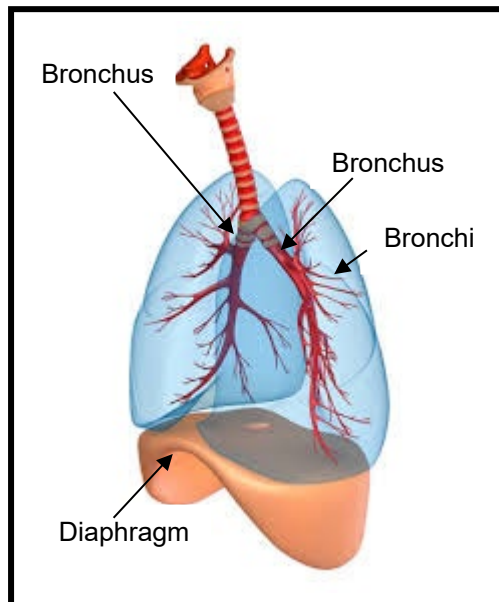


OXYGEN ADMINISTRATION

Vocabulary:

Alveoli: Tiny balloon-like sacks at the end of bronchioles.

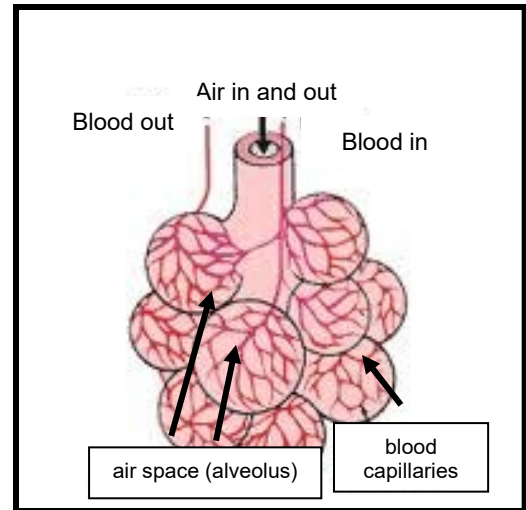
Bronchioles: Smaller and smaller branches of the bronchi that connect to the alveoli.



Epiglottis: A flap of cartilage at the entrance of the trachea. It closes over the trachea to prevent food and fluid from entering the windpipe and lungs.

Trachea: Windpipe. Tube that allows air to pass from the back of the mouth into the lungs.

Pleura: Thin membrane with 2 layers around the lungs. Fluid between these 2 layers provides for lubrication allowing for smooth, uniform expansion and contraction of the lungs during breathing.



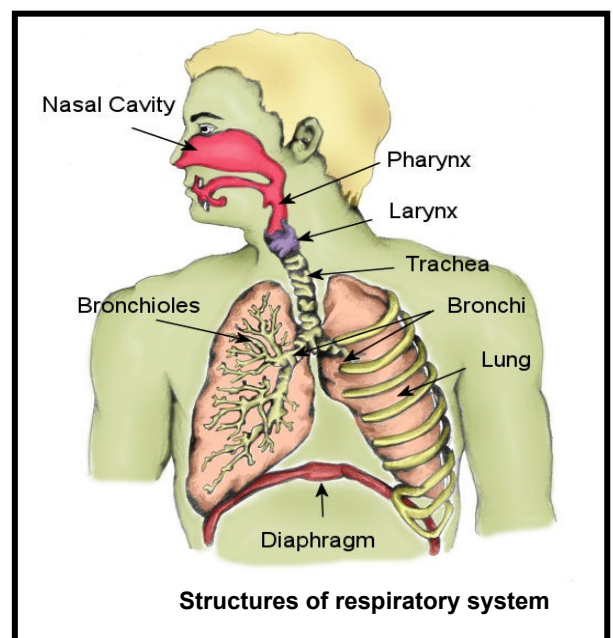
Bronchi: Smaller air passages originating from the bronchus in each lung. There are many of these.

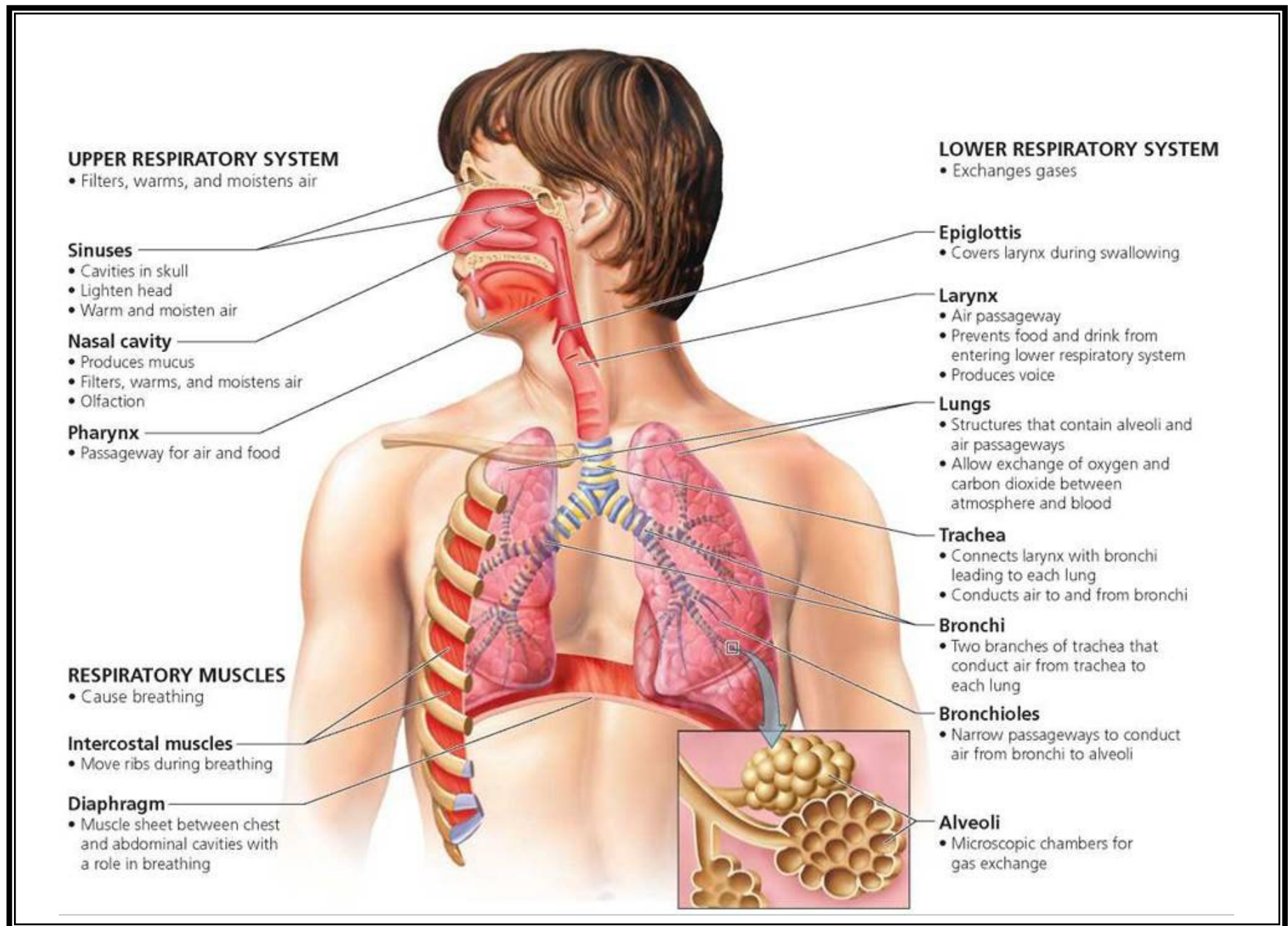
Bronchus: One main air passage into each lung. Originates at the end of the trachea.

Capillaries: Very tiny blood vessels in the wall of the alveolus that absorb oxygen that is then distributed to the body.

Diaphragm: Dome shaped muscle separating the chest from the abdomen. It is the muscle that makes breathing happen.

Lungs: Main organ for the respiratory system. Contains 5 lobes: 2 on the left and 3 on the right. They supply oxygen to the body as well as eliminate carbon dioxide from the body.





Administration of Oxygen (O₂)

Oxygen:

O₂ is a colorless, odorless gas. It is essential for life. O₂ in the air is absorbed through the lungs and into the blood where it binds to the hemoglobin in red blood cells. It is the circulating red blood cells that distribute oxygen throughout the body.

Why O₂ is used

- ◀ To restore O₂ blood levels to normal.
- ◀ Decrease shortness of breath and fatigue.
- ◀ Improve sleep in those with sleep apnea.
- ◀ Increase life span of some people with COPD (chronic obstructive pulmonary disease).



Transporter

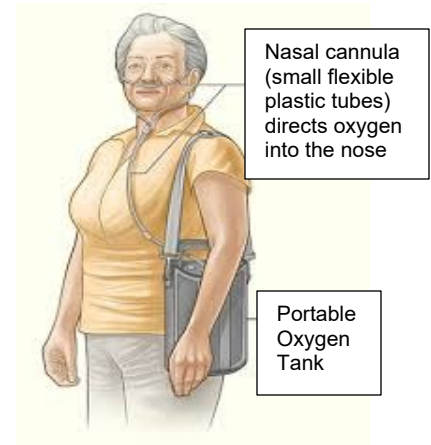
How O₂ can be given

- ◀ By nasal cannula
- ◀ By mask

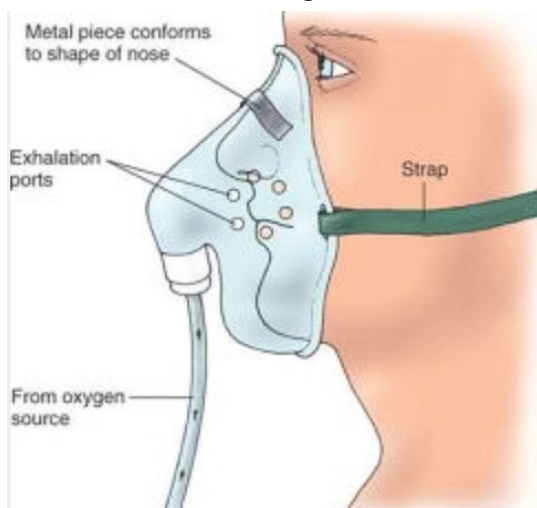
A person may use a **concentrator** that extracts oxygen from the air;

OR

A person may use oxygen supplied from an **oxygen tank**



Person wearing O₂ mask



Man using oxygen concentrator



OXYGEN THERAPY

Oxygen is an inhaled medication that requires a prescription.

Oxygen is a medication administered in the form of an inhaled gas. As with any medication, you are expected to follow orders precisely as written on the MAR. The dose (amount) is the **flow rate and is indicated as liters per minute**. The flow rate must be set only at the prescribed rate. Example: 2 liters per minute.

Time frames for receiving oxygen

Depending on the needs of the person the prescription for oxygen may be to administer as needed, intermittently, or continuously.

Transportation

Anyone transporting a person on oxygen needs to know how to shut off the tank if it is hissing or there is an accident.



Side Effects of Oxygen Therapy

- Fatigue (tiredness)
- Morning headaches
- Dry and/or bloody nose
- Skin irritation from face mask or nasal cannula

Care for a person on oxygen

- ✦ Protect the person's nose, face and ears from irritation caused by the nasal cannula or face mask. Use a water-based lubricant where the mask or cannula rub the face, nose or ears. Vaseline® or petroleum jelly is NOT a water-based lubricant.
- ✦ Be sure to strictly follow safety measures to prevent a fire or explosion.
- ✦ Provide frequent opportunities for the person to keep their mouth and throat moist.

Responsibility for ordering more supplies

Getting more supplies is everyone's job.

Call the equipment provider for refills when you see supplies are getting low. Document and communicate with others that you have reordered supplies.



The Equipment supplier must be available by phone 24/7. The contact information should be maintained in an easily accessible location that everyone knows.

Call the supplier for questions about equipment functioning, and safety questions.

Signs of receiving too little oxygen

- ◄ Confusion
- ◄ Headache
- ◄ Restlessness
- ◄ Blurred vision
- ◄ Tunnel vision
- ◄ Cyanosis (bluish tint to the lips, earlobes, and/or nail beds)
- ◄ Rapid heart rate
- ◄ Elevated blood pressure
- ◄ Rapid breathing
- ◄ Shortness of breath
- ◄ Excessive tiredness

Signs of receiving too much oxygen

- ◄ Slow respiratory rate < 8 breaths/minute
- ◄ Difficult to wake up



When to call a healthcare professional (HCP)



- ◄ If you see any signs of receiving too much or too little oxygen (see boxes to left)
- ◄ For any of the side effects listed on page 65
- ◄ If the equipment is not working right
- ◄ If the person is declining oxygen therapy or insisting you change the number of liters given
- ◄ If the person is having trouble sleeping because they cannot breathe well

Cleaning the oxygen equipment

Oxygen Concentrator

- ◄ Clean at least once a week. The outside of the concentrator can be wiped down with a damp cloth and a mild dish detergent. Never spray the cleaner directly onto the machine.
- ◄ The oxygen concentrator may have exterior filters that need to be cleaned at least once a week. They can be easily removed and placed under warm running water. Excess water should be squeezed out and the filters should be left out to air dry.

Cannula/Mask

- ◄ Clean daily; if visibly soiled; or after intermittent use.
- ◄ Towel or air dry.
- ◄ Replace every 2 (two) weeks.
- ◄ Use mild dish detergent and rinse.

Tubing

- ◄ Replace monthly.

Water Trap

- ◄ Empty as needed.
- ◄ Remove at least twice a week and clean with mild dish detergent and rinse.

Humidifier Bottle

- ◄ Use only distilled or sterile water.
- ◄ Empty daily and replace with fresh distilled or sterile water.
- ◄ Clean and disinfect at least twice a week. First wash with mild dish detergent and rinse well; then soak in 1 part water and 1 part distilled white vinegar. Rinse thoroughly.



Distilled white vinegar



Distilled Water

Safety Tips for Use of Oxygen in the Home

- Below is a listing of precautions you **MUST** take when oxygen is in use. These precautions are arranged in categories. If you have questions about the safe storage and use of O₂ contact the O₂ supplier.

Smoking Precautions

- ⚡ **No one should be smoking** when oxygen is in use. If the person using oxygen insists on smoking, they will need to remove their mask/cannula. Turn off the oxygen, remove mask/cannula from their face and body. Then, wait 10 minutes after turning the oxygen off before smoking. Anyone else in the house that insists on smoking, must go outside when oxygen is in use.
- ⚡ **In homes where a variety of support persons or visitors come and go, posting “No smoking” signs in every room where oxygen is stored or in use will remind everyone to not smoke around the oxygen.**

Precautions while working in the kitchen

- ⚡ When the stove is in use and the person is in the kitchen, turn off their oxygen and remove their mask/cannula. If the stove or appliances are not in use oxygen can remain on. If the person must always have oxygen, there may be times when it is not safe for them to be in the kitchen.
- ⚡ When using electrical devices such as can openers, mixers, blenders, knives, or skillets while the person using oxygen is in the kitchen, turn off the oxygen and remove their mask/cannula.
- ⚡ A person wearing a mask or cannula must be at least 10 feet away from the stove or active electrical appliances. Tanks must be at least 10 feet from the stove or electrical appliances in use, even if the O₂ is turned off.

Precautions with use of health, hygiene and beauty products

- ⚡ Products containing oil or grease, such as body oil and some moisturizers can easily ignite. Keep oils and grease away from where oxygen is in use. This includes petroleum products such as some lip balms and nail polish remover (acetone).
- ⚡ Aerosol sprays containing combustible materials (i.e. hairspray, air fresheners) should not be used while the oxygen is in use.
- ⚡ Electric razors or hairdryers should not be used while oxygen is on. Battery powered razors and hairdryers can be used when oxygen is on.
- ⚡ Appliances that have a control switch (i.e. heating pad, vibrating devices, electric blankets, electric toothbrushes) should not be used when oxygen is on because the control switch could generate a spark.

Precautions while working with projects/crafts

- ⚡ Petrol, solvents, thinners, cleaners, adhesives, paints, waxes and polishes, combustible liquids, or anything in an aerosol can should not be used while oxygen is on.

(precautions are continued on the next page)

Oxygen Tank Precautions (the tank contains compressed oxygen gas)

- ✦ Keep oxygen tanks at least 10 feet away from a heat source (heater, gas stove), open flame or electrical devices.
- ✦ Store oxygen tank upright in a well-ventilated area away from flame, heat source or direct sunlight. Do not cover the tank with cloth or plastic. Do not store in closets, behind curtains, near outlets, or other confined spaces. Secure tank on a stand with a strap to hold it in place.
- ✦ Handle the tank gently to avoid damaging it.
- ✦ If transporting an oxygen tank, do not lay it down in the bed of a truck or trunk of a car. Place it carefully on the back seat of the car. Secure it so it does not roll around and stays in place.
- ✦ Be sure to use the correct pressure gauge and regulator.
- ✦ When the tank is almost empty, close the valve and mark the tank as empty. Do not store full and empty tanks together.

Oxygen Concentrator Precautions (concentrators filter nitrogen out of the air, providing almost pure oxygen)

- ✦ Be sure the concentrator is plugged into an electrical outlet. Never use an extension cord or power strip.
- ✦ Keep concentrator away from curtains or drapes and place in a well-ventilated area.
- ✦ Do not keep concentrator in a closet or other confined space when in use.
- ✦ Be sure the concentrator is inspected and serviced per the supplier's instructions.

General Precautions

- ✦ Be sure all electrical equipment near the oxygen is properly grounded.
- ✦ Be sure you have smoke alarms in the home.
- ✦ Avoid materials that cause static electricity. Use cotton blankets.
- ✦ Candles, matches, wood stoves and sparking toys can serve as ignition sources. Keep these items out of the home.
- ✦ Keep oxygen equipment clean and dust free.
- ✦ Help people to stay at least 10 feet away from an open flame if oxygen is flowing. This includes fireplaces, wood burning stoves and gas stoves.
- ✦ Avoid build-up of static electricity by using a humidifier in the winter when the heat is on and the air tends to be dry. Encourage the person to wear cotton. Avoid wool and nylon as these fabrics attract static electricity.
- ✦ Be aware to keep oxygen tubing from dragging on the floor to prevent falls, tangles or disconnections.

Steps for Administering Oxygen (O₂)

1. Wash hands.
2. Start at the beginning of the medication administration record (MAR) and review, checking for the following:
 - a) Individual's name
 - b) All medications ordered
 - c) Medications to be given now
 - d) Confirm that the previous dose was given
 - e) Confirm the dose for this time and date has not yet been given
 - f) Any allergies
 - g) Special instructions for giving the medication
3. Read all the pages of the person's MAR to confirm ALL the medications you will need to prepare for administration. This includes the **entire medication name (including strength)**, the dose (amount), and route of each medication you will be giving to the person at this time.
4. The **first check of the MAR**. Read the MAR for the oxygen order to assure the 5 Rights (**I M DR T**):
 - 1) **Individual's name**
 - 2) **Medication:** Oxygen
 - 3) **Dose:** Flow rate (liters per minute) and length of time
 - 4) **Route:** Inhaled using cannula or mask
 - 5) **Time & date:** When to administer (ex: pulse oximeter reading of 92 or below)
5. Get oxygen supply and equipment from storage. Clean equipment if dirty.
6. When using a concentrator, make sure it is plugged in and away from the wall.
When using a tank, confirm that the tank supply level is adequate for the oxygen administration and determine when the tank supply level will need to be rechecked.
7. The **second check of the MAR**. Read the MAR for the oxygen order to assure the 5 Rights (**I M DR T**):
 - 1) **Individual's name**
 - 2) **Medication:** Oxygen
 - 3) **Dose:** Flow rate (liters per minute) and length of time
 - 4) **Route:** Inhaled using cannula or mask
 - 5) **Time & date:** When to administer (ex: pulse oximeter reading of 92 or below)
8. Identify the person to receive the medication. Take your time and make sure you are giving the oxygen to the correct person. Confirm the person's identity with a picture or with another personnel who knows the person.
9. Explain the safety precautions that need to be followed while the oxygen is being administered.
10. Connect the nasal cannula or mask to the oxygen source.
11. Turn on the oxygen and adjust flow rate as directed on the MAR.

If any part of the order is not clear and the person's pulse oximeter reading is 92 or below, proceed with administering oxygen at a flow rate of 2 liters per minute and contact a healthcare professional IMMEDIATELY.

12. Without touching the cannula or mask, use your hand to check that the oxygen is flowing from cannula or mask.
13. Place the cannula in the person's nostrils and loop the tubing over their ears or place the mask on the person's face.
14. Adjust the cannula or mask as necessary for the person's comfort.
15. Instruct the person using a cannula to breathe through their nose with their mouth closed.
16. The **third check of the MAR**. Read the MAR for the oxygen order to assure the correct amount of oxygen is being administered according to the 5 Rights (**I M DR T**):
 - 1) **Individual's name**
 - 2) **Medication:** Oxygen
 - 3) **Dose:** Flow rate (liters per minute) and length of time
 - 4) **Route:** Inhaled using cannula or mask
 - 5) **Time & date:** When to administer (ex: pulse oximeter reading of 92 or below)
17. Note the time to recheck pulse oximeter reading or end oxygen administration.
18. Leave the person in a safe and comfortable manner.
19. Document that oxygen administration was initiated. Place your initials on the MAR in the space for the specific Individual's **Medication(s)**, **Dose** (# of liters per minute), **Route** (mask or cannula) and **Time/date**, Documenting that you have started the oxygen (**I M DR TD**).
20. Document any complaints/concerns and action taken, including any comfort measures initiated. If the oxygen is being used as needed, document the reason for the need and the response to the treatment.
21. If oxygen was missed, held, declined or given late, document by circling your initials and explain on the back of the MAR. Write an Unusual Incident Report.
22. Make sure your initials, full name, and title are written in a space provided for signatures on the MAR or on a Master Signature Log.
23. Recheck the set flow rate, oxygen supply and flow from cannula/mask when transitioning the person to a new location and/or from one oxygen device to another oxygen device to assure the device is turned on and functioning properly. Document findings and actions taken.
24. When using an E cylinder, recheck the pressure gauge regularly to make sure the cylinder is not empty. Use a cylinder duration chart (see sample below) provided by the medical supplier to determine when the tank will be empty and plan to recheck the pressure gauge prior to that time to ensure continuous oxygen supply.



NOTE: In cases when the pressure gauge is not full (2,200psi) or flow rates are greater than 3 liters per minute, the oxygen flow and gauge should be checked more frequently. Follow any additional guidance provided by the oxygen supply company.

25. When the oxygen gauge is near or at the red zone, change the tank by repeating steps 5-21.

26. Check pulse oximeter reading as directed on the MAR. Document the outcome. Continue or discontinue oxygen as prescribed.
27. Document the time when oxygen administration was ended, the pulse oximeter reading if taken, and the response to the treatment.
28. The cannula/mask should be removed and cleaned if oxygen is not flowing or if it is visibly soiled.

Sample Oxygen Cylinder Duration Charts

<i>Oxygen Cylinder Duration for Continuous Flow</i>				
<i>Flow Rate (LPM)</i>	<i>B Cylinder</i>	<i>C Cylinder</i>	<i>D Cylinder</i>	<i>E Cylinder</i>
<i>Hours @ 1.0</i>	2.7	4.0	6.7	10.7
<i>Hours @ 2.0</i>	1.3	2.0	3.3	5.3
<i>Hours @ 3.0</i>	.90	1.3	2.2	3.5
<i>Hours @ 4.0</i>	.67	1.0	1.6	2.6
<i>Hours @ 5.0</i>	.55	.75	1.4	2.0
<i>Hours @ 6.0</i>	.45	.6	1.1	1.5
<i>Hours @ 8.0</i>	.33	.5	.8	1.0

E Cylinder Duration Chart				
Litre Flow	Pressure Gauge Reading			
	Full	$\frac{3}{4}$ Full	$\frac{1}{2}$ Full	$\frac{1}{4}$ Full
1	10 hours	7 hours	4.5 hours	2 hours
2	5 hours	3.5 hours	2 hours	1 hour
3	3.25 hours	1.5 hours	1.5 hours	0.75 hours
4	2.5 hours	1.75 hours	1 hour	0.5 hours

✓ **Skills checklists to be signed by trainee and trainer are available on the DODD website.**