I.  **PURPOSE:**
To provide guidelines for the recording of 24 hour ambulatory EEGs in accordance with lab requirements.

II. **CLINICAL GUIDELINE:**
Main purpose for ambulatory EEG is to assess interictal epileptiform activity, to assist in diagnosing epileptic versus non-epileptic events and to investigate frequency of seizures of patients who are not aware or unable to report that they are having seizures.

Ambulatory EEG is ordered on outpatients only. Patients may be from nursing home or a rehabilitation center. Patient or caregiver will bring orders from patients’ physician indicating number of days to be recorded. Patients are instructed to continue their medications unless instructed otherwise by their physician. Patients will be given a log sheet on which to record any events (seizures, loss of consciousness, change in mental status, or behavioral changes).

Hyperventilation and photic stimulation are not routinely performed unless requested by patient’s physician. Recording includes EKG leads.

III. **PERSONS AFFECTED:**
Neurological Testing Center staff and Attending Neurophysiologist.

IV. **PROCEDURE GUIDELINES:**

A.  **PATIENT PREPARATION:**

1. Patients are instructed to wash their hair the night before their appointment
2. Patients are instructed to take their medications as prescribed by their physician.
3. Patients are instructed to remove any hair pieces or weaves prior to testing.

B.  **EQUIPMENT:**

1. All equipment to be used on patients must first be inspected by Biomed and have proper asset tags.
2. All cables used with unit must be in good condition.

C.  **DIGITAL SPECIFICATIONS:**
1. Playback EEG system must confirm to following specifications:
   a. Sensitivity as appropriate
   b. Filter settings: Low Frequency Filter of 1.6 Hz and High Frequency Filter of 70Hz.
   c. Digital speed 30 mm/second

D. TECHNICAL SPECIFICATIONS:

1. Electrode Placement:
   a. Measure and mark head with grease pencil according to the 10-20 International System of Measurement.
   b. A1 and A2 electrodes are included.
   c. Prep scalp with abrasive cream.
   d. Apply electrodes using gauze and collodion. Non-ether adhesive is available per ordering physician request for patients who are pregnant.
   e. Electrode paste or electrolyte cream/gel may be used when applying electrodes.
   f. Electrodes are gathered together behind patient’s head and secured by tape or coban in order to keep them out of the patient’s way.
   g. Patients may have their head wrapped to protect electrodes, but no dressing material may be placed under patient’s chin.
   h. Describe any skull defects and document on EEG recording and report.
   i. Document any electrode placement deviations to the 10-20 System if electrodes need to move due to skull abnormalities or skin lacerations/sutures/edema.

2. Impedances
   a. Impedances should be less than 5 K ohms
   b. Document any skin conditions or medical treatment that limit ability to obtain satisfactory impedances

3. EKG leads
   a. 2 EKG pads are used to record heart beat
   b. ii. Prep skin with alcohol pad and wipe dry
   c. Attach 2 fresh EKG pads just below clavicle bone on the left and right sides.

E. EEG RECORDING:

1. Connect ambulatory unit ether net cable to EEG computer to launch study.
2. Choose montage: Ambulatory__EKG+A1A2.tsp on ambulatory recording unit.
3. Ask the patient to lie quietly with eyes closed for 5 minutes to obtain background activity.
4. Instruct patient not to chew gum due to mouth movement artifact.
5. Instruct patient not to get ambulatory unit wet; Patient cannot shower or take a tub bath while being recorded. They may wash up using a sink/wash bowl
6. Give patient event log sheet. Explain to patient and accompanying homecare staff or family member the importance of logging any seizures, events or symptoms (seizures, headache, tremors, confusion, twitching, behavioral changes)
7. Inform the patient/caregiver of the time of the next days’ returning appointment.

F. RECORDING DOWNLOAD:

1. Download file to C drive
2. Check that entire recording is available and of acceptable quality
3. Copy recording from C drive to raw data drive (G drive) and add to database.
4. Process the ambulatory EEG through automatic seizure detection software (e.g. Persyst/Insight) and validate that the processing was complete.

G. DOCUMENTATION:

1. Patient identification
   a. Two forms of identification are required. Ask the patient for their name and birth date.
   b. Verify wristband if patient is from an outside facility (i.e nursing home or rehabilitation center)
2. Clinical History:
   a. Obtained from patient or caregiver. Additional information may be found in Epic or Power Chart.
   b. Description of seizures; first and most recent seizure occurrence
   c. Family history of seizures.
   d. Patient risk factors for seizures: birth injury, head trauma, stroke, brain or systemic infectious diseases, febrile seizures, previous brain/head surgery.
   e. Seizure triggers.
   f. Pertinent medical history.
   g. Current anti-epileptic medications and other pertinent medications.
   h. Results of most recent brain imaging studies.
   i. Verify if patient is sleep deprived.
   j. Document any attached/implanted medical devices
3. Record Annotation
CLINICAL GUIDELINE

Subject:  
NEUROLOGICAL TESTING CENTER  

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NTC Policy #2

Title: 
AMBULATORY EEG CLINICAL GUIDELINE 
Revision of:  
NEW  
Effective Date:  

a. Demographics and log number  
b. Patient name and MRN  
c. Patient’s age and DOB  
d. Date of service  
e. Assignment of study number in following format: Study Type + Year and 3 digit accession number: AM13-001

4. EEG annotation:  
1. Patient’s mental status /level of consciousness  
b. Background activity  
c. Identify sleep stages when possible  
d. Inter-ictal and non-epileptiform abnormalities  
e. Clinical EEG seizure onset and end  
f. Number seizures/events chronologically as they occur  
g. Document HV, PS if performed

5. Report:  
a. Includes naming activity, frequency, amplitude, location, morphology, rhythmicity, amount and reactivity.  
b. Describe any events i.e. seizures, symptoms or behavioral changes.

6. Communication  
a. Notify the Fellow reading ambulatory studies when a new patient is hooked-up and the number of days for which they are scheduled.

H. BILLING:  

1. There is one charge per report.  
2. Charging:  
a. 1st day by the person who hooks up the patient  
b. Additional days: whoever fixes electrodes when the patient returns. If the patient does not come every day, the person who fixes or takes off electrodes will charge for the prior day as well.  
c. Reviewing technologist will delete charges if the study is incomplete or corrupted and will verify that there is a charge and report per day.
POLICY UPDATE SCHEDULE:

Minimum of every three years or more often as appropriate.

REFERENCES:


Appendices:

Appendix A:
Montages: RUN I - VI; TNO; HEADBAND; NEONATE; ECS

Appendix B: Clinical Guidelines:
Adult EEG clinical guidelines

APPROVAL

Responsible Party: Manager, Neurological Testing and Sleep Disorders Center

Reviewers: Medical Director, Neurological Testing Center
Manager, Neurological Testing and Sleep Disorders Center
Head, Epilepsy Section, Northwestern University, Department of Neurology

Approval Parties: Manager, Neurological Testing and Sleep Disorders Center
Medical Director, Neurological Testing Center