PURPOSE:
To prevent or reverse hypoxemia and provide oxygen to the tissues.

CONSIDERATIONS:
1. Oxygen is provided to the patient through a variety of devices (e.g., mask, nasal cannula, tracheostomy collar, trans-tracheal) from a variety of sources (e.g., cylinder, concentrator, liquid oxygen system).
2. Home oxygen therapy is provided as a joint effort of the patient and family, physician, respiratory vendor, respiratory therapist and homecare staff. The nurse must carefully coordinate the activities and teaching strategies of all healthcare providers to prevent overwhelming or confusing the patient and/or family.
3. Oxygen therapy must be prescribed by the patient's physician, not the respiratory equipment vendor. The physician is responsible for identifying the type of therapy, the rate (LPM), based on Arterial Blood Gases, and equipment needed by the patient. The nurse and/or respiratory therapist may need to provide vital information regarding sources of electricity, financial circumstances, mobility of patient, etc., to enable the physician to make an appropriate selection.
4. Oxygen masks may not be appropriate for use with chronic obstructive pulmonary disease patients because oxygen delivery cannot be controlled with precision.
5. A tracheostomy collar or tracheostomy mask is indicated when oxygen must be given to a patient with a tracheostomy.
6. Trans-tracheal oxygen therapy is held in place by a necklace. Since trans-tracheal oxygen therapy bypasses the mouth, nose and throat, a humidifier is required at flow rates of 1 LPM or greater.
7. Trans-tracheal Oxygen therapy requires daily assessment of equipment and incision site.
8. Oxygen promotes and feeds combustion. The patient should be cautioned about the following:
   a. No smoking or ignition of matches when oxygen is in use. A sign should be posted in the patient care area indicating that these activities are not permitted.
   b. To reduce the possibility of spark ignition, non-electrical appliances should be substituted for electrical appliances, e.g., electric shaver, electric blanket.
   c. The use of oil, (in particular, oil-based lubricants such as petroleum jelly), grease, aerosols, solvents or alcohol should be avoided near the oxygen source, valves or fittings.
   d. Static electricity in fabrics made of wool, silk, or synthetics can be reduced by using fabric softeners in laundering or drying.
   e. The source of oxygen (cylinder, concentrator, liquid system) should be kept a minimum of 15 feet away from heat and direct sunlight. Store the oxygen (in upright position) in well-ventilated area to reduce possibility of explosion.
   f. Avoid bumping, dropping or puncturing oxygen source.
   g. Turn source of oxygen off when not in use.
   h. Electrical cords should be grounded and extension cords not used.
8. Oxygen is colorless, odorless and tasteless. Patients who receive inadequate oxygen may not be aware they are suffering from hypoxia. Families and health professionals should observe the patient frequently for symptoms of hypoxia (shortage of oxygen in the body):
   a. Restlessness, anxiety/euphoria.
   b. Irregular respirations/dyspnea.
   c. Drowsiness/confusion and/or inability to concentrate/altered level of consciousness.
   d. Increased heart rate/arrhythmia.
   e. Perspiration, cold, clammy skin.
   f. Flaring of nostrils, use of accessory muscles of respiration.
   g. Altered blood pressure.
   h. Yawning.
   i. Cyanosis.
   j. Muscle and mental fatigue.
   k. Headache.
   l. Dizziness/visual impairment.
   m. Nausea.
9. Patients with compromised respiratory systems are understandably anxious about ongoing oxygen supply.
   a. A back-up source of oxygen should be available in the patient's home in case the oxygen source malfunctions or is prematurely depleted.
10. Give emergency phone numbers to the patient for:
   a. Paramedics and ambulance.
   b. Physician.
   c. Home health agency.
   d. Respiratory equipment vendor.
   e. Hospital.
11. Teach family members to operate, maintain and troubleshoot equipment. Equipment should be checked at least daily.
12. Patients experiencing inadequate oxygenation may feel that more oxygen will relieve their discomfort. Therefore, it is essential to emphasize to the patient that oxygen is to be used only at the flow rate prescribed. Alert the patient to the danger of oxygen above prescribed limits.
13. Water-soluble lubricant may be applied to lips and nasal membranes PRN for dryness and lubrication.
14. Moisture and pressure may cause skin breakdown under oxygen tubing and straps on administration devices. Therefore, the skin must be examined frequently, kept clean and dry, and relieved of pressure. Gauze may be tucked under tubing.
15. Oxygen delivery devices should be cleaned or replaced when dirty or contaminated with secretions to prevent infection.

16. If used, humidifier water should be replaced:
   a. If water is below a minimum level
   b. Daily. Adding water to the water present in the humidifier will encourage growth of bacteria. The humidifier bottle should be cleaned or changed at least every 2 weeks.

17. DO NOT use more than 50 feet of oxygen extension tubing connected to oxygen delivery device.

**EQUIPMENT:**

- Stethoscope
- Oxygen source (cylinder, concentrator or liquid oxygen system)
- Oxygen delivery device (cannula, mask, trach collar), 2 sets
- Humidity bottles and adapters, if needed
- Sterile distilled water
- "Oxygen in Use" signs
- Cleansing solution
- Gloves
- Instructions for specific types of equipment from vendor supplying equipment*

* A wide variety of oxygen therapy equipment is available from respiratory equipment suppliers. To describe the exact operation of each type is beyond the scope of this procedure. It is imperative that the nurse reviews the operation of specific equipment with the vendor. General guidelines for major types of equipment are included in this procedure.

**PROCEDURE:**

1. Adhere to Standard Precautions.
2. Explain procedure to patient.
3. Review order from physician for oxygen therapy.
4. Evaluate the patient's respiratory status. Assure a patent airway before commencing oxygen administration.
5. Post "Oxygen in Use" warning sign. Evaluate environment for hazards related to combustion.
6. Evaluate patency of nostrils if nasal cannula is to be used.
7. Prepare oxygen source:
   a. Crack (break seal) on cylinder, plug in concentrator, check liquid contents of liquid system.
   b. Screw humidifier onto tank outlet or concentrator oxygen outlet, if humidifier is to be used.
   c. Connect oxygen tubing to oxygen source.
   d. Set flow on flow dial, flow tube, oxygen flow control, or flow meter at prescribed liter flow.
   e. If concentrator is used, turn power switch on and adjust flow rate.
8. Apply oxygen delivery device:
   a. Nasal Cannula
      (1) Set flow rate as ordered (humidity not required for < 4 L/minute)
         (a) 1-2 L/minute provides 23-30% O2
         (b) 3-5 L/minute provides 30-40% O2
         (c) 6 L/minute provides 42% O2
      (2) Place prongs in nostrils with flat surface against skin.
      (3) If prongs are curved, direct curve downward toward floor of nostrils.
      (4) Secure cannula tubing over each ear and slide adjuster under chin to secure tubing taking care to adjust to patient comfort.
      (5) Clean nasal cannula daily and PRN. (Refer to After Care.)
      (6) Provide frequent mouth and nasal care, lubricate nose with water-soluble lubricant if dry.
   b. Oxygen Mask
      (1) Select a mask that will afford patient the best fit.
      (2) Set flow rate as ordered by physician. Rate must exceed 5 liters/minute to flush mask of carbon dioxide. In high humidity masks, oxygen should be turned up until mist flows from mask. For low flow systems:
         (a) Simple mask: 6-8 L/minute provides 40-60% oxygen.
         (b) Partial rebreather mask: 6-11 L/minute provides 50-75% oxygen.
         (c) Non-rebreather: 12 L/minute provides 80-100% oxygen.
      (3) Position mask over the patient's face covering the nose, mouth and chin to obtain a tight seal.
      (4) Slip loosened elastic strap over patient's head, positioning it above or below the ears.
      (5) Tighten elastic strap so that mask is snug but not uncomfortably tight. Make sure that oxygen is not leaking into patient's eyes.
      (6) If rebreathing mask is used, check to see that one-way valves are functioning properly. This mask excludes room air and a valve malfunction could lead to a build-up of carbon dioxide in the mask.
      (7) If a non-rebreathing or partial rebreathing mask is used:
         (a) Flush the mask and bag with oxygen before applying.
         (b) Observe bag and make sure that there is only slight deflation when the patient breathes. If marked deflation occurs, increase the flow rate of oxygen bag.
         (c) Keep the reservoir bag from kinking or twisting and free to expand at all times.
      (8) Clean mask daily and PRN. (Refer to After Care.)
c. Trach Collar or Trach Mask
   (1) Attach the large-bore tubing coming from the oxygen source to the swivel adapter on the collar.
   (2) Set oxygen flow rate and concentration as ordered.
      (a) 8-10 L/minute provides 30-100% oxygen in this high flow system
   (3) Place elastic strap in one flange of trach collar.
   (4) Place collar’s opening directly over the patient’s tracheostomy tube.
   (5) Slip the unattached end of the elastic strap behind the patient’s neck while stabilizing trach collar with free hand. Attach elastic to free flange. Tighten gently.
   (6) Position wide bore tubing.
   (7) DO NOT block exhalation port.
   (8) Assure that nebulizer delivers constant mist.
   (9) Empty any build-up of condensation every 2 hours.
   (10) Clean tracheostomy collar as needed.

9. Discard soiled supplies in appropriate containers.

AFTER CARE:
1. Clean oxygen therapy equipment as instructed by respiratory equipment company using cleaning solution. Two sets should be used alternately with one being cleaned while the other in use. (See Cleaning and Disinfection of Respiratory Therapy Equipment.)

2. Document in patient’s record:
   a. Date and time oxygen is being used.
   b. Flow rate and concentration of oxygen.
   c. Patient’s response to oxygen therapy.
   d. Findings of physical assessment.
   e. Equipment evaluation for safety, functioning and time of oxygen source change.
   f. Instructions given to patient/caregiver.
   g. Patient/caregiver understanding of instructions using ‘teach back’ method.