



# BASIC LIFE SUPPORT FIELD GUIDE

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*This publication is available in English and French.*

**The Red Cross Fundamental Principles**

**Humanity:** We serve people, but not systems.

**Impartiality:** We care for the victims and the aggressors alike.

**Neutrality:** We take initiatives, but never take sides.

**Independence:** We bow to needs, but not rulers.

**Voluntary Service:** We work around the clock, but never for personal gain.

**Unity:** We have many talents, but a single idea.

**Universality:** We respect nations, but our work knows no bounds.

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## BASIC LIFE SUPPORT TERMINOLOGY

Throughout the Basic Life Support course, the following terms are used as they are defined here.

**Basic life support (BLS):** The recognition of and initial intervention or treatment given by pre-hospital or in-facility responders to a patient suffering from cardiac arrest or respiratory arrest.

**In-facility:** Any environment within a clinical (including hospital) setting.

**Pre-hospital:** Any environment outside of a clinical (including hospital) setting.

**Responder:** Any individual with the professional responsibility to provide care to a patient in either a pre-hospital or an in-facility setting.

# 1 Introduction to Basic Life Support

In order to provide high-quality cardiopulmonary resuscitation (CPR), it is important that responders act as a high-performance team (page 51)—this forms the cornerstone of any successful resuscitation event. As such, a team leader is an essential part of a high-performance team. Some responsibilities of a team leader include:

- Coordinating all team members.
- Ensuring everyone clearly understands their roles during a resuscitation attempt.

- Making sure that all key interventions are performed in a timely manner.
- Minimizing interruptions to CPR.

As a responder, it is important that you ensure optimum performance by staying up to date on your BLS skills through frequent training.

## LEGAL ISSUES

### Consent

Consent is the legal permission that a patient gives to receive care.

### RESPONSIVE PATIENT

You are required to get consent from the patient before performing assessments or treatment.

### UNRESPONSIVE PATIENT

In cases where the patient is unresponsive, the law assumes that the patient would grant consent if he or she were able to do so (*implied consent*).

If a child requires urgent care and his or her parent or guardian is not available, provide the necessary interventions.

### Abandonment

Once you have initiated treatment for a patient, you are legally required to continue.

### Advance Directives

Advance directives are documented instructions from a competent person that outline the individual's wishes concerning healthcare decisions.

# 2 Basic Life Support Skills

## GLOVE REMOVAL



Figure 2–1, a–c: Proper technique for glove removal.

## PRIMARY ASSESSMENT

### Level of Responsiveness

Determine the patient's level of responsiveness (LOR) by gently tapping the patient on the shoulder and asking, "Are you okay?"

### Open the Airway

To open and assess an unresponsive patient's airway, perform a head-tilt/chin-lift:

1. Place two fingers under the patient's mandible (jaw).
2. Place the palm of your other hand on the patient's forehead.
3. Tilt the patient's head back while lifting the chin.

This motion will reposition the tongue so that it does not block the airway.

When assessing an infant, avoid hyperextending the neck.

If the patient has a suspected head and/or spinal injury, perform a jaw thrust:

1. Kneel or stand behind the patient's head.
2. Place both palms on the patient's cheekbones.
3. Place two fingers of each hand under the patient's mandible and pull forward.

If the jaw thrust is unsuccessful, do a head-tilt/chin-lift, keeping the neck in line with the body.

## Check Breathing and Circulation

Simultaneously check the patient's breathing and circulation (carotid pulse) (Table 2–1) for no longer than 10 seconds.

If no pulse is detected after a maximum of 10 seconds, initiate CPR/AED.

## Agonal Respirations

Agonal respirations are an inadequate and irregular pattern of breathing sometimes associated with cardiac

arrest. If a patient indicates agonal respirations, he or she is not breathing normally.

The ABCs in a primary assessment refers to simultaneously assessing the patient's airway, breathing, and circulation.

Table 2–1: Checking the Pulse for an Adult, Child, or Infant

RESPONSIVE ADULT OR CHILD	UNRESPONSIVE ADULT OR CHILD	INFANT
<p>Place two or three fingers over the radial artery.</p> 	<p>Place two or three fingers over one of the carotid arteries.</p> 	<p>Place one or two fingers over the brachial artery.</p> 

## CPR

Any patient who is unresponsive and does not have a pulse requires CPR (Table 2–2).

# CPR Chest Compressions

Table 2–2: CPR Chest Compressions

	ADULT	CHILD	INFANT	NEONATE
<b>HAND POSITION:</b>	Two hands on sternum	One or two hands on sternum	Two fingers on sternum (just below nipple line) <b>OR</b> Encircling method	Two fingers on sternum (just below nipple line) <b>OR</b> Encircling method
<b>COMPRESSION DEPTH:</b>	at least 5 cm (about 2 in.)	1/3 of the chest depth	1/3 of the chest depth	1/3 of the chest depth
<b>ONE-RESPONDER CYCLE:</b>	30 compressions, 2 ventilations	30 compressions, 2 ventilations	30 compressions, 2 ventilations	3 compressions, 1 ventilation
<b>TWO-RESPONDER CYCLE:</b>	30 compressions, 2 ventilations	15 compressions, 2 ventilations	15 compressions, 2 ventilations	3 compressions, 1 ventilations
<b>COMPRESSION RATE:</b>	100–120 per minute (30 compressions in 15–18 seconds)	100–120 per minute (30 compressions in 15–18 seconds)	100–120 per minute (30 compressions in 15–18 seconds)	100–120 per minute (30 compressions in 15–18 seconds)

For two-responder CPR: After approximately 2 minutes (about 5 cycles) of continuous CPR, responders should switch roles to avoid fatigue and maintain high-quality compressions.

## Minimize CPR Interruptions

*Chest compression fraction* is the measurement of the amount of time that compressions are being performed. A chest compression fraction time of around 80% is the aim, with a minimum of around 60%.

## Resuscitation Mask

A resuscitation mask (or *pocket mask*) is used for direct ventilations (Figure 2–2 and 2–3, a–b). It also acts as personal protective equipment (PPE), providing a barrier between you and the patient during resuscitation.



Figure 2–2: A resuscitation mask should be positioned over the mouth and nose, with the lower rim placed between the patient's lower lip and chin.



a



b

## Bag-Valve-Mask

A bag-valve-mask (BVM) is used for a patient in respiratory arrest or a patient whose respiratory rate is too low or too high.

A BVM is best used by two responders (Figure 2–4 and Figure 2–5). To properly use a BVM, you must attach it to an oxygen reservoir bag.

If you are using a BVM without a partner (Figure 2–6), you must maintain the mask seal with one hand, monitor the airway, and simultaneously provide ventilations with your other hand.

Figure 2–3, a–b: To use a resuscitation mask: a, position yourself behind the patient's head and hold the two sides tightly against the face; or b, position yourself beside the patient and hold the mask in place.



Figure 2–4: When using a BVM with a partner, Responder A is positioned by the patient's head, facing the chest, with one thumb on each side of the mask to maintain a tight seal on the patient's face.



Figure 2–5: When using a BVM with a partner, one responder maintains a tight seal of the mask on the patient's face, and a second responder provides ventilations by squeezing the bag smoothly, never forcefully.



Figure 2–6: If using a BVM without a partner, make a “C” with your thumb and index finger to maintain the mask seal. Place the other three fingers of the same hand under the mandible to maintain the angle of the head, protecting the airway.

## CHILDREN AND INFANTS

Some BVMs are designed specifically for children and infants. These BVMs also include a valve that prevents overinflation of the lungs.

## Defibrillators

The automated external defibrillator (AED) is the most common defibrillator, but there are many others that vary slightly in use. It is important that you know and follow the manufacturer’s instructions for proper use and maintenance of your particular defibrillator.

Use a defibrillator in combination with CPR for patients in cardiac arrest. If two responders are present, one should begin CPR while the second prepares the defibrillator and applies the pads to the patient.

Activate the defibrillator immediately to allow the device to begin analyzing the patient as soon as possible.

1. Expose and prepare the patient's chest.
2. Attach the pads to the patient's chest as directed by the defibrillator's manufacturer.
  - Typically, one pad is placed on the upper right side of the chest and the other on the lower left side with 2.5 cm (1 in.) of space between them.
3. Pause CPR to allow the defibrillator to analyze the patient's heart rhythm. Do not touch the patient or the defibrillator during this time. The defibrillator will notify you when the analysis is complete. Follow the defibrillator's prompts.
4. Continue chest compressions while the defibrillator charges in preparation to deliver a shock.
5. Resume CPR, follow the defibrillator's prompts, and reanalyze after 5 CPR cycles.
6. If the defibrillator advises a shock and then later advises *no shock*, the patient's condition has changed. Quickly reassess the patient's circulation before proceeding.

If the patient is pregnant, put a blanket or cushion under the patient's right hip to help blood return to the heart if doing so does not disrupt CPR.

## SPECIAL CONSIDERATIONS

- Do not defibrillate neonates (0–28 days old).
- Do not defibrillate in water.
- Do not defibrillate in the presence of flammable materials.
- Do not defibrillate while in a moving vehicle.

anatomical structure (e.g., the tongue or swollen tissues of the mouth and throat).

**Foreign-body airway obstructions** (FBAO) occur when the airway is blocked by a foreign object (e.g., a piece of food) or by fluids (e.g., vomit). This may also be referred to as a *mechanical obstruction*.

An airway obstruction can be either partial or complete.

Partial airway obstruction:

- The patient can breathe but has difficulty (e.g., wheezing).
- Have the patient cough forcefully. If possible, have the patient sit down and lean forward.

## AIRWAY OBSTRUCTION

There are two types of airway obstruction:

1. Anatomical airway obstruction
2. Foreign-body airway obstruction

**Anatomical airway obstructions** occur when the airway is blocked by an

- Partial choking can quickly escalate to complete choking; monitor the patient closely.

Complete airway obstruction:

- The patient cannot speak, breathe, or cough effectively.
- The patient may be able to cough weakly or make high-pitched noises.
- Immediate intervention is required.

The interventions for both responsive and unresponsive patients with complete airway obstructions are primarily effective for FBAO, but these interventions should be attempted even if you are unsure whether the obstruction is anatomical or mechanical (FBAO).

## Responsive Adult or Child

Alternate between at least two of the following three methods for clearing an FBAO in a responsive adult or child: back blows, abdominal thrusts, and chest thrusts (Figure 2–7 and Figure 2–8). Choose the method most suitable for the patient.

Regardless of the combination of methods you choose, continue interventions until one of the following occurs:

- The foreign body is dislodged.
- The patient begins to breathe or cough.
- The patient becomes unresponsive.

If the patient becomes unresponsive and collapses, begin treatment for an unresponsive patient (page 18).

If the patient is in a wheelchair, lock the wheels before providing care.

## BACK BLOWS

1. Assume a stable stance behind the patient.
  - Wrap one arm around the patient's chest and bend the patient forward at the waist until the upper airway is at least parallel to the ground.

2. With the heel of your other hand, deliver 5 firm blows between the shoulder blades, checking after each blow to see if the obstruction has cleared.



Figure 2–7: Back blows for an FBAO in a responsive adult.

## ABDOMINAL THRUSTS

1. Assume a stable stance behind the patient.
2. Make a fist and place it thumb-side-in against the patient's abdomen, just above the navel and well below the lower tip of the sternum (breastbone).
3. Grasp your fist with your other hand and give up to 5 quick upward thrusts into the abdomen, checking after each thrust to see if the obstruction has been cleared.

Abdominal thrusts are a good default choice for most patients, but they are not suitable for pregnant women and may be difficult with bariatric (obese) patients. In these cases, chest thrusts are recommended



Figure 2–8: Abdominal thrusts for an FBAO in a responsive adult.

## **CHEST THRUSTS**

1. Assume a stable stance behind the patient.
2. Make a fist and place it thumb-side-in against the patient's sternum.
3. Grasp your fist with your other hand and perform up to 5 quick thrusts, pulling directly back towards you with each one and checking after each thrust to see if the object has been dislodged.

## **Unresponsive Adult or Child**

1. Perform sets of 30 chest compressions as in the CPR protocol.

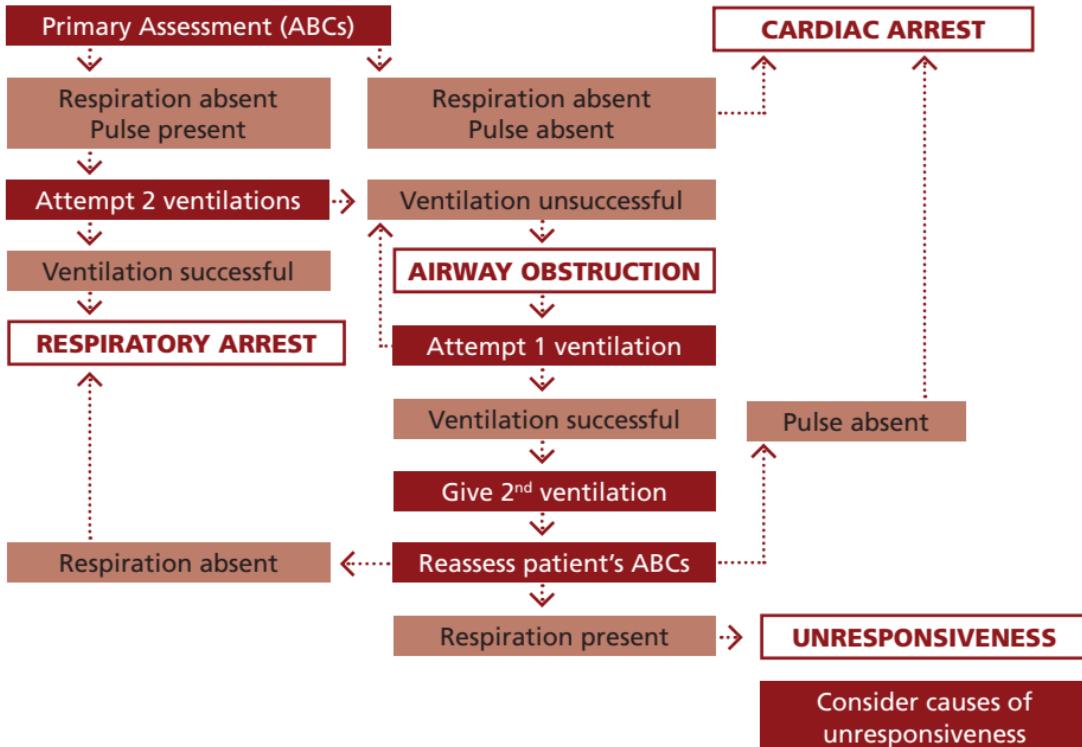
2. After performing each set of 30 chest compressions, look inside the patient's mouth.
  - If you see an object, carefully remove it using a finger sweep: Grasp the tongue and lower jaw and lift, then sweep the object out using your finger.
3. After looking in the mouth, or after removing an object, open the airway and attempt to ventilate.
  - If your ventilation goes in, give a second ventilation.
  - If your first ventilation does not go in, reposition the head and attempt to give a second ventilation. If it does not go in, resume the CPR sequence, starting with 30 chest compressions.

Repeat this sequence (Figure 2–9) until the airway is clear.

4. If your ventilations cause the chest to rise, the obstruction is clear. Reassess and provide care according to what you find.

Tilting the patient's head back farther is only necessary on your initial unsuccessful ventilation: On consecutive cycles, simply attempt one ventilation and then resume compressions.

Figure 2–9: Care for a Foreign-Body Airway Obstruction—Unresponsive Adult or Child



## Responsive Infant

Support the head and neck of the infant during interventions. Remember to check after each back blow and chest compression to see if the object has been dislodged.



Figure 2–10, a–c: To care for a responsive choking infant: sandwich the infant between your forearms; a turn the infant prone along your forearm on your lap; b, give up to 5 firm back blows with the heel of your hand between the shoulder blades; and then c, turn the infant supine, lower your arm onto your thigh, and give up to 5 chest thrusts.

## Unresponsive Infant

1. Perform 30 chest compressions as in the CPR protocol.
2. Visually inspect the mouth.
  - Open the infant's mouth by placing your thumb on the lower teeth and gently opening the mouth.
  - Look for an object. If you can see it, carefully pick it out with your thumb and little finger.
3. Open the airway and attempt to ventilate.
  - If the ventilation goes in, give a second ventilation.
  - If the infant's chest does not rise after the first ventilation, reposition the head to adjust the airway and attempt to give

another ventilation. Repeat the set of compressions, then look inside the infant's mouth for a foreign object prior to attempting ventilations again.

4. Repeat this sequence until the airway is clear or you transfer care of the patient.

Tilting the infant's head back farther is only necessary on your initial ventilation attempt.

## OBSTRUCTED AIRWAY SELF-RESCUE

If you are alone and you are choking, dial EMS/9-1-1 and leave the phone off the hook. This will tell the dispatcher where to send help. If there are people nearby, move to a place where they will notice you (Figure 2–11).

Any patient who has received interventions for an obstructed airway should be referred to a physician for examination as soon as possible.



Figure 2–11: To attempt to give yourself abdominal thrusts, press your abdomen onto a firm object such as the back of a chair.

# ASSISTED VENTILATION

Assisted ventilation is a technique of manually delivering atmospheric air and/or supplemental oxygen into a patient's lungs.

Assisted ventilation is indicated for the following conditions:

- Respiratory arrest
- Irregular respiratory rates (i.e., lower than 10 breaths per minute or higher than 30 breaths per minute)

The most common ventilation devices are the resuscitation mask and the BVM.

1. Maintain an open airway using the head-tilt/chin-lift or jaw thrust.

## 2. Give 1 ventilation:

- Every 5 to 6 seconds for an adult.
- Every 3 to 5 seconds for a child.
- On inhalation and a second ventilation after exhalation if the patient has bradypnea (breathing too slowly).
- On every second inhalation if the patient has tachypnea (breathing too quickly).

## 3. Watch the chest:

- The chest should just start to rise with each ventilation.

# 3 Airway Management

## OPENING THE MOUTH

### Crossed-Finger Technique

To use the crossed-finger technique (Figure 3–1):

1. Cross the thumb and index finger of one hand.
2. Place the thumb on the patient's lower front teeth and the index finger on the upper front teeth.
3. Open the mouth using a scissor motion.

### Tongue-Jaw Lift Technique

To use the tongue-jaw lift technique (Figure 3–2):

1. Place your index finger beneath the patient's chin.
2. Insert your thumb of the same hand into the patient's mouth and grasp the tongue between your thumb and finger.
3. Gently lift the mandible forward to open the patient's mouth.



Figure 3–1: The crossed-finger technique.



Figure 3–2: The tongue-jaw lift technique.

## AIRWAY ADJUNCTS

An airway adjunct (e.g., oropharyngeal airway (OPA) or nasopharyngeal airway (NPA)), may not suffice to maintain airway patency (i.e., an open airway) alone. Continuously monitor the patient's respiration after inserting an adjunct and use manual techniques (e.g., head-tilt/chin-lift) as needed.

### Oropharyngeal Airways

- Indicated for unresponsive adults, children, or infants
- Available in a variety of sizes
- Will not interfere with assisted ventilations or oxygen delivery if properly sized and inserted
- Will interfere with suctioning (page 33)

## INSERTION

Figure 3–3 to Figure 3–6 show the steps to properly insert an OPA. If the patient gags upon insertion of the device, he or she may be partially responsive. Stop your attempt. Maintain airway patency using other methods and continue your patient assessment. Reattempt insertion frequently.



Figure 3–3: Measure the OPA against the patient's cheek.



Figure 3–4: Properly insert the OPA.



Figure 3–5: Rotate the OPA as it reaches the back of the throat.



Figure 3–6: The flange end should rest on the lips.

## CHILDREN AND INFANTS

Younger children and infants have delicate airways: Practise extra caution to prevent injury, and avoid hyperextending the neck.

To insert an OPA for a child, gently slide the tip along the inside of the cheek, and then rotate it 90 degrees to place it into the throat (Figure 3–7).

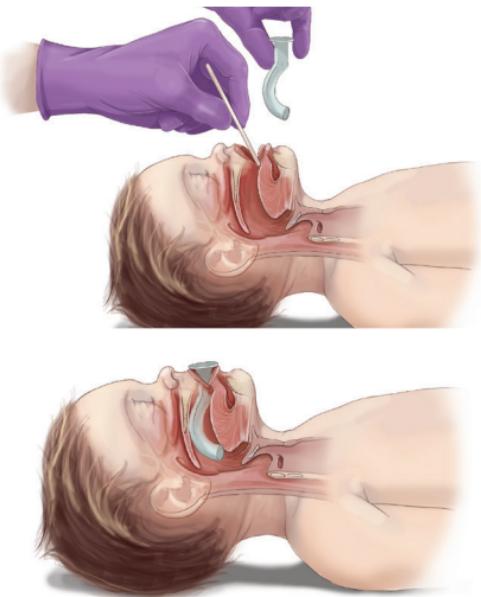


Figure 3–7: You may attempt to insert the OPA by gently sliding the tip along the inside of the cheek and then rotating it 90 degrees to place it into the throat.

To insert an OPA for an infant, place padding under the shoulders to maintain a neutral position and avoid hyperextending the neck. Use a tongue depressor to hold the tongue in place. Place the OPA against the lower lip with the concave side facing down, and slide the OPA smoothly into place without rotating it, following the natural curvature of the mouth and throat.

## REMOVAL

To remove an OPA from a patient of any age:

1. Grasp the flange between your thumb and index finger.
2. Pull gently towards the patient's chin; the OPA will slide out smoothly.

## Nasopharyngeal Airways

- Indicated for unresponsive and responsive adults
- Not indicated for patients with suspected skull fracture, epistaxis (nosebleeds), or facial trauma
- Available in a variety of sizes
- Will not interfere with suctioning (page 33)
- May cause epistaxis, leading to blood in the airway



Figure 3-8: Measure the NPA.

## INSERTION

1. Measure the NPA and then lubricate it with a water-soluble lubricant (Figure 3-8).
2. Insert the NPA into the right nostril with the bevel toward the septum (Figure 3-9, a–b).



Figure 3-9, a–b: a, Advance the airway gently, straight in; b, the flange end should rest against the nostril.

Never force an NPA into the airway. If it does not pass easily, remove the NPA and try the other nostril.

## REMOVAL

Grasp the flange gently between your thumb and index finger and gently draw the device out.

## Supraglottic Airways

When other airway management is ineffective, a supraglottic airway (SGA) is used to maintain airway patency, protect the airway, and/or provide unobstructed ventilations.

An SGA is not indicated if you suspect a caustic substance has been ingested or if the patient has:

- Active vomiting.
- Airway edema (swelling).
- Stridor (a high-pitched sound when breathing due to a partially obstructed upper airway).

Aspiration (taking blood, vomit, saliva, or other foreign material into the lungs) is a risk with supraglottic airways, especially if the patient has gastric inflation or high airway pressure.

## **INSERTION**

1. Deflate the cuffs using a 20 mL to 30 mL syringe, and then apply a water-soluble gel lubricant to the outer cuff.
2. Position yourself behind the supine patient's head and tilt the head back approximately 15 degrees, without lateral deviation.
3. Insert the SGA into the patient's mouth, directing it to the back of the hypopharynx.
4. Use the syringe to inflate the cuffs so that they seal the patient's airway and hold the SGA in place.
5. Confirm that the SGA is correctly positioned by observing the chest expansion and auscultating both sides of the chest.

- If your level of training and local protocol allow it, consider applying a CO<sub>2</sub> detector or end-tidal CO<sub>2</sub> monitor to confirm correct placement.
- 6. Secure the ends of the SGA in place.

Never make more than two attempts to insert an SGA into a patient's airway.

## **REMOVAL**

To remove the SGA, simply reverse the steps for insertion: Detach the tape, string, and/or strap, deflate the cuffs with the syringe, and draw the SGA out of the patient's airway. Be

prepared to support the patient's airway as you remove the SGA.

Consult the manufacturer's guidelines to determine the appropriate volume of air needed to inflate the cuffs. If necessary, attach a BVM to the tube.

## SUCTION

Suctioning is a method of clearing foreign matter from the airway by using a manual or mechanical suction device.

A variety of suction devices are available. Always follow the manufacturer's instructions for the proper use and maintenance of your specific device.

The basic steps to properly use a suction device are as follows:

1. Provide rapid suction until the airway is clear (Figure 3–10 to Figure 3–11).
2. After suctioning, provide supplemental oxygen (page 37).



Figure 3–10: Determine the depth of safe insertion.

A bulb syringe is used to provide suction for an infant. Deflate the bulb syringe before inserting it into the infant's airway.



Figure 3–11: Insert the suction tip.

# 4 Oxygen Therapy

## PULSE OXIMETRY

Pulse oximetry is a non-invasive method of measuring the percentage of hemoglobin that is saturated with oxygen (*oxygen saturation*). The reading is recorded as a percentage of oxygen saturation and is written as  $\text{SpO}_2$ . Apply a pulse oximeter, take an  $\text{SpO}_2$  reading, and administer supplemental oxygen as required (Table 4-1).

The initial  $\text{SpO}_2$  reading is the *room air saturation*. Pulse oximetry is also used to assess the adequacy of oxygen delivery.

Continue administering high-concentration oxygen to all patients with suspected carbon monoxide (CO) poisoning, regardless of the saturation readings.

Table 4–1: Pulse Oximetry

RANGE	VALUE	TREATMENT
Normal	95 to 100% SpO <sub>2</sub>	None
Mild hypoxia	91 to 94% SpO <sub>2</sub>	Administer emergency oxygen using a nasal cannula or a standard oxygen mask.
Moderate hypoxia	86 to 90% SpO <sub>2</sub>	Administer emergency oxygen using a non-rebreather mask or a bag-valve-mask with oxygen reservoir.
Severe hypoxia	85% or lower SpO <sub>2</sub>	Administer emergency oxygen using a non-rebreather mask or a bag-valve-mask with oxygen reservoir.

## Procedure

1. Refer to the manufacturer's directions to ensure that you are using the device properly.
2. Document the SpO<sub>2</sub> and the time of recording.
3. Assess the patient's pulse manually and compare this number with the pulse oximeter's reading.

## SUPPLEMENTAL OXYGEN

If a patient is not receiving sufficient oxygen through normal respiration, the blood's oxygen saturation must be increased by providing supplemental oxygen (Figure 4-1).

## Oxygen Cylinders

Depending on their size, oxygen cylinders (Figure 4-2) used in the pre-hospital setting typically hold between 350 and 625 litres of oxygen. These cylinders have internal pressures of approximately 2,000 pounds per square inch (psi) (13,790 kilopascals or kPa).



Figure 4-2: An oxygen cylinder usually has a green or white top with a yellow diamond indicating oxygen.



Figure 4–1: Administering supplemental oxygen allows a substantially higher oxygen concentration to be delivered to the patient.

## Oxygen Regulator

You must first reduce the pressure of the oxygen inside the cylinder from 2,000 psi to a range of 30 to 70 psi.

This is done using the oxygen regulator, which is either integrated or independent.

## Duration of Flow

The calculation to determine how long an oxygen cylinder will last is as follows:

$$\text{Duration of flow} = \frac{(\text{gauge pressure} - 200 \text{ psi}) \times C}{\text{Flow rate (litres per minute)}}$$

The “gauge pressure” is the reading on the cylinder’s pressure gauge and “200 psi” is the safe residual

Figure 4–3, a–d, outlines the steps to attach an independent regulator to an oxygen cylinder. Regulators normally deliver between 1 and 25 litres per minute (LPM).

pressure, indicating when to change the tank. “C” is the cylinder constant; the constants for each size cylinder (which is designated by a letter on the cylinder) are:

$$\text{D cylinder} = 0.16 \text{ L/psi}$$

$$\text{E cylinder} = 0.28 \text{ L/psi}$$

$$\text{M cylinder} = 1.56 \text{ L/psi}$$

If the patient is being transported, you must include extrication and transportation time in your calculation.



a



c



b



d

Figure 4–3, a-d: To attach an independent regulator to a cylinder: a, insert the gasket into the pressure regulator; b, confirm that the pin index corresponds to the oxygen tank; c, seat the prongs of the regulator inside the cylinder and hand-tighten the screw until the regulator is snug; and d, turn on the oxygen and check how much pressure is in the cylinder.

## Oxygen Delivery Devices

Table 4–2: Common Oxygen Delivery Devices

DEVICE	COMMON FLOW RATE	OXYGEN CONCENTRATION	FUNCTION
Nasal cannula	1–4 LPM	24–36%	Breathing patients only
Resuscitation mask	6+ LPM	35–55%	Breathing and non-breathing patients
Standard mask	6–10 LPM	40–60%	Breathing patients only
Non-rebreather mask (with oxygen reservoir)	10+ LPM	90+%	Breathing patients only
Bag-valve-mask resuscitator (with oxygen reservoir)	15 LPM	90+%	Breathing and non-breathing patients



a



c



b

Figure 4–4, a–c: Examples of common oxygen delivery devices include: a, a nasal cannula; b, a BVM; and c, a non-rebreather mask.

## Administering Oxygen

1. Attach the delivery device to the oxygen port on the regulator.
2. Set the appropriate flow rate.
3. Listen and feel to make sure that oxygen is flowing into the delivery device.
  - If using a delivery device with a reservoir bag, ensure that the bag is full.
4. Place the delivery device on the patient.

Attaching an oxygen humidifier to a regulator can minimize irritation of the respiratory tract. This is not usually done in a pre-hospital setting, but it may be used for long transfers.

# 5 Basic Life Support: Special Considerations

## TRAUMA

If the patient is breathing, stabilize the patient in the position found. If the patient begins to vomit, position on one side to keep the airway clear while maintaining in-line stabilization.

## HYPOTHERMIA

If vital signs seem absent, check for signs of pulse and respiration for 60 seconds. If neither is detected, start CPR.

## OPIOID OVERDOSE

Signs and symptoms of opioid overdose include:

- Decreased LOR.
- Constricted pupils or rolled-back eyes.
- Limp muscles.
- Slow or absent pulse or respiration.
- Low SpO<sub>2</sub> (< 92% on room air).
- Cold and pale or blue skin.

Naloxone is a drug that quickly counteracts the effects of opioid overdose. If your scope of practice and protocols allow, administering naloxone is indicated for most cases of suspected opioid overdose. It is safe to use naloxone even if an overdose cannot be confirmed.

## ANAPHYLAXIS

Anaphylaxis (*anaphylactic shock*) is caused by an extreme allergy to a substance.

Assess the patient's airway and breathing. If the patient is experiencing respiratory distress or complains that his or her

throat is closing, you should suspect anaphylaxis.

If the patient has an epinephrine auto-injector, assist him or her in using it. If it is within your scope of practice, or covered by medical direction, you may be able to administer the epinephrine yourself.

The patient requires immediate transport to a medical facility even if he or she injects epinephrine; epinephrine does not correct the underlying condition.

1. Remove the safety cap from the injector and push the auto-injector firmly against the outer upper thigh with a quick motion.
  - You should hear a click.
  - Hold the auto-injector in place for approximately 10 seconds.

2. Remove the auto-injector and rub the injection site for approximately 30 seconds.
3. Ensure that the used epinephrine auto-injector is transported with the patient to the hospital.

If a patient does not respond to the initial dose of epinephrine within 5 minutes, a second dose may be indicated.

## SIX RIGHTS OF MEDICATION

Prior to having the patient take any medication, you must ensure that the Six Rights of Medication have been met:

1. Right person
2. Right medication
3. Right dosage
4. Right time
5. Right route
6. Right documentation

## HIGH-PERFORMANCE CPR

When a patient is in cardiac arrest and two responders are present, responders should provide high-performance (HP) CPR:

1. The first responder (Responder A) begins CPR while the second (Responder B) deploys the defibrillator and requests any additional resources that may be required.
2. When Responder B is available, he or she moves to the patient's head to maintain airway patency and hold the BVM in place.
  - Responder A continues to

give chest compressions and squeezes the BVM to provide ventilations.

3. Responder B checks the effectiveness of the compressions by feeling for the carotid pulse (or the brachial pulse in infants) while Responder A is giving compressions.
  - Responder B should provide feedback to Responder A about the effectiveness of the compressions.
4. After approximately 2 minutes (about 5 cycles) of continuous CPR, the responders switch roles to avoid fatigue and maintain high-quality compressions.
  - When Responder A completes the last ventilation, Responder

- B moves immediately into position beside the patient's chest while Responder A moves to the head.
- Responder B begins compressions immediately to reduce off-chest time.

A patient who has lost a significant amount of blood may not have a strong pulse even if compressions are effective.

assume the role of team leader. The team leader's role is to coordinate the actions of the other responders, record patient information, and communicate with other incoming personnel.

If more advanced personnel arrive, the team leader will provide them with a report of the situation and the patient's status. When transferring care of a patient in cardiac arrest, try to minimize off-chest time. The goal is to achieve a near-seamless continuation of CPR.

The ratio of compressions to ventilations can be different when you are working as a team (page 8).

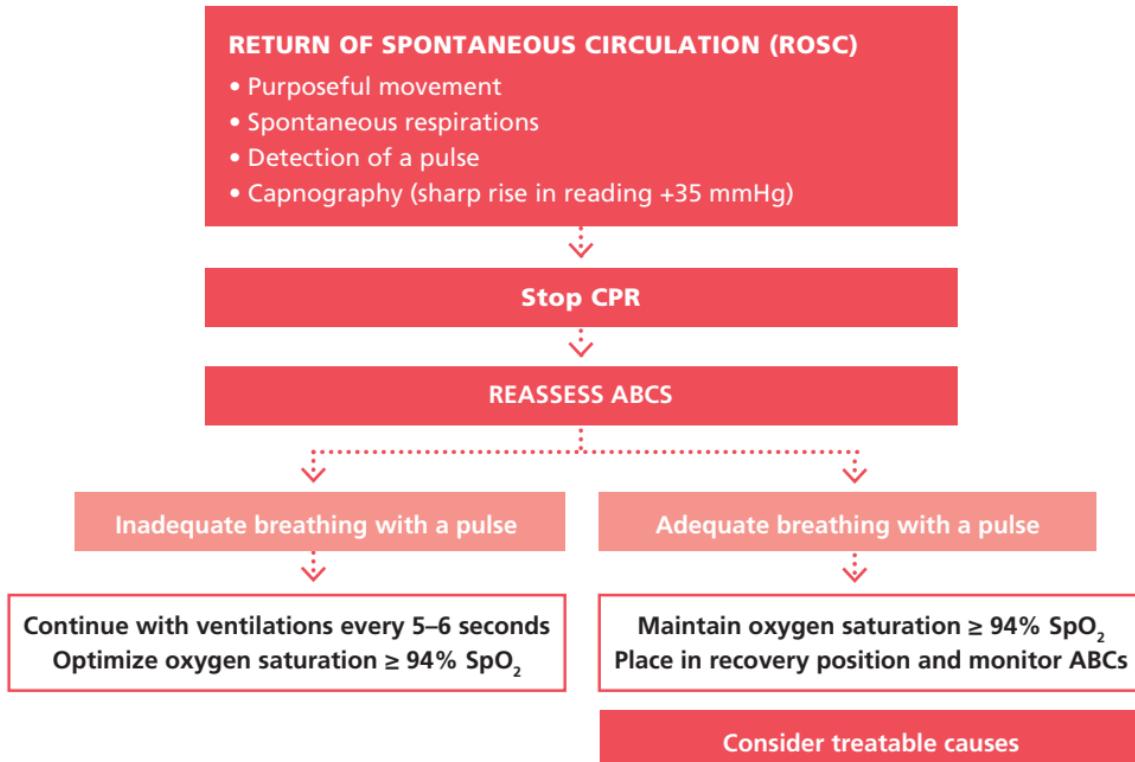
If more than two responders are available, one responder should

## POST-CARDIAC ARREST CARE

Return of spontaneous circulation (ROSC) patients must be monitored very closely (Figure 5–1). Check the pulse regularly, and be prepared to resume CPR if the heart stops again. Keep the defibrillator pads attached to the patient's chest.

Ventilate the patient or provide assisted ventilations as necessary. A patient who has experienced cardiac arrest is likely to be at least moderately hypoxic, so high-flow supplemental oxygen is indicated. Monitor the patient's airway and be prepared to provide suction or other interventions if necessary.

Figure 5–1: Post-resuscitation care for ROSC patients.



## HIGH-PERFORMANCE TEAM COMMUNICATION

An HP team must employ effective communication practices. Some elements of effective team dynamics include:

- Closed-loop communication
- Designated roles
- Mutual respect

well with the event and identify any areas of improvement. Debriefs should always be conducted with a positive attitude. As well, debriefs should focus not only on individual performance, but also on team and systems performances.

## POST-EVENT DEBRIEF

Immediately following the event, the team leader should initiate a *hot debrief* with all the team members. The debrief should focus on what went

## ACKNOWLEDGEMENTS

This project was completed to fulfill the need for both a stand-alone and an integrated basic life support (BLS) program. This new program not only establishes the knowledge and skills essential to BLS, but also may be layered with courses of the Professional Responder Program, providing a complete yet customizable learning experience.

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