PRACTICE EXAM 8: VASCULAR TECHNOLOGY SIMULATION (170 QUESTIONS)

This practice examination contains 170 questions. Allow approximately three hours. Select the single best answer for each question. The official ARDMS VT examination uses a scaled score from 300 to 700, with 555 required to pass; this practice score is not an official scaled score.

1. Which finding best represents normal common carotid artery spectral waveform?

A. high-resistance flow with absent diastolic velocity
B. low-resistance flow with persistent forward diastolic velocity
C. continuous nonphasic venous flow
D. bidirectional flow throughout systole

2. Which finding best represents normal external carotid artery waveform?

A. marked continuous diastolic flow like the ICA
B. respiratory phasicity without pulsatility
C. relatively high resistance with brisk systolic upstroke
D. reversed systolic flow at baseline

3. Which finding best represents normal internal carotid artery waveform?

A. high resistance with little diastolic flow
B. venous phasicity with augmentation
C. low resistance with substantial forward diastolic flow
D. to-and-fro flow at the origin

4. Which finding best represents vertebral artery flow direction?

A. retrograde toward the arm
B. antegrade toward the brain
C. bidirectional with every heartbeat
D. absent during diastole

5. Which finding best represents normal lower-extremity artery at rest?

A. continuous monophasic low-resistance waveform
B. nonphasic venous waveform
C. to-and-fro pseudoaneurysm waveform
D. triphasic high-resistance waveform

6. Which finding best represents normal lower-extremity venous Doppler?

A. respiratory phasicity and augmentation
B. triphasic arterial pulsatility
C. continuous high-velocity systolic flow
D. persistent reflux after release

7. Which finding best represents portal vein flow direction?

A. hepatopetal flow toward the liver
B. hepatofugal flow away from the liver
C. alternating flow with respiration
D. retrograde flow toward the spleen

8. Which finding best represents hepatic vein waveform?

A. triphasic high-resistance arterial flow
B. continuous flow without cardiac variation
C. multiphasic flow influenced by the cardiac cycle
D. to-and-fro flow at a neck

9. Which finding best represents renal artery resistance?

A. high-resistance waveform with absent diastolic flow
B. low-resistance waveform with continuous diastolic flow
C. venous respiratory phasicity
D. bidirectional systolic flow

10. Which finding best represents celiac artery fasting waveform?

A. high-resistance pattern with minimal diastolic flow
B. continuous venous waveform
C. reversed systolic flow
D. low-resistance pattern with forward diastolic flow

11. Which finding best represents superior mesenteric artery fasting waveform?

A. low-resistance pattern identical to the renal artery
B. high-resistance pattern with limited diastolic flow
C. continuous nonpulsatile flow
D. retrograde flow throughout systole

12. Which finding best represents great saphenous vein location?

A. deep to the femoral artery throughout the thigh
B. lateral to the fibula within muscle
C. within the saphenous compartment along the medial limb

D. inside the popliteal artery sheath

13. Which finding best represents small saphenous vein course?

A. posterior calf toward the popliteal region
B. anterior thigh toward the femoral vein
C. medial thigh toward the common femoral artery
D. deep calf beside the anterior tibial artery

14. Which finding best represents common femoral vein landmark?

A. lateral to the common femoral artery near the groin
B. posterior to the profunda femoris artery only
C. inside the femoral artery wall in the stated examination setting
D. medial to the common femoral artery near the groin

15. Which finding best represents brachial artery bifurcation?

A. axillary and subclavian arteries
B. radial and ulnar arteries
C. anterior and posterior tibial arteries
D. common and profunda femoral arteries

16. Which finding best represents common femoral artery branches?

A. superficial femoral and profunda femoris arteries
B. radial and ulnar arteries
C. anterior and posterior tibial arteries
D. internal and external carotid arteries

17. Which finding best represents popliteal artery branches?

A. radial artery and ulnar artery
B. celiac artery and superior mesenteric artery
C. anterior tibial artery and tibioperoneal trunk
D. internal carotid and external carotid arteries

18. Which finding best represents aortic bifurcation?

A. right and left renal arteries
B. superior and inferior mesenteric arteries
C. common femoral and profunda arteries
D. right and left common iliac arteries

19. During a vascular laboratory examination, which observation is most consistent with normal common carotid artery spectral waveform?

A. high-resistance flow with absent diastolic velocity
B. continuous nonphasic venous flow
C. bidirectional flow throughout systole
D. low-resistance flow with persistent forward diastolic velocity

20. During a vascular laboratory examination, which observation is most consistent with normal external carotid artery waveform?

A. relatively high resistance with brisk systolic upstroke
B. marked continuous diastolic flow like the ICA
C. respiratory phasicity without pulsatility
D. reversed systolic flow at baseline

21. During a vascular laboratory examination, which observation is most consistent with normal internal carotid artery waveform?

A. high resistance with little diastolic flow
B. venous phasicity with augmentation
C. low resistance with substantial forward diastolic flow
D. to-and-fro flow at the origin

22. During a vascular laboratory examination, which observation is most consistent with vertebral artery flow direction?

A. retrograde toward the arm
B. antegrade toward the brain
C. bidirectional with every heartbeat
D. absent during diastole

23. During a vascular laboratory examination, which observation is most consistent with normal lower-extremity artery at rest?

A. triphasic high-resistance waveform
B. continuous monophasic low-resistance waveform
C. nonphasic venous waveform
D. to-and-fro pseudoaneurysm waveform

24. During a vascular laboratory examination, which observation is most consistent with normal lower-extremity venous Doppler?

A. triphasic arterial pulsatility
B. respiratory phasicity and augmentation
C. continuous high-velocity systolic flow
D. persistent reflux after release

25. During a vascular laboratory examination, which observation is most consistent with portal vein flow direction?

A. hepatofugal flow away from the liver
B. alternating flow with respiration
C. retrograde flow toward the spleen
D. hepatopetal flow toward the liver

26. During a vascular laboratory examination, which observation is most consistent with hepatic vein waveform?

A. triphasic high-resistance arterial flow
B. continuous flow without cardiac variation
C. multiphasic flow influenced by the cardiac cycle
D. to-and-fro flow at a neck

27. During a vascular laboratory examination, which observation is most consistent with renal artery resistance?

A. high-resistance waveform with absent diastolic flow
B. venous respiratory phasicity
C. low-resistance waveform with continuous diastolic flow
D. bidirectional systolic flow

28. During a vascular laboratory examination, which observation is most consistent with celiac artery fasting waveform?

A. high-resistance pattern with minimal diastolic flow
B. low-resistance pattern with forward diastolic flow
C. continuous venous waveform
D. reversed systolic flow

29. During a vascular laboratory examination, which observation is most consistent with superior mesenteric artery fasting waveform?

A. low-resistance pattern identical to the renal artery
B. continuous nonpulsatile flow
C. retrograde flow throughout systole
D. high-resistance pattern with limited diastolic flow

30. During a vascular laboratory examination, which observation is most consistent with great saphenous vein location?

A. within the saphenous compartment along the medial limb
B. deep to the femoral artery throughout the thigh
C. lateral to the fibula within muscle
D. inside the popliteal artery sheath

31. During a vascular laboratory examination, which observation is most consistent with small saphenous vein course?

A. anterior thigh toward the femoral vein
B. medial thigh toward the common femoral artery
C. deep calf beside the anterior tibial artery
D. posterior calf toward the popliteal region

32. During a vascular laboratory examination, which observation is most consistent with common femoral vein landmark?

A. lateral to the common femoral artery near the groin
B. medial to the common femoral artery near the groin
C. posterior to the profunda femoris artery only
D. inside the femoral artery wall in the stated examination setting

33. During a vascular laboratory examination, which observation is most consistent with brachial artery bifurcation?

A. axillary and subclavian arteries
B. anterior and posterior tibial arteries
C. radial and ulnar arteries
D. common and profunda femoral arteries

34. During a vascular laboratory examination, which observation is most consistent with common femoral artery branches?

A. superficial femoral and profunda femoris arteries
B. radial and ulnar arteries
C. anterior and posterior tibial arteries
D. internal and external carotid arteries

35. During a vascular laboratory examination, which observation is most consistent with popliteal artery branches?

A. radial artery and ulnar artery
B. celiac artery and superior mesenteric artery
C. internal carotid and external carotid arteries
D. anterior tibial artery and tibioperoneal trunk

36. During a vascular laboratory examination, which observation is most consistent with aortic bifurcation?

A. right and left renal arteries
B. right and left common iliac arteries
C. superior and inferior mesenteric arteries
D. common femoral and profunda arteries

37. Which finding best represents acute deep venous thrombosis?

A. dilated noncompressible vein with hypoechoic thrombus
B. small compressible vein with echogenic walls
C. triphasic arterial waveform
D. normal augmentation and complete coaptation

38. Which finding best represents chronic deep venous thrombosis?

A. dilated vein with free-floating hypoechoic clot
B. completely compressible vein without residual material
C. retracted vein with echogenic wall-adherent material and collaterals
D. normal respiratory phasicity only in the stated examination setting

39. Which finding best represents venous reflux?

A. brief forward augmentation after distal compression
B. reversed flow persisting beyond the accepted provocative interval
C. arterial triphasic flow at rest
D. complete venous compression in the stated examination setting

40. Which finding best represents pseudoaneurysm neck?

A. continuous antegrade low-resistance flow
B. triphasic arterial flow without reversal
C. to-and-fro spectral Doppler flow
D. respiratory phasic venous flow

41. Which finding best represents pseudoaneurysm sac?

A. yin-yang bidirectional color pattern
B. uniform absence of color in every setting
C. laminar single-color venous flow
D. triphasic spectral tracing only

42. Which finding best represents arteriovenous fistula?

A. high-resistance feeding artery and nonpulsatile vein
B. absent arterial and venous flow
C. normal triphasic artery with respiratory vein
D. low-resistance feeding artery and pulsatile draining vein

43. Which finding best represents hemodynamically significant arterial stenosis?

A. uniform velocity decrease without focal disturbance
B. complete venous compressibility in the stated examination setting
C. normal respiratory phasicity in the stated examination setting
D. focal velocity increase with turbulence and distal spectral broadening

44. Which finding best represents arterial occlusion?

A. no detectable flow with collateral reconstitution distally
B. focal high velocity through a patent lumen
C. normal triphasic flow throughout
D. venous reflux after Valsalva

45. Which finding best represents tardus-parvus waveform?

A. sharp upstroke with high pulsatility in the stated examination setting
B. delayed systolic upstroke and reduced amplitude distal to obstruction
C. to-and-fro flow in a pseudoaneurysm neck

D. normal venous phasicity in the stated examination setting

46. Which finding best represents subclavian steal physiology?

A. carotid flow reversal caused by distal femoral disease
B. portal reversal caused by renal stenosis
C. vertebral flow reversal caused by proximal subclavian obstruction
D. venous reflux caused by carotid plaque

47. Which finding best represents carotid plaque surface ulceration?

A. smooth intimal surface without color penetration
B. complete acoustic shadow without visible lumen
C. normal jugular venous valve in the stated examination setting
D. irregular crater extending into plaque with flow entering it

48. Which finding best represents fibromuscular dysplasia?

A. isolated ostial plaque at the aortic origin
B. uniform venous wall thickening in the stated examination setting
C. alternating stenosis and dilation in the mid-to-distal renal artery
D. complete renal vein thrombosis in the stated examination setting

49. Which finding best represents portal hypertension?

A. triphasic peripheral arterial flow in the stated examination setting
B. dilated portal system with reduced or reversed portal flow and collaterals
C. isolated high-resistance renal flow in the stated examination setting
D. normal hepatopetal flow without collaterals in the stated examination setting

50. Which finding best represents Budd-Chiari syndrome?

A. hepatic venous outflow obstruction
B. superior mesenteric arterial embolism
C. isolated carotid bifurcation plaque
D. lower-extremity superficial reflux

51. Which finding best represents median arcuate ligament compression?

A. fixed renal vein occlusion unaffected by breathing
B. carotid stenosis relieved by arm exercise
C. elevated celiac velocity that may vary with respiration
D. femoral DVT with triphasic flow

52. Which finding best represents nutcracker phenomenon?

A. right renal artery compression behind the IVC
B. left renal vein compression between the SMA and aorta
C. portal vein compression by the spleen
D. femoral vein compression by the profunda artery

53. Which finding best represents May-Thurner anatomy?

A. right renal vein compressed by the SMA in the stated examination setting
B. left carotid compressed by the jugular vein in the stated examination setting
C. popliteal artery compressed by the tibial vein in the stated examination setting
D. left common iliac vein compressed by the right common iliac artery

54. Which finding best represents popliteal artery aneurysm complication?

A. mural thrombus with distal embolization
B. isolated portal hypertension
C. carotid body tumor formation
D. renal cortical infarction only

55. Which finding best represents mesenteric ischemia after a meal?

A. postprandial abdominal pain from inadequate flow reserve
B. arm claudication from vertebral reversal
C. leg edema from superficial reflux
D. headache from temporal arteritis

56. Which finding best represents renal artery stenosis consequence?

A. portal hypertension through splenic reflux
B. renovascular hypertension through reduced renal perfusion
C. venous claudication through calf reflux
D. carotid bruit through jugular obstruction

57. Which finding best represents carotid body tumor?

A. avascular cyst compressing the jugular vein in the stated examination setting
B. thrombus confined to the common carotid lumen
C. plaque at the subclavian origin in the stated examination setting
D. hypervascular mass that splays the internal and external carotid arteries

58. Which finding best represents Baker cyst?

A. arterial plaque at the femoral bifurcation in the stated examination setting
B. aneurysm of the carotid bulb in the stated examination setting
C. fluid collection in the popliteal fossa that may mimic DVT symptoms

D. thrombus in the portal vein in the stated examination setting

59. Which finding best represents thoracic outlet arterial compression?

A. fixed portal reversal after eating
B. dynamic subclavian waveform change with provocative positioning
C. renal venous reflux with Valsalva
D. carotid plaque disappearance on inspiration

60. Which finding best represents deep venous obstruction clue?

A. brisk augmentation after distal compression
B. complete compressibility at every level
C. loss of respiratory phasicity in a peripheral vein
D. normal valve closure in the stated examination setting

61. Which finding best represents compartment syndrome perfusion?

A. benign condition excluded by any Doppler signal
B. venous disorder diagnosed by reflux alone
C. carotid disorder diagnosed by bruit
D. clinical emergency despite potentially preserved large-artery signals

62. Which finding best represents aneurysm measurement?

A. outer wall to outer wall perpendicular to the vessel axis
B. inner lumen only along an oblique plane
C. color jet width parallel to flow in the stated examination setting
D. spectral envelope height in the stated examination setting

63. Which finding best represents aortic dissection?

A. intimal flap separating true and false lumens
B. isolated echogenic plaque without a flap
C. venous valve leaflet in the IVC
D. normal aortic pulsatility in the stated examination setting

64. During a vascular laboratory examination, which observation is most consistent with acute deep venous thrombosis?

A. small compressible vein with echogenic walls
B. dilated noncompressible vein with hypoechoic thrombus
C. triphasic arterial waveform
D. normal augmentation and complete coaptation

65. During a vascular laboratory examination, which observation is most consistent with chronic deep venous thrombosis?

A. dilated vein with free-floating hypoechoic clot
B. completely compressible vein without residual material
C. normal respiratory phasicity only in the stated examination setting
D. retracted vein with echogenic wall-adherent material and collaterals

66. During a vascular laboratory examination, which observation is most consistent with venous reflux?

A. brief forward augmentation after distal compression
B. arterial triphasic flow at rest
C. reversed flow persisting beyond the accepted provocative interval
D. complete venous compression in the stated examination setting

67. During a vascular laboratory examination, which observation is most consistent with pseudoaneurysm neck?

A. continuous antegrade low-resistance flow
B. triphasic arterial flow without reversal
C. respiratory phasic venous flow
D. to-and-fro spectral Doppler flow

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A. uniform absence of color in every setting
B. laminar single-color venous flow
C. yin-yang bidirectional color pattern
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A. focal velocity increase with turbulence and distal spectral broadening
B. uniform velocity decrease without focal disturbance
C. complete venous compressibility in the stated examination setting
D. normal respiratory phasicity in the stated examination setting

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C. uniform venous wall thickening in the stated examination setting
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79. During a vascular laboratory examination, which observation is most consistent with nutcracker phenomenon?

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B. left renal vein compression between the SMA and aorta
C. portal vein compression by the spleen
D. femoral vein compression by the profunda artery

80. During a vascular laboratory examination, which observation is most consistent with May-Thurner anatomy?

A. left common iliac vein compressed by the right common iliac artery
B. right renal vein compressed by the SMA in the stated examination setting
C. left carotid compressed by the jugular vein in the stated examination setting
D. popliteal artery compressed by the tibial vein in the stated examination setting

81. During a vascular laboratory examination, which observation is most consistent with popliteal artery aneurysm complication?

A. isolated portal hypertension
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D. plaque at the subclavian origin in the stated examination setting

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C. aneurysm of the carotid bulb in the stated examination setting
D. thrombus in the portal vein in the stated examination setting

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C. complete compressibility at every level
D. normal valve closure in the stated examination setting

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B. venous disorder diagnosed by reflux alone
C. clinical emergency despite potentially preserved large-artery signals
D. carotid disorder diagnosed by bruit

89. During a vascular laboratory examination, which observation is most consistent with aneurysm measurement?

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C. color jet width parallel to flow in the stated examination setting
D. spectral envelope height in the stated examination setting

90. During a vascular laboratory examination, which observation is most consistent with aortic dissection?

A. isolated echogenic plaque without a flap
B. venous valve leaflet in the IVC
C. normal aortic pulsatility in the stated examination setting
D. intimal flap separating true and false lumens

91. Which finding best represents dialysis access inflow?

A. normal resting high-resistance waveform
B. absent diastolic flow in every patent access
C. arterialized low-resistance waveform with increased volume flow
D. venous respiratory waveform only

92. Which finding best represents dialysis access outflow stenosis?

A. focal velocity acceleration with turbulence in the draining vein
B. uniform laminar flow without velocity change
C. complete compression of the anastomosis in the stated examination setting
D. triphasic flow in the outflow vein

93. Which finding best represents bypass graft stenosis?

A. uniform velocities with normal contour
B. focal velocity increase and abnormal velocity ratio
C. complete absence of a graft lumen
D. normal venous augmentation in the stated examination setting

94. Which finding best represents EVAR endoleak?

A. normal flow confined to the graft lumen in the stated examination setting
B. venous flow in the inferior vena cava in the stated examination setting
C. artifact removed by lowering gain in the stated examination setting
D. persistent blood flow outside the graft but within the aneurysm sac

95. Which finding best represents TIPS evaluation?

A. ankle pressures and digital PPG only in the stated examination setting
B. carotid plaque morphology only in the stated examination setting
C. upper-extremity venous compression only in the stated examination setting
D. flow direction and velocities through the shunt and portal branches

96. Which finding best represents renal transplant artery?

A. native carotid bifurcation only in the stated examination setting
B. anastomosis and entire accessible artery with intrarenal waveforms
C. portal vein without renal parenchyma
D. lower-extremity venous reflux only in the stated examination setting

97. Which finding best represents venous ablation follow-up?

A. treated vein closure and absence of thrombus extension into deep veins
B. recanalization of every treated segment as normal in the stated examination setting
C. triphasic flow inside the treated vein in the stated examination setting
D. loss of deep venous compressibility as expected in the stated examination setting

98. Which finding best represents stent surveillance?

A. only grayscale diameter without Doppler
B. venous compression through the metal
C. in-stent and edge velocities compared with adjacent segments
D. no evaluation when artifact is present

99. Which finding best represents prosthetic graft infection concern?

A. perigraft fluid or gas with compatible clinical findings
B. uniform graft wall appearance alone
C. normal triphasic distal flow in the stated examination setting

D. expected color fill throughout in the stated examination setting

100. Which finding best represents dialysis steal syndrome?

A. portal flow reversal from cirrhosis
B. carotid stenosis from plaque in the stated examination setting
C. deep venous reflux after ablation
D. reduced distal arterial perfusion related to access flow

101. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

102. Which finding best represents noncompressible ankle arteries?

A. report a normal ABI without qualification
B. increase cuff pressure indefinitely
C. consider toe pressures or alternative physiologic testing
D. diagnose venous reflux from the ABI

103. Which finding best represents segmental pressure drop?

A. identical pressures prove acute DVT in the stated examination setting
B. higher distal pressure proves aneurysm in the stated examination setting
C. a meaningful decrease between adjacent cuff levels suggests intervening disease
D. all pressure differences are artifact in the stated examination setting

104. Which finding best represents pulse volume recording distal disease?

A. sharp peak with normal dicrotic features
B. damped contour with delayed upstroke and reduced amplitude
C. respiratory phasic venous tracing in the stated examination setting
D. to-and-fro pseudoaneurysm tracing in the stated examination setting

105. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 1.25
C. 4
D. 0.75

106. Which finding best represents toe pressure advantage?

A. digital arteries are less often noncompressible than ankle arteries
B. toe arteries always have higher pressure than brachial arteries
C. toe pressure diagnoses DVT in the stated examination setting
D. toe cuffs eliminate motion artifact in the stated examination setting

107. Which finding best represents venous PPG refill time?

A. prolonged refill always proves acute DVT
B. triphasic refill indicates arterial stenosis
C. no refill is normal after exercise
D. shortened refill suggests venous reflux

108. Which finding best represents proper pressure cuff width?

A. narrower than the artery lumen
B. identical for every limb size
C. approximately 20 percent wider than the limb diameter
D. twice the entire limb length

109. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.75
B. 0.25
C. 1.25
D. 4

110. Which finding best represents upper-extremity arterial pressures?

A. use ankle pressure as the only reference
B. compare bilateral brachial and forearm pressures with waveforms
C. apply venous tourniquets throughout in the stated examination setting
D. ignore side-to-side differences in the stated examination setting

111. During a vascular laboratory examination, which observation is most consistent with ankle-brachial index calculation?

A. lowest brachial pressure divided by ankle pressure
B. ankle pressure minus brachial pressure
C. highest ankle pressure divided by highest brachial pressure
D. brachial pressure plus toe pressure

112. During a vascular laboratory examination, which observation is most consistent with noncompressible ankle arteries?

A. consider toe pressures or alternative physiologic testing
B. report a normal ABI without qualification
C. increase cuff pressure indefinitely
D. diagnose venous reflux from the ABI

113. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

114. During a vascular laboratory examination, which observation is most consistent with pulse volume recording distal disease?

A. sharp peak with normal dicrotic features
B. respiratory phasic venous tracing in the stated examination setting
C. to-and-fro pseudoaneurysm tracing in the stated examination setting
D. damped contour with delayed upstroke and reduced amplitude

115. During a vascular laboratory examination, which observation is most consistent with exercise ABI purpose?

A. diagnose carotid plaque morphology in the stated examination setting
B. unmask flow-limiting disease when resting results are normal or borderline
C. measure venous reflux exclusively in the stated examination setting
D. confirm portal hypertension in the stated examination setting

116. During a vascular laboratory examination, which observation is most consistent with toe pressure advantage?

A. digital arteries are less often noncompressible than ankle arteries
B. toe arteries always have higher pressure than brachial arteries
C. toe pressure diagnoses DVT in the stated examination setting
D. toe cuffs eliminate motion artifact in the stated examination setting

117. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 1.25
C. 0.75
D. 4

118. During a vascular laboratory examination, which observation is most consistent with proper pressure cuff width?

A. narrower than the artery lumen
B. identical for every limb size
C. twice the entire limb length
D. approximately 20 percent wider than the limb diameter

119. During a vascular laboratory examination, which observation is most consistent with reactive hyperemia testing?

A. measures carotid intima thickness
B. assesses arterial reserve after temporary occlusion
C. confirms venous valve anatomy
D. classifies endoleaks in the stated examination setting

120. During a vascular laboratory examination, which observation is most consistent with upper-extremity arterial pressures?

A. use ankle pressure as the only reference
B. apply venous tourniquets throughout in the stated examination setting
C. ignore side-to-side differences in the stated examination setting
D. compare bilateral brachial and forearm pressures with waveforms

121. Which finding best represents pseudoaneurysm thrombin injection guidance?

A. place the needle blindly into the parent artery in the stated examination setting
B. inject without confirming flow in the stated examination setting
C. keep the needle tip visible within the sac away from the neck
D. compress the distal artery throughout injection in the stated examination setting

122. Which finding best represents manual pseudoaneurysm compression?

A. compress the neck while monitoring sac and distal arterial flow
B. compress only the distal artery in the stated examination setting
C. avoid Doppler monitoring in the stated examination setting
D. stop when sac flow increases in the stated examination setting

123. Which finding best represents venous ablation guidance?

A. place the catheter within a deep artery
B. confirm catheter position and tumescent anesthesia around the target vein
C. ignore the saphenofemoral junction in the stated examination setting
D. omit postprocedure deep-vein assessment in the stated examination setting

124. Which finding best represents intraoperative completion duplex?

A. replace all surgical inspection in the stated examination setting

B. measure only venous reflux in the stated examination setting
C. exclude flow evaluation in the stated examination setting
D. identify residual stenosis, flap, thrombosis, or technical defect

125. Which finding best represents sterile transducer preparation?

A. use a sterile cover and sterile coupling medium without contaminating the field
B. use nonsterile gel inside an open wound in the stated examination setting
C. place the cable across the field uncovered in the stated examination setting
D. omit probe disinfection in the stated examination setting

126. Which finding best represents post-thrombin assessment?

A. confirm parent artery occlusion in the stated examination setting
B. expect increased neck flow in the stated examination setting
C. confirm sac thrombosis and parent artery patency with distal perfusion
D. avoid checking pedal signals in the stated examination setting

127. Which finding best represents biopsy or access guidance?

A. advance the needle beyond the image plane
B. visualize the needle continuously and plan a path avoiding vessels
C. maximize output without reason in the stated examination setting
D. ignore anticoagulation history in the stated examination setting

128. Which finding best represents intraoperative carotid assessment?

A. assess only jugular compressibility in the stated examination setting
B. measure ankle pressure only in the stated examination setting
C. evaluate lumen, residual plaque, flap, and flow after repair
D. ignore spectral Doppler in the stated examination setting

129. Which finding best represents procedure timeout?

A. perform after needle insertion in the stated examination setting
B. replace informed consent in the stated examination setting
C. omit when the patient is known
D. verify patient, procedure, site, and required resources before starting

130. Which finding best represents vasovagal response during procedure?

A. stop, assess the patient, and summon appropriate clinical support
B. continue without monitoring in the stated examination setting
C. place the patient upright immediately in the stated examination setting
D. increase compression without evaluation in the stated examination setting

131. Which finding best represents postprocedure hematoma?

A. evaluate size, internal flow, and relationship to nearby vessels
B. assume every mass is thrombosed in the stated examination setting
C. use compression without checking perfusion in the stated examination setting
D. ignore expanding symptoms in the stated examination setting

132. Which finding best represents needle visualization?

A. use the steepest possible angle in the stated examination setting
B. turn off all gain in the stated examination setting
C. image only after advancement in the stated examination setting
D. align the beam to improve reflection from the needle

133. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

134. Which finding best represents Doppler angle correction?

A. place perpendicular to flow for spectral velocity in the stated examination setting
B. use 90 degrees for maximum shift in the stated examination setting
C. align with flow direction and keep the angle at or below 60 degrees
D. ignore vessel direction in the stated examination setting

135. Which finding best represents color blooming?

A. reduce excessive color gain
B. increase color gain further
C. lower wall filter to zero always
D. increase persistence indefinitely

136. Which finding best represents spectral broadening from technique?

A. place a very large gate across disturbed walls
B. maximize gain until the window fills
C. use an appropriate sample volume centered in laminar flow
D. increase angle beyond 70 degrees in the stated examination setting

137. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

138. Which finding best represents posterior enhancement?

A. dark shadow behind calcification in the stated examination setting
B. velocity wraparound on color in the stated examination setting
C. duplicate anatomy across a diaphragm
D. increased brightness deep to a low-attenuation fluid structure

139. Which finding best represents ALARA principle?

A. maximize output for every examination in the stated examination setting
B. ignore thermal and mechanical indices in the stated examination setting
C. use the lowest output and shortest exposure that answer the clinical question
D. extend dwell time routinely in the stated examination setting

140. Which finding best represents quality assurance phantom?

A. replace all preventive maintenance
B. diagnose vascular disease directly
C. calibrate blood pressure cuffs only
D. track system performance consistently over time

141. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

142. Which finding best represents sample volume placement for stenosis?

A. interrogate before, within, and beyond the lesion
B. sample only far distal to the lesion
C. sample only the adjacent vein
D. avoid angle correction at the lesion

143. Which finding best represents wall filter effect?

A. a high filter always improves venous sensitivity
B. it changes grayscale depth only in the stated examination setting
C. it eliminates angle error in the stated examination setting
D. an excessively high filter can remove slow flow signals

144. Which finding best represents power Doppler?

A. precise velocity measurement with spectral tracing
B. sensitive display of low flow without directional information
C. directional display immune to motion
D. grayscale-only tissue imaging in the stated examination setting

145. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 1.25

C. 0.75
D. 4

146. Which finding best represents mirror artifact?

A. duplicated structure across a strong reflector
B. color wraparound from low scale
C. shadow behind calcification
D. loss of slow flow from wall filter

147. Which finding best represents range ambiguity?

A. echoes from a previous pulse assigned to the wrong depth
B. incorrect velocity from angle correction in the stated examination setting
C. shadow from plaque in the stated examination setting
D. venous reflux after Valsalva in the stated examination setting

148. Which finding best represents appropriate use?

A. perform every possible protocol regardless of indication
B. omit history review in the stated examination setting
C. match the examination and protocol to the clinical indication
D. substitute ultrasound for all modalities in the stated examination setting

149. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 0.75
C. 1.25
D. 4

150. Which finding best represents ergonomic scanning?

A. abduct the shoulder throughout every study in the stated examination setting
B. twist the trunk to reach the patient in the stated examination setting
C. apply maximum grip pressure in the stated examination setting
D. adjust bed, chair, monitor, and patient position to reduce reach and force

151. Which finding best represents critical result workflow?

A. leave an unconfirmed voicemail only
B. wait until the next routine visit
C. tell the patient a final diagnosis independently
D. follow the laboratory's documented escalation and read-back process

152. Which finding best represents comparison with prior studies?

A. use consistent technique and note interval changes
B. change criteria between examinations
C. ignore surgical history in the stated examination setting
D. compare only image brightness

153. A renal waveform has a peak systolic velocity of 100 cm/s and end-diastolic velocity of 25 cm/s. What is the resistive index?

A. 0.25
B. 1.25
C. 0.75
D. 4

154. During a vascular laboratory examination, which observation is most consistent with Doppler angle correction?

A. place perpendicular to flow for spectral velocity in the stated examination setting
B. align with flow direction and keep the angle at or below 60 degrees
C. use 90 degrees for maximum shift in the stated examination setting
D. ignore vessel direction in the stated examination setting

155. During a vascular laboratory examination, which observation is most consistent with color blooming?

A. reduce excessive color gain
B. increase color gain further
C. lower wall filter to zero always
D. increase persistence indefinitely

156. During a vascular laboratory examination, which observation is most consistent with spectral broadening from technique?

A. place a very large gate across disturbed walls
B. use an appropriate sample volume centered in laminar flow
C. maximize gain until the window fills
D. increase angle beyond 70 degrees in the stated examination setting

157. Which finding best represents patient identification?

A. use room number alone
B. ask another patient to confirm
C. identify only after scanning
D. use two approved identifiers before the examination

158. Which finding best represents focused vascular history?

A. record only the appointment time in the stated examination setting
B. omit prior imaging and surgery in the stated examination setting
C. document symptoms, onset, laterality, interventions, medications, and risk factors
D. ask only about allergies in the stated examination setting

159. Which finding best represents abdominal vascular preparation?

A. require prolonged fasting for every emergency
B. encourage a large meal immediately before
C. omit medication review in the stated examination setting
D. follow laboratory fasting instructions when clinically appropriate

160. Which finding best represents technical limitation documentation?

A. state the limitation and its effect on the examination
B. omit nondiagnostic segments from the report
C. invent normal findings for unseen vessels
D. blame the patient without detail in the stated examination setting

161. Which finding best represents preliminary findings?

A. issue an independent final physician diagnosis
B. withhold critical observations in the stated examination setting
C. communicate within scope and according to laboratory policy
D. alter images after interpretation in the stated examination setting

162. Which finding best represents image archiving?

A. save only one representative image in the stated examination setting
B. verify required images, labels, measurements, and waveforms are stored
C. delete technically difficult segments in the stated examination setting
D. archive without patient identifiers in the stated examination setting

163. Which finding best represents patient positioning?

A. force every patient into one standard position
B. adapt safely to symptoms, mobility, and hemodynamic effects
C. ignore orthostatic symptoms in the stated examination setting
D. stand an unstable patient alone

164. Which finding best represents critical finding communication?

A. wait for routine report distribution in the stated examination setting
B. tell family members without permission in the stated examination setting
C. notify the designated clinician promptly and document the exchange
D. leave before confirming receipt in the stated examination setting

165. Which finding best represents informed cooperation?

A. explain the examination in understandable language and answer questions
B. promise a specific diagnosis in the stated examination setting
C. avoid describing compression maneuvers in the stated examination setting
D. continue despite withdrawn cooperation in the stated examination setting

166. Which finding best represents prior intervention review?

A. assume standard anatomy after surgery in the stated examination setting
B. ignore graft orientation in the stated examination setting
C. use native-vessel criteria without context in the stated examination setting

D. read the operative or procedural report before scanning when available

167. Which finding best represents medication history?

A. stop prescribed medications independently in the stated examination setting
B. ignore anticoagulation before procedures in the stated examination setting
C. diagnose stenosis from medication list in the stated examination setting
D. recognize that vasoactive and anticoagulant drugs may affect context and risk

168. Which finding best represents professional communication?

A. use objective terminology and avoid unsupported conclusions
B. use ambiguous shorthand without definitions
C. discuss results publicly in the stated examination setting
D. document opinions as confirmed diagnoses

169. Which finding best represents unexpected incidental finding?

A. delete the image because it is outside the order
B. provide a definitive unrelated diagnosis
C. document and communicate it according to laboratory policy
D. ignore any potentially important mass

170. Which finding best represents exam modification?

A. stop after the minimum images regardless of findings in the stated examination setting
B. extend or adapt imaging when real-time findings justify it and policy permits
C. change patient identity to match an order in the stated examination setting
D. omit the symptomatic side in the stated examination setting

Practice Exam 8: Answer Key and Explanations

1. B — The common carotid supplies both external and internal carotid beds, so its normal waveform has an intermediate-to-low resistance pattern with forward diastolic flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation.

2. C — The external carotid supplies muscular and facial beds, producing a higher-resistance waveform than the internal carotid artery. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

3. C — The internal carotid supplies the brain, a continuously perfused low-resistance vascular bed, so forward diastolic flow is normally prominent. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

4. B — Normal vertebral arterial flow is antegrade, traveling cranially through the transverse foramina toward the basilar circulation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

5. D — A healthy resting limb has high peripheral resistance and elastic recoil, producing forward systole, brief early-diastolic reversal, and late forward flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

6. A — Normal peripheral venous flow varies with respiration and increases with distal augmentation, demonstrating patency between the compression site and sample location. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

7. A — Normal portal venous flow is hepatopetal, carrying nutrient-rich blood from the gastrointestinal tract and spleen toward the liver. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

8. C — Hepatic venous waveforms are characteristically pulsatile and multiphasic because right atrial pressure changes are transmitted into the hepatic veins. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

9. B — The kidneys require continuous perfusion, so normal renal arteries display low resistance and sustained forward flow during diastole. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

10. D — The celiac artery supplies the liver and spleen, which maintain low-resistance circulation even during fasting. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

11. B — During fasting, the superior mesenteric circulation has relatively high resistance; after eating, diastolic flow rises as bowel perfusion increases. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

12. C — The great saphenous vein courses in the superficial saphenous compartment and is commonly followed along the medial leg and thigh. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

13. A — The small saphenous vein usually ascends in the posterior calf and commonly drains near the popliteal fossa. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

14. D — At the groin, the common femoral vein usually lies medial to the common femoral artery, a useful orientation landmark. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

15. B — The brachial artery divides near the antecubital fossa into the radial and ulnar arteries supplying the forearm and hand. This is the single best choice because it integrates anatomy, hemodynamics, and

standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

16. A — The common femoral artery divides into the superficial femoral artery and the profunda femoris artery in the proximal thigh. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

17. C — The popliteal artery first gives rise to the anterior tibial artery and then continues as the tibioperoneal trunk. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

18. D — The distal abdominal aorta bifurcates into the right and left common iliac arteries, typically near the fourth lumbar vertebral level. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

19. D — The common carotid supplies both external and internal carotid beds, so its normal waveform has an intermediate-to-low resistance pattern with forward diastolic flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation.

20. A — The external carotid supplies muscular and facial beds, producing a higher-resistance waveform than the internal carotid artery. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

21. C — The internal carotid supplies the brain, a continuously perfused low-resistance vascular bed, so forward diastolic flow is normally prominent. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

22. B — Normal vertebral arterial flow is antegrade, traveling cranially through the transverse foramina toward the basilar circulation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

23. A — A healthy resting limb has high peripheral resistance and elastic recoil, producing forward systole, brief early-diastolic reversal, and late forward flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

24. B — Normal peripheral venous flow varies with respiration and increases with distal augmentation, demonstrating patency between the compression site and sample location. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

25. D — Normal portal venous flow is hepatopetal, carrying nutrient-rich blood from the gastrointestinal tract and spleen toward the liver. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

26. C — Hepatic venous waveforms are characteristically pulsatile and multiphasic because right atrial pressure changes are transmitted into the hepatic veins. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

27. C — The kidneys require continuous perfusion, so normal renal arteries display low resistance and sustained forward flow during diastole. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

28. B — The celiac artery supplies the liver and spleen, which maintain low-resistance circulation even during fasting. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

29. D — During fasting, the superior mesenteric circulation has relatively high resistance; after eating, diastolic flow rises as bowel perfusion increases. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

30. A — The great saphenous vein courses in the superficial saphenous compartment and is commonly followed along the medial leg and thigh. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel,

mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

31. D — The small saphenous vein usually ascends in the posterior calf and commonly drains near the popliteal fossa. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

32. B — At the groin, the common femoral vein usually lies medial to the common femoral artery, a useful orientation landmark. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

33. C — The brachial artery divides near the antecubital fossa into the radial and ulnar arteries supplying the forearm and hand. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

34. A — The common femoral artery divides into the superficial femoral artery and the profunda femoris artery in the proximal thigh. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

35. D — The popliteal artery first gives rise to the anterior tibial artery and then continues as the tibioperoneal trunk. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

36. B — The distal abdominal aorta bifurcates into the right and left common iliac arteries, typically near the fourth lumbar vertebral level. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

37. A — Acute thrombus often makes the vein enlarged and noncompressible, while recently formed clot may be relatively hypoechoic. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

38. C — Chronic thrombosis commonly produces echogenic organized material, wall thickening, recanalized channels, collateral veins, and a smaller irregular lumen. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

39. B — Pathologic reflux is sustained retrograde venous flow after a maneuver that challenges valve closure, not the brief transient response of normal valves. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

40. C — A pseudoaneurysm neck demonstrates blood entering the sac during systole and returning toward the artery during diastole, creating to-and-fro flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

41. A — Swirling blood in a pseudoaneurysm sac often produces the characteristic red-and-blue yin-yang appearance on color Doppler. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

42. D — An arteriovenous connection lowers downstream resistance, increases feeding-artery diastolic flow, and transmits pulsatility and arterialized velocity to the draining vein. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

43. D — A narrowing accelerates flow through the reduced lumen and commonly creates aliasing, turbulence, and spectral broadening at and beyond the lesion. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

44. A — True occlusion produces no flow within the obstructed segment despite optimized settings; collateral pathways may restore damped flow beyond it. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

45. B — A significant proximal obstruction dampens and delays the downstream systolic pressure wave, producing the tardus-parvus contour. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel,

mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

46. C — Proximal subclavian obstruction can lower pressure beyond the lesion and draw blood retrograde through the ipsilateral vertebral artery to supply the arm. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

47. D — Ulceration is an irregular depression in the plaque surface that may fill with color flow and increases embolic potential. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

48. C — Renal fibromuscular dysplasia classically affects the mid-to-distal artery and may create alternating narrowed and dilated segments rather than ostial plaque. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

49. B — Portal hypertension may enlarge portal veins, reduce or reverse hepatopetal flow, and create portosystemic collateral pathways. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

50. A — Budd-Chiari syndrome results from obstruction of hepatic venous outflow involving hepatic veins, the inferior vena cava, or both. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

51. C — Median arcuate ligament compression can narrow the proximal celiac artery, often producing respiratory variation in velocity and vessel configuration. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

52. B — The left renal vein may be compressed between the superior mesenteric artery and aorta, causing venous hypertension and collateralization. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

53. D — May-Thurner syndrome involves compression of the left common iliac vein by the overlying right common iliac artery against the spine. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

54. A — Popliteal aneurysms may thrombose or generate distal emboli, threatening tibial runoff and limb perfusion even without rupture. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

55. A — Chronic mesenteric arterial disease commonly causes postprandial pain because intestinal demand rises after eating but stenotic vessels cannot supply adequate flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

56. B — Reduced renal perfusion activates renin-mediated mechanisms that can produce difficult-to-control renovascular hypertension. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data, and clinical.

57. D — A carotid body tumor is typically hypervascular and located at the bifurcation, where it separates or splays the internal and external carotid arteries. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation.

58. C — A Baker cyst is a fluid-filled popliteal lesion that can cause posterior knee pain or swelling and clinically resemble venous thrombosis. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

59. B — Arterial thoracic outlet compression is dynamic; provocative arm positions may reduce subclavian flow, dampen the waveform, or reproduce symptoms. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

60. C — Continuous peripheral venous flow with loss of respiratory variation can indicate a more proximal obstruction between the sample and the heart. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives

describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

61. D — Compartment pressure can compromise microvascular tissue perfusion before large-artery Doppler signals disappear, so normal signals do not exclude the emergency. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

62. A — Aneurysm surveillance requires reproducible maximum diameter measurements perpendicular to the vessel axis, commonly from outer wall to outer wall. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

63. A — Dissection creates a tear and intimal flap that divides the aorta into true and false flow channels with potentially different Doppler characteristics. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

64. B — Acute thrombus often makes the vein enlarged and noncompressible, while recently formed clot may be relatively hypoechoic. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

65. D — Chronic thrombosis commonly produces echogenic organized material, wall thickening, recanalized channels, collateral veins, and a smaller irregular lumen. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

66. C — Pathologic reflux is sustained retrograde venous flow after a maneuver that challenges valve closure, not the brief transient response of normal valves. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

67. D — A pseudoaneurysm neck demonstrates blood entering the sac during systole and returning toward the artery during diastole, creating to-and-fro flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

68. C — Swirling blood in a pseudoaneurysm sac often produces the characteristic red-and-blue yin-yang appearance on color Doppler. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

69. B — An arteriovenous connection lowers downstream resistance, increases feeding-artery diastolic flow, and transmits pulsatility and arterialized velocity to the draining vein. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

70. A — A narrowing accelerates flow through the reduced lumen and commonly creates aliasing, turbulence, and spectral broadening at and beyond the lesion. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

71. C — True occlusion produces no flow within the obstructed segment despite optimized settings; collateral pathways may restore damped flow beyond it. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

72. A — A significant proximal obstruction dampens and delays the downstream systolic pressure wave, producing the tardus-parvus contour. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

73. D — Proximal subclavian obstruction can lower pressure beyond the lesion and draw blood retrograde through the ipsilateral vertebral artery to supply the arm. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

74. B — Ulceration is an irregular depression in the plaque surface that may fill with color flow and increases embolic potential. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

75. B — Renal fibromuscular dysplasia classically affects the mid-to-distal artery and may create alternating narrowed and dilated segments rather than ostial plaque. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The

alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

76. C — Portal hypertension may enlarge portal veins, reduce or reverse hepatopetal flow, and create portosystemic collateral pathways. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

77. D — Budd-Chiari syndrome results from obstruction of hepatic venous outflow involving hepatic veins, the inferior vena cava, or both. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

78. A — Median arcuate ligament compression can narrow the proximal celiac artery, often producing respiratory variation in velocity and vessel configuration. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

79. B — The left renal vein may be compressed between the superior mesenteric artery and aorta, causing venous hypertension and collateralization. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

80. A — May-Thurner syndrome involves compression of the left common iliac vein by the overlying right common iliac artery against the spine. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

81. C — Popliteal aneurysms may thrombose or generate distal emboli, threatening tibial runoff and limb perfusion even without rupture. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

82. D — Chronic mesenteric arterial disease commonly causes postprandial pain because intestinal demand rises after eating but stenotic vessels cannot supply adequate flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

83. C — Reduced renal perfusion activates renin-mediated mechanisms that can produce difficult-to-control renovascular hypertension. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data, and clinical.

84. B — A carotid body tumor is typically hypervascular and located at the bifurcation, where it separates or splays the internal and external carotid arteries. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation.

85. A — A Baker cyst is a fluid-filled popliteal lesion that can cause posterior knee pain or swelling and clinically resemble venous thrombosis. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

86. D — Arterial thoracic outlet compression is dynamic; provocative arm positions may reduce subclavian flow, dampen the waveform, or reproduce symptoms. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

87. A — Continuous peripheral venous flow with loss of respiratory variation can indicate a more proximal obstruction between the sample and the heart. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

88. C — Compartment pressure can compromise microvascular tissue perfusion before large-artery Doppler signals disappear, so normal signals do not exclude the emergency. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

89. B — Aneurysm surveillance requires reproducible maximum diameter measurements perpendicular to the vessel axis, commonly from outer wall to outer wall. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

90. D — Dissection creates a tear and intimal flap that divides the aorta into true and false flow channels with potentially different Doppler characteristics. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a

different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

91. C — A functioning arteriovenous access lowers resistance and increases inflow velocity and volume, creating a strongly diastolic arterial waveform. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

92. A — Outflow narrowing accelerates venous velocity, creates turbulence, and may elevate access pressures or reduce effective dialysis flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

93. B — Duplex surveillance identifies graft stenosis by focal acceleration, spectral disturbance, and comparison with adjacent graft velocities. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

94. D — An endoleak is continued perfusion of the excluded aneurysm sac outside the endograft lumen and requires classification and surveillance. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

95. D — TIPS surveillance assesses shunt patency, velocity changes, portal flow direction, and indirect signs of malfunction. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

96. B — Transplant evaluation includes the arterial anastomosis, main transplant artery, renal vein, and intrarenal perfusion patterns. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

97. A — Post-ablation ultrasound confirms intended treated-vein closure while checking the deep system for thrombus extension or other complications. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

98. C — Stent surveillance uses color and spectral Doppler through the stent and its edges, looking for focal acceleration or disturbed flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

99. A — Unexpected perigraft fluid, gas, inflammatory change, or pseudoaneurysm can raise concern for infection when correlated with the clinical presentation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

100. D — Dialysis steal occurs when access flow contributes to inadequate hand perfusion, often requiring comparison of distal flow with and without access compression. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

101. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

102. C — Medial arterial calcification can prevent cuff compression and falsely elevate ABI, so toe pressures or other methods are more informative. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

103. C — A substantial pressure decrease between adjacent limb levels localizes hemodynamically significant arterial disease to the intervening segment. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

104. B — Arterial obstruction progressively rounds and delays the PVR systolic upstroke while reducing amplitude and eliminating normal contour features. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

105. D — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical

response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

106. A — Toe vessels are less affected by medial calcification, making toe pressure useful when ankle arteries cannot be compressed reliably. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

107. D — Venous photoplethysmography evaluates refilling after calf-muscle emptying; abnormally rapid refill supports incompetent venous valves. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data.

108. C — An appropriately sized cuff distributes pressure effectively; a cuff that is too small can falsely elevate the measured pressure. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

109. A — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

110. B — Bilateral pressure and waveform comparison helps localize upper-extremity inflow or segmental arterial disease. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data, and.

111. C — The ABI compares the higher ankle artery pressure with the higher brachial pressure, creating a standardized ratio of limb to systemic pressure. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with.

112. A — Medial arterial calcification can prevent cuff compression and falsely elevate ABI, so toe pressures or other methods are more informative. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

113. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

114. D — Arterial obstruction progressively rounds and delays the PVR systolic upstroke while reducing amplitude and eliminating normal contour features. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

115. B — Exercise increases limb demand; a postexercise pressure decline can reveal arterial disease not apparent under resting conditions. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

116. A — Toe vessels are less affected by medial calcification, making toe pressure useful when ankle arteries cannot be compressed reliably. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

117. C — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

118. D — An appropriately sized cuff distributes pressure effectively; a cuff that is too small can falsely elevate the measured pressure. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

119. B — Temporary occlusion followed by release increases flow demand, allowing physiologic assessment of the limb's capacity to augment perfusion. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

120. D — Bilateral pressure and waveform comparison helps localize upper-extremity inflow or segmental arterial disease. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism,

artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data, and.

121. C — Continuous needle visualization and separation from the pseudoaneurysm neck reduce the risk of thrombin entering the native artery. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

122. A — Ultrasound-guided compression targets the neck to interrupt sac inflow while preserving and repeatedly checking distal perfusion. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

123. B — Ultrasound confirms intraluminal catheter position, safe distance from deep junctions, and circumferential tumescent coverage before energy delivery. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

124. D — Completion duplex provides immediate hemodynamic and anatomic assessment so a correctable technical defect can be addressed before closure. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

125. A — A sterile cover, appropriate sterile gel, and careful cable management protect the procedural field while maintaining image quality. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

126. C — After thrombin injection, ultrasound should document loss of sac flow while ensuring the native artery and distal circulation remain patent. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

127. B — Real-time visualization and a safe planned trajectory reduce unintended vascular injury during image-guided access or biopsy procedures. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

128. C — Intraoperative carotid imaging can identify residual narrowing, intimal flap, thrombus, or abnormal flow that may require immediate revision. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

129. D — A standardized timeout prevents wrong-patient, wrong-site, and wrong-procedure events and confirms team readiness before intervention. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

130. A — Patient safety takes priority; symptoms such as bradycardia, hypotension, pallor, or syncope require prompt assessment and team response. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

131. A — Ultrasound distinguishes a simple hematoma from active bleeding, pseudoaneurysm, or arteriovenous fistula and helps guide escalation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

132. D — Needle conspicuity improves when the insonation geometry produces a stronger specular reflection and the needle remains within the imaging plane. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

133. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

134. C — Velocity accuracy depends strongly on the cosine of the insonation angle, so consistent alignment at sixty degrees or less limits error. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

135. A — Excessive color gain causes color to spill beyond vessel boundaries; lowering gain until random extraluminal color disappears improves lumen definition. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives

describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

136. C — An oversized or poorly positioned sample volume records a wider range of velocities and can create artificial spectral broadening. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

137. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

138. D — Fluid attenuates less sound than surrounding tissue, leaving relatively greater beam intensity and brightness distal to the structure. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

139. C — ALARA guides prudent ultrasound use by minimizing acoustic exposure while still acquiring the diagnostic information needed for patient care. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

140. D — Regular phantom testing can reveal changes in resolution, sensitivity, distance accuracy, dead zone, or uniformity before clinical image quality degrades. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

141. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

142. A — Systematic sampling documents baseline, maximal jet velocity, and downstream disturbance, supporting accurate localization and grading. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

143. D — The wall filter suppresses low-frequency Doppler shifts; setting it too high can erase genuine slow venous or diastolic flow. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

144. B — Power Doppler depicts the strength of moving blood signals and is sensitive to slow flow, but it does not show direction or velocity. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation.

145. C — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

146. A — A strong specular reflector can redirect echoes and create an apparent duplicate structure at an incorrect deeper location. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

147. A — At high pulse repetition frequency, late returning echoes may be attributed to a later pulse and displayed at an incorrect depth. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

148. C — Appropriate use begins with the clinical question and selects a focused examination likely to provide meaningful information for management. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

149. B — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

150. D — Neutral posture, close patient positioning, equipment adjustment, and microbreaks reduce cumulative musculoskeletal strain for the sonographer. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives

describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

151. D — Critical findings require prompt communication through the approved chain, documentation of recipient and time, and confirmation that the message was understood. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

152. A — Reproducible technique and criteria allow meaningful assessment of progression, improvement, or postintervention change across serial studies. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

153. C — Resistive index equals PSV minus EDV divided by PSV; using 100 and 25 produces 0.75. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic.

154. B — Velocity accuracy depends strongly on the cosine of the insonation angle, so consistent alignment at sixty degrees or less limits error. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

155. A — Excessive color gain causes color to spill beyond vessel boundaries; lowering gain until random extraluminal color disappears improves lumen definition. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

156. B — An oversized or poorly positioned sample volume records a wider range of velocities and can create artificial spectral broadening. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

157. D — Two independent approved identifiers reduce wrong-patient errors before imaging, procedures, documentation, or communication occurs. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler, physiologic data.

158. C — A focused history directs protocol selection, helps interpret hemodynamic findings, and identifies prior interventions or risks that alter technique. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

159. D — Fasting can reduce bowel gas and postprandial mesenteric variation, but urgent examinations and patient safety may require protocol adaptation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

160. A — Clear documentation identifies which segments were limited, why they were limited, and how diagnostic confidence was affected. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral.

161. C — The technologist documents objective findings and communicates them through established policy while the authorized interpreting clinician provides the final interpretation. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging.

162. B — Complete, correctly labeled archives allow interpretation, comparison, quality review, and defensible documentation of the examination performed. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

163. B — Position affects hydrostatic pressure, venous filling, access, and safety; the protocol should be adapted while documenting meaningful limitations. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

164. C — Timely escalation of acute DVT, critical stenosis, aneurysm, or other urgent findings supports patient safety and continuity of care. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

165. A — A clear explanation improves cooperation and comfort while respecting the technologist's scope and the patient's right to ask questions or decline. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives

describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale.

166. D — Procedural details identify conduit type, anastomoses, stents, treated segments, and expected anatomy, guiding a complete and accurate examination. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow.

167. D — Medication review provides clinical context, identifies bleeding or procedural considerations, and helps explain physiologic responses without authorizing medication changes. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

168. A — Objective, standardized language makes preliminary findings understandable and reduces ambiguity while protecting confidentiality and professional scope. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color flow, spectral Doppler.

169. C — Potentially important incidental observations should be documented and escalated through policy so the interpreting clinician can determine appropriate follow-up. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.

170. B — Real-time findings may require additional views or segments, but modifications should remain clinically relevant, within protocol, and clearly documented. This is the single best choice because it integrates anatomy, hemodynamics, and standard vascular laboratory technique. The alternatives describe a different vessel, mechanism, artifact, or clinical response and therefore do not fit the stated finding. Correlation with grayscale imaging, color.