TRANSCRANIAL DOPPLER (TCD) ULTRASOUND
MED202.047
BlueReview POSTED DATE: 11/17/2003
EFFECTIVE DATE: 10/24/2003

COVERAGE:

Transcranial Doppler (TCD) Ultrasound is considered medically necessary when used for the following:

- Assessing for vasoconstriction such as in patients with subarachnoid hemorrhage;
- Reviewing for severe stenosis in the carotid, vertebral and circle of Willis arteries;
- Evaluating patterns and degrees of collateral circulation where identified areas of severe occlusion occur as in carotid endarterectomy or intracranial atherosclerosis;
- Determining risk in patient for transient ischemic attacks (TIA) or cerebrovascular accidents (CVA);
- Identifying arteriovenous malformations (AVMs) and following flow patterns; or,
- Assessing suspected brain death.

TCD is considered investigational and experimental when used in following indications:

- Evaluation of hemodynamic importance of extracranial atherosclerosis;
- Monitoring cerebral blood flow following trauma;
- Assessing migraine and tension headaches;
- Reviewing cerebral blood velocity during cardiopulmonary bypass surgery and embolic events;
- Evaluating blood flow patterns in central nervous system infections;
- Assessing dementia; or
- Evaluating glaucoma.

DESCRIPTION:
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TCD ULTRASOUND is a non-invasive modality for imaging blood flow in cerebral arteries and veins. In TCD, 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).

The sites are:

- Temporal bone along the orbito-meatal line (the opening of the boney cavity that contains the eyeball);
- Optic foramina (a passage through the bone for the eye); and,
- Foramen magnum (the large opening in the inferior and anterior part of the occipital bone interconnecting the vertebral canal and the cranial cavity) at the base of the skull.

Sound waves transmitted through these windows are reflected by blood in the intracranial vasculature. The frequency shift of the reflected sound waves recorded at the probe is used to estimate blood flow velocity or volume.

RATIONALE:

Routine TCD examination of the intracranial arteries was demonstrated to be possible in 1982. TCD is primarily a technique for measuring relative changes in flow. One fact that has to be constantly kept in mind when utilizing TCD is that the value obtained for a particular artery is the velocity of blood flowing through the vessel, and unless the diameter of the vessel is established by other means it is not possible to determine the actual blood flow.

The American Academy of Neurology technology assessment report published in 1990 stated that TCD established value in the assessment of patients with intracranial stenosis, collateral circulation, subarachnoid hemorrhage, and brain death. A panel of international experts reviewed the literature published up to 1998 and ranked the specific clinical applications of TCD based on the strength and quality of published evidence. This review sustained the position by the Academy in 1990.

PRICING:

Since TCD Ultrasound (93886 or 93888) and magnetic resonance angiography of the head (70541) use different physical and technical principles for evaluating the cerebral vasculature, the information obtained from each test can be complementary rather than duplicative.
In some circumstances, it may be necessary to obtain both non-invasive tests before management decisions can be made.

REFERENCES:

- BCBSA TEC Assessment Program, "MRA of the Head", 1996; Tab. 31 and "MRA of the Neck" 1996; Tab. 32, Medical Policy 6.01.07.
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