1. Which of the following is a serum marker of chronic inflammation in patients with an abdominal aortic aneurysm?
   a) Hypercholesterolemia
   b) Elevated platelet count
   c) Elevated high-sensitivity C-reactive protein
   d) Elevated hemoglobin A1c
   e) Elevated levels of tumor necrosis factor alpha

2. What percentage of annual aneurysm-related deaths occur in women?
   a) 10%
   b) 3%
   c) 79%
   d) 44%
   e) 33%

3. What percentage of aneurysm-related deaths occurs in nonsmokers?
   a) 78%
   b) 2.5%
   c) 22.5%
   d) 10%
   e) 34%

4. Population-based studies have identified which of the following as an independent risk factor for abdominal aortic aneurysms?
   a) Female gender
   b) Hypertension
   c) Diabetes
   d) Family history of aneurysms
   e) Ischemic heart disease

5. Cigarette smoking increases the risk of aneurysm growth. Serum levels of cotinine are associated with this risk. Increased serum levels of which of the following are associated with the destruction of connective tissue elements in the aortic wall and growth of the aneurysm?
   a) Elastase
   b) Tumor necrosis factor alpha
   c) Interleukin 8
   d) Cholesterol
   e) Hemoglobin A1c

6. Disorders of the matrix metalloproteinase enzyme system have been confirmed in the aortic wall of experimental animals with aneurysms. Which of the following is associated with large aneurysms?
   a) MMP 2
   b) MMP 3
   c) MMP 1
   d) MMP 4
   e) MMP 9

7. Which of the following is a serum marker of continued smoking?
   a) Serum mercury levels
   b) Serum creatinine level
   c) Serum elastin level
   d) Serum cotinine level
   e) Serum collagenase level
8. Altered matrix metalloproteinase enzymes are produced in aneurysms by which of the following cell types?
   a) Leucocytes
   b) Macrophages
   c) Endothelial cells
   d) Fibroblasts
   e) Stellate cells

9. Which of the following drugs stabilizes the MMP enzyme system in aneurysms?
   a) Penicillin
   b) Erythromycin
   c) Aspirin
   d) Doxycycline
   e) Hydrochlorothiazide

10. Endovascular repair of small aneurysms discovered on ultrasound screening is not recommended for which of the following reasons?
    a) Long-term risk of aneurysm-related death and aneurysm rupture is equivalent in patients undergoing endovascular repair and patients observed without intervention
    b) Endovascular repair is too costly
    c) Endovascular repair is associated with complications in 10% of patients
    d) Mortality of endovascular repair is 1%
    e) Endovascular repair is not feasible for small aneurysms

11. In order to obtain complete data for determining quality of care for patients with abdominal aortic aneurysms according to the Donabedian principles, information in each of the following areas would be necessary except which one?
    a) Structure
    b) Process
    c) Outcomes
    d) Composite measures
    e) Geographic location of facilities

12. The first successful operation for an abdominal aortic aneurysm with aortic replacement was reported in the American literature in 1952 by which of the following surgeons?
    a) DeBakey
    b) Cooley
    c) Blalock
    d) DuBost
    e) Parodi

13. The reported mortality rate for elective open abdominal aortic aneurysm repair is in which of the following ranges?
    a) 0.5%–1%
    b) 1.5%–2%
    c) 8%–10%
    d) 11%–15%
    e) 3%–8%

14. Multicenter retrospective data suggest which of the following surveillance approaches in patients who have undergone endovascular abdominal aortic aneurysm repair?
    a) If no endoleak is discovered at six months postrepair by CT imaging, annual ultrasound imaging thereafter
    b) CT imaging at six month intervals
    c) Magnetic resonance imaging at three and six months postrepair, with CT imaging annually thereafter
    d) Annual CT imaging
    e) Annual magnetic resonance imaging

15. The risk of delayed aneurysm rupture in patients without endoleak after endovascular abdominal aortic aneurysm repair is which of the following?
    a) 3.7%
    b) 5%
    c) 1%
    d) 0.25%
    e) 7.5%
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16. Each of the following is useful for imaging diagnosis of thoracic aortic aneurysms except which one?
   a) Transthoracic echocardiography
   b) Contrast-enhanced multislice CT scanning
   c) Magnetic resonance imaging
   d) Transesophageal echocardiography
   e) Positron emission tomography

17. Each of the following is an important symptom of an acute complication of thoracic aortic aneurysms except which one?
   a) Back pain
   b) Lower extremity numbness
   c) Lower extremity weakness
   d) Headache
   e) Hypotension

18. Each of the following is useful for prevention of paraplegia in patients undergoing operation for thoracic aortic aneurysms except which one?
   a) Spinal fluid drainage
   b) Electrical stimulation
   c) Mild hypothermia
   d) Sequential aortic clamping
   e) Reattachment of intercostal arteries

19. Popliteal artery aneurysm thrombosis with distal embolization can produce all of the following symptoms except which one?
   a) Blue-toe syndrome
   b) Intermittent claudication
   c) Rest pain
   d) Foot drop
   e) Acute limb ischemia

20. Etiologies of superior mesenteric artery aneurysms include all of the following except which one?
   a) Atherosclerosis
   b) Arterial degeneration
   c) Polyarteritis nodosa
   d) Infection
   e) Turner syndrome

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1. The prevalence of abdominal aortic aneurysms is 1.5% in American males who are 45 years old. This prevalence rises to which of the following by age 75?
   a) 4%
   b) 2%
   c) 12.5%
   d) 16%
   e) 25%

2. An abdominal aortic aneurysm is diagnosed if the diameter of the aorta is increased by which of the following percentages?
   a) 12%
   b) 50%
   c) 30%
   d) 75%
   e) 100%

3. Data cited in the article by Kent and coauthors show that the mortality risk for open or endovascular repair of an abdominal aortic aneurysm discovered with ultrasound screening is which of the following?
   a) 3.5%
   b) 0.5%
   c) 6%
   d) 2%
   e) 11.5%

4. Women who are discovered to have an abdominal aortic aneurysm on ultrasound screening have an increased risk of which of the following percentages for a concomitant thoracic aortic aneurysm?
   a) 48%
   b) 12.5%
   c) 65%
   d) 2.5%
   e) 21%

5. Data cited in the article by MacSweeney and coauthors indicated that the annual growth rate for an abdominal aortic aneurysm diagnosed in a nonsmoking male was 0.09 cm. The annual growth rate in smokers was which of the following?
   a) 0.25 cm
   b) 0.07 cm
   c) 0.75 cm
   d) 1.0 cm
   e) 0.16 cm

6. The matrix metalloproteinase (MMP) enzyme system contributes to the growth of abdominal aortic aneurysms. The principle MMP component found in the walls of small aneurysms is which of the following?
   a) MMP 9
   b) MMP 2
   c) MMP 3
   d) MMP 4
   e) MMP 7

7. Aortic wall tissue from aneurysms treated surgically has been shown to have elevated levels of COX-2 receptors. The cell of origin of these receptors is which of the following?
   a) Neutrophils
   b) Fibroblasts
   c) Endothelial cells
   d) Macrophages
   e) Melanocytes
8. Statin drugs reduce aneurysm growth rates by reducing inflammation and stabilizing the MMP enzyme system. Evidence for improvement in inflammation is shown by which of the following?
   a) Reduced neutrophil counts
   b) Reduced levels of interleukin-6
   c) Reduced total white blood cell counts
   d) Reduced levels of C-reactive protein
   e) Absence of antibodies to pneumococcal organisms

9. Doxycycline is possibly effective in reducing the growth rate of abdominal aortic aneurysms. One of the most frequent side effects of this drug is which of the following?
   a) Decreased hearing
   b) Acceleration of cataract growth
   c) Elevated monocyte levels
   d) Tooth discoloration
   e) Pruritus

10. The diagnosis of an abdominal aortic aneurysm is suggested by which of the following findings on plain abdominal radiographs?
    a) Cephalad displacement of the duodenal shadow
    b) Obliteration of the left renal outline
    c) Displacement of the sigmoid colon to the left
    d) Calcification in the abdominal aortic wall
    e) Haziness of the retroperitoneal outline

11. Data from the UK small aneurysm trial showed a reduction in death rates for patients diagnosed with small abdominal aortic aneurysms. This reduction was attributed to which of the following?
    a) Surgical repair of small aneurysms
    b) Reduced numbers of women in the enrolled cohort
    c) Younger age of enrolled patients
    d) Reductions in the number of smokers following enrollment
    e) Reduced frequency of hypertension in enrollees

12. Reported mortality rates for open abdominal aortic aneurysm repair in high-volume institutions are which of the following?
    a) 3% or less
    b) 5–8%
    c) 10%
    d) 0.5%
    e) 14%

13. Data reported in the article by Teixeira and coauthors showed that there were reductions in which of the following groups of complications in patients undergoing retroperitoneal repair of abdominal aortic aneurysms?
    a) Postoperative infectious complications
    b) Pulmonary complications
    c) Incisional hernias
    d) Cardiac and renal complications
    e) Postoperative pain

14. Data from the article by van Marrewijck and coauthors indicate that the risk of delayed aneurysm rupture in patients who undergo endovascular repair of abdominal aortic aneurysms and who have no endoleak discovered on postoperative surveillance imaging is which of the following?
    a) 7.5%
    b) 2.5%
    c) 3.7%
    d) 10%
    e) 0.25%

15. Protocol-driven approaches for endovascular repair of ruptured abdominal aortic aneurysms have shown mortality rates of which of the following ranges?
    a) 13%–17%
    b) 25%–35%
    c) 50%–70%
    d) 4%–6%
    e) 42%–48%
16. Stanford type A thoracic aortic dissections involve which segment of the thoracic aorta?
   a) Aortic valve
   b) Ascending aorta
   c) Aortic arch
   d) Descending aorta
   e) Thoracic aorta at the level of the diaphragm

17. The most feared complication of Stanford type A thoracic aortic dissection is which of the following?
   a) Free rupture into the pleural space with exsanguination
   b) Occlusion of the carotid arteries
   c) Rupture into the pericardium with pericardial tamponade
   d) Disruption of the aortic valve
   e) Damage to the cardiac conduction system

18. Measures for prevention of spinal cord ischemia in patients undergoing repair of thoracic aortic aneurysms include all of the following except which one?
   a) Spinal fluid drainage
   b) Sequential aortic clamping
   c) Reattachment of segmental intercostal arteries
   d) Epidural anesthesia
   e) Mild hypothermia

19. Which of the following femoral artery aneurysms can be managed nonoperatively?
   a) Pseudoaneurysms larger than 3 cm in diameter
   b) Pseudoaneurysms in chronically anticoagulated patients
   c) Aneurysms resulting from interventional radiologic procedures that are smaller than 2.5 cm in diameter
   d) Aneurysms involving the common femoral artery that are larger than 3 cm in diameter
   e) Large aneurysms involving the profunda femoris artery

20. Popliteal artery aneurysms account for which percentage of lower extremity arterial aneurysms?
   a) 8%
   b) 17%
   c) 39%
   d) 70%
   e) 95%

The following four questions are required by the American College of Surgeons for accreditation purposes. You must complete these four questions before submitting your answers.

21. This issue met the stated learning objectives.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

22. The content was relevant to my educational needs and practice environment.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

23. There are potential barriers to incorporating what I have learned from this issue into my practice.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

24. The content was fair, objective, and unbiased.
   a) Strongly agree
   b) Agree
   c) Neutral
   d) Disagree
   e) Strongly disagree

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