OXYGEN THERAPY TITRATION BY PULSE OXIMETRY

PURPOSE: To taper supplemental oxygen to the optimal level indicated for an individual patient.

POLICY:

A. A written physician’s order for O2 therapy titration is mandatory.

B. Upon receipt of a physician’s order for O2 titration, the respiratory therapist will use 92% as the SpO2 endpoint, unless otherwise stated by the physician.

EQUIPMENT: - Pulse oximeter
- Finger, ear and universal probes.

PROCEDURE:

1. Obtain requisition.

2. Verify the physician’s order and review the patient’s chart to obtain pertinent patient data.

- diagnosis
- past medical history
- recent ABG, CO-Ox, Hb results
- indications of pulse oximetry
- Check for factors that can produce erroneous readings.

Conditions that can produce erroneous readings:

- dysfunctional hemoglobin (methemoglobin & carboxyhemoglobin
- increased venous pulsations i.e. elevated CVP
- state of hypoperfusion (vasoconstriction i.e. shock, heart failure)
- anemia
- dark skin pigmentation
- intravascular dyes
3. Explain purpose of visit, following proper introductions and patient identification.

4. Verify that the patient is actually receiving the amount of O₂ prescribed.
   a. Check equipment assembly and connections.
   b. Inquire about the length of time that the patient has been breathing supplemental oxygen.
      (minimum 20 minutes)


6. Position patient comfortably and explain importance of maintaining a steady state. (relatively quiet)

7. Determine the optimal site to obtain an accurate reading.

   **Criteria for site selection**
   a. In cases of low perfusion, the ear lobe should be selected.
   b. If a digit is chosen, the nail should be free of polish. Digits with acrylic nails should not be used. Long nails should be cut.
   c. Ensure that the limb of the selected digit is not set up with a blood pressure cuff.
   d. Ensure that the probe is placed on a digit not subjected to excessive motion.
   e. Ensure that the probe is not subjected to high intensity ambient light.

8. Place the oximeter’s sensor on the selected site. Wait for stabilization.

9. Verify patient’s radial pulse to validate displayed results.

   **Validation of displayed values**
   a. Excellent quality of plethysmographic waveform and/or pulse amplitude.
   b. No discrepancy between the displayed heart rate and the patient’s pulse or of no more than 4 beats.
   c. Reproducibility of results within 2%.
   d. Results reflect patient’s clinical condition.

   • N.B. When the patient’s PaO₂ resides on the steep portion of the HbO₂ dissociation curve, a fluctuation of more than 2% will occur with exertion such as coughing and talking.
10. If unable to obtain an accurate reading, abandon procedure and report difficulties to the attending physician and nurse.

11. Note reading. If the patient is found to be severely hypoxemic on current $O_2$ orders, contact the physician immediately.

12. If Sp0$_2$ is $>92\%$, decrease the F$O_2$ by 4-5% or by 1 L/minute. (apparatus dependent).

13. Watch for signs of tissue hypoxia throughout titration process.

<table>
<thead>
<tr>
<th>Signs of tissue hypoxia</th>
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<td>Tachypnea, dyspnea, tachycardia, diaphoresis, confusion, chest pain, cyanosis</td>
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14. Wait 20 minutes before measuring Sp0$_2$.

   N.B. Always obtain measurements under the same conditions.

15. Continue titration down to room air as long as Sp0$_2$ remains above or equal to 92% for at least 20 minutes.

16. If the Sp0$_2$ falls below the desired level, return to the previous $O_2$ setting. If unable to return to an acceptable Sp0$_2$ level, contact the attending physician and stay with the patient.

17. Indicate in the physician’s orders at which phase is the titration process (level of oxygen therapy with date and time). [The nurse will process the info (order).]

   Document the following on the Respiratory Therapy flowsheet:
### Documentation Requirements

- a. date, time of measurement, pulse oximeter reading, patient’s position and level of activity
- b. F<sub>1</sub>O<sub>2</sub> or supplemental O<sub>2</sub> flow, specifying the type of oxygen delivery device
- c. probe placement, probe type, model of pulse oximeter
- d. stability of readings (length of observation time, range of fluctuation)
- e. clinical appearance of patient
- f. indicators of the validity of the measurements
- g. therapeutic interventions and/or clinical decisions based on the SpO<sub>2</sub> measurements

18. Keep requisition for titration in Rx binder. Continue verifying the patient daily until the titration process is terminated.

19. Remove the oxygen set-up once the following criteria are met:

#### Criteria for removal of O<sub>2</sub> therapy

- a. Able to maintain SpO<sub>2</sub> above or at 92% on RA for 24 hours, unless otherwise specified. (i.e. lowest acceptable level tolerated by the patient i.e. COPD on Home O<sub>2</sub>.
- b. Vital signs remain stable.

20. Indicate in the physician’s orders that the oxygen therapy has been discontinued following the R.T. Oxygen Therapy Titration Protocol.

21. Discontinue and remove the requisition from the Rx binder.