

PRACTICE EXAM 18: VASCULAR TECHNOLOGY SIMULATION (170 QUESTIONS)

This standalone practice exam contains 170 questions. Allow three hours, including review time, to simulate the ARDMS Vascular Technology examination. Select the single best answer for each item. The official examination uses a scaled score from 300 to 700; a score of 555 or better passes.

1. A vascular technologist obtains reproducible grayscale and Doppler data. which vein is formed by union of the splenic and superior mesenteric veins?

- A. Inferior vena cava
- B. Hepatic vein
- C. Left renal vein
- D. Portal vein

2. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which vein is formed by union of the splenic and superior mesenteric veins?

- A. Portal vein
- B. Inferior vena cava
- C. Hepatic vein
- D. Left renal vein

3. A referring clinician requests clarification of a duplex finding. the left renal vein normally passes between which structures?

- A. Celiac artery and pancreas
- B. Inferior vena cava and liver
- C. Superior mesenteric artery and aorta

D. Splenic artery and left kidney

4. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: the left renal vein normally passes between which structures?

A. Superior mesenteric artery and aorta

B. Celiac artery and pancreas

C. Inferior vena cava and liver

D. Splenic artery and left kidney

5. During correlation of symptoms with the recorded waveforms, which artery usually gives rise to the dorsalis pedis artery?

A. Posterior tibial artery

B. Peroneal artery

C. Popliteal artery

D. Anterior tibial artery

6. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which artery usually gives rise to the dorsalis pedis artery?

A. Posterior tibial artery

B. Anterior tibial artery

C. Peroneal artery

D. Popliteal artery

7. During a quality review of stored vascular images, which paired veins accompany the corresponding calf arteries?

A. Posterior tibial veins

B. Great saphenous veins

- C. Small saphenous veins
- D. Common femoral veins

8. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which paired veins accompany the corresponding calf arteries?

- A. Great saphenous veins
- B. Small saphenous veins
- C. Common femoral veins
- D. Posterior tibial veins

9. During review of a complete vascular examination, which intracranial artery is insonated through the transtemporal window flowing toward the probe at typical depth?

- A. Basilar artery
- B. Middle cerebral artery
- C. Vertebral artery
- D. Ophthalmic artery

10. During a quality review of stored vascular images, which answer best resolves the following point: which intracranial artery is insonated through the transtemporal window flowing toward the probe at typical depth?

- A. Basilar artery
- B. Vertebral artery
- C. Middle cerebral artery
- D. Ophthalmic artery

11. While following the laboratory's standardized protocol, where does the common carotid artery normally bifurcate?

- A. At the clavicular head
- B. Below the aortic arch
- C. Near the upper border of the thyroid cartilage
- D. At the mandibular angle only

12. During review of a complete vascular examination, which answer best resolves the following point: where does the common carotid artery normally bifurcate?

- A. At the clavicular head
- B. Below the aortic arch
- C. At the mandibular angle only
- D. Near the upper border of the thyroid cartilage

13. A sonographer checks vessel identity and hemodynamic significance. which artery commonly lies anterior to the aorta and crosses over the left renal vein?

- A. Inferior mesenteric artery
- B. Superior mesenteric artery
- C. Celiac artery
- D. Right renal artery

14. While following the laboratory's standardized protocol, which answer best resolves the following point: which artery commonly lies anterior to the aorta and crosses over the left renal vein?

- A. Superior mesenteric artery
- B. Inferior mesenteric artery
- C. Celiac artery
- D. Right renal artery

15. A vascular technologist obtains reproducible grayscale and Doppler data. which carotid branch normally shows a low-resistance Doppler waveform?

- A. External carotid artery
- B. Superior thyroid artery
- C. Occipital artery
- D. Internal carotid artery

16. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which carotid branch normally shows a low-resistance Doppler waveform?

- A. External carotid artery
- B. Internal carotid artery
- C. Superior thyroid artery
- D. Occipital artery

17. A referring clinician requests clarification of a duplex finding. which artery is the usual continuation of the external iliac artery below the inguinal ligament?

- A. Superficial femoral artery
- B. Deep femoral artery
- C. Common femoral artery
- D. Popliteal artery

18. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which artery is the usual continuation of the external iliac artery below the inguinal ligament?

- A. Common femoral artery
- B. Superficial femoral artery
- C. Deep femoral artery
- D. Popliteal artery

19. During correlation of symptoms with the recorded waveforms, which artery normally supplies the thyroid gland and arises from the external carotid?

- A. Vertebral artery
- B. Superior thyroid artery
- C. Internal thoracic artery
- D. Ascending cervical artery

20. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which artery normally supplies the thyroid gland and arises from the external carotid?

- A. Vertebral artery
- B. Internal thoracic artery
- C. Superior thyroid artery
- D. Ascending cervical artery

21. During a quality review of stored vascular images, which vessel is identified posterior to the medial malleolus?

- A. Anterior tibial artery
- B. Dorsalis pedis artery
- C. Peroneal artery
- D. Posterior tibial artery

22. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which vessel is identified posterior to the medial malleolus?

- A. Posterior tibial artery
- B. Anterior tibial artery
- C. Dorsalis pedis artery
- D. Peroneal artery

23. During review of a complete vascular examination, which superficial vein ascends along the medial leg and thigh?

- A. Small saphenous vein
- B. Anterior tibial vein
- C. Great saphenous vein
- D. Peroneal vein

24. During a quality review of stored vascular images, which answer best resolves the following point: which superficial vein ascends along the medial leg and thigh?

- A. Small saphenous vein
- B. Anterior tibial vein
- C. Peroneal vein
- D. Great saphenous vein

25. While following the laboratory's standardized protocol, which vessel is the direct continuation of the superficial femoral artery after the adductor hiatus?

- A. Popliteal artery
- B. Deep femoral artery
- C. Anterior tibial artery
- D. Common femoral artery

26. During review of a complete vascular examination, which answer best resolves the following point: which vessel is the direct continuation of the superficial femoral artery after the adductor hiatus?

- A. Deep femoral artery
- B. Popliteal artery
- C. Anterior tibial artery
- D. Common femoral artery

27. A sonographer checks vessel identity and hemodynamic significance. which veins drain directly into the inferior vena cava just below the diaphragm?

- A. Portal veins
- B. Splenic veins
- C. Superior mesenteric veins
- D. Hepatic veins

28. While following the laboratory's standardized protocol, which answer best resolves the following point: which veins drain directly into the inferior vena cava just below the diaphragm?

- A. Portal veins
- B. Hepatic veins
- C. Splenic veins
- D. Superior mesenteric veins

29. A vascular technologist obtains reproducible grayscale and Doppler data. which waveform is expected in a normal resting high-resistance lower-extremity artery?

- A. Continuous monophasic flow
- B. Markedly pulsatile venous flow
- C. Triphasic waveform
- D. To-and-fro portal flow

30. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which waveform is expected in a normal resting high-resistance lower-extremity artery?

- A. Triphasic waveform
- B. Continuous monophasic flow
- C. Markedly pulsatile venous flow
- D. To-and-fro portal flow

31. A referring clinician requests clarification of a duplex finding. what is the normal directional term for portal venous flow toward the liver?

- A. Hepatofugal
- B. Hepatopetal
- C. Retrograde systemic
- D. Bidirectional arterial

32. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: what is the normal directional term for portal venous flow toward the liver?

- A. Hepatofugal
- B. Retrograde systemic
- C. Hepatopetal
- D. Bidirectional arterial

33. During correlation of symptoms with the recorded waveforms, which vessel normally arises first from the aortic arch?

- A. Left common carotid artery
- B. Left subclavian artery
- C. Right common carotid artery
- D. Brachiocephalic artery

34. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which vessel normally arises first from the aortic arch?

- A. Brachiocephalic artery
- B. Left common carotid artery
- C. Left subclavian artery
- D. Right common carotid artery

35. During a quality review of stored vascular images, which vein lies most commonly medial to the common femoral artery at the groin?

- A. Great saphenous vein
- B. Common femoral vein
- C. Deep femoral vein
- D. External iliac vein

36. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which vein lies most commonly medial to the common femoral artery at the groin?

- A. Great saphenous vein
- B. Deep femoral vein
- C. Common femoral vein
- D. External iliac vein

37. During review of a complete vascular examination, a focal doubling of peak systolic velocity compared with an adjacent arterial segment generally suggests what?

- A. Approximately 50% diameter-reducing stenosis
- B. Normal laminar transition
- C. Complete arterial occlusion
- D. Isolated venous hypertension

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- A. Normal laminar transition
- B. Complete arterial occlusion
- C. Isolated venous hypertension
- D. Approximately 50% diameter-reducing stenosis

39. While following the laboratory's standardized protocol, which feature supports inflammatory superficial thrombophlebitis?

- A. Compressible deep vein without symptoms
- B. Tender noncompressible superficial vein with surrounding edema
- C. Normal phasic common femoral flow
- D. Painless patent artery with triphasic flow

40. During review of a complete vascular examination, which answer best resolves the following point: which feature supports inflammatory superficial thrombophlebitis?

- A. Tender noncompressible superficial vein with surrounding edema
- B. Compressible deep vein without symptoms
- C. Normal phasic common femoral flow
- D. Painless patent artery with triphasic flow

41. A sonographer checks vessel identity and hemodynamic significance. which waveform supports distal arterial vasodilation caused by tissue ischemia?

- A. Sharp triphasic high-resistance flow
- B. Zero diastolic flow with reversal
- C. Monophasic flow with continuous diastolic component
- D. Normal venous respiratory phasicity

42. While following the laboratory's standardized protocol, which answer best resolves the following point: which waveform supports distal arterial vasodilation caused by tissue ischemia?

- A. Sharp triphasic high-resistance flow
- B. Zero diastolic flow with reversal
- C. Normal venous respiratory phasicity
- D. Monophasic flow with continuous diastolic component

43. A vascular technologist obtains reproducible grayscale and Doppler data. which sonographic feature favors carotid dissection?

- A. Smooth concentric intima-media thickening
- B. Mobile intimal flap with separate flow channels
- C. Calcific plaque at the bulb only
- D. Uniform low-resistance flow bilaterally

44. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which sonographic feature favors carotid dissection?

- A. Smooth concentric intima-media thickening
- B. Calcific plaque at the bulb only
- C. Uniform low-resistance flow bilaterally
- D. Mobile intimal flap with separate flow channels

45. A referring clinician requests clarification of a duplex finding. which feature favors chronic rather than acute venous thrombosis?

- A. Echogenic wall-adherent material with recanalized channels
- B. Distended vein with soft thrombus
- C. Free-floating hypoechoic tail
- D. New complete noncompressibility

46. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which feature favors chronic rather than acute venous thrombosis?

- A. Distended vein with soft thrombus
- B. Free-floating hypoechoic tail
- C. Echogenic wall-adherent material with recanalized channels
- D. New complete noncompressibility

47. During correlation of symptoms with the recorded waveforms, which finding supports hemodynamically significant aortoiliac disease?

- A. Monophasic common femoral waveforms bilaterally
- B. Triphasic ankle waveforms bilaterally
- C. Normal respiratory venous phasicity
- D. Low-resistance internal carotid flow

48. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which finding supports hemodynamically significant aortoiliac disease?

- A. Triphasic ankle waveforms bilaterally
- B. Normal respiratory venous phasicity
- C. Monophasic common femoral waveforms bilaterally
- D. Low-resistance internal carotid flow

49. During a quality review of stored vascular images, which lesion commonly causes arm pressure asymmetry and dampened ipsilateral waveforms?

- A. Distal ulnar venous reflux
- B. Internal carotid tortuosity
- C. Contralateral femoral occlusion
- D. Proximal subclavian stenosis

50. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which lesion commonly causes arm pressure asymmetry and dampened ipsilateral waveforms?

- A. Distal ulnar venous reflux
- B. Proximal subclavian stenosis
- C. Internal carotid tortuosity
- D. Contralateral femoral occlusion

51. During review of a complete vascular examination, reversed flow in the vertebral artery most commonly suggests what condition?

- A. Distal internal carotid stenosis
- B. External carotid occlusion
- C. Proximal subclavian artery obstruction
- D. Jugular venous thrombosis

52. During a quality review of stored vascular images, which answer best resolves the following point: reversed flow in the vertebral artery most commonly suggests what condition?

- A. Proximal subclavian artery obstruction
- B. Distal internal carotid stenosis
- C. External carotid occlusion
- D. Jugular venous thrombosis

53. While following the laboratory's standardized protocol, a tardus-parvus waveform in a renal artery segment indicates what?

- A. Normal high-resistance perfusion
- B. Hemodynamically important proximal obstruction
- C. Distal arteriovenous fistula
- D. Isolated venous reflux

54. During review of a complete vascular examination, which answer best resolves the following point: a tardus-parvus waveform in a renal artery segment indicates what?

- A. Normal high-resistance perfusion
- B. Distal arteriovenous fistula
- C. Isolated venous reflux

D. Hemodynamically important proximal obstruction

55. A sonographer checks vessel identity and hemodynamic significance. which duplex finding most strongly indicates a hemodynamically significant focal arterial stenosis?

- A. Uniform velocity throughout the segment
- B. Spontaneous venous phasicity
- C. Complete color filling at low scale
- D. Focal velocity increase with post-stenotic turbulence

56. While following the laboratory's standardized protocol, which answer best resolves the following point: which duplex finding most strongly indicates a hemodynamically significant focal arterial stenosis?

- A. Uniform velocity throughout the segment
- B. Focal velocity increase with post-stenotic turbulence
- C. Spontaneous venous phasicity
- D. Complete color filling at low scale

57. A vascular technologist obtains reproducible grayscale and Doppler data. which finding is expected distal to a severe arterial stenosis?

- A. Higher pulsatility with early reversal
- B. Uniformly increased wall motion
- C. Dampened delayed systolic upstroke
- D. Normal sharp triphasic contour

58. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which finding is expected distal to a severe arterial stenosis?

- A. Dampened delayed systolic upstroke

- B. Higher pulsatility with early reversal
- C. Uniformly increased wall motion
- D. Normal sharp triphasic contour

59. A referring clinician requests clarification of a duplex finding. which finding suggests renal parenchymal disease rather than isolated main renal artery stenosis?

- A. Focal ostial aliasing on one side
- B. Localized main renal velocity increase
- C. Unilateral post-stenotic turbulence
- D. Elevated intrarenal resistive indices bilaterally

60. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which finding suggests renal parenchymal disease rather than isolated main renal artery stenosis?

- A. Elevated intrarenal resistive indices bilaterally
- B. Focal ostial aliasing on one side
- C. Localized main renal velocity increase
- D. Unilateral post-stenotic turbulence

61. During correlation of symptoms with the recorded waveforms, which finding is most consistent with acute lower-extremity deep vein thrombosis?

- A. Small compressible vein with echogenic walls
- B. Complete collapse under light pressure
- C. Dilated noncompressible vein with hypoechoic material
- D. Thin chronic web with collaterals

62. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which finding is most consistent with acute lower-extremity deep vein thrombosis?

- A. Small compressible vein with echogenic walls
- B. Dilated noncompressible vein with hypoechoic material
- C. Complete collapse under light pressure
- D. Thin chronic web with collaterals

63. During a quality review of stored vascular images, which carotid plaque feature raises concern for surface disruption?

- A. Smooth homogeneous wall contour
- B. Uniform anechoic blood pool
- C. Ulcerated irregular lumen interface
- D. Symmetric intima-media thickness

64. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which carotid plaque feature raises concern for surface disruption?

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- B. Ulcerated irregular lumen interface
- C. Uniform anechoic blood pool
- D. Symmetric intima-media thickness

65. During review of a complete vascular examination, which plaque composition usually produces dense acoustic shadowing?

- A. Heavily calcified plaque
- B. Soft lipid-rich plaque
- C. Fresh hypoechoic thrombus
- D. Uncomplicated fibrous cap

66. During a quality review of stored vascular images, which answer best resolves the following point: which plaque composition usually produces dense acoustic shadowing?

- A. Soft lipid-rich plaque
- B. Fresh hypoechoic thrombus
- C. Uncomplicated fibrous cap
- D. Heavily calcified plaque

67. While following the laboratory's standardized protocol, which transcranial Doppler change can indicate vasospasm?

- A. Uniformly absent venous pulsatility
- B. Rising focal mean flow velocity
- C. Falling extracranial venous velocity
- D. Stable low arterial velocities

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- C. Rising focal mean flow velocity
- D. Stable low arterial velocities

69. A sonographer checks vessel identity and hemodynamic significance. which waveform feature is expected near an arteriovenous fistula?

- A. High velocity with reduced downstream resistance
- B. Absent diastolic arterial flow
- C. Markedly increased pulsatility index
- D. Normal quiet venous phasicity

70. While following the laboratory's standardized protocol, which answer best resolves the following point: which waveform feature is expected near an arteriovenous fistula?

- A. Absent diastolic arterial flow
- B. Markedly increased pulsatility index
- C. Normal quiet venous phasicity
- D. High velocity with reduced downstream resistance

71. A vascular technologist obtains reproducible grayscale and Doppler data. which finding is most typical of significant venous valvular incompetence?

- A. Brief flow cessation with respiration
- B. Rapid antegrade augmentation only
- C. Complete venous compressibility
- D. Prolonged retrograde flow after provocation

72. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which finding is most typical of significant venous valvular incompetence?

- A. Brief flow cessation with respiration
- B. Rapid antegrade augmentation only
- C. Prolonged retrograde flow after provocation
- D. Complete venous compressibility

73. A referring clinician requests clarification of a duplex finding. which venous Doppler finding suggests proximal iliac obstruction?

- A. Normal augmentation after distal compression
- B. Loss of respiratory phasicity in the common femoral vein
- C. Complete collapse with transducer pressure
- D. Brief valve closure after Valsalva

74. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which venous Doppler finding suggests proximal iliac obstruction?

- A. Loss of respiratory phasicity in the common femoral vein
- B. Normal augmentation after distal compression
- C. Complete collapse with transducer pressure
- D. Brief valve closure after Valsalva

75. During correlation of symptoms with the recorded waveforms, which finding distinguishes complete arterial occlusion from near occlusion?

- A. Very low trickle flow through a channel
- B. No flow despite optimized sensitive settings
- C. Aliasing at the narrowest segment
- D. Post-stenotic spectral broadening

76. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which finding distinguishes complete arterial occlusion from near occlusion?

- A. Very low trickle flow through a channel
- B. Aliasing at the narrowest segment
- C. Post-stenotic spectral broadening
- D. No flow despite optimized sensitive settings

77. During a quality review of stored vascular images, which finding is most consistent with popliteal artery entrapment?

- A. Dynamic arterial compression during plantar flexion
- B. Fixed venous reflux during Valsalva
- C. Constant carotid velocity elevation
- D. Portal flow reversal after eating

78. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which finding is most consistent with popliteal artery entrapment?

- A. Fixed venous reflux during Valsalva
- B. Constant carotid velocity elevation
- C. Dynamic arterial compression during plantar flexion
- D. Portal flow reversal after eating

79. During review of a complete vascular examination, which color Doppler appearance is characteristic of a patent pseudoaneurysm sac?

- A. Bidirectional swirling yin-yang pattern
- B. Uniform single-color laminar flow
- C. No detectable flow at low scale
- D. Parallel venous color bands

80. During a quality review of stored vascular images, which answer best resolves the following point: which color Doppler appearance is characteristic of a patent pseudoaneurysm sac?

- A. Uniform single-color laminar flow
- B. No detectable flow at low scale
- C. Bidirectional swirling yin-yang pattern
- D. Parallel venous color bands

81. While following the laboratory's standardized protocol, which pattern is typical of pseudoaneurysm flow at the neck?

- A. Continuous hepatopetal waveform
- B. To-and-fro spectral waveform
- C. Triphasic high-resistance waveform
- D. Absent flow in every plane

82. During review of a complete vascular examination, which answer best resolves the following point: which pattern is typical of pseudoaneurysm flow at the neck?

- A. Continuous hepatopetal waveform
- B. Triphasic high-resistance waveform
- C. Absent flow in every plane
- D. To-and-fro spectral waveform

83. A sonographer checks vessel identity and hemodynamic significance. which duplex feature suggests thrombus within an aneurysm rather than flowing lumen?

- A. Echogenic material without internal Doppler signal
- B. Anechoic channel with color filling
- C. Pulsatile spectral signal in the sac
- D. Aliasing through the residual channel

84. While following the laboratory's standardized protocol, which answer best resolves the following point: which duplex feature suggests thrombus within an aneurysm rather than flowing lumen?

- A. Anechoic channel with color filling
- B. Pulsatile spectral signal in the sac
- C. Echogenic material without internal Doppler signal
- D. Aliasing through the residual channel

85. A vascular technologist obtains reproducible grayscale and Doppler data. which finding is characteristic of portal hypertension?

- A. Normal hepatopetal portal flow
- B. Hepatofugal portal venous flow
- C. Triphasic hepatic arterial flow
- D. Compressible portal vein

86. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which finding is characteristic of portal hypertension?

- A. Normal hepatopetal portal flow
- B. Hepatofugal portal venous flow
- C. Triphasic hepatic arterial flow
- D. Compressible portal vein

87. A referring clinician requests clarification of a duplex finding. which condition commonly produces elevated velocities in the celiac artery during expiration?

- A. Renal vein thrombosis
- B. Portal vein occlusion
- C. Inferior mesenteric aneurysm
- D. Median arcuate ligament compression

88. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which condition commonly produces elevated velocities in the celiac artery during expiration?

- A. Renal vein thrombosis
- B. Portal vein occlusion
- C. Median arcuate ligament compression
- D. Inferior mesenteric aneurysm

89. During correlation of symptoms with the recorded waveforms, which ultrasound finding is most concerning for impending abdominal aortic aneurysm rupture?

- A. New periaortic fluid with focal wall discontinuity
- B. Stable mural thrombus alone
- C. Posterior acoustic shadow from calcium
- D. Uniform residual lumen color

90. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which ultrasound finding is most concerning for impending abdominal aortic aneurysm rupture?

- A. Stable mural thrombus alone
- B. Posterior acoustic shadow from calcium
- C. Uniform residual lumen color
- D. New periaortic fluid with focal wall discontinuity

91. During a quality review of stored vascular images, which finding suggests stenosis in an infrainguinal bypass graft?

- A. Uniform laminar flow along the graft
- B. Expected low velocity in a large graft
- C. Focal graft velocity increase and disturbed flow
- D. Triphasic native inflow without change

92. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which finding suggests stenosis in an infrainguinal bypass graft?

- A. Focal graft velocity increase and disturbed flow
- B. Uniform laminar flow along the graft
- C. Expected low velocity in a large graft
- D. Triphasic native inflow without change

93. During review of a complete vascular examination, which finding indicates a hemodynamically significant dialysis graft stenosis?

- A. Uniform graft velocity and color fill
- B. Expected arterialized venous outflow
- C. Patent anastomosis without turbulence
- D. Focal velocity acceleration with lumen narrowing

94. During a quality review of stored vascular images, which answer best resolves the following point: which finding indicates a hemodynamically significant dialysis graft stenosis?

- A. Uniform graft velocity and color fill
- B. Focal velocity acceleration with lumen narrowing
- C. Expected arterialized venous outflow
- D. Patent anastomosis without turbulence

95. While following the laboratory's standardized protocol, which waveform is expected in the artery feeding a functioning dialysis fistula?

- A. High-resistance waveform with reversal
- B. Absent systolic flow throughout
- C. Normal portal venous waveform
- D. Low-resistance waveform with increased diastolic flow

96. During review of a complete vascular examination, which answer best resolves the following point: which waveform is expected in the artery feeding a functioning dialysis fistula?

- A. High-resistance waveform with reversal
- B. Low-resistance waveform with increased diastolic flow
- C. Absent systolic flow throughout
- D. Normal portal venous waveform

97. A sonographer checks vessel identity and hemodynamic significance. after carotid endarterectomy, which early finding requires urgent communication?

- A. Mild smooth wall thickening
- B. Expected caliber enlargement
- C. Mobile intraluminal thrombus at the repair site

D. Patent low-resistance internal carotid flow

98. While following the laboratory's standardized protocol, which answer best resolves the following point: after carotid endarterectomy, which early finding requires urgent communication?

- A. Mobile intraluminal thrombus at the repair site
- B. Mild smooth wall thickening
- C. Expected caliber enlargement
- D. Patent low-resistance internal carotid flow

99. A vascular technologist obtains reproducible grayscale and Doppler data. which endovascular aneurysm repair finding represents persistent sac perfusion?

- A. Endoleak
- B. Graft limb patency
- C. Sac shrinkage
- D. Normal triphasic limb flow

100. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which endovascular aneurysm repair finding represents persistent sac perfusion?

- A. Graft limb patency
- B. Sac shrinkage
- C. Normal triphasic limb flow
- D. Endoleak

101. A referring clinician requests clarification of a duplex finding. which method evaluates reactive hyperemia in an arterial study?

- A. Continuous venous compression
- B. Sustained breath holding only

- C. Temporary cuff occlusion followed by release
- D. Carotid tapping throughout

102. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which method evaluates reactive hyperemia in an arterial study?

- A. Continuous venous compression
- B. Temporary cuff occlusion followed by release
- C. Sustained breath holding only
- D. Carotid tapping throughout

103. During correlation of symptoms with the recorded waveforms, which response is normal after distal limb exercise in a healthy artery?

- A. Pressure remains markedly depressed for minutes
- B. Waveforms become persistently absent
- C. Ankle pressure returns promptly toward baseline
- D. Venous reflux becomes continuous

104. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which response is normal after distal limb exercise in a healthy artery?

- A. Pressure remains markedly depressed for minutes
- B. Waveforms become persistently absent
- C. Venous reflux becomes continuous
- D. Ankle pressure returns promptly toward baseline

105. During a quality review of stored vascular images, which maneuver helps evaluate thoracic outlet arterial compression?

- A. Provocative arm positioning with waveform monitoring

- B. Supine Valsalva during calf compression
- C. Fasting portal velocity measurement
- D. Trendelenburg carotid scanning

106. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which maneuver helps evaluate thoracic outlet arterial compression?

- A. Supine Valsalva during calf compression
- B. Provocative arm positioning with waveform monitoring
- C. Fasting portal velocity measurement
- D. Trendelenburg carotid scanning

107. During review of a complete vascular examination, which test assesses hand perfusion before radial artery harvest?

- A. Carotid bruit auscultation only
- B. Portal vein respiratory testing
- C. Calf venous reflux timing
- D. Palmar arch evaluation with digital waveforms

108. During a quality review of stored vascular images, which answer best resolves the following point: which test assesses hand perfusion before radial artery harvest?

- A. Carotid bruit auscultation only
- B. Portal vein respiratory testing
- C. Palmar arch evaluation with digital waveforms
- D. Calf venous reflux timing

109. While following the laboratory's standardized protocol, which finding suggests a pressure cuff is too narrow?

- A. Consistently absent venous signal
- B. Artificially elevated measured pressure
- C. Artificially reduced arterial diameter
- D. Reversed portal flow

110. During review of a complete vascular examination, which answer best resolves the following point: which finding suggests a pressure cuff is too narrow?

- A. Artificially elevated measured pressure
- B. Consistently absent venous signal
- C. Artificially reduced arterial diameter
- D. Reversed portal flow

111. A sonographer checks vessel identity and hemodynamic significance. which plethysmographic change suggests arterial inflow obstruction?

- A. Brisk upstroke with prominent peak
- B. Normal respiratory venous variation
- C. Increased amplitude after occlusion
- D. Reduced waveform amplitude with delayed systolic rise

112. While following the laboratory's standardized protocol, which answer best resolves the following point: which plethysmographic change suggests arterial inflow obstruction?

- A. Reduced waveform amplitude with delayed systolic rise
- B. Brisk upstroke with prominent peak
- C. Normal respiratory venous variation
- D. Increased amplitude after occlusion

113. A vascular technologist obtains reproducible grayscale and Doppler data. which maneuver is used to provoke lower-extremity venous reflux?

- A. Sustained proximal arterial compression
- B. Rapid ankle pressure inflation only
- C. Distal compression followed by sudden release
- D. Quiet breathing without augmentation

114. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which maneuver is used to provoke lower-extremity venous reflux?

- A. Sustained proximal arterial compression
- B. Distal compression followed by sudden release
- C. Rapid ankle pressure inflation only
- D. Quiet breathing without augmentation

115. A referring clinician requests clarification of a duplex finding. which physiologic test is most useful when ankle arteries are noncompressible?

- A. Ankle pressure alone
- B. Carotid pressure ratio
- C. Portal pulsatility index
- D. Toe pressure or toe-brachial index

116. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which physiologic test is most useful when ankle arteries are noncompressible?

- A. Ankle pressure alone
- B. Carotid pressure ratio
- C. Toe pressure or toe-brachial index
- D. Portal pulsatility index

117. During correlation of symptoms with the recorded waveforms, which physiologic pattern supports small-vessel disease in the foot?

- A. Abnormal toe waveforms despite acceptable ankle pressures
- B. Normal toe and ankle waveforms
- C. Triphasic brachial signals
- D. Normal venous augmentation

118. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: which physiologic pattern supports small-vessel disease in the foot?

- A. Normal toe and ankle waveforms
- B. Abnormal toe waveforms despite acceptable ankle pressures
- C. Triphasic brachial signals
- D. Normal venous augmentation

119. During a quality review of stored vascular images, which test best evaluates segmental severity of lower-extremity arterial disease?

- A. Venous reflux examination
- B. Carotid duplex only
- C. Segmental pressures with pulse volume recordings
- D. Portal vein Doppler

120. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which test best evaluates segmental severity of lower-extremity arterial disease?

- A. Venous reflux examination
- B. Carotid duplex only
- C. Portal vein Doppler
- D. Segmental pressures with pulse volume recordings

121. During review of a complete vascular examination, which ultrasound finding confirms guidewire location within a vessel?

- A. Shadow outside the vessel only
- B. Echogenic linear structure coursing in the lumen
- C. Loss of all vessel compressibility
- D. Stationary skin artifact

122. During a quality review of stored vascular images, which answer best resolves the following point: which ultrasound finding confirms guidewire location within a vessel?

- A. Echogenic linear structure coursing in the lumen
- B. Shadow outside the vessel only
- C. Loss of all vessel compressibility
- D. Stationary skin artifact

123. While following the laboratory's standardized protocol, which practice helps maintain sterility during an ultrasound-guided procedure?

- A. Use a sterile probe cover and sterile gel
- B. Use ordinary gel beneath the needle
- C. Touch the field with an uncovered probe
- D. Reuse a contaminated cover

124. During review of a complete vascular examination, which answer best resolves the following point: which practice helps maintain sterility during an ultrasound-guided procedure?

- A. Use ordinary gel beneath the needle
- B. Touch the field with an uncovered probe
- C. Reuse a contaminated cover
- D. Use a sterile probe cover and sterile gel

125. A sonographer checks vessel identity and hemodynamic significance. before ultrasound-guided arterial access, what should be confirmed?

- A. Only the patient's height
- B. Target patency and absence of obstructing plaque
- C. Portal vein direction
- D. Carotid intima thickness

126. While following the laboratory's standardized protocol, which answer best resolves the following point: before ultrasound-guided arterial access, what should be confirmed?

- A. Only the patient's height
- B. Portal vein direction
- C. Target patency and absence of obstructing plaque
- D. Carotid intima thickness

127. A vascular technologist obtains reproducible grayscale and Doppler data. what is the purpose of intraoperative completion duplex after bypass?

- A. Detect technical defects before wound closure
- B. Measure chronic venous reflux only
- C. Diagnose unrelated carotid disease
- D. Replace all clinical monitoring

128. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: what is the purpose of intraoperative completion duplex after bypass?

- A. Measure chronic venous reflux only
- B. Diagnose unrelated carotid disease
- C. Replace all clinical monitoring
- D. Detect technical defects before wound closure

129. A referring clinician requests clarification of a duplex finding. what is the safest needle visualization principle during ultrasound guidance?

- A. Track only the needle hub
- B. Keep the needle tip continuously identified
- C. Advance whenever tissue moves
- D. Ignore the beam orientation

130. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: what is the safest needle visualization principle during ultrasound guidance?

- A. Keep the needle tip continuously identified
- B. Track only the needle hub
- C. Advance whenever tissue moves
- D. Ignore the beam orientation

131. During correlation of symptoms with the recorded waveforms, during thrombin injection of a pseudoaneurysm, what requires continuous monitoring?

- A. Only systemic venous phasicity
- B. Carotid wall thickness
- C. Parent artery patency and sac thrombosis
- D. Portal respiratory variation

132. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: during thrombin injection of a pseudoaneurysm, what requires continuous monitoring?

- A. Only systemic venous phasicity
- B. Parent artery patency and sac thrombosis
- C. Carotid wall thickness
- D. Portal respiratory variation

133. During a quality review of stored vascular images, which transducer is generally preferred for superficial carotid imaging?

- A. Low-frequency phased array
- B. Continuous-wave pencil probe only
- C. Low-frequency curvilinear array
- D. High-frequency linear array

134. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which transducer is generally preferred for superficial carotid imaging?

- A. Low-frequency phased array
- B. Continuous-wave pencil probe only
- C. High-frequency linear array
- D. Low-frequency curvilinear array

135. During review of a complete vascular examination, which control most directly changes the frequency of emitted pulses?

- A. Overall B-mode gain
- B. Pulse repetition frequency
- C. Dynamic range
- D. Gray-map selection

136. During a quality review of stored vascular images, which answer best resolves the following point: which control most directly changes the frequency of emitted pulses?

- A. Overall B-mode gain
- B. Dynamic range
- C. Pulse repetition frequency
- D. Gray-map selection

137. While following the laboratory's standardized protocol, what commonly causes spectral broadening artifact?

- A. Appropriately centered small gate
- B. Correct angle alignment
- C. Low output power alone
- D. Excessively large Doppler sample volume

138. During review of a complete vascular examination, which answer best resolves the following point: what commonly causes spectral broadening artifact?

- A. Excessively large Doppler sample volume
- B. Appropriately centered small gate
- C. Correct angle alignment
- D. Low output power alone

139. A sonographer checks vessel identity and hemodynamic significance. what should be done when a transducer cable has exposed wiring?

- A. Cover it temporarily and continue
- B. Remove it from service and report the defect
- C. Immerse the connector in disinfectant
- D. Use maximum output to test it

140. While following the laboratory's standardized protocol, which answer best resolves the following point: what should be done when a transducer cable has exposed wiring?

- A. Cover it temporarily and continue
- B. Immerse the connector in disinfectant
- C. Remove it from service and report the defect
- D. Use maximum output to test it

141. A vascular technologist obtains reproducible grayscale and Doppler data. which phantom test evaluates distance measurement accuracy?

- A. Imaging known targets at calibrated separations
- B. Measuring patient blood pressure
- C. Counting stored reports
- D. Reviewing appointment duration

142. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which phantom test evaluates distance measurement accuracy?

- A. Measuring patient blood pressure
- B. Counting stored reports
- C. Reviewing appointment duration
- D. Imaging known targets at calibrated separations

143. A referring clinician requests clarification of a duplex finding. which quality measure compares test results with a reference standard?

- A. Room turnover time
- B. Accuracy correlation
- C. Patient arrival interval
- D. Transducer cable length

144. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which quality measure compares test results with a reference standard?

- A. Accuracy correlation
- B. Room turnover time
- C. Patient arrival interval
- D. Transducer cable length

145. During correlation of symptoms with the recorded waveforms, what is the effect of increasing wall filter?

- A. Improved display of slow venous flow
- B. Increased penetration of B-mode
- C. Removal of low-frequency Doppler shifts
- D. Elimination of all aliasing

146. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: what is the effect of increasing wall filter?

- A. Improved display of slow venous flow
- B. Increased penetration of B-mode
- C. Elimination of all aliasing
- D. Removal of low-frequency Doppler shifts

147. During a quality review of stored vascular images, which Doppler angle practice best supports reproducible velocity measurement?

- A. Use 90 degrees for every vessel
- B. Keep the correction cursor parallel to flow at 60 degrees or less
- C. Align the cursor with the vessel wall regardless of flow
- D. Change the angle between serial measurements

148. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: which Doppler angle practice best supports reproducible velocity measurement?

- A. Keep the correction cursor parallel to flow at 60 degrees or less
- B. Use 90 degrees for every vessel
- C. Align the cursor with the vessel wall regardless of flow
- D. Change the angle between serial measurements

149. During review of a complete vascular examination, which action follows the ALARA principle?

- A. Use maximum output throughout imaging
- B. Maintain prolonged spectral Doppler sampling
- C. Disregard displayed output indicators
- D. Use minimum output and exposure needed

150. During a quality review of stored vascular images, which answer best resolves the following point: which action follows the ALARA principle?

- A. Use maximum output throughout imaging
- B. Maintain prolonged spectral Doppler sampling
- C. Use minimum output and exposure needed
- D. Disregard displayed output indicators

151. While following the laboratory's standardized protocol, what does color Doppler blooming indicate?

- A. The vessel is definitely stenosed
- B. The transducer frequency is too low only
- C. The wall filter is always too high
- D. Color gain is excessively high

152. During review of a complete vascular examination, which answer best resolves the following point: what does color Doppler blooming indicate?

- A. The vessel is definitely stenosed
- B. The transducer frequency is too low only
- C. Color gain is excessively high
- D. The wall filter is always too high

153. A sonographer checks vessel identity and hemodynamic significance. which change improves detection of very slow venous flow?

- A. Lower scale and wall filter
- B. Raise scale and wall filter
- C. Increase transducer pressure
- D. Reduce color gain to zero

154. While following the laboratory's standardized protocol, which answer best resolves the following point: which change improves detection of very slow venous flow?

- A. Raise scale and wall filter
- B. Lower scale and wall filter
- C. Increase transducer pressure
- D. Reduce color gain to zero

155. A vascular technologist obtains reproducible grayscale and Doppler data. which adjustment reduces color aliasing when true velocity is high?

- A. Lower the pulse repetition frequency
- B. Increase the color velocity scale
- C. Raise baseline without changing scale
- D. Increase persistence maximally

156. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which adjustment reduces color aliasing when true velocity is high?

- A. Increase the color velocity scale
- B. Lower the pulse repetition frequency
- C. Raise baseline without changing scale
- D. Increase persistence maximally

157. A referring clinician requests clarification of a duplex finding. which documentation supports reproducible serial surveillance?

- A. Save one unlabeled image
- B. Report only that flow was seen
- C. Record vessel segment, method, angle, and measured values
- D. Omit prior-study comparison

158. A vascular technologist obtains reproducible grayscale and Doppler data. which answer best resolves the following point: which documentation supports reproducible serial surveillance?

- A. Save one unlabeled image
- B. Report only that flow was seen
- C. Omit prior-study comparison
- D. Record vessel segment, method, angle, and measured values

159. During correlation of symptoms with the recorded waveforms, what should occur before scanning a painful postoperative limb?

- A. Apply maximal pressure immediately
- B. Remove dressings without authorization
- C. Explain the examination and assess tolerance and precautions
- D. Ignore infection-control requirements

160. A referring clinician requests clarification of a duplex finding. which answer best resolves the following point: what should occur before scanning a painful postoperative limb?

- A. Apply maximal pressure immediately
- B. Explain the examination and assess tolerance and precautions
- C. Remove dressings without authorization
- D. Ignore infection-control requirements

161. During a quality review of stored vascular images, how should a critical vascular finding be documented?

- A. Mention it only at shift change
- B. Delete preliminary images
- C. Wait for routine report signing
- D. Record the finding, recipient, time, and read-back per policy

162. During correlation of symptoms with the recorded waveforms, which answer best resolves the following point: how should a critical vascular finding be documented?

- A. Record the finding, recipient, time, and read-back per policy
- B. Mention it only at shift change
- C. Delete preliminary images
- D. Wait for routine report signing

163. During review of a complete vascular examination, before beginning a vascular examination, which action is essential?

- A. Rely only on room location
- B. Verify patient identity using approved identifiers
- C. Use the diagnosis as identity
- D. Ask another patient to confirm

164. During a quality review of stored vascular images, which answer best resolves the following point: before beginning a vascular examination, which action is essential?

- A. Verify patient identity using approved identifiers
- B. Rely only on room location
- C. Use the diagnosis as identity
- D. Ask another patient to confirm

165. While following the laboratory's standardized protocol, which preparation is commonly requested for a mesenteric duplex study?

- A. Heavy meal immediately beforehand
- B. Continuous exercise before scanning
- C. Fasting to reduce bowel gas and postprandial flow effects
- D. Full bladder for every patient

166. During review of a complete vascular examination, which answer best resolves the following point: which preparation is commonly requested for a mesenteric duplex study?

- A. Heavy meal immediately beforehand
- B. Continuous exercise before scanning
- C. Full bladder for every patient
- D. Fasting to reduce bowel gas and postprandial flow effects

167. A sonographer checks vessel identity and hemodynamic significance. what is the best response when the ultrasound order conflicts with the patient's symptoms?

- A. Perform an unrelated study without notice
- B. Change the order silently
- C. Clarify the requested examination before proceeding
- D. Ignore the symptoms completely

168. While following the laboratory's standardized protocol, which answer best resolves the following point: what is the best response when the ultrasound order conflicts with the patient's symptoms?

- A. Perform an unrelated study without notice
- B. Change the order silently
- C. Ignore the symptoms completely
- D. Clarify the requested examination before proceeding

169. A vascular technologist obtains reproducible grayscale and Doppler data. which history detail is most relevant before a lower-extremity arterial study?

- A. Preferred sleeping position only
- B. Location and timing of exertional symptoms
- C. Remote dental procedure
- D. Dominant writing hand alone

170. A sonographer checks vessel identity and hemodynamic significance. which answer best resolves the following point: which history detail is most relevant before a lower-extremity arterial study?

- A. Location and timing of exertional symptoms
- B. Preferred sleeping position only
- C. Remote dental procedure
- D. Dominant writing hand alone

Practice Exam 18: Answer Key and Explanations

1. D — The main portal vein is usually formed posterior to the pancreatic neck by union of the splenic and superior mesenteric veins. It carries nutrient-rich blood toward the liver. Hepatic veins instead drain the liver into the inferior vena cava. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic.

2. A — The main portal vein is usually formed posterior to the pancreatic neck by union of the splenic and superior mesenteric veins. It carries nutrient-rich blood toward the liver. Hepatic veins instead drain the liver into the inferior vena cava. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple.

3. C — The left renal vein crosses anterior to the aorta and posterior to the superior mesenteric artery before entering the inferior vena cava. This anatomic corridor is clinically important because compression there can produce nutcracker physiology. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

4. A — The left renal vein crosses anterior to the aorta and posterior to the superior mesenteric artery before entering the inferior vena cava. This anatomic corridor is clinically important because

compression there can produce nutcracker physiology. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

5. D — The anterior tibial artery crosses the ankle and continues as the dorsalis pedis artery on the foot. The posterior tibial passes behind the medial malleolus, while the peroneal remains deeper and lateral. The popliteal divides proximally into tibial pathways. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic.

6. B — The anterior tibial artery crosses the ankle and continues as the dorsalis pedis artery on the foot. The posterior tibial passes behind the medial malleolus, while the peroneal remains deeper and lateral. The popliteal divides proximally into tibial pathways. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple.

7. A — Deep calf arteries are commonly accompanied by paired venae comitantes, including the posterior tibial veins. The great and small saphenous veins are superficial single trunks, while the common femoral vein is normally a single proximal vessel. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

8. D — Deep calf arteries are commonly accompanied by paired venae comitantes, including the posterior tibial veins. The great and small saphenous veins are superficial single trunks, while the common femoral vein is normally a single proximal vessel. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

9. B — The middle cerebral artery is commonly found through the transtemporal window and normally flows toward the transducer at standard depths. The basilar and vertebral arteries are usually assessed through the suboccipital window, while the ophthalmic artery is examined transorbitally. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic.

10. C — The middle cerebral artery is commonly found through the transtemporal window and normally flows toward the transducer at standard depths. The basilar and vertebral arteries are usually assessed through the suboccipital window, while the ophthalmic artery is examined transorbitally. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple.

11. C — The common carotid typically bifurcates near the C3-C4 level, around the upper border of the thyroid cartilage, although normal variation exists. The clavicle and aortic arch are too proximal, and the mandibular angle is usually more distal. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

12. D — The common carotid typically bifurcates near the C3-C4 level, around the upper border of the thyroid cartilage, although normal variation exists. The clavicle and aortic arch are too proximal, and the mandibular angle is usually more distal. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

13. B — The superior mesenteric artery arises from the anterior aorta and passes over the left renal vein. This relationship creates the anatomic angle implicated in renal vein compression. The other arteries have different origins or courses. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

14. A — The superior mesenteric artery arises from the anterior aorta and passes over the left renal vein. This relationship creates the anatomic angle implicated in renal vein compression. The other arteries have different origins or courses. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

15. D — The internal carotid supplies the brain, a continuously perfused low-resistance vascular bed, so forward diastolic flow is normally prominent. External carotid branches supply higher-resistance facial and scalp beds and generally demonstrate more pulsatility and less sustained diastolic flow. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

16. B — The internal carotid supplies the brain, a continuously perfused low-resistance vascular bed, so forward diastolic flow is normally prominent. External carotid branches supply higher-resistance facial and scalp beds and generally demonstrate more pulsatility and less sustained diastolic flow. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views.

17. C — The external iliac artery becomes the common femoral artery as it passes beneath the inguinal ligament. The common femoral later bifurcates into the superficial femoral and deep femoral arteries. The popliteal artery is a distal continuation beyond the adductor hiatus. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated.

18. A — The external iliac artery becomes the common femoral artery as it passes beneath the inguinal ligament. The common femoral later bifurcates into the superficial femoral and deep femoral arteries. The popliteal artery is a distal continuation beyond the adductor hiatus. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in.

19. B — The superior thyroid artery is usually the first anterior branch of the external carotid and supplies the upper thyroid. Its presence can help distinguish the external carotid from the internal carotid, which has no cervical branches. This conclusion should be integrated with the remaining

examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

20. C — The superior thyroid artery is usually the first anterior branch of the external carotid and supplies the upper thyroid. Its presence can help distinguish the external carotid from the internal carotid, which has no cervical branches. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

21. D — The posterior tibial artery travels behind the medial malleolus with its paired veins and is accessible there for Doppler assessment. The anterior tibial continues onto the dorsum as dorsalis pedis. The peroneal artery courses deeper along the fibula. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

22. A — The posterior tibial artery travels behind the medial malleolus with its paired veins and is accessible there for Doppler assessment. The anterior tibial continues onto the dorsum as dorsalis pedis. The peroneal artery courses deeper along the fibula. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views.

23. C — The great saphenous vein travels anterior to the medial malleolus and ascends along the medial leg and thigh to join the common femoral vein. The small saphenous courses posteriorly, while tibial and peroneal veins are deep paired veins. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

24. D — The great saphenous vein travels anterior to the medial malleolus and ascends along the medial leg and thigh to join the common femoral vein. The small saphenous courses posteriorly, while tibial and peroneal veins are deep paired veins. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views.

25. A — After passing through the adductor hiatus, the superficial femoral artery becomes the popliteal artery. The popliteal later divides into tibial pathways. The deep femoral branches proximally, and the common femoral is located above the bifurcation. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

26. B — After passing through the adductor hiatus, the superficial femoral artery becomes the popliteal artery. The popliteal later divides into tibial pathways. The deep femoral branches proximally, and the common femoral is located above the bifurcation. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

27. D — The hepatic veins carry blood from the liver directly into the inferior vena cava near the diaphragm. Portal, splenic, and superior mesenteric veins belong to the portal circulation and deliver blood to the liver rather than directly to the cava. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated.

28. B — The hepatic veins carry blood from the liver directly into the inferior vena cava near the diaphragm. Portal, splenic, and superior mesenteric veins belong to the portal circulation and deliver blood to the liver rather than directly to the cava. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in.

29. C — A healthy resting limb artery typically shows rapid systolic forward flow, brief early-diastolic reversal, and late-diastolic forward flow. This triphasic pattern reflects good arterial compliance and high peripheral resistance. Continuous monophasic flow suggests altered resistance or disease, while the other patterns are venous. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and.

30. A — A healthy resting limb artery typically shows rapid systolic forward flow, brief early-diastolic reversal, and late-diastolic forward flow. This triphasic pattern reflects good arterial compliance and high peripheral resistance. Continuous monophasic flow suggests altered resistance or disease, while the other patterns are venous. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming.

31. B — Hepatopetal means flowing toward the liver and describes normal main portal venous direction. Hepatofugal denotes flow away from the liver and may occur with significant portal hypertension. The remaining terms do not correctly describe normal portal venous direction. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

32. C — Hepatopetal means flowing toward the liver and describes normal main portal venous direction. Hepatofugal denotes flow away from the liver and may occur with significant portal hypertension. The remaining terms do not correctly describe normal portal venous direction. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views.

33. D — In the usual arch configuration, the brachiocephalic artery is the first branch. It subsequently divides into the right common carotid and right subclavian arteries. The left common carotid and left subclavian arise separately and more distally from the arch. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic.

34. A — In the usual arch configuration, the brachiocephalic artery is the first branch. It subsequently divides into the right common carotid and right subclavian arteries. The left common carotid and left subclavian arise separately and more distally from the arch. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple.

35. B — At the groin the common femoral vein generally lies medial to the common femoral artery. Recognizing this relationship supports correct vessel identification and compression technique. The great saphenous joins superficially, while the deep femoral and external iliac occupy different levels. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated.

36. C — At the groin the common femoral vein generally lies medial to the common femoral artery. Recognizing this relationship supports correct vessel identification and compression technique. The great saphenous joins superficially, while the deep femoral and external iliac occupy different levels. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in.

37. A — A focal velocity ratio near 2:1 commonly supports an approximately 50% diameter reduction in many peripheral arterial criteria sets. Exact thresholds are laboratory and vessel specific, so morphology, color findings, and downstream waveforms must also be considered. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

38. D — A focal velocity ratio near 2:1 commonly supports an approximately 50% diameter reduction in many peripheral arterial criteria sets. Exact thresholds are laboratory and vessel specific, so morphology, color findings, and downstream waveforms must also be considered. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

39. B — Superficial thrombophlebitis typically produces pain, tenderness, wall thickening, intraluminal thrombus, noncompressibility, and surrounding inflammatory change in a superficial vein. Deep veins must also be assessed because concurrent deep thrombosis can occur. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

40. A — Superficial thrombophlebitis typically produces pain, tenderness, wall thickening, intraluminal thrombus, noncompressibility, and surrounding inflammatory change in a superficial vein. Deep veins must also be assessed because concurrent deep thrombosis can occur. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

41. C — Ischemic tissue lowers distal resistance, often producing monophasic arterial flow with persistent forward diastolic flow. A crisp triphasic pattern reflects normal high resistance at rest. Venous phasicity is not an arterial resistance indicator. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

42. D — Ischemic tissue lowers distal resistance, often producing monophasic arterial flow with persistent forward diastolic flow. A crisp triphasic pattern reflects normal high resistance at rest. Venous phasicity is not an arterial resistance indicator. The distractors involve a different anatomic level, flow

mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

43. B — Dissection may create an intimal flap separating true and false lumens, with differing flow patterns or mural hematoma. Atherosclerotic calcification at the bulb and symmetric normal flow do not establish dissection. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

44. D — Dissection may create an intimal flap separating true and false lumens, with differing flow patterns or mural hematoma. Atherosclerotic calcification at the bulb and symmetric normal flow do not establish dissection. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

45. A — Chronic thrombotic change commonly appears echogenic, contracted, wall adherent, and partly recanalized, sometimes with collaterals. Acute thrombus more often distends the vein and is relatively hypoechoic. Clinical history and the full examination remain important. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

46. C — Chronic thrombotic change commonly appears echogenic, contracted, wall adherent, and partly recanalized, sometimes with collaterals. Acute thrombus more often distends the vein and is relatively hypoechoic. Clinical history and the full examination remain important. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

47. A — Bilateral monophasic common femoral waveforms suggest inflow disease proximal to both groins, often involving the aorta or iliac arteries. Normal triphasic distal waveforms would argue against major inflow compromise. The other findings involve different vascular systems. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

48. C — Bilateral monophasic common femoral waveforms suggest inflow disease proximal to both groins, often involving the aorta or iliac arteries. Normal triphasic distal waveforms would argue against major inflow compromise. The other findings involve different vascular systems. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

49. D — A proximal subclavian stenosis reduces pressure delivered to the affected arm, creating interarm pressure differences and dampened downstream arterial waveforms. Severe disease may alter vertebral flow direction. The alternative lesions do not explain the full upper-extremity pattern. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

50. B — A proximal subclavian stenosis reduces pressure delivered to the affected arm, creating interarm pressure differences and dampened downstream arterial waveforms. Severe disease may alter vertebral flow direction. The alternative lesions do not explain the full upper-extremity pattern. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

51. C — A pressure-reducing stenosis or occlusion proximal to the vertebral origin can draw blood retrograde down the vertebral artery to supply the arm, producing subclavian steal physiology. Carotid and jugular lesions do not create this classic pattern. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

52. A — A pressure-reducing stenosis or occlusion proximal to the vertebral origin can draw blood retrograde down the vertebral artery to supply the arm, producing subclavian steal physiology. Carotid and jugular lesions do not create this classic pattern. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

53. B — Tardus-parvus morphology combines a delayed systolic upstroke with reduced systolic amplitude and reflects dampening beyond a significant proximal stenosis. It is an indirect downstream sign. Venous reflux and isolated fistula physiology produce different waveform changes. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

54. D — Tardus-parvus morphology combines a delayed systolic upstroke with reduced systolic amplitude and reflects dampening beyond a significant proximal stenosis. It is an indirect downstream sign. Venous reflux and isolated fistula physiology produce different waveform changes. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

55. D — A significant narrowing accelerates blood locally and often produces spectral broadening and turbulence downstream. Comparing the stenotic velocity with an adjacent normal segment strengthens interpretation. Uniform velocity and normal venous findings do not demonstrate focal arterial narrowing. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

56. B — A significant narrowing accelerates blood locally and often produces spectral broadening and turbulence downstream. Comparing the stenotic velocity with an adjacent normal segment strengthens interpretation. Uniform velocity and normal venous findings do not demonstrate focal arterial narrowing. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

57. C — A severe upstream lesion dissipates pulse energy and delays systolic acceleration, causing a dampened tardus-parvus or monophasic distal waveform. A sharp triphasic contour argues against major proximal obstruction at that level. This conclusion should be integrated with the remaining examination,

the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

58. A — A severe upstream lesion dissipates pulse energy and delays systolic acceleration, causing a dampened tardus-parvus or monophasic distal waveform. A sharp triphasic contour argues against major proximal obstruction at that level. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

59. D — Bilateral elevation of intrarenal resistance suggests diffuse parenchymal or small-vessel disease, especially when kidneys show structural changes. Focal ostial acceleration and post-stenotic turbulence are direct signs of main renal artery narrowing. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

60. A — Bilateral elevation of intrarenal resistance suggests diffuse parenchymal or small-vessel disease, especially when kidneys show structural changes. Focal ostial acceleration and post-stenotic turbulence are direct signs of main renal artery narrowing. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

61. C — Acute thrombus often makes the vein enlarged and noncompressible, with relatively hypoechoic intraluminal material. Chronic disease more often produces wall thickening, echogenic residual material, webs, reduced caliber, and collateral channels. Compression remains the primary diagnostic maneuver. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

62. B — Acute thrombus often makes the vein enlarged and noncompressible, with relatively hypoechoic intraluminal material. Chronic disease more often produces wall thickening, echogenic residual material, webs, reduced caliber, and collateral channels. Compression remains the primary diagnostic maneuver. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

63. C — An irregular plaque surface with a distinct crater communicating with the lumen suggests ulceration and possible embolic potential. Smooth homogeneous contour and uniform blood filling do not indicate surface disruption. Careful multiplanar imaging helps avoid artifact. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

64. B — An irregular plaque surface with a distinct crater communicating with the lumen suggests ulceration and possible embolic potential. Smooth homogeneous contour and uniform blood filling do not indicate surface disruption. Careful multiplanar imaging helps avoid artifact. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

65. A — Calcium strongly attenuates and reflects ultrasound, commonly creating bright echoes with posterior acoustic shadowing. Soft plaque and fresh thrombus tend to be less echogenic and usually do not produce dense shadowing. Shadowing can obscure the residual lumen. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

66. D — Calcium strongly attenuates and reflects ultrasound, commonly creating bright echoes with posterior acoustic shadowing. Soft plaque and fresh thrombus tend to be less echogenic and usually do not produce dense shadowing. Shadowing can obscure the residual lumen. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

67. B — Vasospasm narrows the arterial lumen and can produce a focal rise in mean velocity. Interpretation should consider velocity ratios, trends, insonation quality, and hyperemia because elevated flow states can also increase velocity. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

68. C — Vasospasm narrows the arterial lumen and can produce a focal rise in mean velocity. Interpretation should consider velocity ratios, trends, insonation quality, and hyperemia because elevated flow states can also increase velocity. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

69. A — An arteriovenous fistula provides a low-resistance pathway, increasing arterial velocity and diastolic flow near the communication. The draining vein may become pulsatile and arterialized. Absent diastolic flow and increased resistance contradict this physiology. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

70. D — An arteriovenous fistula provides a low-resistance pathway, increasing arterial velocity and diastolic flow near the communication. The draining vein may become pulsatile and arterialized. Absent diastolic flow and increased resistance contradict this physiology. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

71. D — Sustained retrograde flow following Valsalva or distal augmentation indicates failure of valve closure and supports reflux. Compressibility evaluates thrombus, while antegrade augmentation demonstrates a patent pathway but does not itself prove valvular competence. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

72. C — Sustained retrograde flow following Valsalva or distal augmentation indicates failure of valve closure and supports reflux. Compressibility evaluates thrombus, while antegrade augmentation demonstrates a patent pathway but does not itself prove valvular competence. The distractors involve a

different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

73. B — Common femoral venous flow should vary with respiration. Persistent continuous flow, especially when asymmetric, suggests proximal obstruction such as iliac thrombosis or compression. Normal augmentation and compressibility address patency but do not exclude a more proximal lesion. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

74. A — Common femoral venous flow should vary with respiration. Persistent continuous flow, especially when asymmetric, suggests proximal obstruction such as iliac thrombosis or compression. Normal augmentation and compressibility address patency but do not exclude a more proximal lesion. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

75. B — True occlusion requires failure to detect flow after optimizing gain, scale, wall filter, power Doppler, and insonation approach. Demonstrable trickle flow establishes patency and near occlusion. Aliasing or post-stenotic disturbance also implies residual flow. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

76. D — True occlusion requires failure to detect flow after optimizing gain, scale, wall filter, power Doppler, and insonation approach. Demonstrable trickle flow establishes patency and near occlusion. Aliasing or post-stenotic disturbance also implies residual flow. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

77. A — Popliteal artery entrapment can be provoked by plantar flexion or dorsiflexion, causing dynamic lumen narrowing, velocity change, or temporary occlusion. Testing must correlate symptoms and compare neutral with provocative positions. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

78. C — Popliteal artery entrapment can be provoked by plantar flexion or dorsiflexion, causing dynamic lumen narrowing, velocity change, or temporary occlusion. Testing must correlate symptoms and compare neutral with provocative positions. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

79. A — A patent pseudoaneurysm often shows bidirectional swirling color, commonly called the yin-yang sign, because blood circulates within the sac. The diagnosis is strengthened by demonstrating neck continuity and a to-and-fro spectral waveform. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

80. C — A patent pseudoaneurysm often shows bidirectional swirling color, commonly called the yin-yang sign, because blood circulates within the sac. The diagnosis is strengthened by demonstrating neck continuity and a to-and-fro spectral waveform. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

81. B — Blood entering the pseudoaneurysm during systole and returning toward the parent artery during diastole creates the characteristic to-and-fro neck waveform. Swirling color may appear within the sac. Complete absence of flow suggests thrombosis rather than a patent pseudoaneurysm. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

82. D — Blood entering the pseudoaneurysm during systole and returning toward the parent artery during diastole creates the characteristic to-and-fro neck waveform. Swirling color may appear within the sac. Complete absence of flow suggests thrombosis rather than a patent pseudoaneurysm. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views.

83. A — Mural thrombus may appear echogenic or heterogeneous and lacks internal flow when Doppler settings are sufficiently sensitive. The remaining patent lumen should fill with color and produce spectral signals. Multiple planes help distinguish thrombus from artifact. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

84. C — Mural thrombus may appear echogenic or heterogeneous and lacks internal flow when Doppler settings are sufficiently sensitive. The remaining patent lumen should fill with color and produce spectral signals. Multiple planes help distinguish thrombus from artifact. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

85. B — Advanced portal hypertension may reverse portal flow away from the liver, termed hepatofugal flow, and can produce collateral pathways. Normal portal flow is hepatopetal. Direction must be verified with correct color map and spectral baseline settings. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

86. B — Advanced portal hypertension may reverse portal flow away from the liver, termed hepatofugal flow, and can produce collateral pathways. Normal portal flow is hepatopetal. Direction must be verified with correct color map and spectral baseline settings. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

87. D — The median arcuate ligament may compress the proximal celiac artery more during expiration as the diaphragm rises, producing respiratory variation in velocity and vessel contour. The other conditions do not characteristically create this dynamic celiac pattern. This conclusion should be

integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

88. C — The median arcuate ligament may compress the proximal celiac artery more during expiration as the diaphragm rises, producing respiratory variation in velocity and vessel contour. The other conditions do not characteristically create this dynamic celiac pattern. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

89. A — Periaortic fluid or hematoma combined with focal wall disruption is an urgent sign of possible leakage or rupture. Mural thrombus and calcification are common chronic aneurysm features and do not alone establish rupture. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

90. D — Periaortic fluid or hematoma combined with focal wall disruption is an urgent sign of possible leakage or rupture. Mural thrombus and calcification are common chronic aneurysm features and do not alone establish rupture. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

91. C — A focal velocity rise with visible narrowing and disturbed flow supports bypass graft stenosis. Surveillance requires assessment of inflow, the entire conduit, both anastomoses, and outflow. Uniform laminar flow does not indicate a focal lesion. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

92. A — A focal velocity rise with visible narrowing and disturbed flow supports bypass graft stenosis. Surveillance requires assessment of inflow, the entire conduit, both anastomoses, and outflow. Uniform laminar flow does not indicate a focal lesion. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

93. D — A graft stenosis produces focal narrowing, marked velocity acceleration, aliasing, and often downstream turbulence. Interpretation also considers access flow and velocity ratios. Arterialized venous outflow is expected in a functioning access and is not alone abnormal. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

94. B — A graft stenosis produces focal narrowing, marked velocity acceleration, aliasing, and often downstream turbulence. Interpretation also considers access flow and velocity ratios. Arterialized venous outflow is expected in a functioning access and is not alone abnormal. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

95. D — A mature fistula creates a low-resistance shunt, so the feeding artery demonstrates increased volume flow and prominent forward diastolic flow. High resistance may suggest access dysfunction or poor outflow. Portal venous morphology is unrelated. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

96. B — A mature fistula creates a low-resistance shunt, so the feeding artery demonstrates increased volume flow and prominent forward diastolic flow. High resistance may suggest access dysfunction or poor outflow. Portal venous morphology is unrelated. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

97. C — A mobile thrombus at a fresh carotid repair poses an embolic risk and warrants immediate communication according to laboratory policy. Mild wall irregularity or caliber change may be postoperative. The complete study and clinical condition guide escalation. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

98. A — A mobile thrombus at a fresh carotid repair poses an embolic risk and warrants immediate communication according to laboratory policy. Mild wall irregularity or caliber change may be postoperative. The complete study and clinical condition guide escalation. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps.

99. A — An endoleak is continued blood flow outside the stent graft but within the aneurysm sac. Surveillance evaluates leak presence, source, sac size, and graft limb patency. Sac shrinkage generally supports successful exclusion rather than persistent perfusion. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

100. D — An endoleak is continued blood flow outside the stent graft but within the aneurysm sac. Surveillance evaluates leak presence, source, sac size, and graft limb patency. Sac shrinkage generally supports successful exclusion rather than persistent perfusion. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

101. C — Inflating a cuff to temporarily occlude arterial inflow and then releasing it produces reactive hyperemia. The resulting pressure and waveform response can reveal disease by increasing flow demand, although exercise testing is often preferred when feasible. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

102. B — Inflating a cuff to temporarily occlude arterial inflow and then releasing it produces reactive hyperemia. The resulting pressure and waveform response can reveal disease by increasing flow demand, although exercise testing is often preferred when feasible. The distractors involve a different

anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude.

103. C — In a healthy arterial system, exercise increases flow but ankle pressure recovers rapidly. A substantial postexercise pressure drop with delayed recovery can unmask hemodynamically significant disease that is not evident at rest. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

104. D — In a healthy arterial system, exercise increases flow but ankle pressure recovers rapidly. A substantial postexercise pressure drop with delayed recovery can unmask hemodynamically significant disease that is not evident at rest. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

105. A — Thoracic outlet assessment compares arterial waveforms or photoplethysmographic signals during neutral and provocative arm positions while reproducing symptoms cautiously. Positional loss alone can occur in healthy people, so clinical correlation is essential. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

106. B — Thoracic outlet assessment compares arterial waveforms or photoplethysmographic signals during neutral and provocative arm positions while reproducing symptoms cautiously. Positional loss alone can occur in healthy people, so clinical correlation is essential. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

107. D — Palmar arch testing evaluates whether ulnar collateral flow can maintain digital perfusion if the radial artery is removed or used. Digital photoplethysmographic waveforms are observed during selective arterial compression. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

108. C — Palmar arch testing evaluates whether ulnar collateral flow can maintain digital perfusion if the radial artery is removed or used. Digital photoplethysmographic waveforms are observed during selective arterial compression. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

109. B — A cuff that is too narrow requires excessive pressure to occlude the artery and can falsely elevate the recorded systolic pressure. Correct cuff width and placement are essential for reliable segmental and ankle measurements. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

110. A — A cuff that is too narrow requires excessive pressure to occlude the artery and can falsely elevate the recorded systolic pressure. Correct cuff width and placement are essential for reliable segmental and ankle measurements. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

111. D — Pulse volume recordings distal to significant inflow disease lose amplitude, have a rounded delayed upstroke, and may lose the dicrotic notch. These contour changes complement pressure measurements and are less affected by noncompressible arteries. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

112. A — Pulse volume recordings distal to significant inflow disease lose amplitude, have a rounded delayed upstroke, and may lose the dicrotic notch. These contour changes complement pressure measurements and are less affected by noncompressible arteries. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

113. C — Manual distal compression followed by release creates an antegrade bolus and then challenges valve closure. Retrograde flow persisting beyond the laboratory threshold supports reflux. Patient position and technique should follow validated protocol. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

114. B — Manual distal compression followed by release creates an antegrade bolus and then challenges valve closure. Retrograde flow persisting beyond the laboratory threshold supports reflux. Patient position and technique should follow validated protocol. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

115. D — Digital arteries are less commonly affected by medial calcification than ankle arteries, so toe pressures and toe-brachial indices can provide useful perfusion information when ankle pressures are artificially elevated or noncompressible. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

116. C — Digital arteries are less commonly affected by medial calcification than ankle arteries, so toe pressures and toe-brachial indices can provide useful perfusion information when ankle pressures are artificially elevated or noncompressible. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

117. A — Distal small-vessel disease may impair toe pressures and photoplethysmographic waveforms even when ankle pressures appear acceptable, particularly when calcification makes ankle vessels unreliable. Toe findings better reflect distal perfusion. This conclusion should be integrated with the

remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

118. B — Distal small-vessel disease may impair toe pressures and photoplethysmographic waveforms even when ankle pressures appear acceptable, particularly when calcification makes ankle vessels unreliable. Toe findings better reflect distal perfusion. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

119. C — Segmental limb pressures and pulse volume recordings localize hemodynamically important arterial disease by comparing pressure drops and waveform morphology at multiple levels. Venous, carotid, and portal examinations answer different clinical questions. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

120. D — Segmental limb pressures and pulse volume recordings localize hemodynamically important arterial disease by comparing pressure drops and waveform morphology at multiple levels. Venous, carotid, and portal examinations answer different clinical questions. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

121. B — A guidewire appears as an echogenic linear structure within the vessel lumen and should be followed in more than one plane when practical. Visualization helps prevent extraluminal advancement or entry into an unintended branch. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

122. A — A guidewire appears as an echogenic linear structure within the vessel lumen and should be followed in more than one plane when practical. Visualization helps prevent extraluminal advancement or entry into an unintended branch. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

123. A — A sterile transducer cover and sterile coupling gel help preserve the sterile field during invasive guidance. Standard nonsterile gel or an uncovered probe can introduce contamination. Local infection-control policy also governs preparation and handling. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

124. D — A sterile transducer cover and sterile coupling gel help preserve the sterile field during invasive guidance. Standard nonsterile gel or an uncovered probe can introduce contamination. Local infection-control policy also governs preparation and handling. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

125. B — Preaccess ultrasound should identify the artery, vein, bifurcation, plaque, thrombus, depth, and surrounding structures. Selecting a patent segment without obstructive anterior-wall plaque improves access safety and success. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting. Clinical correlation remains necessary.

126. C — Preaccess ultrasound should identify the artery, vein, bifurcation, plaque, thrombus, depth, and surrounding structures. Selecting a patent segment without obstructive anterior-wall plaque improves access safety and success. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

127. A — Completion duplex can identify residual stenosis, intimal flap, thrombus, poor anastomotic geometry, or inadequate flow while surgical correction remains immediately possible. It complements, rather than replaces, operative judgment and postoperative surveillance. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

128. D — Completion duplex can identify residual stenosis, intimal flap, thrombus, poor anastomotic geometry, or inadequate flow while surgical correction remains immediately possible. It complements, rather than replaces, operative judgment and postoperative surveillance. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

129. B — Continuous identification of the needle tip reduces the chance of unintended vessel, nerve, or organ injury. In-plane or out-of-plane technique may be used, but the operator must distinguish the tip from the shaft before advancing. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

130. A — Continuous identification of the needle tip reduces the chance of unintended vessel, nerve, or organ injury. In-plane or out-of-plane technique may be used, but the operator must distinguish the tip from the shaft before advancing. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact.

131. C — Ultrasound monitoring documents needle position, progressive sac thrombosis, and continued parent artery and distal arterial patency. Thrombin entering the native artery can cause embolic occlusion, so real-time observation is critical. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

132. B — Ultrasound monitoring documents needle position, progressive sac thrombosis, and continued parent artery and distal arterial patency. Thrombin entering the native artery can cause embolic occlusion, so real-time observation is critical. The distractors involve a different anatomic level, flow

mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

133. D — A high-frequency linear array provides strong near-field detail and a rectangular field suitable for superficial carotid vessels. Lower-frequency arrays penetrate deeper but sacrifice resolution. A pencil probe does not provide anatomic B-mode imaging. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

134. C — A high-frequency linear array provides strong near-field detail and a rectangular field suitable for superficial carotid vessels. Lower-frequency arrays penetrate deeper but sacrifice resolution. A pencil probe does not provide anatomic B-mode imaging. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

135. B — Pulse repetition frequency determines how often pulses are transmitted and affects the maximum unaliased Doppler velocity and imaging depth. Gain and gray mapping change display appearance but do not set transmission timing. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

136. C — Pulse repetition frequency determines how often pulses are transmitted and affects the maximum unaliased Doppler velocity and imaging depth. Gain and gray mapping change display appearance but do not set transmission timing. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

137. D — A large sample volume includes a wider range of velocities from different streamlines and can fill the spectral window artificially. Gate size, placement, gain, and beam-vessel geometry should be optimized before interpreting turbulence. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

138. A — A large sample volume includes a wider range of velocities from different streamlines and can fill the spectral window artificially. Gate size, placement, gain, and beam-vessel geometry should be optimized before interpreting turbulence. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

139. B — Exposed wiring creates electrical, infection-control, and equipment risks. The transducer should be removed from clinical service, labeled according to policy, and reported for inspection or replacement rather than temporarily patched and reused. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

140. C — Exposed wiring creates electrical, infection-control, and equipment risks. The transducer should be removed from clinical service, labeled according to policy, and reported for inspection or replacement rather than temporarily patched and reused. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

141. A — A tissue-equivalent phantom contains targets at known distances. Comparing displayed measurements with those reference separations evaluates vertical and horizontal distance accuracy. Patient and workflow measures do not test scanner spatial calibration. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

142. D — A tissue-equivalent phantom contains targets at known distances. Comparing displayed measurements with those reference separations evaluates vertical and horizontal distance accuracy. Patient and workflow measures do not test scanner spatial calibration. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

143. B — Comparing vascular laboratory classifications with angiography, surgery, or another accepted reference helps estimate sensitivity, specificity, predictive values, and overall accuracy. Operational timing measures may be useful administratively but do not establish diagnostic agreement. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

144. A — Comparing vascular laboratory classifications with angiography, surgery, or another accepted reference helps estimate sensitivity, specificity, predictive values, and overall accuracy. Operational timing measures may be useful administratively but do not establish diagnostic agreement. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports.

145. C — The wall filter suppresses low-frequency signals from vessel wall and tissue motion. Setting it too high can erase genuine slow flow, especially venous or end-diastolic signals. It does not directly improve penetration or eliminate velocity aliasing. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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147. B — Velocity error increases sharply as the insonation angle approaches 90 degrees. Aligning the correction cursor with the actual flow direction and maintaining an angle of 60 degrees or less improves accuracy and reproducibility. This conclusion should be integrated with the remaining examination, the

patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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149. D — ALARA means keeping acoustic exposure as low as reasonably achievable while obtaining diagnostic information. Operators should minimize output power and dwell time, particularly with spectral Doppler, without compromising the necessary examination. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

150. C — ALARA means keeping acoustic exposure as low as reasonably achievable while obtaining diagnostic information. Operators should minimize output power and dwell time, particularly with spectral Doppler, without compromising the necessary examination. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.

151. D — Excess color gain allows noise and color to extend beyond the vessel walls, creating blooming and an apparent oversized lumen. Gain should be increased to noise and then reduced slightly for a stable display. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

152. C — Excess color gain allows noise and color to extend beyond the vessel walls, creating blooming and an apparent oversized lumen. Gain should be increased to noise and then reduced slightly for a stable display. The distractors involve a different anatomic level, flow mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and.

153. A — Slow venous flow produces low-frequency shifts. Lowering the pulse repetition frequency and wall filter makes these signals easier to display. Excess pressure may collapse the vein, while excessive gain reduction hides flow. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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155. B — Increasing the color scale or pulse repetition frequency expands the measurable velocity range and reduces aliasing. Lowering the scale worsens aliasing. Baseline shift changes display allocation but

does not increase the total Nyquist range. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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157. C — Clear labels, standardized segments, technique, Doppler angle, measurements, and comparison with prior results allow subsequent examinations to reproduce the method and evaluate change. Unlabeled or vague documentation weakens surveillance. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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159. C — The sonographer should explain the procedure, review surgical precautions, inspect the area, assess pain and tolerance, and modify pressure or positioning appropriately. Dressings and wounds require authorization and infection-control measures. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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161. D — Critical-result communication should be prompt and traceable. Documentation generally includes the finding, person notified, time, and confirmation or read-back according to institutional policy. Routine reporting alone may delay necessary care. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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163. B — Using approved identifiers, commonly name and date of birth, prevents wrong-patient examinations and reporting errors. Room number, diagnosis, or another patient's statement is not a reliable identity check. Institutional policy determines the exact process. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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167. C — When the order and clinical presentation do not match, the sonographer should clarify the intended examination with the responsible clinician according to policy. Silent substitution or ignoring relevant symptoms risks an incomplete or incorrect study. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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169. B — Claudication location, walking distance, rest pain, wounds, prior interventions, medications, and risk factors help tailor the arterial examination and interpret findings. Unrelated history does not meaningfully address limb perfusion. This conclusion should be integrated with the remaining examination, the patient's presentation, prior interventions, and the laboratory's validated diagnostic criteria before reporting.

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mechanism, examination purpose, or technical adjustment. Confirming the observation in multiple views helps exclude artifact and supports a defensible interpretation.