SPEX Practice Test

1. A 57-year-old man goes to see his physician because of intermittent chest pain. It sometimes occurs with effort, and sometimes at rest, and usually lasts 5 to 10 minutes. It is midsternal with some radiation to the throat. He has a history of high blood pressure. He discontinued smoking at about age 50. His only medication is amlodipine 10 mg daily. He has a family history of hypertension and diabetes type 2. He denies other significant medical problems. On examination his blood pressure is 135/85, pulse 76 and regular, height 70 inches and weight 210 lb. His chest is clear and no cardiac murmurs or rubs are heard. The balance of the examination is negative. His electrocardiogram (ECG) is normal.

What is the next logical procedure most likely to provide a diagnosis?

a. Lipid profile
b. Hemoglobin A_{1c}
c. Technetium Tc-99m sestamibi stress test
d. Coronary angiography
e. Esophagogastroduodenoscopy (EGD)

2. Two days later the above patient awakens with severe, persistent chest pain. There is mild diaphoresis but no nausea or vomiting. He is given 2 chewable aspirin tablets and nitroglycerin spray by the paramedics and taken to the emergency room. His blood pressure is now 160/90 and electrocardiogram shows a sinus tachycardia with ST depressions and some inverted T waves in the lateral precordial leads. His chest pain has diminished somewhat.

What would be the next most reasonable course of action?

a. Send the patient to the catheterization laboratory immediately
b. Draw blood for a troponin level
c. Obtain a high-resolution CT scan of the chest
d. Request a cardiac ultrasound
e. Start clopidogrel

3. The above patient has angiography that shows a 90% obstruction in a major branch of the left anterior descending artery (LAD). The other arteries appear less than 30% obstructed. A drug-eluting stent is placed in the severely obstructed vessel after balloon angioplasty and the patient then reports he is pain free at rest and with exercise. The resting electrocardiogram is now normal and an isotopic stress test fails to show evidence of myocardial ischemia.

The patient may be discharged on all the following drugs EXCEPT:

a. clopidogrel.
b. warfarin.
c. an angiotensin-converting enzyme (ACE) inhibitor.
d. a statin.
e. aspirin.

4. A 67-year-old woman consults her physician because of several episodes of weakness in the right arm and hand, accompanied by slightly garbled speech. There is no loss of conscience. The events last 5 to 15 minutes, after which she returns to her normal state. She is a widow, living alone, and right-handed. She has been treated for high blood pressure and diabetes for the past 5 years and is taking a diuretic and an angiotensin receptor blocker (ARB) and metformin. She denies blurred vision, seizures, vertigo, or other neurologic disease, or heart disease. Her last hemoglobin A_{1c} was 6.6%. On examination her blood pressure is 150/80, pulse regular. A bruit is heard over the left carotid artery. There is a grade 2/6 midsystolic murmur at the cardiac base but no other abnormalities. Neurologic exam does not reveal extremity weakness, abnormal reflexes, or motor or sensory abnormalities. Her cranial nerves are intact.

What is the most likely diagnosis that accounts for her symptoms?

a. Transient ischemic attacks (TIA)
b. Left hemispheric stroke
c. Seizure disorder
d. Vertebrobasilar insufficiency
e. Aortic stenosis

5. Routine blood tests for the above patient show a normal CBC and platelet count, a fasting glucose of 150 mg/dL, and mild transaminase elevations. A chest x-ray indicates a borderline enlarged cardiac silhouette and clear lung fields. An electrocardiogram is read as normal sinus rhythm with a left anterior hemiblock but without ST changes or Q waves.

The next diagnostic procedure should be:

a. echocardiogram.
b. referral to a vascular surgeon.
c. cerebral angiography.
d. duplex carotid scan.
e. MR angiography.

6. This patient was found to have a 95% stenosis of the left carotid artery on cerebral angiography and underwent a successful endarterectomy. No evidence of prior stroke was found on brain MRI and her cardiac ultrasound confirmed mild left ventricular hypertrophy but no abnormalities of wall motion or possible sources of emboli.

Appropriate discharge medication(s) should include:

a. low molecular weight heparin.
b. aspirin and clopidogrel.
c. warfarin.
d. aspirin alone.
e. aspirin and a statin.

7. A 25-year-old single man is seen for a routine preemployment physical. His medical history reveals an appendectomy at age 16 but no serious medical illness. He had a febrile illness with swollen glands, fatigue, and fever to 101 °F several months ago, but it resolved by itself and he did not see a doctor. Further questioning reveals that he is bisexual and has had sexual encounters with men and women but has a steady girlfriend at this time. He is vague about condom use. He denies sexually transmitted disease or intravenous drug use but occasionally snorts a little cocaine. Physical examination is essentially negative except for the appendectomy scar. No oropharyngeal abnormalities are noted and there is no evidence of lymphadenopathy or hepatosplenomegaly. A chest x-ray is negative. CBC, liver function tests, VDRL, and hepatitis panel are all negative. An HIV screening test is positive and confirmed by Western blot. A purified protein derivative (PPD) test is negative.

What is an appropriate next course of action with this patient?

a. Observation only with repeat examination and blood tests in 6 months
b. Observation only with HIV testing of his girlfriend
c. Begin highly active antiretroviral therapy (HAART)
d. Obtain a CD4 T-lymphocyte count
e. Obtain a CD4 T-lymphocyte count and a plasma HIV RNA determination

8. Results of the above patient's follow-up testing are a CD4 T-cell count of 400/mL and a plasma HIV RNA value of 75,000. HIV screening of his girlfriend was negative but 1 male sexual contact was found to be positive. He was warned to practice safe sex with latex condoms and avoid homosexual contacts if possible. Follow-up testing in 6 months showed a CD4 T-cell decline to 340/mL and a rise in the viral load to 110,000. He remains asymptomatic.

How should he be treated now?

a. Continued observation and repeat testing
b. A nonnucleoside reverse transcriptase inhibitor (NNRTI) only
c. A protease inhibitor (PI) only
d. A protease inhibitor and a nucleoside reverse transcriptase inhibitor (NRTI)
e. An NNRTI and a PI

9. The young man begins treatment with a protease inhibitor and NRTI. Six months later his girlfriend is found to be HIV positive. They admit to having unprotected sex several times. She is also 5 weeks pregnant and referred by her obstetrician for possible treatment. She feels well except for some morning sickness and has an essentially clean medical history. Her CD4 T-cell level is 500/mL and the HIV RNA is 20,000 copies/mL.

What is the most prudent treatment option for her to prevent transmission to the fetus?

a. Zidovudine monotherapy
b. No therapy until her HIV RNA is above 50,000
c. Combination ART immediately
d. Combination ART after her first trimester is completed
e. Defer treatment until just before delivery

10. A 74-year-old white man is in for an annual physical examination. His major complaint is joint pain and stiffness, especially in the knees, for which he takes naproxen regularly and an occasional hydrocodone. He has a history of angina in his mid-60s and underwent an angioplasty. He is also taking atorvastatin, low-dose aspirin, and an angiotensin receptor blocker. He is not diabetic and has no history of gastrointestinal or genitourinary disorders. He denies chest pain or dyspnea as well as abdominal pain or changes in bowel habits. His weight has been stable at 170 lb. On exam his blood pressure is 140/85, regular pulse at 70. Head, neck, chest, and cardiac examination are negative. The abdomen is slightly tender but there is no rebound or guarding, palpable mass, or hepatosplenomegaly. The prostate is enlarged but benign. Rectal exam is otherwise negative. Typical osteoarthritic changes of the hands are noted. Fecal occult blood testing is positive. A CBC shows hypochromic anemia with a hemoglobin of 10 g/dL and serum iron of 10 mcg/mL and a ferritin level of 5 ng/mL. He denies hematemesis, obvious rectal bleeding, or maroon-colored feces.

What is the most likely cause of the occult blood loss in this patient?

a. Diverticular bleeding
b. Angiodysplasia
c. Colon cancer
d. Gastric ulceration
e. Hemorrhoids

11. The above patient is advised to stop the aspirin and naproxen and to report any obvious rectal bleeding. He is then referred to a gastroenterologist for further workup.

What should be the next diagnostic procedure?

a. Upper gastrointestinal endoscopy (EGD)
b. Colonoscopy
c. Both EGD and colonoscopy
d. Angiography
e. Air contrast barium enema

12. The patient undergoes both upper and lower endoscopy but no bleeding lesion or clot is noted. No gastric or duodenal ulcer is seen and the esophageal mucosa appears intact. He has scattered diverticula and a few small colonic polyps that are removed and reported as benign by pathology. A repeat EGD remains negative but occult blood in the stool tests remain positive.

What should be the next diagnostic step?

a. Isotopic red blood cell scan
b. Surgical intraoperative enteroscopy
c. Angiography
d. Capsule endoscopy
e. Push enteroscopy

Answer Key and Explanations

1. C: The most important objective is to determine if this man has coronary artery disease (CAD). A lipid profile may indicate his risk for the condition but he already has elevated risk due to his history of smoking, high blood pressure, and possibly diabetes. The hemoglobin A_{1c} will offer information about the latter but not about CAD. EGD may be useful to rule out an upper gastrointestinal cause of his symptoms, such as gastroesophageal reflux or esophageal spasm. Most important is to detect the presence of coronary disease. Since he is stable and pain free, an isotopic stress test is preferred to immediate angiography.

2. B: From the clinical presentation, this man has an acute coronary syndrome (ACS), most likely a non–ST-segment elevation myocardial infarction (NSTEMI). Recent evidence has shown that ST depression confers a worse prognosis than T-wave inversion alone. An elevated troponin level will indicate myocardial damage and results are now available quickly. Thirty-day mortality has been shown to be proportional to the degree of troponin I elevation. Since he is in the high-risk category, he should then be sent to the catheterization laboratory for coronary angiography as soon as possible with balloon angioplasty and stenting if needed. High-resolution CT scanning may detect coronary calcifications but angiography remains the "gold standard" for the detection of CAD. Clopidogrel is indicated for ACS patients whose catheterization is delayed more than 24 hours. Cardiac ultrasound may show some abnormalities of wall motion but will only delay the necessary heart catheterization.

3. B: Warfarin is not usually indicated for CAD patients unless complicated by atrial fibrillation or venous thromboembolism. Clopidogrel, a platelet inhibitor, is generally prescribed to diminish the chance of stent thrombosis, although some patients (15% to 48%) are resistant and higher doses or a new drug, prasugrel, may be required. A statin is definitely indicated even if the LDL cholesterol is in the normal range. Many cardiologists believe that the LDL cholesterol should be reduced to less than 70 mg/dL in patients such as this one. Low-dose aspirin is often added unless there is a history of gastrointestinal or other bleeding risk. ACE inhibitors have also been shown to have a beneficial effect in these patients in addition to their antihypertensive action.

4. A: This woman has been experiencing transient ischemic attacks, presumably arising from vascular disease of the left carotid artery. These attacks may last up to an hour or two before resolution but persistence of these symptoms beyond 24 hours suggests a completed stroke. Her diabetes and hypertension are risk factors for cerebrovascular disease and the bruit suggests narrowing of the vessel. Her symptoms do not suggest a seizure disorder. The absence of vertigo, visual symptoms, or drop attacks rules against vertebrobasilar disease. She may well have a degree of aortic stenosis but this alone should not explain her constellation of symptoms.

5. D: Since the presumptive diagnosis is carotid stenosis leading to transient ischemic attacks, duplex scanning of the carotids is a reasonable initial and noninvasive test. It combines B-mode ultrasonography and range-gated pulsed Doppler. It will usually disclose the luminal diameter and blood velocity, although only that portion of the carotid circulation between the clavicles and mandible may be visualized. This study is probably best done before referral to a vascular or neurosurgeon so that the results will be available if the consultation is required. Cerebral angiography is usually performed prior to endarterectomy to determine if the patient is likely to benefit from the surgical procedure. It exposes the patient to ionizing radiation and contrast material. MR angiography is useful for large lesions but less useful for smaller ones and tends to exaggerate the degree of stenosis. This patient should also have a cardiac ultrasound because there

is a suggestion of left ventricular prominence and to rule out a possible cardiac source of emboli. A CT or MRI of the brain should also be done to exclude a previous stroke or other brain lesion.

6. E: All patients who have had a stroke or TIA should undergo secondary prophylaxis. Aspirin and other antiplatelet drugs may reduce the incidence of another stroke by 30%. The daily dose of aspirin has not been established with certainty. Clopidogrel may also be used at a 75 mg/day dosage but the combination of aspirin and clopidogrel is not found to be superior to aspirin alone, it costs considerably more, and probably increases the bleeding risk. All patients with cerebrovascular disease should be treated aggressively with statins, which have been found to reduce the stroke rate by 25%. Warfarin and low molecular weight heparin have not been found to be effective in stroke prevention and are quite inconvenient since one requires frequent laboratory testing and the other subcutaneous injection.

7. E: Since this patient is asymptomatic and free of obvious opportunistic infection, there is no rush to treat him based only on the positive HIV test. His history of a febrile illness with lymphadenopathy may or may not be related to the initial phase of HIV viremia. Decisions regarding treatment in an asymptomatic patient such as this are largely based on the CD4 count and the plasma viral load. Therefore, both values should be obtained for a decision regarding immediate treatment and as a baseline for follow-up. There is some controversy about the indications for treatment based on these values; some doctors begin therapy with CD4 T-cell levels as high as 500/mL. Standard guidelines to initiate treatment are if CD4 T-cell levels are below 200/mL; strongly consider if the count is between 200/mL and 350/mL. Many AIDS experts will treat if the count is over 350/mL and the viral load exceeds 100,000 copies. Therapy may be deferred if the count is greater than 350/mL and the viral load is less than 100,000, although some experts believe that viral counts above 55,000 should be treated regardless of the CD4 T-cell count. The girlfriend and any other named sexual contacts should be screened. There is some very recent evidence that sexual transmission of the virus to an HIV-negative partner may be blocked by early ART.

8. D: HAART therapy in a new HIV-positive patient should be initiated with combination drug therapy to discourage the emergence of resistant strains. There are numerous drugs on the market in each major category and several combinations of 2 and 3 drugs that make taking them easier. Lists of possible adverse effects from each drug must be gone over carefully with the patient before initiating therapy. Authorities recommend the combination of a PI and an NNRTI with a NRTI. Therefore, reasonable combinations might be atazanavir and ritonavir (PI) with zidovudine/lamivudine (NRTI) or efavirenz (NNRTI) with zidovudine/lamivudine. Three drug treatments appear as satisfactory as four in new patients. Treatment should reduce the HIV viral load 0.5 to 0.75 log by week 4 and 1 log at week 8. There should be no detection of the virus by 4 to 6 months. A rising CD4 T-cell level usually accompanies a diminution in the viral RNA.

9. D: Treatment of HIV-infected pregnant women has evolved over the past few years. Instead of zidovudine or nevirapine monotherapy, combination ART including zidovudine is recommended for those who have HIV RNA levels above 1,000 copies/mL. Women with levels lower than this have a small risk of transmission to the newborn. While most ART drugs are not teratogenic, many have not been studied adequately and some may contribute to the adverse effects of pregnancy. Waiting until the second trimester is probably safest.

10. D: All the answers are possible causes of occult gastrointestinal bleeding in this age group but an upper gastrointestinal source is 5 times more likely than a lower one. Gastric ulceration is common in patients taking NSAIDs and/or aspirin, often without abdominal pain. Hemorrhoidal bleeding may be the most common cause of lower gastrointestinal bleeding but most often the

blood is fresh and mixed with stool. The negative rectal exam tends to make this source less likely. Angiodysplasia (telangiectasia), a small vascular malformation of the gut, sometimes multiple, is increasingly reported as a cause of gastrointestinal bleeding, frequently intermittent. Diverticular bleeding, often maroon in color, is another possibility. Finally, colon cancer is the cause of lower gastrointestinal bleeding in about 3% to 5% of cases and may be present without other symptoms, especially if it is in the ascending or transverse colon.

11. C: Both the upper and lower gastrointestinal tract should be examined in patients with occult blood loss since there may be more than 1 lesion. This is often done one after another for patient convenience and to avoid giving anesthesia twice. Barium enema is now rarely used since colonoscopy can identify a bleeding lesion or clot and take a biopsy and/or coagulate it. Angiography is useful for brisk bleeding lesions (at least 1 mL/min) when endoscopy has failed to detect the source or is obscured by blood.

12. D: Capsule endoscopy (patient swallows a small camera within an ingestible capsule and images are transmitted to a receiver on the patient's abdomen for review) has a good diagnostic yield (60% to 90%) in occult bleeding cases in which traditional endoscopy has failed to detect a lesion. Angiography is mostly useful for rapid bleeding. Isotope tagged red blood cell scintigraphy may identify the site of gastrointestinal bleeding at lower blood flows (0.1 mL/min) but cannot determine the cause. Push enteroscopy of the small bowel has a yield of 38% to 75% and may be tried if the bleeding is not rapid. If all of the above fail to disclose the source and bleeding continues, surgical intervention with intraoperative enteroscopy may be tried. In all cases, iron therapy and follow-up hemoglobin values should be carried out with transfusion if necessary.

13. A: Asymptomatic but overweight diabetic patients with a hemoglobin A_{1c} less than 8% should probably be given a short trial of diet and exercise before beginning hypoglycemic therapy. The current guidelines from the American Diabetes Association require reduction to less than 7%. Some other authorities demand a reduction to less than 6.5%, although a recent clinical trial indicates that too aggressive treatment may be counterproductive. The patient should be seen at 3- to 4-month intervals with follow-up blood testing. Monitoring of blood pressure, lipid levels, and abdominal girth is also recommended. If glycemic control is not achieved, metformin or one of the others may be started.

14. B: It is clear that this patient is unlikely to be controlled on diet and exercise, so hypoglycemic therapy is indicated. His weight, abdominal girth, elevated blood pressure, high triglycerides, and low HDL-C suggest he has "metabolic syndrome," although this designation is somewhat controversial. He needs reduction of his LDL-C and hemoglobin A_{1c}, as well as his blood pressure. The best approach would be to begin metformin and a statin immediately, and save introduction of an antihypertensive at a follow-up visit as starting three drugs at once may obscure adverse effects or cause noncompliance. Most doctors would choose metformin for this patient since it does not cause weight gain and has been shown to reduce macrovascular complications of diabetes mellitus. Using a sulfonylurea is a second choice since it tends to increase weight and it is an insulin secretagogue, and the likelihood of hypoglycemic episodes is greater than with metformin. Insulin may ultimately be required in type 2 diabetic patients but a trial of oral therapy is preferred for a patient such as this. When antihypertensive therapy is started, an ACE inhibitor or an ARB would be preferable to a beta-blocker or diuretic since the latter drugs have a tendency to raise the blood sugar, though modestly. A reduction to less than 140 mm Hg systolic is advisable.

15. E: This patient now has mild symptoms and his glycohemoglobin has risen to greater than 8%. Some doctors would begin insulin at this point but most authorities suggest a trial of a second daytime oral drug. The exact type depends on the patient's compliance, cost of the medication, and