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Subject: Transcranial Doppler Studies

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DESCRIPTION:

[Transcranial](#) Doppler ultrasound (TCD) is a non-invasive ultrasound technology for imaging blood flow in the cerebral arteries and veins. In TCD, ultrasonic waves are generated by a probe placed over the skull generates ultrasonic waves. The bony plate of the skull limits TCD measurements to three primary sites (or acoustic windows), which are the temporal bone along the orbito-meatal line, the foramen magnum at the base of the skull, and the optic foramina. Sound waves transmitted through these windows are reflected by blood cells in the intracranial vasculature. The frequency shifts of the reflected sound waves recorded at the probe are used in evaluating direction, depth, speed, and characteristics of blood flow in the intracranial arteries.

POSITION STATEMENT:

Transcranial Doppler studies **meet the definition of medical necessity** when performed for **ANY** of the following conditions:

- Monitoring for vasospasm in association with subarachnoid hemorrhage
- Intraoperative use during [carotid endarterectomy](#) for assessing collateral perfusion and embolization
- Assessment of members suspected of having steno-occlusive disease of the intracranial arteries
- As a tool to determine risk for transient ischemic attacks (TIA) or cardiovascular accidents (CVA) in members with sickle cell disease
- Evaluation of very low birth weight preterm infants with gestational age less than 30 weeks.

Transcranial Doppler studies are considered **experimental or investigational**, as there is insufficient clinical evidence to support the use of transcranial Doppler studies for all other indications, and specifically for the following conditions:

- Evaluation of the hemodynamic significance of extracranial vascular atherosclerosis
- Detection and assessment of circulatory patterns of [arteriovenous malformations \(AVM\)](#)
- Evaluation of cerebral blood flow following trauma
- Assessment of cerebral circulatory arrest as a measure of brain death
- Assessment of migraine and tension headaches
- Assessment of the adequacy of cerebral blood flow and embolic events during cardiopulmonary bypass surgery
- Evaluation of blood flow patterns in central nervous system infections
- Evaluation of dementia
- Evaluation of glaucoma
- Assessment of hydrocephalus
- Monitoring cerebral vascular resistance and the effects of vasodilators and other drugs in the treatment of stroke and other brain damage.

BILLING/CODING INFORMATION:

CPT Coding:

93886	Transcranial Doppler study of the intracranial arteries; complete study
93888	Transcranial Doppler study of the intracranial arteries; limited study
93890	Transcranial Doppler study of the intracranial arteries; vasoreactivity study
93892	Transcranial Doppler study of the intracranial arteries; emboli detection without intravenous microbubble injection
93893	Transcranial Doppler study of the intracranial arteries; emboli detection with intravenous microbubble injection

ICD-10 Diagnosis Codes That Support Medical Necessity:

D57.00 – D57.02	Hb-SS disease with crisis
D57.1	Sickle-cell disease without crisis

D57.20	Sickle-cell/Hb-C disease without crisis
D57.211 – D57.219	Sickle-cell/Hb-C disease with crisis
D57.80	Other sickle-cell disorders without crisis
D57.811 – D57.819	Other sickle-cell disorders with crisis
G45.0	Vertebro-basilar artery syndrome
G93.9	Disorder of brain, unspecified
G93.81– G93.89	Other specified disorders of brain
I60.00 – I60.02	Nontraumatic subarachnoid hemorrhage from carotid siphon and bifurcation
I60.10 – I60.12	Nontraumatic subarachnoid hemorrhage from middle cerebral artery
I60.2	Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I60.30 – I60.32	Nontraumatic subarachnoid hemorrhage from posterior communicating artery
I60.4	Nontraumatic subarachnoid hemorrhage from basilar artery
I60.50 – I60.52	Nontraumatic subarachnoid hemorrhage from vertebral artery
I60.6	Nontraumatic subarachnoid hemorrhage from other intracranial arteries
I60.7	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
I60.8	Other nontraumatic subarachnoid hemorrhage
I60.9	Nontraumatic subarachnoid hemorrhage, unspecified
I63.011 – I63.019	Cerebral infarction due to thrombosis of vertebral artery
I63.02	Cerebral infarction due to thrombosis of basilar artery
I63.031 – I63.039	Cerebral infarction due to thrombosis of carotid artery

I63.09	Cerebral infarction due to thrombosis of other precerebral artery
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.111 – I63.119	Cerebral infarction due to embolism of vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.131 – I63.139	Cerebral infarction due to embolism of carotid artery
I63.211 – I63.219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar arteries
I63.231 – I63.239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
I63.30	Cerebral infarction due to thrombosis of unspecified cerebral artery
I63.311 – I63.319	Cerebral infarction due to thrombosis of middle cerebral artery
I63.321 – I63.329	Cerebral infarction due to thrombosis of anterior cerebral artery
I63.331 – I63.339	Cerebral infarction due to thrombosis of posterior cerebral artery
I63.341 – I63.349	Cerebral infarction due to thrombosis of cerebellar artery
I63.39	Cerebral infarction due to thrombosis of other cerebral artery
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.50	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.411 – I63.419	Cerebral infarction due to embolism of middle cerebral artery

I63.421 – I63.429	Cerebral infarction due to embolism of anterior cerebral artery
I63.431 – I63.439	Cerebral infarction due to embolism of posterior cerebral artery
I63.441 – I63.449	Cerebral infarction due to embolism of cerebellar artery
I63.49	Cerebral infarction due to embolism of other cerebral artery
I63.511 – I63.519	Cerebral infarction due to unspecified occlusion or stenosis of middle cerebral artery
I63.521 – I63.529	Cerebral infarction due to unspecified occlusion or stenosis of anterior cerebral artery
I63.531 – I63.539	Cerebral infarction due to unspecified occlusion or stenosis of posterior cerebral artery
I63.541 – I63.549	Cerebral infarction due to unspecified occlusion or stenosis of cerebellar artery
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
I63.81	Other cerebral infarction due to occlusion or stenosis of small artery
I63.89	Other cerebral infarction
I63.9	Occlusion and stenosis of unspecified precerebral artery
I65.01 – I65.09	Occlusion and stenosis of vertebral artery
I65.1	Occlusion and stenosis of basilar artery
I65.21 – I65.29	Occlusion and stenosis of carotid artery
I65.8	Occlusion and stenosis of other precerebral arteries

I65.9	Occlusion and stenosis of unspecified precerebral artery
I66.01 – I66.09	Occlusion and stenosis of middle cerebral artery
I66.11 – I66.19	Occlusion and stenosis of anterior cerebral artery
I66.21 – I66.29	Occlusion and stenosis of posterior cerebral artery
I66.3	Occlusion and stenosis of cerebellar arteries
I66.8	Occlusion and stenosis of other cerebral arteries
I67.2	Cerebral atherosclerosis
P05.00 – P05.08	Newborn light for gestational age
P05.10 – P05.18	Newborn small for gestational age
P07.00 – P07.03	Extremely low birth weight newborn
P07.10 – P07.18	Other low birth weight newborn
P07.20 – P07.25	Extreme immaturity of newborn
P07.30	Preterm newborn, unspecified weeks of gestation
P07.31	Preterm newborn, gestational age 29 completed weeks
P07.33	Preterm newborn, gestational age 30 completed weeks
Q28.2	Arteriovenous malformation of cerebral vessels
Q28.3	Other malformations of cerebral vessels

REIMBURSEMENT INFORMATION:

A complete transcranial Doppler evaluation includes ultrasound examination of the right and left anterior circulation and the posterior circulation, including the vertebral arteries and basilar artery. A limited transcranial Doppler evaluation includes two or less of the above mentioned areas.

Excludes hand-held Dopplers that do not provide a hard copy or vascular flow bidirectional analysis. Includes complete transcranial Doppler (TCD) study. Includes patient care required to perform/supervise studies and interpret results. Includes ultrasound evaluation of right/left anterior circulation territories and posterior circulation territory.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products:

The following Local Coverage Determination (LCD) was reviewed on the last guideline reviewed date: Transcranial Doppler Studies, (L33977) located at fcso.com.

DEFINITIONS:

Arterial-venous malformation (AVM): abnormal connection between an artery and a vein.

Carotid endarterectomy: surgical procedure used in the treatment of atherosclerosis that involves opening the carotid artery of the neck to remove plaque deposits.

Embolism: sudden blockage of an artery by a clot or foreign material, which has been brought to the site by the blood stream.

Transcranial: blood vessels of the head are difficult to visualize through the cranial bone (skull), but can be viewed through certain areas such as the eye sockets, the temple, and the base of the skull, where a sound wave probe can visualize cerebral or intracranial blood vessels.

RELATED GUIDELINES:

None applicable.

OTHER:

Other names used to report transcranial Doppler studies:

Transcranial Doppler ultrasound

TCD

REFERENCES:

1. ACR–AIUM–SPR–SRU Practice Parameter for the Performance of Transcranial Doppler Ultrasound, Revised 2017.
2. Blue Cross Blue Shield Association Medical Policy Reference Manual. 6.01.07 Transcranial Doppler Ultrasound, 06/12/08.

3. Florida Medicare Part B Local Coverage Determination. Transcranial Doppler Studies L33977, 10/01/17.
4. Ment LR, Bada HS, Barnes P, Grant PE, Hirtz D, Papile LA, Pinto-Martin J, Rivkin M, Slovis TL. Practice parameter: neuroimaging of the neonate: report of the Quality Standards Subcommittee of the American Academy of Neurology and the Practice Committee of the Child Neurology Society. Neurology. 2002 Jun 25; 58(12): 1726-38.
5. Sarkar S, Ghosh S, Ghosh SK et al. Role of transcranial Doppler ultrasonography in stroke. Postgraduate Medical Journal 2007 Nov; 83(985):683-689.
6. Sloan MA, Alexandrov AV, Tegeler CH, Spencer MP, Caplan LR, Feldmann E, Wechsler LR, Newell DW, Gomez CR, Babikian VL, Lefkowitz D, Goldman RS, Armon C, Hsu CY, Gooding DS. Assessment: Transcranial Doppler ultrasonography: Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. Neurology 2004 May 11; 62(9): 1468-81.

COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the BCBSF Medical Policy & Coverage Committee on 07/26/18.

GUIDELINE UPDATE INFORMATION:

07/15/01	Medical Coverage Guideline Reformatted and Revised.
12/15/02	Review and revision of guideline; ICD-9 diagnosis code corrected; references updated.
12/15/03	Review and revision of guideline consisting of updated references.
12/15/04	Review and revision of guideline consisting of updated references.
01/01/05	Annual HCPCS update; consisting of addition of 93890, 93892 and 93893.
02/15/06	Review and revision of guideline consisting of updated references.
02/15/07	Review and revision of guideline consisting of updated references.
06/15/07	Reformatted guideline.
02/15/08	Review and revision of guideline consisting of updated references.
02/15/10	Review and revision of guideline consisting of updated references.
01/15/11	Revision; related ICD-10 codes added.

12/01/11	Update; added related ICD-10 codes.
02/15/12	Scheduled review. Revised description section for clarification of technology. No change in position statements.
04/01/12	Update; added related ICD-10 codes.
01/01/14	Revision; Program Exceptions section updated.
10/01/15	Revision; updated ICD9 and ICD10 coding section.
11/01/15	Revision: ICD-9 Codes deleted.
10/01/16	Quarterly code update; deleted I60.20-I60.22; added I60.2.
08/15/18	Review; no change in position statement. Updated references.
10/01/18	ICD-10 coding update; deleted I63.8; added I63.81 and I63.89.