EXAM QUESTIONS 2002-2003

1. Features that help distinguish CD from UC include all of the following EXCEPT:
   (A) episcleritis
   B) small bowel involvement
   C) granuloma
   D) fistula
   E) skip lesions

2. A major rationale for using mesalamine in the treatment of ulcerative colitis is based upon its ability to:
   A. Inhibit the growth of Helicobacter Pylori (H. Pylori)
   B. Inhibit stomach acid secretion
   C. Inhibit prostaglandin formation
   D. Bind to and inactivate tumor necrosis factor-α (TNF-α)
   E. Stimulate the production of interleukin-2 (IL-2)

3. Acceptable treatment options for maintaining remission in a patient with Crohn's ileocolitis include all of the following EXCEPT:
   A. Budesonide
   B. Mesalamine
   C. 6-Mercaptopurine
   D. Ciprofloxacin
   E. Methotrexate

4. The following statements about the CARD15 gene are all true EXCEPT:
   A) It is located on chromosome 16
   B) It is linked to CD involving the ileum but not UC
   C) The gene product recognizes bacterial LPS and signals through NFκB
   D) Having two mutant copies results in a 20-30% chance of developing disease
   E) Plants have a similar gene involved in innate immunity
Questions 5-8 pertain to the following scenario

A 59 year old male returns from a camping trip and develops cramps and bloody diarrhea. He recalls drinking well water and swimming in a pond. He was on antibiotics 2 weeks ago for a URI and takes ibuprofen 2-3x per week. Sigmoidoscopy shows erythematous, abnormal appearing mucosa. Stool studies and biopsies are pending.

5. Differential diagnosis at this point includes all of the following EXCEPT:
   - A) ischemic colitis
   - B) lymphocytic colitis
   - C) ulcerative colitis
   - D) infectious colitis
   - E) Crohn’s colitis

6. All of the following are results of oral prednisone treatment that can be beneficial in treating colitis EXCEPT:
   - A. Inhibition of neutrophil migration to the intestine
   - B. Inhibition of leukotriene formation
   - C. Inhibition of interleukin-1 (IL-1) production
   - D. Inhibition of prostaglandin formation
   - E. Inhibition of histamine secretion

7. The pathogenesis of IBD is thought to involve all of the following EXCEPT:
   - A) environmental factors
   - B) genetic factors
   - C) anxiety
   - D) dysregulated mucosal immunity

8. Infliximab is used in the treatment of inflammatory bowel disease (Crohn's disease) because of its ability to:
   - A. Inhibit the production of intercellular adhesion molecule 1 (ICAM-1)
   - B. Bind to tumor necrosis factor-α (TNF-α)
   - C. Stimulate the production of interleukin-10 (IL-10)
   - D. Inhibit the production of lipoxygenase enzyme
   - E. Bind to cyclophilin and inhibit calcineurin enzyme activity
Questions 9-15 pertain to the following scenario

A 42-year-old Hispanic man with no past medical history presents with symptoms of recent upper respiratory infection. He feels weak and complains of mild nausea and generalized malaise. He also reports some weight loss. The review of systems is negative including no history of melena or hematochezia. He just returned from Puerto Rico after a 2-week visit to his relatives. He takes no medications. He drinks several beers per week. He quit smoking and never used IV drugs. He got a tattoo on his back 3 weeks ago.

On physical examination, he is moderately obese, afebrile, with stable vital signs. He has a few spider nevi on the anterior neck and chest, and mild scleral jaundice. His lungs are clear and his heart exam is normal. Abdominal exam reveals mild splenomegaly with no palpable liver, no mass, scar, or free fluid appreciated. Rectal exam shows guaiac (+) brown stool. There is no leg edema. Neurological exam is unremarkable.

Laboratory studies show the following:
AST 82 U/l
ALT 99 U/l
Alkaline phosphatase 149 U/l
Total bilirubin 2.2 mg/dl
Albumin 3.0 g/dl
Prothrombin time 14.3 sec (INR 1.40)
WBC 7,300/mm³
Hemoglobin 13.8 g/dl
Platelet count 58,000/mm³
Chem-7 within normal range

Chest X-ray shows no infiltrate or pleural effusion. Abdominal CT scan confirms splenomegaly with splenic varices. A **cirrhotic liver** is also reported with no ascites.

9. Which one of the following statements regarding this patient is NOT true?

A. Once isolated splenic varices are found, the suspicion of prehepatic portal hypertension should be raised
B. The pattern of transaminase elevation is not characteristic of alcoholic liver injury
C. Elevation of alkaline phosphatase is usually not seen in alcoholic liver disease and should direct the differential diagnosis toward obstructive biliary disease
D. Study of urine electrolytes is likely to reveal pre-ascitic avidity for sodium retention
E. If alcohol is the major etiology of cirrhosis, a micronodular pattern is expected
Additional laboratory testing reveals that the patient is HCV antibody positive and he has an HCV viral load of 276,000 IU/ml. Hepatitis A and B serology is negative. Alpha-fetoprotein is 6.2 ng/ml.

10. Based on these findings, which one of the following statements is NOT correct?

A. The risk of this patient for developing hepatocellular carcinoma (HCC) is higher with simultaneous alcoholic and viral liver injury
B. The primary mode of acquiring HCV infection in the US is through intravenous drug use
C. The prevalence of HCV infection among patients with severe alcoholic liver disease is significantly higher than in the normal population
D. The risk of this man for developing HCC based on his ethnicity is significantly higher
E. The current level of alpha-fetoprotein makes the presence of HCC in this patient less likely

Upper endoscopy is performed and grade III varices with no stigmata of recent hemorrhage are found in the lower half of esophagus along with signs of moderate portal gastropathy. The patient undergoes variceal banding on 3 consecutive occasions resulting in the disappearance of all esophageal varices.

He remains stable and abstinent with essentially unchanged laboratory parameters for another 6 months. He returns for a follow-up visit reporting a weight gain of 9 lbs, mild lethargy, and leg swelling. He is afebrile. Physical exam reveals a nontender abdomen with flank dullness, and pitting bilateral leg edema.

11. All of the following statements would describe this patient’s condition EXCEPT?

A. Ascitic fluid analysis is most likely to show a high serum-ascitic albumin gradient
B. Partial reversal of liver fibrosis upon abstinence has been reported and, based on the patient’s worsening clinical condition, abstinence in this case may have had little value
C. With a urine sodium excretion below 10 mEq/day, this patient has a mean survival time of 6 months
D. Once ascites is appreciated by flank dullness, at least 1500 cc is present
E. The esophageal varices seen in this patient are formed through collaterals of anterior branches of the left gastric vein

Diagnostic paracentesis at this time reveals the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Albumin</td>
<td>2.3 mg/dl</td>
</tr>
<tr>
<td>Ascites Albumin</td>
<td>0.9 mg/dl</td>
</tr>
<tr>
<td>Ascites WBC</td>
<td>360 (90% PMN’s)</td>
</tr>
<tr>
<td>Ascites RBC</td>
<td>5</td>
</tr>
</tbody>
</table>
12. Based upon the results above, which one of the following is the best initial measure to treat this patient?

A. Start spironolactone (up to 400 mg daily) and furosemide (up to 160 mg daily)
B. Start sodium restriction (1000 mg/day) on an outpatient basis
C. Admit the patient and start IV cefotaxime
D. Start sodium restriction along with fluid restriction if serum Na is below 125 mEq/l
E. Consider ambulatory therapeutic paracentesis

13. Which one of the following statements regarding other therapeutic measures in this case is NOT true?

A. With a Child-Pugh score of 7, this patient should be considered for liver transplantation
B. Selective beta-blocker therapy should be continued and the pulse rate kept around 60/min to control portal hypertension
C. Treatment of hepatitis C with PEG-interferon and ribavirin should not be initiated
D. Liver transplantation should not be considered until the patient is reliably abstinent for at least 6 months
E. Therapeutic paracentesis is an accepted treatment if ascites is refractory to diuretics in a compliant patient

Questions 14 and 15 refer to the following labeled photomicrographs (same case):

14. If the liver in this patient were biopsied on his first presentation, which of the histologic patterns would be most likely to be found?

A. 

B. 

C. 

D. 

E. 

15. If a liver biopsy were performed **during his last hospitalization**, which of the above histologic pattern is most likely?

16. The most prominent histologic features in the early stage of HCV liver disease are:
   A. Fatty change with Mallory hyaline
   B. Fibrous bands bridging from portal triad to central vein
   C. Lymphoid aggregates in the portal triad with piecemeal necrosis of adjacent hepatocytes
   D. Fibrous septa and hepatocyte regeneration

17. Which of the above features are more commonly at later stages of HCV liver disease?
   A. Fatty change with Mallory hyaline
   B. Fibrous bands bridging from portal triad to central vein
   C. Lymphoid aggregates in the portal triad with piecemeal necrosis of adjacent hepatocytes
   D. Fibrous septa and hepatocyte regeneration

18. Which of the above histologic features are more commonly associated with alcoholic liver disease than with HCV?
   A. Fatty change with Mallory hyaline
   B. Fibrous bands bridging from portal triad to central vein
   C. Lymphoid aggregates in the portal triad with piecemeal necrosis of adjacent hepatocytes
   D. Fibrous septa and hepatocyte regeneration

**Questions 19-20 pertain to the following scenario:**

A 47 year old businessman presents to the emergency department for evaluation of lethargy and nausea. Social history is notable for engaging in many “three-martini” business lunches. He denies illicit drug use, and has not been sexually active in six months. Review of systems is notable for a recent upper respiratory infection, for which he has been taking over the counter cold remedies. Physical examination is notable for right upper quadrant tenderness and mild lethargy.

Labwork is notable for the following:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>14.2</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>44.5%</td>
</tr>
<tr>
<td>Platelet count</td>
<td>170,000</td>
</tr>
<tr>
<td>AST</td>
<td>6453</td>
</tr>
<tr>
<td>ALT</td>
<td>7123</td>
</tr>
<tr>
<td>HbcAb</td>
<td>Positive</td>
</tr>
<tr>
<td>HBsAb</td>
<td>Positive</td>
</tr>
<tr>
<td>HBsAg</td>
<td>Negative</td>
</tr>
<tr>
<td>HCV Elisa</td>
<td>Positive</td>
</tr>
<tr>
<td>HCV RNA</td>
<td>Negative</td>
</tr>
</tbody>
</table>
19. Which of the following is most appropriate therapy for this patient?

A. Peg-interferon/Ribavirin
B. Hepatitis B immune globulin
C. N-acetyl cysteine
D. Prednisone
E. 6-Mercaptopurine

20. If a liver biopsy were performed, changes in hepatocytes would include all EXCEPT:
A. Ground glass hepatocytes
B. Councilman bodies
C. Sanded nuclei of some hepatocytes
D. Fibrous septa
E. Infiltration of the portal tracts with chronic inflammatory cells

21. Mechanisms which may contribute to the formation of ascites include all of the following EXCEPT:

A. Renin-Angiotensin-Aldosterone system activation
B. Increased renal blood flow
C. Peripheral vasodilation
D. Renal sodium avidity

A patient with new onset ascites undergoes a diagnostic paracentesis.

**Lab work is as follows:**

- Serum Protein: 7.0 g/dL
- Serum Albumin: 3.3 g/dL
- Ascites Albumin: 2.5 g/dL
- Ascites WBC: 280 cells/mm3 (7% neutrophils)

22. Compatible diagnoses include:
23. A patient with known cirrhosis presents to his physician complaining of worsening shortness of breath. He notes that he feels better when he lies down, and worse when he is upright, even at rest. Exam is notable for clear lungs; he has numerous spider nevi on the upper torso, loss of the normal male hair pattern, and gynecomastia. The most compatible blood gas result (breathing room air) is:

A. \( \text{PaO}_2 = 75 \text{ mm Hg}, \text{PCO}_2 = 50 \text{ mm Hg} \)
B. \( \text{PaO}_2 = 75 \text{ mm Hg}, \text{PCO}_2 = 30 \text{ mm Hg} \)
C. \( \text{PaO}_2 = 80 \text{ mm Hg}, \text{PCO}_2 = 40 \text{ mm Hg} \)

24. A patient presents with iron deficiency anemia. Colonoscopy is negative, and upper endoscopy demonstrates “portal hypertensive” gastropathy and non-bleeding esophageal and gastric varices. In order to better understand the mechanism of his portal hypertension, he undergoes hepatic vein catheterization. The hepatic venous pressure gradient is calculated, and is found to be 3 mm Hg. This finding would be consistent with which of the following diagnoses?

A. Hemochromatosis
B. Cirrhosis secondary to sclerosing cholangitis
C. Constrictive Pericarditis
D. Cirrhosis secondary to Chronic Hepatitis C

25. Pancreatic lipase requires all of the following for efficient action, EXCEPT:

A. Emulsification of fats by bile salts
B. Colipase
C. pH of the lumen < 3
D. Downstream effects of secretin release

26. Acute pancreatitis may be the result of all of the following EXCEPT:

A. Release of cathepsin B into the duodenal lumen
B. Reflux of duodenal contents into the pancreatic ducts
C. Autocatalysis of trypsinogen
D. Hypertriglyceridemia
27. Systemic outcomes of acute pancreatitis may include all of the following EXCEPT:

A. Thrombin activation leading to disseminated intravascular coagulation
B. Phospholipase activation causing inactivation of pulmonary surfactant leading to respiratory dysfunction
C. Kallikrein activation leading to bradykinin production, vasoconstriction, and hypertension
D. Complement activation leading to increased leukocyte chemotaxis

True (A) or False (B):

28. ✗ The two most common causes of pancreatitis in the US are biliary tract disease and alcoholism

29. ✗ Infections with mumps, coxsackie virus and Mycoplasma are less common causes of pancreatitis

30. ✗ Occlusion of pancreatic ducts with intestinal parasites can cause biliary obstruction and acute or chronic pancreatitis

31. ✗ Ischemia of the pancreas never causes pancreatitis

32. ✗ Defective intracellular transport with intracellular activation of proenzymes is a mechanism implicated in alcohol-associated pancreatitis

33. ✗ It can be difficult to distinguish well-differentiated pancreatic carcinoma from chronic pancreatitis

34. ✗ Chronic pancreatitis is a sudden destruction of the parenchyma by autoimmune attack

35. ✗ Endocrine insufficiency is never associated with any form of pancreatitis
36. Acute pancreatitis can cause shock, disseminated intravascular coagulation, and ARDS.

37. Steps required for excretion of bilirubin include all of the following EXCEPT:

A. Enzymatic glucuronidation of bilirubin by uridine diphosphate glucuronide glucuronyltransferase
B. Deconjugation of bilirubin to urobilinogen by intestinal bacteria
C. Uptake of bilirubin via Na+-independent organic anion transporter
D. Secretion of bilirubin conjugates via Multidrug-resistance-associated protein or Canalicular multi-specific organic anion transporter

38. A patient with acute pancreatitis is febrile to 100.3 °F at the time of admission. WBC is elevated to 12,000 (nl 4,500 – 11,000). CT scan shows free fluid around the pancreas without gas; the pancreas enhances uniformly with IV contrast. The liver, gallbladder, and biliary tree are normal. The best action to take at this time would be:

A. Start broad spectrum IV antibiotics (e.g. imipenim)
B. Continue conservative pain and intravenous fluid management
C. Do an CT guided aspiration of the peri-pancreatic fluid for gram stain and culture
D. Urgent ERCP

A 45 year old male is referred for evaluation of abnormal liver function tests that were found on an insurance screening physical. He is overweight and has non-insulin requiring diabetes. Physical exam is unremarkable. He may have one or two beers on the weekends, but denies other alcohol use. Lab results are as follows:

<table>
<thead>
<tr>
<th>Lab</th>
<th>Patient</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilirubin</td>
<td>1.1</td>
<td>0.2 – 1.2</td>
</tr>
<tr>
<td>ALT</td>
<td>73</td>
<td>7 – 40</td>
</tr>
<tr>
<td>AST</td>
<td>67</td>
<td>7 – 40</td>
</tr>
<tr>
<td>Alk Phos</td>
<td>117</td>
<td>30-115</td>
</tr>
</tbody>
</table>

Hepatitis A IgG (+); Hepatitis A IgM (-)
Hepatitis BsAg, BsAb, BcAb all (-)
Hepatitis C Antibody (+); Hepatitis C PCR (-)

ANA < 1:20
Anti-Smooth muscle Antibody (-)
Ceruloplasmin, Iron studies, alpha-1-antitrypsin are all normal
39. The most likely diagnosis is:
   A. Non-alcoholic steatohepatitis
   B. Hepatitis A
   C. Alcoholic Hepatitis
   D. Autoimmune Hepatitis

40. Distension of the rectum causes:
   A. reflex contraction of the external anal sphincter
   B. reflex relaxation of the internal anal sphincter
   C. rebound contraction of both the internal and external sphincters
   D. retrograde mass movement in the direction of the proximal colon

41. Marker of severe acute pancreatitis:
   A. Elevated serum Amylase
   B. Elevated serum Lipase
   C. Intravascular volume depletion and metabolic acidosis
   D. Pancreatic edema on CT scan

42. Neonatal hyperbilirubinemia is associated with all of the following EXCEPT:
   A. Increased hepatic bilirubin uptake
   B. Decreased UGT activity
   C. Hemolysis
   D. Increased enterohepatic circulation of bilirubin

43. Gut peptides have all of the following physiologic actions EXCEPT:
   A. Peptides may be present in presynaptic nerve terminals
   B. Gut peptides may be detected circulating in the blood
   C. The actions of neuropeptides can be elicited by intravenous infusion of the peptide
   D. The effects of a hormonal peptide can be antagonized at the receptor level

44. Physiologic effects of Cholecystokinin include all of the following EXCEPT:
   A. Stimulates gallbladder contraction
   B. Stimulates Sphincter of Oddi contraction
   C. Potentiates the effects of Secretin
   D. Inhibits gastric acid secretion
45. A 64 year old woman presents to her physician complaining of dyspepsia. Her only medication is naproxyn sodium, which she takes for osteoarthritis. She has never had any surgery. Esophagogastroduodenoscopy reveals ulcerations at the second portion of the duodenum. pH of the gastric fluid is 7.5. A fasting gastrin level is drawn the day after the procedure is completed, and returns at 1200 pg/ml. The best explanation for her elevated gastrin level is:

A. Drawing the gastrin level after distension of the stomach
B. Zollinger-Ellison Syndrome
C. Atrophic gastritis
D. Somatostatinoma

46. A biopsy of the stomach performed during endoscopy would reveal the histology shown below:
47. This histologic pattern is most indicative of
   A. Mucosal hyperplasia
   B. Chronic gastritis with intestinal metaplasia
   C. Squamous metaplasia
   D. Dysplastic adenomatous change
   E. Minimal change disease

48. During phase III of the migrating motor complex (MMC), the following occurs:
   A. The fundus receptively relaxes
   B. The pylorus contracts to prevent gastric emptying and allow grinding of gastric contents
   C. Contractions propagate indigestible material from the stomach into the small bowel
   D. Contractions become unorganized and non-propagated

49. Esophageal peristalsis requires all of the following EXCEPT:
   A. Intact myenteric plexus
   B. Must be initiated by a swallow
   C. Acetylcholine release
   D. Activity of both longitudinal and circular muscle layers

---

Question 50 pertains to the following scenario:

A 57 year old male presents for evaluation of several weeks of progressive itching, nausea, dark urine, and yellow eyes. Extensive evaluation reveals an obstructing cholangiocarcinoma with hilar lymph nodes and liver metastases. He is palliatively treated with a wire-mesh biliary stent. He returns one week later and feels markedly improved. He remains jaundiced though.

**His labs are as follows:**

<table>
<thead>
<tr>
<th>Lab</th>
<th>Pre-stent</th>
<th>Post-stent</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilirubin</td>
<td>13.7</td>
<td>6.6</td>
<td>0.2 – 1.2 mg/dl</td>
</tr>
<tr>
<td>ALT</td>
<td>321</td>
<td>73</td>
<td>7 – 40 U/L</td>
</tr>
<tr>
<td>AST</td>
<td>279</td>
<td>55</td>
<td>7 – 40 U/L</td>
</tr>
<tr>
<td>Alk Phos</td>
<td>749</td>
<td>224</td>
<td>30-115 U/L</td>
</tr>
</tbody>
</table>
50. His bilirubin is still elevated because:
   A. The stent is obstructed and needs replacement
   B. His liver metastases have spread
   C. He is now hemolyzing massively
   D. Clearance of bilirubin is prolonged in this patient

51. Systemic effect of pancreatitis include all of the following EXCEPT:
   A. inappropriate activation of thrombin
   B. increased fluid in the pulmonary acinar space
   C. decreased permeability of the alveolar-capillary membranes
   D. increased capillary permeability and vasodilation

52. Mutations in the Hepatitis B Core region may lead to all of the following EXCEPT:
   A. diminished cytotoxic T cell response to the "wild type" HBV core peptide
   B. infection in patients previously vaccinated with the recombinant Hepatitis B vaccine
   C. a more severe form of chronic active hepatitis and cirrhosis
   D. absence of Hepatitis B e Antigen

53. Which statement best characterizes the relationship of cholesterol and bile:
   A. cholesterol is a polar molecule which enables it to dissolve in bile
   B. cholesterol crystallization is unlikely to occur in the absence of lecithin
   C. cholesterol solubility in bile is accomplished via mixed micelles composed of bile salts and lecithin
   D. cholesterol is insoluble in the two-phase metastable zone

54. Effects of alcohol on the pancreas include all of the following EXCEPT:
   A. decreased inhibition of trypsin
   B. increased intraductal pressure
   C. increased reflux of duodenal contents into the pancreatic duct
   D. precipitation of oxalate plugs in the small pancreatic ductules
A 37 year old female nurse presents complaining of several months of watery diarrhea. Stool cultures, stool for ova & parasites, stool WBC are all negative. Her weight has been stable. Family history is negative. Flexible sigmoidoscopy is negative.

Stool electrolytes reveal the following:

\[ \text{Na}^+ = 10 \text{ mEq/L} \quad \text{K}^+ = 12 \text{ mEq/L} \quad \text{Stool Osmolarity} = 30 \text{ mOsm/kg H}_2\text{O} \]
\[ \text{(Normal Serum Osmolarity} = \sim 285-295 \text{ mOsm/kg H}_2\text{O}) \]

55. The likely mechanism of her diarrhea is:

A. Secretory diarrhea  
B. Osmotic diarrhea caused by a non-absorbable substance  
C. Osmotic diarrhea caused by a metabolizable substance  
D. Factitious diarrhea

56. A patient presents with bloating and occasional vomiting. Upper GI series shows some retained solid food, but shows no gross anatomic abnormality. Gastric emptying scan shows impaired emptying of solids. The etiology may include all of the following EXCEPT:

A. Anticholinergic drugs  
B. Diabetes  
C. Chronic atrophic gastritis  
D. Amyloidosis

57. A nurse presents to employee health complaining of nausea, fatigue, and relatively acute onset of jaundice. She recalls a needle stick injury approximately 7 weeks ago that she did not report. She is concerned that the patient may have had hepatitis C. The best test to diagnose acute Hepatitis C in this patient would be:

A. First generation Hepatitis C ELISA  
B. Second generation Hepatitis C ELISA  
C. Hepatitis C RIBA Assay  
D. Hepatitis C RNA by PCR

58. A patient with burning epigastric pain undergoes upper endoscopy and is found to have a duodenal ulcer. Mechanisms by which H.Pylori could play a role in the development of this ulcer include all of the following EXCEPT:

A. decreased fundic somatostatin levels  
B. increased gastrin release  
C. down regulation of mucosal defense factors  
D. production of inflammatory cytokines
59. Normal gut luminal bacteria inhibit pathogenic bacteria by all of the following mechanisms EXCEPT:

A. Reduction of luminal oxygen tension
B. Production of cyclohexamine, which is toxic to pathogenic bacteria
C. Decreasing bacterial adherence
D. Degradation of bacterial toxins

#60-63. One possible approach to treating a patient with a gastric ulcer would be the use of drugs that can inhibit acid secretion in the stomach. Match the numbered drugs below with the single most appropriate lettered mechanism of action for lowering stomach acid secretion. Each lettered choice may be used once, more than once, or not at all.

60. Omeprazole
61. Famotidine
62. Misoprostol
63. Pirenzepine

A. Activation of prostaglandin E₃ receptors
B. Blockade of histamine H₁ receptors
C. Blockade of cholinergic muscarinic M₂ receptors
D. Inhibition of parietal cell H⁺/K⁺-ATPase enzyme activity
E. Blockade of histamine H₂ receptors

64. Indicate which of the following statements concerning *H. Pylori* are CORRECT:

A. Most (>50%) of individuals infected with *H Pylori* in the stomach develop peptic ulcers
B. Metronidazole is an acceptable agent to use in attempting to eradicate *H. Pylori*
C. The best approach for therapy to eradicate *H. Pylori* is to start with a single therapeutic agent, and then include additional agents if the single original agent isn't effective
D. A and B
E. B and C

65. A patient is evaluated for dysphagia. Barium swallow shows pooling of contrast in the valleculae, poor clearance of the pharynx, and rare, silent aspiration. Contrast that passes into the esophagus appears to transit appropriately. The most likely diagnosis is:
66. A 33 year old woman complains of several months of non-bloody diarrhea and flatulence. She has lost 12 pounds during this time. Stool Wright stain (for WBC) is negative. Stool sudan stain (fecal fat) is positive. Breath hydrogen testing with lactose shows a late peak in breath hydrogen excretion. D-xylene test shows diminished excretion of D-xylene in the urine at 5 hours. The most appropriate next test would be:

A. Secretin stimulation test to assess pancreatic exocrine function
B. Anti-Endomysial or Tissue Transglutaminase assay
C. ERCP to r/o pancreas divisum
D. Schilling Test Parts I and II

67. A 27 year old male presents with diarrhea and abdominal cramping. He is finishing a course of erythromycin for sinusitis. Factors which may contribute to his diarrhea include all of the following EXCEPT:

A. Overgrowth of pathogenic bacteria
B. Altered bowel motility
C. Impaired carbohydrate metabolism in the colon
D. Reduced brush border disaccharidases

68. One treatment to reduce diarrhea is administration of loperamide (Imodium). Indicate which of the following statements concerning loperamide are CORRECT:

A. It is an inhibitor of acetylcholine release in the gut
B. It is an agonist at opiate μ receptors in the gut
C. It stimulates the release of norepinephrine in the gut
D. A and B
E. B and C

69. The following statements about Peyer’s patches are true EXCEPT:
A. they sample for luminal antigens via specialized villi
B. they are heavily infiltrated with lymphocytes
C. sensitized lymphocytes travel from the Peyer’s patches to mesenteric lymph nodes
D. they may permissive to intestinal infection

70. Bacterial overgrowth in the small intestine may be associated with:
A. C. Dificile colitis
B. jejunal diverticulosis
C. conjugation of bile salts in the intestinal lumen
D. bloody stools

71. H. Pylori infection is a likely contributor to all of the following EXCEPT:
A. Epidemic hypochlorhydria
B. Gastric MALT lymphoma
C. Gastroesophageal Reflux Disease
D. Atrophic gastritis

72. Alcohol induces liver injury via all of the following EXCEPT:
A. depletion of glutathione
B. generation of reactive oxygen species
C. generation of acetaldehyde-protein adducts
D. induction of increased levels of mRNA coding for alcohol dehydrogenase

73. Gut bacteria are responsible for all of the following EXCEPT:
A. Hydrolysis of urea and other proteins with the production of ammonia
B. Production of Vitamin K
C. Production of luminal mutagens which may promote neoplasia in the colon
D. Conjugation of secondary bile acids in the lumen

74. Oral polio vaccine makes use of the following process:
A. induction of oral tolerance
B. induction of IgA and IgG antibody production
C. antigen induced inactivation of reactive lymphocytes
D. induction of hyporesponsiveness of luminal antigens

75. All of the following are true about Hepatitis E EXCEPT:
76. Appropriate coordination of the antrum, pylorus, and duodenum lead to all of the following events EXCEPT:

A. Passage of hypertonic material into the duodenum increases gastric emptying
B. Passage of fats into the duodenum delays gastric emptying
C. Material which passes into the duodenum is usually < 2 mm in size
D. Indigestible material is passed into the duodenum during the interdigestive period

77. A struggling first year student calls you back to the physiology “dog lab”. Given that this is a nightmare, you arrive to find that the experiments are being conducted on a very small dog, which has a long ringed tail, and looks much more like an opossum. The student tells you that he is studying LES motility. He has given atropine and finds that there is a minimal effect on LES tone. He has given tetrodotoxin and finds that it has no effect on LES tone, but that LES relaxation is blocked. From this, you logically conclude that:

A. LES tone is adrenergically mediated
B. LES tone is mediated through non-adrenergic, non-cholinergic neurotransmitters
C. LES relaxation is neurally mediated
D. LES relaxation is mediated through nicotinic receptors

78. Depending upon the clinical circumstances, *H. pylori* has been demonstrated to adhere to:

A. gastric antral mucosa
B. gastric fundic mucosa
C. gastric metaplastic mucosa in the duodenal bulb
D. duodenal bulb mucosa

79. Slow waves (basic electrical rhythm) are propagated aborally in each of the following bowel segments EXCEPT:

A. Stomach
B. Small Intestine
C. Right Colon  
D. Left Colon  

80. A seven year old child with failure to thrive is found to have steatorrhea on the basis of a 24 hour fecal fat collection. All of the following tests may help you determine the etiology EXCEPT:  

A. Small bowel biopsy for functional assessment of brush border enzyme activity  
B. D-Xylose test  
C. Sweat chloride test  
D. Lactulose breath hydrogen test  

81. A patient presents to the medical walk-in clinic because his eyes have turned yellow. He has minimal, if any, symptoms. A medical student evaluates him before all of the lab results have returned. The bilirubin is 3.5 (nl 0.2-1.2) mg/dl. The rest of the liver function tests are pending. The urinanalysis shows pH 5/ Specific gravity 1.020/Clear urine/ Dipstick (-)/Micro (-). The chemistry is normal. The CBC is pending. The student presents the patient to an attending and provides the following differential diagnostic list. The attending congratulates the student for remembering so much from BI0282, and deduces that, of the choices given, the most likely diagnosis is:  

A. Choledocholithiasis  
B. Sarcoidosis  
C. Gilbert’s Syndrome  
D. Dubin-Johnson Syndrome  

82. All of the following serve to reduce gastrin production EXCEPT:  

A. Enterogastrones  
B. Intraluminal gastric acid  
C. Local release of somatostatin  
D. Chewing food without swallowing it  

83. A previously asymptomatic individual presents for evaluation of right-sided chest pain, which started after a fall. X-rays reveal right rib fractures, at the location where he is having pain. Incidentally, his gallbladder is noted to have a few small stones in it, and the wall has a calcified appearance. You would recommend:  

A. Treatment with oral dissolution therapy (e.g. ursodeoxycholic acid)  
B. Referral for gallbladder resection now  
C. Monitoring for the development of symptoms, and then referral for surgery  
D. Referral for surgery only if he joins the astronaut training corp  

84. Overnight secretion of acid is primarily driven by:  

A. action of histamine alone
B. action of acetylcholine and histamine
C. action of gastrin alone
D. action of gastrin and histamine

85. In atrophic gastritis, changes include all of the following EXCEPT:
A. Marked loss of glandular structure
B. Parietal cells are conspicuously absent
C. Caseating granulomas
D. Hyperplasia of gastrin-producing G-cells of the antral mucosa
E. Cystic dilation of persisting glands

Match the description of pain to the most consistent clinical scenario:

86. rebound tenderness  
87. periumbilical pain  
88. localized tenderness  
89. epigastric tenderness  

A) sigmoid diverticulitis
B) duodenal ulcer
C) mesenteric ischemia
D) acute pancreatitis

Match the mechanism of gallstone formation to each of the listed risk factors:

90. Total Parenteral Nutrition  
91. Ileal Resection  
92. Chronic Hemolysis  
93. Estrogen therapy

A) Bile salt deficiency
B) Increased secretion of unconjugated bilirubin
C) Increased biliary secretion of cholesterol
D) Gallbladder stasis

Select the single best answer:

94. Infections that occur in the mouth include Herpes Simplex Type 1. All of the following statements about HSV are true EXCEPT:
A. Infective from wet sores
B. Causes gingivostomatitis in children ages 2-4
C. Is a small RNA virus
D. Causes multinucleate polykaryons
E. Is not associated with HIV

95. Systemic diseases that affect primarily the mucous membranes of the mouth include all EXCEPT.
A. Bullous pemphigoid
B. Erythema multiforme
C. Pemphigous
D. HSV Type II
E. Leukemia

96. Leukoplakia is
A. Caused by HIV
B. A sequelae of HSV blisters
C. A white plaque that cannot be removed by scraping
D. Usually found in young women

97. Squamous cell carcinoma is all EXCEPT
A. 95% of all cancers of the oral cavity
B. May be caused by tobacco, HPV, and/or sun exposure
C. Metastasizes early and causes gastric obstruction
D. May be due to a genetic predisposition
E. Early detection is imperative

98. Neoplasia of the larynx include all EXCEPT:
A. Papillomas
B. Hematomas
C. Singer's nodes
D. Carcinoma of the vocal cord

99. Otitis the most common cause of ER visits for children in the US. Causes of otitis include all EXCEPT
A. Aseptic serous otitis
B. H. Influenza
C. Parvovirus
D. Beta hemolytic Streptococcus
The specimen shown above displays the classic features of

A. Peutz-Jehgers syndrome
B. Familial adenomatous polyposis
C. Diverticulitis
D. Hyperplastic polyps
A Salivary gland neoplasia is shown below.

101. This tumor is:
    A. Malignant and likely to invade adjacent tissue and metastasize
    B. A benign growth with recurrence rates of 2%

102. The clinical course of the tumor is:
    A. Survival rates at 5, 10 and 25 yrs of 49, 42 and 33%
    B. Survival of less than 5 yrs expected
A six-year old boy presents with failure to thrive and chronic vomiting. He had always been an unhappy child. A psych evaluation is negative. A biopsy of his duodenum could show:

A. Diffuse severe atrophy and blunting of the villi
B. Squamous metaplasia of the intestinal mucosa
C. Acute inflammatory infiltrate and hemorrhagic necrosis
E. Duodenal ulcer with carcinoma in situ

**Match the following histologic descriptions with either Ulcerative Colitis (A) or Crohn's Disease (B)**

104. **E** Continuous colonic involvement, beginning in the rectum

105. **E** Skip lesions

106. **E** Involvement of the small intestine alone in 40% of cases

107. **E** Pseudopolyps and linear ulcers

108. **E** Transmural inflammation, ulcerations and fissures

109. **E** Toxic megacolon

110. **E** Non-caseating granulomas

111. **E** Crypt abscess
You are a lab technician working in a liver disease clinic. Unfortunately, the labels have come off of the blood samples drawn that day. You must match sets of LFT’s to the specific patient diseases:

[Normal values: Bili 0.2-1.2 mg/dl, Alk Phos 30-115 U/L; SGOT (AST) = 7-40 U/L; SGPT (ALT) = 7-40 U/L]

112. Primary Sclerosing Cholangitis with RUQ pain and fever

A. Bili = 1.2, Alk Phos = 117
   AST = 42       ALT = 45

113. Autoimmune Hepatitis

B. Bili = 12, Alk Phos = 133
   AST = 445      ALT = 532

114. Chronic Hepatitis C

C. Bili = 3.5, Alk Phos = 453
   AST = 174      ALT = 215

D. Bili = 2.2, Alk Phos = 221
   AST = 52       ALT = 54

115. Primary Biliary Cirrhosis

According to the Fredrickson, Levy, Lees classification scheme for lipid/lipoprotein disorders, of the disorders below, indicate for which type the statin drugs (e.g., lovastatin) would be considered reasonable first or second choice drugs capable of producing significant therapeutic effect:

A. Type I
B. Type IIa
C. Type IIb
D. A and B
E. B and C

117-120. Match up the numbered lipid-lowering drug below with the single most appropriate lettered statement. Each lettered choice may be used once, more than once, or not at all.
117. Colesevelam

118. Niacin

119. Gemfibrozil

120. Simvastatin

A. Of the drugs above, the most potent for reducing blood triglycerides
B. An inhibitor of HMG CoA Reductase
C. A drug which binds to (and sequesters) bile acids
D. An inhibitor of cholesterol oxidation
E. Produces flushing as a side effect

#121-124. Match the numbered drug with the most appropriate single lettered description. Each lettered description may be used once, more than once, or not at all.

121. Dimenhydrinate

122. Ondansetron

123. Prochlorperazine (Compazine)

124. Apomorphine

A. Proemetic: Agonist at dopamine D₂ receptor sites
B. Antiemetic: Antagonist at dopamine D₂ receptor sites
C. Anti-motion sickness, but not emetic for agents directly stimulating the chemoreceptor trigger zone: Antagonist at histamine₁ (H₁) receptor sites
D. Antiemetic: Antagonist at serotonin₃ (5-HT₃) receptor sites

125. Indicate which of the following statements concerning niacin, when used to treat lipid/lipoprotein disorders, are CORRECT:

A. It increases plasma LDL levels
B. It reduces hepatic lipoprotein (e.g., VLDL) synthesis
C. It increases plasma HDL levels
D. A and B
E. B and C

126. A major side effect statistically shown to occur as a result of lovastatin treatment:
A. Cataracts
B. Cardiac arrhythmia
C. Myositis
D. Hypertension
E. Pulmonary fibrosis

127. Agents which can be useful in the treatment of gastroesophageal reflux disease (GERD, a.k.a. heartburn):

A. Nizatidine
B. Mg(OH)₂ + Al(OH)₃ (Mylanta)
C. Omeprazole
D. A and B
E. A, B and C

#128-132. Match the numbered anti-epileptic drugs with the most appropriate anti-epileptic mechanism of action. Each lettered choice may be used once, more than once, or not at all.

128. Tiagabine
129. Clonazepam
130. Phenytoin
131. Phenobarbital
132. Carbamazepine

A. Inhibition of voltage-dependent sodium channels
B. Potentiation of GABA action at GABA_A receptor sites
C. Inhibition of glutamic acid synthesis
D. Inhibition of GABA reuptake
E. Stimulation of glutamic acid reuptake
133. Indicate which of the anti-epileptic drugs below would be the most preferred for treating an absence (petit mal) seizure:

A. Phenytoin  
B. Phenobarbital  
C. Ethosuximide  
D. Primidone  
E. Carbamazepine

134. Indicate which of the following statements concerning sumatriptan as an anti-migraine headache agent are CORRECT:

A. It is used only in the asymptomatic phase (between attacks) for treating migraine headaches  
B. Its use is contraindicated in patients with ischemic heart disease because it can cause coronary artery spasm  
C. It is a serotonin$_{1D}$ (5-HT$_{1D}$) receptor agonist  
D. A and B  
E. B and C
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Question</th>
<th>Answer</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A</td>
<td>46.</td>
<td>A</td>
<td>91.</td>
<td>A</td>
</tr>
<tr>
<td>2.</td>
<td>C</td>
<td>47.</td>
<td>B</td>
<td>92.</td>
<td>B</td>
</tr>
<tr>
<td>5.</td>
<td>B</td>
<td>50.</td>
<td>D</td>
<td>95.</td>
<td>D</td>
</tr>
<tr>
<td>7.</td>
<td>C</td>
<td>52.</td>
<td>B</td>
<td>97.</td>
<td>C</td>
</tr>
<tr>
<td>10.</td>
<td>D</td>
<td>55.</td>
<td>D</td>
<td>100.</td>
<td>B</td>
</tr>
<tr>
<td>12.</td>
<td>C</td>
<td>57.</td>
<td>D</td>
<td>102.</td>
<td>A</td>
</tr>
<tr>
<td>13.</td>
<td>B</td>
<td>58.</td>
<td>A</td>
<td>103.</td>
<td>A</td>
</tr>
<tr>
<td>15.</td>
<td>B</td>
<td>60.</td>
<td>D</td>
<td>105.</td>
<td>B</td>
</tr>
<tr>
<td>17.</td>
<td>D</td>
<td>62.</td>
<td>A</td>
<td>107.</td>
<td>A</td>
</tr>
<tr>
<td>19.</td>
<td>C</td>
<td>64.</td>
<td>B</td>
<td>109.</td>
<td>A</td>
</tr>
<tr>
<td>22.</td>
<td>B</td>
<td>67.</td>
<td>D</td>
<td>112.</td>
<td>C</td>
</tr>
<tr>
<td>23.</td>
<td>B</td>
<td>68.</td>
<td>D</td>
<td>113.</td>
<td>B</td>
</tr>
<tr>
<td>24.</td>
<td>C</td>
<td>69.</td>
<td>A</td>
<td>114.</td>
<td>A</td>
</tr>
<tr>
<td>25.</td>
<td>C</td>
<td>70.</td>
<td>B</td>
<td>115.</td>
<td>A</td>
</tr>
<tr>
<td>27.</td>
<td>C</td>
<td>72.</td>
<td>D</td>
<td>117.</td>
<td>C</td>
</tr>
<tr>
<td>28.</td>
<td>A</td>
<td>73.</td>
<td>D</td>
<td>118.</td>
<td>E</td>
</tr>
<tr>
<td>29.</td>
<td>A</td>
<td>74.</td>
<td>B</td>
<td>119.</td>
<td>A</td>
</tr>
<tr>
<td>30.</td>
<td>A</td>
<td>75.</td>
<td>C</td>
<td>120.</td>
<td>B</td>
</tr>
<tr>
<td>31.</td>
<td>B</td>
<td>76.</td>
<td>A</td>
<td>121.</td>
<td>C</td>
</tr>
<tr>
<td>32.</td>
<td>A</td>
<td>77.</td>
<td>C</td>
<td>122.</td>
<td>D</td>
</tr>
<tr>
<td>33.</td>
<td>A</td>
<td>78.</td>
<td>D</td>
<td>123.</td>
<td>B</td>
</tr>
<tr>
<td>34.</td>
<td>B</td>
<td>79.</td>
<td>C</td>
<td>124.</td>
<td>A</td>
</tr>
<tr>
<td>35.</td>
<td>B</td>
<td>80.</td>
<td>A</td>
<td>125.</td>
<td>E</td>
</tr>
<tr>
<td>37.</td>
<td>B</td>
<td>82.</td>
<td>D</td>
<td>127.</td>
<td>E</td>
</tr>
<tr>
<td>38.</td>
<td>B</td>
<td>83.</td>
<td>B</td>
<td>128.</td>
<td>D</td>
</tr>
<tr>
<td>40.</td>
<td>B</td>
<td>85.</td>
<td>C</td>
<td>130.</td>
<td>A</td>
</tr>
<tr>
<td>41.</td>
<td>C</td>
<td>86.</td>
<td>D</td>
<td>131.</td>
<td>B</td>
</tr>
<tr>
<td>42.</td>
<td>A</td>
<td>87.</td>
<td>C</td>
<td>132.</td>
<td>A</td>
</tr>
<tr>
<td>43.</td>
<td>C</td>
<td>88.</td>
<td>A</td>
<td>133.</td>
<td>C</td>
</tr>
<tr>
<td>44.</td>
<td>B</td>
<td>89.</td>
<td>B</td>
<td>134.</td>
<td>E</td>
</tr>
<tr>
<td>45.</td>
<td>C</td>
<td>90.</td>
<td>D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>