

Brain Blood Flow Testing

Brain Blood Flow Testing refers to the use of clinical or instrumental methods to detect, measure, or confirm the presence or absence of cerebral perfusion—that is, the flow of blood through the brain's vascular system.

□ **Purpose** To determine whether oxygenated blood is reaching brain tissue, which is essential for assessing:

Brain viability or function

Irreversibility of brain injury

Compliance with legal and ethical criteria for death

□ **Common Methods** Cerebral Near-Infrared Spectroscopy (NIRS) – monitors regional oxygen saturation in the brain.

Transcranial Doppler (TCD) – detects blood flow velocity in major cerebral arteries.

Radionuclide Cerebral Perfusion Scans (e.g., HMPAO SPECT) – visualizes active perfusion.

CT/MR Perfusion Imaging – provides detailed maps of blood flow to different brain regions.

Digital Subtraction Angiography (DSA) – gold standard for demonstrating cerebral circulation.

EEG/BIS Monitoring (indirect) – absence of electrical activity may correlate with absent flow, but not a direct measure.

△ **Clinical Contexts** Determination of brain death

Organ donation (especially DCD with TA-NRP)

Monitoring during cardiac arrest or circulatory support

Assessing prognosis in severe brain injury

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