

# TEST QUESTIONS AND CME APPLICATION-2011

## Techniques In Noninvasive Vascular Diagnosis, 3rd Edition

Note: This CME application is valid only for the Third Edition of Techniques. Continuing Medical Education Credits are authorized and sponsored by the Society of Vascular Ultrasound (SVU).

### Introduction

- Upon successful completion of the textbook and CME self-test, participants can earn **15 SVU CME credits**.
- SVU CME credits may be applied towards the CME requirements of the ARDMS, the ARRT, CCI, and CARDUP, as well as ICAVL and ACR accreditation organizations.
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### Process

- 1) Read and study the textbook (third edition). Download this test and application from our website at [www.Summerpublishing.com](http://www.Summerpublishing.com). Print entire document, or **just print pages 2 and 3**.
- 2) Take the examination and use the answer sheet provided. Complete the applicant information and the evaluation form (the evaluation form is required for CME activity). Submit pages 2 and 3, (no need to send in the test questions).
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**Course Objectives:** Upon completion of reading and studying “Techniques in Noninvasive Vascular Diagnosis”, the participant should be able to:

1. Describe basic Doppler and color Doppler fundamentals as they apply to vascular diagnosis.
2. Describe cerebrovascular, upper and lower venous and arterial anatomy .
3. List and apply diagnostic criteria for carotid, venous, and arterial disease determination.
4. Describe normal venous and arterial hemodynamics and how flow patterns are altered by disease.
5. Describe abdominal vascular anatomy.
6. List diagnostic criteria for abdominal vascular duplex ultrasound exams.
7. Describe bypass and hemodialysis grafts/fistulas, and list normal and abnormal flow velocity parameters.
8. Describe methods of physiologic, indirect testing for upper and lower arterial disease.
9. Describe potential collateral pathways, and Doppler waveforms in the presence of subclavian or innominate artery obstruction.
10. Change and adjust appropriate imaging, Doppler and Color Doppler controls to optimize exam quality.
11. Recognize Doppler and imaging artifacts and describe how they occur.
12. Describe various disease processes that affect upper and lower extremity arteries and veins.
13. Describe intracranial vascular anatomy and transcranial Doppler (TCD) methods.
14. List appropriate access “windows” for various intracranial arteries in the TCD exam.
15. Describe diagnostic methods for evaluation of vasculogenic impotence.

Name \_\_\_\_\_

**Evaluation form: Required for CME. Please circle answer.**

1) To what extent was the material in the book of direct value in your practice?

Significant.    Moderate.    Minimal.    Insignificant.

2) To what extent were the stated course objectives met?

Greatly.    Partially.    Not at all.

3) The quality of the graphics and educational material were:

Excellent.    Good.    Fair.    Poor.

4) What did you like best about the book and self instructional program? \_\_\_\_\_

5) What did you like the least about the book and self instructional? \_\_\_\_\_

6) What subject matter should be included in future editions? \_\_\_\_\_

*The Society of Vascular Ultrasound has determined that a minimum of 60 Post-test questions are required for 15 CME credits. (The SDMS now requires 150 questions for 15 CMEs).*

**Please circle one answer for each question. Online Test Version # 4**

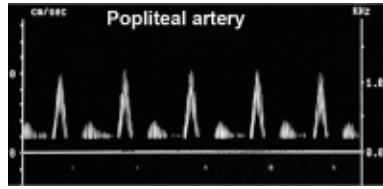
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- 1) *In which bypass graft procedure is a valvulotome used?*
  - A. Aorto-bifemoral.
  - B. In situ vein bypass.
  - C. Reversed vein bypass.
  - D. Radial artery harvest.
- 2) *Which of the following is the manual test for palmar arch patency?*
  - A. Adson's test.
  - B. TOS test.
  - C. PPG.
  - D. Allen's test.
- 3) *Intracranial cross-filling often occurs in which of the following vessels in the presence of an occluded ICA?*
  - A. Vertebral artery.
  - B. Basilar artery.
  - C. Anterior communicating artery.
  - D. Posterior cerebral artery.
- 4) *Which of the following arteries is NOT involved with penile arterial perfusion?*
  - A. External Iliac.
  - B. Cavernousal.
  - C. Bulbourethral.
  - D. Dorsal.
- 5) *Which of the following is a major cause of vasculogenic impotence?*
  - A. Stenosis of the dorsal artery.
  - B. Vasoconstriction of the cavernousal arterioles.
  - C. Occlusion of the external iliac artery.
  - D. Cavernousal venous leak.
- 6) *Normal portal vein flow direction in the liver is called?*
  - A. Hepatofugal flow.
  - B. Hepatopetal flow.
  - C. High resistant flow.
  - D. Collateral flow.
- 7) *What relationship does the right renal artery (RRA) have to the inferior vena cava (IVC)?*
  - A. RRA passes transverse to the IVC.
  - B. RRA passes anterior to the IVC.
  - C. RRA passes posterior to the IVC.
  - D. RRA passes superior to the IVC.
- 8) *Which of the following is the threshold for an abnormal renal artery to aortic ratio (RAR)?*
  - A. 3.5
  - B. 2.5
  - C. 2.0
  - D. 1.5
- 9) *The pulsed Doppler frequency most suitable for an adult transcranial Doppler exam is:*
  - A. 0.5 MHz.
  - B. 2.0 MHz.
  - C. 3.5 MHz.
  - D. 4.5 MHz.
- 10) *A tardus-parvus waveform in a segmental renal artery suggests what condition?*
  - A. Renal parenchymal disease.
  - B. Stenosis or occlusion of the main renal artery.
  - C. Coarctation of the aorta.
  - D. Renal vein thrombosis.
- 11) *Which of the following is the first branch off the abdominal aorta?*
  - A. Superior mesenteric artery.
  - B. Renal artery.
  - C. Celiac axis.
  - D. Common iliac artery.
- 12) *A transjugular intrahepatic portosystemic shunt (TIPS) courses between what 2 vascular structures?*
  - A. Portal vein to hepatic artery.
  - B. Portal vein to hepatic vein.
  - C. Jugular vein to hepatic vein.
  - D. Hepatic vein to inferior vena cava.
- 13) *The calf muscle veins that drain into the posterior tibial or peroneal veins are known as:*
  - A. Soleal veins.
  - B. Small saphenous veins.
  - C. Gastrocnemius veins.
  - D. Perforator veins.
- 14) *Which of the following is the best "window" for the evaluation of vertebral and basilar arteries with transcranial Doppler?*
  - A. Transorbital window.
  - B. Suborbital window.
  - C. Transtemporal window.
  - D. Suboccipital window.
- 15) *What is the first branch of the internal carotid artery (ICA)?*
  - A. Superior thyroid artery.
  - B. Middle cerebral artery.
  - C. Ophthalmic artery.
  - D. Superficial temporal artery.
- 16) *The dorsalis pedis artery is a continuation of which vessel?*
  - A. Anterior tibial artery.
  - B. Gastrocnemius artery.
  - C. Peroneal artery.
  - D. Posterior tibial artery.

- 17) Abdominal pain that develops 15-30 minutes after eating is sometimes called "fear of food" syndrome. Which of the following is a possible cause?
- Cardiac angina.
  - Mesenteric ischemia.
  - Nutcracker syndrome.
  - Budd-Chiari syndrome.
- 18) In most spectral Doppler systems, blood flow away from the Doppler beam is depicted as a \_\_\_\_\_ sign and is displayed \_\_\_\_\_ the baseline in the un-inverted spectral display.
- positive, above
  - negative, below
  - positive, below
  - negative, above
- 19) Which of the following ankle/brachial indices (ABI) is most consistent with the symptom of ischemic rest pain?
- 0.3
  - 0.5
  - 0.8
  - 1.0
- 20) In the presence of an innominate artery occlusion, the ipsilateral common carotid artery (CCA) is often supplied by \_\_\_\_\_ flow in the right \_\_\_\_\_ artery.
- retrograde, external carotid
  - retrograde, subclavian
  - antegrade, vertebral
  - antegrade, external carotid
- 21) The portal vein is formed by the confluence of which two veins?
- Splenic, superior mesenteric.
  - Celiac, duodenal.
  - Hepatic, IVC.
  - Inferior mesenteric, renal.
- 22) Buerger's disease or thromboangiitis obliterans is an arterial disorder involving which of the following vessels?
- Renal arteries.
  - Coronary arteries.
  - Digital arteries.
  - Pelvic arteries.
- 23) A high resistivity index found unilaterally in one of the main renal arteries suggests:
- Renal dissection.
  - Main renal artery stenosis.
  - Renal parenchymal disease.
  - Fibromuscular dysplasia.
- 24) Which of the following conditions would cause an abnormal pulse volume recording (PVR) at the high-thigh location?
- Superficial femoral artery occlusion.
  - Internal iliac artery stenosis.
  - Popliteal artery occlusion.
  - Significant aorto-iliac disease.
- 25) A Brescia-Cimino fistula is created for hemodialysis access by anastomosis of which upper extremity artery and vein?
- Radial artery and cephalic vein.
  - Ulnar artery and cephalic vein.
  - Subclavian artery and subclavian vein.
  - Brachial artery and brachial vein.
- 26) The appearance of "early systolic deceleration" in the left vertebral artery waveform is usually due to which of the following conditions?
- Basilar artery obstruction.
  - Axillary artery stenosis.
  - Proximal left subclavian stenosis.
  - Proximal vertebral artery stenosis.
- 27) A high-pressure extravasation of blood out of an artery and into the surrounding tissue is called a(n):
- Aneurysm.
  - Arterial-Venous fistula.
  - Pseudo-aneurysm.
  - A-V malformation.
- 28) In transcranial Doppler, the middle cerebral artery is accessed through the \_\_\_\_\_ "window" and typically demonstrates flow direction \_\_\_\_\_ the transducer.
- suboccipital, away from
  - transtemporal, away from
  - transorbital, towards
  - transtemporal, towards
- 29) The reported advantage of a four-cuff segmental pressure test over a three-cuff method is differentiating which of these diseased segments?
- Aorta disease from iliac disease.
  - Femoral artery from popliteal artery disease.
  - Aorto-iliac (inflow) from femoral artery disease.
  - Common femoral artery from profunda femoris disease.
- 30) What pulsed-wave Doppler parameter is decreased when the range gate or sample volume is reduced in size?
- Gain.
  - Spatial pulse length.
  - Lateral resolution.
  - PRF.

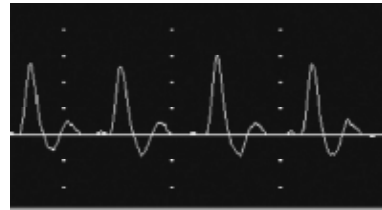
31) What's causing this peripheral arterial waveform to look "goofy"?

- A. High wall filter.
- B. Low wall filter.
- C. No diastolic flow.
- D. Wrong PRF.



32) This Doppler waveform is derived from what type of processing or analysis?

- A. Autocorrelation.
- B. Fast Fourier Transform.
- C. Zero crossing detection.
- D. Time interval histogram.



33) A patient presents with the classic cerebrovascular symptom of left amaurosis fugax. Of the choices below, what is the most likely cause?

- A. Occlusion of the left ICA.
- B. Atheroemboli from the right ICA.
- C. Occlusion of the left vertebral artery.
- D. Atheroemboli from the left ICA.

34) A stroke symptom in which a patient cannot speak or express themselves is called :

- A. Aphasia.
- B. Syncope.
- C. Amaurosis.
- D. Dysarthria.

35) Which of the following is a non-atherosclerotic disease involving the mid segment of the ICA and found predominately in females?

- A. Takayasu's arteritis.
- B. Scleroderma.
- C. Arteriosclerosis.
- D. Fibromuscular dysplasia.

36) The carotid angiographic measurement method advocated by the SRU consensus panel and used in the NASCET study compares the ICA residual lumen to the diameter of the distal ICA. True or False?

- A. True.
- B. False.

37) A subclavian artery aneurysm is a possible complication of:

- A. Thoracic outlet compression.
- B. Raynaud's disease.
- C. Fibromuscular dysplasia.
- D. Marfan's syndrome.

38) In addition to incompetent valves, which of the following can also cause venous insufficiency?

- A. Arterial occlusive disease.
- B. Hydrostatic pressure.
- C. Superficial thrombophlebitis.
- D. Chronic outflow obstruction.

39) Venous pressure in the lower limb is increased when walking. True or False?

- A. True.
- B. False.

40) Virchow's triad is best described as the following?

- A. High cardiac output and intimal injury.
- B. Circulatory stasis and hypocoagulability with intimal injury.
- C. Circulatory stasis, hypercoagulability and intimal injury.
- D. Intimal injury, hypercoagulability and poor stroke volume.

41) ABIs are calculated in the following manner: the left ankle pressure is divided by the left brachial pressure, and the right ankle pressure is divided by right brachial pressure. True or False?

- A. True.
- B. False.

42) A condition resulting in a grossly swollen and cyanotic leg that is caused by iliofemoral venous thrombosis is known as:

- A. Stasis dermatitis.
- B. Lymph edema.
- C. Homan's sign.
- D. Phlegmasia cerulea dolens.

43) For accurate blood pressure determination, the cuff bladder should be \_\_\_\_\_ of the limb circumference.

- A. 40%
- B. 30%
- C. 20%
- D. 10%

44) What CFA waveform characteristic would suggest significant aorto-iliac disease?

- A. The presence of diastolic flow.
- B. Delayed rise time.
- C. Low peak systolic velocity.
- D. Absence of triphasic flow.

45) A hyperemic waveform, existing in the in situ vein graft 3 weeks following a femoral to distal vein bypass, is most likely due to which of these conditions?

- A. Graft occlusion.
- B. Chronic vasodilation.
- C. Vasoconstriction.
- D. Graft stenosis.

- 46) *What is the average speed of sound in tissue?*
- 1450 cm/sec.
  - 750 m/sec.
  - 1540 m/sec.
  - 6000 m/sec.
- 47) *Packet size, ensemble length, and color sensitivity are all terms used to describe which function of color Doppler?*
- Scan line density.
  - Frame rate.
  - Color encoding.
  - Number of transmitted pulses per scanline.
- 48) *To reduce or eliminate aliasing in spectral Doppler, you should:*
- Increase PRF.
  - Decrease PRF.
  - Use a high frequency transducer.
  - Increase sample volume size.
- 49) *Elevation- plane focus of a transducer is also referred to as:*
- Lateral resolution.
  - Slice thickness.
  - Axial resolution.
  - Temporal resolution.
- 50) *To increase color Doppler frame rate, you should:*
- Reduce color box width.
  - Turn on "triplex" function.
  - Increase packet size.
  - Reduce color box length.
- 51) *Which normal vessel demonstrates the highest flow resistance?*
- Common carotid artery.
  - Internal carotid artery.
  - External carotid artery.
  - Vertebral artery.
- 52) *Which of the following best describes the position of the ICA in the neck ?*
- It lies posterior to the ECA.
  - It's situated lateral to the ECA.
  - It lies in the far-field of the ultrasound image.
  - It appears in the near field of the ultrasound image.
- 53) *Which of the following statements regarding subclavian steal is most likely true?*
- Subclavian steal occurs most frequently on the right side.
  - Subclavian steal usually results in neurological symptoms.
  - The right vertebral artery supplies the left arm.
  - The left common carotid artery flow is reduced.
- 54) *A high resistance flow pattern in the distal portion of the ICA suggests which of the following conditions?*
- Proximal CCA disease.
  - Proximal ICA disease.
  - Intracranial A-V fistula.
  - Severe distal ICA stenosis.
- 55) *Which of these statements would best describe the low threshold of a >70% ICA stenosis?*
- End diastolic velocity > 80 cm/sec.
  - ICA/CCA ratio >4.0.
  - Peak systolic velocity > 125 cm/s.
  - >70% stenosis by diameter measurement of plaque.
- 56) *Which of the following is not a potential complication of a reversed femoro-popliteal vein graft?*
- Neo-intimal hyperplasia.
  - Graft aneurysm.
  - Fistula via non-ligated perforator vein.
  - Graft kink.
- 57) *Of the symptoms listed below, which is generally not associated with arterial insufficiency?*
- Limb swelling.
  - Dependent rubor.
  - "Blue Toe" syndrome.
  - Rest pain in feet and toes.
- 58) *The calf muscle veins that drain into the popliteal vein are known as:*
- Lesser saphenous vein.
  - Soleal veins.
  - Gastrocnemius veins.
  - Perforator veins.
- 59) *Blue Toe syndrome is usually caused by which of the following?*
- Thrombo-emboli.
  - Buerger's disease.
  - Vasospasm.
  - Venous insufficiency.
- 60) *The left innominate vein is formed by the confluence of the internal jugular vein and what other vein?*
- Superior vena cava.
  - Internal mammary.
  - External jugular.
  - Subclavian.