

## **NEONATE AND INFANT POLYSOMNOGRAPHY PROTOCOL**

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### **PURPOSE**

Provide adequate information to perform quality polysomnograms on the neonate and infant. *Neonate* generally refers to a child up to one month of age after birth, and *infant* generally refers to a child between 1 month and 12 months of age. If the infant is premature (i.e., less than 38 weeks gestation), the age is adjusted from the gestational age.

### **INDICATIONS**

- Sleep induces changes in the function and control of the respiratory system. These changes may result in clinically significant abnormalities in upper-airway function and gas exchange in normal children and those with underlying respiratory or central nervous system disease.
- Neonates and infants, especially those born prematurely, frequently experience apnea or bradycardia during sleep and feeding in the first several weeks of life. Virtually all neonates and infants under 1000 g will experience apnea. Apnea may be mixed, central or obstructive. Periodic breathing or respiratory dysrhythmia also may be present.
- An apparent life-threatening event (ALTE) is an episode of apnea, color change (e.g., pallor, cyanosis or erythema), hypotonia, or unresponsiveness that the observer believes to be life threatening to the infant and for which some intervention (e.g., stimulation, shaking, and/or cardiopulmonary resuscitation) is felt to be required. The major concerns following one of these episodes relate to the specific etiology as well as the risk of recurrent events and death.
- Although polysomnography may not be indicated for routine evaluation of neonates and infants with an uncomplicated ALTE, it may be helpful in defining the frequency and type of apnea and the extent of cardiac, blood gas and sleep alterations in infants with apnea or ALTE. These patients include infants with suspected obstructive sleep apnea, those with recurrent isolated bradycardia without central apnea, and those suspected to have abnormal respiratory control.
- Other indications include, but are not limited to: chronic lung disease, neuromuscular disease, gastro-esophageal reflux with or without apnea, craniofacial malformations and sleep-related seizures.

### **POLICY**

- As long our facility does not have the expertise to perform a neonatal or infant polysomnogram, the patient will be sent to an accredited sleep disorders facility that has this capability.
- Neonates will be scheduled for daytime or nighttime testing in the NICU nursery or in the sleep disorders facility with a NICU nurse available, if needed. Infants usually will be studied in the sleep disorders facility with adequate medical personnel coverage.

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- Because it is the policy of the NICU that neonates will be disturbed as little as possible, application of electrodes, in some circumstances, may need to be applied in conjunction with nursing procedures during the “Hands On” periods. “Hands On” time is usually every three to four hours and no longer than 10 to 15 minutes. Organizing the electrode and sensor application is essential.
- Patient-to-technologist ratio will be 1:1.
- Feedings depend on the nature of the neonate/infant. An exceptionally fussy patient may do better if fed prior to electrode application; however, feeding usually follows the electrode application.
- Electrodes will be applied in accordance with the following procedure to maintain consistency and high quality recording during the study. Two methods of application are acceptable. The preferred technique is the paste-application method. The head-wrap method with Kling or Coban gauze also may be used.
- When evaluating sleep-disordered breathing in the neonate and infant, it is recommended to record both airflow and CO<sub>2</sub>.
- **IN MOST CASES, DO NOT PLACE NEONATE OR INFANT IN PRONE POSITION DURING THE POLYSOMNOGRAM.** If symptoms occur only in the prone position, this position is to be used with direct observation throughout the evaluation by a caretaker skilled in infant CPR.
- Sleep-study data should be collected for a minimum of eight hours, if indicated, and should include at least one and preferably two feedings.
- Staff must be experienced in the care of infants.

### **PROCEDURE**

#### **Prior to initiating procedure**

- 1.0** Confirm physician orders for polysomnogram and any other procedures such as supplemental nocturnal oxygen and/or nasal CPAP.
- 2.0** Confirm that a history and physical are in patient’s sleep facility chart.
- 3.0** If ordered, confirm proper operation of video camera and recording equipment for audiovisual monitoring.
- 4.0** Contact appropriate nursing staff and arrange mutual time for initiating electrode and sensor application and performing the actual polysomnography when study is to be performed in an inpatient area.
- 5.0** Confirm pediatric resuscitation equipment is in the testing facility and easily accessible.
- 6.0** Assemble all neonate/infant-related supplies and electrode sensors before patient preparation.
- 7.0** When testing in the NICU area, it may be necessary to change from normal uniform into scrubs and gown specific for that area.

Connect polysomnography equipment and CO<sub>2</sub>/SpO<sub>2</sub> monitor to power source. Locate a power outlet that will not obstruct traffic flow during the sleep study recording. Turn on computer and monitors. Select appropriate montage and then calibrate SpO<sub>2</sub>, CO<sub>2</sub> and heart-rate signals. After

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all systems are calibrated and in order, proceed to the electrode and sensor placement/application.