

IAC Vascular Testing Communication

Updated Recommendations for Carotid Stenosis Interpretation Criteria

In 2014, IAC Vascular Testing issued a White Paper on the considerable variation in criteria used to interpret the degree of internal carotid artery (ICA) stenosis in carotid duplex ultrasound examinations¹. In the document, IAC Vascular Testing reviewed the history of the issue and potential impact of this variation on the clinical value and comparability of carotid stenosis measurements. As an initial step to reduce this variability, IAC Vascular Testing recommended adoption of the diagnostic criteria proposed by Society of Radiologists in Ultrasound (SRU) Consensus Conference² by labs not using validated, internally-derived stenosis criteria. IAC Vascular Testing then developed and carried out a research study using “real world” carotid duplex scans from IAC-accredited vascular labs and contrast arteriography to assess the validity of the SRU Consensus Conference criteria and to potentially refine the SRU criteria or develop distinct criteria that could be applicable to IAC-accredited facilities that perform carotid duplex examinations.

This study was recently completed and the final results have been published in the peer reviewed journal *Vascular Medicine*³. The data confirmed the findings of several others that the SRU peak systolic velocity (PSV) threshold of 125 cm/sec for a 50% diameter reducing stenosis of the ICA is overly sensitive and has inadequate specificity and accuracy and supports the adoption of a higher PSV threshold value of 180 cm/s. The study sample with high-grade stenoses was insufficient to recommend modification of the SRU Criteria for higher degrees of internal carotid stenosis (70% and 80%). **Based upon these data derived from the work product of IAC-accredited labs, IAC Vascular Testing now recommends general adoption of modified SRU criteria incorporating the higher PSV threshold value of 180 cm/sec for 50% diameter reducing ICA stenosis. IAC Vascular Testing recognizes there may be selected cases with 50-69% ICA stenosis in which PSV < 180 cm/sec, but there is elevated ICA/CCA PSV ratio > 2.0 with significant plaque and other features of stenosis (e.g., post-stenotic turbulence). Therefore, all Doppler and gray scale parameters should be considered for the interpretation of the degree of ICA stenosis.**

IAC Vascular Testing recommends the use of these modified criteria for carotid interpretation at this time. Broad acceptance of this recommendation will enhance the accuracy of the detection of clinically-relevant ICA stenoses and further reduce the variability in grading of ICA stenosis on duplex studies by IAC-accredited vascular labs.

Recommended Modification of the SRU Consensus Conference Criteria for Internal Carotid Artery Stenosis for Implementation in IAC-Accredited Vascular Laboratories

Degree of Stenosis, %	Primary Parameters		Additional Parameters	
	ICA PSV, cm/sec	Plaque Estimate, %	ICA/CCA PSV Ratio	ICA EDV, cm/sec
Normal	<180	None	<2.0	<40
<50	<180	<50	<2.0	<40
50-69%	180–230	>50	2.0–4.0	40–100
>70 but less than near occlusion	>230	>50	>4.0	>100
Near occlusion	High, low, or undetectable	Visible	Variable	Variable
Total occlusion	Undetectable	Visible, no detectable lumen	Not applicable	Not applicable

*Plaque estimate (diameter reduction) with grayscale and color Doppler US.

Modified from diagnostic criteria proposed by Society of Radiologists in Ultrasound (SRU) Consensus Conference²

REFERENCES

1. <https://www.intersocietal.org/vascular/forms/IACCarotidCriteriaWhitePaper1-2014.pdf>
2. Grant EG, Benson CB, Moneta GL, Alexandrov AV, Baker JD, Bluth EI, et al. Carotid artery stenosis: grayscale and Doppler US diagnosis – Society of Radiologists in Ultrasound Consensus Conference. *Radiology* 2003;229:340-6.
3. Gornik HL, Rundek T, Gardener H, et al. Optimization of duplex velocity criteria for diagnosis of internal carotid artery (ICA) stenosis: A report of the Intersocietal Accreditation Commission (IAC) Vascular Testing Division Carotid Diagnostic Criteria Committee. *Vascular Medicine* 2021;e-published ahead of print. Available for free download at: <https://journals.sagepub.com/doi/full/10.1177/1358863X211011253>.