** emphasis on blood supply and lesions of the brainstem and cortex, all of the cranial nerves and their functions
57. **MRI of the carotids with occlusion of the anterior cerebral artery:** would effect the contralateral leg
58. **Schwannoma in jugular foramen:** weakness of palate/loss gag reflex/laryngeal paralysis (X), trapezius/sternocleidomastoid (XI), loss taste sensation posterior third of tongue (IX)
59. **Weber syndrome:** lesion of oculomotor nerve and UMN signs with a midline, midbrain lesion
60. **Horner's syndrome:** diagram of vertebra and sympathetic trunk; pick cervical sympathetic ganglion
61. **Pupil light reflexes with eye diagrams of pupils:** one set is an oculomotor nerve lesion
62. **Extent of the spinal cord in adults:** extends to second sacral vertebra
63. **Gross of brainstem anterior view--find area of oculomotor nerve**
64. **Frontal lobe lesion:** affects personality
65. **Bitemporal hemianopsia:** lesion at the optic chiasm; commonly a craniopharyngioma (derived from Rathke's pouch)
66. **Inferior quadrantanopia:** defect in the superior fibers in the parietal lobe
67. **Loss of sensation in the hands, history of burns without knowing it: syringomyelia in cervical cord and involvement of crossed spinothalamics:** syringomyelia
68. **C2 transection of fasciculus gracilis:** effects vibration and fine touch of lower extremity only
69. **CN III and UMN signs on opposite side:** midline midbrain lesion
70. **Loss of pain and temperature and UMN signs on opposite side:** mid pons lesion
71. **Horner's syndrome with localization of lesion on a diagram:** lateral medullary syndrome with associated cranial nerve palsy in the medulla and hypothalamus with associated temperature regulation problems
72. **Parkinson's disease:** MPTP drug of abuse association
73. **Cross-section of an embryo:** identify neural crest tissue
74. **Blood production prior to birth:** liver, bone marrow
75. **Bochdalek hernia in posterolateral part of diaphragm on left:** present early in life; visceral contents extend into the chest cavity causing severe respiratory distress at birth; parasternal diaphragmatic hernias extend through the foramen of Morgagni beneath the sternum and do not usually develop symptoms until later in life.
76. **Artery associated with foregut:** celiac; midgut: superior mesenteric; hindgut: inferior mesenteric
77. **Damage to hearing in a rock and roll band player:** injury to cochlea
78. **Know normal histologic appearance of small bowel and stomach**
79. **Argyll-Robertson pupil:** accommodates when patient follows finger moving towards the nose but does not react to direct light; neurosyphilis

Microbiology Questions:

NOTE: Suggest using these high yield facts along with those in First AID for boards

1. **Mechanism of action of *Streptococcus agalactiae* (group B streptococcus):** inhibits phagocytosis
2. **Cause of an immunodeficiency with a high IgM:** defect in isotype switching

3. **Cyclosporine necessary in identical twin transplant--?why:** there is still some difference in MHC sites from crossover of chromosomes during meiosis
4. **Major drift with influenza:** major changes in the reassortment of genome pieces indicating a need for a new vaccine; only protects against influenza A; egg based vaccine; killed virus vaccine
5. **Receptor for HIV:** CD4 molecule on helper T cells (also macrophages, dendritic cells)
6. **Tetany at birth:** DiGeorge syndrome, a pure T cell deficiency due to absence of the third and fourth pharyngeal pouches (3rd inferior parathyroids + thymus; 4th superior parathyroids); absent thymic shadow
7. **Graft versus host reaction:** common in T cell deficiencies; must irradiate the donor blood to destroy lymphocytes (also destroys CMV)
8. **CD common to both B and T cells:** CD45 is present in all leukocytes
9. **Complement fixation reactions:** read Jawitz section in Medical Microbiology on immunologic tests
10. **Hanta virus:** carried in rodents (deer mice); ARDS, hemorrhage, renal failure; viral RNA in lung tissue (PCR test)
11. ***Staphylococcus aureus***: protein A attaches to Fc receptor of macrophages, hence blocking opsonization of bacteria
12. ***Proteus mirabilis***: moves with flagella; urease producer
13. ***C. diphtheria***: toxin inhibits elongation factor 2 by ADP-ribosylation, hence blocking protein synthesis
14. ***Mycoplasma pneumoniae***: requires sterols
15. **Pneumonitis (larval transmigration) + ova in stools:** Ascaris or hookworm; not Strongyloides (rhabditiform larvae in the stool not eggs)
16. **Latex agglutination reactions:** antibody to capsular antigens is attached to the beads
17. **Locations of cells in lymph node:** B (follicles), T (paracortex), histiocytes (sinuses)
18. **Cells that attack protozoans:** CD_4 T cells
19. **What gives bacteria their shape:** peptidoglycan layer in the cell wall
20. **Tumbling motility, Gram positive rod:** *Listeria monocytogenes*; invades mononuclear cells, beta-hemolysis in blood agar, transplacental infection in fetus or occurs in renal transplant patients, mainly contracted from eating unpasteurized cheese
21. **Gray membrane that bleeds when removed:** Diphtheria
22. **Dengue:** transmitted by mosquito (Aedes aegypti; same mosquito as in yellow fever); "breakbone fever"; may be hemorrhagic
23. **Infection associated with premature rupture of the membrane:** group B streptococcus (*S. agalactiae*); CAMP test
24. **IL-1 function on B lymphocytes:** activates B cells
25. **Location for *S. aureus* carriers:** anterior nares
26. **River blindness:** Onchocerca, bite of blackfly, do skin biopsy, ivermectin
27. **Rhinovirus:** common cold occurs more often in fall and winter; person to person droplet infection and contamination of hands; acid-labile (does not cause gastroenteritis because of this)
28. **Virus responsible for a cold in spring and summer:** adenovirus
29. **Lactobacillus in vagina:** responsible for the acid pH
30. **Influenza vaccine:** killed; egg-based
31. **Pruritic skin lesion in Gulf War veteran:** cutaneous leishmaniasis due to bite of sandfly
32. **Hib vaccine:** antibody against capsular polysaccharide
33. **In addition to the normal childhood immunizations, what additional immunizations are recommended in sickle cell disease and cystic fibrosis:** Pneumococcus and influenza (Pneumovax is given after 2 years of age)
34. **Which live vaccine can be given to a patient with AIDS:** MMR (MMR is given only because the natural infection for measles is worse than the one that potentially could happen with the attenuated virus)
35. **List the live vaccines:** MMR, varicella, OPV, BCG, smallpox, and yellow fever
36. **List the polysaccharide vaccines:** Pneumococcus and Hib (meningococcal vaccine is another example)
37. **List the killed virus vaccines:** influenza, rabies, SALK vaccine
38. **List the immunizations that are contraindicated in patients with anaphylactic reactions against eggs:** MMR, influenza, yellow fever
39. **List immunizations that are contraindicated in patients with anaphylactic reactions against neomycin:** MMR, varicella (neomycin is used as a preservative)
40. **Verrucoid lesion in lower extremity in a patient returning from South America:** South American blastomycosis, yeast with a ships wheel appearance; North American blastomycosis has wide based buds
41. **AIDS patient with 2 peaks in the natural history of his disease:** p24 antigen
42. **ELISA test for HIV:** anti-gp 120 antibodies, confirm with western blot
43. **Best test for detecting HIV viral burden in blood:** HIV RNA by PCR
44. **Newborn baby in HIV positive mother:** newborn has anti-gp 120 in the serum (IgG antibody); prevent HIV in newborn by giving mother AZT.
45. **Animal association with toxoplasmosis:** cat
46. **Most common cause of diarrhea in children:** rotavirus
47. ***E. coli:*** attaches to the urogenital epithelium, hence its #1 status for urinary tract infections
48. **Bruton's agammaglobulinemia:** SXR; defect in pre-B to B cells; prone to respiratory infections; need IV gamma globulin
48. **SCID:** first immunodeficiency treated with gene therapy (replacement of adenosine deaminase)

50. **Wiskott Aldrich:** SXR; triad of sinopulmonary infections, eczema, thrombocytopenia; B and T cell deficiency; increased incidence of leukemia/lymphoma
51. **Part of a vaccine that is antigenic:** polysaccharide capsule
52. **Person working with animal hides develops lung disease:** *Bacillus anthrax* (woolsorter's disease)
53. **Cryptococcus:** evades host destruction via its polysaccharide capsule
54. **Child with anemia and diarrhea—? parasite:** hookworm produces iron deficiency
55. **Lymphocutaneous nodules in a rose gardener:** sporotrichosis; treat with potassium iodide
56. **Elderly male smoker with non-productive cough, bacteria fails to grow on ordinary media (must be supplemented with iron and cysteine), need Dieterle silver stain to identify:** Legionella; treat with erythromycin
57. **Macrophage activation:** γ-interferon secreted from helper T cell
58. **Know examples of all the hypersensitivity reactions:** see immunopathology notes
59. **IgA deficiency:** sinopulmonary disease; most common genetic immunodeficiency
60. **AIDS:** most common acquired immunodeficiency
61: **HLA system coded on chromosome 6**
62. **Hyperacute rejection of a transplant:** ABO incompatibility or patient had anti-HLA antibodies against an HLA antigen in the graft
63. **HLA-A, B, C code for class I antigens:** CD_8 cytotoxic T cells recognize
64. **HLA-D loci code for class II antigens:** CD_4 helper T cells, macrophages recognize
65. **Graft vs host reaction:** NK cell mediated; common in bone marrow and liver transplants; rash, jaundice (necrosis of bile ducts), diarrhea, danger in T cell deficient patients
66. **Know antibodies in different diseases:**

Autoantibody	Comments
Anti-acetylcholine receptor antibody (AChR)	Present in generalized **myasthenia gravis** (90%) and myasthenia gravis associated with thymoma (60%). Responsible for the defect in neuromuscular transmission. Correlates with disease activity.
Anticentromere antibody	Associated with the **CREST syndrome** (60%) and **PSS** (10%).
Anti-gliadin antibody	Associated with celiac disease (95%). Alcohol extract of gluten in wheat.
Anti-glomerular basement membrane antibody	Present in **Goodpasture's syndrome** (> 90% sensitivity and specificity). Antibody is against an epitope from type IV collagen in the basement membrane of the glomerulus and pulmonary capillaries.
Anti-insulin and anti-islet cell antibodies	**Anti-insulin antibodies develop in pre-type I diabetes mellitus** before insulin is used in treatment. They also develop in patients taking bovine or porcine insulin but not human insulin. **Anti-islet cell antibodies are noted in type I diabetes mellitus** (60-90%). Antibodies are not present in type II DM.
Anti-microsomal antibody	Associated with **Hashimoto's autoimmune thyroiditis** (97%) and **autoimmune hepatitis** (70%).
Anti-mitochondrial antibody	Present in **primary biliary cirrhosis** (90-100%).
Anti-neutrophil cytoplasmic antibody (ANCA).	C (cytoplasmic) ANCA is present in **Wegener's granulomatosis** (> 90% sensitivity) and is also a marker of disease activity. **P (perinuclear) ANCA is associated with polyarteritis nodosa** (> 80%) and other inflammatory conditions (ulcerative colitis, crescentic glomerulonephritis). The antibody is against myeloperoxidase.
Anti-parietal cell and intrinsic factor antibodies	**Parietal cell antibodies are present in 90% of patients with pernicious anemia (PA),** but is also noted in chronic atrophic gastritis, thus limiting its specificity. **Antibodies to intrinsic factor** (IF) are type I (blocking antibody that prevents B12 from binding to IF) and type II (binding antibody that binds to IF or the IF-B12 complex), the former having the greatest specificity for diagnosing PA.
Anti-smooth muscle antibody	Associated with **autoimmune hepatitis** (70%).
Anti-thyroglobulin antibody	Present in **Hashimoto's autoimmune thyroiditis** (85%) and **Grave's disease** (30%). Less sensitive than anti-microsomal antibody in Hashimoto's thyroiditis.

67. **Know HLA relationships:**

Disease	HLA Relationship	Approximate Relative Risk
Hemochromatosis	A3	~ 7%
Myasthenia gravis	B8	~ 3%
Celiac disease	B8 and DR3	~ 13%
Ankylosing spondylitis	B27	~ 80%
Multiple sclerosis	DR2	~ 3%
Type I DM	DR3 and DR4	~ 3%
Rheumatoid arthritis	DR4	~ 6%

68. **Destroy *C. difficile* in bedpan**: autoclave
69. **Hanta virus:** carried in rodents (deer mice); ARDS, hemorrhage, renal failure; viral RNA in lung tissue (PCR test)
70. **Blastomycosis:** spores associated with beaver dams and inland water ways
71. **Impetigo:** more commonly caused by *S. aureus* than group A streptococcus

Biochemistry Questions:

NOTE: Suggest using these high yield facts along with those in First AID for boards

1. **Rate limiting reaction in cholesterol synthesis**: HMG Co reductase
2. **Findings in PKU**: mousy odor; tyrosine missing, hence it must be supplied in the diet, can diagnose by amniocentesis and finding the abnormal gene; eliminate phenylalanine from diet (Nutrasweet is aspartate and phenylalanine, so cannot use it)
3. **I cell disease**: inability to phosphorylate the mannose residues of potential lysosomal enzymes, hence they cannot be taken up by the lysosomes to degrade complex substrates
4. **Number of glucoses necessary to build palmitic acid a 16 carbon compound: 4 glucoses**, each glucose run producing 2 acetyl CoA, the latter containing 2 carbons each
5. **Insulin lack in DKA: decreased** glycolysis, glycogenesis, fatty acid synthesis, storage of fat in adipose
6. **Uncoupling agents (e.g., alcohol, salicylates):** produces brown fat from increased heat from reactions trying to increase the generation of more protons to make ATP
7. **Von Gierke's:** decreased glucose 6-phosphatase (gluconeogenic enzyme) with decrease in glucose (fasting hypoglycemia) and increase in glucose 6-phosphate with production of normal glycogen in the liver and kidneys; stimulation tests with glucagon, fructose, etc. cannot increase the glucose levels owing to the missing enzyme
8. **Biochemical processes in both cytosol and mitochondria:** urea cycle, heme synthesis, gluconeogenesis
9. **Female with pheochromocytoma:** what dietary alteration: probably **decrease phenylalanine** (essential AA) and tyrosine (not an essential AA) in the diet
10. **Pregnant female with PKU: what diet**: low in phenylalanine and high in tyrosine; avoid Nutrasweet since it contains aspartate and phenylalanine
11. **Lesch Nyhan:** SXR with absent HGPRT, self-mutilation, hyperuricemia, mental retardation
12. **Glucokinase:** only in liver, high Vm and high Km, not inhibited by glucose 6-phosphate; hexokinase: in all tissues; inhibited by glucose 6-phosphate; low Vm and low Km
13. **Branched chain amino acids and maple syrup urine disease**
14. **Glycogenolysis:** review biochemistry
15. **Key enzyme in gluconeogenesis**: fructose 1,6 bisphosphatase (catalyzes the conversion of fructose 1,6-bisphosphate to fructose 6-phosphate)
16. **Locations of glucose 6-phosphatase (gluconeogenic hormone):** liver, kidney, intestinal epithelium (lesser extent than others); absent in von Gierke's disease
17. **Shuttles and what they carry:** carnitine (even chained fatty acids), malate (NADH)
18. **Functions of LDL**: vitamin D synthesis, other steroid synthesis, cell membranes, synthesis of bile salts/acids
19. **Acetyl CoA uses**: how many times used in FA synthesis, CH synthesis, ketone body synthesis
20. **Km and Vmax Lineweaver Burke**: competitive vs non-competitive inhibitors
21. **Question on fatty acid length and energy production**
22. **Urea cycle**: method of eliminating ammonia
23. **Epinephrine given and only small branched chains found**: debrancher deficiency
24. **Know cholesterol synthesis**: review Harvey/Champe
25. **Origin of apolipoproteins 100 (liver) and 48 (intestine)**
26. **Rate limiting step in glycogenolysis:** glycogen phosphorylase
27. **Reason why liver can not use ketones for fuel**: liver cannot activate acetoacetate in the mitochondria, which requires succinyl CoA: acetoacetate CoA transferase (a thiotransferase enzyme) in order to convert AcAc into acetoacetyl CoA.
28. **McArdles disease**: absent muscle phosphorylase; increased glycogen in muscle; no increase in lactic acid after exercise
29. **Pregnant woman is a beer drinker--what supplements does she need**: still needs folate because alcohol increases loss of folate in urine and stool which offsets the amount of folate present in beer; furthermore, she would probably be taken off beer because of fetal alcohol syndrome and would need folate; iron is not affected by beer drinking
30. **Insulin:** key hormone of the fed state; **glucagon:** key hormone of the fasting state
31. **Mannose 6-phosphate**: involved in transfer of dolichol (lipid) in the RER in the synthesis of O-linked glycosides
32. **Know all the lysosomal storage diseases:** see Genetics notes; two SXR diseases are Fabry's and Hunter's syndrome
33. **Know all the reactions involving NAD/NADH and NADP/NADPH**: review Champe Harvey book
34. **Major source of NADPH**: HMP shunt; malate dehydrogenase reaction to a lesser extent; NADPH supplies reducing equivalents
35. **Mutation changes an amino acid sequence--which one would have the greatest effect on migration in a serum protein electrophoresis**: one with the most negative charges (most acidic)--glutamine; one that would remain closest to the anode (- pole) is the most basic amino acid--arginine
36. **Mechanism of ketoacidosis in DKA**: increased β-oxidation of fatty acids and production of acetyl CoA, which is used by the liver to synthesize ketone bodies
37. **Promoter location:** linear gene drawing with labels: pick upstream location
38. **Energy source for protein synthesis**: GTP

39. **Isoenzyme with 2 genes, 4 subunits:** LDH isoenzymes; 5 isotypes: LLLL, LLLH, LLHH, LHHH, HHHH
40. **Second messengers:** atrial natriuretic peptide: cGMP, insulin: tyrosine kinase, nicotinic: ion channels; see Katzung/Trevor page 43 for more second messenger relationships
41. **Best method of detecting relatedness of a new bacteria**: restriction fragment length polymorphism

Pharmacology Questions:

NOTE: Suggest using these high yield facts along with those in First AID for boards

1. **Treatment of schistosomiasis**: praziquantel
2. **Treatment of benzodiazepam overdose**: flumazenil
3. **Arachidonic acid metabolism**: review notes in inflammation or pharmacology
4. **Cause of cough in patient on an ACE inhibitor**: bradykinin
5. **Use of epinephrine in shock: 1:1000 dilution subcutaneously**
6. **Dantrolene**: used in the treatment of malignant hyperthermia after halothane
7. **Treatment of acetaminophen overdose**: acetylcysteine to replace used up GSH (neutralizes acetaminophen free radicals formed in the liver cytochrome system)
8. **Mechanism of loop diuretic**: blocks Na-K-2Cl cotransport pump in the thick ascending limb in the renal medulla; also blocks calcium reabsorption
9. **Cyanide poisoning treatment**: review in environmental pathology notes; amyl nitrite and **thiosulfate**
10. **Thrush**: may be a complication of a corticosteroid inhaler
11. **Isotretinoin:** always do a pregnancy test in females; put them on BCP
12. **Mechanism of propylthiouracil**: blocks iodination of the tyrosine residues of thyroglobulin; also blocks coupling of DIT and MIT; only drug that can be used in pregnancy but may produce goiter in the newborn and nail defects
13. **P450 system in the liver**: makes drugs water soluble
14. **Angioedema and renal failure**: ACE inhibitor relationship
15. **Mechanism of action of retinoic acid**: behaves like a steroid in that it binds to receptors in the nucleus with subsequent transcription of genes; proteins produced by this action are important in growth, differentiation, reproduction, and embryonic development
16. **Allopurinol action in purine synthesis**: blocks xanthine oxidase (schematic of purine metabolism was provided and had to identify the reactions [hypoxanthine to xanthine and xanthine to uric acid])
17. **Most common antibiotic used to prevent endocarditis in patients with valvular disease**: amoxicillin is the drug of choice; all valvular diseases except asymptomatic MVP and all congenital heart disease except asymptomatic ASD)
18. **Yellow coloration of the skin that can be mistaken for jaundice--? drug**: quinacrine; chlorpromazine and arsenic produce a blue-gray color to the skin)
19. **Diffuse erythema followed by separation of the skin (scalded skin syndrome or toxic epidermal necrolysis)--?drug**: barbiturates, sulfonamides, phenytoin, NSAIDs
20. **Hair loss in a woman--?drug:** oral contraceptives (predictable side effect; estrogen causes hair to be at same stage of development; may also occur after delivery)
21. **Erythematous, hyperpigmented plaque-like lesion that recurs at the same site every time:** fixed drug eruption (phenolphthalein, NSAIDs, tetracycline, Bactrim, and barbiturates are the most common cause of these reactions)
22. **Group of drugs has the highest association with urticarial and maculopapular lesions:** amoxicillin, TMP/SMX, ampicillin/penicillin (rashes are the MOST COMMON adverse reaction to drugs, with maculopapular rashes leading the list; most drug reactions involving skin are NOT type I hypersensitivity histamine-related)
23. **Elderly woman on thiazides is most at risk for developing:** gout
24. **Tardive dyskinesia, malignant syndrome (sweating, hyperpyrexia, autonomic instability):** neuroleptics
25. **Antipsychotic drug requiring visual examination:** thioridazine (also produces heart conduction defects)
26. **Nephrogenic diabetes insipidus--? drug**: lithium for bipolar disturbances
27. **Drug contraindicated with MAO inhibitors**: epinephrine
28. **Use of phentolamine:** non-selective α-blocker that lowers blood pressure during surgery for a pheochromocytoma
29. **Mechanism of AZT**: inhibits reverse transcriptase
30. **Treatment of Pb poisoning**: BAL and EDTA
31. **Drugs involved in folate metabolism**: phenytoin blocks intestinal conjugase (polyglutamate to monoglutamate, BCP blocks uptake of monoglutamate, methotrexate/TMP-SMX block dihydrofolate reductase
32. **Cromolyn sodium**: stabilizes mast cell membrane preventing release of preformed mediators and release of prostaglandins/leukotrienes after the release reaction
33. **Methotrexate:** blocks dihydrofolate reductase and the conversion of dihydrofolate to tetrahydrofolate
34. **Glucuronyl transferase in liver renders compounds water soluble**
35. **Cyclooxygenase**: aspirin inhibits irreversible, NSAIDs reversible
36. **Thromboxane A_2:** synthesized in platelet; vasoconstrictor and increases platelet aggregation
37. **Effect of proton blockers**: blocks H^+-K^+-ATPase proton pump in parietal cell; not a receptor mediated event; **H_2 blockers**: blocks H_2 receptor, which normally activates adenylate cyclase producing cAMP which stimulates protein kinase; **acetylcholine**: activates cholinergic receptor causing the release of calcium, which stimulates protein

kinase; **misoprostol:** blocks the prostaglandin receptor, which normally inhibits adenylate cyclase and cAMP production

38. **Pharmacology general**: heavy emphasis on antimicrobials, cardiovascular drugs, asthma drugs, NSAIDs, endocrine drugs, CNS drugs; know the class of drug, mechanism of action, and significant side effects
39. **7-fold membrane spanning protein-? drug**: propanolol a beta blocker
40. **Phase 3 clinical trials**: double blind
41. **Ticlopidine:** substitute for aspirin in preventing strokes, CAD if the patient is allergic to aspirin
42. **Drug induced SLE**: procainamide and hydralazine
43. **Overdose of succinylcholine**: use acetylcholine blockers
44. **Finasteride**: blocks 5-α reductase, which converts testosterone into dihydrotestosterone, hence testosterone would increase proximal to the block and dihydrotestosterone would decrease
45. **Flutamide, cyproterone, spironolactone**: block androgen receptor, hence testosterone/ dihydrotestosterone increase but have not physiologic effect
46. **Ketoconazole**: inhibits testosterone synthesis (suppresses adrenal steroid synthesis)
47. **Leuprolide**: GnRH analogue, which when given in sustained fashion, inhibits FSH and LH, hence lowering testosterone and estrogen levels
48. **ACE inhibitors**: increase in renin and ATI, but a decrease in ATII and aldosterone
49. **Arsenic poisoning**: dimercaprol
50. **Chloroquine in treatment of malaria--malaria recurred-why?**: exoerythrocytic/hepatic stage (e.g., *P. vivax*, *P. ovale*); drug kills active disease but does not eradicate hepatic stage
51. **Primaquine in treatment of malaria:** not good in the active stage but does kill the hepatic stage of *P. vivax* and *ovale*
52. **Dantrolene:** reduces the release of calcium from the sarcoplasmic reticulum of skeletal muscle; antispasmodic drug; also used in treating malignant hyperthermia
53. **Methanol:** increased anion gap metabolic acidosis due to conversion of methanol into formic acid; optic nerve degeneration and blindness; treat with alcohol infusion to block metabolism of methanol by alcohol dehydrogenase
54. **Botulism toxin**: blocks the release of acetylcholine (diagram of neurotransmitter synthesis and must locate the block); good diagram in Katzung/Trevor book on page 41
55. **Ribavirin**: used in severe RSV infections in children
56. **Asthma:** albuterol (β_2-selective agonist; bronchodilator)
57. **Acetylcholine breakdown**: occurs in the synapse into choline and acetate by acetylcholinesterase in the cleft; products are recycled and not excreted
58. **Know the graph of NOR/EPI/isoproterenol and effects on blood pressure and heart rate, plus the effect of α_1-blockers**: see graph in Katzung/Trevor book page 70
59. **Amphotericin**: disrupts cell membrane permeability; binds to ergosterol in the membrane
60. **Ketoconazole**: inhibits the metabolism of nonsedating antihistamines like Seldane leading to cardiac arrhythmias
61. **Be very familiar with second messengers**: see Harvey/Champe biochem book page 80
62. **Opioid toxicity**: naloxone (opioid receptor antagonist)
63. **Opioids**: no tolerance to miosis and constipation
64. **Codeine:** metabolized into morphine in small amounts owing to significant first pass metabolism of morphine in the liver
65. **Delirium tremens**: use benzodiazepines
66. **Lovastatin**: inhibits HMG CoA reductase
67. **Patent ductus arteriosus**: keep open with PGE

Physiology Questions:

NOTE: Suggest using these high yield facts along with those in First AID for boards; a lot of graphs are used; know the classic cardiac cycle graph very well; review Yarrow diagrams on fluid alterations in my notes

1. **Major site of water reabsorption in the GI tract**: in descending order: jejunum, ileum, colon
2. **Most effective nephron site for acid excretion**: proximal tubule of the kidney
3. **Nephron site for ADH effect**: collecting tubule
4. **Nephron site for greatest generation of free water**: thick ascending limb in the medulla
5. **Compression of the thorax under water:** produces a restrictive pattern on PFTs
6. **Constriction of the efferent arteriole**: increases the GFR and decreases renal plasma flow
7. **Know Starling equation for GFR ml/min:** GFR = Kf [(P_{GC} - P_{BS}) - π_{GC}], where Kf = hydraulic conductance in ml/min . mm Hg or filtration coefficient in ml/min . mm Hg, P_{GC} = hydrostatic pressure in the glomerular capillary in mm Hg (pushes fluid out of the capillary; e.g., +45 mm Hg; it is increased if the efferent arteriole is constricted and decreased if the afferent arteriole is constricted), P_{BS} = hydrostatic pressure in Bowman's space in mm Hg (pushes fluid into the capillary; e.g., -10 mm Hg), and π_{GC} = the oncotic pressure in the glomerular capillary in mm Hg (brings fluid back into the capillary; e.g., -19 mm Hg); the net filtration is the algebraic sum of the above 3 parameters (in the above example, the net pressure would be -10 + 45 -19 = + 16 mm Hg)--fluid should move out of the glomerular capillaries;

question: what Starling force changes to produce a net ultrafiltration of zero (answer: π_{GC}, which **becomes increased** [pulls fluid back into the glomerular capillary; using the above example— 10 + 45 - 35 = 0 net pressure]; it is the only factor that does not remain constant along the length of the capillary owing to differences in protein concentration; the high π_{GC} at the end of the glomerular capillary extends into the peritubular capillaries that surrounds the nephrons and allows for the reabsorption of solutes).

8. **Filtration fraction in the glomerulus**: FF = GFR/RPF; constrict afferent arteriole, no change in FF (↓ GFR/↓ RPF), constrict efferent arteriole increases FF (↑↑ GFR/↓ RPF), increase plasma protein concentration, hence increasing π_{GC}, decreases the FF (↓ GFR/no change RPF); decreasing plasma protein concentration, hence decreasing π_{GC}, increases the FF (↑ GFR/no change RPF); constricting the ureter, decreases PBS, hence decreasing GFR and the FF without affecting RPF (↓ GFR/no change RPF)
9. **Negative charge of GBM**: heparan sulfate
10. **S1 heart sound correlates with C wave in the jugular venous pulses (C wave is closure of the tricuspid valve); know the jugular venous pulses:** see box in cardiovascular notes on physical diagnosis
11. **Carotid massage:** decreases heart rate and increases vasodilatation (carotid sinus baroreceptor innervated by the IX and Xth nerve; impulses generated in this receptor inhibit tonic discharge of the vasoconstrictor nerves and excite vagal innervation of the heart producing vasodilatation, venodilation, drop in blood pressure and heart rate, and a decrease in cardiac output)