

What's in a Name? Ordering Noninvasive Vascular Diagnostic Studies

Over the past several decades, the terminology and format used to order noninvasive vascular diagnostic studies has evolved due to a variety of factors including changes in technology, clinical utilization and regulation. The cumulative effect of these changes has resulted in accuracy of Pacific Vascular's (PVI) current studies potentially exceeding the technical accuracy of the terminology with which they are ordered. Consequently, we would like to provide a brief review of the historical roles these issues have had in our development as well as the current requirements.

Prior to the 1980's, Pacific Vascular's assessment of the cerebrovascular circulation was limited to the use of continuous wave (CW) Doppler ultrasound. This technology was reasonably accurate, but very operator dependent, made inferences as to the status of blood vessels based on blood flow physiology only, and was limited to the assessment of the pre-cerebral extracranial arteries. As a result, noninvasive testing was typically used only to select patients for arteriography prior to possible intervention.

In the 1980's, duplex scanning was introduced and made commercially available within the field of noninvasive vascular technology. Duplex scanning was attractive in that it provided for both the anatomical (2-D B-mode imaging) and physiological (Doppler ultrasound) assessment of blood vessels. Also introduced in the 1980's was transcranial Doppler, which allowed for extension of the noninvasive assessment of the cerebral circulation beyond the angle of the jaw. The combination of duplex scanning and transcranial Doppler resulted in more accurate localization and characterization of disease, as well as assessment for intracranial lesions and collateralization effects. As a consequence, the vast majority of surgical interventions (carotid endarterectomy) are now performed without antecedent arteriography.

Prior to the 1980's, a physician's order for noninvasive testing of the cerebral circulation typically included request for a "carotid Doppler". Although representing generally accepted terminology, such reference did not, even at that time, accurately reflect the test being requested or performed. In addition to the carotid arteries, the vertebral and subclavian arteries were and are also evaluated. The clinical relevance, of course, is that not all TIA's and stroke are related to carotid territory ischemia [thus, Pacific Vascular's use of the term "Cerebrovascular Evaluation" in describing its test for assessment of the cerebral circulation].

From a practical standpoint, up until the development of duplex scanning and transcranial Doppler, it mattered little whether a test was ordered as a "carotid Doppler" or "Cerebrovascular Evaluation" as the only CPT codes that existed for cerebrovascular

testing were for physiologic testing (e.g., phonoangiography, CW Doppler). However, in keeping with the technological advances and the increased reliance and utilization of the information provided, new CPT codes were developed which reflected the three modalities available to assess the cerebrovascular circulation, namely physiologic testing (e.g., CW Doppler), duplex scanning and transcranial Doppler. Thus, when ordering a "Cerebrovascular Evaluation or CVE" today, complete assessment of the cerebral circulation both carotid and vertebralbasilar, extracranially and intracranially, is undertaken using CW Doppler (at no charge), duplex scanning and transcranial Doppler.

When a more limited examination is desired, request should be made for a "Cerebrovascular Evaluation (CVE)- Abbreviated" which includes assessment of the carotid and vertebralbasilar circulation extracranially only or a "Transcranial Doppler Evaluation" which includes assessment of the carotid and vertebralbasilar circulation intracranially only.

Given present day technology, clinical utilization practices and regulatory changes, it becomes unclear what is meant by a physician's order for a "carotid Doppler" or "carotid Duplex", terminology that does not technically describe procedures that represent current standards of practice. If taken literally, vascular laboratories would be restricted to assessment of the carotid arteries only with either CW Doppler or duplex scanning. Not only would this be unnecessarily restrictive and detrimental to patient care, it would be out of compliance with laboratory accreditation standards that require that the vertebral arteries be evaluated on all patients (Pacific Vascular's laboratories are accredited by the Intersocietal Commission for the Accreditation of Vascular Laboratories). Thus, when a "carotid Doppler" or "carotid Duplex" is ordered, assumption is made that what is being requested is assessment of the cerebral circulation. If intending to order a more limited study, please follow the suggestions above.

Similar potential for confusion exists with regard to the noninvasive assessment of other vascular beds as well, namely peripheral venous, peripheral arterial and abdominal vascular evaluations. For example, "venous Doppler" studies are commonly ordered in patients with signs or symptoms of deep vein thrombosis. Again, this terminology is restrictive and not reflective of current standards of practice (e.g., use of duplex scanning).

To facilitate communication and the ordering of noninvasive vascular tests please see the following list of noninvasive vascular

tests offered by Pacific Vascular and related terminology. For more detailed information please refer to PVI's Capabilities Folder and Vascular Laboratory Referral (if you need either of these, please contact Lynette Faye @ (425) 398- 7773).

Cerebrovascular Circulation

- Cerebrovascular Evaluation or **CVE**
(bilateral, carotid/vertebrobasilar, extracranial/intracranial)
- Cerebrovascular Evaluation- Abbreviated or **CVE Abbreviated**
(bilateral, carotid/vertebrobasilar, extracranial)
- Cerebrovascular Evaluation- Limited or **CVE Limited**
(unilateral, carotid, extracranial)
- Transcranial Doppler or **TCD**
(carotid/vertebrobasilar, intracranial)

Specialized Tests:

- Vasospasm Study
- Head Rotation Study
(to assess for mechanical compression of VA's)
- Transcranial Doppler Emboli Monitoring
- Right to Left Shunt Study (a.k.a. PFO study)
- Intraoperative duplex scan - carotid *

Peripheral Venous

- Lower Extremity Venous Evaluation or **LEV**
- Upper Extremity Venous Evaluation or **UEV**

Specialized Tests:

- Lower Extremity Vein Mapping
- Upper Extremity Vein Mapping
- Venous Closure Procedure*

Peripheral Arterial

- Lower Extremity Arterial Evaluation or **LEA**
- Upper Extremity Arterial Evaluation or **UEA**
- Thoracic Outlet Phenomenon Evaluation
- Lower Extremity Raynaud's Phenomenon Evaluation
- Upper Extremity Raynaud's Phenomenon Evaluation

Specialized Tests:

- Pseudoaneurysm Study
- Ultrasound Guided Thrombin Injection (of Pseudoaneurysm)*
- tcpO2 Measurements
- Radial Artery Mapping
- TRAM Flap Mapping
- Intraoperative duplex scan - autogenous vein bypass graft*

Abdominal Vascular

- Renal Artery Duplex Scan
- Mesenteric Artery Duplex Scan
- Hepato-portal Duplex Scan
- Renal/Liver Transplant Evaluation
- Abdominal Aortic Aneurysm Evaluation

Other

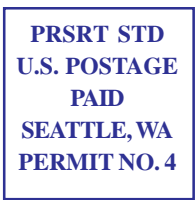
- Pre-op Vascular (Dialysis) Access Site Evaluation
- Vascular (Dialysis) Access Site Evaluation

**Limited locations only*

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North Locations

- Northwest Hospital
- Stevens Hospital

Central Locations

- Swedish Medical Center/Ballard
- Swedish Medical Center/Providence
- Jefferson Square, West Seattle
- Nordstrom Medical Tower

East Location

- Evergreen Place, Kirkland

South Locations

- Auburn Regional Medical Center
- Enumclaw Medical Center
- St. Clare Hospital, Tacoma
- St. Francis Hospital, Federal Way
- TRA Medical Imaging, Tacoma
- Valley Medical Center

Port Townsend

- Jefferson General Hospital

Yakima

- Central WA Vascular Institute