

OHVI RECOMMENDATIONS

Vascular Diagnostic Criteria and Indications

Carotid Duplex Indications

- + Cervical bruit on exam.
- + CVA/TIA symptoms.
- + Hollenhorst plaque on retinal exam.
- + Amaurosis fugax.
- + Suspected carotid artery dissection or pulsatile mass.
- + Pre CABG assessment.
- + Subclavian steal syndrome.
- + Symptoms suggestive of or known vertebra-basilar occlusive disease.
- + Know carotid artery disease.
- + Atherosclerotic disease in other vascular beds.
- + Follow-up of intervention (Carotid Endarterectomy/ Carotid Stent).

Carotid Duplex Diagnostic Criteria

Degree of Stenosis	Optional Classification	ICA PSV	Plaque Estimate	ICA EDV	ICA/CCA ratio
Normal		<125 cm/s	None	<40 cm/s	<2.0
<50%	(Mild)	<125cm/s	<50% (Mild)	<40cm/s	<2.0
50-69%	(Moderate)	125-230 cm/s	≤50% (Moderate)	40-100cm/s	2.0-4.0
≥70%	(Severe)	>230cm/s	>50% (Severe)	>100cm/s	>4.0
80-99%	(Severe)	>230cm/s	>50% (Severe)	>135cm/s	>4.0
Near Occlusion	(Severe)	High, Low or Undetectable	Visible	Variable	Variable
Occlusion		Undetectable	Visible with no lumen	N/A	N/A

Carotid Stent Diagnostic Criteria

Degree of Restenosis	In Stent ICA PSV
Normal	<325 cm/s
Hemodynamically significant stenosis	>325 cm/s

Renal Artery Duplex Indications

- + Malignant HTN
- + Resistant HTN
- + Worsening BP in long-standing patient
- + HTN in patient <35 years old
- + Unexplained increase in creatinine
- + Increased creatinine (>50% of normal baseline) after administration of ACE/ARBs
- + Acute renal failure with aortic dissection
- + Epigastric Bruit
- + Unexplained kidney size discrepancy >1.5 cm
- + Surveillance of known renal artery stenosis
- + Refractory congestive heart failure
- + “Flash” pulmonary edema

Renal Artery Duplex Diagnostic Criteria

Percentage of Stenosis	Renal Aortic Ratio	PSV	EDV	Flow state
0-59%	<3.5	<200 cm/s		No turbulent flow
60-99%	>3.5	>200 cm/s		Significant turbulent flow
>80%	>3.5	>200 cm/s	>150cm/s	Significant turbulent flow
Occluded	N/A	0 cm/s		No flow noted (in RA and/or kidney)

If Aortic velocities are <40 cm/s or >100 cm/s the PSV velocity alone will be used to interpret percentage of stenosis.

< 200 cm/s = 0-59%

>200 cm/s = 60-99%

Renal Artery Stent Diagnostic Criteria

Percentage of Stenosis	Renal Aortic Ratio	PSV	Flow state
0-59%	<4.3	<300 cm/s	No turbulent flow
60-99%	>4.3	>300 cm/s	Significant turbulent flow
Occluded	N/A	0 cm/s	No flow noted (in RA or kidney) with atrophic kidney noted

Aorta Iliac Duplex Indications

- + New onset of abdominal or back pain
- + Femoral or popliteal aneurysm
- + Pulsatile abdominal mass
- + X-ray suggesting AAA
- + Thoracic aneurysm
- + Known AAA
- + Evidence of athero-emboli in the lower extremities or toes
- + Abnormal testing suggestive of aorta/iliac disease
- + Decreased/absent femoral pulse
- + Abdominal or femoral bruit

Abdominal Aortic Aneurysm Duplex Diagnostic Criteria

Diagnosis	Diameter	
	Aorta	CIA
Normal	<3.0 cm	<2.0 cm
Ectasia	1.5 times adjacent diameter	1.5 cm – 2.0 cm
Aneurysm	>3.0 cm	>2.0 cm

Ectasia can be defined by size or shape of vessel

Aorta Iliac Duplex Diagnostic Criteria

Percentage of Stenosis	PSV	Ratio	Flow State	Plaque
Normal	<200 cm/s		No turbulent flow noted	No plaque noted
<50%	<200 cm/s		Mild turbulent flow noted	Mild plaque noted
50-99%	>200 cm/s	2 x proximal segment	Significant turbulent flow noted	Significant plaque noted
Occluded	0 cm/s		No flow noted	Significant plaque noted

Aorta Iliac Stent Diagnostic Criteria

Degree of Restenosis	In Stent PSV
Normal	No increase in velocity
Hemodynamically significant stenosis	Doubling of velocity from proximal segment

LOWER EXTREMITY ARTERIAL STUDIES

Lower Extremity Arterial Study Indications

- + Lower extremity claudication
- + Leg/foot/toe pain at rest
- + Foot or toe ulcer/gangrene
- + Infection of leg/foot without palpable pulses
- + Suspected acute limb ischemia
- + Evidence of atheroemboli in the lower extremity

Resting ABI Diagnostic Criteria

ABI range	Disease
>1.3 or >255 mmHg	Calcified
.9 to 1.29	Normal
.7 to .89	Mild
.4 to .69	Moderate
<.4	Severe

Lower Arterial Duplex Diagnostic Criteria

Percentage of Stenosis	PSV	Ratio	Flow State	Plaque
Normal	No increase	N/A	No turbulent flow noted	No plaque noted
<50%	Mildly increased	Less than doubling	No or mild turbulent flow noted	Mild plaque noted
50-99%	Increased	Double from proximal segment	Significant turbulent flow noted	Significant plaque noted
Occluded	0 cm/s	N/A	No flow noted	Significant plaque noted

Lower Arterial Stent Diagnostic Criteria

Degree of Restenosis	In Stent PSV
Normal	No increase in velocity
Hemodynamically significant stenosis	Doubling of velocity from proximal segment

LOWER EXTREMITY VENOUS STUDIES

Lower Extremity Venous Study Indications

- + Edema
- + Swelling of limb
- + Pain in limb without swelling
- + History of deep venous thrombosis
- + Suspected or diagnosed pulmonary embolus
- + Shortness of breath with suspected or know pulmonary embolism
- + Phlebitis and/or thrombophlebitis

Resting ABI Diagnostic Criteria

Thrombus Characteristics:

- + **Acute DVT**
 - Hypoechoic thrombus.
 - Vein markedly dilated (if occluded).
 - Thrombus poorly organized, non-occlusive and/or mobile.
- + **Age Indeterminate DVT**
 - Difficult to assign acute or chronic characteristics.
 - Vein wall appearing close to normal diameter.
 - Mixed echogenic thrombus.
- + **Chronic DVT**
 - Web-like appearance of thrombus.
 - Thrombus attached to walls with regular border and rigid texture.
 - Thrombus appears bright and echogenic.
 - May see collateral veins.
 - Normal sized or atrophied vein.
- + **Abnormal Doppler Signals**
 - No flow – Note with complete occlusion of the vein with acute clot.
 - Continuous flow/lack of augmentation – Proximal thrombus or extrinsic compression is suspected.
- + **Normal Doppler Signals**
 - Spontaneous and phasic signals should be heard at all levels.
 - Augmentation of venous flow noted with distal compression.
 - Valsalva causes the spontaneous, phasic signal to cease.

References

ACCF/ACR/AIUM/ASE/IAC/SCAI/SCVS/SIR/SVM/SVS/SVU, 2013 Appropriate Use Criteria for Peripheral Vascular Ultrasound and Physiological Testing Part II: Testing for Venous Disease and Evaluation of Hemodialysis Access. A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force. Heather L. Gornik, MD, FACC, FAHA, FSVM, Chair*, Marie D. Gerhard-Herman, MD, FACC, Sanjay Misra, MD, FSIR, FAHA, Emile R. Mohler III, MD, FACC, R. Eugene Zierler, MD, FACS. Journal of the American College of Cardiology_ 2013 by the American College of Cardiology Foundation. .Vol. 62, No. 7, 2013, ISSN 0735-1097, <http://dx.doi.org/10.1016/j.jacc.2013.05.001>.

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WHAT IS A RECOMMENDATION?

A guideline outlining the OhioHealth Vascular Institute philosophy for care and/or treatment of a specific patient population.

WHY?

The goal of the Vascular Diagnostics Criteria & Indications is to standardize the diagnostic approach to vascular disease at all OhioHealth facilities to ensure patients are not “under or over” treated based on established guidelines and evidence based scientific publications with clinically relevant interpretation to a broader patient population.

WHERE TO DOCUMENT:

Documentation should be maintained in the patient’s medical record.

APPROVED BY:

- + Revised 2019
- + Vascular Institute Executive Committee: 07/13/16
- + Heart & Vascular Clinical Guidance Committee: 08/10/16
- + ED Clinical Guidance Committee:
- + Primary Care Clinical Guidance Committee:
- + Hospitalist Clinical Guidance Committee:
- + System Clinical Guidance Committee:

FOR QUESTIONS OR TO PROVIDE FEEDBACK, PLEASE CONTACT:

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