

## Pneumogram

- Purpose:** A pneumogram is used by the physician to diagnose and treat any irregular cardiopulmonary patterns an infant may have.
- Description:** A pneumogram is a ten to twenty-four hour recording of the patient's heart rate, respiratory pattern (impedance), respiratory airflow, pulse oximetry, activity (awake, quiet or sleep) and patient position. Esophageal pH may also be recorded during the study. The recording is to be scored by the NICU coordinator, or in his/her absence, by the patient care coordinator. The report will then be sent to the ordering NICU attending physician for interpretation. Completed studies will be kept on file per hospital policy. The recorder is to be cleaned and set up after each patient use then stored in the NICU coordinator's office.
- Indications:**
1. An infant that is considered at risk for SIDS.
  2. An infant that is having significant episodes of apnea and/or bradycardia to determine whether to intervention with pharmacologic agents such as caffeine or theophylline is warranted.
  3. To determine the efficacy of a pharmacologic agent in preventing apnea and/or bradycardia.
  4. In conjunction with a pH probe study to diagnose esophageal reflux.
  5. To determine the need for home monitoring.
- Equipment:**
1. Respirationics Smart Monitor™ with accessories
  2. Respirationics Smart Recorder™ with accessories
  3. Respirationics patient leads (part number 9510)
  4. Masimo pulse oximeter probe
  5. Respirationics nasal cannula (part number 1008330)
- Personnel:** Respiratory Therapists and Technicians
- Procedure:**
- Smart Monitor™
1. Connect patient cable (ECG) to "patient input"
  2. Connect leads to patient cable
  3. Attach patient leads to patient per patient cable configuration
  4. Connect "Monitor Power" cord to "Power Input" on the back of the monitor
  5. Attach recorder cable to "Recorder Output" on the back of the monitor
  6. Turn monitor on
- Smart Recorder™
1. Attach recorder cable to "Auxiliary" on the back of the recorder
  2. Plug in DC power cable to "DC Power" on the back of the recorder
  3. Plug in "6 Channel Patient Cable" to the front of the recorder
  4. Plug in pulse oximeter cable to the front of the recorder
  5. Press "Power" to turn recorder on
- Patient Sensors
1. Place Masimo pulse oximeter probe on the sole of the foot under the fourth toe (detector) to top of the foot (emitter)
  2. Insert the sensor "tab" into the Masimo patient cable

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*Note: Masimo performs a calibration when oximetry first begins. Should the sensor fall off or be removed from the patient, disconnect the sensor from the patient cable and reconnect. This will ensure that the oximeter performs a calibration and will provide accurate readings.*

3. Place airflow sensor cannula in the patient's nares. Secure with Tegaderm™
  4. Attach airflow connector
  5. Attach the airflow connector to the light blue socket on the patient cable
  6. Attach the body position sensor by pressing the Velcro backing on the sensor onto the Velcro pad on the middle of the chest effort belt
  7. Attach the body position cable to the yellow socket on the patient cable.
- Note: The body position sensor must be in a cable-down orientation. Drape the wire down the patient's chest and between the legs.*
8. Wrap the actimeter bracelet around the patient's wrist and secure it with the Velcro tab
  9. Secure the actimeter to the wristband. Orient the wire away from the baby's body.
  10. Attach the actimeter cable to the green socket on the patient cable

Navigating the LCD Display

1. Use the ▲ and ▼ buttons to display the menu for the parameter that you would like to setup or change.
2. Once the menu is displayed, press the **ENTER** button
3. The displayed menu will blink
4. Use the ▲ and ▼ buttons to view the available parameters for the selected menu.
5. To select a menu setting on the LCD display, press the **Enter** button to select the displayed parameter.

Patient Setup

This is the most commonly used menu. Use it to enter the patient name, enter the medical record number and select the configuration that is to be used. The waveforms may also be checked to verify the signal quality.

LCD Display Shows -

**Menu Selections:**  
**Patient Name**

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*This is the default menu. To proceed, press ▲.*

*To enter the Patient Name:*

1. Press **Enter** to begin entering patient name
2. Press ▲ or ▼ to browse through the alphabet and select the letter you need. When the letter you want appears, press **Enter**. Press **Enter** twice to place a space in between the first and last name.
3. When you have finished the name, press ▲ or ▼ until the ^ appears. Then press **Enter**.
4. Press ▲ to proceed to the next menu or ▼ to move to the previous menu.

LCD Display Shows -

**Patient ID**

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*To enter the Patient ID:*

1. Press ▲ or ▼ until Patient ID is displayed
2. Press **Enter** to begin entering the medical record number
3. Press ▲ or ▼ to browse through the numbers and select the digit needed. When the digit displays, press **Enter**

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4. When you have finished the medical record number, press ▲ or ▼ until the ^ appears. Then press **Enter**.
5. Press ▲ to proceed to the next menu or ▼ to move to the previous menu.

LCD Display Shows –  
**Select Configuration**  
**Configuration #1**  
**Configuration # 2**  
**Configuration #3**

*To select the recording configuration needed:*

1. Press ▲ or ▼ until Configuration is displayed
2. Press **Enter** to activate
3. Press ▲ or ▼ to select the configuration needed. When the configuration needed appears, press **Enter**
4. Press ▲ to proceed to the next menu or ▼ to move to the previous menu.

*Note: Configuration # 1 will be used for most studies. Configuration #2 will be used for esophageal pH studies. These configurations are pre-programmed!*

LCD Display Shows –  
**Check Waveform?**  
**no (yes)**

*To verify the quality of the channel signals before the recording begins:*

1. Press ▲ or ▼ until Check Waveforms is displayed
2. Press **Enter** to activate
3. Press ▲ to select **YES**
4. Press **Enter**, the first waveform in the selected configuration displays
5. Press ▲ to display the next waveform, etc

LCD Display Shows –  
**Press RECORD key to begin**

*To begin recording when the setup is complete:*

1. Press the **Record** button on the front of the Smart Recorder™

Ending a Patient Study

1. Press the “Power” button to turn the recorder off
2. Press and hold “Reset” button on the monitor
3. While holding “Reset” button, press “Off/On” button to turn the monitor off.
4. Disconnect leads, pulse oximeter probe, airflow cannula, and patient sensors
5. Clean monitor and patient sensors
6. Repack monitor, recorders and accessories
7. Return to NICU coordinator’s office or the supervisors’ office.

Infection Control:

1. Patient leads, airflow cannula and pulse oximeter probe are single patient use only
2. Smart Monitor™, Smart Recorder™ and accessories are to be cleaned with a hospital approved disinfectant
3. NICU infection control guidelines are to be followed while performing studies

References:

1. Smart Monitor™ Operator’s manual
2. Smart Recorder™ Operator’s manual

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