OLIVE VIEW-UCLA MEDICAL CENTER
RESPIRATORY CARE SERVICES – SLEEP MEDICINE
POLICY & PROCEDURE

NUMBER: 9107
VERSION: 1

SUBJECT/TITLE: PEDIATRIC POLYSOMNOGRAPHY PROTOCOL

PURPOSE: Provide adequate information to perform quality Polysomnogram on pediatric patients per physician order with confidence and competence. Pediatric patients include age-specific ranges of Toddler (2-3 years), Pre-school child (4-5 years), School-age child (6-12 years), and Adolescent (13-17 years). Polysomnography is essential to diagnose certain sleep related conditions. Below is a list of common indications.

INDICATIONS:

- Snoring
- Excessive daytime somnolence
- Insomnia, unexplained, resistant to therapy
- Neuromuscular disease
- Disorders of arousal, which include, but are not limited to: confusional arousals, sleepwalking and sleep terrors. Other parasomnias include hypnagogic hallucinations, sleep paralysis, nocturnal seizures, bruxism and rhythmic movement disorder.
- Sleep-associated seizures

POLICY: Toddler (2-3 years), Pre-school (4-5 years), and School-age children (6-12 years)

1.0 Schedule for nighttime testing with one parent or caretaker available throughout the procedure. A visit to the sleep center prior to the scheduled procedure is encouraged to help parent and child become familiar with the surroundings and to answer any questions they might have.
2.0 Encourage parent to bring patient's comfort items such as snacks, bottles, diapers and favorite bedtime toy or blanket.
3.0 Patient-testing suite will be "child proofed" (outlet covers, no sharp corners or objects).
4.0 Bed style will be determined based on size and age of patient. Cribs will be used for younger patients. Bedside safety rails will be used when appropriate. Protect mattress with the addition of waterproof pads to the normal bed linen in the event of risk of enuresis episodes.
5.0 Parent will stay in the patient room at the discretion of the medical director. Parent should not sleep in the same bed with the child, unless necessary to complete study. A recliner or bed should be provided for parent's comfort, and whenever possible parents should be able to remain in the testing room.
6.0 Feedings depend on the patient's schedule. The fussy patient may do better if fed prior to electrode application. Feeding time may vary, depending on indications for and timing of the study.
7.0 Additional toys and children's videos will be available to keep patient occupied during electrode application.
8.0 Technologist-to-patient ratio will be 1:1, if indicated. Maximum ratio is 1:2. Electrodes will be

applied to obtain consistency and maintain high quality signals during the recording. The 10-20 method of application with 10-20 past is used at OVMC.

Adolescent (13-17 years)

1.0 Schedule for nighttime testing with one parent or caretaker available throughout the procedure.
2.0 Follow adult protocol for polysomnography testing.
3.0 Maximum technologist-to-patient ratio is 1:2. In cases that involve significant anxiety or developmental disabilities, a 1:1 technologist-to-patient ratio may be necessary.

PROCEDURE: Prior to Patient Arrival at the Sleep Center

1.0 Confirm physician order for polysomnogram and any other procedures such as supplemental nocturnal oxygen and/or nasal CPAP.
2.0 Confirm that a history and physical examination are in the patient's chart. Determine the child's usual sleep/wake schedule and make effort to schedule the polysomnogram start time within 30 minutes of the child's usual bed time.
3.0 Confirm physician order or center protocol for appropriate montages to be utilized.
4.0 Confirm that age-specific resuscitation equipment is available in the sleep facility.
5.0 Patient suite and sensors should be inspected and prepared prior to patient's arrival.
6.0 Calibrate polygraph and/or computer and related monitors and confirm proper operation.
7.0 Confirm proper operation of video camera.

Patient/Parent Preparation for Testing

1.0 After escorting the parent and the patient to the patient suite, explain procedure to the patient and parent in terms the child can understand.
2.0 Consent-to-treat form should be signed.

Electrode Placement/Application
WASH HANDS THOROUGHLY

EEG

1.0 Preparation of scalp electrodes:
  1.1 The EEG leads must be applied according to the International 10-20 System to assure accurate electrode application. Electrode sites generally used for the polysomnogram are ground, F3, F4, C3, C4, O1, O2, M1 and M2. Additional electrodes will depend on system or montages to be utilized. A system reference electrode is also used for computerized systems.
  1.2 Prepare the electrode sites using skin abrasive specifically designated for skin preparation. Apply abrasive to marked electrode sites with cotton swab using care to avoid over-abrading the scalp. Allow to dry.
  1.3 Application of electrodes is accomplished by the10-20 application method.
  1.4 Place TEN-20 conductive paste in electrode cups and apply them to the prepared areas on the scalp. Secure the electrode cups by applying 1" x 2" gauze pieces with a small amount of 10-20 paste over each of the electrode cups and securing them with a few hairs crossed over the gauze patches.

EOG

1.0 Properly identify each location of electrode placement, prepare sites with skin abrasive gel and allow to dry.

2.0 Fill electrode cups with conductive cream and apply one electrode 1 cm above and 1 cm away from outer canthus of the right eye and the other electrode cup 1 cm below and 1 cm away from outer canthus of the left eye.
3.0 Tape the electrodes in place. Guide wires toward back of patient's neck.

EMG

1.0 Submental/Mentalis
1.1 After properly preparing electrode sites and filling electrode cups with conductive paste, apply one electrodes at the center of the chin and one electrode beneath the chin.
1.2 Secure electrodes with gauze or paper tape and drape over patient's ears toward back of his or her neck.
2.0 Left/Right Anterior Tibialis
2.1 Prepare each electrode site with skin abrasive gel. Allow to dry.
2.2 Identify muscle by flexing patient's ankle and observing muscle movement at the site.
2.3 Place stick on electrode on that portion of patient's legs. Secure with paper tape

EKG

1.0 Identify and prepare sites with skin abrasive gel and allow to dry.
2.0 Apply EKG electrodes or patches and attach snap electrodes. Placement of electrodes should be below the clavicles and equidistant from the sternum.

Respiration

1.0 Airflow devices
1.1 A single, double or triple bead nasal and/or oral thermocouple or thermistor is secured directly below the nostrils to record air temperature changes at patient's nose and/or mouth. A number of different devices are available. Nasal pressure transducers should be used, in accordance with the *AASM Manual for the Scoring of Sleep and Associated Events*. Choice of device is at the technologist's discretion.
2.0 CO2 monitoring (end-tidal or transcutaneous)
2.1 When evaluating sleep-disordered breathing in children, it is recommended that both airflow and CO2 be recorded.

Respiratory Effort

1.0 For monitoring respiratory effort, use one of the following:
1.1 Esophageal manometry, if used. (Not used at OVMC for peds).
1.2 Both thoracic and abdominal RIP belts (calibrated or uncalibrated)

Oximetry

1.0 An oximeter probe is attached to patient's finger, toe, nose or ear; choice of site depends on technologist discretion and available sensors.

Final Preparation

1.0 Group sensor wires together and secure them. Arrange wires out of reach of the child.
2.0 Confirm patient's comfort in bed.
3.0 If applicable, raise side rails to the up-and-locked position. Document in technologist's notes.
4.0 Confirm impedances.
5.0 Confirm data at polygraph or computer.

Collection

1.0 Begin recording at this time and perform patient calibrations.
2.0 After completing patient calibrations document "Lights Out."

3.0 Document all observed actions and reactions.
4.0 Correct any artifact and document it as it occurs during the recording.
5.0 Sleep study data should generally be collected for a minimum of 7 hours, if indicated.

End of Sleep Study

1.0 At the end of the polysomnogram, gently awaken patient and document "Lights On."
2.0 End recording and if necessary exit from the computer program.
3.0 Gently remove all sensors from patient. Take care to avoid irritation of patient's sensitive skin.
4.0 Carefully and diligently soak each electrode site with warm water until the electrode gently lifts away from the patient's skin.
4.0 Assure that most paste residue has been removed from patients head.

After the Polysomnogram

1.0 Carefully sort wires and group them together by lengths and application sites.
2.0 Remove any remaining tape, wash electrodes with hot water, rinse well and allow to dry, and then wipe down wires and electrode cups with a germicidal wiping cloth.
3.0 Inspect wires at this time to insure their integrity.
4.0 Return any equipment and all cleaned and disinfected wires to their storage area for future use.

General Cleanup Checklist

1.0 Discard all used tape, collars, gauze, etc.
2.0 Clean and disinfect thermocouples/thermistors, if not disposable.
3.0 Return patient-preparation kit to appropriate area.
4.0 Stock patient-preparation kit as needed.
5.0 If CPAP and/or oxygen equipment was used, connecting tubing, patient bore tubing, masks and any other equipment and place in designated "dirty equipment area" for cleaning and disinfecting.
6.0 Discard disposable equipment such as the nasal cannula, disposable belts etc.
7.0 Remove any lint from CPAP equipment filter if indicated.
8.0 Remove used linen and place in appropriate dirty-linen container. (OVMC environmental staff).
9.0 Leave patient suites in clean and orderly condition. (OVMC environmental staff).

Scoring the Polysomnogram

1.0 Sleep-stage scoring is based on the *AASM Manual for the Scoring of Sleep and Associated Events: Rules, Terminology and Technical Specifications, if age appropriate.*

References:	
Approved by: Jeanne Wallace (Division Chief)	Date: 09/13/2017
Review Date: **09/13**/2020	Revision Date:
Distribution: Respiratory Care	