

# POLICIES & PROCEDURES

## SLEEP RESEARCH LAB

Date: 1/2001\_\_\_\_\_

Approved:\_\_\_\_\_

### CALIBRATIONS

The purpose of doing calibrations, both machine and biophysical, is to validate the integrity of the input data. The following procedure should be followed after hookup and plug-in to the Grass system.

1. **Check that there is data coming in on all channels and that the data is artifact-free.**
  - a. EOG and EEG channels\*
    - 1) 60 Hz artifact or electrode popping
      - a) Do impedance check on Grass system. Reapply electrode if necessary.
  - b. Airflow channels
    - 1) If signal amplitude is low, first try repositioning the sensor. Then increase gain on the Grass.
    - 2) If airflow is not in phase with Resptrace inspiration and expiration, reverse plug-in in jackbox or invert polarity on Grass.
  - c. Nasal pressure\*
    - 1) Hit <gain set> on Nasal Pressure remote box. Hold for 3 seconds. Gain will automatically adjust to individual's pressure.
    - 2) If amplitude decreases during the night's study, hit <gain set> again, or reposition cannula if volunteer wakes up.
    - 3) If no signal, check the battery in unit and replace if necessary.
  - d. Resptrace\*
    - 1) Tighten the Velcro straps on the oscillator and transducer cable before every study.
    - 2) Calibrate the Resptrace box according to operating instructions. When finished, set button to <Operate>.
    - 3) Check that there is no noise or artifact in the channels.
    - 4) Noisy signal may indicate a bad belt or loose connection. First check that the belt pins are plugged in all the way into the transducer cable.
    - 5) If noise persists, change the belt.
    - 6) If the noise still persists, change the following the this order.
      - a) Transducer cable
      - b) Cable from oscillator to wall connector.
    - 7) Any persistent problem beyond this point, contact me.
  - e. Oximeter\*
    - 1) Turn down pulse volume after turning on unit. Turn off alarm.
    - 2) Check that signal is coming into Grass and that indicators on Grass SaO2 channel match what is seen on the oximeter.
    - 3) If digital value seems too low (below 90), reposition finger probe.

- 4) If there is no signal coming in, check that cable between oximeter and wall connection is plugged in.
- 5) If still no signal, replace BNC cable from Grass system to wall in control room.

**2. Do not start the recording on the Grass until all of the above procedures have been done.**

3. After starting the recording, begin bio-cals. After each bio-calibration, check the appropriate channel to see the response. If no response, repeat the bio-cal. Reposition any sensors if no response is seen.

a. Iso-maneuver

- 1) After instructing the volunteer on the iso-maneuver procedure, have the volunteer begin by twice taking in a deep breath and exhaling. After the second exhalation, have the volunteer hold his/her breath, apply the nose clips, and with mouth tightly closed make paradoxical movements of the chest and abdomen, simulating an apneic event. Check the computer monitor and whichever channel (Rib Cage or Abdomen) is lowest in amplitude, adjust the gain on the Resptrace calbox until it is equal to the other and the SUM is as flat as possible. If both Rib Cage and Abdomen are low, adjust both until they are equal and the SUM is flat.
- 2) Once gain has been adjusted, lock down the gain button for each channel. Once the gain has been set, it should not be adjusted unless absolutely necessary to see the amplitude of the signal.

b. Perform the remaining bio-calibrations:

- 1) Eyes closed for 15 seconds
- 2) Eyes open for 15 seconds
- 3) Move eyes up and back to center
- 4) Move eyes down and back to center
- 5) Move eyes left and back to center
- 6) Move eyes right and back to center
- 7) Blink several times
- 8) Clench teeth and relax
- 9) Move tongue back and forth in mouth
- 10) Flex left big toe
- 11) Flex right big toe
- 12) Count from 1 to 10
- 13) Simulate snore sounds
- 14) Put on nose clip and breathe through mouth
- 15) Remove nose clips, close mouth and breathe through nose
- 16) Take a deep breathe, exhale, and hold breath as long as possible  
Record peak SAO2 and lowest value as a user-defined annotation.
- 17) Close eyes and start steady state for 2 minutes
- 18) Open eyes and start steady state for 2 minutes
- 19) End steady state

**\*Data channels critical to the analysis process.** Loss of data in these channels may cause data to be unscorable.