Patient Preparation and Electrode/ Sensor Application

**Audience:** All personnel in the Sleep Disorder Center.

**Purpose:** To establish guidelines for the consistent placement of electrodes and sensors for the recording of physiologic data during polysomnograms.

**Policy:** Standard procedures will be followed to prepare the patient for polysomnography. All sensors and electrodes will be applied following standard procedures and adhering to published standards and guidelines.

- Apply surface electrodes to cephalic and non-cephalic sites with conductive cream and tape.
- The 10-20 International Electrode Placement will be used for measurement and placement of EEG electrodes.
  - Cephalic sites include: F3, F4, C3, C4, O1, O2, M1, M2 and ground placed on the forehead or CZ.
- EOG electrodes should be placed approximately 1 cm above and slightly lateral to the outer canthus of one eye and another electrode should be placed 1 cm below and slightly lateral to the outer canthus of the other eye. Both electrodes are referred to the same ear or mastoid electrode, either M1 or M2.
- EMG, Chin: Three electrodes should be placed on the muscle areas on and beneath the chin (mental, submental) about 2 cm apart. The cables should be taped with slack to decrease pulling of the electrodes at the application site.
- EMG, Right and left anterior tibialis: The tibialis anterior muscle is located on the lateral aspect of the tibia.
  - If two channels are available on the PSG Montage. Two electrodes should be placed on the belly of the muscle approximately 2 cm apart. The cables should be taped with slack to decrease pulling of the electrodes at the application site.
  - If only one channel is available on the PSG montage. One electrode will be placed on the belly of the muscle.
- ECG electrodes:
  - One electrode is placed under the center of the left breast, equivalent to the V4 position.
  - The other electrode is placed 5 cm below the right mid-clavicular line.
- Thermocouples: A thermocouple detects airflow by measuring the difference in temperature between expired and inspired air. It does not measure airflow quantitatively. One thermocouple should be placed in each nostril and one in the front of the mouth. They should be secured with tape.
- Chest Movement: Inductance plethysmography belts should be placed to differentiate thoracic and abdominal movement.
  - The abdominal transducer belt should be placed over the lower abdominal area.
o With male patient the thoracic belt should be place on the nipple line.
o With female patients the belt should be placed above the breasts.
o Stretch both transducers simultaneously to insure that the polarity is identical.

- Oximeter: Arterial oxygen saturation can be monitored non-invasively by an oximeter. If the subject has adequate peripheral perfusion, it may be placed on the finger. The cable may be secured with tape.
- Nasal Pressure: Nasal pressure is used to monitor snoring and flow limitation. A nasal cannula is connected to the appropriate port on the device located in the patient’s room.
- If a Sleep Behavior Disorder (RBD) study is ordered or Arm movement recording is requested by ordering physician:
o One electrode will be placed on the meatiest area of muscle on each forearm.

Upon completion of testing:
- Gently remove cephalic and non-cephalic electrodes, thermistors, bands, masks, tape. Attempt to remove most adhesive residue and conductive cream from patient’s body.
- Disk electrodes should first be cleaned with gauze, tap water, or ideally with a mechanical cleaner to remove particulate matter. They should be immersed in 2% glutaraldehyde solutions for at least 30 minutes or other noncorrosive disinfecting agents (phenols, iodophors, alcohol, 5% sodium hypochlorite).
- Other cable and wires should be wiped down with alcohol and adhesive residue removed.
- CPAP mask, tubing, and humidifier chamber will be rinsed and disinfected with appropriate germicidal cleaner.

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