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| Magellan Healthcare | | |
| Clinical guidelines CAROTID DUPLEX SCAN (ULTRASOUND) | Original Date: | September 2013 |
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| CPT Codes: 93880 – Bilateral 93882 - Unilateral or Limited | Last Review Date: | August 2016 |
| Guideline Number: NIA_CG_330 | Last Revised Date: | September 2015 |
| Responsible Department: Clinical Operations | Implementation Date: | January 2017 |

INTRODUCTION:

A Duplex scan is an ultrasonic scanning procedure used to characterize the pattern and direction of blood flow in arteries or veins with the production of real-time images. While cerebrovascular ultrasound is a safe and widely available modality it does have its particular shortcomings and specific indications. Obtaining a high quality study requires the interplay of a number of factors. There are established criteria that are important to consider in order to ensure reliable, interpretable and meaningful results.

Complete Cerebrovascular Ultrasound studies are bilateral unless there is a specific clinical indication that warrants a limited study and investigate the common, external and internal carotid arteries as well as the vertebral arteries. 2D (Grayscale) and Doppler velocities are included.

A review of common clinical scenarios where cerebrovascular ultrasound is used follows. These scenarios are scored for appropriate use on a scale of 1-9. A median score of 7-9 indicates that this is an appropriate test for the specific indication. A median score of 4-6 indicates that there is unclear evidence as to the appropriateness of the test. A median score of 1-3 indicates that the test is not generally acceptable for the indication.

Initial Clinical Reviewers (ICRs) and Physician Clinical Reviewers (PCRs) must be able to apply criteria based on individual needs and based on an assessment of the local delivery system.

ACCF/ACR/AIUM/ASE/ASN/ICAVL/SCAI/SCCT/SIR/SVM/SVS 2012 Appropriate Use Criteria

| ACCF et al. Criteria # | Indications A _ appropriate; I _ inappropriate; U _ uncertain <i>(Refer to the “Additional Consideration” section for any clinical indication below that is followed by the letters a - e)</i> | Appropriate Use Score (1-9) |
|---|--|------------------------------------|
| Evaluation for Cerebrovascular Disease – Potential Signs and/or Symptoms | | |
| 1. | <ul style="list-style-type: none"> New or worsening hemispheric neurological symptoms (e.g., unilateral motor or sensory deficit, speech impairment, or amaurosis fugax) (a) | A (9) |

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| | <ul style="list-style-type: none"> Evaluation of transient ischemic attack or stroke | |
| 2. | <ul style="list-style-type: none"> Hollenhorst plaque visualized on retinal examination | A (8) |
| 3. | <ul style="list-style-type: none"> Lightheadedness or impaired vision in the setting of upper extremity exertion Evaluation for subclavian–vertebral steal phenomenon | A (7) |
| 4. | <ul style="list-style-type: none"> Syncope of uncertain cause after initial cardiovascular evaluation (d) | U (5) |
| 5. | <ul style="list-style-type: none"> Suspected symptomatic vertebrobasilar occlusive disease in the symptomatic patient (e.g., vertigo, ataxia, diplopia, dysphagia, dysarthria) | A (7) |
| 6. | <ul style="list-style-type: none"> Evaluation for suspected carotid artery dissection (b) | A (8) |
| 7. | <ul style="list-style-type: none"> Pulsatile neck mass | A (8) |
| 8. | <ul style="list-style-type: none"> Cervical bruit No prior carotid artery assessment | A (7) |
| Evaluation for Cerebrovascular Disease—Asymptomatic With Comorbidities or Risk Factors for Carotid Artery Stenosis | | |
| 9. | <ul style="list-style-type: none"> No cervical bruit Atherosclerotic disease in other vascular beds (e.g., lower extremity PAD, coronary artery disease, abdominal aortic aneurysm) (c) | A (7) |
| 10. | <ul style="list-style-type: none"> No cervical bruit History of neck irradiation ≥ 10 years ago | U (5) |
| 11. | <ul style="list-style-type: none"> Known renal fibromuscular dysplasia | U (5) |
| Prior to Open Heart Surgery | | |
| 12. | <ul style="list-style-type: none"> Planned coronary artery bypass grafting (CABG) (c) | U (6) |
| 13. | <ul style="list-style-type: none"> Atherosclerotic disease in other vascular beds (e.g., lower extremity PAD, coronary artery disease, abdominal aortic aneurysm), or history of neck irradiation ≥ 10 years ago Planned valve repair/replacement surgery (without CABG) (c) | U (6) |
| 14. | <ul style="list-style-type: none"> Atherosclerotic risk factors present | U (6) |

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| | <ul style="list-style-type: none"> Planned valve repair/replacement surgery (without CABG) (c) | | | |
| 15. | <ul style="list-style-type: none"> No atherosclerotic risk factors Planned valve repair/replacement surgery (without CABG) (c) | | | U (4) |
| Follow-Up or Surveillance for Carotid Artery Stenosis – Asymptomatic*+ | | | | |
| 16. | <ul style="list-style-type: none"> Normal prior examination (no plaque, no stenosis) (c) (e) | | | I (1) |
| Surveillance Frequency During First Year | | At 3 to 5 months | At 6 to 8 months | At 9 to 12 months |
| 17. | <ul style="list-style-type: none"> Plaque without significant stenosis of the ICA (plaque, normal ICA velocity) (e) | I (1) | I (1) | I (1) |
| 18. | <ul style="list-style-type: none"> Mild ICA stenosis (e.g., <50%) (e) | I (1) | I (1) | I (1) |
| 19. | <ul style="list-style-type: none"> Moderate ICA stenosis (e.g., 50% to 69%) (e) | I (2) | U (6) | U (6) |
| 20. | <ul style="list-style-type: none"> Severe ICA stenosis (e.g., 70% to 99%) (e) | U (5) | A (7) | U (6) |
| Surveillance Frequency After First Year | | Every 6 months | Every 12 months | Every 24 months or greater |
| 21. | <ul style="list-style-type: none"> Plaque without significant stenosis of the ICA (plaque, normal ICA velocity) (e) | I (1) | I (3) | I (1) |
| 22. | <ul style="list-style-type: none"> Mild ICA stenosis (e.g., <50%) (e) | I (2) | U (5) | U (6) |
| 23. | <ul style="list-style-type: none"> Moderate ICA stenosis (e.g., 50% to 69%) (e) | I (3) | A (7) | U (6) |
| 24. | <ul style="list-style-type: none"> Severe ICA stenosis (e.g., 70% to 99%) (e) | A (7) | A (7) | U (6) |
| Surveillance After Carotid Artery Intervention | | | | |
| 25. | <ul style="list-style-type: none"> Baseline (within 1 month) after carotid intervention | | A (8) | |
| Asymptomatic or Stable Symptoms After Baseline Study, Surveillance Frequency During First Year. | | At 3 to 5 months | At 6 to 8 months | At 9 to 12 months |
| 26. | <ul style="list-style-type: none"> Following normal ipsilateral ICA baseline study. | I (2) | A (7) | A (7) |
| 27. | <ul style="list-style-type: none"> Following abnormal ipsilateral ICA baseline study | U (4) | A (7) | U (5) |

| Asymptomatic or Stable Symptoms After Baseline Study, Surveillance Frequency After First Year | | Every 6 months | Every 12 months | Every 24 months or greater |
|---|---|----------------|-----------------|----------------------------|
| 28. | <ul style="list-style-type: none"> Following normal ipsilateral ICA baseline study. | I (2) | A (7) | U (5) |
| 29. | <ul style="list-style-type: none"> Following abnormal ipsilateral ICA baseline study | U (4) | A (7) | U (5) |

*In the setting of interval development of clinical symptoms in a previously asymptomatic patient or for rapid progression of stenosis during subsequent follow-up (e.g., stenosis category change during a limited period of time), more intensive surveillance may be indicated.

Periodic surveillance duplex ultrasound should be performed according to the severity of stenosis of the contralateral side.

LIMITED STUDY INDICATIONS (CPT code: 93882)

A limited study is indicated under the following circumstances:

- 1) Post intervention surveillance where the contralateral carotid is free of disease.
- 2) Post intervention where the contralateral carotid has less than 70% stenosis and the surveillance period on the contralateral carotid has been less than 9 month.
- 3) Emergent or urgent requests in the immediate postoperative or postprocedural period.

ADDITIONAL CONSIDERATIONS

- a. Cerebrovascular ultrasound is rated as **Appropriate** for evaluation of vertebrobasilar occlusive disease. Other Ultrasound protocols including Transcranial Doppler and other imaging modalities such as MRI or CT may be indicated.
- b. Carotid Ultrasound is rated as **Appropriate** for Carotid artery dissection. This is in the scenario of suspected carotid dissection as a continuation of dissection of the aortic arch or ascending aorta and is **Inappropriate** in the setting of trauma where distal dissection and intracranial extension cannot be diagnosed by Ultrasound. CT and MRI are used in this scenario.
- c. The appropriateness for cerebrovascular duplex is rated as **Uncertain** for all scenarios prior to cardiac surgery. This excludes patients with cerebrovascular symptoms. In patients with cerebrovascular symptoms (prior hemispheric stroke, TIA, etc.) cerebrovascular duplex would be **Appropriate**. Routine scanning of asymptomatic patients and particularly those without atherosclerotic comorbidities is **Inappropriate**.
- d. The use of Carotid Duplex in the evaluation for syncope without cardiac cause is rated as **Uncertain**. Cerebrovascular disease is a rare cause of syncope, but can be seen in severe and usually bilateral internal carotid stenosis, in severe vertebral basilar disease and in subclavian steal syndrome. Without cardiovascular risk factors or demonstrated atherosclerotic disease elsewhere the yield of Carotid Duplex in the evaluation of syncope is very low.

- e. Clinical management of asymptomatic patients with demonstrated atherosclerotic disease requires periodic ultrasound surveillance. Any follow-up in patients with a normal baseline carotid ultrasound is **Inappropriate**. The frequency and appropriateness of testing intervals can change in the setting of new abnormalities on a surveillance study.
- f. Screening studies are **Inappropriate** in the setting of a low Framingham risk score. Screening studies are also **Inappropriate** in patients with low or intermediate Framingham risk scores who have undergone other risk assessment imaging such as carotid IMT measurement or coronary artery calcium scoring.

ADDITIONAL INFORMATION

Definitions:

Claudication: Reproducible muscle discomfort or fatigue occurring with exertion at the same workload and relieved with rest, typically due to arterial obstruction.

Cold extremity: Reduced temperature from patient history or observed on physical examination by physician.

Physiological testing: Evaluation of the peripheral circulation based on measurement of limb blood pressures with pulse volume recordings or Doppler waveforms, or other parameters without utilizing data from direct imaging of the blood vessels.

Resistant hypertension: The failure to normalize blood pressure on 3 or more drug regimens with medications at maximum doses and at least 1 of the medications being a diuretic agent.

Abbreviations:

ABI - ankle-brachial index

ACE - angiotensin-converting enzyme inhibitor

ARB - angiotensin II receptor blocker

CABG - coronary artery bypass graft

CT - computed tomography

GI - gastrointestinal

ICA - internal carotid artery

ICAVL - Intersocietal Commission for the Accreditation of Vascular Laboratories

IMT - intima-media thickness

PAD - peripheral artery disease

PVR - pulse volume recording

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