Northwestern Memorial® Hospital

CLINICAL GUIDELINE

Subject: **NEUROLOGICAL TESTING CENTER**	Pages 5	NTC Policy #4
Title: **Electroencephalography as supportive testing in the determination of brain death**	Revision of: NEW	Effective Date:

I. PURPOSE:

To provide guidelines for the recording of Electrocerebral Silence Electroencephalography in accordance with the American Clinical Neurophysiology Society (ACNS) guidelines.

To provide supportive testing for the determination of brain death according to the NMH policy # 5.88, revision of 12/18/2007.

II. CLINICAL GUIDELINE:

Supportive testing (e.g. with EEG) is mandatory when exclusion factors are present to assess brain death (neuromuscular blockade, known or suspected cervical spine injury, facial trauma that precludes accurate testing of the cranial nerves and brainstem function and the EEG exclusion factors listed below) or if any element of the clinical exam, including the Apnea Diffusion Challenge, cannot be safely or reliably completed.

Certain EEG exclusion factors (hypothermia with core body temperature below 32°C (90°F), drug or alcohol intoxication, intoxication due to metabolic derangement (i.e. hepatic encephalopathy, preterminal uremia), hypotension as indicated by mean arterial pressure less than 55 mmHg) may invalidate the results of the electroencephalography.

Hence, the EEG as supportive testing to determine Electrocerebral Silence should only performed in:

a. patients with documented neurologic examination consistent with brain death
b. after the Apnea Diffusion Challenge (unless the commencement of the Apnea test is contraindicated).
c. in absence of EEG exclusion factors

The EEG for the evaluation of brain death is considered an emergent test and will be performed at the earliest possibility including overnight and on the weekend. The

attending neurophysiologist should be notified of any ECS requests to verify indication and facilitate testing and reporting.

III. PERSONS AFFECTED:

Neurological Testing Center technical staff, Attending Neurophysiologist. Neurology and Neurosurgical team, Neurospine ICU team.

IV. PROCEDURE GUIDELINES:

A. Definition

Electrocerebral inactivity (ECI) or electrocerebral silence (ECS) is defined as no EEG activity over 2 uV when recording from scalp electrode pairs 10 or more cm apart with interelectrode impedances under 10,000 Ohms (10 KOhms), but over 100 Ohms.

B. Technical Guidelines:

1. A Full Set of Scalp Electrodes Should Be Utilized
2. Interelectrode Impedances Should Be Under 10,000 Ohms But Over 100 Ohms
3. The Integrity of the Entire Recording System Should Be Tested
4. Interelectrode Distances Should Be at Least 10 Centimeters
5. Sensitivity Must Be Increased from 7 uV/mm to at Least 2 uV/mm *for at Least 30 Minutes* of the Recording, with Inclusion of Appropriate Calibrations
6. Filter Settings Should Be Appropriate for the Assessment of ECS
7. Additional Monitoring Techniques Should be Employed When Necessary
8. There Should Be No EEG Reactivity to Intense Somatosensory, Auditory, or Visual Stimuli
9. Recordings Should Be Made Only by a Qualified Technologist
10. A Repeat EEG Should Be Performed If There is Doubt About ECI

C. Recording

The recording is to be performed by a registered EEG technologists. Electrodes can be placed according to standard 10-20 placement. Each individual electrode integrity ("tap test") has to be confirmed.
The study will be reviewed using the double distance "ECS" montage with the sensitivity parameters indicated above.

D. Report

Relevant parts of the history include the nature of the insult, the result of the neurological testing and any ancillary tests performed to confirm brain death. The history should also include if the patient is a potential candidate for organ transplant if applicable.

List drug levels of any pertinent meds including sedatives. If indicated, drug levels should be documented.

The patient's temperature at time of study should be included and the presence of any warming blanket.

The guideline states there should be no reactivity to intense somatosensory, auditory or visual stimuli. We don't use visual stimuli. Most machine don't have photic on them.

E. Communication

The attending neurophysiologist has to be notified immediately at the end of the recording.

F. Billing

EEG study to confirm electrocerebral silence have a separate charge code (CPT 95824).

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POLICY UPDATE SCHEDULE:

Minimum of every three years or more often as appropriate.

REFERENCES:

1. *Guideline 1: Minimum Technical Requirements for Performing Clinical Electroencephalographpy, American Clinical Neurophysiology Society, 2006*
2. *Guideline 3: Minimum Technical Standards for EEG Recording in Suspected Cerebral Death, American Clinical Neurophysiology Society, 2006*

Appendix A:
NMH NTC Standard Montages

Appendix B: Clinical Guidelines:
NMH ECS guidelines

Appendix C:
Guidelines for ordering Emergency EEGs and cVEEG monitoring

APPROVAL

Responsible Party:	Manager, Neurological Testing and Sleep Disorders Center
Reviewers:	Medical Director, Neurological Testing Center Manager, Neurological Testing and Sleep Disorders Medical Director, Comprehensive Epilepsy Center
Approval Parties:	Manager, Neurological Testing and Sleep Disorders Center
	Medical Director, Comprehensive Epilepsy Center

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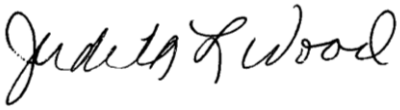
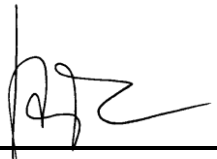
Policy Approved by:

X 

Judith Wood
Manager, Neurological Testing Center

X 

Stephan Schuele, MD
Medical Director, Neurological Testing Center