

LOS ANGELES UNIFIED SCHOOL DISTRICT
Student Health and Human Services Division
District Nursing Services

OXYGEN THERAPY

I. GENERAL GUIDELINES

Oxygen therapy: administration of oxygen at concentrations greater than that in room air (20.9 %). Therapy provides additional oxygen to maintain body function when person is unable to get enough oxygen through normal breathing. Refer to LAUSD BUL-2356.0, *Oxygen Use In School*.

A. PURPOSE

The primary indication for oxygen therapy is hypoxia (a deficiency of oxygen reaching the tissues of the body) manifested by disturbance in circulation, respiration, and/or central nervous system function.

Clinical symptoms of hypoxia are:

1. Circulatory
 - a. Tachycardia---rapid heart rate
 - b. Bradycardia---slow heart rate
 - c. Cyanosis---bluish discoloration of nail beds, lips, or skin
2. Respiratory
 - a. Dyspnea---difficult or labored breathing
 - b. Irregular breathing
3. Central Nervous System
 - a. Decreased mental alertness
 - b. Restlessness

B. GENERAL INFORMATION

Oxygen therapy is prescribed for students who need supplemental oxygen due to chronic lung disease (chronic pulmonary dysplasia, cystic fibrosis) or cardiac disorder. Students with chronic medical conditions such as, (seizure disorder, severe asthma) may need supplemental oxygen on an emergency basis. Oxygen therapy may be part of the care needed by a child with tracheostomy and/or mechanical ventilator.

1. Oxygen can be administered from three types of sources:
 - a. Oxygen tank – oxygen gas is compressed and filled under high pressure. A small portable tank/cylinder can be carried in a shoulder bag, backpack or small wheeled cart.
 - b. Liquid Oxygen is a very cold liquid (-297°F) that becomes gas when released from a thermal storage container. Liquid oxygen evaporates easily and must be refilled frequently.

- c. Oxygen concentrator is an electrically-operated device that separates oxygen from ambient room air, filters out other gases, and concentrates the oxygen in the machine.
2. Three common means of oxygen delivery:
 - 1) Nasal cannula consists of two small plastic prongs inserted into the nostrils from oxygen supply tubing.
 - 2) Oxygen masks are plastic reservoirs designed to fit over the nose and mouth and be secured around the head by an elastic strap or around the ears by tubes. Mask is used when high flow oxygen rate is needed or when the nasal passages are obstructed.
 - 3) Tracheal oxygen adapters (collar or T-tube) are devices that attach either directly to tracheostomy tube or to a heat-moisture exchanger (HME). HME or artificial nose collects expired heat and moisture and returns it during the following inspiration.

Oxygen may also be administered through the tracheostomy tube as a component of mechanical ventilation.

C. PRECAUTIONS

1. LAUSD Policy Bulletin BUL-2356.0 *Oxygen Use In School* addresses the safe handling, transportation and storage of oxygen.
2. Oxygen supports combustion, so there is a danger of fire when oxygen is being used.
 - a. Do not smoke or allow open flames near oxygen.
 - b. Do not permit alcohol, oil, grease (petroleum jelly), highly flammable material including matches or tinctures (i.e., green soap) or other fire producing equipment to come into contact with oxygen cylinders, liquid oxygen, valves, regulators or fittings. Do not handle equipment with greasy hands or cloths.
 - c. Do not use oxygen within five feet of electrical appliances.
 - d. Keep oxygen unit firmly secured in an upright position.
 - e. Store oxygen away from heaters, radiators or hot sun. Keep it in an open area. Never put it in a small enclosed space (closet, behind curtains).
3. "OXYGEN IN USE" and "NO SMOKING" signs must be posted.
4. A fire extinguisher must be located in the immediate area(s).
5. Operational status and oxygen level are to be checked each morning and equipment monitored at regular intervals.
6. Oxygen concentrator requires portable oxygen backup in case of power failure. Portable oxygen is required during transportation.
7. Do not use an extension cord to connect the concentrator to an electrical outlet and do not connect other appliances to the same outlet.
8. If liquid oxygen spills, **do not touch**. Liquid oxygen can cause frost bite because of its very low temperature. Notify supplier for clean up.
9. The licensed healthcare provider must provide new authorization for any changes in the oxygen flow rate.

D. PERSONNEL

1. School nurse or school physician
2. Designated school personnel under the direct or indirect supervision of the school nurse.

E. EQUIPMENT

Provided by parent:

1. Portable oxygen unit as ordered by licensed healthcare provider:
 - a. School nurse will determine and arrange the appropriate number of oxygen cylinders to be delivered at school including the maintenance of oxygen equipment.
 - b. Liquid oxygen canister plus backup reservoir
 - c. Oxygen concentrator **plus** oxygen cylinder(s)
2. Oxygen unit must include flow meter, pressure gauge and wrench
3. Oxygen connecting tubing
4. Cannula, mask, or tracheostomy collar
5. Humidification device and distilled water (if ordered, for oxygen concentrator)
6. Stored oxygen unit(s) must also include a flow meter and pressure gauge.

Provided by school:

1. Signs to be posted
2. Fire extinguisher(s)
3. Disposable gloves
4. Plastic bag for disposal of waste

II. PROCEDURE

ESSENTIAL STEPS	KEY POINTS AND PRECAUTIONS
1. Ensure that “ Oxygen in Use ” and “ NO Smoking ” signs are posted.	
2. Wash hands.	
3. Adjust body alignment for optimal chest expansion.	Position at 45-90 degree angle.
4. Assemble equipment. <ul style="list-style-type: none"> ▪ Oxygen source ▪ Cannula / mask /or tracheostomy collar ▪ Humidity source, if ordered Adaptor for connection tubing	Fill humidifier (if ordered) with distilled water to indicated level. Attach humidification device to connection tubing if ordered by physician.
5. Attach connection tubing for nasal cannula/mask to oxygen source. For tracheostomy, attach humidifier device at one end of tubing on the collar.	Connecting tubing must be secured tightly to avoid oxygen leakage.
6. Set oxygen flow on flow meter to rate prescribed by the licensed healthcare provider. Turn on the oxygen source. Open the tank by turning valve with the wrench, one complete turn to the LEFT (counter clockwise).	

ESSENTIAL STEPS	KEY POINTS AND PRECAUTION
7. Check flow of oxygen from cannula prongs or mask. Observe for a fine mist at the end of the tubing when using a tracheostomy collar.	If no flow is present, check oxygen supply, flow rate and that gauge and tubing connections are secure and patent.
8. a. Gently insert cannula prongs into student's nostrils and loop the tubing over each ear then secure by sliding the clasp up under the chin. b. Place the mask over the student's nose and mouth. Tighten the elastic band over the student's head and mask over the bridge of the nose to fit snugly. c. Place collar around student's neck over the tracheostomy tube. d. When using a humidifier, set up humidification device as ordered. Follow student's specific guidelines.	Make sure student is comfortable and equipment is correctly placed. If student is not comfortable, the cannula tubing may be secured behind the head rather than the chin. Make sure mask does not touch the eyes. Collar must fit snugly and comfortably for the student. Some students may use a cool mist. With prolonged humidification, moisture collection in the tubing can block the flow of air/oxygen and may require periodic removal.
9. Continue treatment as prescribed by physician.	Monitor at regular intervals being certain equipment is connected, liter flow is at prescribed level and connection tubing is patent. Observe for pressure marks or irritations on the skin and accumulation of nasal discharge. If there is irritation and dryness of nasal mucosa and lips, offer fluids, if not restricted.
10. When student is not relieved and show signs of respiratory distress. Begin CPR, if indicated, and call emergency 911. Signs of respiratory distress are: <ul style="list-style-type: none"> • Shortness of breath or rapid respiratory rate • Agitation • Blueness or pallor of the lips, nails or earlobes • Pulling in of the muscles at the neck or chest • Confusion, dizziness or headache • Rapid or pounding pulse 	
11. When treatment is complete or when changing tanks, turn liter flow gauge off and close oxygen unit valve.	

ESSENTIAL STEPS	KEY POINTS AND PRECAUTION
<p>12. Wash hands and put on gloves when handling waste material. Wipe mask, prongs, or tracheostomy collar with soap and water. Dry and store in a clean plastic bag.</p> <p>Nasal prongs or mask must be changed periodically, depending on frequency of oxygen administration.</p>	<p>Check gauge for oxygen level. Inform parent or supply company to keep appropriate number of oxygen cylinders as needed.</p> <p>Nasal cannula/mask may need to be changed after a cold or flu.</p>
<p>13. Remove gloves and wash hands.</p>	
<p>14. Discard waste materials</p>	<p>Universal Precautions require all waste materials be double bagged.</p>
<p>15. Document Procedure:</p> <ol style="list-style-type: none"> Time therapy began Liter flow rate Time therapy ended Student's response 	<p>PRN oxygen therapy, must document reason for administering the oxygen.</p>

APPROVED:

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Date



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References:

California School Nurses Organization. The Green Book: California Guidelines for Specialized Physical Healthcare Procedures in School Settings, Section 3. Pp 4-10. 2nd Edition (4/11). Sacramento, CA.

Porter, Haynie M, Bierle T, Caldwell T, Palfrey J, (2001) Guidelines for Care Children and Youth assisted by Medical Technology in Educational Settings, Supplemental Oxygen Use (pp 260-264)

American Association of Respiratory Care. (2007).Clinical Practice Guideline Vol. 52 No1. Oxygen Therapy in the Home or Alternate Site Health Care Facility (pp 1063-1068).

Children's Hospitals and Clinics of Minnesota. Patient/Parent Education (2007). Oxygen Safety at Home (pp 1-5)