studycast®

Carotid Guidance

Understanding the Exam

A carotid ultrasound is performed to evaluate blood flow from the heart to the brain. A doctor will recommend a carotid ultrasound to patients who have transient ischemic attacks, certain types of stroke, or a medical condition that increases the risk of stroke. The test is often used to detect plaque buildup in the carotid arteries and determine if the buildup is blocking blood flow to the brain.

Carotid ultrasound can be performed after an intervention, such as a stent placement, (stent placement, etc.) to survey the intervention (not for assessment of the surrounding artery). It is worth noting that the criteria used to define stenosis is different in an unoperated vessel vs. a vessel following an endarterectomy.

The exam is usually completed within 30 to 45 minutes.

Performing and Approving Users

		Required Credentials	Common Additional Credentials
Performed by	Vascular Sonographer	One of the following: • RVT (Registered Vascular technologist) • RVS (Registered Vascular Specialist) • RPhS (Registered Phlebology Sonographer)	• Registered Diagnostic Cardiac Sonographer (RDCS): Certified by the American Registry for Diagnostic Medical Sonography (ARDMS) • Registered Cardiac Sonographer (RCS): Certified by Cardiovascular Credentialing International (CCI) • Cardiac-Interventional Radiography RT(CI) • Vascular-Interventional Radiography RT(VI)

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			• Cardiovascular-Interventional Radiography RT(CV)
Read by	Radiologist Internal Medicine/ Cardiologist/ Vascular surgeon	ABR (American Board of Radiology) certified radiologists hold certifications in DR (diagnostic radiology) or IR/DR (interventional radiology/diagnostic radiology). Board certified physician who is trained in vascular interpretation and holds a RPVI registry.	Any radiologist registered in vascular interpretation (RPVI) by the Alliance for Physician Certification and Advancement (APCA) may interpret this exam.

Facility Types

This type of study is performed in these facility types:

- Vein centers
- Mobile imaging providers
- Imaging centers
- Office-based lab (OBL)
- Ambulatory surgery center (ASC)
- Office interventional suite (OIS)
- Hospital Cath labs/interventional suites

Worksheet

Laterality

Selecting bilateral will produce a complete exam that includes both carotid artery systems. Choosing either right or left will produce a limited exam that only includes findings from the respective carotid artery system.

Measurements and Observations

Right and Left Tabs

- Represent the scans of the left and right carotid artery systems. Techs record observations on plaque size and stenosis, blood flow, waveform analysis and arterial wall integrity.
- An indication of Stenosis (or Plaque Size) must be made for the user to be able to comment on Plaque Morphology at a given level as the presence of Plaque implies a narrowing of the artery.
- Stenosis (or Plaque Size) values are automatically selected when the entered values for PSV, EDV and ICA/CCA ratio meet the criteria for a row in the Carotid Criteria chart. (Can be turned off via MyChoices)
- Waveform observations document flow direction, resistance, and phasicity.
- The presence of a Stent renders native Carotid Criteria invalid at that level (i.e. Stenosis/Plaque size will not be automatically triggered).
- Drop-downs allow the user to select which ICA and CCA to use to recalculate the ICA/CCA ratio. A Conclusion statement will generate if this ratio is >4.0 on a given side.

MyChoice form options

- Waveform, Stenosis/Visual Plaque Size (VPS), and Plaque Morphology can each be excluded from observations.
- Set default vessel configuration.
- Waveform trigger: Setting a waveform observation automatically sets all waveforms below. This can be turned off.

Carotid Criteria Tab

- This tab lists the ranges that are used to automate observations. If a measurement is out of range, the worksheet will automatically identify it as an abnormality.

MyChoice form options

- Default criteria = Mayo Clinic, can use another source or define custom criteria

iDiagram

Use the diagram to indicate Stenosis (or Plaque Size), Plaque Morphology, and presence of a Stent or surgical intervention (Endarterectomy) at each segment. Selections made in the iDiagram are represented in the Observations dropdowns and vice-versa.

Findings

Findings statements comment on stenosis, plaque morphology, and waveform observations.

MyChoice form options

- Findings statement can be generated for each segment (default) or a single statement per vessel group
- Three available statement styles: Long (default), Short, and Short (imaging)

Conclusions

Conclusions generate a Stenosis (or Plaque Size) statement for each vessel (ECA, ICA, CCA) based on the most severe Stenosis (or Plaque Size) selection in each vessel.

MyChoice form options

- Can exclude ICA/CCA ratio statement
- Choose which items (when abnormal) generate statements
- Can group Bulb with ECA, ICA, or CCA

Report

Accreditation

Reports are designed to meet requirements from

- **SVU:** Society for Vascular Ultrasound
- **IAC-vascular:** Intersocietal Accreditation Commission
- **ACR:** American College of Radiology

MyChoice form options

- Can exclude criteria table, diagram, and stenosis column individually
- Can set position (top/bottom) of criteria table and conclusions

Demo Path

When training, insert this demo path after you have covered basic worksheet orientation.

The Studycast Carotid worksheet allows you to document velocity, stenosis, plaque, plaque morphology, and waveform* characteristics for the CCA, bifurcation, ICA, ECA and subclavian.

> * In summer 2020, SVU/SVM released a consensus statement on documenting Doppler waveforms on arterial exams. Studycast worksheets (including Carotid) reflect the recommended approach and nomenclature by allowing you to select the **flow direction**, **resistance**, and **phasicity** of the waveform.

You can also document interventions (Interventions tab).

Velocities populate automatically from the ultrasound machine. You'll use the dropdowns to document plaque size and morphology. And for the waveforms, you'll document flow direction, resistance, and phasicity.

Waveforms default to normal.

The default segments for calculating ICA /CCA ratios can is specified on the MyChoices form but can be modified for any given exam. Brachial pressures, vessel geometry and other values are documented below.

Note that the Carotid criteria can be customized by account, and based on the criteria set up, velocities can automatically set the stenosis observation. You can change the observation.

Note that plaque size and morphology are documented in the diagram, as well. Demonstrate that if you update the diagram, the corresponding observation dropdown updates (and vice versa). Show how to cycle through the choices in the diagram by choosing VPS/Stenosis (depending on configuration) or Plaque and then clicking repeatedly on a segment – or show them how they can click on the legend and then apply that value to a segment

Generate findings. When you generate conclusions, it pulls down a summary of the abnormalities noted in the findings.

If the client performs interventions at their facility, demo the Interventions tab.

In this tab, you can document multiple stents and multiple endarterectomies. Demonstrate by selecting from the observations, including location, waveform, and velocity. Generate findings and note that these findings are reflected.

Demonstrate how stents and endarterectomies can also be documented directly on the interactive diagram. Show how to click and drag to place a stent or endarterectomy. Note that the corresponding observations update when you document on the diagram and vice versa.

Generate the findings and conclusions to show that the intervention is documented there.

Preview the report and mention that you can access the report in 3 ways: the preview report button, the report tab within the worksheet, or (if your monitor is at least 1920 pixels wide, the worksheet + report tab).

Go back to the worksheet and note that you can generate a procedure statement by selecting the type of procedure and laterality and clicking the informed consent box. You can also comment on whether the NASCET* criteria were followed by choosing from the PQRS drop down (point out the preview that appears next to the dropdown). This can

help with reimbursement for the practice. Open the report and show the procedure statement and NASCET statement.

*The North American Symptomatic Carotid Endarterectomy Trial (NASCET) demonstrated a conclusive benefit for carotid endarterectomy in patients with symptomatic 70-99% ICA stenosis.

SWOT Analysis

Strengths	Weaknesses
1. Interactive diagram 2. Custom Criteria 3. Custom findings and conclusion statements 4. Complete reporting on all native extracranial and intracranial included in worksheet. 5. Adaptable calculation panel for measuring from the viewer and saving to the worksheet. 6. Ability to comment on Waveform characteristics	1. No area to document velocities for Subclavian/carotid bypass or Carotid/subclavian bypass grafts. 2. Limited procedure selection for exam types. 3. No documentation for bilat BP to show on report.
Opportunities	**Threats**
1. Add the graft to the worksheet. (IAC requirement for vascular intervention) 2. Consider adding the ability to document bilateral blood pressures (brachial) as this is a standard in some labs, but not required by IAC. 3. Expand within existing client base already using Studycast for individual departments/procedures	