LIFESAVING SOCIETY®
The Lifeguarding Experts

OXYGEN THERAPY
FIRST AID PROGRAM

PREAMBLE

Respiration is the exchange of gases between the atmosphere and the living cells of the body. Hypoxia is an inadequate supply of oxygen to the body tissues, whereas, anoxia is when the body tissues are getting no oxygen at all. This can be caused by an inadequate airway (e.g. choking), breathing complications (e.g. absent or ineffective breathing) or circulatory problems (e.g. a heart attack results in the poor circulation of oxygen).

Rescuers should note that while giving the victim oxygen is beneficial, the victim's airway must continually be monitored. **Effective victim care without oxygen is better than oxygen without resuscitation. Oxygen is NOT a substitute for resuscitation.**

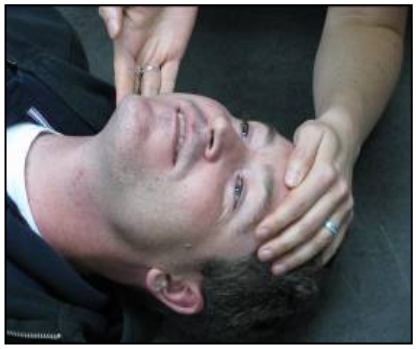
VICTIM CARE

The rescuer must assess the victim and if necessary, ensure that effective resuscitation has been initiated prior to the application of oxygen.

Airway

The most common cause of an airway obstruction in an unresponsive victim is the tongue. The lay rescuer will open the airway using the head-tilt/chin-lift:

- Place one hand on the victim's forehead and apply firm backward (downward) pressure with your palm to tilt the head back.
- Place the first three fingers of your other hand under the 90-degree angle of the victim's lower jaw. Lift the jaw to bring the chin forward (upward) towards the ceiling/sky.
- Maintain pressure on the jaw, both up and towards the forehead.



Breathing

If the victim is not breathing or not breathing normally, the rescuer will start CPR at a ratio of 30 compressions to 2 ventilations using a pocket mask.

- The rescuer will use a "CE" Clamp to maintain the airway and to seal the mask to the victim's face when ventilating the victim.

Circulation

Absent or ineffective breathing is to be viewed as a sign of circulatory impairment, thus, the rescuer will start CPR.

Head Tilt/Chin Lift using a "CE" Clamp

OXYGEN THERAPY

The rescuer will only apply oxygen after calling EMS and assessing the victim's ABCs. Oxygen should not be given to victims who are hyperventilating or who refuse oxygen as a treatment. Oxygen masks should not be placed over the face of a victim with an on-going airway bleed or vomiting as this can result in aspiration.

Oxygen should only be administered if the victim is not breathing, oxygen saturation is below 94% or there is history of drowning, decompression illness or carbon monoxide poisoning. The consensus in science is that there is some benefit to administering supplemental oxygen for specific hypoxic conditions regardless of the victim's oxygen saturation level. Therefore, a victim should receive supplemental oxygen immediately (regardless of O2 saturation reading) by trained personnel if the victim has suffered or is suffering from any of the following:

- Drowning
- Decompression illness
- Carbon monoxide poisoning
- Respiratory arrest (Ineffective Breathing)

All other victims are assessed with a pulse oximeter to determine the need for supplemental oxygen. Oxygen should only be given to these victims if their saturation is less than 94%.

The Oxygen Cylinder

- A "D" size cylinder contains 2000-2200 psi of O2 when full (or 350-420 liters).
- The tank should be changed at 200psi.
- Only open the cylinder a 1/4 turn (90degrees counter-clockwise).
- Oxygen use dangers :

  Fire such as open flame/smoking can cause the oxygen to explode

  Oil and grease are explosive when exposed to oxygen.

  Rough handling - dropping the tank or breaking the medical post can turn the cylinder into a missile - do not use/store in an upright position.

  Tunnel vision by the rescuer - focusing on trying to use the equipment and forgetting about patient care

Regulator

- Reduces the high pressure within the cylinder to a safe working pressure.
- The flow rate gauge measures liter flow per minute (lpm) and the pressure measures the pounds per square inch in the tank (psi).
- The regulator must be bled, flow rate gauge turned off and the tank turned off after every use.

Inhalator

- Is used on all breathing victims and can include a standard (or simple) face mask or a non-rebreather mask.
- 10 lpm flow is used

- Standard (or simple) face mask delivers 60% oxygen and a non-rebreather delivers 90-100% oxygen.

Ventilator

- Can be a pocket mask or a bag, valve and mask (BVM) and is used on all victims with absent or ineffective breathing.
- A 15 lpm flow is used.
- A pocket mask delivers 50-60% oxygen and a BVM delivers 90-100% oxygen.

Oxygen Formula

Rescuers must monitor the oxygen levels in the tank as they do not want to bleed the tank dry. If the tank has been emptied, it will have to be tested to ensure that the integrity of the cylinder has not been compromised. The following formula allows the rescuer to **estimate** how long the oxygen will last during a rescue.

At 10lpm, multiply the first two of the four digits by 2.	At 15lpm, multiply the first two of the four digits by 1.
• **20**00 psi x 2 = 40 mins	• **20**00 psi x 1 = 20 mins
• **15**00 psi x 2 = 30 mins	• **15**00 psi x 1 = 15 mins
• **08**00 psi x 2 = 16 mins	• **08**00 psi x 1 = 8 mins

Oral Airways

- An Oropharyngeal Airway (OPA) is a hollow plastic device that will prevent the tongue from blocking the airway and assist in maintaining a patent airway.
- Should be used on all unconscious victims unless they refuse it (gag reflex), have active vomiting or have ongoing bleeding in the airway.
- Recommended with a pocket mask on an unconscious victim.
- A BVM should only be used with an oral airway.

Measurement

- To measure an OPA, use only the curved portion of the airway (do not include the straight part or colored part).
- Measure from the angle of the jaw (below the ear) to the corner of the mouth.
- If the measurement falls between sizes, the larger of the two should be used to prevent an airway obstruction.

Inserting the OPA

- Grasp the lower jaw and tongue firmly.
- Visually inspect the airway for any foreign objects/fluid before inserting OPA.
- Hold the OPA in the happy face position (so it looks like a smile!).

- Slide it along the roof of the mouth. When it reaches the back, rotate it 180° so that it slips into position behind the tongue.
- The flange remains outside the lips.
- Assess for a clear airway.

Cautions

- If the victim gags or vomits, remove the OPA immediately.
- An OPA will prevent the tongue from blocking the throat because there is a hollow space down the centre of it for the air to pass through.
- Additional care should be taken with children and infants when inserting OPAs to avoid hard and soft palate damage.
- If there is any fluid (vomit, saliva, blood, water, etc.) in the victim's throat, the hollow space in the OPA may be blocked by the fluid. An OPA will NOT prevent fluid from causing an obstructed airway. If fluid is present, roll the victim to a drainage position, remove the OPA and clear the airway using a finger sweep. Reinsert the airway only after visually inspecting the airway and OPA to ensure it is not blocked.

Reference

This handout is a supplement to the Canadian First Aid Manual (CFAM). The CFAM should be referenced for additional information on resuscitation and oxygen use.

- Oxygen administration – CFAM page 84-85
- Advanced airway management – CFAM page 86-88

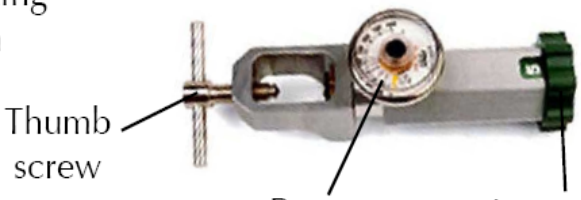
For additional information on the use of pulse oximeters, refer to the Lifesaving Society's Pulse Oximeter Info Bulletin available online at lifesaving.bc.ca.

OXYGEN UNIT

CYLINDER

"D" Size
2000-2200 psi
Silver, Green, White

REGULATOR

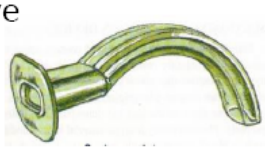


WRENCH

DELIVERY DEVICE

Pocket mask with one-way valve

Simple face mask



Oropharyngeal airway