

How to Build a Vascular Ultrasound Lab Program-- A Physician's Perspective

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Equity Shareholder

Access Vascular

Primacea

Boston Scientific

Janacare

Efemoral

R3 Vascular

Embolitech

Vascular Therapies

Healthcare Insights

Venarum

Nectero

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So, You Want To Start a Vascular Laboratory?

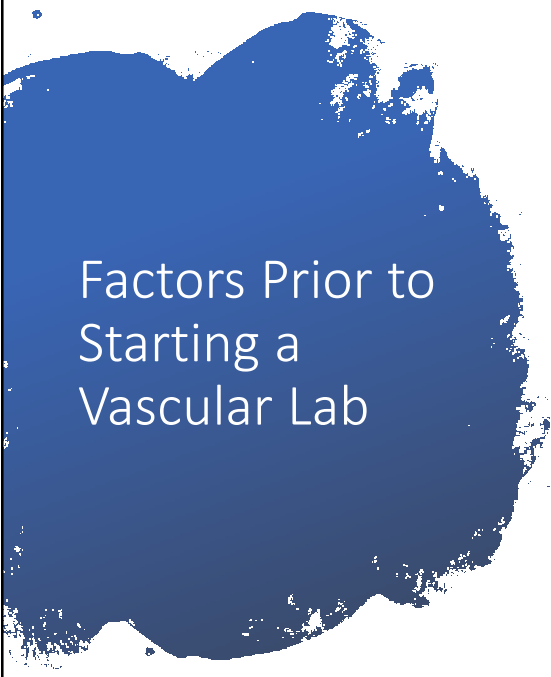


What's Your Motivation?

- Starting a new vascular practice
- Starting a new job where you have been recruited to form and lead a vascular laboratory
- Build your clinical practice
- Interested in clinical research in vascular laboratory testing

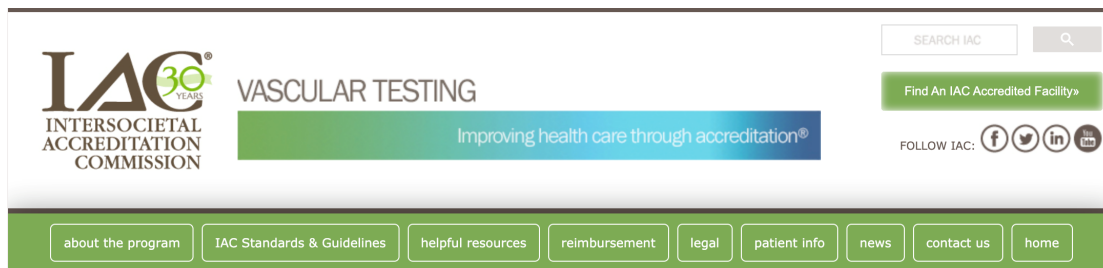


There are many factors to consider...



Factors Prior to Starting a Vascular Lab

- Have you been adequately trained?
- Do you have the optimal certification?
- How committed are you to quality?
- Do you have the financial backing?
 - Space
 - Equipment
 - Hiring power
 - Financial/accounting/billing/administrative support
- Courage (after all, this is a highly competitive endeavor)



Start With The Guidance You Need

What Does It
Take to be a
Medical
Director


- Licensed M.D. or D.O. in the jurisdiction where lab will exist
- Must Meet *One* of the Following:
 - RPVI *or*
 - ASN (if only performing cerebrovascular testing)
 - Formal training (completion of residency/fellowship including didactics)
 - Informal training (combination of CME and supervision (minimum of 8 hours per modality))
 - Established practice (worked in a facility for at least 3 years)



Case Volumes Required

- **Formal and Informal Training**

- Extracranial Carotid (100 cases)
- Intracranial Cerebrovascular (100 cases)
- Peripheral Artery Physiologic (100 cases)
- Peripheral Artery Duplex (100 cases)
- Venous Duplex Ultrasound (100 cases)
- Visceral Vascular Duplex Ultrasound (100 cases)



Informal Training CME Requirements

- 40 hours of relevant Cat 1 CME within prior 3 years
- 20 hours on
 - Techniques
 - Limitations
 - Accuracies
 - Methods
- 20 hours on
 - Clinical topics relevant to non-invasive testing
- 8 hours per modality



Case Volumes Required

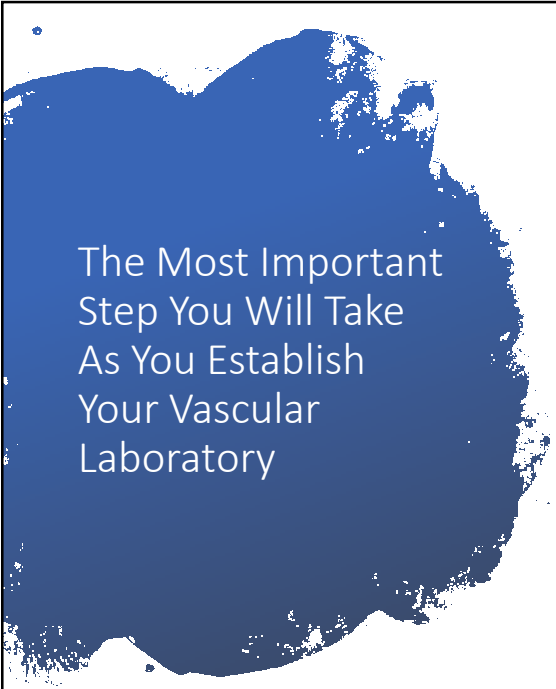
- **Established Practice**

- Extracranial Carotid (300 cases)
- Intracranial Cerebrovascular (300 cases)
- Peripheral Artery Physiologic (300 cases)
- Peripheral Artery Duplex (300 cases)
- Venous Duplex Ultrasound (300 cases)
- Visceral Vascular Duplex Ultrasound (300 cases)



Responsibilities of a Medical Director

- All services provided in the lab
- Oversight of quality
- Oversight of all operations
- Credentialing and supervision of medical staff
- Maintaining compliance with accreditation/certification
- Ongoing proficiency
 - Interpret minimum of 5 exams/modality/month
- Ongoing CME
 - 15 hours Cat 1 CME q3 years
 - At least 1 hour focused on work-related musculoskeletal disorders



The Most Important Step You Will Take As You Establish Your Vascular Laboratory

- Find the BEST Technical Director around
 - Don't skimp on salary
 - Do your homework
 - Absolutely check references
 - Watch the tech perform examinations
 - Ask for samples of reports/images from prior patients
 - Determine interest/capabilities for leadership



Financial Considerations

- Space
- Reporting system
 - Templates
 - Electronic (ideally cloud-based)
 - Uniform interpretation criteria
 - Reports must include
 - Patient ID/Date of exam/Appropriate clinical indication/name and description of exam
 - Description of positive/negative findings
 - Velocity data in appropriate exams (i.e. arterial/venous duplex US)
 - Location/severity of abnormalities
 - Incidental findings
 - Reasons for technically limited exams
 - Comparison with prior exams
 - Interpreting physician name/signature
 - Date of Signature



Financial Considerations

- Space
- Reporting system
- Administrative/Clerical Support
- Billing/Personnel (Tech, Nursing, Physician, Environmental)
- Quality Oversight



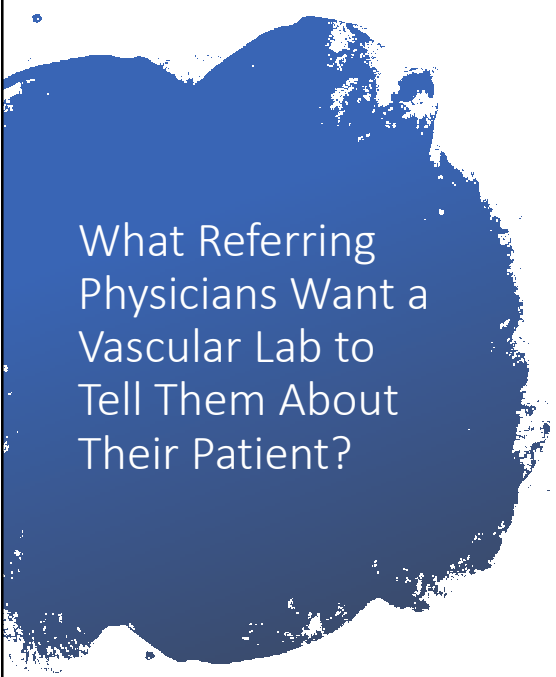
Quality Programs

- Must be in writing
- Components
 - Appropriateness
 - Technical quality
 - Interpretive quality review
 - Report completion and timeliness
 - Case review



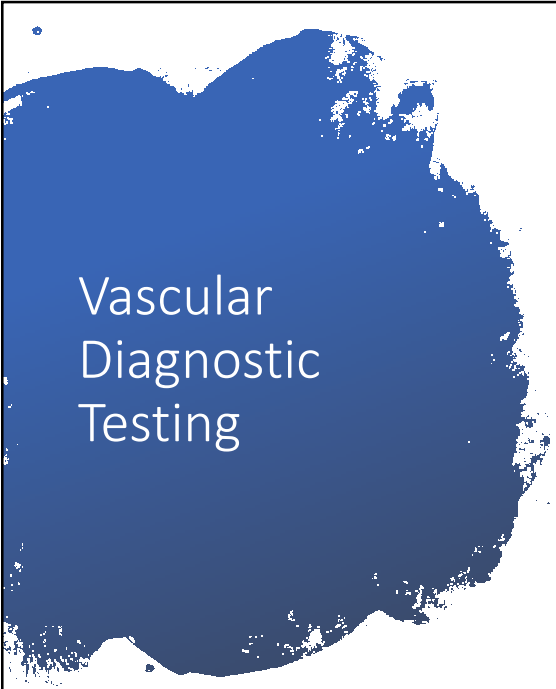
Quality Case Review

- Case review with
 - Any appropriate correlation
 - Axial imaging results
 - CT
 - MR
 - Angiography
 - Surgical Findings
 - Clinical outcome
 - Minimum of four cases/year
 - At least 2/modality
 - Must be a mechanism for educating referring physicians to improve appropriateness of testing



What Referring Physicians Want a Vascular Lab to Tell Them About Their Patient?

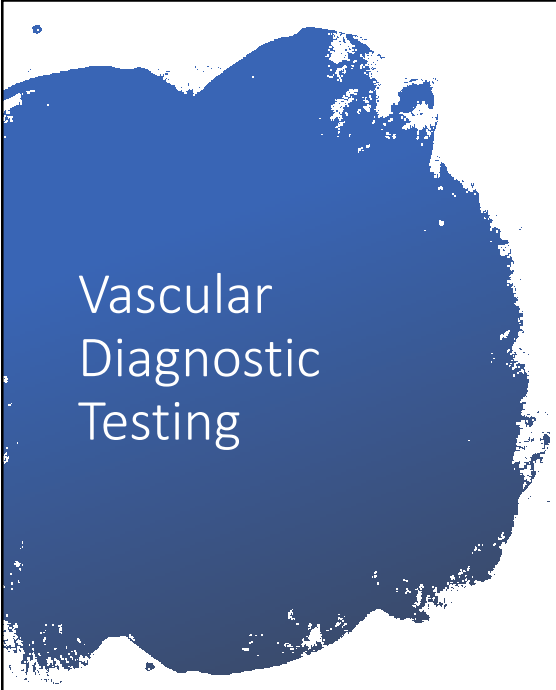
- Does the patient have vascular disease?
- What is the best therapy for the patient?
- How has a prior intervention worked?
- Can you figure out the problem without exposure to radiation, contrast, intravenous/intra-arterial access?



Vascular Diagnostic Testing

- Peripheral Artery Disease
- Carotid Artery Disease
 - Extracranial
 - Intracranial
- Venous Thromboembolic Disease
- Renal Artery Disease
- Abdominal Aortic Aneurysm

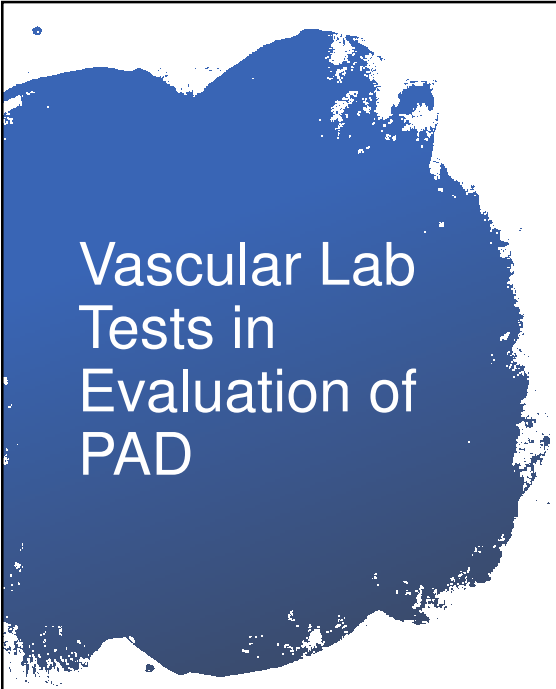
19



Vascular Diagnostic Testing

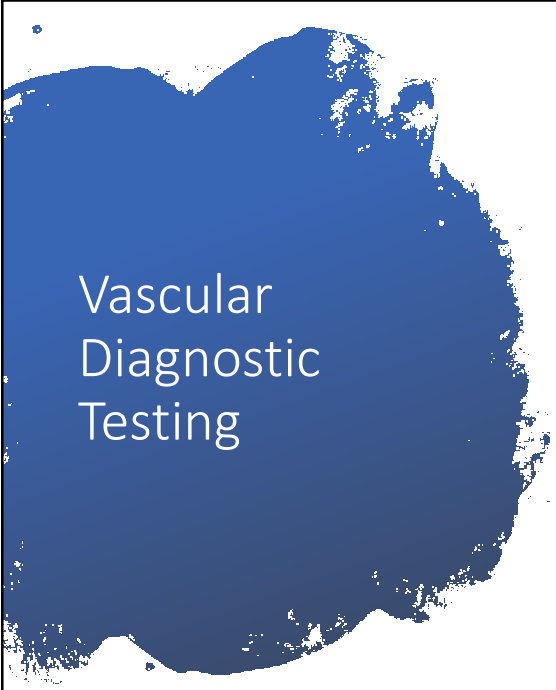
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20



Vascular Lab Tests in Evaluation of PAD

- Segmental Limb Pressures
- Pulse Volume Recordings
- Doppler Waveforms
- Exercise Treadmill Testing
- Distal perfusion assessment
 - TcPO₂
 - Intrinsic foot perfusion



Vascular Diagnostic Testing

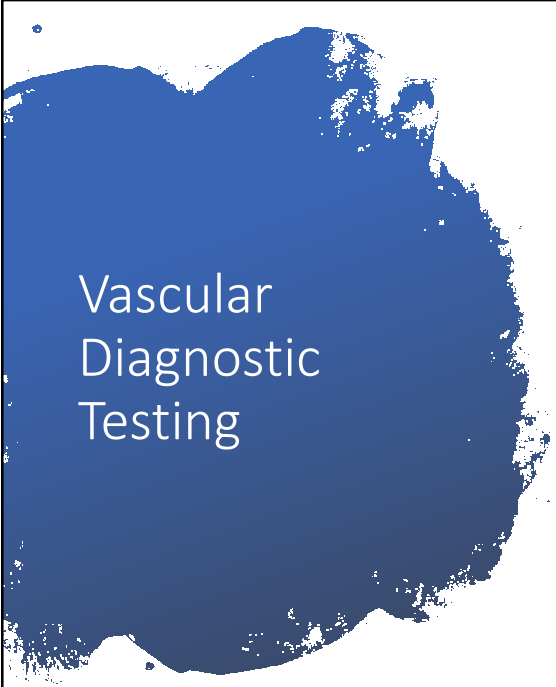
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Diagnosis of Extracranial Carotid Artery Disease

- Complete neurologic history and physical examination
- Complete medical history and physical examination
- **Carotid Duplex Ultrasonography**
 - +/- TCD
- (?) Magnetic Resonance Arteriography
- (?) CT Angiography
- (?) Arteriography

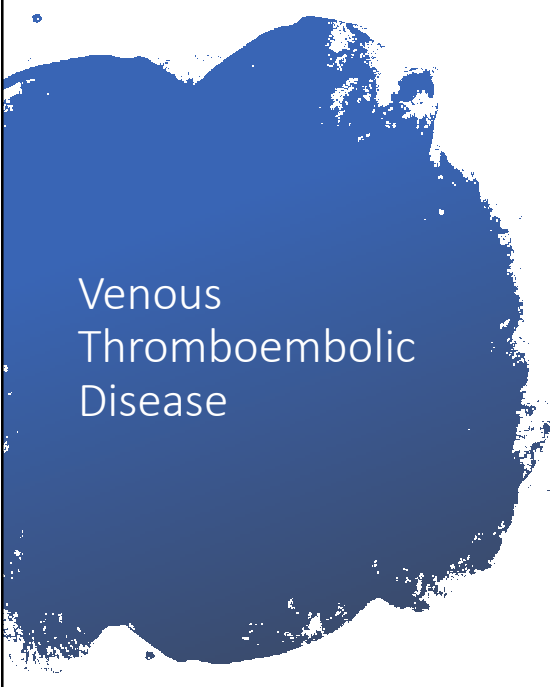
The Best Vascular Technologists Don't Copy
Numbers off a Screen....They Go the Distance to
Answer the Question/Explain the Abnormality



Vascular Diagnostic Testing

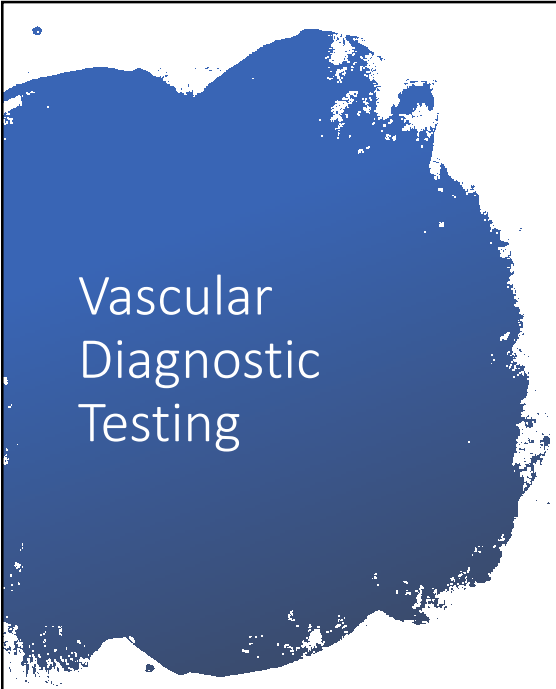
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- **Venous Thromboembolic Disease**
- Renal Artery Disease
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25



Venous Thromboembolic Disease

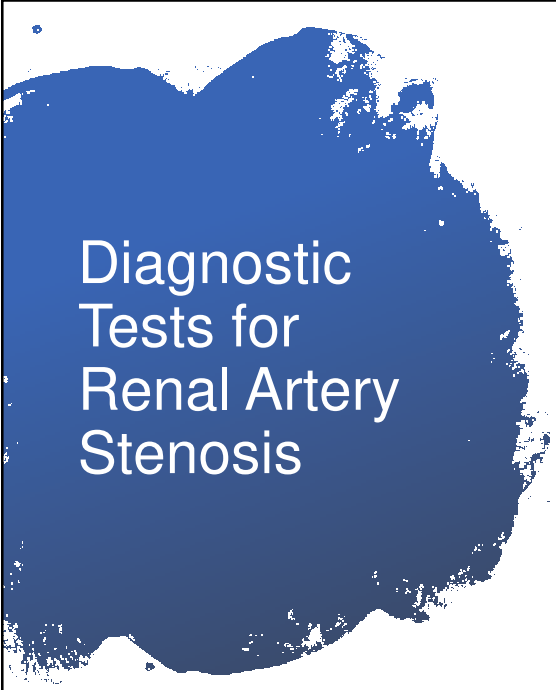
- Deep venous thrombosis assessment
 - Consider the test you want to routinely offer
 - Through the popliteal vein
 - Through the deep veins of the calf
 - Willingness to offer assessment of iliac veins/IVC pre/post-intervention
- Venous reflux testing
 - Diagnostic
 - Assistance with superficial vein ablation



Vascular Diagnostic Testing

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27



Diagnostic Tests for Renal Artery Stenosis

- Rapid Sequence IVP
- Radionuclide Imaging
 - Without/With ACE Inhibitor
- Plasma Renin Activity
- **Renal Artery Duplex
Ultrasonography**
- Renal Vein Renin Ratios
- Magnetic Resonance Arteriography
- Computerized Helical CT Scan
- Digital Subtraction Arteriography

28

- Peripheral Artery Disease
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 - Intracranial
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- Renal Artery Disease
- **Abdominal Aortic Aneurysm**

29



Abdominal Aortic Aneurysm

- Duplex Ultrasonography is the ideal screening test
- Common Requests
 - Does the patient have an AAA?
 - Has the (known) AAA increased in size when compared to the prior exam?
- Best to perform early morning after overnight fast

30



What Makes A Great Vascular Diagnostic Lab?

- Well organized, highly committed physician, technical, administrative team
- All exams performed with a comprehensive testing protocol
- Technologists and physicians strive to answer the clinical question posed and any abnormalities identified
- All interpretations use lab-specific criteria
- Comprehensive, reproducible, reportable quality assurance for all testing modalities
 - All staff participate
 - Results made public

31



How To Be Competitive?

- Build your lab on three components
 - Skill and expertise
- Timeliness of
 - Appointments
 - Results
 - (i.e. 'customer service'!)
- Quality that is transparent and constantly working to improve