Maintenance of Wakefulness Test

Audience: All personnel in the Center for Sleep Disorders.

Purpose: To establish technical guidelines for MWT procedures performed on outpatients in the sleep disorders center.

Policy: MWT is indicated to asses a person's ability to remain awake when his or her inability to remain awake constitutes a public or personal safety issue. MWT may be indicated in patients with excessive daytime sleepiness to assess response to treatment.

General Considerations:
The patient's use of tobacco, caffeine and medications before the MWT should be determined by the sleep clinician before the MWT. Drug screening may be indicated to ensure that sleepiness or wakefulness during the MWT is not influenced by substances other than medically prescribed drugs. The physician may request a urine specimen for drug screening; the timing of this specimen is determined by the physician.

The patient should be informed to:

- Eat breakfast, if customary, prior to their appointment
- Bring a light lunch, snacks, and drinks for consumption between testing sessions (no chocolate or caffeine)
- Bring any prescription medication that they may need during the day (Sleep Center personnel are not responsible for administering any medications)

Procedure:

1. Determine that an MWT needs to be performed.
    - Ordered by the referring physician and must be approved by the Medical Director or his designee
    - Performance of a PSG prior to MWT is at the discretion of the Medical Director or his designee based on clinical circumstances
    - A urine drugs screen (UDS) panel 2 (DRG2 U) on the Special Chemistry-Form 2, may be ordered during the MWT prior to nap four.
    - The patient must sign a consent form for the UDS.

2. The study will consist of 4 trials at 2 hour intervals.
    - The first trial will begin between 1.5 to 3 hours after the patient's usual wake up time.
    - The test will last for 40 minutes in the event the patient does not fall to sleep.

    - Twenty minute trials may be done at the discretion of the Medical Director or his designee or based on agency requirements (i.e. FAA, DOT guidelines). Use of 20 minute trials must be justified and specified in the Epic referral.
  - The room should be maximally insulated from external light. The designated light source should be positioned slightly behind the patients head such that it is just outside of his/her field of vision. Room temperature should be based on the patient's comfort level. The subject should be seated in bed, with the back and head supported by a bed rest (bolster pillow) such that the neck is not uncomfortable flexed or extended.
  - The recording is terminated after 40 minutes if no sleep occurs.
  - The patient will be awakened and the trial concluded upon the following:
    - Three consecutive epochs of stage 1.
    - Any epoch of stage 2,3,4 or REM
  - Sleep onset for the MWT is defined as the first epoch of any stage of sleep.
  - The Sleep Technologist who performs the study should be experienced in conducting the test.
3. Performing the MWT:
  - After completion of the polysomnography (if applicable), airflow, chest respiration belts, oximeter probe and leg EMG leads are removed.
  - Prior to the MWT the patient should dress in street clothes, eat breakfast and use the bathroom. The MWT procedure should be explained to the patient. The patient is told that he or she cannot sing or make unnecessary movements during the test nor have caffeinated beverages or food including energy drinks and energy bars.
  - Between trials the patient should be out of bed and overseen by continuous visual monitoring by technicians to ensure that no napping occurs.
  - The first page of the MWT is labeled with the following information:
    - Patient name
    - Patient identifier
    - MWT
    - Room number
    - Date of test
    - Patient date of birth.
    - Ordering physician
    - Initials of technologist performing the study

MSLT/ MWT Montage

Channel	Output	Sensitivity	Low Filter	High Filter	Width
1	C4-M1	200µV	0.3Hz	35.0Hz	100%
2	O2-M1	200µV	0.3Hz	35.0Hz	100%
3	F4-M1	200µV	0.3Hz	35.0Hz	100%
4	E2-M1	200µV	0.3Hz	35.0Hz	100%
5	E1-M2	200µV	0.3Hz	35.0Hz	100%
6	EKG1-EKG2				100%
7	HR				100%
8	Chin1-Chin2	200µV	10.Hz	70.0Hz	100%

- A 50-microvolt standard calibration is performed for all recording channels.
- The electrodes are visually inspected for good adherence, and any loose electrodes are replaced.
- An impedance check is performed, and any electrodes >5000 ohms are replaced and rechecked.
- Patient is placed in bed at rest time, and the head box is plugged in.
- The room lights are out with a dim light illuminated behind the patient.
- The following schedule of events occurs prior to each test:
    - 30 minutes before- cessation of smoking.
    - 15 minutes before- suspension of physical activity.
    - 10 minutes before-preparation for bed.
    - 5 minutes before- electrodes connected and calibrations completed (see below)
    - 5 seconds before- instructions to relax and remain awake.
    - 0- lights out.
- Technologist starts polygraph and makes adjustments in tracing. When tracing is acceptable, technologist must perform electrical calibration followed by patient biocalibrations:
    - Eyes open for 30 seconds
    - Eyes closed for 30 seconds
    - Moving eyes only, look right and look to left. Repeat 5 times.
    - Moving eyes only, look up and look down. Repeat 5 times.
    - Blink several times
    - Grit teeth.
- Inform patient that the nap has begun with the following statement: “Please sit still and remain awake for as long as possible. Look directly ahead of you, and do not look directly at the light.”

- Patients are not allowed to use extraordinary measures to stay awake such as slapping the face or singing.
- Label the sleep study log sheet with the following information:
    - Patient name, medical record number and date
    - Lights out and time.
    - Patient position.
    - Patient movements
    - Sensitivity or filter settings
    - Lights on and time
- The test is ended after 40 minutes if no sleep occurs. If sleep does occur, the test is ended after unequivocal sleep, defined as three consecutive epochs of stage 1, or 1 epoch of any other stage of sleep.
- Electrical and biological calibrations must be performed prior to each trial and after the last trial prior to ending the recording.
- Disconnect the head box from the cable between trials. Inform patient that he or she must stay awake until the start of the next test at approximately (time).

4. End of Study
    - After ending biological and electrical calibrations turn off polygraph or exit computer.
    - Gently remove all sensors from patient, Take care to avoid irritation of patient's skin.
    - Carefully remove tape and electrode from the patient's skin.
    - After all electrodes have been removed assure that all paste residue has been removed from the patient including the paste on the head by rubbing an alcohol soaked gauze over the sites.
    - Discharge patient from the sleep center.

5. After the Polysomnogram
    - Carefully sort wires and group them together by length or application site.
    - Remove any remaining tape, wash electrodes with soap and water, rinse and wipe down with Cavicide Wipes.
    - Inspect wires at this time to ensure their integrity.
    - Return any equipment and all disinfected wires to the storage area for future use

6. General Cleanup Checklist
    - Discard all used tape, collars, gauze, etc.
    - Return patient preparation cart to appropriate area.
    - Stock patient preparation cart as needed.
        - If CPAP and/or oxygen equipment was used, remove and empty humidifier, connecting tubing, nasal cannula, and

any other equipment and place in designated "dirty equipment area" for cleaning and disinfecting.
- Discard disposable equipment such as the nasal cannula or disposable oximeter probe.
- Remove any lint from CPAP equipment filter.
- Remove all used linen and place in appropriate dirty linen container.

- Wipe down the bed, bedside table and any equipment or controls used with caviwipes.
- Make the bed with clean sheets, hospital thermal blanket and bedspread.
- Leave patient suites in clean and orderly condition.

7. Scoring
   - The sleep latency is determined from lights out to the first epoch of any stage of sleep.
   - The following data should be included with the results:
     - Start and stop times for each trial
     - Sleep latency
     - Total sleep time
     - Stages of sleep achieved for each trial
     - Mean sleep latency

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