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## IAC Vascular Testing White Paper on Carotid Stenosis Interpretation Criteria

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### INTRODUCTION

Through its ongoing evaluation of application data submitted since 1991 as well as feedback collected through surveys of participating facilities on this topic, IAC Vascular Testing (formerly ICAVL) is aware that there is significant inconsistency related to the use of internal carotid artery (ICA) diagnostic criteria. Patients with the same degree of carotid artery disease may have different interpretations and potentially different recommendations for management from different accredited facilities.

In an effort to bring standardization to the field of vascular testing, specifically carotid stenosis interpretation, IAC Vascular Testing has issued a recommendation, that in the absence of a rigorously, internally validated single set of diagnostic criteria, facilities should consider the use of one single set of standardized diagnostic criteria: The Society of Radiologists in Ultrasound (SRU) criteria for carotid stenosis interpretation described in “Carotid Artery Stenosis: Grayscale and Doppler Ultrasound Diagnosis – Society of Radiologists (SRU) in Ultrasound Consensus Conference.”<sup>1</sup>

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### BACKGROUND

Historically, IAC Vascular Testing has not required, endorsed, or referenced any specific diagnostic criteria for carotid stenosis interpretation in their Standards for Extracranial Cerebrovascular Testing. IAC Vascular Testing does require facilities to have written protocols for the performance of the study and referenced or internally validated diagnostic criteria for the interpretation of stenosis. IAC Vascular Testing does require that the physician interpretation adhere to the facility’s chosen diagnostic criteria. IAC Vascular Testing does require facilities to perform Quality Improvement (QI) to assess the performance and accuracy of its diagnostic criteria (i.e., correlation studies, QI meetings).

Since the original University of Washington criteria were published and widely adopted in the 1980s, an ongoing effort to refine carotid criteria has continued to the present time. Unfortunately, this continued evolution has led to the proliferation of different criteria and less standardization of interpretation criteria. For this reason, IAC Vascular Testing initiated an effort to define the extent of the problem. We propose an interim recommendation for ICA stenosis criteria until rigorously validated criteria are available.

### DATA COLLECTION

When data from the IAC Vascular Testing accredited facilities were first analyzed in 2002, the results

indicated the use of many different criteria for carotid stenosis interpretation. In 2002, many of the criteria was centered on the University of Washington criteria<sup>2</sup> or the Bluth criteria<sup>3</sup>. There was a general lack of adherence and many facilities used modified or hybrid criteria to determine the degree of carotid stenosis. Additionally, bulb diameter reduction was still widely used despite the publication of the NASCET and ACAS trials and the wide acceptance of outflow diameter reduction as the gold standard for measuring carotid stenosis.

In 2010, the IAC conducted a research study to gauge the variance in what carotid criteria were being used to determine percent stenosis<sup>4</sup>. Instead of improvement in standardization, there were even more diagnostic criteria in use in accredited facilities with less agreement as to which criteria should be used for carotid stenosis interpretation. In reviewing the survey results, the IAC Vascular Testing Board of Directors found it concerning that accredited facilities were not consistently applying diagnostic criteria as published and that hybrids of multiple criteria were being used. As a result of this internal research of IAC accredited facilities, a subsequent survey of medical and technical staff of accredited vascular laboratories was performed in 2012. This survey collected feedback on whether the IAC should provide recommendations as to which criteria should be used for carotid artery stenosis interpretation<sup>5</sup>. In this survey, 68% of respondents felt that there should be only one set of diagnostic criteria for ICA stenosis

amongst facilities performing carotid duplex ultrasonography and that IAC Vascular Testing should require the consistent use of one set of researched and validated criteria for carotid stenosis interpretation. As a result, at its summer 2013 meeting, the IAC Vascular Testing Board of Directors passed a motion to establish recommended criteria for carotid stenosis interpretation.

## RATIONALE

- After careful review and discussion, the IAC Vascular Testing Board of Directors felt that no existing criteria for carotid stenosis interpretation has been validated sufficiently to fulfill all of the needs for facilities performing carotid interpretation.
- While the original SRU criteria published in 2003 have several issues, virtually all subsequent attempts at defining new criteria include some elements of the original SRU criteria.
- The SRU criteria are based upon the NASCET standard for angiographic measurement of carotid artery stenosis.
- No large prospective validation of the SRU criteria has ever been performed even though they have been in use for nearly 10 years.
- Since 2006, the SRU criteria, either as originally outlined or in a modified form, are the most common criteria currently being used by vascular facilities applying for accreditation for the first time.

## RECOMMENDATION

Following an in-depth literature review of the published ICA stenosis criteria in use throughout the United States and Canada, IAC Vascular Testing recommends the use of the “Carotid Artery Stenosis: Grayscale and Doppler Ultrasound Diagnosis – Society of Radiologists in Ultrasound (SRU) Consensus Conference” criteria for carotid interpretation.

Facilities which have rigorously internally validated their own criteria may continue to use these criteria at the present time.

## FUTURE ACTIONS

The IAC Vascular Testing Board of Directors plans to internally validate and make recommendations for specific ICA stenosis diagnostic criteria to be used by all facilities applying for accreditation. The future recommended diagnostic criteria may or may not be identical to the SRU consensus criteria. A multi-disciplinary Carotid Diagnostic Criteria Committee has been formed by IAC Vascular Testing and will convene regularly to move this effort forward. Periodic status updates regarding the progress of this important initiative will be provided to IAC accredited vascular testing facilities.

## SUMMARY

With this action, the IAC Vascular Testing Board of Directors hopes that the documented variances in carotid stenosis interpretation can begin to be resolved. The variability in carotid stenosis interpretation across accredited facilities undermines the usefulness of this important diagnostic modality. The IAC Vascular Testing Board of Directors feels that more standardization of carotid duplex ultrasound diagnostic criteria will address these concerns and will enhance the accuracy, reproducibility, portability and value of duplex sonography for the diagnosis of carotid disease.

## REFERENCES

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