

CME Self-test Course Objectives:

Upon completion of reading and studying *Techniques in Noninvasive Vascular Diagnosis- 5th edition*, the participant should be able to:

1. Discuss Doppler and color Doppler fundamentals as they apply to vascular diagnosis, including parameter optimization, Doppler artifact identification, and avoidance of common pitfalls.
2. Describe extracranial cerebrovascular anatomy, pathology, normal and abnormal hemodynamics, and flow characteristics of various disease conditions.
3. Describe color duplex imaging methods of the carotid and vertebral arteries for typical and atypical disease conditions, including athero occlusive pathology, dissection, FMD, and subclavian steal.
4. List and apply the latest diagnostic criteria for carotid artery stenosis categorization, including post-interventional Doppler parameters, to identify disease progression.
5. Describe intracranial vascular anatomy, transcranial Doppler (TCD and TCI) access windows, and methods to diagnose and monitor intracranial cerebrovascular pathologies.
6. Discuss fluid dynamics and physical principles relating to normal and abnormal perfusion, including the principles of Bernoulli and Poiseuille's law.
7. Describe lower extremity arterial anatomy, pathology and symptoms, and disease mechanisms of athero-occlusive disease, aneurysms, pseudoaneurysms, thromboembolism, and FMD.
8. Describe physiologic (indirect) testing methods and diagnostic criteria for the upper and lower extremities, including PVR, CW-Doppler waveform, segmental pressures, ABIs, and stress testing.
9. Define color Doppler imaging methods of the lower extremity arteries for stenosis, occlusion, entrapment, aneurysm, and pseudoaneurysm and interpretation criteria. In addition, the participant will relate the latest nomenclature for peripheral arterial waveforms and the appropriate application of these descriptors to flow dynamics in the upper and lower extremities.
10. Identify subclavian and innominate artery obstruction and potential collateral pathways.
11. Describe hemodialysis access configurations, preoperative mapping methods, and postoperative surveillance of fistulas and grafts.
12. Explain upper and lower extremity venous anatomy, hemodynamics, and pathophysiology, including deep and superficial thrombosis and venous insufficiency.
13. Describe methods for imaging the upper and lower extremities veins for thrombosis, compression syndromes, venous reflux, and preoperative vein mapping for ablation and bypass procedures.
14. List methods for evaluating superficial, deep vein, and perforator incompetence.
15. Describe methods for assessing abdominal aortic aneurysms and procedures/methods in post-procedure follow-up of Endovascular Aneurysm Repair (EVAR).
16. Discuss kidney anatomy, hemodynamics, and Doppler methods to detect renal artery stenosis and parenchymal disease, and to assess intervention results, whether stenting or transplantation.
17. Discuss mesenteric anatomy, hemodynamics, and disease processes, including mesenteric ischemia and compression syndromes.
18. Describe portal and hepatic anatomy, hemodynamics, and disease processes, including portal hypertension, Budd-Chiari syndrome, and post-procedure assessment of porto-hepatic stents.
19. Explain patient and sonographer safety precautions, personal protection methods, patient isolation, and transducer reprocessing in preventing infection transmission.
20. Discuss methods of statistical analysis in quality assurance, including the calculation of sensitivity, specificity, positive predictive value, negative predictive value, and accuracy.