The following vignette applies to the next 2 items

A 24-year-old Caucasian male presents to your office complaining of periodic constipation and dull abdominal pain for the last two years. The pain is predominantly periumbilical and gets better with bowel movements. He denies any recent weight loss, nausea, vomiting, diarrhea, or bloody stools. He has no significant past medical history. He smokes one pack of cigarettes daily and consumes alcohol occasionally. He has no known medication allergies. His father and paternal aunt were both diagnosed with colon cancer at a young age. Physical examination is unremarkable. There are no skeletal deformities, the thyroid gland is not enlarged, and the oral mucosa has no patches, ulcers, erosions, or pigmentary changes. The abdomen is soft, non-distended, and non-tender on palpation. Colonoscopy reveals innumerable polyps in the colon and rectum.

Item 1 of 2

What is the best next step in managing this patient?

A. CT scan of the abdomen
B. Serum fractionated metanephrines
C. Serum TSH and calcitonin levels
D. Urinalysis and urine cytology
E. Upper GI endoscopy

Explanation:

The most likely diagnosis in this case is familial adenomatous polyposis (FAP). FAP is transmitted in an autosomal dominant fashion, so patients will typically have a history of a first degree relative with early onset colon cancer. However, up to 1/3 of patients with FAP have no such family history due to a new mutation. Polyposis typically begins in the second or third decade of life and patients usually have over 100 adenomatous polyps on colonoscopy. Symptoms preceding the colonoscopy are often vague and nonspecific. Genetic testing for mutations in the APC gene is available to confirm the diagnosis. The vast majority of these patients will progress to develop colorectal carcinoma if colectomy is not performed. Patients with FAP are also at risk of developing extracolonic neoplasms. Both gastric and duodenal adenomas/carcinomas are more prevalent among patients with FAP so upper GI endoscopy at this time would be warranted.

(Choice A) CT scans may be helpful in identifying desmoid tumors, a component of Gardner's syndrome, which is a subtype of FAP. However, screening abdominal CT is not necessary when a diagnosis of FAP is made.

(Choice B) Metanephrines are elevated in patients with pheochromocytoma, which is not associated with FAP.

(Choice C) Both follicular and papillary neoplasms are more prevalent among patients with FAP, however neither of these would generally result in changes in the serum TSH. Elevated calcitonin may be seen in medullary thyroid cancer. Thyroid biopsy may be needed in patients with palpable thyroid nodules, although none were felt in this patient.

(Choice D) Urine cytology and urinalysis may be helpful in identifying a bladder neoplasm, however there is no association of FAP with bladder neoplasms.

Educational objective:
Familial adenomatous polyposis (FAP) typically presents as a large number (more than 100) of polyps seen on colonoscopy in a patient in their second or third decade of life, usually with a family history of the disease. Gastric and duodenal adenomas/carcinomas are associated with the disease so a screening upper GI endoscopy should be performed after a diagnosis of FAP is made.

28% of people answered this question correctly;

Item 2 of 2

Several large (>1cm) colonic polyps were biopsied and found to be adenomas. The option of proctocolectomy is discussed with the patient but he adamantly refuses the surgery. Without surgery, what is the risk of colon cancer in this patient by the age of 45?

A. <10%
B. 25%
C. 50%
D. 75%
E. >95%

Explanation:

Nearly all patients with familial adenomatous polyposis (FAP) develop colon cancer by the age of 45, so surgical referral for colectomy is generally made at the time of diagnosis. In some younger patients with sparser, smaller colonic polyps, it may be permissible to hold off on colectomy temporarily to accommodate school and/or work activities. Total proctocolectomy with an ileoanal anastomosis is the preferred surgical procedure, although a subtotal colectomy with colonoscopic surveillance can be considered for a select subgroup of patients. Surveillance via colonoscopy is not generally a reasonable alternative for the majority of these patients as the sheer number of adenomatous polyps make adequate sampling difficult. COX-2 inhibitors as well as the anti-inflammatory medication sulindac have been shown to cause a regression in the degree of polyposis, although microadenomas are still thought to persist in these patients, which can progress to colon cancer.

(Choice A) The general population has a lifetime risk of around 10% for developing colon cancer, but this risk is greatly elevated in patients with FAP.

(Choice B) The colon cancer risk is much higher than 25% for patients with FAP.

(Choice C) Peutz-Jeghers syndrome has a lifetime risk of colon cancer of around 40%, but this diagnosis is unlikely in this patient given the absence of abnormal oral pigmentation.

(Choice D) The lifetime risk of developing colon cancer in Lynch syndrome, also known as hereditary nonpolyposis colorectal cancer, is approximately 70-75%.

Educational objective:
The vast majority of patients with familial adenomatous polyposis (FAP) will go on to develop colon cancer by the age of 45. Prophylactic colectomy is therefore strongly recommended. They should also get surveillance upper endoscopy.

71% of people answered this question correctly;

The following vignette applies to the next 3 items

A 34-year-old Caucasian woman presents to urgent care complaining of malaise and a change in her skin color. She was in good health until approximately two weeks ago when she began to feel very fatigued. Soon thereafter she noticed some yellowish discoloration of the whites of her eyes. Her medical history is remarkable for irritable bowel syndrome and migraine headaches. Her immunization history is unknown. She is currently single and has two sexual partners. She drinks on social occasions and does not smoke cigarettes or use recreational drugs. Vital signs are normal. Physical examination demonstrates lungs that are clear to auscultation and normal heart sounds. Palpation of the abdomen reveals mild hepatomegaly with some tenderness. Icterus is evident. The remainder of the physical examination is unremarkable. Laboratory evaluation includes the following results:

Serum Chemistry

Sodium	139 mEq/L
Potassium	4.4 mEq/L
Chloride	103 mEq/L
Bicarbonate	22 mEq/L
BUN	15 mg/dL
Creatinine	0.9 mg/dL
Glucose	110 mg/dL

Complete Blood Count

Hb	14.1 g/dL
Hct	41.7%
MCV	86 fl
Platelet count	260,000/cmm
Leukocyte count	5800/cmm
Segmented neutrophils	56%
Bands	1%
Lymphocytes	37%
Monocytes	3%
Eosinophils	2%
Basophils	1%

Liver Function Tests

ALT	960 IU/L
AST	768 IU/L
Total bilirubin	5.2 mg/dL
Serum albumin	3.8 mg/dL
Serum hCG	3 IU/L
Prothrombin time	13 sec

Item 1 of 3

Hepatitis serology is pending. Which of the following is the most appropriate next step in the management of this patient's care?

A. Admit to the hospital for observation
B. Admit to the hospital and begin intravenous antibiotics
C. Advice complete bed rest for one week
D. Prescribe ursodeoxycholic acid and schedule follow-up appointment after three days, with instructions to return sooner if condition worsens
E. Schedule follow-up appointment to review hepatitis panel results, with instructions to return sooner if condition worsens

Explanation:

In a young, stable, and otherwise healthy adult who presents with jaundice and right upper quadrant discomfort, it is common practice to complete the medical evaluation on an outpatient basis. This patient's presentation is highly suggestive of hepatic dysfunction, but further speculation should be withheld until her hepatitis panel returns **(Choice E)**.

Admission to the hospital for observation **(Choice A)** is appropriate only if there is concern that the patient's condition will worsen rapidly in the near future.

Admission to the hospital for intravenous antibiotics **(Choice B)** would be appropriate if it seemed that a bacterial infection was present in the hepatobiliary system. Since this patient is afebrile and her white blood cell count is normal, a bacterial infection appears unlikely.

Ursodeoxycholic acid **(Choice D)** is occasionally used to dissolve cholesterol gallstones in patients who are not good surgical candidates. It can also prevent gallstone formation in patients on weight loss regimens.

Educational Objective:
Stable and otherwise healthy adults who present with jaundice can be evaluated on an outpatient basis.

*Extremely important question for USMLE step-3

46% of people answered this question correctly;

Item 2 of 3

The hepatitis panel shows:

Anti-HBe	Negative
Anti-HBs	Negative
HBeAg	Positive
HBsAg	Positive
IgG anti-HBc	Negative
IgM anti-HBc	Positive

What is the most appropriate means of treating this patient's condition?

A. Supportive measures
B. Hepatitis B immunoglobulin and hepatitis B vaccine
C. Interferon and zanamivir
D. Interferon and ribavirin
E. Liver transplantation

Explanation:

Markers for acute hepatitis B infection include HBsAg, IgM anti-HBc, and HBeAg (an indicator of high infectivity). In contrast, the markers for chronic hepatitis B infection include HBsAg, anti-HBe, and IgG anti-HBc.

Acute hepatitis B virus infection is a subclinical or anicteric syndrome in 70% of patients, with the remaining 30% complaining of symptoms such as anorexia, nausea, jaundice, and right upper quadrant discomfort. The symptoms usually resolve after 1-3 months but some patients will complain of persistent fatigue even after their aminotransferase elevations normalize. If the serum ALT remains elevated for longer than six months, progression to chronic hepatitis has occurred. Treatment of acute hepatitis B consists of supportive measures **(Choice A)**.

Hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine (HBV) should be administered as postexposure prophylaxis to health care workers exposed to blood or other potentially infectious excretions **(Choice B)**. For maximal efficacy, it is important that the HBIG and HBV be given as soon as possible (ideally within 24 hours of exposure).

Interferon and zanamivir **(Choice C)** are not indicated for the treatment of hepatitis B. While interferon is of some use in treating hepatitis C, zanamivir is only indicated for influenza prophylaxis or treatment.

Therapy with interferon alfa-2b and ribavirin **(Choice D)** is appropriate for patients with chronic hepatitis C who are suffering from compensated liver disease never treated with alfa interferon or for patients who have failed interferon monotherapy.

Liver transplantation **(Choice E)** is the only hope for some patients with end-stage liver failure

caused by infection with hepatitis B virus. The usage of HBIG, lamivudine, and adefovir in this patient population has increased three-year post-transplant survival rates to 65%.

Educational Objective:
Treatment of acute hepatitis B consists of supportive measures.

*Extremely important question for USMLE step-3

38% of people answered this question correctly;

Item 3 of 3

The patient voices concern about her prognosis. What is the likelihood she will develop chronic hepatitis?

A. 0%
B. 1-10%
C. 15-30%
D. 40-60%
E. 100%

Explanation:

Interestingly, one of the best prognostic indicators for patients stricken with acute hepatitis B is the prothrombin time; if it remains normal, the infection will likely resolve with no significant sequelae. The risk of developing chronic hepatitis B depends largely on the age at infection. Perinatally acquired infection results in a 90% progression rate; infection between ages one and five years results in a 20-50% progression rate; and an infection acquired as an adult results in <5% progression rate **(Choice B)**.

It is inaccurate to advise the patient that the likelihood she will develop chronic hepatitis is anything other than <5% **(Choices A, C, D, and E)**.

Educational Objective:
Fewer than 5% of adults stricken with acute hepatitis B infection will go on to develop chronic hepatitis B, whereas 90% of infants that acquire acute hepatitis B perinatally will go on to develop chronic hepatitis B.

*Extremely important question for USMLE step-3

44% of people answered this question correctly;

The following vignette applies to the next 3 items

A 36-year-old Caucasian man comes to the office because he has been having foul-smelling loose stools for the past ten months. He has also noted that his clothes are much more loose now, and he has lost some weight, but he is not sure how much. He does not have any significant past medical history, and his family history is also non-contributory. His family migrated from Italy when he was two years old. He now works in the family-owned restaurant. He denies any history of smoking, alcohol, intravenous drug abuse, exposure to sick contacts, or history of travel outside the United States. He has been married for the last ten years, and denies any extramarital sexual contacts. His physical examination, including the vital signs, is within normal limits. He has tried various therapies, including psyllium and other herbal preparations for the diarrhea without much success. His fecal occult blood test is negative for blood.

Item 1 of 3

What is the most appropriate next step in the management of this patient?

A. Stool cultures and sensitivity
B. Stool microscopic examination
C. Antiendomysial antibody measurement
D. A trial of loperamide
E. Check ELISA for HIV

Explanation:

The patient is suffering from chronic diarrhea, which is defined as the production of loose stools with or without an increased frequency for more than four weeks duration. It is important to realize that chronic diarrhea is only a symptom which can be caused by a large variety of disorders. In the developed countries, some of the common causes are irritable bowel syndrome, inflammatory bowel disease, chronic infection, and malabsorption syndromes such as celiac disease and lactose intolerance. Identification of the specific cause of chronic diarrhea is necessary in order to treat it effectively. With the appropriate evaluation, the specific cause can be found in approximately 90% of patients with chronic diarrhea.

According to the American Gastroenterological Association guidelines for the evaluation of patients with chronic diarrhea, any evaluation should begin with a comprehensive history. This will provide a specific clue to the diagnosis and will help direct the further course of investigation. Apart from the routine laboratory tests, stool analysis can yield important information about the cause of diarrhea. Some of the specific things to look for in the stool sample include microscopic examination for leukocytes and parasites, occult blood, and special staining for fat, pH, and electrolytes for calculating the osmotic gap.

(Choice A) Bacterial infections rarely cause chronic diarrhea in a young immunocompetent patient; therefore, routine fecal cultures have a low yield in such situations, and are not

indicated.

(Choice C) IgA endomysial antibodies are highly specific for the diagnosis of untreated celiac disease; however, this is not indicated in the initial workup of chronic diarrhea.

(Choice D) The use of loperamide to control chronic diarrhea without a specific diagnosis is not appropriate.

(Choice E) The patient has no known risk factors for contracting HIV disease; therefore, an ELISA for HIV is not indicated initially at this point.

Educational Objective:
Microscopic examination of the stool for leucocytes, ova, parasites, and occult blood should be performed initially in the evaluation of patients with chronic diarrhea.

28% of people answered this question correctly;

Item 2 of 3

After the initial visit, the patient continues to have large amounts of foul-smelling stools. The complete blood count that was done earlier reveals the following:

Hemoglobin	10.2 g/L
MCV	76 fl
Platelets	260,000/mm3
Leukocyte count	8,500/mm3
Neutrophils	55%
Eosinophils	3%
Lymphocytes	32%
Monocytes	10%

Meanwhile, you discover that the patient has lost approximately 20 pounds in the last 10 months. You decide to proceed with endoscopic examination and biopsy of the gastrointestinal tract. Which of the following is the most likely biopsy picture of this patient?

A. Transmural inflammation with lymphocytic infiltration
B. Superficial mucosal inflammation with infiltration of plasma cells
C. Villus blunting with lymphocytic and plasma cell infiltration
D. Diffuse hypertrophy of the intestinal villi
E. Polyp formation in the small intestine

Explanation:

The patient appears to be suffering from chronic diarrhea due to a malabsorption syndrome, which is most likely celiac disease. Patients with celiac disease have diarrhea with voluminous, foul-smelling and floating stools due to steatorrhea. Patients, especially later in the course of the disease, may present with non-gastrointestinal manifestations such as iron-deficiency anemia, vitamin D and calcium deficiency, thereby causing osteopenia, osteomalacia, arthritis, and significant weight loss.

The mainstay of diagnosis of celiac disease is a small intestinal biopsy. Biopsies are usually taken from the distal duodenum during an upper GI endoscopy. The characteristic histologic findings are villus blunting, loss of the normal villus architecture, and increased lymphocytic infiltration of the mucosa.

(Choice A) Transmural inflammation of the mucosa is seen in patients with Crohn's disease.

(Choice B) Superficial mucosal inflammation with infiltration of plasma cells is the characteristic histologic finding in patients with ulcerative colitis.

(Choice E) Multiple polyps in the small intestine can cause a secretory diarrhea in some patients, but these are unlikely to cause a malabsorption syndrome.

Educational Objective:

Celiac disease is diagnosed with a small intestinal biopsy, and the characteristic histologic findings are loss of the normal villus architecture, mucosal flattening (villus blunting), and lymphocytic infiltration.

77% of people answered this question correctly;

Item 3 of 3

Which of the following is the most appropriate treatment for this condition?

A. Antibiotics for four to six weeks
B. Start him on pancreatic enzyme supplementation
C. Iron sulfate 325 mg twice a day
D. Prescribe a gluten-free diet
E. A trial of oral prednisone

Explanation:

It is important to correctly diagnose the cause of chronic diarrhea in order to institute the specific therapy. The mainstay of treatment of patients with celiac disease is a gluten-free diet. Dietary counseling is thus an important part of the overall management of such patients. Those who are diagnosed with celiac sprue should be referred to a dietician to tailor their diet according to their specific needs. Since the principal source of gluten in the diet is wheat, rye, and barley, all patients with diagnosed celiac disease should be advised to refrain from eating these food products. In addition, patients should be informed that the consumption of soya bean, rice, corn, and potatoes is safe. Since patients with untreated longstanding celiac disease can develop nutritional deficiencies, supplementation of iron, folate, calcium and other vitamins may be required if patients are found to be deficient.

Most patients will show some clinical improvement approximately two to three weeks after the initiation of a gluten-free diet; however, normalization of the villus architecture can take a few months. The diagnosis of celiac disease should be questioned in patients who fail to show clinical or histological improvement after being on a gluten-free diet for four to six months.

(Choice A) Systemic antibiotics are only indicated in patients with chronic bacterial infections or Whipple's disease. These have no role in the management of patients with celiac disease.

(Choice B) Pancreatic enzyme supplementations are useful in patients with malabsorption due to chronic pancreatitis.

(Choice C) Iron supplements may be needed to correct an underlying anemia; however, treatment with a gluten-free diet is initially required to allow for the adequate absorption of iron.

(Choice E) Oral corticosteroids are not routinely used in the treatment of patients with celiac disease. These are only used when a patient with refractory celiac sprue fails to respond to a gluten-free diet.

Educational Objective:
The mainstay of treatment of celiac sprue is the elimination of gluten-containing food products from the diet.

84% of people answered this question correctly;

A 55-year-old Caucasian man comes to the physician's office and complains of abdominal pain and diarrhea for the past four months. His symptoms began gradually, and are progressively getting worse. He describes the pain as, "mostly a dull aching type, but at times it is colicky also." His stools are watery and are not accompanied by blood or mucus. He reports a 12 lbs weight loss over the past four months. He denies any history of fever. He recalls occasional episodes of vomiting of recently ingested food in the past. He is an avid tennis player, but he can no longer play because he easily gets tired nowadays. His past medical history is significant for the diagnosis of celiac sprue in childhood, for which he was started on a gluten-free diet. He responded well to these dietary modifications and never had any problems thereafter, until now. He watches his diet very carefully. He works as a financial advisor and has never used tobacco, alcohol, or illicit drugs. He is monogamous with his wife. He is currently not taking any medications, and he has no known drug allergies. Physical examination reveals an emaciated man with pallor. Which of the following is the most likely diagnosis of this patient?

A. Chronic pancreatitis
B. Lactase deficiency
C. Whipple's disease
D. Intestinal lymphoma
E. AIDS

Explanation:

It is important to remember that patients with celiac sprue are at an increased risk of developing intestinal T cell lymphomas. The jejunum is most commonly affected, and the tumors are usually nodular or ulcerative. Some patients may present with perforative peritonitis. The most common presenting symptoms are abdominal pain, weight loss and diarrhea. Malabsorption results in anemia and poor nutritional status. The diagnosis of intestinal lymphoma must be suspected in any patient with celiac disease who presents with gastrointestinal symptoms despite adherence to a gluten-free diet. Treatment is with surgery and chemotherapy, but the relapse rates are high and the prognosis in such cases is poor.

(Choices A and C) Although chronic pancreatitis and Whipple's disease are associated with signs and symptoms of malabsorption, this patient's history of celiac sprue makes intestinal lymphoma the more likely diagnosis than the other choices.

(Choice B) Lactose intolerance usually does not cause anemia.

(Choice E) Since the history does not suggest any risk factors, it is unlikely that the diagnosis is AIDS.

Educational Objective:
Patients with a history of celiac disease are at an increased risk of developing intestinal lymphomas. This diagnosis must be suspected in any patient with celiac disease who presents with gastrointestinal symptoms despite adherence to a gluten-free diet.

66% of people answered this question correctly;

The following vignette applies to the next 2 items

A 56-year-old male presents with a several month history of difficulty swallowing. He reports that the problem started with meat sticking in his throat, but has since progressed to the point that even liquids are now difficult to swallow. He denies shortness of breath, voice changes, or heartburn. He notes that sometimes he coughs during meals. He has lost several pounds during the last two months. His past medical history is significant for hypertension. He was evaluated for persistent right ear pain four weeks ago. He smokes two packs of cigarettes daily and consumes 6-8 bottles of beer on weekends. He is not sexually active. His blood pressure is 144/88 mmHg and his heart rate is 80/min. His lungs are clear on auscultation. Neck palpation reveals no lymph node enlargement or thyromegaly.

Item 1 of 2

What is the best initial step in the management of this patient?

A. Barium swallow
B. Bronchoscopy
C. CT scan of the chest
D. Esophageal manometry
E. Upper GI endoscopy

Explanation:

This patient has dysphagia. Dysphagia can be further categorized into oropharyngeal or esophageal dysphagia. This patient's coughing with swallowing as well as his recent ear pain (referred pain) is suggestive of an oropharyngeal or proximal esophageal source of his symptoms. Drooling, difficulty initiating a swallow, and a cervical location of symptoms may also suggest oropharyngeal dysphagia.

Patients with esophageal dysphagia have symptoms several seconds after a swallow with complaints often referable to the parasternal region. Initial dysphagia with both solids and liquids is suggestive of a motility disorder while dysphagia initially for solids only that progresses to dysphagia with liquids is typically seen with mechanical obstruction.

This patient's presentation is most consistent with a mechanical obstruction, which in combination with his recent weight loss and history of alcohol use and smoking is concerning for an underlying esophageal malignancy. Given that this patient's lesion is likely oropharyngeal or in the proximal esophagus, a barium swallow would be the most reasonable first step. Barium swallow is also indicated in patients where there is a suspicion for achalasia or a long segment stricture such as patients with prior radiation or caustic ingestion. Upper GI endoscopy may still be needed following the barium swallow.

(Choice B) Bronchoscopy would not be indicated at this time. Given this patient's difficulties in swallowing, his cough is likely secondary to a problem in the oropharynx or proximal

esophagus as opposed to the airways.

(Choice C) A CT scan of the chest may eventually be needed in this patient if a malignancy is found in the oropharynx or esophagus, but it would not be the first line test since it does not evaluate the mucosa as well as a barium swallow does.

(Choice D) Manometry may be helpful if there is suspicion for an esophageal motility disorder, but this patient's history of dysphagia initially with solids that progresses to involve liquids is suggestive of mechanical obstruction.

(Choice E) Upper GI endoscopy would be the best first test if this patient's lesion was thought to be more distal in the esophagus. Intubation of the upper esophagus during endoscopy is not well visualized and this may result in perforation of the underlying pathology.

Educational objective:
Drooling, difficulty initiating a swallow, a cervical location of symptoms, coughing, and ear symptoms are all suggestive of an oropharyngeal source of dysphagia. A barium swallow should be the first test in these patients or in those where there is suspicion for achalasia or a long segment esophageal stricture.

51% of people answered this question correctly;

Item 2 of 2

Endoscopy reveals an upper esophageal mass with irregular contours that partially obstructs the lumen of the esophagus. What is the most likely histological type of the tumor?

A. Adenocarcinoma
B. Melanoma
C. Squamous cell carcinoma
D. Stromal tumor

Explanation:

The two main histopathologic types of esophageal carcinoma are adenocarcinoma and squamous cell carcinoma. Previously squamous cell carcinoma was more common, but in recent years the incidence of esophageal adenocarcinoma has been increasing while the incidence of squamous cell carcinoma has been decreasing. The incidence of each type varies with esophageal location. Adenocarcinoma characteristically occurs in patients with chronic gastroesophageal reflux so it generally is seen in the distal esophagus, with some cases occurring in the midesophagus in patients with severe Barrett's esophagus. Upper esophageal lesions, like that seen here, are far more likely to be squamous cell carcinoma. Alcohol and tobacco use are risk factors for esophageal squamous cell carcinoma (just as they are for other squamous cell cancers of the head and neck).

(Choice A) The majority of esophageal cancers are adenocarcinoma, although adenocarcinoma in the proximal third of the esophagus is very rare secondary to its association with gastroesophageal reflux.

(Choice B) Melanoma can occur in the esophagus but is much rarer in this location than either squamous cell carcinoma or adenocarcinoma.

(Choice D) Stromal tumors also occur in the esophagus, but with less frequency than squamous cell carcinoma or adenocarcinoma.

Educational objective:
Esophageal adenocarcinoma is associated with chronic gastroesophageal reflux while squamous cell carcinoma is often seen in patients with chronic alcohol and/or tobacco use.

76% of people answered this question correctly;

A 75-year-old Caucasian man comes to the office because of constipation. He has had this problem for at least ten years. He eats wheat bran, raisins and prunes, and drinks great amounts of water. He had benign prostatic hypertrophy that was surgically corrected, but led to chronic renal failure two years ago. He also has chronic hypertension. He does not use tobacco, alcohol or illicit drugs. He takes amlodipine daily. Examination of the abdomen shows no abnormalities. Rectal exam reveals hardened stools; rapid fecal occult blood test (FOBT) is negative. A colonoscopy performed seven years ago was normal. Which of the following is the most appropriate pharmacotherapy?

A. Docusate sodium
B. Milk of magnesia
C. Psyllium
D. Castor oil
E. Bisacodyl

Explanation:

Psyllium is a bulk laxative that is indicated for chronic constipation because it has minimal adverse effects.

(Choice A) Docusate sodium is less effective than laxatives, and is not useful for chronic constipation.

(Choice B) Milk of magnesia is contraindicated in renal failure because it can lead to hypermagnesemia.

(Choice D) Castor oil is not recommended on a regular basis because it can produce fluid and electrolyte derangements, which can occur more frequently in patients with renal impairment.

(Choice E) Bisacodyl is a stimulant laxative that affects electrolyte transport in the intestine. Its chronic use can cause hypokalemia and salt overload. The latter complication can be especially dangerous for a patient with renal failure and hypertension.

Educational Objective:
The mainstay of treatment for chronic constipation is the use of dietary fiber, adequate hydration and bulk laxatives (e.g. psyllium or methylcellulose). Milk of magnesia is contraindicated in renal failure. Docusate sodium is not very effective. Castor oil can produce significant electrolyte abnormalities. Bisacodyl can lead to hypokalemia or salt overload.

21% of people answered this question correctly;

A healthy 61-year-old man comes to see you in the office for a follow-up visit. He recently had his second screening colonoscopy. His first colonoscopy was at age 50. He has no family history of colon cancer. The most recent colonoscopy revealed a 1cm pedunculated polyp in the sigmoid colon as well as two small pedunculated polyps in the descending colon. All the polyps were completely resected and sent for histopathology. The sigmoid lesion is an adenomatous polyp with an area of well-differentiated adenocarcinoma invading the muscularis mucosa in the head of the polyp. The stalk and the polyp margins are free of cancerous tissue. There is no lymphatic or vascular involvement seen in the tissue sample. The two descending colon polyps are hyperplastic. Which of the following is the most appropriate next step in management?

A. Colonoscopic surveillance
B. Radiation therapy
C. Right-sided hemicolectomy
D. Sigmoid colon resection
E. Systemic chemotherapy

Explanation:

Colon polyps such as those seen in this patient are typically removed at colonoscopy if they are found. Adenomatous polyps demonstrate a typical progression from dysplasia to carcinoma in situ and finally adenocarcinoma. Management of adenocarcinoma arising in a polyp is usually different from other forms of colonic adenocarcinoma. If the invasive adenocarcinoma is in the head of the polyp, the margins are uninvolved, the lesion is well-differentiated, and there is no lymphovascular invasion then the patient can usually undergo nonoperative management. However, consultation is typically required with the patient on a case by case basis. In patients who are managed nonoperatively, follow up colonoscopy should be performed in 3 months to exclude residual or recurrent disease. This short interval follow up can also assess for a synchronous lesion. The endoscopist can tattoo the area of the polyp at the time of initial biopsy so that the area can be found easily in the future. Subsequent follow ups should be obtained at 1, 4, and 9 years following the initial polyp resection as these patients are at an increased risk of having colonic adenocarcinoma in the future.

(Choice B) Radiation therapy is only used in patients with locally advanced colonic adenocarcinoma. Radiation therapy plays a larger role in patients with rectal adenocarcinoma.

(Choice C) No polyps were identified in the right colon at colonoscopy, so right hemicolectomy would certainly not be indicated.

(Choice D) Sigmoid colon resection is unnecessary since this adenocarcinoma arose within a polyp and does not have any concerning features that would necessitate surgical resection.

(Choice E) Chemotherapy may be used in neoadjuvant, adjuvant, or palliative settings in patients with stage IV disease. Chemotherapy is unnecessary in patients with adenocarcinoma developing with a polyp.

44% of people answered this question correctly;

The following vignette applies to the next 3 items

A 34-year-old Caucasian male presents to your office with abdominal cramps, watery stools and mild fever. His symptoms started two days ago, and he has tried several over-the-counter anti-diarrheal agents without any success. He denies any gross blood or black discoloration of the stool, nausea and vomiting, although he admits that his appetite has decreased a little. His past medical history is significant for a recent episode of acute sinusitis treated with amoxicillin. He does not smoke or consume alcohol. He denies any recent travel or contact with a patient with similar symptoms. He is sexually active with his wife and uses condoms for contraception. He works as a programmer at a private firm and does not consider his job stressful. Physical examination reveals mild tenderness in the left lower quadrant of his abdomen. His stool is positive for occult blood, but is negative for *C. difficile* toxin by rapid immunoassay.

Item 1 of 3

Which of the following is the best next step in the management of this patient?

A. Repeat immunoassay for C. difficile toxin
B. Do colonoscopy
C. Order abdominal CT scan
D. Order stool culture for C. difficile
E. Obtain blood cultures and liver function tests

Explanation:

The given symptoms and findings in this patient, as well as the history of recent antibiotic treatment, are highly suggestive of *C. difficile* colitis. Rapid immunoassays to detect *C. difficile* toxins are gaining popularity among clinicians because these are less time-consuming and less expensive than the older stool cytotoxin test. These rapid tests have very high specificity (close to 100%); however, their sensitivity is about 70-87%, which is lower than that of the stool cytotoxin test (94-100%). Because of this lower sensitivity, repeating the test may be necessary in patients in whom the pretest probability of *C. difficile* infection is high and an initial test result is negative.

(Choices B and C) Repeating the rapid immunoassay test is more reasonable and cost-effective in this case than proceeding with colonoscopy or abdominal CT. Furthermore, endoscopy is not generally recommended in patients with a classical scenario of *C. difficile* colitis, although this may provide valuable information in specific situations when a quick diagnosis is imperative, or when the diagnosis is in doubt.

(Choice D) Stool cultures of *C. difficile* are very labor-intensive and are not helpful because nontoxigenic strains of *C. difficile* exist.

Educational Objective:

Rapid stool tests to detect *C. difficile* toxins have very high specificity (close to 100%); however, their sensitivity is about 70-87%. Due to this lower sensitivity, repeating the test may be necessary in patients in whom the pretest probability of *C difficile* infection is high and an initial test result is negative.

34% of people answered this question correctly;

Item 2 of 3

After running the appropriate tests, you proceed with treatment. Which of the following agents is the best initial choice for this patient?

A. Vancomycin
B. Cholestyramine
C. Bacitracin
D. Metronidazole
E. Clindamycin

Explanation:

There are several agents available for the treatment of *C. difficile* colitis. Vancomycin and metronidazole are the most popular agents because their efficacy and safety have been tested in many clinical trials. Metronidazole can be given in either oral or intravenous form because of its biliary secretion, whereas vancomycin should be given only in oral form as it will not be absorbed from the intestine. Most authors currently recommend metronidazole as the first-line agent over vancomycin because of the following reasons:
1) both agents have been shown to be equally effective;
2) metronidazole treatment is much cheaper than vancomycin treatment;
3) vancomycin may lead to the selection of vancomycin-resistant enterococci, and this may create a future problem in public health.

(Choice C) Oral bacitracin has been tried with success for *C. difficile*-induced diarrhea, but this is not commonly used, mainly due to its limited availability.

(Choice D) Cholestyramine has also been proven to be effective for this condition, but its efficacy is much lower than that of vancomycin and metronidazole.

(Choice E) Clindamycin is an agent that is often implicated as a cause of *C. difficile*-induced diarrhea. It is not the agent used for its treatment.

Educational Objective:
Most authors currently recommend oral or intravenous metronidazole as the first-line agent over oral vancomycin for the treatment of *C. difficile*-induced colitis.

86% of people answered this question correctly;

Item 3 of 3

Soon after the initiation of therapy, the patient seems to recover completely. One week after the completion of therapy, he returns to your office and complains of abdominal cramps and watery diarrhea again. His stool is positive for occult blood and the rapid immunoassay test is positive for *C. difficile* toxin in the stool. Which of the following is the best next step in the treatment of this patient?

A. Vancomycin
B. Cholestyramine
C. Bacitracin
D. Metronidazole
E. Clindamycin

Explanation:

This patient seems to be suffering from a relapse of *C. difficile* colitis. The most likely reason for the recurrence is the regeneration of the replicating form, with toxin production from the spore form. In patients with recurring symptoms after successful treatment, the cause of diarrhea should be ascertained first (the scenario says that rapid immunoassay is positive for *C. difficile* toxin in the stool). The management of a first relapse following therapy for *C. difficile* diarrhea and colitis does not differ substantially from treatment of the initial episode: metronidazole is preferred to vancomycin due to cost and bacterial resistance considerations.

(Choice A) There is no reason to suspect *C. difficile* resistance to metronidazole because it is believed to be very rare, if it even exists; however, most authors recommend switching to vancomycin after more than one relapse because it seems to be more effective in such cases than metronidazole treatment.

(Choices C and B) Bacitracin and cholestyramine have very limited roles in the treatment of patients with relapsing *C. difficile* diarrhea.

(Choice E) Clindamycin is an agent that is often implicated as a cause of *C. difficile*-induced diarrhea; it is not the agent for its treatment.

Educational Objective:
The most common cause of recurrence of *C. difficile* is not due to resistance to the treatment. Rather, it is due to the development of the replicating form with toxin production from the spore form. The management of a first relapse following therapy for *C. difficile* diarrhea and colitis does not differ substantially from treatment of the initial episode.

40% of people answered this question correctly;

A 42-year-old Caucasian man comes to see you in the office with symptoms of dyspepsia and heartburn for the last two years. His symptoms are progressively getting worse. He has tried lifestyle changes, over-the-counter antacids, and ranitidine earlier, but these have not significantly relieved his symptoms. He denies any history of dysphagia, odynophagia, weight loss, or gastrointestinal bleeding. He has no other medical problems. He works as an assistant to a lawyer. He smokes a pack of cigarettes daily and drinks 6 to 8 cups of coffee daily. His physical examination is unremarkable. Which of the following is the most appropriate next step in the management of this patient?

A. Start him on a trial of a proton pump inhibitor
B. Obtain esophageal manometry
C. Schedule him for an ambulatory pH monitoring
D. Refer to a gastroenterologist
E. Refer to a surgeon for antireflux surgery

Explanation:

The patient has symptoms consistent with gastroesophageal reflux disease. This results from a combination of excessive gastric acid reflux and impaired clearance of the acid by the esophagus. Mild symptoms can usually be managed by simple lifestyle and dietary modifications, antacids, and non-prescription H2 blockers. Patients with more severe and prolonged symptoms, and those who fail initial management usually require more aggressive therapy, which involves a trial of proton pump inhibitors for at least eight weeks. All the available agents in this class have similar efficacy when used in equivalent doses.

(Choices B and C) Esophageal manometry and pH monitoring have very limited and specific roles. Manometry is used to facilitate the placement of ambulatory pH probes and to guide antireflux surgery. Ambulatory pH monitoring helps to confirm the diagnosis in patients with persistent symptoms without the endoscopic evidence of mucosal damage. It also helps to evaluate reflux-associated pulmonary and upper respiratory symptoms.

(Choice D) The patient should be referred to a gastroenterologist for an upper endoscopy if he fails a trial of proton pump inhibitors. Endoscopy should be considered early in the course if patients present with symptoms of dysphagia, odynophagia, weight loss, or gastrointestinal bleeding.

(Choice E) Antireflux surgery is too invasive, and should not be recommended unless all other modalities have failed.

Educational objective:
A trial of proton pump inhibitors should be used in patients who have failed other conservative therapies. Endoscopy should be done early if the patient complains of dysphagia, odynophagia, significant weight loss, and GI bleeding.

73% of people answered this question correctly;

A 52-year-old man is being evaluated for upper abdominal discomfort, nausea, and occasional heartburn for the past six months. These symptoms are partially relieved with over-the-counter antacids. He denies any chest pain, dysphagia, odynophagia, vomiting, black stools, bloody stools, or weight loss. His past medical history is significant for hypertension and mild intermittent asthma. Upper GI endoscopy reveals the presence of moderate esophagitis with velvety, reddish mucosa extending from the squamocolumnar junction into the distal esophagus. There is also mild antral gastritis. Biopsy results are consistent with a diagnosis of Barrett's esophagus with no dysplasia. Antral mucosal biopsies do not show evidence of *H. pylori* infection. The patient is started on proton pump inhibitor therapy. Which of the following is the best next step in managing this patient?

A. Endoscopic ablative therapy
B. Endoscopic mucosal resection
C. Regular endoscopic surveillance
D. Repeat H. pylori testing in 8 weeks
E. Surgical esophagectomy

Explanation:

Barrett's esophagus is metaplastic epithelium in the esophagus which replaces the normal stratified squamous epithelium. It can precede development of adenocarcinoma. This patient's diagnosis of Barrett's esophagus is likely secondary to chronic gastroesophageal reflux. Initiation of proton pump inhibitor therapy can help decrease the patient's symptoms, and there is evidence that it may decrease the risk of Barrett's esophagus progressing to cancer as well. The best step in managing this patient would be regular endoscopic surveillance to evaluate for the development of dysplasia as there is no treatment for the metaplastic epithelium itself. Surveillance of Barrett's esophagus is usually done on a yearly basis, and consists of four quadrant biopsies within every 2 cm of metaplastic epithelium. Treatment with esophagectomy or endoscopic treatments is needed in patients who develop high grade dysplasia, whereas a six month follow up endoscopy can be considered in patients with mild dysplasia. The patient's age and willingness to cooperate with subsequent recommended treatments should be considered before embarking on a surveillance regimen.

(Choice A) Endoscopic ablative therapy is a treatment possibility for esophageal dysplasia, but there is no dysplasia in this patient's esophagus on the baseline biopsy.

(Choice B) Endoscopic mucosal resection is an additional possible treatment for esophageal dysplasia, but is unnecessary in patients with nondysplastic Barrett's esophagus.

(Choice D) Repeat *H. pylori* testing is unnecessary in this patient.

(Choice E) Surgical esophagectomy is the most invasive possible treatment for high grade dysplasia, but is the only treatment certain to remove all the dysplastic tissue.

Educational objective:

Annual surveillance endoscopy is recommended for patients with Barrett's esophagus. Further treatment with endoscopic ablation, endoscopic mucosal resection, or surgical esophagectomy is needed for patients who develop high grade dysplasia.

88% of people answered this question correctly;

A 33-year-old Caucasian male presents to your office and complains that solid food 'sticks in the chest.' He says that he has to chew food more carefully, take more liquids with meals, and swallow small portions. He recalls having a similar episode several months ago that got better after 'following a diet', but it was much less severe. He has had periodic chest pain behind the sternum for the last several years. He denies any recent significant weight loss, abdominal pain, nausea, vomiting, diarrhea/constipation, black stools and neck lumps. He smokes one pack of cigarettes daily and consumes alcohol occasionally. He is currently not taking any medications. Which of the following is the most likely diagnosis in this patient?

A. Esophageal adenocarcinoma
B. Squamous cell carcinoma
C. Achalasia
D. Barrett's esophagus
E. Esophageal stricture

Explanation:

It is important to identify the non-classical presentations of GERD, including periodic retrosternal chest pain that can mimic angina. The resulting erosive esophagitis may cause transitory dysphagia, which may result in a peptic stricture if left untreated. Peptic stricture formation is a well-known complication of GERD that can cause obstructive dysphagia. In this case, the typical clinical picture of obstructive dysphagia is given: difficulty swallowing solid food, prolonged and careful chewing, and swallowing small portions.

(Choices A and B) Malignancies can cause obstructive dysphagia; however, the following information from the patient's history do not support this diagnosis: (1) young age, (2) absence of weight loss, and (3) previous history of GERD and GERD-induced stricture.

(Choice C) Achalasia usually causes dysmotility-type dysphagia that is characterized by a difficulty in swallowing both solids and liquids.

(Choice D) Barrett's esophagus is a pre-malignant complication of GERD. It does not cause dysphagia.

Educational Objective:
Peptic stricture is a well-known complication of GERD that results from the healing process of ulcerative esophagitis. Dysphagia usually starts with solids followed by liquids. Young age and lack of alarming symptoms argue against a diagnosis of malignancy.

46% of people answered this question correctly;

The following vignette applies to the next 2 items

A 69-year-old African-American man comes to see you in the office. He recently had a screening colonoscopy, and was found to have a 1.8 cm pedunculated colon polyp on the right side, which was completely excised. The biopsy showed a high-grade dysplastic villous adenoma without any involvement of the stalk and its margins. There was no vascular or lymphatic involvement, either. There is no family history of colon polyps or colorectal cancer. He is otherwise in good health, and has no other medical problems.

Item 1 of 2

Which of the following is the most appropriate next step in the management of this patient?

A. Do nothing at this point.
B. Repeat colonoscopy in 4 weeks.
C. Arrange for elective right hemicolectomy.
D. Repeat colonoscopy in 1 year.
E. Schedule for total colectomy.

Explanation:

The patient had a complete resection of a < 2 cm pedunculated adenomatous polyp. The guidelines issued by the American College of Gastroenterology recommend that **no further treatment** is necessary if all the following criteria are fulfilled:

1. The polyp is considered to be completely excised.
2. There is accurate determination of the depth of invasion, grade of differentiation, and completeness of excision of the carcinoma.
3. The cancer is not poorly differentiated.
4. There is no vascular or lymphatic involvement.
5. The margins of the excision and the stalk of a pedunculated adenoma are not involved. Invasion of the stalk of a pedunculated polyp is not an unfavorable prognostic finding, as long as the cancer does not extend to the margin of the stalk resection.

Based on the above guidelines, the patient does not need any other procedure after a complete polypectomy.

(Choices B and D) A follow-up colonoscopy should usually be performed 3-4 months after the removal of a large (> 2 cm) **sessile polyp,** or if there is concern that any large adenoma has not been completely removed.

(Choices C and E) Partial or complete surgical removal of the colon is inappropriate in this patient. It is generally recommended for **invasive cancer** in a sessile adenoma.

Educational Objective:

No further treatment is indicated after a complete excision of a pedunculated adenomatous polyp without any evidence of invasion on histologic examination.

32% of people answered this question correctly;

Item 2 of 2

Which of the following is the most appropriate next step in the surveillance of this patient after an initial colonoscopic polypectomy?

A. Annual colonoscopy
B. Colonoscopy in 20 years
C. Colonoscopy in 3 years
D. Colonoscopy in 5 years
E. Colonoscopy in 10 years

Explanation:

The patient in the vignette had a single, < 2 cm, pedunculated adenoma, which was completely excised. Based on the national polyp study and guidelines from the American College of Gastroenterology, repeat surveillance colonoscopy should be performed in three years in high risk patients to look for metachronous adenoma (one that is diagnosed six months after the index neoplasm). This includes patients whose baseline colonoscopy had multiple adenomas (> 2), a large adenoma (> 1 cm), a villous adenoma, or an adenoma with high-grade dysplasia. The surveillance intervals can be extended to five years if no adenomas are detected at the three-year follow-up colonoscopy.

(Choice A) Multiple adenomas (more than four) or a suboptimal examination at the initial colonoscopy may require earlier colonoscopy (after **one year**).

(Choice D) A colonoscopy should generally be repeated in three years if one or more adenomas of >=1 cm are found on the previous colonoscopy, or if three or more adenomas of any size are detected. A **five-year** surveillance interval is adequate for patients with one to two adenomas (< 1 cm in size each) on index colonoscopy.

Educational Objective:
A **three-year** interval for surveillance colonoscopy is safe and cost-effective for the majority of patients with adenomatous polyps.

41% of people answered this question correctly;

A 54-year-old Caucasian woman comes to the office for abdominal discomfort. She has been feeling weak for the past seven days. She is not eating well because of nausea, and has noticed that her urine has become darker. She has hypertension, generalized anxiety disorder, and obesity. Her medications include lisinopril, hydrochlorothiazide and aspirin. She has been taking some herbal medications for the past four months. She was using ginseng as an energy booster and kava to control her anxiety. Two months ago, she started to use gingko biloba in an attempt to improve her memory problems. She states that she had been feeling better, less anxious, and more alert, until last week. She does not use tobacco, alcohol or drugs. Her family history is not significant. She has no known allergies. Examination shows mild jaundice. Heart sounds are normal and lung sounds are clear. The liver is palpable 2 cm below the costal margin and tender. Neurologic examination reveals no abnormalities. Her laboratory tests reveal the following:

CBC

Ht	44%
Platelet count	220,000/cmm
Leukocyte count	9,000/cmm
Segmented neutrophils	55%
Lymphocytes	42%
Monocytes	3%

Serum Chemistry

Serum Na	143 mEq/L
Serum K	4.2 mEq/L
Chloride	106 mEq/L
Bicarbonate	26 mEq/L
BUN	21 mg/dL
Serum Creatinine	1.0 mg/dL
Calcium	9.7 mg/dL
Blood Glucose	98mg/dL

LFT

Total bilirubin	3.2 mg/dL
Direct bilirubin	2.8 mg/dL
Alkaline phosphatase	200 U/L
Aspartate aminotransferase	350 U/L
Alanine aminotransferase	420 U/L

Which of the following is the most probable cause of the patient's disease?

A. Viral hepatitis

B. Enalapril

C. Kava

D. Gingko biloba

E. Ginseng

Explanation:

The patient's laboratory test results show that there is moderate hepatic injury. Kava (Piper methysticum) has been identified as a cause of hepatitis, cirrhosis and liver failure. Several patients have died in Europe, Canada and the United States after its ingestion. The mechanism is still unclear, but the United States Food and Drug Administration (FDA) has already issued a warning to the public concerning its use (year 2002).

(Choice A) Viral hepatitis is usually associated with AST and ALT levels over 500 units. The classic presentation is a period of fever, malaise, asthenia, nausea and vomiting, followed by the development of jaundice. This patient's clinical features are different.

(Choice B) Enalapril is metabolized in the kidney. There are no cases reporting its role as a hepatotoxic drug.

(Choice D) Gingko has been related to bleeding (due to its antiplatelet activity) and seizures. These adverse effects are generally reversible, temporary and mild. There are no reports of liver toxicity with this herb.

(Choice E) Ginseng has been associated with some serious adverse effects (i.e., schizophrenia, severe headache, and Stevens-Johnson syndrome), as well as other less dangerous effects (i.e., vaginal bleeding, insomnia, diarrhea or mastalgia). Its use has not been related to liver damage.

Educational objective:
Some popular herbal remedies have significant side effects and can be toxic to a specific organ. Aconite is cardiotoxic, and may cause arrhythmias and hypotension. Kava can cause liver injury. Gingko biloba has been related to bleeding, while ginseng has been associated with Stevens-Johnson syndrome and psychosis.

42% of people answered this question correctly;

A 78-year-old white male with a history of hypertension and degenerative joint disease comes to the physician because of a two-month history of fecal incontinence. He denies any abdominal distention, nausea, vomiting, or abdominal pain. He takes hydrochlorothiazide and acetaminophen. His family history is negative for colon cancer. He had a colonoscopy five years ago which was unremarkable. His vital signs are stable. The abdomen is soft and nontender; the bowel sounds are present. Rectal examination shows fecal impaction. Which of the following is the most appropriate next step in the management of this patient?

A. Prescribe stool softeners and advise increased fluid intake and send the patient home.
B. Advise the patient to eat a high fiber diet, increase fluid intake, and send the patient home.
C. Administer enemas followed by rectal suppositories to evacuate the bowel.
D. Place a rectal tube and admit the patient to the hospital.
E. Request gastroenterology consultation to perform colonoscopic decompression.

Explanation:

Fecal impaction is the most common cause of fecal incontinence in elderly patients. The most appropriate initial treatment for this patient is to disimpact the stool and empty the colon until there is no return of stool by using enemas and suppositories. Suppositories are frequently used to ensure complete emptying.

(Choice B) Once complete emptying has been achieved by the use of enemas and suppositories, the patient should be instructed to increase his fluid intake and dietary fiber. The use a stool softener may also be advised to the patient.

(Choice A) Use of stool softeners or oral cathartics is usually appropriate in the setting of constipation, but would not be helpful in patients with an established fecal impaction.

(Choice D) A rectal tube is used in patients who have acute pseudoobstruction of the colon, resulting in a dilated colon and abdominal distention.

(Choice E) Colonoscopic decompression is performed in patients who have failed conservative management.

Educational Objective:
Fecal impaction is generally managed by using enemas followed by suppositories to ensure complete emptying of the bowels. Once complete emptying has been achieved, the patient is instructed to increase his fiber and fluid intake.

65% of people answered this question correctly;

A 59-year-old Caucasian man undergoes screening colonoscopy. His first colonoscopy, at age 50, was unremarkable. He has no family history of colon cancer. His colonoscopy now shows a 0.9 cm pedunculated polyp in the sigmoid colon as well as two pedunculated polyps in the ascending colon that are less than 1cm. The polyps are completely resected and sent for histopathology. The sigmoid lesion is an adenomatous polyp without villous features. The ascending colon polyps are hyperplastic. The patient is otherwise in good health and takes no medications. Which of the following is the most appropriate follow-up for this patient?

A. Repeat sigmoidoscopy within 6 months
B. Repeat colonoscopy in one year
C. Repeat colonoscopy in five years
D. Repeat colonoscopy in ten years

Explanation:

Adenomatous colon polyps are neoplastic lesions which have the potential to develop into colonic adenocarcinomas. Adenomatous polyps make up about 2/3 of polypoid lesions in the colon. Polyps visualized at colonoscopy are generally removed, unless there are a large number, so that they can be pathologically evaluated and so they do not go on to evolve into adenocarcinoma. Hyperplastic polyps rarely if ever develop into malignancy and should not affect recommendations for future colonoscopic surveillance. However, this patient should have follow-up colonoscopy sooner than the recommended 10 year screening interval for the general population since he is at greater risk of having adenomatous polyps in the future. Patients who have 1 or 2 adenomatous tubular polyps measuring less than 1.0 cm and without high grade dysplasia can have follow-up colonoscopy in five years. Patients should have follow-up colonoscopy in three years if there are 3-10 polyps, size greater than 1.0 cm, villous features, or high grade dysplasia.

Number/Size/Histopathology	**Surveillance colonoscopy**
Hyperplastic polyps	10 years
1 or 2 small (<1 cm) tubular adenomas with no high-grade dysplasia	5 years
3 or more adenomas High-grade dysplasia Villous features Any adenoma 1 cm or larger in size	3 years

Educational objective:
Patients with adenomatous polyps should have follow-up colonoscopy performed more frequently than the 10 year interval recommended for the general population. Patients who

have 1 or 2 adenomatous tubular polyps measuring less than 1.0 cm and without high grade dysplasia can have follow-up colonoscopy in five years. Polyps with that are larger than 1.0 cm or have other concerning features should be followed up in 3 years.

49% of people answered this question correctly;

A 33-year-old Caucasian male presents to your office with a one-week history of fever and skin rash. He also describes fleeting pain in his joints without any swelling, redness or restriction in movement. The pain usually subsides after one or two pills of acetaminophen. He denies any recent travel or insect bites. His laboratory findings are:

ALT	500 U/L
AST	520 U/L
Alkaline phosphatase	50 U/L
Total bilirubin	2.1 mg/dL
BUN	15 mg/dL
Creatinine	0.8 mg/dL

He is HBsAg positive. Which of the following has the closest resemblance to this patient's condition?

A. Hypotension and angioedema
B. Autoimmune hemolytic anemia
C. Serum sickness
D. Contact dermatitis
E. Infectious arthritis

Explanation:

A serum sickness-like syndrome may develop in the prodromal phase of hepatitis B infection. This manifests as fever, rash and arthralgias, and usually resolves with the onset of jaundice. The serum sickness-like syndrome is attributed to the circulating immune complexes (type III reaction); other extrahepatic manifestations of hepatitis B infection that can be explained by circulating immune complexes are polyarteritis nodosa and glomerulonephritis (usually membrane nephropathy, less often membranoproliferative glomerulonephritis).

(Choice E) These manifestations are unlikely to be caused by direct viral invasion of the tissues.

(Choice A) Anaphylactic reactions are caused by an IgE-mediated process called immediate hypersensitivity.

(Choice B) Autoimmune hemolytic anemia is typically explained by type II reaction mediated by cytotoxic antibodies.

(Choice D) Contact dermatitis is a good example of delayed hypersensitivity or type IV reaction.

Educational Objective:
A serum sickness-like syndrome in patients with prodromal hepatitis B infection can be attributed to circulating immune complexes. Other extrahepatic manifestations of hepatitis B

infection that can be explained by circulating immune complexes are polyarteritis nodosa and glomerulonephritis.

58% of people answered this question correctly;

The following vignette applies to the next 2 items

A 53-year-old man presents to the physician with a six-month history of abdominal discomfort. He describes post-prandial bloating and discomfort in the upper abdomen. He has frequent loose stools that appear 'bulky,' 'foul smelling' and 'difficult to flush.' His only other medical problem is heartburn. He denies dysphagia, odynophagia, vomiting, black stools, blood in the stool, or weight loss. He drinks 4-5 bottles of beer daily and occasional hard liquor over the weekend. He does not smoke. He takes antacids and ibuprofen to relieve his abdominal discomfort. His blood pressure is 122/78 mmHg and his heart rate is 86/min, regular. His BMI is 21 kg/m^2. The lungs are clear to auscultation. The abdomen is soft, non-tender and non-distended. There is no rebound tenderness or rigidity. There is no palpable hepatomegaly.

Item 1 of 2

Which of the following is the best test in managing this patient?

A. Barium swallow
B. CT scan of the abdomen
C. Lactose tolerance test
D. Serum amylase and lipase
E. Upper GI endoscopy

Explanation:

The bulky, foul smelling stools which are difficult to flush described by this patient is consistent with steatorrhea secondary to fat malabsorption. Given this patient's history of high daily alcohol intake, chronic pancreatitis is a strong possibility and may explain his fat malabsorption. Abdominal pain in chronic pancreatitis tends to be epigastric with radiation to the back. The pain may be either episodic or continuous, and may be worsened shortly after eating. A sudden change in the character of the pain can be caused by an acute flare superimposed on chronic pancreatitis. Glucose intolerance is also frequently seen in patients with chronic pancreatitis.

Given the high likelihood of chronic pancreatitis, a CT scan of the abdomen would be the most appropriate test. Pancreatic calcifications are the hallmark finding of chronic pancreatitis. Pancreatic enlargement, ductal dilatation, and pseudocysts may also be seen. CT has a higher sensitivity and specificity for chronic pancreatitis compared to plain radiographs or ultrasound. MRI can be a viable alternative as well.

(Choice A) A barium swallow will only evaluate the esophagus and possibly portions of the stomach, but this patient's abnormality most likely is within the pancreas.

(Choice C) The voluminous and difficult to flush stool is commonly seen with fat malabsorption and not carbohydrate malabsorption (lactose intolerance). Carbohydrate malabsorption

usually causes flatulence and watery diarrhea.

(Choice D) Serum amylase and lipase may be mildly elevated in chronic pancreatitis, but frequently are normal as the levels of these enzymes are decreased within the pancreas as it is replaced by fibrosis. These studies would be reasonable if acute pancreatitis (not chronic pancreatitis) were suspected.

(Choice E) Upper GI endoscopy would not evaluate the pancreas unless an ERCP was performed as well. ERCP can be used in cases where the diagnosis is unclear after noninvasive imaging or if an intervention is planned.

Educational objective:
Abdominal pain accompanied by fat malabsorption should raise suspicion of chronic pancreatitis, particularly in patients with a history of high alcohol intake. A CT is commonly used to assess for pancreatic calcifications, pancreatic enlargement, ductal dilatation, and pseudocysts in order to confirm the diagnosis.

27% of people answered this question correctly;

Item 2 of 2

The patient comes for follow-up in four weeks. He has persistent abdominal symptoms but no new complaints. His initial lab work shows the following:

WBC count	9,200/mm3
Hemoglobin	14.3 g/dL
Platelets	92,000/mm3
Albumin	3.6 mg/dL
Total bilirubin	1.2 mg/dL
AST	91 U/L
ALT	32 U/L
Creatinine	0.8 mg/dL
TSH	2.1 mU/L

The patient is advised about alcohol abstinence. Which of the following is most helpful to control his abdominal symptoms?

A. Cholestyramine
B. Lactose-free diet
C. Low-fat diet
D. Metoclopramide
E. Proton pump inhibitor

Explanation:

After a diagnosis of chronic pancreatitis is confirmed by CT, the initial treatment would be lifestyle and diet modifications. This patient has already been appropriately counseled on alcohol abstinence. Dietary modifications consist of eating smaller meals that are low in fat in order to avoid symptoms of fat malabsorption. Pancreatic enzyme replacement can be considered when dietary modification is ineffective. The usage of opioid medications can be considered but should be utilized judiciously. There are multiple alternatives for patients who fail these medical therapies. Celiac nerve block, endoscopic decompression of the pancreatic duct, and extracorporeal shock wave lithotripsy to disrupt pancreatic duct calcifications are all minimally invasive tools that have been used. Possible surgical options include decompression of the pancreatic duct by anastamosing it to the jejunum, partial or complete pancreatic resection, and denervation of the afferent nerve fibers leaving the pancreas.

(Choice A) Cholestyramine is a bile acid resin that is not indicated in this patient since it would likely worsen this patient's symptoms of abdominal bloating and discomfort.

(Choice B) A lactose free diet would only be helpful if this patient's symptoms were related to lactase insufficiency, but there is no history of flatulence or watery diarrhea corresponding to lactose intake.

(Choice D) Metoclopramide is used to treat gastroparesis (delayed gastric emptying), not chronic pancreatitis.

(Choice E) An acid suppressant such as a proton pump inhibitor will not help with this patient's symptoms from chronic pancreatitis. However, a proton pump inhibitor should be started if the patient is eventually given pancreatic enzyme replacements in order to prevent inactivation of the enzymes by gastric acid.

Educational objective:
Cessation of alcohol intake and dietary modifications consisting of smaller meals that are low in fat are the first line treatment of chronic pancreatitis. Pancreatic enzyme replacement and possibly opiate medications are the next treatments if conservative measures are unsuccessful. A variety of minimally invasive and surgical treatments are possible in patients with chronic pancreatitis refractory to medical interventions.

67% of people answered this question correctly;

A 48-year-old Caucasian parole officer presents to his primary care physician complaining of chest pain. He describes it as a burning sensation localized in the epigastric and retrosternal regions of his chest. He was recently diagnosed with gastroesophageal reflux disease and was prescribed pharmacological treatment. He admits he did not regularly take his medications. Vital signs are normal. Physical examination is unremarkable. Which of the following symptoms is the patient most likely to report in association with his disease?

A. Hypersalivation
B. Burning postprandial pain exacerbated by emotional stress
C. Pain on an empty stomach, especially late at night
D. Diaphoresis and crushing chest pain that radiates to the arm
E. Severe pain upon swallowing

Explanation:

Gastroesophageal reflux disease (GERD) may be characterized by heartburn, regurgitation, and dysphagia. The chest pain of heartburn is described as an uncomfortable squeezing or burning sensation in the retrosternal chest that radiates toward the back, neck, jaw or arms. The pain may resolve spontaneously or after consumption of antacids, and usually occurs postprandially, can awaken patients from sleep, and worsens with emotional stress **(Choice B)**.

An unusual symptom of GERD, hypersalivation **(Choice A)** can cause patients to foam at the mouth from secreting as much as 10 mL of saliva per minute.

Pain on an empty stomach **(Choice C)** is commonly reported in patients who have duodenal ulcers.

Diaphoresis and crushing chest pain that radiates to the arm **(Choice D)** is a common presentation of patients suffering from acute coronary syndrome.

Severe pain upon swallowing **(Choice E)** is an unusual complaint of patients suffering from GERD and is suggestive of an esophageal ulcer (HSV infection).

Educational Objective:
The chest pain of gastroesophageal reflux disease is described as an uncomfortable squeezing or burning sensation in the retrosternal chest that radiates toward the back, neck, jaw or arms. The pain may resolve spontaneously or after consumption of antacids, and usually occurs postprandially, can awaken patients from sleep, and worsens with emotional stress.

54% of people answered this question correctly;

The following vignette applies to the next 2 items

A healthy 38-year-old Caucasian woman comes to the physician because of heartburn and upper abdominal discomfort. She has had these symptoms for the past six weeks. She has no other medical problems. She does not use tobacco or drink alcohol. She has been taking pantoprazole 40 mg once a day for the last four weeks. She is allergic to penicillin. She had an upper GI endoscopy with biopsy two weeks ago, which revealed the presence of multiple small gastric erosions and two small duodenal ulcers. The biopsy of the ulcers was positive for the presence of *Helicobacter pylori* .

Item 1 of 2

Which of the following is the most appropriate next step in the management of this patient?

A. Continue pantoprazole for another four weeks.
B. Recommend triple therapy with pantoprazole, clarithromycin, and amoxicillin for two weeks.
C. Recommend switching to esomeprazole for four weeks.
D. Recommend dual therapy with esomeprazole and clarithromycin for four weeks.
E. Recommend triple therapy with pantoprazole, metronidazole, and clarithromycin for two weeks.

Explanation:

Helicobacter pylori infection is an important risk factor for the development of peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma. It may also have a role in the pathogenesis of non-ulcer dyspepsia and gastroesophageal reflux disease (GERD). It is the most common cause of peptic ulcer disease (PUD), and accounts for 70-80% of duodenal ulcers and approximately 50% of gastric ulcers. Failure to eradicate *H. pylori* in PUD is associated with an annual recurrence rate of 70-80%, while *H. pylori* eradication is associated with a rate of less than 10%.

Multiple regimens have been proposed for the eradication of *H. pylori* infection. The preferred regimen is **triple therapy** with a proton pump inhibitor (pantoprazole, lansoprazole, omeprazole, or esomeprazole), amoxicillin (1 gram twice a day) and clarithromycin (500 mg twice a day) for two weeks. Metronidazole (500 mg twice daily) can be substituted for amoxicillin in penicillin-allergic patients.

(Choice A) Patients with documented *H. pylori infection* should be treated with triple drug therapy to eradicate the infection. Proton pump inhibitors (PPI) given alone will not eradicate the *H. pylori* infection.

(Choice B) Metronidazole should be used instead of amoxicillin since the patient is allergic to penicillin.

(Choice C) The patient needs triple therapy with PPI plus two antibiotics for the eradication of the *H. pylori* infection. Switching to a different PPI is incorrect.

(Choice D) Dual therapy with a PPI and one antibiotic (clarithromycin or amoxicillin) has been approved for the treatment of *H. pylori* infection; however, it has significantly lower eradication rates than the standard regimens, and is therefore less preferred.

Educational Objective:
Triple drug therapy with a PPI, clarithromycin, and amoxicillin (metronidazole in case of penicillin allergy) for two weeks is the regimen of choice for the eradication of *H. pylori* infection.

*Keep your eyes open for any drug contraindications or allergies.

62% of people answered this question correctly;

Item 2 of 2

The patient returns to your office one month after completing the therapy you prescribed. She reports that her symptoms are "only 25% better", and she continues to have nighttime symptoms. She denies any recent weight loss, hematemesis, melena, or dysphagia. Her urea breath test result is positive. Which of the following is the most appropriate next step in the management of this patient?

A. Refer to a gastroenterologist for a repeat endoscopy.
B. Refer to a surgeon to discuss surgical options for ulcer treatment.
C. Ask a pathologist to review the biopsy results for an occult malignancy.
D. Ask her to repeat the same therapy.
E. Prescribe quadruple therapy with pantoprazole, bismuth, tetracycline, and metronidazole.

Explanation:

The patient has a persistent *H. pylori* infection, and is usually due to failure of therapy, rather than reinfection. There is a high prevalence of *H. pylori* resistance to clarithromycin and metronidazole in the United States. Prior use of metronidazole or macrolide antibiotics (clarithromycin) appears to increase the risk of *H. pylori* resistance. For patients who fail the initial course of *H. pylori* treatment, there are two commonly used approaches that have been shown to be helpful. The first approach is the use of a different combination of drugs/antibiotics for another two weeks. The second and more preferable approach is to prescribe quadruple therapy (PPI, bismuth, tetracycline, and metronidazole) which should be taken with meals for two weeks. A urea breath test or stool antigen testing (four to six weeks after treatment completion!) can be performed to confirm the eradication of *H. pylori*.

(Choices A, B, and C) Referring the patient for a repeat endoscopy or surgical evaluation, and asking to review biopsy results are all inappropriate at this time.

(Choice D) The patient is not likely to respond to another course of the same therapy if she failed the initial treatment for *H. pylori* infection.

Educational objective:
Persistent *H. pylori* infection may be due to failure of triple drug therapy, and should be treated with a different regimen, preferably quadruple therapy using a PPI and bismuth-based triple therapy (bismuth, tetracycline, and metronidazole).

58% of people answered this question correctly;

A 33-year-old Hispanic woman comes to the office and complains of postprandial, right-sided abdominal pain, usually after eating fatty foods. She has no other medical problems. She does not use tobacco, alcohol or drugs. She takes no medications. Physical examination reveals mild to moderate right upper quadrant tenderness. Murphy's sign is negative. An abdominal ultrasound is ordered. One week later, the patient returns for the results. The sonogram shows multiple middle-sized gallstones. The patient is informed about the possibility of a cholecystectomy. She is concerned about the type of diet or medications she may need to take after the procedure. Which of the following is the most appropriate statement regarding her postsurgical condition?

A. You may need to use antacids
B. Usually, no change in the diet is needed
C. You will need a low-fat diet
D. Some tablets of cholecystokinin may help your digestion
E. You can take metoclopramide to avoid having symptoms

Explanation:

Patients usually do not require diet modifications after cholecystectomy. A normal diet is usually well tolerated. Approximately 50% of the patients may have diarrhea, flatulence or bloating, but these symptoms are usually mild and do not necessitate any interventions.

(Choice D) Cholecystokinin is a digestive enzyme that stimulates the contraction of the gallbladder and the secretion of pancreatic enzymes (e.g., trypsin, nucleases). It is produced by the duodenal and jejunal mucosa; therefore, its replacement is not needed after a cholecystectomy.

(Choice E) Metoclopramide is a prokinetic agent that can worsen diarrhea.

(Choice C) A low-fat diet is not necessary; however, eating an excessive amount of dietary fat can lead to malabsorption.

(Choice A) Antacids are not indicated, as there is no increase in gastric acid secretions.

Educational Objective:
Patients who have undergone cholecystectomy do not need to change their dietary habits. Half of them may have transient and mild episodes of diarrhea, flatulence or bloating that will be self-limited.

43% of people answered this question correctly;

A 39-year-old African-American man comes to your clinic because of heartburn and epigastric discomfort, noted especially after taking meals, for the past 3 months. He has been taking omeprazole (Prilosec OTC, 20mg) for the last two weeks, although this has not relieved him of his symptoms. He has no other medical problems. He does not use tobacco, alcohol, or illicit drugs. His family history is insignificant. Physical examination does not reveal any abnormalities. Screening results for *H. pylori* antibodies is positive. Which of the following is the most appropriate next step in the management of this patient?

A. Add antibiotics to his present medication.
B. Add antacids to his present medication.
C. Add bismuth to his present medication.
D. Stop Prilosec and start ranitidine.
E. Continue taking Prilosec for another 4 weeks.

Explanation:

The current treatment of choice for *H. pylori* gastritis includes a proton pump inhibitor (PPI), amoxicillin, and clarithromycin. In penicillin-allergic patients, amoxicillin can be substituted with metronidazole. Bismuth salts are frequently added to this regimen as an adjuvant (Remember, though, that it is not the major component of therapy). For these reasons, the most appropriate next step in the management of this patient is to add antibiotics to the patient's current medication.

(Choice B) Antacids only give temporary symptomatic relief. They have no role in the treatment of *H. pylori* infection.

(Choice C) As explained above, the addition of bismuth salts to PPIs is a good option for treatment, but should only be considered as an adjuvant to the antibiotic regimen.

(Choice D) PPIs are superior to H2 Blockers in reducing acid production. Moreover, H2 Blockers alone are not sufficient to kill *H. pylori*. Simply changing the patient's medication from Prilosec to ranitidine will not help at all.

(Choice E) PPIs are good in reducing acid production; however as a sole agent, PPIs have not been proven to be efficacious in killing *H. Pylori*.

Educational Objective:
The treatment of choice for *H.Pylori* gastritis is proton pump inhibitor (PPI) + amoxicillin + clarithromycin. In penicillin-allergic patients, amoxicillin can be substituted with metronidazole. Bismuth salts are frequently added to this regimen as an adjuvant.

90% of people answered this question correctly;

A 65-year-old female with a past medical history of essential hypertension, type 2 diabetes mellitus, peripheral vascular disease, coronary artery disease, and dyslipidemia presents with epigastric pain for the past two months. The pain is described as, "crampy, dull, and sometimes goes to the back." The pain is worse after eating. Four weeks of over-the-counter omeprazole did not relieve her pain. She also complains of an 8 lb weight loss and decreased desire to eat. Her bowel habits are normal. She had a two-vessel coronary artery bypass surgery three years ago. Her medications include glipizide, metformin, simvastatin, and lisinopril. She also takes naproxene for occasional headaches as needed. She is an ex-smoker with a 42 pack-year smoking history. Her temperature is 36.7C (98F), blood pressure is 172/86 mm Hg, pulse is 90/min, and respirations are 16/min. There is a right-sided carotid bruit. Her abdomen is soft and non-tender. Ultrasound of the abdomen shows a normal gallbladder without any stones. An upper endoscopy shows mild esophagitis and mild antral erythema. A CT scan of the abdomen demonstrates diffuse aortic atherosclerosis. Screening colonoscopy done eight years ago was unremarkable. Which of the following is the most appropriate course of action?

A. Abdominal angiography
B. Colonoscopy
C. *H. pylori* stool antigen testing
D. Lactose tolerance test
E. 72-hour fecal fat determination

Explanation:

This patient clearly has multiple atherosclerotic risk factors as well as known coronary artery disease and probable right carotid atherosclerotic disease given the bruit heard on physical exam. She has had a fairly extensive evaluation at this point consisting of ultrasound, CT, and endoscopy. Only mild esophagitis and gastric antral erythema have been noted thus far, which is seen in many patients and does not fully account for her pain. The key to making the diagnosis is the worsening of her dull, crampy epigastric pain after eating. Given her known atherosclerotic disease, the most likely diagnosis at this point is chronic mesenteric ischemia. The disease is sometimes referred to as "intestinal angina" since it presents as abdominal pain when there is increased oxygen demand in the bowel after eating, much as patients with cardiac ischemia experience chest pain with increased myocardial oxygen demands. The pain may become so severe that patients avoid food and consequently lose weight. Due to the large number of collateral vessels supplying the bowel, multiple high grade stenoses are typically need in the mesenteric vasculature before patients become symptomatic.

CT angiogram, MR angiogram, and duplex ultrasound are all noninvasive means of making the diagnosis. Angiography remains the gold standard for making the diagnosis, and intervention with angioplasty and/or stenting can be done in the same setting. Noninvasive tests are helpful in localizing the obstruction and to identify the best route it can be reached through with angiography.

(Choice B) This patient has had a colonoscopy within the recommended screening window of 10 years and there were no findings on CT to suggest a colonic neoplasm, although this certainly does not exclude the possibility. However, chronic mesenteric ischemia is more likely at this point given the patient's symptoms and vascular disease.

(Choice C) H. pylori testing was likely already done at the time of EGD. Even if it was not tested, the mild antral gastritis does not explain the current symptoms.

(Choice D) This patient's symptoms appear to be related to ingestion of all foods and not just lactose. Lactose intolerance is also frequently associated with borborygmi and abnormal bulky, watery stools.

(Choice E) This patient has no evidence of steatorrhea to suggest malabsorption.

Educational objective:
Chronic mesenteric ischemia should be considered in patients with crampy epigastric pain that worsens with meals who have had a negative initial workup. The diagnosis can be made noninvasively with CTA, MRA, or duplex ultrasound although angiography remains the gold standard test. Noninvasive tests are helpful in localizing the obstruction and to identify the best route it can be reached with angiography.

65% of people answered this question correctly;

A 13-year-old Asian American girl presents to the office complaining of periodic stomach cramps. The abdominal pain typically arises shortly after she eats a meal, and is associated with flatulence, feelings of bloating, and occasional nonbloody diarrhea. The symptoms are particularly common after she ingests dairy products such as milk, cheese, or yogurt. Her mother and uncle are lactose-intolerant. Her temperature is 37.0C (98.6F), blood pressure is 110/68 mm Hg, pulse is 70/min, and respirations are 14/min. The physical examination is unremarkable, with a nontender abdomen, no hepatosplenomegaly, and active bowel sounds. Lactose intolerance appears to be the likely diagnosis, and the patient is informed that a lactose breath hydrogen test is necessary for confirmation. The girl's mother asks if any particular preparation needs to be done prior to the test. Which of the following is the most appropriate response?

A. She should consume anything but dairy products in the eight hours before taking the test
B. She should consume only dairy products in the eight hours before taking the test
C. She should wait and take the test after an episode of diarrhea associated with dairy product consumption
D. She will need to fast for eight hours before taking the test
E. There are no restrictions upon eating or drinking before taking the test

Explanation:

Lactose intolerance occurs when there is insufficient amounts of lactase enzyme in the brush border of the duodenum, thereby resulting in the inability to break down ingested lactose into glucose and galactose. Levels of this enzyme decline naturally with aging, and as much as 75-90% of the Asian, African, and South American populations are lactose intolerant. Symptoms can include nausea, abdominal pain and bloating, flatulence, and diarrhea, which arise when the free lactose is fermented by colonic bacteria to form short-chain fatty acids and hydrogen gas.

The preferred means of diagnosis is the lactose breath hydrogen test, which requires the patient to drink a lactose-containing beverage and then breathe into a bag at set intervals over two to three hours. The exhaled air is tested with gas chromatography for the presence of hydrogen. Typically, an increase in breath hydrogen concentration >20 ppm is suggestive of lactose intolerance. In preparation for this test, patients should fast for eight hours, consuming no food or water.

(Choices A, B, and E) It is incorrect to advise the patient to consume food or drink within the eight hours before taking the test.

(Choice C) When the test is administered during times of active diarrhea, the intestinal transit time may not be long enough for sufficient fermentation to occur - thereby leading to a false negative result. It is therefore inappropriate to advise the patient to wait to take the test until she is experiencing diarrhea.

Educational Objective:
Lactose intolerance can be diagnosed with the lactose breath hydrogen test, because free lactose is fermented by colonic bacteria to form fatty acids and hydrogen gas. The test involves measuring the amount of hydrogen gas exhaled in the few hours after consuming a lactose-containing beverage. In preparation for the test, patients should fast for eight hours.

34% of people answered this question correctly;

A 64-year-old African American male presents to your office complaining of fatigue. He can hardly walk two blocks without having to rest because he feels he has 'little energy.' He has lost 5 pounds over the last two months. He also experiences constipation, and has been using over-the-counter laxatives recently. He denies nausea, vomiting, abdominal pain, diarrhea, and black stools. His past medical history is significant for hypertension controlled with low-dose thiazide diuretics. His blood pressure is 140/90 mmHg while supine and heart rate is 100/min. His abdomen is soft and non-tender on palpation. Significant laboratory findings are a hematocrit of 25% and a positive fecal occult blood test. What is the best next step in the management of this patient?

A. Sigmoidoscopy
B. Gastroduodenoscopy
C. Colonoscopy
D. Barium studies
E. Abdominal ultrasonography

Explanation:

This patient presents with anemia that is most likely associated with occult gastrointestinal bleeding. Immediate evaluation is mandatory because potentially fatal conditions such as colon cancer may be present. Colonoscopy is the initial test of choice in patients with iron-deficiency anemia and positive fecal occult blood test.

(Choice A) Unlike sigmoidoscopy that helps to visualize only up to 60 cm of the distal colon, colonoscopy enables the clinician to examine almost the entire colon and therefore increases the sensitivity of the procedure for colon cancer. In addition to distal lesions, proximal satellite lesions may sometimes be detected.

(Choice B) In patients with no obvious pathologic findings on colonoscopy, upper gastrointestinal endoscopy should be performed.

(Choice D) An upper gastrointestinal series and barium enema can be used instead of endoscopy, but these tests have lower sensitivity and do not offer the option of simultaneous diagnostic and therapeutic intervention (e.g., biopsy or polypectomy).

(Choice E) Abdominal ultrasonography is of little diagnostic value in this patient.

Educational Objective:
Colonoscopy is the initial test of choice in patients with iron-deficiency anemia and positive fecal occult blood test. In patients with no obvious pathologic findings on colonoscopy, upper gastrointestinal endoscopy should be performed.

89% of people answered this question correctly;

A healthy 62-year-old Caucasian man comes to see you for follow-up. He recently had a screening sigmoidoscopy. The report from the gastroenterologist says that he had two sessile polyps in the sigmoid colon, which were removed and sent for histology. The polyps were 1.5 cm and 2 cm in size. The result of the biopsy comes back as villous adenoma with low-grade dysplasia. The stalk of the polyp and the resected margins are free of dysplastic changes. The patient has never had any symptoms in the past. There is no history of colon polyps or cancer in his immediate family. Which of the following is the most appropriate next step in the management of this patient?

A. Do nothing at this point.
B. Schedule him for a double contrast barium enema.
C. Schedule him for a colonoscopy now.
D. Schedule a colonoscopy in 1 year.
E. Schedule a colonoscopy in 3 - 5 years.

Explanation:

Colon polyps refer to a protuberance of colonic tissue into the lumen of the colon. They are usually asymptomatic, and are classified into neoplastic or nonneoplastic, based on the histopathology. Two-thirds of all the colon polyps are adenomas and have malignant potential. Nearly all the cases of colorectal cancer arise from adenomas. Early detection and removal of adenomatous colonic polyps are associated with a significant reduction in overall morbidity and mortality due to colorectal cancer. Double contrast barium enema, flexible sigmoidoscopy, and colonoscopy are all used for screening for colon polyps and colorectal cancer. Studies have shown that 30-50% of patients with one adenoma will have at least one other adenoma at a different site (synchronous adenoma). Examination of the complete large bowel and removal of **all** the adenomas is an important step in reducing the risk of subsequent cancer; therefore, the patient should be screened with a complete colonoscopy to detect and resect all synchronous adenomas.

(Choices A, D, and E) The patient needs a full colonoscopy at this time to detect all synchronous adenomas. He should not be left without a follow-up colonoscopy for a year or more.

(Choice B) A colonoscopy is considered the optimal examination for detection of adenomatous polyps. It is more sensitive than a double contrast barium enema in visualizing polyps, and also allows for biopsy and therapeutic polypectomy at the same time.

Educational Objective:
All patients with adenomatous polyps found on screening sigmoidoscopy should have a complete colonoscopy for detection of synchronous adenomas.

48% of people answered this question correctly;

A 55-year-old chronic alcoholic male presents to your office in the early morning with complaints of severe abdominal pain and vomiting after binge drinking the night before. He describes the pain as very severe and radiating to the back. His blood pressure is 95/52 mmHg, pulse rate is 110/min, temperature is 37.9°C (100.3°F), and respiratory rate is 18/min. His laboratory test results are as follows:

WBC count	16,200/mm ^{3}
Total bilirubin	1.0 mg/dl
Serum lipase	1,200 IU/L
ALT	55 IU/L
Blood glucose	178 mg/dL
Serum calcium	9.2 mg/dL
BUN	20 mg/dL

Abdominal ultrasound shows no gallstones or pericholecystic fluid collection. The pancreas is not well visualized due to gastric shadow. Which of the following test results would be most helpful in assessing the need for antibiotic therapy in this patient?

A. Area under the curve (AUC) for lipase elevation
B. CT scan of the abdomen with contrast
C. Endoscopic retrograde cholangiopancreatography (ERCP)
D. Inflammatory biomarkers
E. Full liver function panel

Explanation:

The most prominent abnormality in this patient's laboratory values is his markedly elevated serum lipase. The most likely cause of his severe abdominal pain is therefore acute pancreatitis. The two most common causes of acute pancreatitis are alcohol and gallstones, with the former being more likely in this patient given his recent binge drinking and absence of gallstones on ultrasound. His borderline low blood pressure and tachycardia along with his low grade fever and elevated WBC may all be indicative of a severe systemic inflammatory response to his pancreatitis.

A CT scan is usually not necessary to make a diagnosis of pancreatitis, but it can be helpful in assessing its severity and complications. A contrast-enhanced CT is indicated in this patient at this time to assess for pancreatic necrosis or other complications. Patients in whom 30% or more of the pancreas is necrotic may benefit from prophylactic antibiotics, with imipenem and meropenem being the most commonly used agents.

(Choice A) There is no factor related to the lipase elevation that can be used to guide therapy with prophylactic antibiotics.

(Choice C) Early ERCP may be of benefit only in patients with pancreatitis caused by gallstones.

(Choice D) Inflammatory biomarkers would inevitably be high in this patient and would not be helpful in guiding management.

(Choice E) There may be elevated liver enzymes in patients with pancreatitis, but these are not helpful in guiding management.

Educational objective:
While CT is not generally used to confirm a diagnosis of acute pancreatitis, it may be helpful in determining its severity or assessing for complications. Patients with pancreatic necrosis over 30% may benefit from prophylactic antibiotic therapy with meropenem or imipenem.

73% of people answered this question correctly;

A 54-year-old, Caucasian, wheelchair-bound man is admitted to the hospital for treatment of right leg cellulitis. He was diagnosed with amyotrophic lateral sclerosis three years ago. He has no other medical problems. He is on the disability program. He does not use tobacco, alcohol or illicit drugs. He is receiving intravenous cefazolin for the infection, and ibuprofen for pain control. The nurse informs you that the patient is having difficulties swallowing food, even though he is on a bland diet. His wife tells you that he almost choked while eating his lunch twice in the last two months. Which of the following will be the most appropriate course of action for this patient?

A. Discuss the possibility of total parenteral nutrition (TPN)
B. Discuss the possibility of nasogastric tube (NGT)
C. Discuss the possibility of performing a gastrostomy
D. Change the patient to a liquid diet
E. Start peripheral parenteral nutrition (PPN)

Explanation:

Amyotrophic Lateral Sclerosis (ALS) is a progressive degenerative disease with a mean survival time expectancy of three to five years. Muscular atrophy leads to immobility, sialorrhea, dysarthria, poor sleep, dysphagia and dyspnea. The dysphagia that occurs in ALS is non-reversible. Management is palliative, and involves the use of a percutaneous gastrostomy (PEG) tube. Although placement of a PEG tube does not decrease the risk of aspiration when compared with an NGT, it is more comfortable for the patient. Other advantages of the use of a PEG tube are: it does not lead to the development of sinusitis, and it does not affect the patient's breathing or speech.

(Choice E) Peripheral parenteral nutrition (PPN) is a transient measure. Because it is usually administered peripherally, it is insufficient to meet the energy and nutrient demands of the patient.

(Choice A) Total parenteral nutrition (TPN) is invasive and is a temporary measure with a high risk of systemic infections or thrombotic events.

(Choice B) A nasogastric tube (NGT) acts as a vehicle for transitory food and fluids administration; however, it produces discomfort, can aggravate the patient's dyspnea and lead to sinusitis.

(Choice D) Because the dysphagia that occurs in patients with ALS is progressive, giving the patient a liquid diet will not decrease the risk of aspiration.

Educational Objective:
ALS is a neurodegenerative disease that progresses to severe muscular weakness, dysarthria, dysphagia, and dyspnea. The dysphagia that develops is irreversible, and must be treated through percutaneous gastrostomy (PEG) tube placement. Although placement of a PEG tube will not decrease the risk of aspiration when compared with an NGT, it is more

comfortable for the patient. Other advantages of the use of a PEG tube are: it does not lead to the development of sinusitis, and it does not affect the patient's breathing or speech. Temporary measures (TPN or PPN) are only used in the emergency setting, but should not be part of the standard long-term management.

54% of people answered this question correctly;

A 46-year-old female comes with a two-week history of intermittent epigastric abdominal pain and nausea. The pain gets better after a light meal or a cup of milk. The symptoms often occur at night. She has never had these symptoms before. She is currently not taking any medications. Endoscopy reveals a small duodenal ulcer in the bulbar area. The serology test for Helicobacter pylori is positive. You decide to manage the patient with triple drug therapy. Which of the following is the most appropriate next step to confirm the eradication of H. pylori infection in this patient?

A. Repeat serology test 4 weeks after the completion of the therapy
B. Repeat endoscopy with biopsy 4 weeks after the completion of the therapy
C. Obtain a blood culture 1 week after the initiation of the therapy
D. C14 urea breath testing 1 week after the initiation of the therapy
E. Fecal antigen testing 4 weeks after the completion of the therapy

Explanation:

Temporary improvement of epigastric pain after a small meal is typical of duodenal ulcers, whereas pain exacerbation after meals tends to occur with gastric ulcers. Worsening symptoms at night is also frequent with duodenal ulcers. H. pylori infection is highly associated with duodenal ulcers, with at least 70% of patients being infected. The combination of proton pump inhibitor omeprazole, clarithromycin, and amoxicillin is the commonly used triple therapy.

Confirmation of H. pylori eradication is recommended for patients with a duodenal ulcer. Either a urea breath test or fecal antigen test can be performed to confirm eradication, but neither should be performed until 4 weeks after the completion of therapy. The fecal antigen test is more readily available but may be less accurate than the urea breath test. Intake of antibiotics or bismuth can result in false-negative test results for both the urea breath and fecal antigen tests. Eradication should also be confirmed in patients with persistent dyspepsia, MALT lymphoma, or who have had resection of early gastric cancer.

(Choice A) H. pylori serology tests evaluate for the presence of antibodies. However, H. pylori antibodies may be present after the infection has been eradicated and therefore they should not be used to assess for eradication for at least a year.

(Choice B) Surveillance endoscopy is generally indicated to confirm the healing of gastric ulcers, which have **high** risk for malignancy. The risk of malignancy is extremely low with duodenal ulcers and no surveillance endoscopy is needed. Even so, endoscopy would not directly confirm H. pylori eradication.

(Choice C) H. pylori bacteria is not typically present in the bloodstream of infected patients, and therefore blood culture should not be used to evaluate for eradication.

(Choice D) Urea breath testing can be used at least 4 weeks after the completion of therapy. 1 week is too soon and may result in a false positive test.

Educational objective:

Confirmation of H. pylori eradication is recommended for patients with ulcers or ongoing dyspepsia. Either urea breath or fecal antigen testing can be used after 4 weeks to confirm H. pylori eradication. H. pylori serology should not be used since it may remain positive a year or more after eradication.

42% of people answered this question correctly;

A 47-year-old African-American woman comes for a routine follow-up visit. She requests colorectal cancer screening because her mother died of colon cancer at the age of 65. There is no other relevant family history. She has hypertension and diabetes, which are well-controlled with losartan and glibenclamide, respectively. She drinks alcohol socially, and has never smoked. Her vital signs and physical examination are normal. A fecal occult blood test is positive. What is the most appropriate next step in the management of this patient?

A. Flexible sigmoidoscopy
B. Colonoscopy
C. Single contrast barium enema
D. Double contrast barium enema
E. Give two more FOBT cards and have her repeat the test at home

Explanation:

Fecal occult blood tests (FOBT) may have high false-negative and false-positive rates due to intermittent bleeding and bleeding from extra-colonic sites, respectively. Nevertheless, a positive FOBT mandates a search for a gastrointestinal source of bleeding. Colonoscopy is the initial method of choice because it evaluates the whole colon and allows for biopsy of possibly malignant lesions. Removal of premalignant polyps in screened populations can reduce the incidence and mortality from colorectal carcinoma.

(Choice A) Flexible sigmoidoscopy allows for visualization of the distal 60cm of the colon, where most tumors are located; however, due to unexplained reasons, the prevalence of proximal tumors is rising, and the number of distal lesions are dropping. Colonoscopy is therefore the better choice.

(Choices C and D) The American Cancer Society proposes double-contrast barium enema as an option for colorectal cancer screening; however, colonoscopy is more sensitive and permits biopsy and/or removal of malignant or premalignant lesions.

(Choice E) Using more than one FOBT card can improve detection of intermittent bleeding. Performing further tests when there is already a positive result is redundant and unnecessary.

Educational Objective:
A gastrointestinal source of bleeding must be sought whenever there is fecal occult blood. It is essential to rule out colorectal cancer. Colonoscopy is indicated in patients with positive fecal occult blood tests. Other colorectal cancer screening methods are double-contrast barium enema and sigmoidoscopy. Stool tests for oncogene DNA (eg. damaged APC or p53 genes) are being studied.

83% of people answered this question correctly;

A 52-year-old high school football coach comes to your office complaining of upper abdominal pain and one episode of vomiting. His symptoms started approximately two months ago, when he experienced a vague pain in the upper abdomen while eating at an Italian restaurant. This pain has increased in severity recently, and is worse with eating. The pain is not felt at night while he is sleeping, and he denies ever waking up in the night because of pain. He denies any history of weight loss or difficulty in swallowing. His medication history includes an occasional over-the-counter ibuprofen use for chronic knee pain. He smokes half a pack of cigarettes daily and drinks socially. His physical examination reveals an anxious man with a pulse rate of 78/min, blood pressure of 120/80 mmHg and respiratory rate of 14/min. His abdomen is soft, with mild epigastric tenderness on palpation; there are normoactive bowel sounds. There is no guarding or rebound tenderness present. His rectal examination shows brown, guaiac-positive stools. There is no evidence of any external or internal hemorrhoids. What is the next best step in the management of this patient?

A. Antibody testing for H. pylori
B. Start the patient on empiric treatment for H. pylori
C. Refer him for endoscopy and biopsy
D. Perform a breath urease test

Explanation:

The patient in the above vignette has a classic presentation of peptic ulcer disease, most likely due to nonsteroidal antiinflammatory drug (ibuprofen) use. The diagnosis is usually suspected based on the clinical history, and confirmation of the presence of an ulcer is usually done by an upper GI barium study, or more commonly, by endoscopy.

All patients with symptoms of dyspepsia or peptic ulcer disease do not need an initial invasive procedure for diagnostic evaluation. The American Gastroenterological Association has made recommendations on the initial endoscopic evaluation of patients with suspected dyspepsia or peptic ulcer disease. According to the current recommendations, all patients greater than 45 years of age with new onset of symptoms or patients with "alarm" symptoms (weight loss, anemia, dysphagia, early satiety or occult bleeding) at any age at initial presentation should have an endoscopy done. Upper GI endoscopy is a sensitive and specific diagnostic procedure for diagnosing peptic ulcer disease. A biopsy specimen should also be obtained while performing an initial endoscopy to look for *H. pylori* and to exclude the possibility of gastric malignancy, especially in older individuals.

(Choices A and D) *H. pylori* is an important risk factor for the development of peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma. It is the most common cause of peptic ulcer disease, and accounts for 70-80% of duodenal ulcers and 50% of all the gastric ulcers. Failure to eradicate *H. pylori* in patients with peptic ulcer disease is associated with a very high rate of ulcer recurrence.

Non-invasive testing for *H. pylori* with serological testing or breath urease test is appropriate for patients less than 45 years of age and without any "alarm" symptoms; however, patients

over the age of 45 years with new onset symptoms have a small risk of gastric malignancy and should be referred for an endoscopy and biopsy of any visible ulcers.

(Choice B) An initial trial of therapy without *H. pylori* testing is not recommended. Empiric treatment should only be provided in young patients if the *H. pylori* test result is positive.

Educational Objective:
An initial Upper GI endoscopy should be performed in all patients with "alarm" symptoms (weight loss, anemia, early satiety, and dysphagia) and in patients over the age of 45 years with new onset symptoms of peptic ulcer disease.

66% of people answered this question correctly;

A 40-year-old female comes to the physician because of chest pain and dysphagia. These symptoms have been present for the past 12 months. The episodes last from a few seconds to a few minutes. She denies any weight loss, fevers, or chills. Her chest x-ray, ECG, and barium swallow are normal. Manometric studies demonstrate simultaneous high amplitude contractions with normal relaxation of the lower esophageal sphincter. What is the most likely cause of her symptoms?

A. Zenker's diverticulum
B. Diffuse esophageal spasm
C. Achalasia
D. Scleroderma
E. Esophagitis

Explanation:

Diffuse esophageal spasm manifests with chest pain and dysphagia. The etiology is unclear, although in many patients it is associated with emotional factors and functional gastrointestinal disorders. Manometric studies demonstrate high amplitude peristaltic contractions. In contrast to achalasia, the lower esophageal sphincter usually has a normal relaxation response. Manometric findings may be intermittent, thus making the diagnosis difficult. The esophagogram is frequently normal, although the classic corkscrew esophagus is seen occasionally. Treatment is with antispasmodics, dietary modulation, and psychiatric counseling. Surgery is very rarely required for this disorder.

(Choice A) Zenker's diverticulum is a disorder of the proximal esophagus generally seen in females. The diverticulum may vary in size and is generally asymptomatic in presentation. The occasional patient may present with complaints of food sticking in the throat, halitosis, and regurgitation. There is no pain associated with the diverticulum. Treatment is surgery.

(Choice C) In achalasia, the lower esophageal sphincter does not relax (high tone). Histopathology reveals hypertrophied, inner circular muscle with the absence or degeneration of ganglia in Auerbach's plexus. Manometry will show the absence of peristalsis. The cause is not known, but a similar condition in South America is caused by the parasite, *Trypanosoma cruzi*. An esophagogram typically reveals a dilated esophagus with a bird's beak narrowing of the distal esophagus. Therapy is balloon dilation of the narrowed esophagus or surgery.

(Choice D) Scleroderma is a collagen vascular disorder which can present with loss of distal peristalsis of the esophagus. There is complete atrophy of the esophageal smooth muscle and fibrosis. The lower esophageal sphincter becomes incompetent (low tone) with time, leading to reflux esophagitis and a stricture. The condition is progressive and difficult to treat.

(Choice E) Esophagitis can be due to several causes, the most common being herpes, *Candida*, or a cytomegalovirus. Esophagitis generally occurs in immunocompromised individuals (e.g., those with AIDS, malignancy, diabetes) and may present with dysphagia, oral thrush, or odynophagia. Endoscopy with washings, culture, and biopsy may reveal the cause.

Educational Objective:
Diffuse esophageal spasm is usually seen in young females and can present with intermittent episodes of chest pain and dysphagia. A barium swallow may reveal a "corkscrew" esophagus. Treatment is supportive.

**Extremely high yield question for USMLE. Understand the pathophysiology, the presence of and the absence of peristalsis, and LES tone in all of the above conditions.

84% of people answered this question correctly;

A 35-year-old Caucasian female presents to your office with several months history of heartburn. She also describes a periodic 'sticking sensation' in her throat during the meal. Her past medical history is significant for asthma controlled with inhaled steroids and an acoustic neuroma which was removed two years ago. She does not smoke or consume alcohol, and she denies any recreational drug use. She is not allergic to any medications. She works as a secretary at a private firm and considers her work moderately stressful. Her family history is significant for breast cancer in her mother and prostate cancer in her father. Endoscopic evaluation shows mild hyperemia in the distal esophagus. Esophageal manometry reveals the absence of peristaltic waves in the lower two-thirds of the esophagus and a significant decrease in lower esophageal sphincter tone. Which of the following is the most likely cause of this patient's complaints?

A. Achalasia
B. GERD with or without hiatal hernia
C. Scleroderma
D. Non-ulcer dyspepsia
E. Diffuse esophageal spasm

Explanation:

The clinical scenario described is most consistent with an esophageal dysmotility associated with scleroderma. Two important clues are present in this scenario: the typical symptoms and manometric findings. A 'sticking sensation' in the throat (dysphagia) accompanied by heartburn is characteristic for scleroderma. The absence of peristaltic waves in the lower two-thirds of the esophagus and a significant decrease in lower esophageal sphincter (LES) tone are also very characteristic.

(Choice B) GERD may be associated with dysphagia due to a stricture, but in this stage, the heartburn would have usually disappeared or diminished significantly. Furthermore, patients with GERD may also have a decreased LES; however, the absence of peristaltic waves is not typical for this disease.

(Choice A) Manometric findings in achalasia include a significant decrease or absence of peristaltic waves and increased LES tone.

(Choice E) Diffuse esophageal spasm is characterized by chest pain and dysphagia, not heartburn. Manometry may reveal periodic high-amplitude non-peristaltic waves.

(Choice D) Non-ulcer dyspepsia is not usually accompanied by esophageal dysmotility.

Educational Objective:
The absence of peristaltic waves in the lower two-thirds of the esophagus and a significant decrease in lower esophageal sphincter (LES) tone are characteristic for esophageal dysmotility associated with scleroderma.

45% of people answered this question correctly;

A 34-year-old Caucasian male is referred to your office because a routine check-up revealed the following results:

AST	15 U/L
ALT	16 U/L
Anti-HAV IgG	Positive
Anti-HCV antibodies	Positive
HBsAg	Negative
Anti-HbsAg	Negative

The patient has no present complaints. His past medical history is insignificant. He smokes one pack of cigarettes daily and consumes alcohol occasionally. He denies any recreational drug use. He is sexually active with his girlfriend and uses condoms for contraception. He is concerned about the results of his blood work-up. Which of the following is the best response to this patient's concern?

A. The patient has hepatitis C infection
B. The patient had hepatitis C and now is cured
C. The patient is at a high risk of hepatitis C
D. The diagnosis is unclear and confirmation is necessary
E. The patient is free of disease and can donate blood

Explanation:

In patients with positive ELISA-anti-HCV antibodies, there are several potential explanations: persistent hepatitis C infection, cleared infection or false-positive ELISA result. The probability of each of these explanations depends on the patient's history, laboratory findings, and most importantly, on the risk profile and liver function tests. The diagnosis should be confirmed by high-specificity testing (usually HCV RNA); before this, no conclusive answer can be offered to the patient.

(Choice C) This patient belongs to the low risk category (no previous transfusions, no IV drug use or sexual promiscuity) and has normal AST and ALT levels.

(Choice A) The positive predictive value of ELISA in such a patient is low, ranging from 35 to 45%.

(Choice B) Persistence of positive anti-HCV antibodies, combined with normal liver function tests and negative HCV RNA, may indicate cleared hepatitis C infection.

Educational Objective:
In patients with positive ELISA-anti-HCV antibodies, there are several potential explanations: persistent hepatitis C infection, cleared infection or false-positive ELISA result. The diagnosis should be confirmed by high-specificity testing (usually HCV RNA). The positive predictive value of ELISA-anti-HCV in a patient with a low risk profile and normal AST/ALT is low.

High yield question

38% of people answered this question correctly;

A 40-year-old man is admitted in the intensive care unit (ICU) after being involved in a major motor vehicle accident. He was an unrestrained driver, and his toxicological screen was positive for alcohol and amphetamines. He sustained head injuries and blunt chest trauma. He has been on mechanical ventilation for 72 hours after the intubation and has received 6 units of blood products. On the third day of hospitalization, he has one episode of coffee-ground colored, heme-positive emesis. His blood pressure is 112/65 mm Hg and pulse is 103/min. Which of the following measures, if employed timely, would have been most effective in preventing this patient's condition?

A. Antacids via nasogastric tube
B. Early enteral nutrition
C. Intravenous H2 receptor antagonist
D. Glucocorticoid therapy
E. Sucralfate via nasogastric tube

Explanation:

This patient clearly has an upper gastrointestinal bleed given the presence of coffee-ground colored vomitus. Upper gastrointestinal bleeding commonly presents with vomiting of coffee-ground colored material and/or melena (black, tar-like stool). In the presence of an upper gastrointestinal bleed, gastric acid oxidizes the iron contained in blood, giving vomitus and stool a dark color.

The development of stress ulceration in the stomach is a common occurrence among ICU patients. ICU patients are predisposed to the development of stress ulcerations secondary to decreased mucosal protection and increased acid secretion. Most of these ulcerations occur within the first 72 hours and tend to be located in the proximal stomach. Ulcerations occurring after 14 days tend to be located in the duodenum. Risk factors for the development of stress ulcerations in ICU patients include:

- coagulopathy
- a history of GI ulceration or bleeding in the last year
- mechanical ventilation for more than 48 hours

Prophylaxis is indicated for an ICU patient with any of the above risk factors. Prophylaxis is additionally indicated if a patient has two or more of: sepsis, ICU admission longer than 1 week, occult GI bleeding lasting longer than 6 days, and glucocorticoid therapy.

A proton pump inhibitor (e.g. omeprazole) is the agent of choice for patients able to take medications via an enteral tube. For patients who require intravenous therapy, H_2 receptor antagonists (e.g. ranitidine) are typically the agents of choice since they appear to have a similar efficacy as intravenous proton pump inhibitors but are much less expensive. However, prophylaxis is not without risk, because agents that increase gastric pH promote growth of bacteria in the stomach and put patients at risk for nosocomial aspiration pneumonia.

(Choice A) If medication can be given via an enteral tube, proton pump inhibitors are preferred to antacids.

(Choice B) Some studies have shown that early enteral nutrition may be effective in decreasing the risk of stress ulcer formation, but current recommendations suggest that early enteral nutrition should not be used as a substitute for medical therapy.

(Choice D) Glucocorticoids are considered to be a risk factor for the formation of stress ulcers and therefore would not make a good prophylactic agent.

(Choice E) Sucralfate via an enteric tube can be used for stress prophylaxis, but either a proton pump inhibitor or H2 antagonist is preferred.

Educational objective:
Prophylaxis for stress ulcers is recommended for ICU patients with coagulopathy, a history of GI bleeding in the last year, mechanical ventilation for more than 48 hours, or two of the following: sepsis, ICU admission longer than 1 week, occult GI bleeding lasting longer than 6 days, and glucocorticoid therapy. A proton pump inhibitor would be the agent of choice if the patient is able to take medications via an enteral tube, but H2 receptor antagonists are typically the agents of choice for patients requiring intravenous medications.

46% of people answered this question correctly;

A 50-year-old Caucasian male presents to your office for routine check-up. He says, 'I gained some weight recently, and I know I should give up fast food.' He complains of frequent heartburns that is relieved with food intake and over-the-counter antacids. His past medical history is insignificant. He does not smoke currently, but he used to smoke 1-2 packs of cigarettes daily for 25 years. He consumes 1-2 bottles of beer on weekends. His blood pressure is 150/90 mmHg and heart rate is 85/min. His occult fecal blood test is positive. You recommend esophagogastroscopy, but he replies that the procedure would give him a lot of discomfort. He has heard of 'video pills' that he can swallow and 'these would show the stomach.' He requests for such a pill. What is the best response to this patient's request?

A. No such pills exist. You must be misinformed
B. Video pills have low resolution and are therefore inferior to endoscopy
C. Video pills have limited view and endoscopy is clearly preferred
D. Video pills may be associated with high rates of GI perforation
E. Video pills are a good alternative to endoscopy in your case

Explanation:

The patient is most probably talking about wireless video endoscopy, a novel technique that is gaining popularity in gastroenterology. A video capsule is taken by the patient and video recording is traced by the outside sensors. Currently, it has been proven to be an effective tool to diagnose some small bowel disease because visualization of the majority of the small bowel mucosa is not possible with push endoscopy. It can be helpful to identify the source of small bowel hemorrhage, tumors, ulceration and inflammatory conditions.

(Choice B) The images acquired are of excellent resolution and have an 8:1 magnification, which is higher than that of conventional endoscopes.

(Choice E) Limited views of the esophagus, stomach and cecum are obtained by this technique; therefore, in no way can it currently replace endoscopy for the diagnosis of esophageal and stomach disease.

(Choice D) Complications of wireless video endoscopy are rare. Retention of the capsule happens in less than 1% of patients.

Educational Objective:
Wireless video endoscopy is an effective tool to diagnose some small bowel disease because visualization of the majority of the small bowel mucosa is not possible with push endoscopy. Endoscopy is preferred for the diagnosis of esophageal and stomach disease.

73% of people answered this question correctly;

The following vignette applies to the next 2 items

A 33-year-old Caucasian male presents to the emergency department with two episodes of coffee-ground colored vomiting. He denies ever having such symptoms in the past. He also denies any abdominal pain, dizziness, syncope and black stool. His past medical history is insignificant. He does not smoke or consume alcohol. His blood pressure is 120/72 mmHg while supine and 122/70 mmHg while standing. His heart rate is 90/min. The physical examination is within normal limits. Endoscopy reveals a single small longitudinal tear at the gastro-esophageal junction that is not actively bleeding.

Item 1 of 2

Which of the following is the best management for this patient?

A. Observation and supportive care
B. Thermal coagulation
C. Sclerotherapy
D. Band ligation
E. IV infusion of vasopressin

Explanation:

This patient presents with upper GI hemorrhage caused by a Mallory-Weiss tear. The "classic" presentation of hematemesis preceded by a bout of retching/vomiting only occurs in 30% of patients. Endoscopy is the gold standard in establishing the diagnosis. This procedure typically reveals a single longitudinal tear at the gastro-esophageal junction. In patients with Mallory-Weiss tear who are not actively bleeding (such as the patient in this case), observation and supportive care are typically necessary.

(Choices B, C, and D) Endoscopy also allows for therapeutic interventions (i.e., thermal coagulation, sclerotherapy and band ligation) to stop active bleeding.

(Choice E) IV infusion of vasopressin, esophageal balloon tamponade, and angiographic arterial embolization have been used occasionally to control severe or refractory hemorrhage.

Educational Objective:
In patients with Mallory-Weiss tear who are not actively bleeding, observation and supportive care are typically necessary.

82% of people answered this question correctly;

Item 2 of 2

Which of the following is the most likely associated finding in this type of patient?

A. Increased lower esophageal sphincter (LES) tone
B. Hiatal hernia
C. Gastric atrophy
D. Peptic ulcer disease
E. Esophageal varicosities

Explanation:

Hiatal hernia is the most well known anatomical predisposing factor for Mallory-Weiss syndrome. According to different sources, it is present in 40-100% of patients with this syndrome. During retching or vomiting, the transmural pressure gradient is greater within the hernia than the rest of the stomach, thereby making this location the most likely to sustain a tear. Other precipitating factors include retching, vomiting, straining, hiccuping, coughing, primal scream therapy, blunt abdominal trauma, cardiopulmonary resuscitation, and diagnostic or therapeutic manipulation (e.g., endoscopy).

(Choice E) Esophageal varicosities may be revealed in chronic alcoholics who present with this syndrome, but these are not predisposing factors to tears per se.

(Choices C, D, and A) No significant association is present with gastric atrophy, peptic ulcer disease and achalasia.

Educational Objective:
Hiatal hernia is present in 40-100% of patients with Mallory-Weiss syndrome.

31% of people answered this question correctly;

A 55-year-old Caucasian male comes to the emergency department with complaints of a sudden onset of upper abdominal pain. He has a history of alcoholism and chronic, recurrent pancreatitis. His physical examination and laboratory evaluation confirm another attack of pancreatitis. He is admitted to the hospital for observation, pain control, intravenous hydration, and bowel rest. Two days later, he complains of nausea and has two episodes of coffee-ground emesis. An upper GI endoscopy reveals the presence of varices in the fundus of the stomach, without any evidence of esophageal varices. Which of the following is the most likely cause of the above findings?

A. Splenic vein thrombosis
B. Portal vein thrombosis
C. Hepatic venoocclusive disease
D. Budd-Chiari syndrome

Explanation:

The presence of isolated gastric varices in a patient with a history of chronic, recurrent pancreatitis is suggestive of splenic vein thrombosis, which is one of the less frequent complications of chronic pancreatitis. The splenic vein runs along the posterior surface of the pancreas, and can get directly inflamed and thrombosed due to recurrent pancreatic inflammation. Apart from gastric varices, patients with chronic splenic vein thrombosis may develop noncirrhotic portal hypertension, ascites, and massive splenomegaly with associated features of hypersplenism (anemia, thrombocytopenia, and leukopenia).

(Choice B) Portal vein thrombosis is one of the causes of prehepatic/noncirrhotic portal hypertension. The clinical consequences of portal vein thrombosis are similar to that of splenic vein thrombosis; however, patients with portal vein thrombosis have both gastric and esophageal varices.

(Choice C) Hepatic venoocclusive disease is due to the occlusion of terminal hepatic venules and causes postsinusoidal portal hypertension. It presents as tender hepatomegaly, jaundice, and ascites.

(Choice D) Budd-Chiari syndrome is due to the thrombosis of hepatic veins or intra/suprahepatic inferior vena cava. Acutely, it presents with right upper quadrant pain, hepatomegaly, jaundice, and rapidly developing ascites. Chronic Budd-Chiari syndrome usually presents with ascites, cirrhosis, and portal hypertension (gastroesophageal varices and splenomegaly).

Educational Objective:
Isolated gastric varices (without evidence of esophageal varices) due to splenic vein thrombosis can be seen as a complication of chronic recurrent pancreatitis.

60% of people answered this question correctly;

A 45-year-old man with a history of intravenous drug use and chronic hepatitis C infection comes to the physician because of a 5-day history of generalized malaise and abdominal pain. He has not had cough, shortness of breath, nausea, vomiting, or change in bowel habits. He is sexually active with multiple partners and uses condoms inconsistently for contraception. His temperature is 37.5 C (99.5 F), blood pressure is 126/82 mm Hg, pulse is 96/min, and respirations are 16/min. He appears cachectic. Examination shows mildly icteric sclerae. The abdomen is distended with hypoactive bowel sounds and vague, diffuse tenderness with no guarding or rebound. There is hepatosplenomegaly and shifting dullness. The lungs are clear to auscultation with decreased breath sounds at the lung bases. The remainder of the examination shows no abnormalities. The lab studies show:

Leukocyte count	11,600/mm^3
Total bilirubin	3.4 mg/dL
Serum creatinine	1.4 mg/dL
INR	1.7

An x-ray film of the chest shows small, bilateral pleural effusions. An ultrasound of the abdomen shows ascites and a small, nodular liver without masses. Which of the following is the most appropriate next step in management?

A. Abdominal paracentesis
B. Antinuclear antibody and cryoglobulin tests
C. CT scan of the abdomen
D. Interferon and ribavirin therapy
E. Liver biopsy

Explanation:

This patient likely has cirrhosis secondary to his chronic hepatitis C infection. His distended abdomen with shifting dullness is consistent with ascites, which is confirmed on ultrasound. His abnormal bilirubin, creatinine, and INR are all likely secondary to his underlying cirrhosis. This patient's presentation of malaise and diffuse abdominal tenderness is vague, but the most reasonable next step at this point would be to perform an abdominal paracentesis to exclude the presence of spontaneous bacterial peritonitis (SBP). SBP is an infection of ascitic fluid without evidence of a surgically treatable source. SBP almost exclusively affects patients who have advanced cirrhosis and clinically detectable ascites.

One should generally maintain a low threshold for considering paracentesis in these patients, because untreated SBP can progress to shock and multisystem organ failure. Findings to suggest SBP include low-grade fever, abdominal pain or discomfort, or altered mental status. Some patients may be asymptomatic but have a mildly elevated leukocyte count or a metabolic acidosis. An ascites polymorphonuclear leukocyte count of >250 cells/mm^3 and a positive ascites culture or gram stain confirm the diagnosis of SBP. Most cases of SBP are caused by translocation of enteric bacteria such as E. coli into the ascites fluid. However,

streptococcal and rarely staphylococcal bacteria can also cause the infection and thus a broad spectrum empiric therapy with an antibiotic such as a third generation cephalosporin (cefotaxime) is often initiated.

(Choice B) An antinuclear antibody screen can be helpful if there is suspicion for autoimmune hepatitis, but this patient's cirrhosis is most likely caused by chronic hepatitis C infection. Cryoglobulinemia is associated with Hepatitis C but would not explain this patient's current symptoms.

(Choice C) A CT scan of the abdomen would be indicated if there was concern for a surgical cause of peritonitis such as a perforated bowel. A CT of a patient with SBP is non-specific and often simply shows ascites. CT can be helpful to further examine any liver mass that is identified on ultrasonogram.

(Choice D) Interferon and ribavirin may be helpful for this patient in the long term to treat his underlying chronic Hepatitis C, but SBP must be excluded in the acute setting.

(Choice E) A liver biopsy may be of use in this patient to confirm the imaging diagnosis of cirrhosis and to assess its severity. However, the first step should be to exclude underlying SBP.

Educational objective:
Spontaneous bacterial peritonitis can present with nonspecific symptoms of fever, abdominal pain or discomfort, or altered mental status in patients with ascites. One should have a low threshold for obtaining a paracentesis and excluding the diagnosis of SBP in cirrhotic patients with ascites.

57% of people answered this question correctly;

The following vignette applies to the next 3 items

A 45-year-old Caucasian woman comes to the emergency department (ED) with complaints of severe abdominal pain. She started having pain in her upper abdomen approximately twelve hours ago. The pain is sharp and radiates to her back. She had two episodes of vomiting before coming to the ED. She has been hospitalized four times in the past with similar complaints. On review of her previous hospitalizations, you notice that there was never a specific cause found for her symptoms. She has a history of diabetes and hypertension, and both are well controlled by diet and exercise. Her blood pressure is 130/70 mmHg, pulse is 92/min, temperature is 36.7C (98F), and respirations are 16/min. She is moderately obese, and is in distress. Her lungs and cardiovascular examination are within normal limits. There is diffuse tenderness to palpation over the whole abdomen, with maximum tenderness present at the epigastric area.

Item 1 of 3

Which of the following is the next step in the diagnosis of the patient's condition?

A. Serial abdominal examination
B. CT scan of the abdomen
C. LFTs with lipase levels
D. No further tests are needed at this point as prior workup was normal
E. Ultrasound of the right upper quadrant

Explanation:

The clinical presentation of the patient is consistent with acute pancreatitis, which is characterized by an acute onset of steady, upper abdominal pain radiating to the back, with associated nausea and vomiting. However, since these symptoms are nonspecific and can be seen in a number of acute abdominal illnesses, confirmation of the diagnosis is necessary with clinical and biochemical markers, as well as radiographic imaging.

A variety of biochemical tests have been devised to diagnose acute pancreatitis. Of these, measurement of the serum amylase and lipase levels are the most frequently used. Serum lipase is more sensitive and specific than serum amylase; therefore, measurement of the former is the diagnostic test of choice. (An elevated serum amylase level is nonspecific as it is also elevated in a number of other conditions such as acute parotitis, intestinal disorders, renal failure, cholecystitis, and fallopian tube diseases.) In addition, a liver function test (LFT) is also obtained since an elevated alkaline phosphatase level may point towards gallstone/common bile duct stones as the etiology of the acute pancreatitis.

(Choice A) Serial abdominal examination can delay the diagnosis of acute pancreatitis, and may even prove to be potentially fatal in these patients. It is only useful to follow the clinical progress of the patient once the diagnosis has been made.

(Choice B) CT scan may be eventually needed to document the severity of pancreatitis and to detect the presence of other intra-abdominal complications. These should only be done if all other biochemical markers fail to provide a diagnosis, or if the patient fails to improve with initial conservative treatment.

(Choice D) Her current symptoms should not be assumed to be benign based on her past history of hospitalizations.

(Choice E) An ultrasound of the right upper quadrant of the abdomen may provide a clue to the cause of her symptoms; however, up to one-third of patients have bowel or intestinal gas that may obscure the pancreas, and thus, the diagnosis.

Educational Objective:
The diagnosis of acute pancreatitis is confirmed initially with an elevated level of serum biochemical markers (amylase or lipase).

*Extremely important question for USMLE step-3

62% of people answered this question correctly;

Item 2 of 3

The initial lab results of the patient reveal the following:

Total bilirubin	1.2 mg/dL
Direct bilirubin	1.0 mg/dL
Alkaline phosphatase	382 units/L
AST	40 units/L
ALT	38 units/L
Albumin	4 g/dL
Serum calcium	8.9 mg/dL
Amylase	1026 mg/dL
Lipase	662 mg/dL

A right upper quadrant ultrasound reveals an enlarged hypoechoic area in the head of the pancreas with mild dilatation of the common bile duct. A contrast-enhanced CT scan of the abdomen reveals enlargement and inflammation of the pancreatic head without any areas of necrosis. Which of the following is the best next step in the management of this patient?

A. Intravenous antibiotics
B. CT-guided needle aspiration of the pancreatic tissue
C. Daily abdominal CT scans
D. Intravenous fluids and narcotics
E. Surgical consult

Explanation:

Most episodes of acute pancreatitis are mild, and patients usually recover in five to seven days. Treatment is usually conservative (i.e., supportive therapy) and aimed at correcting the underlying predisposing condition and preventing any further damage to the pancreatic tissue. Patients can have a significant amount of third space loss of fluids, thereby causing hypotension, acute renal failure and even worsening of the pancreatitis; therefore, all patients should have early and aggressive fluid resuscitation with close monitoring of the urine output to ensure adequate tissue perfusion. Pain control is also important, and is generally achieved with the use of intravenous narcotics.

Based on the radiographic imaging, the patient is suffering from a mild, edematous, acute pancreatitis. The next best step in management is pain control and administration of IV fluids.

(Choice A) Intravenous antibiotics are indicated only in patients with severe necrotizing pancreatitis or in patients with clinical or tissue evidence of infection of the necrotic pancreatic tissue. These are not given to patients with mild attacks of acute pancreatitis.

(Choice B, C) There is no indication for CT-guided aspiration of the pancreatic tissue or daily CT scans.

(Choice E) Surgical debridement is indicated only in patients with extensive tissue necrosis or localized abscess formation.

Educational objective:
Most of the patients with mild acute pancreatitis can be managed conservatively by adequate pain control and intravenous fluid resuscitation.

76% of people answered this question correctly;

Item 3 of 3

While you are making your rounds the next morning, the nurse informs you that the patient has developed a temperature of 39.4C (103F). The rest of her vital signs are within normal limits. Which of the following is the next best step in the management in this patient?

A. Obtain blood cultures
B. Obtain blood cultures and start the patient on imipenem
C. Obtain urine cultures
D. Repeat a stat CT scan
E. Start the patient on intravenous ampicillin

Explanation:

The occurrence of fever in a previously afebrile patient with acute pancreatitis is one of the earliest signs of pancreatic infection. Infection of the pancreatic tissue is the major cause of morbidity and mortality in patients with acute pancreatitis. Most infections are seen late in the clinical course of the disease.

There is considerable evidence from several studies that the early use of antibiotics in patients with severe necrotizing pancreatitis or in patients with evidence of pancreatic infection improves the outcome and reduces mortality. It is important to use a broad-spectrum antibiotic that can achieve good penetration in the pancreatic tissue. Examples of such antibiotics are: imipenem, third generation cephalosporins, piperacillin, fluoroquinolones, and metronidazole. If the patient's condition fails to improve after one week of antibiotic therapy, a CT-guided aspiration of the tissue should be performed to obtain tissue samples for culture and sensitivity.

(Choices A and C) It is important to start the patient on antibiotics as soon as the cultures are drawn. Obtaining blood or urine cultures alone is not sufficient.

(Choice D) Another CT scan is unlikely to change the treatment at this point. The patient should be started on broad-spectrum antibiotics (imipenem) and followed closely for signs of clinical improvement or deterioration.

(Choice E) Ampicillin has a poor tissue penetration into the pancreas, and there is considerable drug resistance against its action by most of the gut bacteria which are associated with pancreatic infection.

Educational Objective:
All patients with severe necrotizing pancreatitis or suspected pancreatic infection should be started on imipenem to decrease the morbidity and mortality associated with the disease. People rarely use a combination of ampicillin, gentamycin, and metronidazole.

*Extremely important question for USMLE step-3

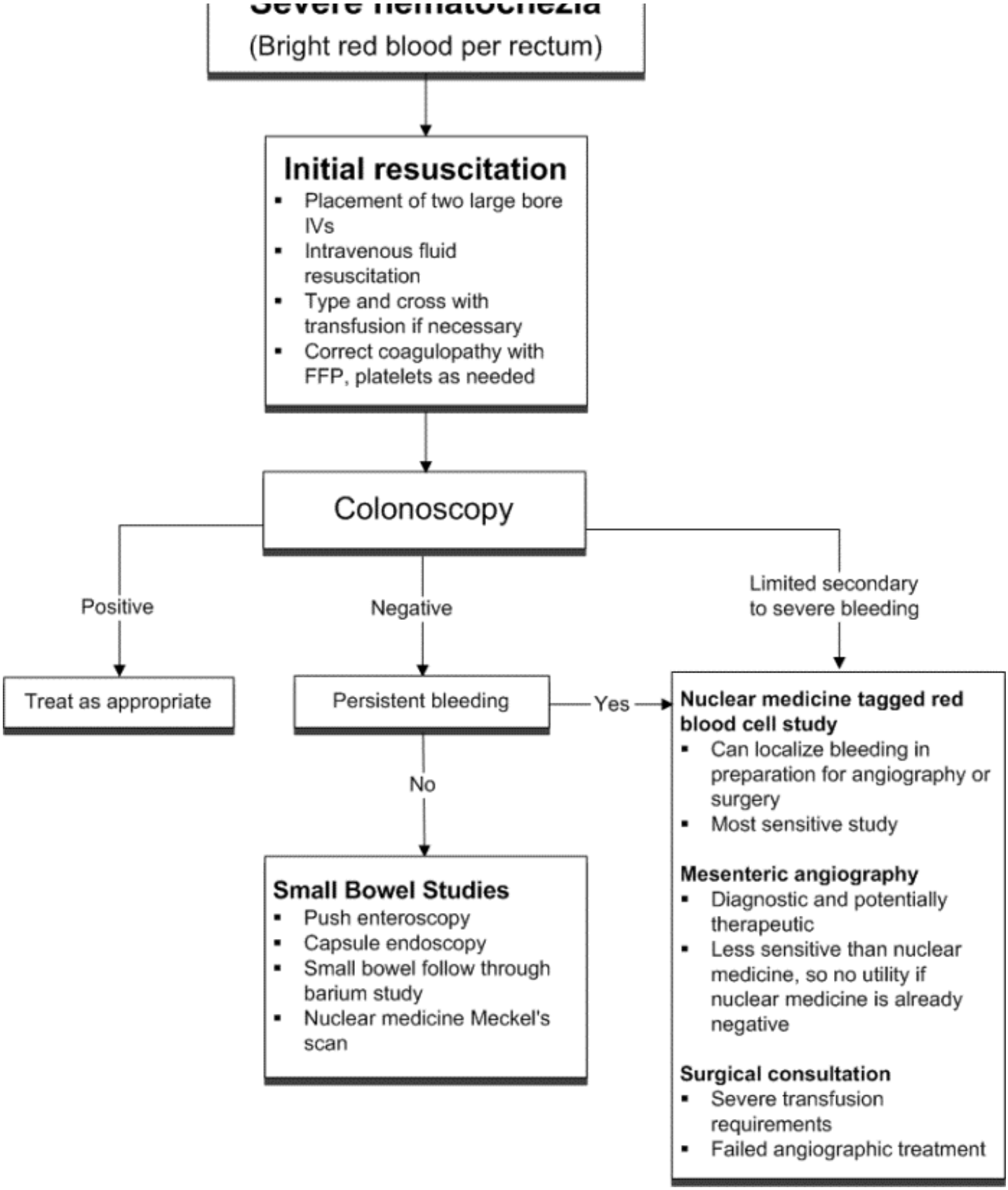
72% of people answered this question correctly;

A 79-year-old Caucasian female is brought to the emergency department (ED) by her daughter because of bloody stools. For the past three days, the patient had been occasionally passing blood with her stools, but this morning she completely filled up the toilet bowl with bloody stools. She denies any associated symptoms such as nausea, vomiting, or abdominal pain. Her past medical history includes mild dementia, hypertension, diet-controlled diabetes mellitus, and osteoarthritis. She takes baby aspirin daily and non-steroidal anti-inflammatory agents occasionally for hip pain. Her temperature is 36.7°C (98°F), heart rate is 92/min, blood pressure is 106/62 mmHg, and respiratory rate is 16/min. She appears pale. Abdominal examination is unremarkable. Rectal examination reveals bright red blood in the rectal vault, without tenderness. Nasogastric aspirate shows copious amounts of bilious fluid. In the ED she has another bloody bowel movement, which is accompanied by mild lightheadedness and diaphoresis. She is started on intravenous fluids and blood work is ordered including blood type and cross-match. Which of the following is the most appropriate next step in the management of this patient?

A. Arrange for colonoscopy
B. Arrange for upper GI endoscopy
C. Order non-contrast CT scan of the abdomen
D. Order radionuclide imaging
E. Start octreotide drip

Explanation:

Severe hematochezia



The first step in evaluation of a gastrointestinal bleed is to determine if the source is in the upper or lower gastrointestinal tract, with the ligament of Treitz being the border between the two sites. Bright red blood from the rectum is nearly always from a lower gastrointestinal source, although rarely an upper gastrointestinal bleed can present this way if bleeding is particularly brisk. Hematemesis and melena are more commonly seen in upper gastrointestinal bleeds. If the source of the bleeding is unclear, a nasogastric aspirate with copious bile but an absence of blood confirms a lower

ulcer, a nasogastric aspirate with copious bile but an absence of blood confirms a lower gastrointestinal source.

This patient received appropriate initial resuscitation with intravenous fluids, as well as a type and cross should a blood transfusion be necessary. The next best step would be to perform a colonoscopy. Most lower gastrointestinal bleeding arises from the colon and rectum, so colonoscopy is usually able to diagnose the underlying cause (and sometimes treat the underlying abnormality). In cases of profuse bleeding, colonoscopy can be difficult to perform, and radionuclide scans or angiography may be more helpful options.

(Choice B) Upper GI endoscopy is unnecessary since this patient's negative nasogastric aspirate and bright red blood per rectum are consistent with a lower gastrointestinal hemorrhage.

(Choice C) A non-contrast CT scan of the abdomen can be helpful for evaluating for bleeding into the peritoneal cavity or retroperitoneum, but is not used in evaluation of a gastrointestinal hemorrhage. An arterial-phase contrast-enhanced CT with negative oral contrast can help localize a source of bleeding, although this is method uncommonly utilized.

(Choice D) Radionuclide imaging, most commonly using technetium-labeled red blood cells, is only used if there is active bleeding that limits evaluation by colonoscopy. A positive study can localize a site of bleeding and help direct interventions done angiographically or surgically.

(Choice E) Octreotide is used in the treatment of bleeding esophageal varices, but this is unlikely in this patient given the lower gastrointestinal source of the bleeding.

Educational objective:
Bright red blood per rectum with a nonbloody nasogastric aspirate suggests a lower gastrointestinal source of hemorrhage. After initial resuscitation with fluids and type and cross for possible transfusion, a colonoscopy is generally the next step since it can be both diagnostic and therapeutic. Radionuclide imaging and angiography are reserved for occasions where active bleeding limits visualization by colonoscopy.

49% of people answered this question correctly;

A 39-year-old Caucasian man is brought to the emergency department because of epigastric pain and melena. He was diagnosed of peptic ulcer disease five years ago. He underwent highly selective vagotomy with antral ulcer resection due to persistent gastrointestinal bleeding one year later. He has no other medical problems. He is a real estate agent. He does not use tobacco or illicit drugs, but drinks alcohol occasionally. His medications include omeprazole and antacids. His blood pressure is 130/80 mm Hg, pulse is 120/min, and respirations are 18/min. He looks pale and frightened. Examination shows a midline scar in the epigastrium. There is moderate tenderness on palpation of the upper half of the abdomen. Some muscular guarding can be appreciated. There is no rebound tenderness, and bowel sounds are present. A rectal exam reveals dark blood. During the examination, the patient feels nauseous and has one episode of hematemesis. He receives intravenous hydration and parenteral pantoprazole. Some laboratory tests are done, including cross-typing for a possible transfusion. The results show the following:

CBC

Hb	7.6 g/dL
Ht	23%
Platelet count	450,000/cmm
Leukocyte count	8,000/cmm
Segmented neutrophils	72%
Bands	3%
Lymphocytes	25%

Serum chemistry

Serum Na	145 mEq/L
Serum K	3.9 mEq/L
Chloride	110 mEq/L
Bicarbonate	25 mEq/L
BUN	28 mg/dL
Serum creatinine	1.2 mg/dL
Calcium	9.9 mg/dL
Glucose	77 mg/dL

Which of the following is the most appropriate test to confirm the diagnosis?

A. Abdominal ultrasound

B. Upper gastrointestinal (GI) radiology series

C. Abdominal computerized tomography (CT) with contrast

D. Upper gastrointestinal (GI) endoscopy

E. Radionuclide imaging

Explanation:

There is a significant rate of rebleeding after gastric surgery for peptic ulcer treatment. For instance, truncal vagotomy with partial antrectomy has a recurrence rate of 5 % to 10% after a mean follow-up of 3.5 years. The preferred method to confirm the source of bleeding is upper gastrointestinal (GI) endoscopy, because it also has therapeutic applications such as photocoagulation or local injection of vasoconstrictor agents. In addition, early endoscopy has been associated with a significant decrease in mortality and hospitalization time.

(Choice A) Abdominal ultrasound is not adequate for the evaluation of gastrointestinal bleeding because it cannot identify intraluminal lesions.

(Choice C) Abdominal CT scan is not regularly used to evaluate GI bleeding because endoscopy is superior to it. Abdominal CT scan with contrast can sometimes localize the source of bleeding of lower gastrointestinal hemorrhages.

(Choice B) Although a contrast study of the esophagus and the stomach can certainly show the presence of ulcerated lesions, it does not offer therapeutic advantages. This is why it is not recommended for a patient who needs immediate evaluation, such as those who are actively bleeding.

(Choice E) Radionuclide scanning is less specific than upper GI endoscopy. Its accuracy depends on the experience of the operator and the type of clinical center; values may be as low as 24% or as high as 91%.

Educational Objective:
Upper GI endoscopy is the preferred method to evaluate upper gastrointestinal bleeding because it also has therapeutic applications. The most common reason for bleeding in a patient with a history of previous gastric lesion is the development of a new ulcerated lesion or the recurrence of the previous one. These lesions are readily diagnosed and managed through endoscopy.

80% of people answered this question correctly;

An 84-year-old man is being treated for advanced pharyngeal cancer with radiation and chemotherapy. He complains of mouth ulcers, pain, and difficulty swallowing. His other medical problems include hypertension, osteoporosis, and Parkinson's disease. He had a stroke several years ago. His older son lives with him, and helps with his care. The patient weighs 132 pounds (60 kg), and his BMI is 22 kg/m ^{2} . His lab values are as follows:

Hemoglobin	9.4 g/dL
Ht	28%
MCV	80fl
Platelet count	250,000/cm ^{3}
Leukocyte count	5,000/cm ^{3}
Segmented neutrophils	74%
Lymphocytes	20%
Monocytes	6%
Serum Na	138 mEq/L
Serum K	4.0 mEq/L
Chloride	108 mEq/L
Bicarbonate	22 mEq/L
BUN	18 mg/dL
Serum Creatinine	0.8 mg/dL
Calcium	8.6 mg/dL
Blood Glucose	122 mg/dL

Gastrostomy tube is placed for enteral feeding. Which of the following is the most appropriate nutrition goal for this patient?

A. 15 kcal/kg per day with 1 g/kg per day of protein
B. 30 kcal/kg per day with 1 g/kg per day of protein
C. 45 kcal/kg per day with 1 g/kg per day of protein
D. 15 kcal/kg per day with 2 g/kg per day of protein

Explanation:

This patient's BMI is currently at an acceptable level and other than mild anemia there are no significant laboratory abnormalities at this time. However, this patient has a number of obstacles in maintaining adequate intake by mouth including his pharyngeal cancer, prior stroke, Parkinson's disease, and mucosal ulcers likely secondary to chemoradiation.

In general, if the gastrointestinal tract is able to function such as in this patient, then enteral feedings are preferred to parenteral feeds. Enteral feeds are more physiologic and in general have fewer complications. A gastrostomy tube can either be placed surgically or percutaneously by endoscopy or interventional radiology. The standard caloric intake recommended for enteral feeding is 30 kcal/kg/day, with a lower amount used for patients with severe preexisting malnutrition in order to prevent refeeding syndrome. A 1g/kg level of protein is appropriate for most patients.

(Choice A) A lower calorie enteral feed could be considered for patients with severe malnutrition in order to prevent refeeding syndrome.

(Choice C) Enteral feeds with calories above the standard 30kcal/kg/day are usually unnecessary.

(Choice D) A low calorie level with elevated protein could be considered for patients with malnutrition, but this patient's baseline nutrition is satisfactory.

Educational objective:
Enteral feeding is preferred to parenteral feedings for patients who have a functioning gastrointestinal system. The standard composition of 30 kcal/kg/day and 1 g/kg/day of protein is satisfactory for most patients with adequate baseline nutrition.

61% of people answered this question correctly;

A 76-year-old Caucasian male is admitted to the hospital with left-lower quadrant pain, anorexia, fever and diarrhea. He takes medication for hypertension, diabetes, hyperlipidemia, hypothyroidism, gout, coronary artery disease and peripheral vascular disease. He does not smoke, and drinks alcohol socially. His blood pressure is 140/80 mmHg, pulse is 102/min, temperature is 38.2C (100.7F) and respirations are 18/min. On physical examination, he is diaphoretic and talking coherently. His lungs are clear and his heart rate is irregular. Tenderness is present over the lower left quadrant. There is no rebound tenderness or rigidity. There is no hepatosplenomegaly. Fecal occult blood testing is positive. The laboratory examination shows the following:

CBC

Hb	13.0g/dL
Ht	36%
Leukocyte count	12,500/mm3
Neutrophils	66%
Bands	5%
Eosinophils	1%
Lymphocytes	22%
Monocytes	6%

Serum chemistry

Serum Na	140 mEq/L
Serum K	3.6 mEq/L
BUN	16 mg/dL
Serum creatinine	1.1 mg/dL
Blood glucose	198 mg/dL

His electrocardiogram shows occasional premature atrial contractions. He is given nothing by mouth, and started on intravenous fluids and antibiotics. After 48 hours, he is still febrile and complaining of pain and diarrhea. What is the most appropriate next step in the management of this patient?

A. Abdominal computed tomography

B. Abdominal ultrasound

C. Colonoscopy

D. Laparotomy

E. Single-contrast barium enema

Explanation:

This patient has a typical presentation of acute diverticulitis. In addition, he seems to have developed a diverticular abscess. Abdominal computed tomography (CT) is the imaging procedure of choice for the diagnosis of diverticulitis. Possible findings include colonic wall

thickening and stranding of mesenteric fat. CT is also ideal for the visualization of the diverticulae themselves, as well as complications of diverticulitis such as perforation, fistulas and abscesses. In this case, CT can confirm the diagnosis and identify the suspected complications. This information will determine the need for surgery or percutaneous CT-guided drainage. Patients with mild disease can be treated as outpatients with a combination of ciprofloxacin and metronidazole.

(Choice E) Contrast enema was the examination of choice before the advent of CT. It can detect diverticula, mucosal abnormalities, luminal strictures, deformity or displacement; however, it is less sensitive than CT (80% vs. 93%), and the use of double contrast carries the risk of diverticular rupture.

(Choice C) Colonoscopy is contraindicated in active diverticulitis because the required insufflation for distending the bowel walls can cause perforation.

(Choice B) Ultrasound can also detect several signs and complications of diverticular disease (e.g., thickened bowel, altered peristalsis, abscesses), but is less sensitive than CT (85% vs. 93%) because colonic gas tends to degrade ultrasound images.

Educational objective:
CT scan is the investigation of choice for diagnosing diverticulitis and identifying any complications such as abscess. Colonoscopy is contraindicated in acute diverticulitis.

75% of people answered this question correctly;

The following vignette applies to the next 2 items

A 35-year-old Caucasian man is seen in the emergency department for the evaluation of fever, weakness, generalized abdominal pain, and bloody stools. He denies any vomiting but his appetite has been poor. He was diagnosed with ulcerative colitis six months ago and he has been on and off sulfasalazine treatment. His flare-up started four days ago, and rapidly progressed to his having multiple bloody bowel movements and severe abdominal pain. He is a current smoker, but he has been trying to quit. He has not been taking any antibiotics recently and he denies recent travel. His temperature is 100 F (37.8 C), heart rate is 124/min, and blood pressure is 106/72 mmHg. His mucous membranes appear dry. Bowel sounds are hypoactive. There is generalized abdominal tenderness and distension without any rebound tenderness or guarding. The percussion note is tympanitic.

Item 1 of 2

Which of the following is the best initial step for managing this patient?

A. Abdominal ultrasound
B. Abdominal x-ray
C. Colonoscopy
D. Stool cultures, ova & parasites

Explanation:

This patient is clearly in the midst of a severe ulcerative colitis flare as evidenced by his multiple bloody bowel movements and severe abdominal pain, particularly given the history of only sporadic use of sulfasalazine. However, this patient has a somewhat toxic appearance, given his fever and tachycardia. The tympany to percussion elicited on physical exam may be secondary to bowel dilatation. This conglomeration of findings is concerning for possible toxic megacolon, and an abdominal x-ray should be performed to evaluate for colonic dilatation. Findings of peritonitis may be absent in toxic megacolon, so the lack of rebound tenderness or guarding on this patient's exam does not exclude the diagnosis. The transverse colon usually shows the most prominent dilatation among the colonic segments in cases of toxic megacolon, generally measuring at least 6 cm in diameter. Multiple air-fluid levels are commonly seen, along with loss of the normal haustral pattern and possibly mucosal ulcerations. Pneumoperitoneum may be present if the toxic megacolon has progressed to perforation. Patients with inflammatory bowel disease are most at risk of developing toxic megacolon early in the course of their disease, possibly even at initial presentation.

(Choice A) Abdominal x-rays typically demonstrate bowel abnormalities better than ultrasound. Furthermore, x-rays tend to be more readily available and less operator-dependent.

(Choice C) Full colonoscopy should be avoided in patients with toxic megacolon because there is a significant risk of perforation.

(Choice D) Toxic megacolon can occur secondary to amebiasis or bacterial infections such as shigella, salmonella, or campylobacter. However, the patient's underlying inflammatory bowel disease would be the most likely cause of toxic megacolon here, and the results of stool studies would not be available readily enough to affect his acute management anyway.

Educational objective:
Toxic megacolon should be suspected in patients who have a history of severe colitis, particularly secondary to inflammatory bowel disease, who develop toxic signs and have a distended, tympanitic abdomen. Abdominal plain films are helpful for making the diagnosis. CT scan is best utilized for early detection of complications.

79% of people answered this question correctly;

Item 2 of 2

Imaging studies show the presence of colonic dilatation with some air-fluid levels. There is no pneumoperitoneum. Initial evaluation shows:

WBC count	18,500/mm^3
Hemoglobin	9.6 g/dL
Platelet count	510,000/mm^3
Serum creatinine	0.9 mg/dL
Serum potassium	3.2 mg/dL

Stool studies are negative for *C. difficile* toxin. At this point, the patient is most likely to benefit from which of the following?

A. 5-aminosalicylic acid compound
B. Broad-spectrum antibiotics and opioids
C. Emergent surgery
D. Glucocorticoids
E. TNF-alpha receptor antagonists

Explanation:

This patient's elevated WBC count along with the presence of a dilated colon with air-fluid levels on x-ray confirms the diagnosis of toxic megacolon. Surgical consultation is recommended upon admission, though surgery can be avoided in up to 50% of patients with aggressive medical management. Therefore nonsurgical treatment is usually attempted first in the absence of perforation. The patient should have a nasogastric tube placed after being put on bowel rest, and should be admitted to the ICU for close monitoring. Any medications that could decrease peristalsis (e.g., anticholinergics, opiates) should be held. The best step at this point would be to start the patient on glucocorticoids to decrease the severity of the underlying inflammatory bowel disease. Note that management depends on the underlying cause of the toxic megacolon, and that glucocorticoids should be avoided in patients with toxic megacolon secondary to C. difficile or other infections. The patient should also receive aggressive fluid resuscitation as he is likely volume depleted given his tachycardia, and any electrolyte abnormalities should be corrected.

(Choice A) 5-aminosalicylic acid compounds, such as sulfasalazine, should not be used acutely in patients with inflammatory bowel disease complicated by toxic megacolon, as they can precipitate attacks. Sulfasalazine could be restarted at a later time after the patient's condition has improved with the glucocorticoids.

(Choice B) Broad-spectrum antibiotics are started in many patients with toxic megacolon given the concern that perforation could eventually develop. However, opioids should definitely be avoided since they decrease bowel motility and may worsen colonic dilatation.

(Choice C) Medical management should be the first-line treatment for patients with toxic megacolon unless perforation has already occurred. Surgery may be needed if the patient does not improve with medical therapies, although surgery should not be prolonged too much because the prognosis is worse if perforation has already occurred.

(Choice E) TNF-alpha receptor antagonists may play a role in the chronic management of patients with ulcerative colitis, but are not used in the acute management of toxic megacolon.

Educational objective:
The first-line treatment for toxic megacolon is medical management to lessen the degree of colitis, with glucocorticoids used for patients with underlying inflammatory bowel disease and appropriate antibiotics used for patients with infectious colitis. 5-ASA compounds and opioids should be avoided in patients with toxic megacolon.

41% of people answered this question correctly;

A healthy 22-year-old Asian man comes to your clinic because of mild, crampy, abdominal pain accompanied by abdominal distention, bloating, flatulence, and diarrhea. He has had these symptoms for the past six years, and has noted that the symptoms usually occur after eating or drinking dairy products. His brother has similar symptoms. He has no other medical problems, and is not taking any medications. He denies the use of tobacco, alcohol, or illicit drugs. He has no known drug allergies. Physical examination reveals no abnormalities. His vital signs are within normal limits. Abdominal x-ray and ultrasound did not reveal any abnormalities. Which of the following is the most appropriate dietary recommendation for the patient?

A. Skim milk
B. Chocolate milk
C. Ice cream
D. Yogurt with live activated cultures

Explanation:

The patient's history is very typical of lactose intolerance. Yogurt is a good alternative source of calcium for this patient, as studies have shown that the fermented milk and live cultures in yogurt contain beta-galactosidase, which is well tolerated in lactose-intolerant patients. It is necessary, however, to advise the patient to be careful when choosing commercially available yogurt products, since milk or milk products are sometimes added back after the fermentation process of these products.

(Choices A, B, and C) Milk and ice cream have high concentrations of lactose. Complete restriction of these and other lactose-containing products is necessary in order to confirm the diagnosis and rid the patient of his symptoms. Once the patient is symptom-free, the patient may be instructed to gradually add lactose-containing products to his diet as long as he is able to tolerate it. Ice cream has a high concentration of sugar and fat, and can be used initially in small quantities after a lactose-free interval.

Educational Objective:
Yogurt is a good alternative source of calcium for patients with lactose intolerance, as studies have shown that the fermented milk and live cultures in yogurt contain beta-galactosidase, which is well tolerated in these patients.

84% of people answered this question correctly;

The following vignette applies to the next 3 items

A 46-year-old man is brought by the police to the emergency department (ED). The police found him unresponsive on a bench in a nearby park. There is evidence of vomitus on his lips and clothes. His breath smells of alcohol. His temperature is 36C (97F), blood pressure is 106/75 mmHg, heart rate is 110/min, and respiratory rate is 12/min. He is extremely drowsy, disoriented, and unresponsive to questions. He has a disheveled appearance and cool extremities. Spider angiomas and palmar erythema can be identified on closer inspection. He has decreased breath sounds at the base of the right lung. The cardiovascular examination is within normal limits. His abdomen is distended with positive fluid shift. While in the ED, he has a large emesis with gross bright, red colored blood.

Item 1 of 3

Which of the following is the best next step in managing this patient?

A. Diagnostic paracentesis
B. Endotracheal intubation
C. Immediate upper GI endoscopy
D. Intravenous antibiotics and beta-blocker
E. Nasogastric tube placement and lavage

Explanation:

This patient clearly has signs and symptoms of chronic liver disease on physical exam, likely secondary to alcohol abuse. His large amount of hematemesis is consistent with an upper gastrointestinal bleed. Given his underlying chronic liver disease, this may be secondary to bleeding varices. A Mallory-Weiss tear would also be possible given his apparent recent vomiting. Appropriate stabilization of the patient should be the first step. This patient is at risk of airway compromise given his unresponsive state and large volume of active hematemesis, possibly leading to aspiration. Endotracheal intubation would therefore be the most important first step. The patient's breathing and circulation should then be assessed. Two large bore intravenous lines should be placed to institute aggressive fluid resuscitation. A blood type and cross should be sent if blood transfusion is deemed necessary. After the patient is appropriately stabilized, an immediate upper endoscopy would be appropriate since it is potentially both diagnostic and therapeutic.

(Choice A) Given this patient's altered mental status and ascites, a diagnostic paracentesis may need to be done to assess for possible spontaneous bacterial peritonitis. However, this is less important than initial stabilization/resuscitation and evaluation of his upper gastrointestinal hemorrhage.

(Choice C) Immediate upper GI endoscopy will likely be necessary given this patient's hematemesis, but this should occur after the patient is first stabilized and resuscitated.

(Choice D) Cirrhotic patients who have upper gastrointestinal bleeding frequently have a coexisting bacterial infection or develop one after admission, so prophylactic antibiotics preferably prior to endoscopy is recommended for these patients.

(Choice E) Nasogastric tube placement and lavage should be placed before endoscopy in order to clear the stomach contents. However, this should occur after the airway is secured.

Educational objective:
The ABCs mnemonic (Airway, Breathing, Circulation) designates the order of management in any patient who is unconscious, unresponsive, or presents with altered sensorium. Endotracheal intubation is indicated in unresponsive patients with a large amount of hematemesis due to aspiration risk, followed by assessment of breathing and circulation. Upper endoscopy should be performed early on since it may be both diagnostic and therapeutic.

47% of people answered this question correctly;

Item 2 of 3

The initial appropriate steps were taken for the patient. He is resuscitated with intravenous fluids and blood product transfusion. The upper GI endoscopy shows large esophageal varices with evidence of recent bleeding, which is treated with band ligation. On the second day of hospitalization, he becomes extremely disoriented and belligerent and he is treated for alcohol withdrawal. On his fourth day of hospitalization, he has another episode of large bloody emesis. His blood pressure is 102/67 and his heart rate is 112/min. His oxygen saturation is 95% on room air. The most recent hemoglobin level is 9.8 g/dL and creatinine is 0.7 mg/dL. His INR is 1.3. What is the most appropriate next step in the management of this patient?

A. Balloon tamponade
B. Intravenous octreotide and beta-blockers
C. Repeat upper GI endoscopy
D. Surgical shunt procedure
E. Transjugular intrahepatic portosystemic shunt (TIPS)

Explanation:

This patient developed rebleeding from varices following initial control. Careful monitoring for signs of alcohol withdrawal using a CIWA scoring system and subsequent management before the patient went into full alcohol withdrawal should have been performed as the extra physiologic stress of withdrawal may have helped to promote his rebleeding episode. The most appropriate step at this time would be repeat upper GI endoscopy with additional endoscopic treatment using either sclerotherapy or banding. If this second round of endoscopic treatment fails then portal shunting with either a surgical shunt or TIPS may be required.

(Choice A) Balloon tamponade has variable effectiveness, and generally is used only until more definitive treatment can be done since there is a high rebleeding rate once the balloon is deflated.

(Choice B) Intravenous octreotide could be considered at this point if it had not been previously started. However, octreotide by itself without endoscopic therapy is not highly effective. Non-selective beta blockers are used prophylactically to prevent recurrent variceal bleeding but should not be used in the acute setting as they can cause systemic hypotension.

(Choice D) A surgical shunting procedure may be necessary if repeat endoscopy does not control this patient's rebleeding.

(Choice E) TIPS placement would also be a consideration if the patient's rebleeding is not controlled by repeat endoscopy. TIPS may be more helpful than surgery in this situation because patients with severe liver dysfunction or other comorbid conditions may be at increased risk of mortality in surgical portal shunting procedures.

Educational objective:

In acute variceal bleeding an endoscopic intervention is the most effective therapy and should be reattempted in the event of recurrent bleeding. If a second attempt at banding fails, surgical shunting or a transjugular intrahepatic portosystemic shunt (TIPS) procedure should be considered.

56% of people answered this question correctly;

Item 3 of 3

The patient has a prolonged a hospital course complicated by nosocomial pneumonia, *C difficile* colitis, and deconditioning. He underwent repeat band ligation of the esophageal varices. In addition to providing counseling to completely stop alcohol consumption, which of the following is the treatment of choice to reduce recurrent bleeding?

A. ACE inhibitor
B. Hydralazine and nitrates
C. Muscarinic antagonist
D. Nonselective beta-blocker
E. Proton pump inhibitor

Explanation:

Medical treatment can be helpful in reducing the risk of rebleeding in patients with esophageal varices secondary to portal hypertension. This treatment is considered primary prevention if the patient has not previously had a bleeding episode but has known esophageal varices, whereas treatment for those with multiple bleeding episodes would be classified as secondary prevention. The first line preventative agents are the nonselective beta-blockers, such as propranolol or nadolol, which help to reduce pressure in the portal venous system. The combination of beta-blockers with repeat surveillance endoscopy and band ligation as necessary results in an even lower mortality than either treatment alone. Several smaller studies have also suggested that the addition of oral nitrate to beta-blocker therapy may result in a further reduction in rebleeding, although this has yet to be validated in larger trials.

(Choice A) ACE inhibitors are used to control systemic hypertension but are not effective in reducing portal pressure and thereby do not reduce the risk of variceal hemorrhage.

(Choice B) A hydralazine and nitrate combination is used in patients with congestive heart failure, although oral nitrate medications by themselves may have a role in the prevention of variceal hemorrhage.

(Choice C) Muscarinic antagonists do not have a role in the prevention of variceal hemorrhage.

(Choice E) Proton pump inhibitors would be used to prevent repeat upper gastrointestinal hemorrhage from peptic ulcer disease, but do not have a significant effect on esophageal varices.

Educational objective:
Nonselective beta-blockers such as nadolol and propranolol can be used in primary and secondary prevention of esophageal variceal hemorrhage, particularly in combination with endoscopic surveillance and band ligation. Oral nitrate medications may also be used as a part of the medication regimen for variceal bleeding prevention.

73% of people answered this question correctly;

The following vignette applies to the next 3 items

A 65-year-old male is brought to the emergency department by his wife because of severe upper abdominal pain. The pain began suddenly four hours ago while he and his wife were watching their favorite television show. The pain radiates to the back and is exacerbated by any movement. He has had gastroesophageal reflux disease (GERD) for many years and has been on various antacids, H-2 blockers, and most recently proton pump inhibitors for symptom control. He also has hypertension controlled with a thiazide diuretic. He walks five miles daily. His diet consists of large amounts of milk and other dairy products, as they help relieve "burning" symptoms in his stomach. In the emergency department, his temperature is 37.8 C (100 F), blood pressure is 110/62 mm Hg, pulse is 110/min, and respirations are 22/min. He is lying flat and motionless on the bed. His mucous membranes are dry. Abdominal examination shows marked tenderness on superficial palpation. He does not allow any further palpation of the abdomen.

Item 1 of 3

Which of the following is the best initial test for this patient?

A. Abdominal ultrasound
B. Upright chest x-ray
C. EKG and cardiac enzymes
D. Serum lipase and lactic acid levels
E. Upper GI endoscopy

Explanation:

This patient's presentation of sudden abdominal pain is highly concerning for a bowel perforation with peritonitis. A perforated peptic ulcer is the most common type of perforated bowel and is especially likely in this patient, who presents with epigastric pain in the setting of a history of GERD and prior "burning" sensations in his abdomen. Patients with peritonitis tend to lie flat and motionless to limit irritation of the peritoneum, in contrast to patients with renal colic who tend to writhe in pain. This patient's marked tenderness with guarding also supports a diagnosis of peritonitis. A rupture of the bowel allows air into the abdomen (pneumoperitoneum), and this air can often be detected on an upright chest x-ray. It is important that the patient be in an upright position so that the any air within the peritoneal cavity can be visualized beneath the diaphragm; identification of pneumoperitoneum in a supine patient can be much more difficult. Given this patient's presentation, the presence of pneumoperitoneum on the chest x-ray would likely be enough to take the patient to the operating room emergently. If the findings of the chest x-ray are unclear, a CT scan of the abdomen may be of use.

(Choice A) Abdominal ultrasound should be considered in evaluation of the acute abdomen when there is concern for gallbladder disease or a ruptured abdominal aortic aneurysm,

neither of which are likely in this patient. A ruptured abdominal aortic aneurysm commonly presents with profound hypotension. While gallbladder disease can cause epigastric pain, it is less likely than a perforated ulcer given this patient's presenting symptoms and history.

(Choice C) Myocardial infarction can present in some patients with pain in the epigastric region, but this patient's physical exam findings are more consistent with peritonitis.

(Choice D) Both of these tests may be indicated as further workup, but a chest x-ray should be completed first, because it may prompt emergent surgical intervention.

(Choice E) Upper GI endoscopy is used in the evaluation of gastritis and peptic ulcer disease, but once perforation has occurred surgical intervention is necessary.

Educational objective:
Peritonitis from viscus perforation should be suspected in patients with sudden onset of abdominal pain with extreme sensitivity to abdominal palpation. Patients with peritonitis tend to lie still in order to minimize irritation of the peritoneum. An upright chest x-ray is reasonably sensitive for detecting pneumoperitoneum and can be helpful in confirming a need for emergent surgical intervention.

59% of people answered this question correctly;

Item 2 of 3

Which of the following is the most appropriate management for this patient?

A. Admit the patient and perform an urgent endoscopy
B. Admit the patient and start him on intravenous fluids
C. Emergent laparotomy
D. Admit the patient and start him on intravenous antibiotics
E. Observe the patient in the emergency room for 24 hours

Explanation:

Peptic ulcer perforation is a potentially fatal complication of peptic ulcer disease. If left untreated, the patient can have a rapid clinical deterioration leading to death within 12-24 hours. On the other hand, with early diagnosis and treatment, the prognosis is generally excellent, with most patients going on to have a full recovery. Emergent exploratory laparotomy with either a simple patch closure or surgical repair of the leak is indicated in all patients with perforated peptic ulcer. This is especially important in elderly patients and patients with large leaks, as they are unlikely to respond to initial conservative therapy.

(Choices B and D) Conservative management with intravenous fluids, nasogastric suction and antibiotics are useful adjunctive therapy for patients who are awaiting surgery; however, most patients should undergo emergent laparotomy with surgical repair of the perforated gut.

(Choice E) Observation in the ED alone is not enough, and the resulting delay can be potentially fatal.

Educational Objective:
Patients with suspected or confirmed peptic ulcer perforation should have emergent exploratory laparotomy with surgical repair of the perforation.

79% of people answered this question correctly;

Item 3 of 3

The appropriate step is taken for the patient, and he recovers well. Three years later, he comes to the emergency department with a one-day history of nausea, vomiting, upper abdominal pain and distension. An abdominal radiograph reveals the presence of multiple air fluid levels in the small intestine consistent with intestinal obstruction. Which of the following is the most likely mechanism of his intestinal obstruction?

A. Intestinal fibrosis due to ulcer healing
B. Adhesion formation in the peritoneal cavity
C. Extension of the ulcer into the intestine
D. Intestinal narrowing due to stricture formation
E. Ogilvie's syndrome

Explanation:

The patient in the vignette is presenting with signs and symptoms of small bowel obstruction. A complete obstruction of the intestinal lumen leads to dilatation of the stomach and small intestine proximal to the obstruction, thereby causing abdominal distension, nausea, vomiting and intermittent abdominal pain. Postoperative adhesion formation is the most common cause of small bowel obstruction in patients with a history of prior abdominal or pelvic surgery. Some of the less common causes include hernia, neoplasm, volvulus, intussusception, and stricture formation in patients with inflammatory bowel disease.

(Choices A and D) Intestinal fibrosis or strictures can occur with ulcer healing; however, postoperative adhesions are still the most common cause of intestinal obstruction in such patients.

(Choice C) Ulcer penetration generally does not lead to intestinal obstruction.

(Choice E) Ogilvie's syndrome (also known as acute colonic pseudoobstruction) is characterized by the dilation of the cecum and right colon in the absence of a mechanical obstruction to the flow of intestinal contents. It tends to involve the right side of the colon, and not the small intestine.

Educational Objective:
Postoperative adhesions are the most common cause of small intestinal obstruction in patients with a history of abdominal surgery.

87% of people answered this question correctly;

A 53-year-old Caucasian man comes to the emergency department because of a sudden onset of nausea, vomiting, and severe epigastric abdominal pain radiating to the back. He denies constipation, diarrhea and black stools. His other medical problems include hypertension, hypercholesterolemia and gastroesophageal reflux disease. He denies the use of tobacco, alcohol, or illicit drugs. His temperature is 37.8C(100F), blood pressure is 130/80mm Hg, pulse is 118/min and respirations are 20/min. The patient's labs reveal:

Hb	13.5g/dL
Platelet count	180,000/cmm
Leukocyte count	12,500/cmm
Segmented neutrophils	79%
Bands	1%
Lymphocytes	20%
Alkaline phosphatase	150 U/L
Amylase	355 U/L
Lipase	523 U/L (N=1-160)

Which of the following is the most likely cause of his symptoms?

A. Metoprolol
B. Thiazide
C. Prazosin
D. Ramipril
E. Amlodipine

Explanation:

Drug- induced pancreatitis accounts for 5% of cases of pancreatitis. Most cases of drug-induced pancreatitis are mild. The common conditions which involve the use of drugs (important for USMLE) that can cause pancreatitis are:

1. Patient on diuretics -- furosemide, thiazides
2. Patient with inflammatory bowel disease -- sulfasalazine, 5-ASA
3. Patient on immunosuppressive agents -- azathioprine, L-asparaginase
4. Patient with history of seizures or bipolar disorder -- valproic acid
5. AIDS patient -- think about didanosine, pentamidine
6. Patient on antibiotics -- metronidazole, tetracycline

Educational Objective:
Furosemide and thiazide diuretics can cause acute pancreatitis.

61% of people answered this question correctly;

A 55-year-old African-American man is brought to the emergency department because of an episode of hematemesis. He has a history of alcoholic cirrhosis with ascites for the last two years. In the emergency room, he is appropriately treated, and has no new episodes of bleeding. He is admitted to the hospital for observation and further work-up. His upper GI endoscopy reveals the presence of esophageal varices with stigmata of recent bleeding. Which of the following is the most likely complication that he is at risk of developing during his hospitalization?

A. Spontaneous bacterial peritonitis
B. Renal failure
C. Congestive heart failure
D. Disseminated intravascular coagulopathy
E. Hemolytic uremic syndrome

Explanation:

Patients who are admitted to the hospital because of recent variceal bleeding are at an increased risk of developing complications during their hospitalization. The principal complications in these patients that lead to increased mortality are: infections, hepatic encephalopathy, and renal failure. The most common complication is the development of an infection, which usually occurs as a urinary tract infection, **spontaneous bacterial peritonitis**, respiratory infection, aspiration pneumonia or primary bacteremia. A large number of trials have evaluated the efficacy of prophylactic antibiotics in cirrhotic patients that were hospitalized for variceal bleeding. All these trials have suggested a decreased incidence of infectious complications with the use of prophylactic antibiotics. The optimal choice of antibiotics and the duration of therapy remain unclear. The currently preferred regimen is the use of a fluoroquinolone (ofloxacin, norfloxacin, or ciprofloxacin) agent for 7-10 days.

(Choice B) The development of renal failure in these patients can have multiple etiologies, such as acute tubular necrosis (ischemic or toxic) or precipitation of hepatorenal syndrome; however, this complication is not as common as the development of an infection.

(Choice C) Congestive heart failure is uncommonly seen in these patients.

(Choice D) Disseminated intravascular coagulopathy occurs rarely in patients with acute variceal hemorrhage, and is usually seen in the presence of underlying infections.

(Choice E) Hepatorenal syndrome is a complication of cirrhosis and a variceal bleed. **Hemolytic uremic syndrome** (HUS) is associated with Shiga toxin-producing *Escherichia coli* (E. coli O157:H7), and is not associated with cirrhosis.

Educational Objective:
Bacterial infections can develop in up to 50% of patients who are hospitalized for acute variceal bleeding; therefore, these patients should be treated prophylactically with antibiotics. The preferred regimen involves the use of a fluoroquinolone (ofloxacin, norfloxacin, or

ciprofloxacin) agent for 7-10 days.

65% of people answered this question correctly;

A 19-year-old African American female comes to the office for a routine physical examination. She requests medications for the acne on her face. She has tried several topical agents as well as oral antibiotics in the past without success. She is sexually active with her boyfriend, and she uses contraceptive pills and condoms regularly. Her blood pressure is 132/85 mmHg and her heart rate is 78/min. Her BMI is 35 kg/m ^{2} . Physical examination shows several open and closed comedones as well as inflammatory papules and nodules on the face, neck, and back. She is prescribed isotretinoin and given the necessary instructions for its use. Two weeks later, she shows up in the emergency department with severe abdominal pain and vomiting. The pain radiates to her back. Physical examination reveals epigastric tenderness and voluntary guarding. Which of the following is the most likely cause of this patient's current problem?

A. Hypercalcemia
B. Hypercoagulable state
C. Hyperglycemia
D. Hyperlipidemia
E. Viral infection

Explanation:

Isotretinoin is an acne medication that is typically reserved for severe, nodular acne which has been resistant to prior treatments including topical agents and oral antibiotics. One of the principal concerns with isotretinoin is its teratogenic potential for a developing fetus, so assurance of appropriate birth control methods is required for sexually active female patients. Hypertriglyceridemia can occur in up to 45% of patients taking the medication. Given this patient's severe epigastric abdominal pain that radiates to the back, the most likely diagnosis is acute pancreatitis secondary to hypertriglyceridemia. This could be confirmed with serum lipase and/or amylase measurement. Patients are at risk for acute pancreatitis when their triglyceride levels exceed 500 mg/dL, and particularly when patients have levels over 1000 mg/dL. Total cholesterol and LDL levels may also become elevated in patients taking isotretinoin. Additional possible side effects of isotretinoin include mucocutaneous lesions, myalgias, hyperostosis, pseudotumor cerebri, night vision abnormalities, bone marrow suppression, and hepatotoxicity.

(Choice A) Hypercalcemia can be a cause of acute pancreatitis. However, hypercalcemia is not a known side effect of isotretinoin and there is nothing else in this patient's presentation to suggest an alternative cause of hypercalcemia.

(Choice B) Hypercoagulable states resulting in pancreatic ischemia are a rare cause of acute pancreatitis, and would be much less likely than isotretinoin-induced hypertriglyceridemia.

(Choice C) Hyperglycemia is not generally associated with acute pancreatitis or any other cause of acute epigastric pain.

(Choice E) Viruses can cause acute pancreatitis, but isotretinoin is not an immunosuppressant and would not predispose this patient to a viral infection.

Educational objective:
Isotretinoin is only used for the treatment of severe acne that has been resistant to other therapies given its side effect profile. The medication is very teratogenic so appropriate birth control methods should be assured in sexually active female patients. Severe hypertriglyceridemia is another potential complication, and can result in acute pancreatitis.

65% of people answered this question correctly;

An 80-year-old white male with a history of hypertension, hypercholesterolemia, coronary artery disease, and coronary artery bypass graft comes to the emergency department because of a two-day history of abdominal pain and bloody diarrhea. The patient describes the pain as severe and predominantly at the left upper quadrant. The diarrhea started a few hours after developing the abdominal pain. His blood pressure is 130/80 mmHg, pulse rate is 98/minute, temperature is 37.2C (98F), and respirations are 16/min. His initial labs showed slightly elevated amylase levels. Nasogastric tube aspiration showed a clear aspirate. An upright abdominal x-ray showed no free air, but edematous and dilated transverse colon was seen. Sigmoidoscopy showed mucosal edema, but no other lesions. Based on the above presentation, which of the following is the most likely diagnosis?

A. Acute pancreatitis
B. Acute ischemic colitis
C. Acute diverticulitis
D. Pseudomembranous colitis
E. Gastric ulcer

Explanation:

This patient has all the risk factors for acute ischemic colitis. He has hypertension, hypercholesterolemia, and coronary artery disease suggestive of atherosclerotic disease. Acute ischemic colitis typically presents with abdominal pain followed by bloody diarrhea. The most vulnerable areas are watershed areas, which include the splenic flexure and rectosigmoid junction. Patients usually have an elevated white count. X-rays and sigmoidoscopies usually show mucosal edema and mucosal ulcerations.

(Choice A) Acute pancreatitis is very unlikely to cause bloody diarrhea. Amylase can be elevated in various conditions, which could cause damage to the bowel wall.

(Choice C) Acute diverticulitis usually presents with left lower quadrant abdominal pain, fever, and an elevated white count. Evidence of diverticula is almost always found on sigmoidoscopy.

(Choice D) Pseudomembranous colitis is usually seen in elderly patients who reside in nursing homes and other long-term care facilities. Patients usually present with abdominal pain, fever, and non-bloody diarrhea. They can have an elevated white count. Stool *Clostridium difficile* toxin assay is positive. Prior history of antibiotic use is also present in majority of the patients.

(Choice E) In 10-15% of the patients, upper GI bleeding can present with severe bloody diarrhea; however, most of the times, nasogastric tube aspiration will reveal either blood or coffee-ground aspirate.

Educational Objective:
Acute ischemic colitis is seen in patients who have evidence of atherosclerotic disease, and

is usually manifested by acute abdominal pain followed by bloody diarrhea. Acute pancreatitis does not usually cause bloody diarrhea.

81% of people answered this question correctly;

A 47-year-old woman is brought to the emergency department because of abdominal pain and weakness. The pain began eight hours ago, and it is associated with nausea and vomiting. Three hours ago, she experienced chills and subjective fever. Her only medical problems are dyspepsia and osteoarthritis. She underwent laparoscopic cholecystectomy for symptomatic gallstones four weeks ago and she had no complications. She does not use tobacco, alcohol, or illicit drugs. She is currently not taking any prescription medications but she uses some herbal supplements and over-the-counter pain killers. She has no known drug allergies. On the way to the hospital she received 2L of normal saline. Her temperature is 102F (39C), blood pressure is 79/54 mmHg, heart rate is 126/min, and respirations are 16/min. Her BMI is 32 kg/m2. On examination, there is icteric skin and sclera. Her mucous membranes appear dry. The heart and lungs are clear on auscultation. There is right upper quadrant and epigastric tenderness without rebound tenderness. She is mildly somnolent but otherwise her neurologic examination is unremarkable. Her laboratory values are as follows:

WBC count	16,000/mm ^{3}
Total bilirubin	6.2 mg/dL
ALT	121 U/L
Alkaline phosphatase	652 U/L
INR	1.4

A bedside abdominal ultrasound reveals bile duct dilatation. The patient is started on intravenous fluids and antibiotics. What is the most appropriate next step in the management of this patient?

A. Biliary drainage
B. Exploratory laparotomy
C. Lactulose and protein restriction
D. Pancreatic imaging
E. Work-up for viral or drug-induced hepatitis

Explanation:

This patient's laboratory values of an elevated bilirubin and alkaline phosphatase are strongly suggestive of biliary obstruction. Biliary injury is an occasional complication of laparoscopic cholecystectomy and can present with either biliary leak or biliary occlusion. Given the dilated bile ducts on the ultrasound without mention of fluid collections this is likely a case of biliary occlusion. Patients with biliary occlusion may be asymptomatic for years until the development of ascending cholangitis.

This patient's fever, jaundice, and right upper quadrant pain is also known as Charcot's triad and is strongly suggestive of the development of ascending cholangitis secondary to biliary occlusion. The additional presence of hypotension and confusion is known as Reynold's pentad and is associated with suppurative cholangitis which has a poorer prognosis.

Antibiotic therapy and fluid resuscitation should be started. Many patients will be adequately

treated with conservative antibiotic management. However patients with persistent abdominal pain, hypotension despite aggressive fluid resuscitation, fever greater than 39C, or mental confusion should be treated with biliary drainage. Biliary drainage can usually be performed nonsurgically via endoscopic or percutaneous means.

(Choice B) Most biliary injuries can be controlled with either endoscopic or percutaneous means, although surgery may be necessary in patients who fail minimally invasive measures.

(Choice C) Lactulose and protein restriction is the treatment for hepatic encephalopathy, but this patient's laboratory values and clinical history are more consistent with biliary obstruction.

(Choice D) Pancreatic imaging could be considered for patients with jaundice and biliary obstruction to exclude an underlying pancreatic mass, but this patient's prior surgical history makes a biliary injury much more likely. Even if he has underlying pancreatic mass resulting in acute cholangitis he would need biliary drainage with stenting emergently and simultaneous biopsy of the mass.

(Choice E) This patient's minimal ALT elevation is likely secondary to biliary obstruction and not underlying hepatitis.

Educational objective:
Charcot's triad of fever, right upper quadrant, pain, and jaundice is strongly suggestive of ascending cholangitis. Persistent abdominal pain, hypotension despite aggressive fluid resuscitation, fever greater than 39C, and mental confusion are all indications for urgent biliary drainage in patients with ascending cholangitis. Biliary injuries from laparoscopic cholecystectomy can present with either biliary leak or obstruction.

66% of people answered this question correctly;

A 64-year-old Caucasian man comes to the emergency department (ED) because of bleeding per the rectum. He has had this symptom for the past hour. He does not use tobacco, alcohol, or drugs. His family history is not significant. His temperature is 37.2 C (99 F), blood pressure is 120/70 mmHg, pulse is 84/min, and respirations are 14/min. His bleeding stops after coming to the ED, where he is given intravenous fluids. He was scheduled for a colonoscopy the next day. The colonoscopy revealed diverticulosis. Which of the following is the most likely cause of bleeding in this patient?

A. Infection of diverticulum
B. Venous bleeding
C. Erosion of the artery
D. Rupture of diverticulum

Explanation:

Erosion of the artery is the most common source of diverticular bleeding. The erosion is caused by a fecalith in the diverticular sac. Vasa recta in the diverticulum are separated from the lumen only by mucosa, and are exposed to luminal trauma. This results to weakness of the artery, which predisposes it to rupture by fecaliths.

(Choice B) Venous bleeding occurs with hemorrhoids; it is not a source of diverticular bleeding.

(Choice A) Diverticulitis is rarely associated with diverticular bleeding.

(Choice D) Rupture of diverticulum is not the most common cause of diverticular bleeding.

Educational Objective:
Erosion of the artery is the most common source of diverticular bleeding.

42% of people answered this question correctly;

A 42-year-old chronic alcoholic female comes to the emergency department with three hours of severe abdominal pain. Her past medical history is significant for alcoholic pancreatitis and alcohol-related seizures. She smokes one pack of cigarettes per day and uses crack cocaine occasionally. Her blood pressure is 92/53 mmHg and her heart rate is 112/min, regular. Her oxygen saturation is 94% on room air. On examination, she is in distress due to pain and has mild epigastric tenderness. Her laboratory test results reveal the following:

Total bilirubin	1.0 mg/dL
AST	45 IU/L
ALT	40 IU/L
Serum lipase	1,500 U/L

Abdominal ultrasound shows no gallstones or pericholecystic fluid collection. The pancreas is not well visualized. Which of the following is the best prognostic indicator for the severity of this patient's disease?

A. Area under the curve (AUC) for lipase elevation
B. APACHE score
C. CT scan of the abdomen on admission
D. Pain severity index
E. Ranson's criteria

Explanation:

The severity of acute pancreatitis can vary widely. Therefore it is helpful to have an accurate predictor of pancreatitis severity for purposes of patient triage and aggressiveness of intervention. Ranson's criteria, one of the earliest systems for determining pancreatitis severity, include 11 variables. However, 6 of these are determined 48 hours after admission. In contrast, the APACHE II scoring system is able to make predictions based on data available at the time of admission. This score incorporates 12 reproducible parameters. Originally created for critically ill patients in ICUs, the APACHE II scoring system has been studied extensively with regards to acute pancreatitis and has been found to have good negative predictive value and a modest positive predictive value. While it has the benefit of being able to be performed at the time of admission, it also lends itself to recalculations throughout admission. Increasing APACHE II scores are seen with severe illness and decreasing scores with mild illness.

(Choice A) While lipase is used in confirming a diagnosis of acute pancreatitis, its degree of elevation has not been shown to correlate with severity or prognosis.

(Choice C) A CT scan on admission should only be considered if there is a question as to the diagnosis. Many patients who eventually develop severe pancreatitis may have near normal CT scans at admission. CT scan is also helpful to indentify the amount of pancreatic necrosis and the need for prophylactic antibiotics.

(Choice D) The severity of the patient's pain does not correlate with prognosis.

(Choice E) Ranson's criteria comprise the oldest scoring system for pancreatitis severity. However, the predictive value is low, and the score can only be calculated after the patient has been hospitalized for 48 hours.

Educational objective:
The APACHE II score is the scoring system of choice to predict the severity of acute pancreatitis given its good predictive values and ability to be calculated at admission. While Ranson's criteria are the oldest scoring system, the predictive value is lower and the score can only be calculated after the patient has been hospitalized for 48 hours.

43% of people answered this question correctly;

A 66-year-old male comes to the emergency department because of bright red blood per rectum. He says he feels weak and dizzy. The bleeding started this morning and was painless. He denies the use of any medications, trauma, or recent surgery. The physical exam is unremarkable, except for an ejection systolic murmur radiating to the carotids in the second right intercostal space. His blood work reveals a hemoglobin level of 9.7 g/dL. His hemoglobin level three months ago was 13 g/dL. What is the most likely diagnosis?

A. Colon cancer
B. Diverticulitis
C. Ulcerative colitis
D. Angiodysplasia
E. Hemorrhoids

Explanation:

Massive colonic bleeding classically has been attributed to diverticulosis, but recent evidence suggests that angiodysplasia, also known as vascular ectasia, is also common. These two entities frequently coexist, and exact identification of the bleeding source may require a combination of endoscopic and radiographic methods. Before the advent of angiography, angiodysplasia was not recognized as a source of colonic bleeding. The cause of angiodysplasia is not known, but may be related to degenerative changes associated with aging and to intramuscular hypertrophy that obstructs submucosal veins. There has been an association between aortic stenosis and angiodysplasia. Another condition associated with angioectasia of the GI tract is end-stage renal disease (ESRD).

(Choice B) Diverticulosis is also a common cause of massive colonic bleeding, and this has been attributed to ruptured vasa recta either at the apex or neck of a diverticulum. The bleeding is generally painless and can be massive. Diagnosis can be made by colonoscopy. However, diverticulitis is an inflammatory condition of the left colon and is usually seen in the elderly. It usually presents with a fever, abdominal pain, and mild bleeding. Diverticulitis can also cause bleeding as a result of superficial mucosal ulcerations, but usually the bleeding is mild. The condition is diagnosed with a CT scan and is readily treated with antibiotics. A change to a diet rich in fiber is recommended to prevent recurrences. A colonoscopy is contraindicated in the acute condition.

(Choice A) Cancer of the colon usually causes occult rather than massive gastrointestinal bleeding. Colon cancers of both the right and left side can cause a trace amount of bleeding and are often present with anemia. The bleeding is generally painless. A guaiac stool test may be the first indication of an underlying colon cancer.

(Choice C) Ulcerative colitis is an inflammatory bowel disorder which can present with lower gastrointestinal bleeding. The bloody diarrhea may be associated with mucus and mild abdominal cramping. The diagnosis is made by endoscopy and barium enema. Surgery is the definitive treatment for ulcerative colitis. Complications of untreated ulcerative colitis include

toxic megacolon, colonic perforation, and cancer.

(Choice E) Hemorrhoids can cause mild bleeding per rectum. In the elderly population who present with a lower gastrointestinal bleed, even if hemorrhoids are present, colon cancer must be ruled out. Hemorrhoids may be visible externally and may present with painless or painful rectal bleeding.

Educational Objective:
The most common cause of massive lower gastrointestinal bleeding in elderly patients is angiodysplasia or diverticulosis. Remember the association of angiodysplasia with aortic stenosis and ESRD.

58% of people answered this question correctly;

The following vignette applies to the next 2 items

A 54-year-old Caucasian man is brought to the emergency department. He complains of chest pain, nausea, vomiting and fever. His symptoms began eight hours ago, and are progressively getting worse. He was drinking alcohol with a group of friends, when he developed persistent nausea and repeated vomiting. As the nausea and vomiting ceased, he began to feel better. He was able to eat meals despite moderately severe chest pain, which he attributed to the vomiting. His chest pain then increased in severity, and the pain radiated to his right shoulder. His chest pain is aggravated by deep inspiration. He developed fever in the last couple of hours. He has no other medical problems. He drinks 3-4 bottles of beer daily. His father had a myocardial infarction at age 50. He takes no medications. His blood pressure is 140/90 mm Hg, heart rate is 118 beats/min, respiratory rate is 22/min, and temperature is 39.2 C (102.5F). On examination, he is alert and awake, but appears mildly dehydrated. Breath sounds are decreased in the left hemithorax, with dullness on percussion of the lower third region. The abdomen is mildly distended and tender, especially in the epigastrium. There is no rebound tenderness. Bowel sounds are present. There are no neurological abnormalities. Chest x-ray reveals a left pleural effusion and a small radiolucent band at the left side of the cardiac silhouette.

Item 1 of 2

Which of the following is the most likely diagnosis?

A. Acute myocardial infarction
B. Esophageal perforation with mediastinitis
C. Acute bacterial pneumonia
D. Acute cholecystitis
E. Acute pancreatitis

Explanation:

This patient's presentation of chest pain after repeated episodes of vomiting is classic for esophageal perforation (Boerhaave's syndrome), complicated with acute mediastinitis. Other associated symptoms are dyspnea, epigastric pain or shoulder pain. Most esophageal tears occur in the distal third of the esophagus, and this leads to pleural effusion. In seventy-five percent of the cases, pleural effusion will develop six hours after perforation. The effusion is located on the left side in 66% of the cases, and can be accompanied by pneumomediastinum, pneumothorax or both. The radiologic finding of a radiolucent band adjacent to the cardiac border is typical of pneumomediastinum.

It takes a mean of more than four hours for fever to develop due to mediastinitis. Urgent management is needed since mediastinitis carries a mortality rate of more than 40% if not properly diagnosed within the first 24 hours.

(Choice D) Patients with acute cholecystitis may also present with shoulder pain and fever;

however, the presence of pneumomediastinum, pleural effusion and chest pain make this diagnosis unlikely.

(Choice E) Acute pancreatitis can be accompanied by left pleural effusion, vomiting, tachycardia and fever; however, the presence of normal bowel sounds and pneumomediastinum makes this an unlikely diagnosis.

(Choice C) The history of previous alcohol intake, subsequent repeated vomiting, fever, and the radiologic finding (left pleural effusion) raises the concern about the possibility of aspiration pneumonia; however, the absence of infiltrates in the chest x-ray makes this diagnosis unlikely. Pleural effusions always follow the development of the radiologic infiltrates.

(Choice A) Myocardial infarction or ischemia is the main differential diagnosis of any episode of chest pain; however, the history of multiple episodes of vomiting prior to the chest pain, as well as the radiologic findings of left pleural effusion and pneumomediastinum, makes this possibility unlikely.

Educational Objective:
Esophageal perforation, also known as Boerhaave's syndrome, usually presents as acute chest pain following episodes of repeated vomiting. Most tears occur in the distal third of the esophagus, which leads to pleural effusion. Pneumomediastinum and pneumothorax can be part of the presentation. Urgent management is needed because of the risk of mediastinitis, which carries a mortality rate of more than 40% if not properly diagnosed within the first 24 hours.

78% of people answered this question correctly;

Item 2 of 2

The patient's fever persists. He looks more dyspneic. His blood pressure is 140/80 mmHg, heart rate is 124/min, respiratory rate is 24/min, and temperature is 39.4 C (102.9F). He is started on intravenous fluids. Urine and blood culture results are pending. His other laboratory tests reveal:

CBC

Hb	11.4 g/dL
Ht	34%
Platelet count	450,000/cmm
Leukocyte count	15,000/cmm
Segmented neutrophils	80%
Bands	3%
Lymphocytes	17%

Serum chemistry

Serum Na	139 mEq/L
Serum K	3.4 mEq/L
Chloride	96 mEq/L
Bicarbonate	32 mEq/L
BUN	34 mg/dL
Serum creatinine	1.2 mg/dL
Calcium	10 mg/dL
Blood Glucose	84 mg/dL

Which of the following is the most appropriate test to confirm the diagnosis?

A. Upper GI endoscopy
B. Cardiac enzymes
C. Esophagogram
D. Amylase and lipase
E. CT scan of the chest and abdomen

Explanation:

The best diagnostic test for esophageal perforation is an esophagogram with water-soluble contrast. This test provides a definite diagnosis in 90% of the cases. If the test is negative but the clinical suspicion is high, barium contrast can be used. Water-soluble contrast is preferred to barium because the latter can produce further mediastinal irritation and injury.

(Choice A) Upper GI endoscopy has no role and should not be used in the evaluation of patients with spontaneous esophagal perforation. Both the endoscope and insufflation of air can cause extension of perforation and worsen the mediastinitis.

(Choices B and D) As previously discussed, the possibilities of this patient having pancreatitis and myocardial infarction are low.

(Choice E) An abdominal CT scan will only allow visualization of the esophagogastric junction, as well as part of the pleural effusion. A chest CT scan may provide a better visualization of the mediastinal compromise; however, it may fail to detect small tears or ruptures of the esophagus, and is therefore not the best diagnostic modality.

Educational Objective:
The best diagnostic test for esophageal perforation is an esophagogram with water-soluble contrast. This test provides a definite diagnosis in 90% of the cases. CT scan of the chest is helpful, but may not detect small tears or ruptures. Upper GI endoscopy has no role and should not be used.

40% of people answered this question correctly;