

Gastrointestinal Pathophysiology Exam 2005
Tufts University School of Medicine

Please select the one BEST answer.

1. A 21 year old man has weight loss and episodic bloody diarrhea. The bloody diarrhea has become more frequent recently. A colonoscopy shows erythema and diffuse small ulcers from the rectum to the mid-transverse colon. Biopsies show architectural distortion and cryptitis.

The most likely diagnosis is which of the following?

- A. Ischemic colitis
 - B. AIDS-associated gastroenteritis
 - C. Clostridium difficile colitis
 - D. Crohn's disease
 - E. Collagenous colitis (lymphocytic colitis)
 - F. Amebiasis
 - G. Ulcerative colitis
 - H. Cytomegalovirus colitis
 - I. Ulcerative jejunoileitis
2. A 42 year old man abuses intravenous drugs. He complains of 2 weeks of anorexia and nausea. He noted that his urine turned dark and his stool turned light. Blood work is consistent with acute viral hepatitis. Serologic studies are done:
- Hepatitis A IgG: positive
 - Hepatitis A IgM: negative
 - Hepatitis C Antibody: negative
 - Hepatitis B surface antigen: positive
 - Hepatitis B surface antibody: negative
 - Hepatitis B core IgM antibody: positive

Which of the following best explains the mechanism of hepatic injury in this patient?

- A. Direct viral cytotoxic effect
 - B. Immune mediated hepatocyte damage
 - C. Direct inhibition of hepatocyte DNA replication
 - D. Direct inhibition of hepatocyte mRNA translation
 - E. Antibody destruction of virus
3. A barium study on a 55 year old man is shown below:



Which of the following would you most likely expect this patient to have?

- A. Dysphagia to solids and liquids
 - B. Dysphagia to liquids
 - C. A hiatal hernia
 - D. A duodenal ulcer
 - E. Esophageal cancer
4. A 66 year old woman has profuse watery diarrhea which has lasted more than 6 weeks. The diarrhea does not improve when oral intake is limited. She has had a 5 pound weight loss. She drinks two glasses of wine nightly. All stool cultures are negative. Fecal leukocytes are negative. A Sudan stain performed on a stool specimen is negative. The D-Xylose test shows 10 grams of xylose in the urine. Stool electrolytes are checked: stool sodium concentration is 85mmol/l and stool potassium concentration is 50mmol/l.

Which of the following is the most likely diagnosis?

- A. Irritable bowel syndrome
 - B. Chronic pancreatitis
 - C. Carcinoid syndrome
 - D. Small intestinal bacterial overgrowth syndrome
 - E. Abuse of lactulose
5. A 65 year old man comes to the emergency room with the acute onset of peri-umbilical abdominal pain, nausea, and vomiting. He drinks alcohol regularly. He takes no medications. On exam, he has a low grade temperature but other vital signs are stable. He has tenderness in the mid-abdomen without rebound or guarding. His lab tests are:

ALT 58 U/l
AST 95 U/l
Total bilirubin 1.1 mg/dl
Alkaline phosphatase 89 U/l
Amylase 1105 U/l
Lipase 1404 U/l

Which of the following is the most likely pathophysiologic mechanism to explain the condition which is causing this patient's pain?

- A. Prolonged hypotension causing ischemia
 - B. Cytotoxic damage to peri-portal hepatocytes
 - C. Reduced stimulation of intracellular calcium signaling pathways
 - D. Inappropriate activation of pancreatic enzymes
 - E. Reduced pancreatic enzyme synthesis and secretion
6. A 65 year old woman has primary biliary cirrhosis and is awaiting liver transplantation. She has ascites and spider angiomas on physical examination and large esophageal varices on upper endoscopy.

Which of the following would most likely be decreased?

- A. Resistance to blood flow through the liver
 - B. Rate of blood flow through the splanchnic circulation
 - C. Level of vasodilators in the blood
 - D. Hepatic vein pressure gradient
 - E. Peripheral vascular resistance
7. A 44 year old man complains of persistent heartburn which occurs daily. He denies any dysphagia or odynophagia.

Which of the following pathophysiologic mechanisms most likely explains his symptoms?

- A. Transient lower esophageal sphincter contractions
 - B. Elevated lower esophageal sphincter pressures
 - C. Slow gastric motility
 - D. Transient lower esophageal sphincter relaxations
 - E. Reduced gastric acid production
8. A 62 year old man has abdominal pain, hematemesis, and melena. He is not taking NSAIDs (non-steroidal anti-inflammatory drugs) or aspirin. An upper endoscopy reveals a large posterior wall duodenal ulcer. A biopsy is obtained from the gastric antrum and a rapid urease test is positive.

Which of the following findings is most likely?

- A. Type A autoimmune gastritis
 - B. CagA positive *H pylori*
 - C. Low gastrin levels after a meal
 - D. Normal gastric acid production
 - E. Absence of gastric metaplasia in the duodenum
9. A 65 year old woman has abnormal liver function tests. She has been experiencing nausea and abdominal pain over the last 7 days. She does not take anti-coagulants. A right upper quadrant ultrasound is normal. Her laboratory tests are as follows:

White blood cell count: 12,500
Glucose: 80 mg/dl
Amylase: 100 U/l

LDH: 305 U/l
Lipase: 25 U/l
Iron: 250mcg/dl
Total iron binding capacity (transferring): 350 mcg/l
Ferritin: 100 ng/ml
Total bilirubin 7.5 mg/dl (Direct bilirubin 7.1 mg/dl)
Alkaline phosphatase 90 U/l
ALT 145 U/l
AST 295 U/l
PT 25 (INR 3.1)
Albumin 3.6 g/dl

Which of the following is the most likely explanation for these findings?

- A. Chronic hepatitis B
 - B. Alcoholic hepatitis
 - C. Hepatitis A
 - D. Primary biliary cirrhosis
 - E. Primary sclerosing cholangitis
10. An 80 year old man has a history of constipation and intermittent left lower quadrant abdominal pain. A colonoscopy shows extensive diverticulosis in the sigmoid colon.

He is at risk for which of the following conditions?

- A. Carcinoma of the colon
 - B. Angiodysplasia
 - C. Gastrointestinal hemorrhage
 - D. Ulcerative colitis
 - E. Malabsorption
11. A 32 year old woman undergoes a gastric bypass operation for morbid obesity. The surgery goes well and she loses 70 kg in two months. She has two children; the youngest was delivered by caesarean section 2 years ago. She comes into the emergency room complaining of intermittent episodes of right upper quadrant abdominal pain. The physical exam is remarkable for right upper quadrant tenderness. Liver function studies are normal. A right upper quadrant ultrasound shows numerous mobile structures with acoustic shadowing in the gallbladder. The bile duct is not dilated.

The most likely risk factor for this patient's condition is which of the following?

- A. Recent pregnancy
 - B. Rapid weight loss
 - C. Age
 - D. High serum cholesterol
 - E. High cholesterol diet
12. A 40 year old man abuses alcohol. He has been admitted to the hospital multiple times with attacks of abdominal pain. His CT scan of the abdomen shows pancreatic calcifications.

What is the most likely initial abnormality in the pathogenesis of this patient's condition?

- A. Islet cell destruction
- B. Repeated episodes of pancreatic inflammation
- C. Hypersecretion of protein into pancreatic ductules
- D. Autodigestion of the pancreas by pancreatic enzymes
- E. Biliary sludge causing pancreatic duct obstruction

13. A 25 year old woman is 2 weeks post-partum after an uncomplicated vaginal delivery. She was constipated during her pregnancy requiring the use of laxatives and bulk forming agents. She comes to the emergency room with the acute onset of bright red blood per rectum. She has no pain when moving her bowels and denies any pain in the anal area. She has no fever.

Which of the following would you most likely expect to see on anoscopy or flexible sigmoidoscopy?

- A. Posterior anal fissure
- B. Perianal abscess
- C. Second degree internal hemorrhoids
- D. Intersphincteric fistula
- E. Trans-sphincteric fistula

14. A 68 year old man is admitted to the intensive care unit with a massive upper GI bleed. He is awaiting liver transplantation for advanced hepatitis C related cirrhosis. He is known to have esophageal varices and you suspect this is the most likely cause of the bleeding.

Which of the following would you most likely expect to find in this patient?

- A. Thick walled esophageal varices
- B. Small varices (grade I)
- C. Hepatic vein pressure gradient less than 12mmHg
- D. Duodenal ulcer
- E. Hepatic vein pressure gradient greater than 12mmHg

15. A 38 year old man is actively using intravenous drugs. He comes to the emergency room because of nausea, vomiting, and anorexia over the last one week. Over the last two days his friends have told him that he looks yellow. On exam, you find him to be alert and oriented without asterixis. His liver edge is slightly prominent and mildly tender. He is jaundiced. He has blood tests checked and his hepatitis A and C serologies are negative. You suspect he has acute hepatitis B.

Which of the following hepatitis B serologies is most likely in this patient?

	Hepatitis B surface antigen	Hepatitis B surface antibody	Hepatitis B core IgM antibody	Hepatitis B e antigen	Hepatitis B e antibody
A	Negative	Positive	Negative	Negative	Negative
B	Negative	Negative	Positive	Negative	Negative
C	Positive	Negative	Negative	Positive	Negative
D	Positive	Negative	Positive	Positive	Negative
E	Positive	Positive	Positive	Negative	Negative

16. A 47 year old woman has severe diarrhea. She was recently diagnosed with a metastatic carcinoid tumor to the liver. Octreotide is begun for better control of the diarrhea.

Aside from slowing gastrointestinal motility and decreasing intestinal secretion what other effect of octreotide would you expect to observe?

- A. Increased pancreatic secretion of enzymes and bicarbonate
- B. Stimulating insulin secretion
- C. Stimulating gastric acid secretion
- D. Reduction in splanchnic blood flow
- E. Increased gallbladder motility

17. A 32 year old woman complains of crampy abdominal pain and diarrhea after eating. She has lost approximately 10 pounds. She is found to be anemic and iron deficient. Her tissue transglutaminase antibodies are positive.

Which of the following conditions is this patient at risk of developing?

- A. Small intestinal adenocarcinoma
- B. Hypercoaguable state
- C. Osteoporosis
- D. Pyoderma gangrenosum
- E. Colon carcinoma

18. You diagnosis a 55 year old man with a benign gastric ulcer. He is started on a proton pump inhibitor and *h pylori* treatment is started. He continues to have symptoms and therefore you start sucralfate.

Which of the following best describes the mechanism of action of sucralfate?

- A. Inhibition of gastric acid
 - B. Inhibition of pepsin secretion
 - C. Synergistic effect on antibiotics for *h pylori*
 - D. Binds ulcer base and increases mucosal prostaglandins
 - E. Activates pepsin
19. An 18 year old man comes to your office for evaluation of persistent right lower quadrant abdominal pain. He has 4-5 loose non-bloody bowel movements daily and has lost about 15 pounds in the last 6 months. Stool cultures are all negative. He has a positive ASCA (antisaccharomyces cerevesiae antibody) and negative p-ANCA (peri-nuclear antineutrophil cytoplasmic) antibodies. A colonoscopy is performed.

Which of the following colonoscopic findings is most likely?

- A. Large deep ulcers
- B. Inflamed rectum
- C. Normal vascular markings
- D. Pinpoint ulcers
- E. Normal appearing terminal ileum

20. An endoscopy performed on a 58 year old woman on ibuprofen for arthritis reveals a large ulcer in the antrum of the stomach. There are no endoscopic stigmata of bleeding. A biopsy is obtained from the stomach for rapid urease testing and this is negative.

Which of the following best explains the pathogenesis of this ulcer?

- A. Reduced blood supply to the stomach
 - B. *H pylori* infection
 - C. Excessive gastric acid production
 - D. Excessive gastrin production
 - E. Inhibition of prostaglandin synthesis
21. A 25 year old man develops severe right upper quadrant abdominal pain that comes on 2 hours after eating several slices of pizza. He has a prior history of diabetes and alcohol abuse. There is a family history of spherocytosis. He develops a high fever and is eventually diagnosed with acute cholecystitis. His gallbladder is removed and the pathologist notes pigment gallstones.

Which of the following most likely contributed to this patient's gallstones?

- A. Insulin dependent diabetes
 - B. Alcohol use
 - C. Hereditary spherocytosis
 - D. Male gender
 - E. Prior need for total parenteral nutrition
22. A 46 year old woman is rejected for a life insurance policy due to abnormal liver function tests and a positive hepatitis C antibody. She seeks your expertise and asks about the natural history of hepatitis C.

Which of the following best describes the natural history of hepatitis C?

- A. 25% of patients will develop chronic hepatitis
- B. More than 70% of patients will develop chronic hepatitis
- C. 5% of patients will develop cirrhosis
- D. 80% of patients will develop cirrhosis
- E. Most patients will require liver transplantation

The following possible answers are for questions 23 and 24:

- A. Low LES (lower esophageal sphincter) pressure, low amplitude esophageal body contractions
- B. Lack of LES relaxation with swallow, low amplitude esophageal body contractions
- C. High UES (upper esophageal sphincter) pressure
- D. Simultaneous high amplitude esophageal body contractions
- E. Low UES pressure
- F. High LES pressure, high amplitude esophageal body contractions
- G. Low LES pressure, high amplitude esophageal body contractions
- H. Transient LES relaxations, low amplitude esophageal body contractions

For each patient with dysphagia, select the most likely esophageal motility abnormalities.

23. A 66 year old man with progressive dysphagia to solids and liquids associated with nocturnal coughing and respiratory problems. An air-fluid level is seen in the esophagus on chest x-ray.
24. A 55 year old woman with progressive dysphagia to solids and liquids. She has severe heartburn. Her physical exam is remarkable for skin changes and sclerodactyly.

The following possible answers are for questions 25, 26, 27:

- A. Drug reaction
- B. Pancreatic cancer causing biliary obstruction
- C. Primary biliary cirrhosis
- D. Acute hepatitis A
- E. Alcoholic hepatitis
- F. Hemochromatosis
- G. Autoimmune hepatitis
- H. Gilbert's syndrome
- I. Primary sclerosing cholangitis
- J. Granulomatous hepatitis

For each patient with jaundice, select the most likely diagnosis.

25. A 26 year old man with mild flu-type symptoms. Total bilirubin 4.5, Direct bilirubin 0.2., normal hemoglobin.
26. A 46 year old woman with ALT 1,500, AST 2,300, Hepatitis A IgG positive, Hepatitis B surface antibody positive, Anti-nuclear antibody (ANA) negative.
27. A 78 year old man with an alkaline phosphatase of 555, AST 58, ALT 79, and a dilated bile duct seen on transabdominal ultrasound.