HIGH YIELD QUESTIONS FOR USMLE

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1. **Physiologic effects of hemorrhage:** drop in diastolic blood pressure, activation of the RAA system from decreased renal blood flow and catecholamine stimulation, catecholamine release from the high pressure baroreceptors (sinus tachycardia, increased cardiac contraction, increase in peripheral resistance, stimulation of the JG apparatus, venoconstriction), increased reabsorption of sodium from the kidneys, release of atrial natriuretic peptide, release of ADH.
2. **Opportunistic infections in AIDS:** know Pneumocystis, CMV, Cryptococcus, MAI, TB, Herpes (esophagitis), Candida (thrush, esophagitis), Cryptosporidium (acid fast; diarrhea)
3. **Cocaine:** decreased uptake of DOPA and NOR; review environmental path notes
4. **Signs/symptoms of drugs of abuse:** review environmental path notes
5. **Serum protein electrophoresis interpretation:** see Table in inflammation notes; now difference between polyclonal (chronic inflammation) and monoclonal (one clone of plasma cells; monoclonal gammopathy of undetermined significance is the most common cause)
6. **Absence of Y chromosome:** germinal ridge moves in the direction of ovarian differentiation; presence of the Y chromosome → testes differentiation
7. **Know sensitivity, specificity, prevalence, incidence, predictive value of a positive and negative test, risk ratio, odds ratio, case fatality risk:** some of this is in general principles notes and the remainder in Fadem's chapter on statistics
8. **UVB light:** produces thymidine dimers, which if not replaced with normal DNA by DNA repair enzymes, may result in cancer (basal cell, squame, melanoma)
9. **ESR increase with age:** probably abnormal and indicates a disease process rather than being an age-related finding
10. **Key elements in wound healing:** granulation tissue, fibronectin
11. **Cause of death in 15-25 age bracket:** MVA; Black male in this age bracket is homicide
12. **Xeroderma pigmentosum:** AR disease with absent DNA repair enzymes and increased incidence of UVB-related skin cancers
13. **Cytochrome oxidase:** inhibited by CO and cyanide
14. **Chronic granulomatous disease of childhood:** SXR disease, absent NADPH oxidase, absent respiratory burst, cannot kill catalase positive *S. aureus* but can kill catalase negative streptococci
15. **Picture of coagulation necrosis** in an acute myocardial infarction
16. **Cause of atrophy in a muscle** in a cast: lack of muscle stimulation
17. **Mosaicism:** non-disjunction in somatic cells
18. **Calculate the reference interval of the test given the mean of the test and 1 SD:** remember to double the SD, since 2 SD covering 95% of the normal population is used
19. **Factors altering the oxygen dissociation curve:** left and right shift; see cell injury notes or Harvey Champ biochemistry book
20. **Mitochondrial inheritance:** mother gives the disease to all her kids but her married son to none of his kids
21. **MC vitamin deficiency in alcoholics:** folate
22. **MC metal deficiency in alcoholics:** magnesium
23. **Vitamin associated with pyruvate dehydrogenase:** thiamin
23. **Always determine the genetic sex of a child with ambiguous genitalia**
25. **Respiratory burst:** NADPH oxidase conversion of molecular oxygen into superoxide free radicals; neutrophils and monocytes only
26. **In caisson disease, what is decreased when a diver comes up too quickly:** PN_2 in blood, since it forms bubbles in the vessels and moves into tissue
27. **Clear cell adenocarcinoma of vagina:** DES exposure; vaginal adenosis is the precursor
28. **What happens to the other kidney if one is damaged:** it undergoes hypertrophy
29. **Vitamin E toxicity:** decreases the levels of the vitamin K dependent factors; increased incidence of hemorrhagic strokes; potentiates the action of warfarin
30. **Biotin reaction:** carboxylase reaction in the conversion of pyruvate to oxaloacetate
31. **Cherry red macula:** Tay Sach disease
32. **Know how to interpret pedigree for all of the inheritance patterns:** review genetics notes
33. **Pyridoxine (B6):** transamination reactions involving the transaminases AST and ALT
34. **Know how to interpret ABGs:** see fluid and hemodynamic notes and examples in tables

35. **Functions of atrial natriuretic peptide:** opposite of angiotensin II– inhibition of ADH release, inhibits ATII effect on stimulating thirst, inhibits aldosterone secretion, inhibits renal reabsorption of Na (direct effect; loss of sodium in the urine), and inhibits renin release;
vasodilatation of the peripheral resistance vessels
36. **Disorders associated with smoking and alcohol:** see environmental pathology notes
37. **Chance of a male with cystic fibrosis having a child:** <5%, since the vas deferens never fully develop or are atretic; females with CF can get pregnant but it is difficult owing to the thick cervical mucus
38. **Vitamin supplements in CF:** all of the fat soluble vitamins
39. **Women is a pure vegan and is breast feeding her baby and the baby develops anemia:** B_{12} deficiency.
40. **EBV attaches to CD_{21} molecule in B cells**
42. **Hypogonadism, mental retardation, and unilateral gynecomastia:** Klinefelter syndrome
43. **Hypogonadism and color blindness:** Kallmann syndrome (absent GnRH)
44. **Hypogonadism, mental retardation, retinitis pigmentosum:** Laurence-Moon-Biedl syndrome
45. **Male with hypogonadism, mental retardation, short stature, and webbed neck:** Noonan syndrome (similar to a Turner's syndrome)
46. **Hypogonadism and anosmia (lack of smell):** Kallmann syndrome
47. **Male pseudohermaphrodite with cryptorchidism:** testicular feminization (absent androgen receptors; SXR; most common cause of male pseudohermaphroditism)
48. **Microdeletion syndrome with hypogonadism, mental retardation, short stature, and obesity:** Prader-Willi syndrome (chromosome 15 deletion is of paternal origin); Angelman syndrome deletion is of maternal origin
49. **Patient with neurofibromatosis has severe diastolic hypertension:** probable pheochromocytoma
50. **Complications of cyclophosphamide:** hemorrhagic cystitis and transitional carcinoma of the bladder
51. **Decline in deaths due to SIDS is attributed to:** having the baby sleep supine (babies rebreathe their own CO_2; those with immature central chemoreceptors do not respond to the respiratory acidosis by moving their heads and die)
52. **Most important risk factor for increased morbidity/mortality in a single 25 year old Black male:** unprotected sex (AIDS #1 killer in this age bracket; also applies to women regardless of age, but not white men, where MVAs are the #1 killer)
53. **Several employees that work in a car assembly plant present with headache, nausea, vomiting, muscle weakness, and abdominal cramps:** lead poisoning from incineration of batteries; may change the history to people making moonshine in an old car radiator
54. **Newborn female presents with edema of the hands and feet and a cystic mass in the neck:** Turner's syndrome with a 45 XO karyotype
55. **Compared to mature breast milk, cow's milk has:** more vitamin K, less ascorbic acid, more vitamin B_{12}, more casein (breast milk has low iron but it is better absorbed; casein is the key protein in cow's milk, while whey is the primary protein in breast milk)
56. **Vitamin that is absent in colostrum:** vitamin D
57. **Anemia in an infant that develops when switched from cow's milk to goat's milk:** goat's milk is low in folate, B6, iron, and high in potassium, chloride, arachidonic acids, and linoleic acids when compared to cow's milk
58. **Type of UV light with the greatest potential for producing a corneal burn (e.g., snow skiing):** UVB (UVB is also the culprit for cancer; B is bad)
59. **Retinal hemorrhages in young children:** possible child abuse (shaking syndrome)
60. **Patient is stung by a bee and begins to have respiratory difficulty, flushing, and abdominal cramping–?treatment:** aqueous epinephrine 1:1000 sc. (0.01 mL/kg sc. or IM)
61. **Fire ant bites:** multiple wheals that later develop into vesicles, and pustules
62. **Black widow bite:** painful bite (carrying some logs from outside, moving boxes in a basement) followed by crampy pain in the thighs and abdomen (Rx with muscle relaxant [calcium gluconate is excellent], tetanus prophylaxis, antivenin if available in severe cases)
63. **Poisonous type of scorpion bite in Southwest:** painful sting followed by local itching, paresthesias, nausea and vomiting and hypertension
64. **Brown recluse spider bite:** painless bite beginning with a slightly tender red papular lesion on the arm that latter forms a hemorrhagic blister surrounded by purpura
65. **Chigger bites:** extremely pruritic discrete, bright red papules on legs and around the waist
66. **Child who ingests 30 adult aspirins will most likely develop:** an increased anion gap metabolic acidosis (children, unlike adults, do not commonly develop a mixed metabolic acidosis and respiratory alkalosis. Rx is to perform gastric lavage and add activated charcoal and to produce an alkaline urine for increased excretion of the acid)
67. **What disease is more likely to infect the fetus after the first trimester:** syphilis
68. **Engineer driving a train involved in a crash with an oncoming train was found to have THC metabolites in his urine–why did this occur:** a delayed reaction time (it also impairs the ability to judge speed and distances)
69. **Angiosarcoma of the liver–causes:** vinyl chloride, arsenic, Thorotrast

70. **Know adrenal steroid synthesis and test results for adrenogenital syndrome:** see genetics notes

Abnormality	21-hydroxylase deficiency	11-hydroxylase deficiency	17-hydroxylase deficiency
Ambiguous genitalia male	No	No	Yes (female appearing; no male hormones); male pseudohermaphrodite
Ambiguous genitalia female	female pseudoherm-aphrodite	female pseudoherm-aphrodite	No
Salt loser with volume depletion	Yes	No	No
Salt retention with hypertension	No	Yes	Yes
Plasma ACTH	Increased	Increased	Increased
Hypocortisolism	Yes	Yes	Yes
Urine 17-ketosteroids	Increased	Increased	Decreased
Urine 17-hydroxycorticoids	Decreased	Increased	Decreased

71. **Know all the teratogens and congenital infections:** see genetics notes

72. **Know the common age-dependent changes:**

System	Age Dependent	Age Related
Cardiovascular	Loss of elasticity of the aorta	Atherosclerosis, coronary atherosclerosis (50% asymptomatic), ischemic heart disease, temporal arteritis, aortic stenosis.
Respiratory	Findings resemble obstructive lung disease: overinflation of the lungs ("senile emphysema"), decreased elasticity, decreased FEV 1 sec, increased functional residual capacity, decreased PaO_2	Cancer and pneumonia.
Musculoskeletal	Osteoarthritis	Osteoporosis and fractures (vertebral most common), rheumatoid arthritis, Paget's disease.
Central nervous system/Special senses	Cataracts, presbycusis (inner ear degeneration), otosclerosis (conductive hearing loss), decreased smell and taste, arcus senilis.	Dementia (Alzheimer's disease, multi-infarct and others), cerebral atrophy, transient ischemic attacks, Parkinson's disease, subdural hematoma, stroke.
Immune system	Increased CD4 and decreased CD8 T cells, increased synthesis of autoantibodies, decreased cellular immunity.	Increased incidence of monoclonal gammopathy of undermined significance, increased incidence of multiple myeloma, increased susceptibility to influenza.
Integument	Loss of skin elasticity, increased cross bridging of collagen, increased body fat, ecchymoses from vessel instability (senile purpura; mainly on hands), decreased skin turgor (tenting of the skin when pinched).	Increased incidence of ultraviolet light induced skin cancers (actinic keratosis [precursor for squamous cell carcinoma], basal cell carcinoma [most common skin cancer] and squamous cell carcinoma. Increased incidence of seborrheic keratosis (pigmented lesions).
Reproductive	Breast and vulvovaginal atrophy, decreased serum estrogens and increased gonadotropins, testicular atrophy with decreased testosterone levels, prostate hyperplasia/cancer.	Increased incidence of cancers of the vulva, vagina, cervix, endometrium, ovary, breast, spermatocytic seminoma and malignant lymphoma of the testis (metastatic).
Renal	Decreased glomerular filtration rate (40% drop) and creatinine clearance (important in dosing drugs properly to avoid toxicity).	Increased incidence of renal adenocarcinoma and renovascular hypertension secondary to atherosclerosis.
Endocrine	Increased carbohydrate intolerance (less insulin receptors from increased adipose).	Type II diabetes.

73. **Target organs for acetaminophen injury:** liver and kidneys (renal medulla); free radical injury

74. **Low AFP:** Down syndrome

75. **Corticosteroids:** block phospholipase A_2 hence decreasing prostaglandin and leukotriene production; decrease leukocyte adhesion (increase neutrophils, decrease lymphocytes and eosinophils)

76. **Ectopic hormone relationships:**

Ectopic hormone	Tumor (s)	Syndrome (s)
ACTH	Most common ectopic secretion ("big" ACTH). Small cell carcinoma of lung, medullary carcinoma of thyroid.	Cushing syndrome (hyperpigmented)
ADH	Small cell carcinoma of lung.	Dilutional hyponatremia
β-hCG	Trophoblastic tumors: benign (hydatidiform mole and invasive mole), malignant (choriocarcinoma). Germ cell tumors of ovary and testes.	Gynecomastia (β-hCG is an LH analogue), hyperthyroidism (similar to TSH), precocious puberty in children.
Calcitonin	Medullary carcinoma of thyroid.	Hypocalcemia.
Erythropoietin	Renal adenocarcinoma, Wilm's tumor, hepatocellular carcinoma, Lindau von Hippel disease (cerebellar hemangioblastoma, renal adenocarcinoma), kidney lesions (cysts, hydronephrosis), large uterine leiomyomas producing hydronephrosis.	Secondary polycythemia (normal PaO_2, ↑ RBC mass, normal plasma volume).
Insulin-like	Hepatocellular carcinoma, retroperitoneal tumors.	Hypoglycemia.
PTH-like Peptide	Squamous carcinoma of lung, renal adenocarcinoma, breast cancer, ovarian cancer.	Hypercalcemia (low PTH)
Serotonin	Carcinoid syndrome due to metastatic small bowel carcinoid to liver, small cell carcinoma of lung, bronchial carcinoid, medullary carcinoma of thyroid.	Carcinoid syndrome: flushing, diarrhea, valvular lesions: tricuspid insufficiency and pulmonic stenosis.

77. **Tumor markers:**

Tumor Marker	Product and Cancer Association (s)
AFP	Gene product (oncofetal antigen). Hepatocellular carcinoma, germ cell tumors: yolk sac or endodermal sinus tumors of testicle or ovary. testicular/ovarian cancer
AAT	Enzyme. Hepatocellular carcinoma, yolk sac or endodermal sinus tumors of testicle or ovary.
β-hCG	Hormone. Trophoblastic tumor in germ cell tumors of ovary/testis and placenta: benign (hydatidiform and invasive moles), malignant (choriocarcinoma).
β2-microglobulin	Protein. Multiple myeloma (excellent prognostic factor). Light chains in urine (Bence Jones protein).
Bombesin	Peptide. Small cell carcinoma of lung, neuroblastoma.
CA 15-3	Glycoprotein (cancer antigen). Breast cancer.
CA 19-9	Glycoprotein (cancer antigen). Pancreatic cancer (excellent marker)
CA 125	Glycoprotein (cancer antigen). Surface derived ovarian cancer.
CEA	Gene product (oncofetal antigen). Colorectal, pancreatic, breast and small cell cancer of lung. Bad prognostic sign if elevated preoperatively (greater incidence of undetected metastasis).
LDH	Enzyme. Marker of Hodgkin's disease. Non-specific tumor marker in general.
Neuron Specific Enolase (NSE)	Enzyme. Small cell carcinoma of lung, neuroblastoma.
PSA	Glycoprotein. Prostate adenocarcinoma. Excellent sensitivity but poor specificity (increased in prostate hyperplasia). Excellent indicator of tumor burden. Not increased after rectal exam.

78. **Precursors/risk factors for all the major cancers:** see table in the neoplasia notes

79. **Carcinogenic viruses:**

Oncogenic RNA Viruses	Tumor (s)	Oncogenic DNA Viruses	Tumor (s)
HTLV-1	Adult T cell leukemia/ lymphoma	HBV	Hepatocellular carcinoma (aflatoxin B a cocarcinogen)
HTLV-2	Hairy cell leukemia	EBV	Burkitt's lymphoma, nasopharyngeal carcinoma, polyclonal malignant lymphoma
HIV	CNS malignant lymphoma	HPV (HSV-2 may act as a cocarcinogen)	Squamous carcinoma of the cervix, vagina, vulva, and anus in homosexuals. Laryngeal papillomas (may progress to cancer)
HCV	Hepatocellular carcinoma	HSV- 8	Kaposi's sarcoma

80. **Know functions of testosterone and dihydrotestosterone in fetal development of a male:** see genetics notes
81. **EM of zebra bodies in lysosomes in Niemann Pick disease:** zebra bodies look like lamellar bodies in type II pneumocytes
82. **Enamel injury in young woman:** bulimia; metabolic alkalosis from vomiting; Boerhaave's syndrome
83. **Anorexia nervosa:** secondary amenorrhea (<15% of ideal body weight; decreased GnRH and gonadotropins), distorted body image, osteoporosis, ventricular arrhythmia most common cause of death
84. **Kwashiorkor:** decreased protein intake but normal total caloric intake (all CHO); fatty liver from decreased apolipoproteins; pitting edema; flaky paint dermatitis
85. **Marasmus:** decreased total caloric intake; loss of muscle mass
86. **Vitamin A deficiency:** squamous metaplasia in eyes, bronchus; nyctalopia
87. **Vitamin A toxicity:** increased intracranial pressure; hypercalcemia
88. **Primary hypothyroidism:** β-carotenemia from decreased conversion of β-carotenes into retinoic acid in the intestine (thyroxine is a cofactor); patient is yellow but for the eyes
89. **Vitamin D metabolism:** see nutrition notes; know this very well

90. **Rickets vs osteomalacia in adults:** craniotabes and rachitic rosary in rickets, not osteomalacia; both have an increase in unmineralized osteoid
91. **Vitamin E deficiency:** cerebellar dysfunction; hemolytic anemia; **toxicity:** interferes with vitamin K dependent factors leading to a hemorrhagic diathesis
92. **Vitamin C deficiency:** teeth bleed when brushed; glossitis; perifollicular hemorrhages; **tea and toast** diet
93. **Thiamin deficiency:** alcohol abuse most common cause (poor nutrition); important biochemical reactions: pyruvate dehydrogenase, transketolase, ketoglutarate dehydrogenase; Wernicke (confusion, ataxia, nystagmus)-Korsakoff (antegrade and retrograde memory deficits); ring hemorrhages in mamillary bodies and periventricular area; high output failure; congestive cardiomyopathy; peripheral neuropathy
94. **Niacin deficiency:** important biochemical reactions: NAD/NADH, NADP/NADPH; pellagra; tryptophan can be used to synthesize niacin (tryptophan decreased in Hartnup's disease, carcinoid syndrome [converted into serotonin], corn diet); diarrhea, dermatitis (hyperpigmentation), dementia
95. **Riboflavin deficiency:** important biochemical reactions: FMN and FAD reactions, synthesis of glutathione; magenta tongue, neovascularization of cornea, angular stomatitis
96. **Pyridoxine deficiency:** INH most common cause; important reactions: transaminase, heme synthesis (sideroblastic anemia with ringed sideroblasts), neurotransmitter synthesis; absent in goat's milk
97. **Pantothenic acid:** important in fatty acid synthase complex; coenzyme reactions
98. **Biotin deficiency:** avidin in raw eggs binds the vitamin; alopecia
99. **Trace metals and their deficiencies:**

Trace Element	Functions	Clinical Disorders
Chromium	Part of the glucose tolerance factor, which potentiates insulin activity.	**Deficiency associated with:** Glucose intolerance Peripheral neuropathy.
Copper	Copper is a cofactor in many enzymes that are involved in oxidation-reduction reactions that bind and directly react with oxygen. Plasma levels are normally increased in pregnancy, inflammation, and with birth control pills. It is bound to ceruloplasmin, which is synthesized in the liver. It is a cofactor for the following enzymes: **Lysyl oxidase:** forms cross-links in collagen and elastic tissue to increase tensile strength. Cytochrome c oxidase: electron-transport system. **Superoxide dismutase:** antioxidant that neutralizes oxygen free radicals. **Ferroxidase:** converts iron to +3 so it can bind to transferrin. **Tyrosinase:** conversion of tyrosine to DOPA in melanin synthesis.	**Deficiency associated with:** Microcytic hypochromic anemia (cannot bind to transferrin). Skeletal abnormalities (defective collagen): osteoporosis. Skin depigmentation (problem with tyrosinase). Dissecting aortic aneurysms (defective collagen and elastic tissue). Mencke's kinky hair syndrome: rare sex-linked recessive disease with impaired utilization of copper. **Toxicity associated with:** **Wilson's disease**: an autosomal recessive disease with a defect in the excretion of copper into bile. It leads to liver damage and eventual deposition of free copper into the eye (Kayser-Fleischer ring) and lenticular nuclei in the brain. Total copper levels are decreased owing to a decrease in ceruloplasmin synthesis by the damaged liver, but free copper levels are increased.
Selenium	Selenium primarily functions in the metalloenzyme glutathione peroxidase, which is an anti-oxidant that destroys peroxides in the cytosol. It neutralizes peroxides in the cytosol, while vitamin E prevents peroxide formation in the membranes of cells. It inhibits DNA synthesis and stimulates the immune system. It is an enzyme cofactor in the peripheral conversion of T4 into T3.	**Deficiency associated with:** Muscle pain and weakness cardiomyopathy.
Zinc	Cofactor in superoxide dismutase, carbonic anhydrase, alkaline phosphatase, collagenases, RNA and DNA polymerases, thymidine kinase, alcohol dehydrogenase.	**Deficiency associated with:** **Growth retardation** **Hypogonadism and infertility** **Decreased taste (dysgeusia)** Rash around the eyes and mouth Poor wound healing Impaired cellular immunity. Deficiency is common in diabetics, alcoholics, and cirrhosis. **Acrodermatitis enteropathica** is a recessive disease characterized by decreased intestinal absorption of zinc.

100. **Goat's milk:** vitamin B6 (pyridoxine) and folate deficiency
101. **Functions of vitamin C:** reduce dietary iron from ferric to ferrous for reabsorption; hydroxylation of proline and lysine (binding site for cross-bridges); prevents nitrosamination; reduces metHb back to reduced Hb

102. **Cyanosis not relieved by oxygen in a patient coming home from a camping trip: methemoglobinemia (water has** nitrites that oxidized iron to ferric condition); SaO_2 not PaO_2 is decreased; methylene blue treatment of choice; ascorbic acid has an ancillary role
103. **Picture of child with fetal alcohol syndrome**
104. **Newborn:** high Hb due to increase in HbF
105. **HbF:** left shifts ODC, protects newborns with sickle cell disease and severe β-thalassemia, increased with hydroxyurea, resistant to alkali/acid denaturation
106. **Raising the upper limit of normal of a test:** increases specificity and predictive value of a positive test; decreases sensitivity and predictive value of a negative test result
107. **Prevalence:** Prevalence (number of people with disease in the population studied) = Incidence (number of new cases over a period of time) x Duration of the disease
108. **Picture of adrenal cortex:** what part is atrophied in a patient on corticosteroids: fasciculata and reticularis, not the glomerulosa where aldosterone is
109. **Apoptosis:** individual cell necrosis; normal involution of structures (atrophy, thymus), programmed cell death, loss of Mullerian structures in males and Wolffian structures in females, Councilman (acidophilic) bodies, psammoma bodies, mechanism of atresia in the bowel (no lumen)
110. **Paraneoplastic syndromes:** ectopic hormones, hypercalcemia (PTH-like peptide from primary squamous carcinoma of the lung, renal adenocarcinoma), acanthosis nigricans (stomach cancer), Eaton-Lambert syndrome (myasthenia-like; small cell carcinoma), polymyositis (lung cancer)
111. **Oncogenesis in HPV:** gene products E6 and E7 in HPV infections inhibit p53 suppressor gene leading to cancer
112. **Metalloenzyme that aids tumor invasion of tissue:** collagenase with Zn as a cofactor
113. **Smoker with history of peptic ulcer disease--? advice:** stop smoking
114. **Normal karyotype in a child with Down syndrome:** probable translocation with chromosome 21 sitting on top of chromosome 14, or an acrocentric (Robertsonian) translocation of chromosome 21
115. **Sepsis in a elderly man with benign prostatic hyperplasia:** usually *E. coli* and can produce endotoxic shock (warm shock due to activation of complement system and release of anaphylatoxins + release of nitric oxide from damaged endothelial cells)
116. **DNA repair defects:** Fanconi's anemia (cross-linking agents)
117. **Effect of barbiturates and other drugs that enhance the liver cytochrome system:** it will decrease heme and increase activity of ALA synthase, the rate limiting enzyme in heme synthesis; dangerous in precipitating porphyric attacks
118. **Genomic imprinting:** did chromosome come from mother or father; e.g., chromosome 15 microdeletion syndromes--Prader Willi and Angelman's syndrome
119. **Normal changes in pregnancy:** greater increase in plasma volume than RBC mass leading to decreased Hb, increased GFR and CCr, decreased BUN, creatinine, and uric acid; increased alkaline phosphatase; respiratory alkalosis from progesterone effect; increased T4 and cortisol from increased synthesis of their binding proteins (free hormone normal)
120. **Main difference in adult male and female:** iron studies all lower in females
121. **Children:** increased alkaline phosphatase (osteoblasts from bone growth) and phosphate, slight decrease in Hb
122. **Analytes increased with hemolyzed blood sample:** LDH, potassium
123. **Lipid most affected by fasting:** triglyceride component coming from chylomicrons; CH and HDL not affected
124. **Enhance cytochrome system in the SER of the liver:** alcohol, barbiturates; increase in serum GGT; decreased drug levels from increased metabolism
125. **Inhibit cytochrome system:** H_2 blockers, proton blockers; danger of drug toxicity
126. **First sign of tissue hypoxia:** swelling of cell from inactive Na/K ATPase pump
127. **Fatty liver:** most commonly due to alcohol
128. **Examples of growth alterations:** atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia; see tables in cell injury notes
129. **Examples of cell accumulations:** melanin, iron, calcium (dystrophic, metastatic), glycogen, bilirubin products: see tables in cell injury notes
130. **Cell cycle:** know parts of the cell cycle, role of p53 suppressor gene in inhibiting kinases, drugs that block specific areas of the cycle; see cell injury notes
131. **Free radicals:** superoxide, OH, peroxide, drugs [acetaminophen, CCL_4]); iron increases FR formation
132. **Types of cell necrosis:** coagulation (infarction; exception CNS), liquefactive (infections, brain infarct or infection), caseous (systemic TB and atypical TB, systemic fungi; all the rest are non-caseating), enzymatic fat necrosis (acute pancreatitis), fibrinoid (necrosis of immunologic injury; small vessel vasculitis, vegetations in RHD and Libman-Sacks), gummatous (tertiary syphilis): see cell injury notes
133. **Chemical mediators of inflammation:** histamine, C3a, C3b, C5a, LTB_4, LTC-D-E_4, bradykinin, prostaglandins; see table in inflammation notes
134. **Factors increasing and decreasing adhesion molecule synthesis:** increase: C5a, LTB4, endotoxins, IL-1, TNF; decrease: catecholamines, corticosteroids, lithium
135. **Recognize a granuloma (circumscribed, red, contain multinucleated giant cells):** example of type IV hypersensitivity; macrophages when activated become epithelioid cells and fuse into multinucleated giant cells

136. **Key factors in wound healing:** role of fibronectin and granulation tissue; factors interfering with healing (infection most common)
137. **Types of inflammation:** suppurative (abscess), cellulitis (streptococcus), granulomatous (TB), pseudomembranous (diphtheria, *C. difficile*), fibrinous (pericarditis), serous (blister)
138. **Important suppressor genes:** p53 (most cancers; chromosome 17), APC (familial polyposis; chromosome 5), BRCA-1 (breast/ovarian cancer; chromosome 17), BRCA-2 (breast cancer; chromosome 13), NF-1 and -2 (neurofibromatosis), Rb (retinoblastoma; chromosome 13)
139. **Fragile X syndrome:** SXR disease; most common genetic cause of mental retardation in **males** (Down syndrome most common overall); **triplet repeat; macroorchidism** at puberty
140. **Cri-du-chat:** deletion of short arm of chromosome 5; mental retardation, cry like a cat, relation with VSD
141. **Marfan's syndrome:** AD; fibrillin defect in elastic tissue; MVP with sudden death; dissection most common cause of death; dislocated lens; homocystinuria is similar (AR disease; differences are mental retardation, vessel thrombosis from increase in homocysteine)
142. **Neurofibromatosis:** AD; brain tumors: meningioma, acoustic neuroma, pheochromocytoma, cafe au lait, Lisch nodules (hamartomas in iris)
143. **Von Hippel Lindau:** AD; cerebellar hemangioblastomas; pheochromocytoma; renal adenocarcinoma (high incidence)
144. **Congenital malformations:** see genetics notes; alcohol number 1 teratogen
145. **Oncogene relationships: erb-B2/neu [HER-2]** codes for a growth factor receptor: breast, ovarian and colon cancer (erb B2); **ras** codes for membrane associated GTP-binding proteins (G proteins) that transduce signals received from growth factor receptors to the phosphatidyl inositol second messenger system: ~30% of all human cancers including cancers of the lung, colon and pancreas as well as leukemia (20-25% of acute myelogenous leukemia); **abl** produces non-receptor proteins located on the inner cell membrane surface: t9;22 translocation leads to chronic myelogenous leukemia; **c-myc** is located in the nucleus and produce protein products that activate nuclear transcription: t8;14 translocation leading to Burkitt's lymphoma; **N-myc**: neuroblastoma; **ret**: MEN IIa and IIb; **bcl-2: t14;18** translocation leads to inactivation of apoptosis gene on B cells leading to immortal cell (no longer programmed to die) and follicular B cell lymphoma
146. **Grade of cancer (histologic appearance of tumor):** well differentiated [low grade] if you can tell what its origin is; poorly differentiated [high grade, anaplastic] if you cannot tell its tissue of origin
147. **Stage of cancer:** T = tumor size, N = nodal metastasis, M = other metastatic sites; more important than grade
148. **Tumor nomenclature:** carcinoma (squamous, adeno-, transitional), sarcoma (mesenchymal origin), hamartoma (not neoplastic; bronchial hamartoma, PJ polyp, hyperplastic polyp), choristoma (not neoplastic, normal pancreas in stomach wall), mixed tumor (parotid salivary gland tumor; 2 tissues from same cell layer), teratoma (tissues from ecto-, endo-, and mesoderm; cystic teratoma of ovary with teeth and hair); review first part of neoplasia notes
149. **Increased AG metabolic acidosis ($AG = Na - [Cl + HCO_3) = 12 +/- 4$ mEq/L):** adding an acid and the anion of the acid replaces the bicarbonate used to buffer the hydrogen ions; e.g., lactate, acetoacetate, β-hydroxybutyrate, phosphate/sulfate (renal failure), salicylate, formate (methanol poisoning), oxalate (ethylene glycol poisoning), acetate (paraldehyde)
150. **Normal AG metabolic acidosis:** losing bicarbonate and bicarbonate is replaced by an equal number of Cl anions, hence the normal AG; type I renal tubular acidosis (distal): aldosterone mediated proton pump in collecting duct is dysfunctional (cannot secrete H ions, which combine with Cl ions to form HCl; cannot regenerate bicarbonate; urine pH >5.5); type II (proximal): lower threshold for bicarbonate reclamation (~15 mEq/L), hence bicarbonate is lost in the urine until the serum bicarbonate is 15 mEq/L, then bicarbonate can be reclaimed (initially urine pH >5.5, but when equilibrium is reached between the threshold and the serum bicarbonate level, the urine pH <5.5); diarrhea: lose sodium, potassium, and bicarbonate, the latter replaced by chloride
151. **Acute transplant rejection:** within 3 months; predominantly cellular immune reaction (type IV; CD_8 cytotoxic T cells; parenchymal damage) and smaller humoral component (vessel damage with fibrosis)
152. **Chemical carcinogens:**

Carcinogen	Tumor (s)	Carcinogen	Tumor (s)
Aniline dyes	Transitional cell carcinoma of bladder, ureters, renal pelvis	**Polycyclic hydrocarbons** (tobacco smoke). **Alcohol is cocarcinogen** for oral, esophageal and laryngeal cancers	**Small cell carcinoma of lung; squamous cancers of oral cavity, esophagus, larynx, lung, cervix; transitional carcinoma of bladder; adenocarcinoma of pancreas**
Benzidine	Transitional cell carcinoma of bladder, ureters, renal pelvis	Chromium	Lung cancer
Cyclophosphamide	Transitional cell carcinoma of bladder, ureters, renal pelvis	**Nickel**	**Lung, nasal cavity cancer**
Phenacetin	Transitional cell carcinoma of bladder, ureters, renal pelvis	**Uranium (radon gas)**	**Lung cancer**
Vinyl chloride	**Angiosarcoma of liver**	Woodworking	Nasal cavity cancer

Thorotrast	Angiosarcoma of liver, hepatocellular carcinoma	**Chewing tobacco**	Verrucous carcinoma in mouth
Arsenic	**Angiosarcoma of liver**, squamous carcinoma of skin, lung cancer	**Alkylating agents**	**Acute leukemia**, malignant lymphoma
Asbestos	**Primary lung cancer if a smoker (co-carcinogen with smoking), mesothelioma if a non-smoker (no relation to smoking)**	**Benzene**	**Acute leukemia**
Oral contraceptives	**Liver cell adenomas, hepatocellular carcinoma**	**Diethylstilbestrol**	**Clear cell adenocarcinoma of cervix and vagina**
Aflatoxins (Aspergillus flavus; cocarcinogen with HBV)	**Hepatocellular carcinoma**	**Nitrosamines** (inhibited by ascorbic acid and refrigeration)	**Esophageal and gastric cancers**
Cadmium	Prostate cancer, lung cancer	Tars, soots, oils	Squamous carcinoma of skin (scrotum in chimney sweeps)

153. **Metastasis:** carcinomas: lymphatic to regional nodes (subcapsular sinus), vessel invasion (uncommon; exceptions follicular cancer of thyroid, renal adenocarcinoma, hepatocellular carcinoma), seeding (ovarian cancers); sarcomas: primarily vascular (lung and bone); tumor cells bind to adhesion molecules on the endothelial surface and bind to fibronectin and laminin receptors when infiltrating through tissue
154. **ESR:** increased in acute/chronic inflammation and monoclonal gammopathies, best initial screen for temporal arteritis, zero sed rate in HbSS disease and polycythemias
155. **SiADH:** small cell carcinoma of the lung, any CNS injury, any pulmonary infection, chlorpropamide; hyponatremia (<120 mEq/L), increased sodium in urine, Uosm greater than Posm (concentrating urine), no pitting edema (TBW increased but not TBNa); restrict water not salt; use demeclocycline if patient has a small cell cancer since the drug produces a nephrogenic DI and allows the patient to drink water
156. **Primary aldosteronism (Conn syndrome):** benign adenoma in zona glomerulosa; low renin hypertension, no pitting edema (escape mechanism from block of proximal reabsorption of sodium), severe hypokalemia (muscle weakness, U waves on ECG), metabolic alkalosis (possible tetany from low ionized calcium), normal to increased serum sodium
157. **Cancer incidence mortality and incidence in males and females in descending order:** mortality due to cancer in males: lung, prostate, **colorectal**; mortality due to cancer in females: lung, breast, **colorectal**; cancer incidence (new cases per year, not mortality) in males: prostate, lung, **colorectal**; cancer incidence in females: breast, lung, **colorectal**; NOTE: colorectal second most common cause of cancer death in both males and females (greater than the sum of prostate and breast cancer)
158. **Cancers decreasing in incidence:** stomach, cervical (Pap smear), endometrial (Pap smear, biopsy with bleeding)
159. **Cancers increasing in incidence:** breast (mammography), prostate (PSA screen), colorectal, pancreas, malignant lymphoma, malignant melanoma (most rapidly increasing cancer in the world), multiple myeloma; cancer more common in blacks than whites
160. **Gynecologic cancers in order of decreasing incidence and mortality:** incidence: **endometrial**, ovarian, cervical; mortality: ovarian, cervical, **endometrial**
161. **Metastasis more common than primary cancer:**

Organ	Most common primary site	Most common primary cancer of the organ
Lymph node	Breast	Non-Hodgkin's lymphoma
Lung	Breast	Adenocarcinoma
Bone	Breast	Multiple myeloma
Liver	Lung	Hepatocellular carcinoma
Adrenal	Lung	Adenocarcinoma
Brain	Lung	Glioblastoma multiforme

162. **Smoking + alcohol:** have synergistic effect on producing cancers of the oral cavity, esophagus, larynx
163. **Birth control pills protect against:** gonorrhea not Chlamydia, ovarian cancer
164. **Birth control pill adverse effects:** see environmental path notes
165. **CO poisoning:** necrosis of the globus pallidus; Parkinson's; SaO_2 decreased, PaO_2 normal; left shift ODC; inhibit cytochrome oxidase
166. **Respiratory acidosis:** increase $PaCO_2$, decrease PaO_2 and SaO_2
167. **Anemia:** normal PaO_2 and SaO_2 but decreased Hb concentration
168. **Normal O_2 content (1.34 [Hb] x SaO_2 + PaO_2):** cyanide poisoning, ischemia, uncoupling of oxidative phosphorylation
169. **Dystrophic calcification:** normal serum calcium/phosphate but deposit of calcium into damaged tissue: atherosclerotic plaques, enzymatic fat necrosis, periventricular calcification in CMV
170. **Metastatic calcification:** increased serum calcium and/or phosphate with deposition of calcium in normal tissue: nephrocalcinosis in primary hyperparathyroidism, calcification of basal ganglia in primary hypoparathyroidism (high phosphorous)

171. **Cell cycle:** p53 suppressor gene produces a protein product that has an inhibitory effect on the kinases that control the movement from one phase to the next in the cell cycle
172. **Labile cells:** contain stem cells; bone marrow stem cells, skin (stratum basalis), intestine (base of the glands)
173. **Stable cells:** in Go phase and must be stimulated to go into the G1 phase (e.g., hormones); most parenchymal cells in organs; smooth muscle; astrocytes and other neuroglial cells
174. **Permanent cells:** cannot enter the cell cycle; skeletal and cardiac muscle; neurons
175. **Most common bone metastasized to:** vertebra; due to the Batson vertebral plexus which communicates with the vena cava.

Systemic Pathology Questions

1. **Cause of Pneumococcus infection in HbSS:** autosplenectomy or functional asplenia
2. **Vessels in esophageal varices:** left gastric and azygous veins
3. **Congenital adhesion molecule (integrins) defect: failure of the umbilical cord to separate at birth;** no adhesion of neutrophils to the endothelial cells, no inflammatory cells in the umbilical stump
4. **Mechanism of spread of *Cryptococcus neoformans*:** hematogenous route; most common cause of meningitis in AIDS and other immunocompromised states
5. **Diagnosis of rotavirus infection:** Rotazyme test of stool; ELISA test with antibodies against the virus
6. **Normal times for gynecomastia:** newborn, puberty, old age; NOTE: it may be unilateral (picture of a young boy with unilateral breast enlargement)
7. **Treatment of astrocytoma:** radiation
8 **Absence seizures:** abrupt onset of impaired consciousness (stare into space); **3-Hz spike** and wave activity on EEG, ethosuximide treatment of choice
9. **Achalasia:** absent myenteric ganglion (Hirschsprung: both submucosal [Meissner's] and myenteric plexus [Auerbach's] are missing)
10. **Aortic aneurysm:** hoarseness from stretching of the left recurrent laryngeal nerve
11. **Sjogren's syndrome:** dry mouth and eyes due to destruction of the minor salivary glands and lacrimal glands
12. **Mitochondrial DNA disorder:** mother gives the disease to all of her children; affected males do not give the disease to their children, since the mitochondria are lost in the tail of the sperm after fertilization.
13. **FSH and LH are increased with removal of the ovaries or testes**
14. **Diabetes insipidus:** hypernatremia, very dilute urine, thirsty, polyuria (absence of concentration), CDI corrected with vasopressin, NDI not corrected with vasopressin
15. **Adult polycystic kidney disease (APKD):** relation to CNS berry aneurysms and subarachnoid hemorrhage
16. **MCC of rabies in USA:** skunk bites (not bats, dogs, or raccoons)
17. **Treatment of pseudomembranous colitis:** metronidazole (cheaper than oral vancomycin)
18. **Treatment of CMV retinitis in AIDS if ganciclovir does not work:** foscarnet (renal toxicity)
19. **Primary treatment of CMV retinitis:** ganciclovir; retinitis most common cause of blindness in AIDS
20. **ERA and PRA positive breast cancer:** use tamoxifen, an anti-estrogen, protects against CAD and osteoporosis, can produce endometrial cancer
21. **Next step if there is a positive RPR in a patient with SLE:** do an FTA-ABS to rule out a true from a false positive RPR, the latter due to anti-cardiolipin antibodies.
22. **Progressive systemic sclerosis:** replacement of smooth muscle with normal collagen and increased subcutaneous deposition of collagen; Raynaud's first sign; sclerodactyly; tight face; dysphagia for solids (no peristalsis, relaxed LES); restrictive lung disease; renal disease; anti-Scl-70 antibodies; CREST syndrome a variant
23. **SLE:** Libman Sachs endocarditis; immunocomplex glomerulonephritis (anti-dsDNA); fibrinous pericarditis; pleural and pericardial effusions; false positive syphilis serology; autoimmune hemolytic anemia, neutropenia, and thrombocytopenia; butterfly rash; joint pains with morning stiffness; anti-Sm and anti-dsDNA; ANA positive in most cases
24. **Effect of metyrapone:** blocks adrenal cortex 11-hydroxylase, hence decreasing cortisol, increasing ACTH, and increasing 11-deoxycortisol proximal to the block; excellent check of ACTH reserve and adrenal function
25. **B_{12} metabolism and deficiency:** thoroughly review B_{12} and folate metabolism in the hematology and nutrition notes, know role of B_{12} in propionate metabolism and formation of SAM from methionine (ATP + methionine), methylmalonic acid increases in B_{12} deficiency (not folate), homocysteine increases in both B_{12} and folate deficiency (most common cause)
26. **Hypercalcemia and multiple myeloma:** secretion of osteoclast activating factor from myeloma cells
27. **Obstructive jaundice:** fat soluble vitamin deficiencies from reduction in bile salts leading to malabsorption; bile contains cholesterol and bile salts/acids
28. **Effects of methotrexate:** megaloblastic anemia from block in dihydrofolate reductase, myelosuppression
29. **Drug-induced SLE:** procainamide is the most common drug; no renal disease; anti-histone and anti-ssDNA rather than anti-dsDNA and anti-Sm antibodies
30. **Heberden's nodes:** osteophytes in DIP joints in osteoarthritis
31. **Amebiasis:** flask shaped ulcers in the cecum
32. **AMI complications:** rupture most common on the 3rd to 7th day; Dressler's syndrome: autoimmune pericarditis 6-8 weeks later

33. **Goodpasture's syndrome:** anti-pulmonary and glomerular capillary basement membrane antibodies; begins with hemoptysis and ends with renal failure (crescentic glomerulonephritis); linear immunofluorescence
34. **Amyloidosis:** review table in lymph node notes
35. **HBV questions:** review hepatobiliary notes
36. **Sepsis in AIDS patients:** disseminated MAI most common and most common cause of death
37. **Most common cause of post-transfusion hepatitis:** HCV (CMV is the most common infection post-transfusion; located in donor lymphocytes)
38. **Most common cause of septic arthritis:** *N. gonorrhoeae*; knee, wrists, feet
39. **Rusty colored sputum:** *Streptococcus pneumoniae* pneumonia (other causes: chronic congestive heart failure, mitral stenosis, Goodpasture's).
40. **Problems in cystic fibrosis patients associated with *P. aeruginosa*:** pneumonia, bronchiectasis, sepsis
41. **Tetralogy of Fallot:** most common cyanotic CHD; degree of infravalvular pulmonary stenosis is the key to whether the patient has cyanosis or is acyanotic
42. **Baby with icterus and edema:** which virus: probably congenital CMV infection
43. **EM of hepatocyte:** glycogen present in fed state (black granules) and disappears after 6 hours (fasting state)
44. **Abdominal abscess:** most commonly due to *Bacteroides fragilis* (*B. fragilis* below the diaphragm; *B. melanogenicus* above the diaphragm)
45. **Tuberous sclerosis:** AD; mental retardation; astrocyte hamartomas in CNS (candlestick drippings on ventricles); adenoma sebaceum; angiomyolipoma (hamartoma) of kidneys; rhabdomyoma of heart
46. ***Staphylococcus aureus*:** protein A attaches to Fc receptor of macrophages, hence blocking opsonization of bacteria
47. **Acute intermittent porphyria (AIP):** AD; two basic defects: an increased activity of ALA synthase when heme is decreased (drug metabolism in liver) and decreased activity of uroporphyrinogen synthase; net effect: increase in δ-aminolevulinic acid (ALA), porphobilinogen (PBG; when oxidized by light, it becomes porphobilin, which gives port wine color to urine; "window sill" test); intermittent exacerbations of neurologic dysfunction including psychosis, neuropathies, severe colicky abdominal pain that is frequently mistaken for a surgical emergency ("bellyful of scars."); periodic infusions of heme reduce the number of attacks.
48. **Porphyria cutanea tarda (PCT):** acquired disease; decreased activity of uroporphyrinogen decarboxylase; net result: increased excretion of uroporphyrin I (urine is wine-red color on voiding), slight increase in the formation of coproporphyrins, normal porphobilinogen levels; photosensitive skin lesions in sun-exposed areas, hyperpigmentation, fragile skin, increased amounts of vellus type hair (hypertrichosis)
49. ***Group A streptococcus:*** pharyngitis predisposes mainly to rheumatic fever (less commonly glomerulonephritis), skin infections predispose mainly to glomerulonephritis (less commonly rheumatic fever)
50. **EM findings consistently present in all primary causes of nephrotic syndrome:** fusion of podocytes
51. **Glomerular crescents:** sign of increased severity of glomerulonephritis; most common GN to progress into chronic renal failure
52. **Goodpasture's:** hemoptysis (first) + glomerulonephritis (crescentic GN)
53. **Monosodium urate crystals in synovial fluid:** needle shaped and yellow when parallel to the slow axis of the compensator
54. **2 year old with 94% HbF:** indicates hereditary persistence of Hgb F (variant of β-thalassemia) owing to absent β and δ chain synthesis with a concomitant increase in Hgb F (α and γ chain synthesis); HbA and HbA2 are absent; high HbF prevents clinical symptoms of thalassemia; there is a uniform distribution of HbF in all RBCs, which separates it from other causes of increased HbF, where only select RBCs contain the HbF; it is compatible with life
55. **Mechanism of acute pyelonephritis (upper urinary tract infection) in females: vesicoureteral reflux**
56. **Pneumothorax in a skin diver:** sudden onset of pleuritic chest pain, collapsed lung with elevation of the diaphragm and shift of trachea to the side of the collapse
57. **Reactivation TB:** in apex of lung where the oxygen is greatest; strict aerobe
58. **Shift of mediastinum:** tension pneumothorax where the air enters the pleural cavity but cannot exit, hence the mediastinal structures shift to the opposite side and the diaphragm is depressed on the affected side
59. **Elderly male smoker with painless jaundice, weight loss:** carcinoma of the head of pancreas
60. **Resting tremor:** Parkinson's disease; intention tremor: multiple sclerosis
61. **Lou Gehrig's disease:** same as amyotrophic lateral sclerosis; destruction of upper and lower motor neurons; defective superoxide dismutase; neuron damage by superoxide free radicals; intrinsic muscles of the hand a common starting point
62. **Superficial dermatophytes:** located in the stratum corneum
63. **Hyperplasia of JG apparatus with increased blood pressure:** renal artery stenosis
64. **Exostosis:** gross of an exostosis from a child (most common benign bone tumor; capped by benign cartilaginous tissue)
65. **Cause of gallstones:** picture of GB with stones; too much CH or too little bile salts/acids
66. **PGI_2 functions:** vasodilator, decrease platelet aggregation
67. **Signs and symptoms of anemias:** B_{12}/folate, exercise intolerance, dyspnea, high output failure; see tables in hematology notes
68. **Picture of black spot on leg:** ecthyma (pyoderma) gangrenosum, due to Pseudomonas aeruginosa; forms black ulcers; relationship with ulcerative colitis

68. **Fever in malaria:** coincides with rupture of RBCs
70. **Primaquine:** often precipitates hemolysis in G6PD deficiency
71. **Condom:** best protection against syphilis
72. **Signs and symptoms of meningitis/organisms by age:** nuchal rigidity, fever; causes in different age brackets (*group B streptococcus* in NB (<1 mth; *E. coli* #2, *L. monocytogenes* #3), *N. meningitidis* (1 mth to 18 years; *S. pneumoniae* #2), > 18 years old: *S. pneumoniae* (*N. meningitidis* #2).
73. **Osteomyelitis in HbSS:** *Staphylococcus aureus* most common; *Salmonella*, if producing osteomyelitis, is most commonly seen in patients with sickle cell disease.
74. **Most common CHD in Downs:** endocardial cushion defect (ASD + VSD); most common cause of death in early age; Alzheimer's most common cause of death after 35
75. **Adult polycystic kidney disease:** AD disease; berry aneurysm relationship and subarachnoid hemorrhage; cysts not present at birth; hypertension
76. **Ankylosing spondylitis:** HLA B27 positive relationship; young man with low back pain (sacroiliitis) progressing to bamboo spine; aortitis and uveitis as well; other relationships--Reiter's syndrome, psoriasis, enterocolitis (Campylobacter, Yersinia, Shigella), ulcerative colitis
77. **Most common cause of esophageal cancer:** smoking (alcohol has a synergistic action)
78. **Philadelphia chromosome:** chromosome 22 with the bcr:abl fusion gene in chronic myelogenous leukemia
79. **Cause of familial hypercholesterolemia:** AD disease with absent LDL receptor
80. **Defect in β-chain in sickle cell trait/disease:** valine for glutamic acid on 6th position of β-chain
81. **Osteogenic sarcoma:** gross of tumor in knee area; located in the metaphysis
82. **Inflammatory bowel disease:**

Characteristic	Ulcerative Colitis	Crohn's Disease
Extent of disease	**Mucosal and submucosal**	**Transmural**
Location	**Primarily targets the rectum** (confined to the rectum in 50%) but can involve the left colon in continuous fashion (no skip lesions) or the entire colon. Anal involvement <20%. Does not involve other areas of the GI tract.	**Terminal ileum alone (30%), ileum and colon (50%), colon alone (20%). Anal involvement 75%** (fissures, fistulas, abscesses). Rectum less commonly involved than in UC. Involves other areas of the GI tract (mouth to anus).
Gross features	**Inflammatory polyps** (pseudopolyps; areas of residual mucosa) 20%. Friable, red mucosa that bleeds easily when touched. Ulceration and hemorrhage. Colon shortened and mucosa flat in quiescent chronic disease. **No skip areas.**	**Fat creeping around the serosa.** Thick bowel wall and narrow lumen in areas of involvement. **Skip areas** (important feature). **Strictures, fistulas** (very diagnostic) in areas other than the anus. **Deep linear ulcers, cobblestone pattern, aphthoid ulcers** (small mucosal ulcers; origin of linear ulcers; early sign).
Microscopic features	Active disease: mucosal inflammation with **crypt abscesses** (neutrophils). Crypt atrophy and branching. Dysplasia/cancer may be present. Chronic disease: neutrophils replaced by lymphocytes/plasma cells. **Dysplasia/cancer may be present.** Crypt atrophy. Lymphoid hyperplasia in rectum.	**Very diagnostic features: noncaseating granulomas (60%), transmural inflammation with subserosal lymphocytic infiltration. Other findings:** aphthoid ulcers overlying lymphoid follicles; thickened bowel wall.
Complications	**More common than CD: toxic megacolon** (hypotonic and distended >6 cm with gas; perforation risk), **sclerosing pericholangitis, HLA B27 + ankylosing spondylitis/uveitis, pyoderma (ecthyma) gangrenosum** *(P. aeruginosa),* **colon adenocarcinoma** (~10%; greatest risk: pancolitis, early onset of UC and increased duration of disease >10 years).	**More common than UC: fistula formation, obstruction, disease in other areas of GI tract, calcium oxalate renal stones.** Less risk for other findings listed for UC.
Clinical	**Left sided abdominal cramping** (not obstruction), **diarrhea with blood and mucus, rectal bleeding and urgency, tenesmus** (ineffectual and painful straining at stool).	**Right lower quadrant colicky pain with diarrhea and bleeding** (colon involvement).
Radiograph	**Lead pipe appearance** in chronic, quiescent disease.	**"String" sign in the terminal ileum** from luminal narrowing by inflammation.

83. **Cause of thrombosis after angioplasty:** localized dissection (not thrombosis)
84. **Mitral valve prolapse:** earliest valvular lesion in Marfans; may be a cause of sudden death; increased myxomatous connective tissue in the valve due to an increase in mucopolysaccharides; click and murmur move closer to S1 with anxiety (shorter diastole) and closer to S2 when lying down (more venous return to the heart); see cardiovascular notes and section on physical diagnosis
85. **Congestive cardiomyopathy:** previous myocarditis (coxsackie most common cause), drugs (doxorubicin, tricyclics), postpartum, alcohol
86. **Gross of the tricuspid valve in the right heart:** infective endocarditis in an intravenous drug abuser
87. **Aschoff body:** pathognomonic lesion of rheumatic fever
88. ***H. pylori*:** urease producer, gram negative coccobacillus
89. **Treatment for recurrent ulcers**: vagotomy

90. **Cave explorer in Arizona with respiratory infection:** coccidioidomycosis (not histoplasmosis; too dry a climate and mainly in Ohio and Midwest)
91. **Know the renin-angiotensin-aldosterone system:** see fluid and hemodynamic notes
92. **Gross picture of a hydatidiform mole**
93. **Postductal coarctation:** unequal pulses between upper and lower extremity; rib notching; systolic murmur between the shoulder blades; Turner's syndrome has a preductal not postductal coarctation
94. **Treatment of DKA:** volume replacement first
95. **Galactorrhea in 3 month old girl:** probable influence of maternal hormones
96. **Child with scrotal enlargement and transilluminates:** hydrocele due to persistence of the tunica vaginalis
97. **Indirect inguinal hernia:** most common type; lateral to the lateral border of the triangle of Hesselbach (lateral border superficial epigastric artery, inferior border inguinal ligament, medial border the lateral aspect of the rectus abdominis muscles)
98. **Intravenous drug abuser in prison--?type of hepatitis:** HBV
99. **Alcohol metabolism:** review in cell injury notes, liver notes, or Champe-Harvey biochemistry
100. **AIDS patient with acute cholecystitis:** Cryptosporidium and CMV are the most common causes (CMV was not listed on the last exam)
101. **Traveler to Mexico who 1 week later develops a watery diarrhea with mucus and blood and colicky bowel movements:** amebiasis
102. **County jail with outbreak of hepatitis:** HAV most likely; if IVDA: then HBV most likely
103. **Familial polyposis:** mother has, what percent chance for kids with the disease: 50%, since it is an AD disease; those that have gene will get cancer; screen with flexible sigmoidoscopy in those affected beginning age 10-12 every 1-2 years; genetic testing to confirm and to test first degree family members
104. **Most common cause of pneumonia in cystic fibrosis:** *P. aeruginosa*
105. **TE fistula:** polyhydramnios in mother; proximal esophagus ends blindly and distal esophagus arises from the trachea (air in the stomach)
106. **Lung findings in RDS:** atelectasis (massive intrapulmonary shunting due to lack of surfactant); hyaline membranes composed of protein
107. **Photomicrograph of sarcoid with non-caseating granulomas in a black man**
108. **Smoker:** identify the x-ray with emphysema--increased AP diameter, depressed diaphragms
109. **PCP in AIDS patient:** treat with TMP/SMX; most common initial AIDS-defining lesion
110. ***Staphylococcus aureus* food poisoning:** 1-6 hours after eating contaminated food with preformed toxin; self-limited
111. **Meckels diverticulum:** vitelline duct remnant; true diverticulum; most common cause of iron deficiency in a newborn and young child (GI bleed)
112. **O157:H7 serotype of *E. coli*:** hemolytic uremic syndrome; raw hamburger
113. **Malaria:** treat with primaquine and develop acute intravascular hemolysis in G6PD deficiency
114. **Deficiency associated with terminal ileal resection:** B_{12} deficiency; duodenum (iron), jejunum (folate, most of the water reabsorption, most of the sodium reabsorption), ileum (B_{12} reabsorption, bile salt/acid reabsorption)
115. **Vitamin K deficiency:** causes bleeding; newborns lack bacterial colonization for K synthesis, hence the need to inject K at birth
116. **Renal agenesis:** oligohydramnios
117. **People in a room with a space heater have a headache:** CO poisoning, treat with 100% oxygen
118. **X-ray with multiple lytic lesions in the hip in a patient with anemia and hypercalcemia:** multiple myeloma
119. **Girl playing soccer is on tetracycline--distribution of the rash:** contact photodermatitis involving face, neck, forearms, and probably the legs (shorts); asked the same question in the past in a baseball player (legs would not be involved)
120. **CNS reaction in a stroke:** gliosis due to proliferation of astrocytes; not collagen deposition
121. **Dissecting aortic aneurysm:** unequal pulses in the upper extremity--left radial absent
122. **Picture of a diabetics lower leg with pigmented lesions:** probably necrobiosis lipoidica diabeticorum
123. **Compare Wegener's granulomatosis (necrotizing granulomatous vasculitis; c-ANCA antibodies) with Goodpasture's syndrome (anti-basement membrane antibodies):** both involve the lungs and kidneys; WG involves upper airway, GP does not.
124. **Gross of a mass in the kidney in an adult:** most likely a renal adenocarcinoma
125. **Gross of torsion of the testicle:** testicle has a bluish black color
126. **Gross of a colloid cyst in the third ventricle:** round object in third ventricle; cause of hydrocephalus
127. **Breast budding (thelarche):** first step in menarche
128. **Picture of an elderly patients hands with senile purpura:** normal age-dependent finding and not a sign of patient abuse
129. **Polyhydramnios:** TE fistula, anencephaly, duodenal atresia
130. **Cross-section of brainstem in a child--yellowish discoloration:** probably kernicterus from hemolytic disease of the newborn
131. **Esophagitis in AIDS:** Herpes I most common
132. **Hepatitis most commonly chronic:** HCV
133. **URI in a child followed by epistaxis and petechia:** ITP (IgG antibody against platelets; type II hypersensitivity)
134. **Roofer for 25 years and a smoker for 10 years:** greatest risk is for primary lung cancer, not a mesothelioma

135. **Bridge painter in New York City with respiratory infection:** most likely **histoplasmosis (starling dung) or** cryptococcus (pigeons); may ask what to treat the patient with: amphotericin
136. **Rat poison ingestion:** contains warfarin and will cause bleeding; treat with vitamin K
137. **Patient who is going to receive a packed RBC transfusion:** must do an antibody screen
138. **ABO incompatibility:** O mother with A or B baby; may occur in first pregnancy; no increase in severity with future pregnancies; spherocytes in cord blood; positive direct Coombs on cord blood RBCs, mild hemolytic anemia, most common cause of jaundice in first 24 hours, protects against Rh sensitization
139. **Child with rash and skin infiltrate with CD1 positive cells:** histiocytosis X (probably Letterer Siwe disease)
140. **Elderly male with low back pain:** do a rectal exam to rule out prostate cancer before any other test; if they state that the serum alkaline phosphatase is elevated, it is osteoblastic metastasis
141. **Most significant risk factor for child having open neural tube defect:** mother's diet lacks folate prior to pregnancy
142. **Treatment regimen to prevent osteoporosis in a woman who had a previous total hysterectomy and bilateral salpingo-oophorectomy:** exercise + calcium 1000 mg + vitamin D 400 U + estrogen with or without progesterone
143. **Treatment regimen to prevent osteoporosis in a 35 year old woman who is still menstruating:** exercise + calcium 1000 mg + vitamin D 400 U (does not need estrogen since she is still menstruating)
144. **Treatment regimen to prevent osteoporosis in a postmenopausal woman who had a previous radical mastectomy that was ERA-PRA positive:** exercise + calcium 1000 mg + vitamin D 400 U (estrogen contraindicated, however, can give tamoxifen which is a weak estrogen)
145. **Oocysts that are acid-fast positive in a patient with AIDS:** Cryptosporidium
146. **Elderly man, who lives at home with his wife, develops pneumonia:** *Streptococcus pneumoniae* (most common community acquired typical pneumonia)
147. **Most common benign tumor in the brain of an adult:** meningioma (glioblastoma multiforme is the most common primary malignant tumor)
148. **Most common site to evaluate in a child with hypertension:** kidneys (Wilm's tumor, renal dysplasia), adrenal medulla (neuroblastoma)
149. **AIDS patient diarrhea--?what organisms can be identified with the string test (Enterotest):** Giardia, strongyloides, Cryptosporidium
150. **Elderly man with sudden onset of abdominal pain and bloody diarrhea:** thrombosis/embolism of the superior mesenteric artery with small bowel infarction (common association with heart disease and atrial fibrillation)
151. **Young girl with grape-like masses protruding from the vagina:** embryonal rhabdomyosarcoma (most common sarcoma; not related to DES)
152. **Crunching sound is noted in the neck and anterior chest in a patient involved in a head-on collision:** ruptured esophagus (Hamman's sign in the chest due to subcutaneous emphysema from air dissecting into the tissue; other scenarios could be an alcoholic who is retching or a bulimic who is vomiting)
153. **Woman complains of generalized muscle weakness, ptosis of the right eye with no pupillary abnormalities:** myasthenia gravis (autoantibody against acetylcholine receptors; type II hypersensitivity)
154. **Schistocytes in the peripheral blood:** prosthetic heart valve, aortic stenosis (most common), DIC, thrombotic thrombocytopenic purpura, marathon runner
155. **Most frequent cancer in the bone in an adult:** metastatic cancer (breast is the overall most common cause)
156. **Most common location in bone for osteomyelitis:** metaphysis (most vascular part of bone; *S. aureus* most common cause; hematogenous spread)
157. **Most appropriate treatment for an elderly woman with a headache localized to the side of her head accompanied by diffuse muscle aches and pains, and an elevated serum CK and ESR:** corticosteroids (temporal arteritis with polymyalgia)
158. **Athlete presents with jaundice, no previous health problems, no history of liver disease, and no previous transfusions; serum transaminases are slightly elevated and serum alkaline phosphatase is markedly elevated:** patient is taking anabolic steroids (cholestatic jaundice)
159. **Most common primary brain tumor location in children:** cerebellum (cerebellar astrocytoma #1, medulloblastoma #2--First AID for Boards is wrong on this one [has medulloblastoma as #1])
160. **Sturge Weber:** port wine nevus on the face in a trigeminal nerve distribution; ipsilateral AV malformation in the brain
161. **Cancers associated with parasitic disease:** squamous cancer of the bladder: *Schistosoma hematobium* (egg has a nipple at the end), cholangiocarcinoma: *Clonorchis sinensis*
162. **Hepatitis associated with urticaria, fever, arthralgias, and the nephrotic syndrome:** Hepatitis B (serum sickness type of disease with type III immunocomplex mechanism; vasculitis associated with **polyarteritis nodosa)**
163. **Targetoid lesions on the skin:** erythema multiforme (most often associated with Herpes simplex; Mycoplasma is another relationship; others include sulfonamides, NSAIDs, phenytoin; Steven's Johnson syndrome involves the mouth)
164. **Flat, hyperpigmented lesions on the forehead and cheeks of a woman:** most commonly due to oral contraceptives (pregnancy is the next most common; this is called chloasma or melasma)
165. **Axillary freckling in a patient with hypertension:** neurofibromatosis
166. **Most common cause of alopecia:** genetic predetermination (most commonly in males; telogen effluvium is when all the hairs enter the resting phase at once [postpartum, BCPs, high fever, crash diet])

167. **Irregular patches of hair loss in child:** trichotillomania (pulling out of one's own hair, note the relationship to the dominant hand)
168. **Young woman with intermittent bouts of diarrhea and constipation associated with cramping right and left lower quadrant pain:** irritable bowel syndrome; flexible sigmoidoscopy is negative; intrinsic bowel motility problem
169. **Immunizations given at birth to a baby whose mother is positive for HBsAg:** Hep B (active immunization) and HBIG (passive immunization)
170. **Farmer and his wife are brought to the ER by their son because they are too weak to walk or drive and their vision is blurry and exam reveals ptosis, facial weakness, nonreactive dilated pupils, dry mucous membranes, and normal DTRs—? diagnosis:** *C. botulinum* food poisoning (the toxin inhibits the release of acetylcholine at the neuromuscular junction; Rx with botulism antitoxin; danger of respiratory paralysis)
171. **Diabetic with wet gangrene of the foot followed by stiffening of the jaw, neck stiffness, and increased irritability and increased hyperreflexia—? diagnosis:** tetanus (Rx: tetanus immune globulin, penicillin, sedation; give full immunization with toxoid when the patient recovers since the infection does not produce high enough titers of protective antibodies)
172. **Patient has hyperpigmented spots on the skin which when scratched become intensely pruritic and red; the cells most likely responsible for this reaction are:** mast cells (the patient has urticaria pigmentosa, which is a mast cell disease where pressure causes the release of histamine setting up an urticarial reaction)
173. **Young man develops extreme fatigue, muscle cramps after exercising, and a pink colored urine after exercising; lactic acid levels do not increase after exercise—? diagnosis:** McArdle's disease with absent muscle phosphorylase (phosphorylase is required to break glycogen down into glucose, hence the muscle has no energy. Lactic acid does not accumulate if glucose is not metabolized).
174. **Patient with dysphagia and a fetid odor to his breath:** Zenker's diverticulum (most common diverticulum in the esophagus; collects food)
175. **Young man with low back pain and limited chest movement:** ankylosing spondylitis (vertebral fusion produces kyphosis, which restricts chest movement)
176. **Drug of abuse that produces reddening of the conjunctiva:** marijuana
177. **Mechanism of action of UV light in the treatment of newborns with physiologic jaundice:** oxidizing UCB into harmless water soluble dipyrroles
178. **Differentiate all the thyroid disorders:**

Disorder	Total Serum T_4	RTU	FT_4-I	TSH	I 131
Grave's Disease	Increased	Increased	Increased	Suppressed	Increased
Factitious Thyrotoxicosis	Increased	Increased	Increased	Suppressed	Decreased
Thyroiditis (acute, subacute)	Increased	Increased	Increased	Suppressed	Decreased
Primary Hypothyroidism (Hashimoto)	Decreased	Decreased	Decreased	Increased	Decreased
Secondary Hypothyroidism (hypopituitarism/hypothalamic)	Decreased	Decreased	Decreased	Decreased	Decreased
Increased TBG (increased estrogen)	Increased	Decreased	Normal	Normal	Normal
Decreased TBG (increased androgens)	Decreased	Increased	Normal	Normal	Normal

RTU = resin T_3 uptake, FT_4-I = free T_4 index, TSH = thyroid stimulating hormone, I 131 = radioactive iodine I 131 uptake, TBG = thyroid binding globulin

179. **Separate Addison's disease from secondary hypocortisolism:** main differences are in ACTH levels, and electrolytes; Addison: increased ACTH; severe hyponatremia, hyperkalemia, metabolic acidosis; no response to ACTH stimulation; hypoglycemia; secondary hypocortisolism: decreased ACTH, mild hyponatremia, hypoglycemia, adrenal response to ACTH stimulation
180. **Picture of patient with Cushing's syndrome:** central obesity, purple stria; use low dose dexamethasone test and 24 hour urine for catecholamines
181. **Carcinoid syndrome:** metastasis to the liver from a primary in the small intestine; measure 5-HIAA
182. **Male with clusters of vesicles on penis:** HSV II; acyclovir decreases recurrences
183. **Treatment of condyloma venereum:** topical podophyllin
184. **Treatment of syphilis:** penicillin
185. **Treatment of gonorrhea:** ceftriaxone (for GC) + doxycycline (for Chlamydia)
186. **Treatment of bacterial vaginosis:** metronidazole (not the partner); clue cells, Gardnerella vaginalis
187. **Treatment of trichomoniasis:** metronidazole (treat partner); Trichomonas is an anaerobe
188. **Treatment of pseudomembranous colitis:** metronidazole
189. **Cause of Graves disease:** stimulating thyroid stimulating antibody against the TSH receptor (type II hypersensitivity)

190. **Microcytic anemia with increased HbA_2 and HbF:** β-thalassemia

	Iron deficiency	ACD	α, β-Thal minor	Sideroblastic
MCV	Low	Low	Low	Low
Serum iron	Low	Low	Normal	High
TIBC	High	Low	Normal	Low
% Saturation	Low	Low	Normal	High
Serum ferritin	Low	High	Normal	High
RDW	High	Normal	Normal	Normal
RBC count	Low	Low	High	Low
RBCFEP	High	High	Normal	High (Pb poison)
Hb electrophor.	Normal	Normal β-thal: ↑Hb A_2 and F	α-thal: normal	Normal
Marrow iron	Absent	Increased	Normal	Increased
Miscellaneous	Ferritin best test	Most commonly normocytic	Hb electrophoresis gold standard test	Coarse basophilic stippling in Pb poisoning

FEP = free erythrocyte protoporphyrin

191. **Most common anemia:** iron deficiency (women <50 menorrhagia, man < 50 duodenal ulcer, man/woman >50 colorectal cancer)
192. **Vitamin deficiency with prolonged PT:** vitamin K
193. **Most common fracture in postmenopausal osteoporosis:** vertebral fracture; osteoclastic activity > osteoblastic activity
194. **India ink prep with narrow based bud:** Cryptococcus
195. **Respiratory problem with pigeons:** cryptococcus
196. **Aspergillus:** fungus ball in abandoned TB cavity; hemoptysis, fruiting body
197. **Frontal lobe abscess in a patient with DKA:** mucormycosis
198. **Pseudomonas related infections:** CF pneumonia (green colored sputum), most common cause of death in burns, malignant otitis externa, ecthyma gangrenosum, step on nail with smelly tennis sneakers, hot tub folliculitis, respirator infections (loves water)
199. **Legionella:** water coolers, flu-like syndrome, hyponatremia and hyperkalemia from interstitial nephritis, Dieterle silver stain, erythromycin
200. **Pasteurella multocida:** cat bite; potential for septic arthritis/tendinitis
201. **Disseminated gonococcemia:** decreased C5-C8 (final common pathway complement components)
202. **Know how to interpret MST II restriction endonuclease studies to separate sickle trait from disease:** see hematology notes table in hematology
203. **Treatment for prolactinoma:** bromocriptine; most common pituitary tumor; secondary amenorrhea and galactorrhea
204. **Most common cause of myocarditis, pericarditis, aseptic meningitis:** coxsackievirus; **picture of lymphocytes in myocardial tissue** on an endomyocardial biopsy
205. **High AFP:** open neural tube defects, hepatocellular carcinoma, yolk sac tumors of ovary or testis
206. **Drugs that increase surfactant:** glucocorticoids, thyroxine
207. **ECG changes:** short QT hypercalcemia, prolonged QT hypocalcemia, U wave hypokalemia, peaked T wave hyperkalemia
208. **Most common cause of jaundice in the first 24 hours after birth:** ABO incompatibility; O mother with an A or B baby; O mother **normally** has anti-A,B IgG antibodies
209: **WBC abnormality in the peripheral blood in B_{12}/folate deficiency:** hypersegmented neutrophil (picture on exam)
210. **Tear drops in peripheral blood:** myelofibrosis in the marrow
211. **Coarse basophilic stippling in peripheral blood:** Pb poisoning
212. **PICA for clay and ice:** iron deficiency
213. **Iron studies in iron overload:** increased iron, % saturation, ferritin, but decreased TIBC (transferrin decreased)
214. **MCC of folate deficiency:** alcohol abuse (not beer)
215. **Polycythemia differential:** hematology notes; relative polycythemia (volume depletion): RBC mass normal (RBC count increased) but plasma volume decreased, normal SaO_2, normal erythropoietin; polycythemia rubra vera: increased RBC mass, increased plasma volume (only one), normal SaO_2, low erythropoietin (suppressed by increased oxygen content); tumors secreting erythropoietin: increased RBC mass, normal plasma volume, normal SaO_2, increased erythropoietin; hypoxic stimulus: increased RBC mass, normal plasma volume, low SaO_2, increased erythropoietin
216. **Leukemias by age:** <15 ALL, 15-39 AML, 40-60 AML and CML, > 60 CLL
217. **Hairy cell leukemia:** B cell leukemia, positive TRAP stain
218. **CML:** t9;22 translocation of c-myc oncogene, low LAP score, Philadelphia chromosome
219. **ALL:** CALLA positive pre-B cell leukemia most common
220. **TdT:** marker of very immature B cells and T cells
221. **Congenital spherocytosis:** AD, spectrin deficiency, increased osmotic fragility
222. **Howell Jolly body:** indicates absent or dysfunctional spleen
223. **Heinz bodies:** peroxide damaged Hb in RBCs in G6PD deficiency

224. **Coombs test:** direct detects IgG/C3 on RBC, indirect is an antibody screen of serum (e.g., anti-D); used in autoimmune hemolytic anemias
225. **Ferritin:** best screen for iron deficiency and ACD
226. **Blood Pb:** best screen/confirmation for Pb poisoning
227. **Pb:** deposits in the epiphyses of bone and can be seen in radiographs of the abdomen
228. **CLL:** most common leukemia; most common cause of generalized lymphadenopathy in people over 60; malignant B cells; hypogammaglobulinemia; massive splenomegaly
229. **Lactase (disaccharidase, brush border enzyme) deficiency:** osmotic diarrhea, hydrogen breath test
230. **Secretory diarrhea:** stimulation of cAMP; *E. coli* traveler's diarrhea, cholera
231. **Streptococcus bovis endocarditis/sepsis:** colon cancer
232. **Alcohol enzyme abnormalities:** AST > ALT, increase in GGT (marker of induction of cytochrome system in the liver [SER hyperplasia on EM])
233. **Hypoglycemia in newborn of diabetic mother:** babies insulin is too high since it was necessary to lower the glucose levels in the baby as a response to the mother's hyperglycemia
234. **Differences between type I and II DM:**

Factors	Type I	Type II
Prevalence	5-10%	90-95%
Age	<20 years (80%), mean of 11 years old	>30 years of age
Body Habitus	Usually thin	**80% are obese. Risk factors:** body weight, age, increased waist-hip ratio of fat.
Family History	Family history uncommon (10%). ~50% concordance rate with identical twins.	**Family history is common (multifactorial inheritance).** ~90% concordance rate with identical twins. Increased in native Americans and African Americans.
Pathogenesis	**Insulin lack.** Presence of **HLA-DQ variants, HLA-DR3** and **-DR4** (90-95%), which renders **patients susceptible to β-islet cell destruction by viruses, autoimmune mechanisms,** or environmental factors. **Viral associations include:** coxsackie B virus, mumps, EBV, rubella, rubeola. Autoimmune destruction associated with cytotoxic T cells producing "insulitis". **Environmental factors:** streptozotocin (drug used in treating malignant islet cell tumors), alloxan, **pentamidine, children exposed to cow's milk** (antibodies against bovine albumin crossreact against the islet cells). Pancreas is **devoid of β cells. Islet cell antibodies in 80%.**	**No HLA relationship. Derangement in insulin secretion relative to glucose load.** Relative insulin deficiency with decreased action of insulin in liver and muscle. **Key problem is peripheral tissue insulin resistance** secondary to a **receptor deficiency** (direct relationship with obesity; more fat = less receptors) and **postreceptor defects** so glucose uptake is impaired. Postreceptor abnormalities include tyrosine kinase abnormalities, problems with translocation of GLUT-4 receptors to facilitate glucose absorption. **β cells are fibrosed and often contain amyloid.**
Initial Symptoms	Rapid onset of polydipsia, polyuria, weight loss.	Insidious onset, symptomatic or asymptomatic.
Ketoacidosis	May occur owing to insulin lack	**No ketoacidosis** but susceptible to **hyperosmolar nonketotic coma** (enough insulin to prevent ketosis but not hyperglycemia). Increased anion gap from lactic not ketoacidosis.
Treatment	Insulin	**Diet most important.** Oral glucose lowering agents. Insulin necessary in some cases.

235. **Congenital heart disease and what oxygen saturations would be in each type:** see cardiovascular notes
236. **Nabothian cysts:** blocked endocervical glands with mucous retention
237. **Photograph of retina with papilledema from increased intracranial pressure**
238. **Know PFTs in restrictive versus obstructive lung disease:** see pulmonary notes and Passo notes
239. **Chronic renal failure–why is calcium reabsorption decreased in the bowel:** vitamin D deficiency from loss of 1α-hydroxylase enzyme and no second hydroxylation
240. **Deviation of uvula to the opposite side in a patient with exudative tonsillitis: peritonsillar abscess**
241. **Minimal change disease:** most common cause of nephrotic syndrome in children; loss of negative charge in the GBM
242. **Membranous GN:** most common cause of nephrotic syndrome in adults; subepithelial deposits; epimembranous spikes with silver stains; HBV relationship
243. **Focal segmental glomerulosclerosis:** most common renal disease (nephrotic) in AIDS, renal transplant patients, IV drug abusers
244. **Diabetic nephropathy (picture):** "Christmas balls" in the mesangium and hyaline arteriolosclerosis in the afferent/efferent arterioles; ACE inhibitors prevent
245. **Wire looping in glomerulus:** SLE glomerulonephritis
246. **Type I membranoproliferative GN:** nephrotic; HCV relationship; tram tracking; subendothelial deposits; **type II membranoproliferative:** C3 nephritic factor (autoantibody against C3; very low C3 levels); dense deposits in GBM

247. **Differences between ulcerative colitis and Crohn's disease:**

Characteristic	Ulcerative Colitis	Crohn's Disease
Extent of disease	**Mucosal and submucosal**	**Transmural**
Location	**Primarily targets the rectum** (confined to the rectum in 50%) but can involve the left colon in continuous fashion (no skip lesions) or the entire colon. Anal involvement <20%. Does not involve other areas of the GI tract.	**Terminal ileum alone (30%), ileum and colon (50%), colon alone (20%). Anal involvement 75%** (fissures, fistulas, abscesses). Rectum less commonly involved than in UC. Involves other areas of the GI tract (mouth to anus).
Gross features	**Inflammatory polyps** (pseudopolyps; areas of residual mucosa) 20%. Friable, red mucosa that bleeds easily when touched. Ulceration and hemorrhage. Colon shortened and mucosa flat in quiescent chronic disease. **No skip areas.**	**Fat creeping around the serosa.** Thick bowel wall and narrow lumen in areas of involvement. **Skip areas** (important feature). **Strictures, fistulas** (very diagnostic) in areas other than the anus. **Deep linear ulcers, cobblestone pattern, aphthoid ulcers** (small mucosal ulcers; origin of linear ulcers; early sign).
Microscopic features	Active disease: mucosal inflammation with crypt **abscesses** (neutrophils). Crypt atrophy and branching. Dysplasia/cancer may be present. Chronic disease: neutrophils replaced by lymphocytes/plasma cells. **Dysplasia/cancer may be present.** Crypt atrophy. Lymphoid hyperplasia in rectum.	**Very diagnostic features: noncaseating granulomas (60%), transmural inflammation with subserosal lymphocytic infiltration. Other findings:** aphthoid ulcers overlying lymphoid follicles; thickened bowel wall.
Complications	**More common than CD: toxic megacolon** (hypotonic and distended >6 cm with gas; perforation risk), **sclerosing pericholangitis, HLA B27+ankylosing spondylitis/ uveitis, pyoderma gangrenosum, colon adenocarcinoma** (~10%; greatest risk: pancolitis, early onset of UC and increased duration of disease >10 years).	**More common than UC: fistula formation, obstruction, disease in other areas of GI tract, calcium oxalate renal stones.** Less risk for other findings listed for UC.
Clinical	**Left sided abdominal cramping** (not obstruction), **diarrhea with blood and mucus, rectal bleeding** and **urgency, tenesmus** (ineffectual and painful straining at stool).	**Right lower quadrant colicky pain with diarrhea and bleeding** (colon involvement).
Radiograph	**Lead pipe appearance** in chronic, quiescent disease.	**"String" sign in the terminal ileum** from luminal narrowing by inflammation.

248. **Differences between gastric and duodenal ulcers:**

Characteristics	Gastric Ulcer	Duodenal Ulcer
Percentage of PUD	25%	75%
Epidemiology	Male/Female ratio 1/1	Male/Female ratio 2/1. Family history in some cases (AD pattern).
Pathogenesis	Defective mucosal barrier owing to (1) *H. pylori* (>75% of cases); association with type B chronic atrophic gastritis, (2) mucosal ischemia (reduced prostaglandin), (3) bile reflux, (4) smoking, (5) COPD, (6) alcohol, (7) renal failure. Blood group A relationship. No MEN I or II relationship.	*H. pylori* association >90%. Increased acid production (increased BAO and MAO), increased parietal cell mass, increased response to stimuli, increased nocturnal secretion, rapid gastric emptying). Decreased bicarbonate in mucus barrier (possible *H. pylori* effect). Other risk factors include blood group O, MEN I (associated with Zollinger-Ellison syndrome component), smoking, alcohol, renal failure, cirrhosis.
Location	Single ulcer on the **lesser curvature of the antrum.**	**Single ulcer on the anterior portion of the first part of the duodenum (most common)** followed by single ulcer on posterior portion (danger of perforation into the pancreas).
Malignant potential	Do not transform into cancer, but cancer may be associated with a benign ulcer in 1-3%. **Cannot tell malignancy by the size of an ulcer, hence the importance of biopsy.**	**No malignant potential** for transformation.
Complications	Bleed and/or perforate (both less common than duodenal ulcers).	Bleed, perforate, gastric outlet obstruction, pancreatitis.
Clinical	Burning epigastric pain soon after eating. Pain increases with food (afraid to eat and lose weight), relieved by antacids. Diet is usually milk and fish.	Burning epigastric pain 1-3 hours after eating, frequently relieved by antacids or food (do not lose weight). Pain wakes patient at night.

249. **Know bilirubin metabolism and causes of jaundice (Gilbert's, physiologic jaundice of newborn, Crigler-Najjar, Dubin Johnson, obstructive jaundice, hepatitis):** see hepatobiliary notes
250. **Know all the types of hepatitis:** see HB notes
251. **Photograph of mass in the vulva:** Bartholin gland abscess/cyst; relationship with GC
252. **Tzanck prep:** detect viral etiology of vesicular disease; e.g. Herpes: multinucleated cell with intranuclear inclusions; same for varicella
253. **Picture of pseudohypha and yeast for Candida**

254. **Picture of trichomonas: pear shaped with flagella**
255. **Picture of Giardia: "owl eyes" with flagella**
256. **Picture of celiac disease:** no villi present; anti-gliadin antibodies
257. **Picture of Whipple's disease:** foamy macrophages in the lamina propria; infectious disease
258. **Lyme disease:** erythema chronicum migrans; Ixodes tick; Borrelia burgdorferi; Bell's palsy; arthritis; doxycycline early; ceftriaxone late
259. **Role of dietary fiber in decreasing colon cancer:** decreased transit time of stool; lithocholic acid has less chance of producing a mutation
260. **Werdnig Hoffmann's disease:** childhood version of ALS
261. **Bisphosphonates:** treatment of osteoporosis; decreases osteoclastic activity; treatment of choice for Paget's disease of bone
262. **Calcitonin:** marker for medullary carcinoma of thyroid; inhibits osteoclast activity
263. **Orbital cellulitis vs cavernous sinus thrombosis:** both have proptosis of the eye and poor eye movements; cavernous sinus thrombosis has papilledema
264. **Most common benign tumor of brain in adults:** meningioma (GBM most common malignant tumor): decreasing frequency: GBM, meningioma, acoustic neuroma (neurofibromatosis relationship)
265. **Toxoplasmosis:** most common space occupying lesion in AIDS
266. **Disseminated MAI:** most common cause of death in AIDS, not wasting syndrome
267. **Asymptomatic African American with hematuria:** do sickle cell screen to rule out sickle cell trait
268. **Osteomyelitis in HbSS:** *Staphylococcus aureus* still more common than Salmonella
269. **Photomicrograph of acoustic neuroma (schwannoma, neurilemmoma; tinnitus, nerve deafness, sensory changes in the face from trigeminal involvement):** zebra tumor with alternating dark and light bands; neurofibromatosis relationship
270. **Picture of ECG with first degree block:** prolonged PR interval
271. **Picture of platelet in the peripheral blood:** small red structure that may cause pallor of an RBC when it is sitting on its surface
272. **Picture of an Auer rod in a myeloblast:** only in acute myelogenous leukemia (not chronic, not lymphocytic, not monocytic)
273. **Weight lifter with weakness in the hand, numbness, and absent pulse:** thoracic outlet syndrome (scalenus anticus muscle spasm compresses the subclavian artery and brachial plexus)
274. **Picture of abdominal aortic aneurysm:** atherosclerosis is the most common cause, not hypertension; rupture most common complication (left flank pain, hypotension, pulsatile mass), ultrasound gold standard
275. **Picture of a child with blue sclera:** osteogenesis imperfecta (brittle bone disease) due to a defect in synthesis of type I collagen
276. **X-ray showing osteopenia, normal alkaline phosphatase (rules out osteomalacia), normal serum protein electrophoresis (rules out multiple myeloma), normal serum calcium (rules out osteomalacia and multiple myeloma):** compatible with osteoporosis (all lab values are normal)
277. **Wilm's tumor:** relationship with chromosome 11; also, aniridia, hypertension
278. **Arrhythmias most common complication of an AMI:** usually ventricular
279. **Burkitt's lymphoma:** most common lymphoma in children, located in abdominal cavity (not the jaw as in the African variant), B cell malignancy, high grade, EBV relationship, t8;14 translocation of c-myc oncogene
280. **Chest x-ray with right middle lobe pneumonia (obscures right margin of the heart):** probably related to obstruction by a bronchogenic carcinoma; could also be aspiration with the patient lying down on the right side
281. **Adrenal gland hyperplasia with:** adrenogenital syndrome (low cortisol increases ACTH), pituitary Cushing's (increase in ACTH), ectopic Cushing's (small cell carcinoma; increased ACTH); atrophy of the gland in adrenal Cushing's (increased cortisol suppresses ACTH)
282. **Pancoast tumor:** squamous cancer at lung apex involving brachial plexus and superior cervical ganglion (Horner's syndrome)
283. **Tricuspid insufficiency in infective endocarditis:** pansystolic murmur that increases with inspiration (all right sided murmurs do from increase filling of the right heart as intrathoracic negative pressure increases), giant c-v jugular venous pulse wave, pulsatile liver
284. **Rheumatic fever:** crossreactivity (mimicry) of antigens in M proteins similar to those to the patients heart; polyarthritis most common sign; others--carditis, subcutaneous nodules, erythema marginatum, chorea (all make up Jone's criteria); blood culture negative (not a septicemia)
285. **Anterior chest pain, widening of the aortic root on echocardiogram, death in 3 days by tamponade:** proximal dissecting aortic aneurysm; aortic insufficiency murmur and unequal pulses can also occur
286. **Chest x-ray of CHF--? what would lungs look like:** hemosiderin laden macrophages
287. **Rheumatoid factor:** IgM antibody against IgG
288. **Pseudogout crystal:** if needle shaped, blue when parallel to the slow axis of the compensator; chunky crystal is always calcium pyrophosphate; association with chondrocalcinosis of the knee in primary hyperparathyroidism
289. **Sterile pyuria (WBCs in the urine) and negative culture (standard culture) after 24 hours:** always think renal TB, could also be Chlamydia trachomatis
290. **Gross photo of a large saddle embolus in a patient on prolonged bed rest**
291. **Child develops a rash while running through bushes:** probable poison ivy, which is a type IV contact dermatitis

292. **Antimicrosomal antibodies:** Hashimoto's thyroiditis and Graves disease; stem of the question should determine which one to pick
293. **Exophthalmos and pretibial myxedema:** unique to Graves disease and no other cause of hyperthyroidism
294. **Hepatocellular carcinoma:** choose HCV if HBV is not listed
295. **Trophozoite of *E. histolytica* phagocytizes RBCs:** diagrams of different types of protozoans accompanied a history of diarrhea with ulcers
296. **Neonatal pneumonia, afebrile, staccato cough, eosinophilia, wheezing:** *C. trachomatis* contracted while passing through the birth canal
297. **ABO typing of mother and father to see if the child is theirs:** remember AB parents cannot have an O child, and O parents cannot have an AB child
298. **Patient with hemolytic anemia post dapsone and aspirin:** G6PD deficiency
299. **Test for infectious mononucleosis:** heterophile antibody
300. **Eisenmenger's syndrome:** when a left to right shunt reverses to a right to left shunt owing to pulmonary hypertension and RVH leading to cyanosis (cyanosis tardive)
301. **Duchenne's muscular dystrophy:** SXR; deficiency of dystrophin (gene deletion); increased serum CK; pseudohypertrophy of calf muscles; Becker's dystrophy is a milder variant (gene mutation rather than deletion)
302. **Juvenile polycystic kidney disease:** AR; bilateral disease; oligohydramnios in mother; cysts in other organs
303. **Cystic fibrosis:** AR disease; defect in chromosome 7 (3 nucleotide deletion which codes for phenylalanine) leading to defective CF transport regulator for chloride ions (decreased Cl reabsorption in sweat glands [basis of sweat test]; increased Na reabsorption and decreased Cl secretion in terminal bronchioles [inspissated mucus]), malabsorption, respiratory infections/failure (most common cause of death; *P. aeruginosa*), secondary biliary cirrhosis, infertility in males, most common cause of bronchiectasis, diabetes mellitus, meconium ileus in newborn
304. **α-Thalassemia:** AR disease; Blacks and Asians; 4 genes control α-chain synthesis; all hemoglobins underproduced (normal Hb electrophoresis in 1 and 2 gene deletions); 3 gene deletions Hb H disease (4 β-chains); 4 gene deletions Hb Bart disease (4 γ-chains; incompatible with life; hydrops fetalis)
305. **Cardiac myxoma:** most common heart tumor; **left** or right atrium; embolize, fever, syncope; benign myxomatous tissue
306. **Cardiac rhabdomyoma:** children; part of tuberous sclerosis complex
307. **Colon cancer risk factors:** age, tubular adenoma >2 cm, familial polyposis (100% penetrance), villous adenoma (villus component increases the cancer risk), low fiber diet; stool guaiac yearly after 50 years old with flexible sigmoidoscopy every 3-5 years
308. **Chronic renal failure:** loss of concentration (first) and dilution, increased BUN/creatinine ratio (maintain 10/1 ratio), waxy and broad casts, normocytic anemia due to loss of erythropoietin, vitamin D deficiency, low calcium with normal to high phosphorous, secondary hyperparathyroidism, renal osteodystrophy: osteoporosis (bone is a buffer for acidosis) and osteomalacia, increased bleeding time (platelet dysfunction), hemorrhagic pericarditis; diabetic nephropathy most common cause
309. **Essential hypertension:** most common type; retention of sodium raises the plasma volume leading to an increase in stroke volume (increased systolic pressure); sodium in smooth muscle cells of peripheral resistance vessels (arterioles) opens up calcium channels, hence increasing vasoconstriction and the diastolic pressure; **Blacks: low** renin hypertension due to increased plasma volume; AMI most common cause of death; control of BP has its greatest effect on reducing incidence of stroke; hyaline arteriolosclerosis small vessel disease; nephrosclerosis is the renal disease; concentric LVH occurs; intracerebral bleeds in the **putamen area (ruptured Charcot-Bouchard aneurysms)**
310. **Hypertension in young woman:** birth control pills increase synthesis of angiotensinogen in liver hypertension
311. **Renovascular hypertension:** most common secondary cause of hypertension; atherosclerosis of renal artery in male, fibromuscular hyperplasia in female; high renin hypertension; uninvolved kidney has suppressed renin levels; bruit in the epigastric area; Captopril markedly increased baseline renin levels
312. **Waterhouse-Friderichsen syndrome:** disseminated meningococcemia with adrenal hemorrhage from DIC; petechial lesions over the body
313. **Hemophilia A:** SXR; prolonged PTT, normal PT; low VIII:C, normal VIII:antigen, normal VIII: VWF; hemarthroses, late rebleeding, mucous membrane bleeding; recombinant factor VIII for severe cases; DDAVP for mild cases
314. **Classical VWD:** AD; prolonged bleeding time, normal PT, prolonged PTT; low VIII:C, low VIII: antigen, low VIII:VWF; most common genetic coagulopathy; DDAVP; cryoprecipitate
315. **Thrombotic thrombocytopenic purpura:** small vessel damage with consumption of platelets due to platelet thrombi (not DIC), microangiopathic hemolytic anemia (RBCs hit platelet plugs; schistocytes), fever, CNS problems, renal failure; treat with plasmapheresis; HUS in children similar except kidney is worst hit while in TTP the brain is worst hit (HUS has O157:H7 *E. coli* relationship as well)
316. **Valvular diseases:** review the tables in the cardiovascular notes
317. **Sudden death in a young athlete:** probable hypertrophic cardiomyopathy
318. **Hypertrophic cardiomyopathy:** aberrant myofibers, conduction disturbances; improve: increase venous return to heart (squatting, lying down), decrease cardiac contractility to increase filling (β-blocker, calcium channel blockers); make worse: Valsalva, cardiac inotropic agents, venodilators

319. **Review chart comparing rheumatoid arthritis with osteoarthritis:**

Characteristic	Osteoarthritis	Rheumatoid Arthritis
Classification	**Group I noninflammatory**	**Group II inflammatory**
Sex/Age	Female dominant. Middle to late decades of life.	Female dominant. All ages.
HLA relationships	Possible HLA A1, B8	**HLA Dr4**
Pathogenesis	**Degenerative**	**Immunologic destruction**
Initial site of involvement	**Articular cartilage**	**Synovial tissue**
Key abnormalities	**Cartilage fibrillation, subchondral bone cysts, osteophytes, secondary synovitis** leading to reduced joint mobility without fusion.	**Inflamed synovial tissue grows over articular cartilage (pannus)** and releases degradative enzymes that degrade bone and cartilage. Reactive fibrosis leads to **fusion (ankylosis) of the joint and immobility.**
Clinical	**Asymmetric involvement of weight bearing joints and small joints of hands (DIP and PIP).** Mild morning stiffness. **Heberden's nodes (DIP) and Bouchard's nodes (PIP).** Compression neuropathies in vertebral column disease.	**Symmetric joint involvement.** Involves smaller joints and knee. **Morning stiffness >1 hr. Targets MCP and PIP joints** in hands. Ulnar deviation. **"Swan neck" deformity:** hyperextension of PIP, flexion of DIP joint. **Boutonniere's deformity:** flexion deformity of PIP and extension of DIP joint. **Atlantoaxial joint:** subluxation (potential for vertebrobasilar insufficiency, particularly when the patient looks down). **Baker's cysts** (synovial cyst) in popliteal fossa (confused with popliteal artery aneurysms). **Extraarticular disease:** *RA vasculitis* (fingers, ankles; correlates with high RF titers), *subcutaneous* (rheumatoid) *nodules* (fibrinoid necrosis), *pulmonary disease* (restrictive lung disease), **Caplan's syndrome** (coal worker's pneumoconiosis or silicosis + RA lung disease), *fibrinous pericarditis, hematologic disease* (anemia chronic disease, iron deficiency anemia, autoimmune hemolytic anemia), *reactive (secondary) amyloidosis,* **Sjogren's syndrome** (RA + dry eyes and dry mouth), **Felty's syndrome** (RA + autoimmune neutropenia and splenomegaly), *uveitis, carpal tunnel syndrome.*
Laboratory	**Slight elevation of alkaline phosphatase** from osteophyte formation.	**Positive rheumatoid factor** (RF; IgM antibody against IgG; positive in 70%). High RF titers correlate with increased severity of disease, rheumatoid nodules, greater frequency of systemic complications, vasculitis, poorer prognosis. Normal to increased serum complement (C3). Increased erythrocyte sedimentation rate (ESR). Polyclonal gammopathy. Positive serum ANA (30%).
X-ray	**Narrowing of joint space. Osteophytes.** Dense, sclerotic bone. **Subchondral bone cysts.**	**Narrowing of joint space from destruction of articular cartilage.** Marginal bone erosions. Fusion (ankylosis) of joint.

MCP = metacarpophalangeal joint PIP = proximal interphalangeal joint DIP = distal interphalangeal joint

320. **Communicating hydrocephalus:** CSF communicates with the subarachnoid space; **choroid plexus papilloma** (makes too much CSF), block arachnoid granulations
321. **Non-communicating hydrocephalus (obstructive):** no communication with subarachnoid space; block at aqueduct of Sylvius (most common), blocks in 4th ventricle, blocks at base of the brain (TB meningitis, blood), Dandy Walker syndrome, Arnold Chiari syndrome
322. **AIDS dementia:** most common HIV-related CNS disease; **multinucleated microglial cells (reservoir for the virus)**
323. **Psoriasis:** hyperkeratosis, regular rete ridge hyperplasia, Munros microabscess, superficial dermis next to epithelial surface (Auspitz sign), erythematous plaques with silvery scales, nail pitting, psoriatic arthritis if HLA-B27 positive, elbows and scalp
324. **Read skin notes for quick coverage of main skin diseases**
325. **Bone tumors in order of increasing age:** Ewings ("onion skinning", fever, small cells), osteogenic sarcoma (knee area, "sunburst appearance", "Codman's triangle"), chondrosarcoma (pelvic girdle, knee area, most common malignant cartilage tumor), multiple myeloma (most common primary cancer of bone)
326. **Paget's disease of bone:** male dominant; initial osteoclastic breakdown and then osteoblastic; thick, weak, mosaic bone prone to pathologic fracture; large head; AV fistulas in bone (high output failure), risk for osteogenic sarcoma, elevated alkaline phosphatase; bisphosphonates treatment of choice
327. **Know CNS bleeds: epidural** (top of dura, skull fracture, torn middle meningeal artery), **subdural** (convexities, tear of bridging veins, fluctuating levels of consciousness), atherosclerotic stroke (usually pale infarct, since no reperfusion), **embolic stroke** (hemorrhagic infarct extends to surface of the brain), **intracerebral bleed** (hypertension; rupture of lenticulostriate Charcot-Bouchard aneurysms; hematoma not an infarct; globus pallidus/putamen area most common), **subarachnoid bleed** (ruptured congenital berry aneurysm [junction of communicating branch with anterior cerebral artery, severe occipital headache, blood covers the brain [may turn yellow after a week from breakdown into bilirubin])

328. **Hodgkin's lymphoma:** RS cell is the neoplastic cell; nodular sclerosing most common type (females, lacunar cells, anterior mediastinum involvement); fever, night sweats, weight loss; youngest (lymphocyte predominant, very few RS cells, excellent prognosis); oldest (lymphocyte depletion; many RS cells, poor prognosis); death by second malignancies from alkylating agents (non-HD lymphoma)
329. **Breast cancer risk:** overall, age most common risk; family history (mother, sister only); history of contralateral breast cancer); unopposed estrogen (early menarche, late menopause); history of endometrial cancer
330. **Silicosis;** risk for TB, not cancer; nodules in lung with crystals; foundry worker, sandblaster
331. **Asbestos:** pipefitter in shipyard, roofer; no risk for TB; smoker + asbestos = primary lung cancer; non-smoker + asbestos = mesothelioma; asbestos body (ferruginous body) looks like a dumbbell (fiber covered by iron)
332. **Fibrocystic change:** most common breast mass <50 years (atypical ductal hyperplasia only risk factor for cancer), bloody nipple discharge <50 (benign intraductal papilloma in lactiferous duct), tumor <35 years of age (fibroadenoma); breast mass >50 (infiltrating ductal cancer)
333. **Breast cancer types:** infiltrating ductal (most common), Paget's (nipple involvement by underlying cancer), medullary (bulky tumor with pushing margins), inflammatory carcinoma (peau du orange; plugging of subepidermal lymphatics by tumor, worst prognosis), lobular cancer (most common cancer of terminal lobules; bilaterality), comedocarcinoma (central area of necrosis in ducts resembling a zit)
334. **How to recognize leukemia and leukemia types:** acute vs chronic (bone marrow exam revealing >30% blast cells is acute leukemia, blast count not high in chronic); usual profile: anemia, thrombocytopenia (CML only leukemia that may have thrombocytosis), high WBC count with blast cells (may be a normal count, but blast cells will be present), generalized lymphadenopathy, hepatosplenomegaly, bone pain, fever; use age brackets to pick out most likely choice (see #438); always do a bone marrow to diagnose leukemia; stains: PAS for ALL, specific esterase for AML, LAP score for CML, non-specific esterase for monocytic leukemias, TRAP stain for hairy cell leukemia
335. **Hemangioma on face of a child:** leave it alone
336. **Osteopetrosis:** too much bone; anemia; marble bone disease; pathologic fractures; entrapment of cranial nerves; deafness
337. **Polycystic ovarian syndrome:** obesity, hirsutism, irregular menses, infertility; increased LH stimulates ovary to produce testosterone and 17-ketosteroids (androgens leading to hirsutism); increased adipose aromatizes androgens to estrogens (endometrial hyperplasia/cancer), which inhibit FSH and enhance LH release, hence continuing the cycle of LH stimulation; lack of FSH causes atresia of follicles and large ovaries with subcortical cysts; LH/FSH ratio >3/1; treat with BCP or clomiphene if patient wants to become pregnant
338. **Pituitary Cushings:** no suppression with low dose dexamethasone but can be suppressed with high dose dexamethasone (indicates only partial autonomy); cannot suppress adrenal Cushings or ectopic Cushings;
339. **Anemia since birth, splenomegaly:** probable congenital spherocytosis, do splenectomy
340. **CT with enlarged internal acoustic meatus in a patient with tinnitus, nerve deafness, vertigo:** acoustic neuroma (schwannoma, neurilemoma)
341. **Hemoptysis with foul smelling stools or pneumonia with foul smelling stools (malabsorption) in a child:** cystic fibrosis, do sweat test
342. **Mother states that child has a salty taste when kissed:** cystic fibrosis, do sweat test
343. **Picture of coronary vessel:** atherosclerosis (slit like spaces), dystrophic calcification (blue blotches), fibrofatty plaque (beneath intimal surface)
344. **Picture with acute inflammation:** numerous neutrophils (nucleus looks like squigglies, small capillaries
345. **Picture with chronic inflammation:** numerous round cell nuclei (lymphocytes) and plasma cells (eccentric nucleus with perinuclear clearing)
346. **Picture of healed myocardial infarction:** blotchy fibrosis unlike sheets of pale staining tissue as in a pale infarction
347. **Heart softest and prone to rupture:** 3-10th day; rupture with tamponade (pericardial sac filled with blood), posteromedial papillary muscle rupture (murmur of mitral insufficiency; pansystolic, apical, systolic; RCA thrombosis), interventricular septal rupture (systolic murmur, hole in IVS)
348. **Peripheral blood pictures:** hypersegmented neutrophil (folate/B_{12}) microcytic hypochromic cells (iron deficiency, ACD, thalassemia, sideroblastic anemia), sickle cells, target cells (bullseye), spherocytes (no central area of pallor), macroovalocytes (PA, folate), tear drop (myelofibrosis), Howell Jolly body (spleen surgically removed or dysfunctional spleen as in HbSS disease), platelet (small, red, anucleate cell), lymphocyte (black dot with a thin rim of cytoplasm), Auer rod (myeloblast with immature nucleus and splinter-like structures in the cytoplasm), smudge cells with lymphocytes (CLL; smudge cells are fragile lymphocytes that rupture), hairy cells (projections from cytoplasm; HCl; B cell malignancy), atypical lymphocyte (big cell with abundant sky blue cytoplasm), eosinophil (large red granules that do not cover the nucleus, same color as RBCs), basophil (large purple granules that do cover the nucleus), rouleau (RBCs with stack of coins effect), schistocytes (fragmented RBCs), reticulocyte (special stain; thin filaments representing RNA), Heinz bodies (special stain, large blue inclusions with involvement of the RBC membrane), coarse basophilic stippling (routine stain, looks like measles of the RBC)
349. **Bone marrow pictures:** megaloblastic marrow (all the cells appear big; giant band; B_{12}/folate deficiency), myelofibrosis (marrow is composed of fibrous tissue, large cells represent megakaryocytes), aplastic anemia (empty marrow with predominantly fat, and islands of lymphocytes), multiple myeloma (plasmablasts with bright blue cytoplasm, eccentric nuclei, perinuclear halo), ringed sideroblast (Prussian blue stain, ring of blue around the nucleus of a normoblast; defect in heme synthesis, sideroblastic anemias [alcohol, pyridoxine, Pb poisoning])

350. **Patient with left supraclavicular node:** Virchow's node, associated with metastatic stomach cancer or any cancer arising in the abdominal cavity; right supraclavicular node drains the lung and upper neck
351. **Roth's spot in the retina, splinter hemorrhages, Osler's nodes (painful) on hands/feet, Janeway lesions hand and feet (painless), hematuria with RBC casts:** immunocomplex vasculitis associated with infective endocarditis
352. **X-ray with local dilated bowel:** *sentinel loop* indicating localized infection, near duodenum or transverse colon = acute pancreatitis, cecum = retrocecal appendicitis
353. **X-ray with step-ladder appearance and air/fluid levels:** bowel obstruction
354. **X-ray with collapsed lung and clear space along the margin:** spontaneous pneumothorax
355. **X-ray of baby with loops of bowel in left pleural cavity: diaphragmatic hernia**
356. **Classic urine casts: RBC casts** = nephritic syndrome (post-streptococcal, IgA nephropathy, Goodpasture), **WBC casts** = acute pyelonephritis, renal tubular casts = acute tubular necrosis, **waxy casts** = chronic renal failure, **broad casts** = chronic renal failure, **hyaline casts** (ghost-like casts, non-refractile, smooth borders) = proteinuria or no clinical significance, **fatty casts** with Maltese crosses = nephrotic syndrome (minimal change, membranous GN)
757. **Urine crystals:** calcium oxalate (looks like the back of an envelope or a square with an X drawn in it; think stone, Crohn's disease, ethylene glycol poisoning), cystine (hexagonal crystal, cystinuria)
358. **Staghorn calculus in kidney:** struvite stone, magnesium ammonium phosphate, alkaline urine that smells like ammonia indicating a urease producing urinary pathogen (e.g., Proteus)
359. **Lipid deposits:** Achilles tendon xanthoma = familial hypercholesterolemia (AD; absent LDL receptor), xanthelasma (yellow plaque on eyelid, consider type II hyperlipidemia with increase in LDL), arcus senilis (rim of white around the outer part of the cornea, consider increased LDL if a young patient or normal age-related change if older patient), eruptive xanthomas (yellow papular lesions over the body; increased triglyceride)
360. **Psammoma bodies:** dystrophic calcification of apoptotic neoplastic cells; meningioma, papillary adenocarcinoma of thyroid, serous cystadenocarcinomas of the ovaries
361. **Addison's disease:** autoimmune destruction; hyperpigmentation; hypotensive; hyponatremia, hyperkalemia, normal gap metabolic acidosis from aldosterone lack; hypoglycemia from hypocortisolism (no gluconeogenesis); eosinophilia (no cortisol effect)
362. **Diabetes insipidus:** central DI: hypernatremia (increased Posm) with very low Uosm (no concentration, losing free water from lack of ADH); after water deprivation, Uosm increases >50% with injection of ADH---nephrogenic DI: same as for central, except ADH is present but cannot reabsorb free water in the collecting tubules and Uosm is <50% increased after ADH administration
363. **Pathology of DM:** non-enzymatic glycosylation: HbAIc for long-term glycemic control (4-8 weeks), hyaline arteriolosclerosis (nephropathy, lacunar infarcts in the brain), enhanced large vessel atherosclerosis; osmotic damage due to conversion of glucose to sorbitol by aldolase reductase: cataracts, microaneurysm in the eye, peripheral neuropathy (Schwann cell destroyed)
364. **DM most common cause of:** blindness, chronic renal disease, peripheral neuropathy (most common cause of pressure ulcers on the bottom of the feet), non-traumatic amputation of the lower leg, ketoacidosis, Charcot neuropathic joint, glucosuria
365. **DKA:** read endocrine notes and the discussion on diabetes mellitus
366. **Pheochromocytoma:** benign tumor (brown color) of adrenal medulla; most unilateral, in adrenal medulla, benign; paroxysmal hypertension, headache, drenching sweats; screen: urine VMA, metanephrines (best); associations: neurofibromatosis, MEN IIa and IIb, von Hippel Lindau
367. **Neuroblastoma:** child; malignant tumor in adrenal medulla and paraganglial tissue; hypertension; metastasis to bone, skin, orbit; Homer Wright rosettes; increased urine catecholamines; S100 antigen positive; age <1 best prognosis
368. **ZE syndrome:** malignant islet cell tumor secreting gastrin; ulcers in usual place but can be multiple or in unusual places; increased basal acid output; increased gastrin with IV secretin test; Whipple's procedure if operable; proton blockers can decrease gastrin; rule out other causes of hypergastrinemia (H2 or proton blockers, chronic atrophic gastritis of body and fundus, renal failure, gastric distention)
369. **MEN I (AD inheritance):** pituitary tumor, parathyroid adenoma, ZE syndrome, peptic ulcers
MEN IIa (AD inheritance): parathyroid adenoma, pheochromocytoma, medullary carcinoma of thyroid (calcitonin tumor marker; calcitonin converted into amyloid)
MEN IIb (AD inheritance): mucosal neuromas in lips, pheochromocytoma, medullary carcinoma
370. **Left heart failure:** decreased cardiac output, dyspnea, pulmonary edema (increased pulmonary venous hydrostatic pressure), left ventricular dilatation (volume overload), S3 heart sound, mitral insufficiency murmur (stretching of MV ring), paroxysmal nocturnal dyspnea and/or pillow orthopnea at night (increased venous return at night cannot be handled by the left heart)
371. **Right heart failure:** most commonly cause by LHF, decreased cardiac output, volume overload of right ventricle, S3 heart sound, murmur of tricuspid insufficiency (stretching of TV ring), jugular neck vein distention, congestive hepatomegaly (nutmeg liver, increased LDH5 isoenzyme, RHF most common cause), ascites, dependent pitting edema (kidney reabsorbs slightly more water than salt, but both are increased and are pushed into the interstitial space by the increased venous hydrostatic pressure; restrict water and salt; ACE inhibitor decreases preload and afterload; diuretics decrease preload)
372. **High output failure:** hyperthyroidism, thiamine deficiency, too much isotonic saline, AV fistula, endotoxic shock in early phases, Paget's disease of bone

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)