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**MEDICAL RESERVE CORPS**

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## Oxygen Therapy for Adult, Child & Infant

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**Purpose:** The purpose of the Administration of Oxygen protocol is to describe the various methods of administering oxygen during a medical emergency.

**Procedure/Policy:** The MRC volunteer is to adhere to the following protocol anytime they are functioning as an MRC volunteer at a MRC First Aid Station or MRC sanctioned event. At no time may a caregiver provide care or treatment outside their scope of practice.

### CONDITIONS REQUIRING OXYGEN

Patients with the following conditions may require supplemental oxygen:

- **Respiratory or cardiac arrest.** CPR is only 25 to 33 percent as effective as normal circulation. High concentrations of oxygen administration is currently recommended when providing artificial ventilation to a patient in respiratory or cardiac arrest.
- **Heart attacks and strokes.** These emergencies result from an interruption of blood to the heart or brain. When this occurs, tissues are deprived of oxygen. Providing extra oxygen is extremely important.
- **Shock (Hypoperfusion).** Since shock is a failure of the cardiovascular system to provide sufficient blood to all of the vital tissues, all cases of shock reduce the amount of oxygenated blood reaching the tissues. Administration of oxygen helps the blood that does reach the tissues deliver the maximum amount of oxygen.
- **Blood loss.** Whether bleeding is internal or external, there is reduced amount of circulating blood and red blood cells, so the blood that is circulating needs to be saturated with oxygen.
- **Respiratory distress and lung diseases.** The lungs are responsible for turning oxygen over to the blood cells to be delivered to the tissues. When the lungs are not functioning properly, supplemental oxygen helps ensure that the body's tissues receive adequate oxygen.
- **Head injuries, other serious injuries, and more.** There are very few emergencies where oxygen administration would not be appropriate. All our body's systems work together. An injury in one part may cause shock (hypoperfusion) that affects the rest of the body.

### CAUTION WITH OXYGEN THERAPY

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- Respiratory depression or respiratory arrest.** Patients in the end stage of COPD may over time lose the normal ability to use the body's blood carbon dioxide levels as a stimulate to breathe. When this occurs, the COPD patient's body may use low blood oxygen as the factor that stimulates him to breathe. Because of this so-called hypoxic drive, first responders have for years been trained to administer only low concentrations of oxygen to these patient's in fear of increasing blood oxygen levels and wiping out their "drive to breathe." It is now widely believed that more harm is done by withholding high-concentrations of oxygen than could be done by administering it.

**OXYGEN DELIVERY DEVICES ADULT, CHILD & INFANT**

Device	Flow Rate	Oxygen Concentration	Appropriate Use
<p>Nonrebreather Mask (NRB)  <b>The nonrebreather mask is a combination mask and reservoir bag. Oxygen fills the reservoir bag, which is attached to the mask by a one-way valve. Exhaled air escapes through the flapper valve ports on one or both sides of the mask. The valves(s) prevent the person from rebreathing exhaled gases to help provide consistently high concentration of oxygen delivery.</b></p>	<p><b>12 - 15 liters per minute (lpm)</b></p>	<p><b>80 - 90 percent</b></p>	<p>Delivery system of choice for patients with signs of hypoxia, those short of breath (SOB), or those suffering chest pain, suffering severe injuries, or displaying an altered mental status (AMS). For patient's that can't tolerate the mask, you can also use the "blow-by" technique by holding the mask close to the patient.</p>
<p>Nasal Cannula  <b>The nasal cannula is used to provide low levels of oxygen or in situations where a person may refuse a mask due to claustrophobia. The nasal cannula delivers oxygen through two prongs that fit in the nostrils.</b></p>	<p><b>1 - 6 lpm</b></p>	<p><b>24 - 44 percent</b></p>	<p>Appropriate for patients who cannot tolerate a mask. You can also use the "blow-by" technique by holding the nasal cannula close to the patient or use a styrofoam cup.</p>
<p>Bag-Valve Mask (BVM)  <b>The system must have a non-jam valve that allows an oxygen inlet flow of 15 lpm. The</b></p>	<p><b>15 lpm</b></p>	<p><b>Nearly 100 percent with an oxygen reservoir and approximately 50 percent without a</b></p>	<p>The BVM can be used to ventilate a nonbreathing patient (positive pressure ventilations) and is also</p>

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<p><b>valve should be nonbreathing (preventing the patient from rebreathing his own exhalations) and not subject to freezing in cold temperatures. Bag and valve combinations can also be attached to an alternate airway adjunct, instead of to the mask. For example, it can be attached to an endotracheal tube or laryngeal mask airway.</b></p>		<p><b>reservoir.</b></p>	<p>helpful to assist ventilations in a patient whose own respiratory attempts are not enough to support life, such as a patient in respiratory failure or drug overdose. The BVM comes in sizes for adult, child, and infants.</p>
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**PEDIATRIC NOTE**

There are several special considerations that you must take into account when assessing and managing breathing in an infant or child.

**Anatomic Considerations**

- The tongue takes up more space proportionately in the mouth than in adults. Always consider using an airway adjunct when performing artificial ventilation.
- The trachea (windpipe) is softer and more flexible in infants and children. Furthermore, small children often have a proportionally larger head, which makes it more difficult to maintain a patent airway. Often padding is necessary behind their shoulders to provide a proper airway position. Always consider this when performing artificial ventilations.
- The chest wall is softer, and infants and children tend to depend more on their diaphragm for breathing. Gastric distension can severely impair the movement of the diaphragm and therefore seriously decrease tidal volume in children.
- Children burn oxygen at twice the rate as adults do. Although they compensate well, hypoxia will often occur more rapidly and decomposition can be swift.

**Management Considerations**

- When ventilating, avoid excessive pressure and volume. Use only enough to make the chest rise.
- Use properly sized face masks when providing ventilations to ensure a good mask seal.
- Use pediatric-sized nonbreather masks (NRB) and nasal cannulas when administering supplemental oxygen.
- Infants and child are prone to gastric distention during ventilations, which may impair adequate ventilations.

**RESCUE BREATHING**

**Adult** = 1 breath every 5 to 6 seconds (check for a pulse every 2 minutes)

**Child and Infant** = 1 breath every 3 to 5 seconds (check for a pulse every 2 minutes)

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**Advanced Airway** = 1 ventilation every 6 to 8 seconds using a BVM with no pauses in compressions!