County of Los Angeles **Department of Health Services**

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

NUMBER: 11430
VERSION: 2

SUBJECT/TITLE: PEDIATRIC PAP TITRATION PROTOCOL

POLICY:

All individuals who record sleep studies must follow best practices for pediatric titrations in order to attain the ideal pressure setting for their patients. Too low of pressures may cause patients to either be sub-optimally treated or to wake up in a panic. Too much pressure may cause the patient to experience bloating or mask leakage. Determining the appropriate pressure setting for each patient will lead to improved adherence and outcome. Pediatric titrations are not an exact science, and it is understood that technologists may need to make minor changes for individual patients. The procedure below is meant as a guideline**.**

PURPOSE:

In order to provide the highest quality care for our patients, our sleep disorders facility adheres to the *AASM Standards of Accreditation*. The accompanying policy and procedure on pediatric titrations follows the spirit of the *Clinical Guidelines for the Manual Titration of Positive Airway Pressure in Patients with Obstructive Sleep Apnea.* We recognize that the guidelines from this 2008 consensus paper are non-binding, and that there may be some minor deviations found in our policy.

SCOPE:

This guideline is based on the 2008 AASM Clinical Guidelines. The scope of this guideline is restricted to adult (>12 years) and pediatric (<12 years) patients with obstructive sleep apnea; these recommendations do not apply to such conditions as neuromuscular disease or intrinsic lung disease. This guideline does not cover PAP titration in the home, nor the use of servoventilation or auto-titrating devices.

1. **Indications for Positive Airway Pressure**
   PAP is indicated for patients who are diagnosed with mild, moderate or severe OSA.

Adult >= 12 years	mild	moderate	severe
AHI	5 to < 15	15 to 30	> 30
Children < 12 years	mild	moderate	severe
AHI	1 to < 5	5 to < 10	> 10

2. **Description and Methodology for Manual PAP Titration**
   The following titration protocols should be used as a guideline in conjunction with sleep center protocols to attain an appropriate titration for each individual patient. Significant variation from the protocol should be documented with appropriate rationale.

2.1 CPAP Titration

Patients < 12 years old	Patients >= 12 years old
CPAP minimum = 4 cm H_20	CPAP minimum = 4 cm H_2O
CPAP maximum = 15 cm H_20	CPAP maximum = 20 cm H_20

Increase pressure by a minimum of 1 cm H_20 with an interval of no less than 5 minutes when you see the following:

Patients < 18 years old
1 obstructive apnea
1 hypopnea
3 RERAs
1 min. of loud or unambiguous snoring

PROCEDURE:

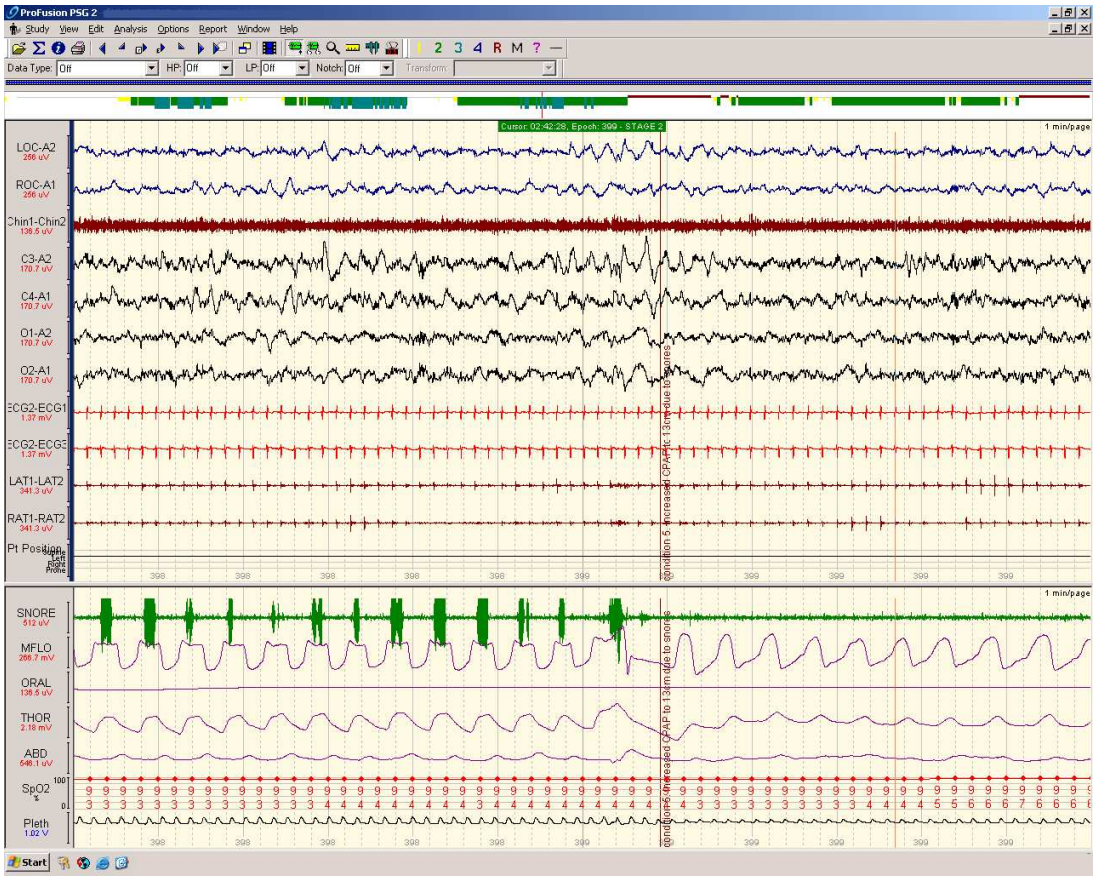
1.0 Review the patient's clinical notes for pertinent history.

2.0 Review the patient's previous sleep study or studies to assess the severity of sleep-disordered breathing, the type of respiratory events, and the position and stage at which the events were most severe. This will help to attain a better titration.
Example: If the patient's sleep-disordered breathing was worse in the supine position, make sure the patient stays in the supine position as much as possible; or, if it was worse during REM sleep, minimize sleep disruption so that the patient can achieve and maintain REM sleep.

3.0 Application of electrodes, montages, filters, sensitivities, and scoring will be performed according to The *AASM Scoring Manual.*

4.0 Begin the patient on a setting of four cm of water. If the patient is morbidly obese or unable to fall asleep on the setting of four cm of water, higher starting pressures may be needed. Bilevel titration should begin at 8/4 cm of water.

5.0 If apneas or frequent hypopneas are present, pressure settings should be increased by one cm of water (inspiratory and expiratory settings should be increased by one cm of water each if bilevel titration). If occasional hypopneas, snoring, or mask flow limitation (see below) are present, pressure settings should be increased by one half cm of water (inspiratory and expiratory settings should be increased by one half cm of water each if bilevel titration) and maintained for at least five minutes to determine if events improve or resolve. Pressure settings may need to be increased more quickly during REM sleep given the limited amount of REM during sleep and the need to treat events during this stage.



Snoring

6.0 If a mask leak occurs, the tech should first fix the leakage before raising the pressure. Otherwise, the final pressure setting chosen for the patient may be too high. Once the mask leak has been fixed, decrease the pressure to the last setting where mouth breathing and/or mask leakage was not present, and then re-titrate as indicated. Make sure to document directly on the study the steps taken to resolve the leak, and the type of masks used. Pressure settings usually do not need to be set as high with a nasal mask than with a full-face mask.

7.0 The recoding technologist should document directly on the study at least every 30 minutes.

8.0 If the patient takes a break from wearing the mask, do not decrease the pressure on attempted return to sleep unless the patient remains awake for 15 minutes, or the patient specifically requests that the pressure be lowered.

9.0 Do not raise pressure settings for central apneas. If the patient develops central apneas, pressure setting may need to be lowered.

10.0 If the patient is unable to tolerate CPAP secondary to 1) Persistent mouth breathing despite use of a full-face mask/chin strap; 2) Inability to exhale against higher expiratory pressures (typically around 15 cm of water in pediatric patients); or 3) has frequent central apneas; the use of bilevel positive airway pressure may be indicated. Make sure to document directly on the study why the patient is being switched from CPAP to

bilevel.

11.0 Ensure that supine sleep has been seen on the chosen setting. Going above the chosen setting by one half or one cm of water to show range may be helpful to ensure that the correct pressure has been established.

NOTE:

You have achieved an optimal titration when you see the following:

a. The Respiratory Disturbance Index (RDI) is <5 per hour for a period of at least 15 minutes at the selected pressure and within the manufacturer's acceptable leak limit.
b. The SpO_2 is above 90% at the selected pressure.
c. Supine REM sleep at the selected pressure is not continually interrupted by spontaneous arousals or awakening.

You have achieved good titration when you see the following:

a. The Respiratory Disturbance Index (RDI) is <10 per hour (or is reduced by 50% if the baseline RDI was <15) for a period of at least 15 minutes at the selected pressure and within the manufacturer's acceptable limit.
b. The SpO_2 is above 90% at the selected pressure.
c. Supine REM sleep at the selected pressure is not continually interrupted by spontaneous arousals or awakenings.

You have achieved an adequate titration when you see the following:

a. The Respiratory Disturbance Index (RDI) is NOT <10 per hour but the RDI is reduced by 75% from baseline.
b. Criteria for optimal or good titration is met but you did NOT get a sample of supine REM at the selected pressure.

An unacceptable titration does not meet any of the above grades.
Repeat titration should be considered.