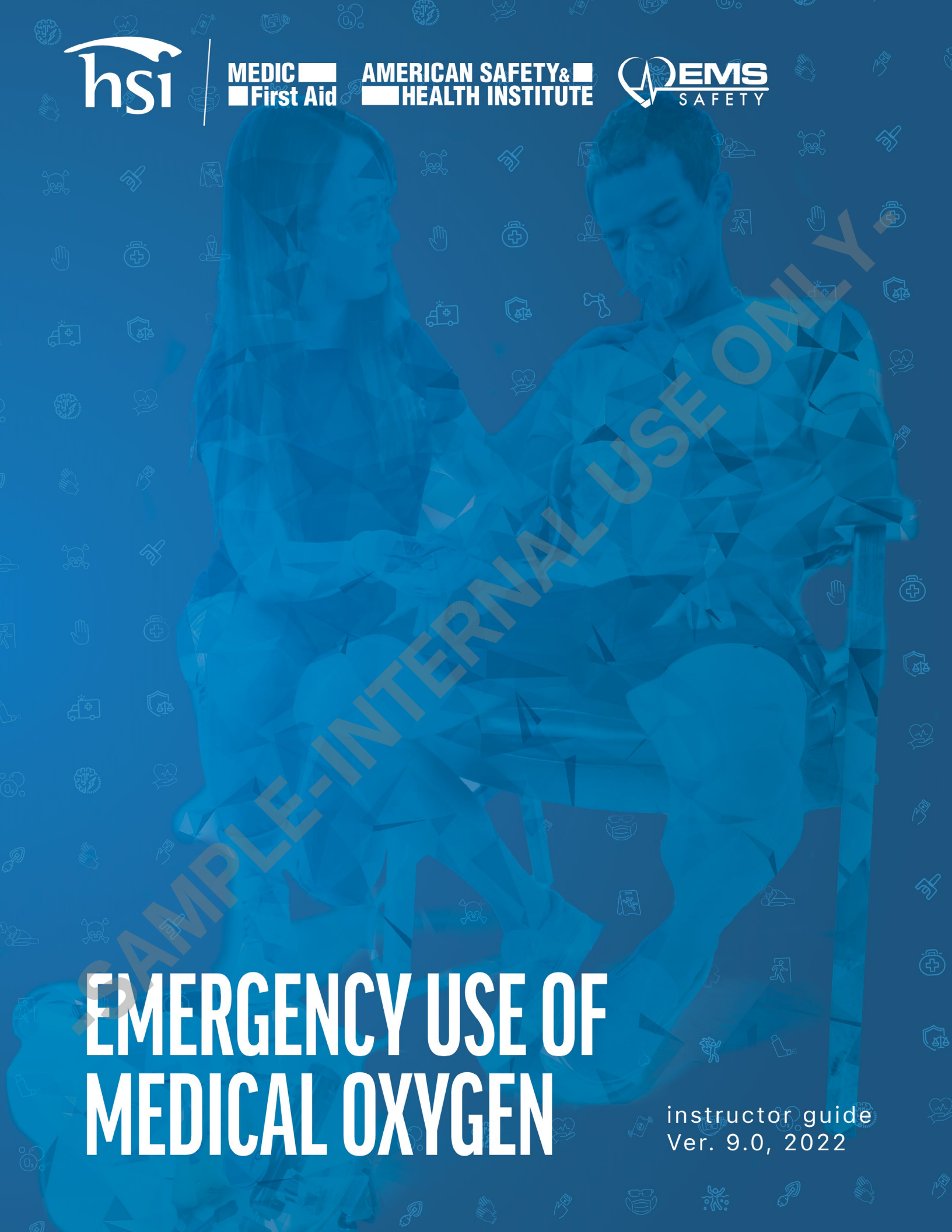
hsi | MEDIC First Aid | AMERICAN SAFETY & HEALTH INSTITUTE | EMS SAFETY





# EMERGENCY USE OF MEDICAL OXYGEN

instructor guide
Ver. 9.0, 2022

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# ABOUT THIS INSTRUCTOR MANUAL

HSI is in the process of transitioning all of our individual health and safety training brands, into a single unified one — HSI. This Instructor Guide consolidates the American Safety and Health Institute (ASHI), MEDIC First Aid, and EMS Safety Emergency Oxygen training programs into a single, completely revised training program incorporating the most current guidelines and treatment recommendations.

To address the risk of confusion in the market and among regulators and others during our brand transition, HSI's Emergency Use of Medical Oxygen (EUMO) certification cards will continue to carry the ASHI, Medic, and EMS Safety logos for a prolonged period of time until they are slowly phased out.

We have integrated and expanded on the best aspects of each training program while streamlining and harmonizing them. We have defined key terms to provide clarity. We have added important information to amplify core instructional design and resuscitation concepts.

The goal of HSI's emergency care training programs is to assist our approved Training Centers and Authorized Instructors to positively impact the lives of others by helping students acquire and improve their knowledge and skills to protect and preserve life, alleviate suffering, and promote recovery.

These outcomes are central to HSI's organizational mission: Making Workplaces & Communities Safer.™



part one

# UNIVERSAL CONCEPTS

Universal concepts cover broad, principal themes that underlie and influence both EUMO instruction and practice.

## Procedures for Adult First Aid, Adult and Pediatric CPR AED, and Basic Life Support, Including EUMO

With this completely revised and updated training program, we have integrated EUMO into the following procedure graphics:

**Adult First Aid | Adult and Pediatric CPR AED**

- Procedure for Adult First Aid/CPR AED, Including EUMO
- Procedure for Adult CPR AED, Including EUMO
- Procedure for Pediatric CPR AED, Including EUMO
- Basic Life Support

**Procedure for Adult Basic Life Support, Including EUMO**

- Procedure for Pregnant Women in Cardiac Arrest, Including EUMO
- Procedure for Pediatric Basic Life Support, Including EUMO
- Procedure for Opioid-Associated Emergencies, Including EUMO

Trained first aid/CPR AED and BLS providers should follow the established procedures when providing emergency care.

This step-by-step guidance for performing first Aid/CPR AED, or BLS and using medical oxygen is based on scientific evidence, national guidelines, and the consensus of experts.

This guidance is reinforced throughout the training program. It is represented by seven procedure graphics found in the EUMO Skill Guide. Procedure graphics are designed to accompany and complement the provider level of the students being taught.

## Assessment

While there are separate procedures for Adult First Aid and Adult and Pediatric CPR AED and BLS, the first steps of assessment are generally the same:

1. Assess scene safety.
2. Take standard precautions.
3. Assess responsiveness.
4. Activate EMS and/or your emergency action plan (EAP).
5. Send someone to get the emergency response kit, an AED, and the medical oxygen delivery system (which may include a pulse oximeter).
6. Assess breathing for no more than 10 seconds (BLS providers assess breathing and pulse at the same time for no more than 10 seconds).

These assessment steps are crucial in all but the most minor circumstances.

**It is important to emphasize that while these steps are listed in sequence, in a real emergency they may need to be carried out in a different order or performed simultaneously (especially when multiple providers are available).**

The steps of assessment and the procedure graphics are intended as decision-making guidance and not an inflexible sequence of steps that must be strictly adhered to.

part two

# EUMO PROGRAM DESCRIPTION

## Class Goal

The purpose of the face-to-face portion of this training program is for participants to gain or improve the skills and confidence necessary to give medical oxygen in an emergency to a person with oxygen deficiency and during resuscitation.

## Terminal Learning Objectives

These objectives identify what participants will be able to do upon successful completion of the face-to-face portion of this blended learning class. These objectives are:

- Correctly demonstrate how to use a pulse oximeter to assess for hypoxia and to monitor oxygen saturation.
- Correctly demonstrate how to give medical oxygen in an emergency to an adult using a simple face mask.
- Correctly demonstrate how to give medical oxygen in an emergency to an adult using a non-rebreather mask.
- Correctly demonstrate how to give medical oxygen in an emergency to an adult/child using a CPR mask.
- Correctly demonstrate how to give medical oxygen in an emergency to an adult/child and infant using a bag-mask device (BLS providers only).

## Class Audience

The intended audience for EUMO is adult first aid and adult and child CPR AED providers and basic life support (BLS) trained healthcare providers, professional rescuers, or public safety providers working a wide variety of occupational settings who desire or are required to be certified in the emergency use of medical oxygen. EUMO BLS certification may only be issued to currently certified BLS providers.

## Class Instructor

**Adult First Aid | CPR AED.** At a minimum, this class may only be taught by a level 1 or level 2 HSI Instructor currently authorized to teach Adult First Aid | CPR AED. A level 1 HSI Instructor is not authorized to teach BLS skills or to issue EUMO certification to BLS providers.

**Basic Life Support.** Instructors who use this program to teach bag-mask ventilation with medical oxygen to healthcare providers, professional rescuers, or public safety providers must, at a minimum, be a currently authorized HSI BLS instructor.

## 6:1 Student-to-Instructor Ratio (SIR)

The recommended Student-to-Instructor ratio (SIR) is 6 students to 1 instructor (6:1). The maximum SIR is 12 students to 1 instructor (12:1). In a Performance Evaluation, the maximum SIR is 2 students to 1 instructor (2:1).

## 1:1 Student-to-Manikin Ratio (SMR)

For optimal practice, the recommended Student-to-Manikin ratio (SMR) is 1 student to 1 manikin (1:1). The maximum SMR is no more than 3 students to 1 manikin (3:1).

## Class Design

This EUMO program is founded in basic principles of instructional design and learning theory. It has been constructed to provide instructors with the necessary flexibility, format, tools, activities, and materials to teach students with varying first aid/CPR AED and BLS knowledge, skills, and experience.

## Class Flexibility

HSI programs are designed to be flexible. Flexibility is "characterized by a ready capability to adapt to new, different, or changing requirements."[16] In the case of EUMO, and whenever possible, adjust the class to reflect the student's occupation. This also includes adjusting the class as necessary to be consistent with local medical protocol.

## Class Format

There are three formats by which students can gain or maintain certification in EUMO using this class.

***Initial Training:*** A traditional or virtual blended learning class for individuals who have never been certified or whose certification has expired.

***Renewal Training.*** A traditional or virtual classroom for individuals who wish to refresh skill competency and maintain certification.

***Challenge.*** A traditional or virtual class for individuals who wish to earn certification by demonstrating both knowledge and skill competency without taking an initial blended learning training class.

16 "Flexible." Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/flexible. Accessed 13 Jan. 2021.

performance evaluation one

# FIRST AID/CPR AED PROVIDER

Student Name: Class Date:

You are a first aid/CPR AED provider who has responded to [_a request for help over your two-way radio_] for a person who passed out [_on the manufacturing plant floor_]. The scene is safe. You have taken standard precautions. Your facility's EAP has been activated and EMS is on the way. The person is gasping and making snorting sounds. You have a first aid kit and a CPR mask with a disposable one-way valve and oxygen inlet. Another provider is a few minutes away, responding with an AED. You have sent an untrained coworker to get the nearby medical oxygen delivery system. Demonstrate what actions you would take next.

| Procedure | Provider Action (Performance Criteria) | Instructor Prompt | Check Off |
|---|---|---|---|
| **Performs Compressions** | ▸ Positions the person on a firm, flat surface.<br>▸ Moves any bulky clothing covering the chest out of the way.<br>▸ Positions 2 hands on the lower half of the breastbone.<br>▸ Performs 30 high-quality chest compressions. Counts out loud. | ***[The student needs to complete 30 compressions before the medical oxygen delivery system arrives.]*** | ☐ |
| **Sets Up Medical Oxygen Delivery System** | ▸ Places the system in a safe position, close to the person, near their head.<br>▸ Positions self at the person's side.<br>▸ Opens the valve to pressurize the regulator.<br>▸ Attaches the supply tubing to the regulator and to the oxygen inlet port of the CPR mask if it is not preconnected. | ***[The student or instructor playing the role of an untrained coworker arrives with the emergency oxygen system.]***<br>***"Here's the oxygen."*** | ☐ |
| **Sets Flow Rate Confirms Oxygen Flow** | ▸ Sets the flow rate to the highest rate available.<br>▸ Confirms oxygen is flowing by listening for a hissing sound and using a hand to feel for oxygen flow through the CPR mask. | | ☐ |
| **Gives Rescue Breaths** | ▸ Tilts the head and lifts the chin to open the airway.<br>▸ Lifts the person's face up into the mask to create an airtight seal.<br>▸ Gives two rescue breaths by blowing through the valve opening.<br>▸ Gives enough air to create a visible rise of the chest, but no more. | | ☐ |
| **Continues High-Quality CPR** | ▸ Immediately resumes CPR with chest compressions.<br>▸ Tries to minimize interruptions to compressions to less than 10 seconds. | | ☐ |
| **END PERFORMANCE EVALUATION** | | | |

☐ Successfully Completed. ☐ Not Successfully Completed. Remediation Required.

Signature of HSI Authorized Instructor HSI Instructor Registry Number:

# CLASS PREPARATION

## About a Month or Two Before Class

- ✓ Secure a classroom with an adequate space and learning environment.
- ✓ Confirm the date, location, and number of students.
- ✓ Reserve training equipment for the class type to be taught.
- ✓ Schedule and confirm additional HSI Authorized Instructors as required/preferred.
- ✓ Order from HSI the EUMO certification cards, skill guides, and other training materials as necessary.

## About Three Weeks Before Class

- ✓ Send a pre-class letter or email to each student that:
  - › Reminds students to complete the online portion of the EUMO course prior to the classroom session.
  - › Confirms the class location, agenda, and time.
  - › Encourages them to check with their employer or accrediting, credentialing, or licensing agency to ensure the class will meet their requirements before attending training.
  - › Informs them that the class will involve close contact with other students, resuscitation manikins, and other equipment.
  - › Reviews any pertinent recommendations from local, state, or federal health authorities that affects what participants should expect in the classroom setting.
  - › Requests that they reschedule their training if they may have been exposed to an infectious disease; are experiencing fever, coughing, shortness of breath, diarrhea, fatigue, or muscle aches; or if they have open wounds or sores on their hands or mouth.
  - › Describes the steps you take to protect students and help ensure a safe and healthy learning environment (hand hygiene, cleaning and disinfecting of surfaces and equipment, physical distancing, etc.).
  - › Reminds them to wear loose, comfortable clothing suitable for skill practice.
  - › Advises them to let you know if they have a disability and what reasonable accommodations may be necessary (see Americans with Disabilities Act in the TCAM for more information).
  - › Provides your contact information.

## A Few Days Before Class

- ✓ Verify each student has successfully completed the online portion of the class scheduled through Otis.
- ✓ If you may have been exposed to an infectious disease; are experiencing fever, coughing, shortness of breath, diarrhea, fatigue, or muscle aches; or have open wounds or sores on your hands or mouth, find another instructor to teach the class or reschedule it.
- ✓ Make sure you have adequate copies of essential class paperwork (or access to electronic versions).
- ✓ Briefly review the Lesson Plans for the class type to be taught.
- ✓ Confirm your internet connection will be available to log in to Otis if you plan to stream the Class Presentation(s) or download it to the HSI Instructor Desktop Video Player or Mobile App and verify the media plays as expected.

## Day of Class

- ✓ Arrive early. Give yourself plenty of time to get set up and organized.
- ✓ Greet students as they arrive, introducing yourself to each one.
  - › Be friendly, considerate, respectful, and professional.
  - › Have students sign in on a sign-in sheet or the Class Roster.
  - › Have students complete a name tag or tent card and select a seat.
- ✓ Begin class. Start on time.
- ✓ Consider using a short, appropriate icebreaker as a warm-up exercise.
  - › Great ideas for these activities can be found on the internet by searching with the keyword “icebreakers.”
- ✓ Establish a connection with the students.
  - › Ask about previous training. Connect the students’ experiences and knowledge to this class.
- ✓ Briefly cover class goals, agenda, breaks, certification requirements, and facility and classroom safety.
  - › Know and share the locations of the following: bathrooms, fire/emergency exits, fire alarm pull stations, best emergency evacuation route, first aid kits, emergency oxygen, and closest AED.
- ✓ Distribute the HSI EUMO Skill Guide.

segment two

# EMERGENCY USE OF MEDICAL OXYGEN SKILLS

lesson two

## ASSESSING FOR OXYGEN DEFICIENCY IN AN EMERGENCY

### PREPARE

**Duration**
**8 minutes**

**Class Format:** Blended Learning
**Delivery Method:** Traditional or Virtual Classroom, Face-to-Face Portion

### PRESENT

#### Begin the Lesson

#### What Students Should Learn

After completing this lesson, students should be able to:

- Recall how to assess for oxygen deficiency in an emergency.
- Correctly demonstrate how to use a pulse oximeter to assess for hypoxia.

#### Why This Topic Matters

Recalling how to assess for oxygen deficiency in an emergency and correctly demonstrate how to use a pulse oximeter to assess for hypoxia are essential skills in establishing the need to provide medical oxygen in an emergency.

#### Instructional Notes

1. It may be helpful to have students take a minute or two on their own to look over the **Procedure for Adult First Aid/CPR AED** and the **Hypoxia Signs and Symptoms** table in the Skill Book.
2. Whenever possible, this skill practice should be conducted with one student playing the role of a responsive, breathing adult. Another student should play the role of provider. The student playing the role of responsive, breathing adult should sit or lie still and breathe normally.
3. This required skill practice has two intended outcomes.
   a. The first intended outcome is to have students recall the procedure for the approach to a responsive breathing person.
   b. The second intended outcome is for students to correctly demonstrate how to use a pulse oximeter to assess for hypoxia.

## PRACTICE & ASSESS

### Conduct a Hands-On Student Practice

- Explain the hands-on practice method you are using.
- Run a Video-Guided Practice or practice with **Skill Sheet 1: Assessing for Oxygen Deficiency in an Emergency** or **Scenario Sheet 1**.

### Assess Students

- Look for correct skill performance by students.
- Use positive coaching and gentle correction to improve student skills.
- Ensure adequate practice time for students to gain skill proficiency.

## WRAP UP

### Encourage Constructive Feedback as Needed

Instructors and students provide specific and constructive feedback to each other and to their peers.

### Reinforce Key Points as Needed

1. If a responsive person is breathing, obtain consent. Rapidly assess them for life-threatening conditions. If any life-threatening conditions are present, including signs and symptoms of hypoxia, immediately provide appropriate care.
2. Switch on the pulse oximeter and place it on the person's middle or index finger.
   a. Remove any fingernail polish. If you cannot, place the device on the person's earlobe.
   b. Have the person stay still and not move the pulse oximeter.
   c. Wait a few seconds until the reading stops changing and displays one steady number.
3. If the responsive person does not have signs and symptoms of hypoxia and the SpO2 is 95% or higher, there is no need to give them medical oxygen.
4. A pulse oximeter should be considered a secondary tool to assess a person for oxygen deficiency. Observation of the person's signs and symptoms is the primary tool.
   a. Multiple factors can affect the accuracy of a pulse oximeter reading, such as poor circulation, skin pigmentation, skin thickness, skin temperature, current tobacco use, and use of fingernail polish.

### Ask a Review Question as Needed

The primary tool used to assess for oxygen deficiency in an emergency is:

a. FAST
b. Pulse oximetry
**c. Observation of signs and symptoms**
d. The presence or absence of chronic medical conditions

### Ask For & Answer Questions Before Moving to the Next Lesson

### Share a Brief Safety & Health Tip

Never withhold medical oxygen in an emergency when a person has signs and symptoms of hypoxia, with or without a pulse oximeter.

lesson seven

# UNRESPONSIVE, PULSE FELT. NOT BREATHING ADULT/CHILD. SEVERE HYPOXIA. TWO BLS PROVIDERS

**SKIP THIS LESSON IF STUDENTS ARE NOT HEALTHCARE PROVIDERS, PROFESSIONAL RESCUERS, OR PUBLIC SAFETY PROVIDERS CURRENTLY CERTIFIED IN BASIC LIFE SUPPORT.**

## PREPARE

**Duration**
**19 minutes**

**Class Format:** Blended Learning
**Delivery Method:** Traditional or Virtual Classroom, Face-to-Face Portion

## PRESENT

### Begin the Lesson

### What Students Should Learn (BLS Providers Only)

After completing this lesson, students should be able to:

- Correctly demonstrate how to give medical oxygen in an emergency to an adult/child using a bag-mask device (and HEPA filter if available).

### Why This Topic Matters

When two BLS providers and appropriate equipment are available, each BLS provider takes a role to deliver effective bag-mask ventilations using medical oxygen during resuscitation.

### Instructional Notes

1. This practice requires two students (or the instructor playing the role of a second student) to be physically present in the same classroom.
2. The first goal of the skill practice for this lesson is to help students integrate the use of medical oxygen into a respiratory arrest scenario using a bag-mask device.
3. The second goal of this practice is to prepare students for successful completion of required Performance Evaluation 2: BLS Provider.
4. You may conduct this required Performance Evaluation (for BLS providers only) at the end of this lesson, or at the end of the class.
5. Explain both goals above to the students so they understand what is expected of them and encourage them to practice accordingly.
6. It may be helpful to have students take a minute or two on their own to look over the Procedure for Adult BLS in the Skill Book.
7. Each group of two or three students will need an adult bag-mask and medical oxygen delivery system. Other PPE, including HEPA filters, disposable gloves, and safety glasses, are recommended but may be verbalized.
8. Remind students to wash their hands and use a non-flammable wipe to disinfect the manikin, pulse oximeter, and oxygen delivery device after each student practices.

## PRACTICE & ASSESS

### Conduct a Hands-On Student Practice

- Explain the hands-on practice method you are using.
- Run a Video-Guided Practice or practice with **Skill Sheet 6: Unresponsive, Pulse Felt. Not Breathing Adult/Child. Severe Hypoxia, Two BLS Providers** or **Scenario Sheet 6**.

### Assess Students

- Look for correct skill performance by students.
- Use positive coaching and gentle correction to improve student skills.
- Ensure adequate practice time for students to gain skill proficiency *(especially because bag-mask ventilation is a challenging skill that requires considerable practice for competency)*.

## WRAP UP

### Encourage Constructive Feedback as Needed

Instructors and students provide specific and constructive feedback to each other and to their peers.

### Reinforce Key Points as Needed

1. If the patient is unresponsive and the pulse is definitely felt but the patient is not breathing normally, two BLS providers may give medical oxygen to an unresponsive adult or child using a bag-mask device with an attached HEPA filter, when available.
2. Two BLS providers working together can provide more effective and efficient adult/child bag-mask ventilation during resuscitation than a single provider can.
3. There are several key points regarding adult/child bag-mask ventilation, with or without medical oxygen:
   a. Always keep the airway open.
   b. Always pull the jaw up into the mask. Pushing the mask down on the face pushes the tongue against the back of the throat. This suffocates, not ventilates, the patient.
   c. Always maintain an effective mask seal.
   d. Always stop ventilating as soon as you see chest rise. Excessive ventilation can force air into the stomach, causing vomiting and airway obstruction.

### Ask a Review Question as Needed

You and another BLS provider have been providing bag-mask ventilation with medical oxygen to a 27-year-old male who accidently overdosed on oxycodone. Giving too many breaths, or breaths that are too large, must be avoided. This is because excessive ventilation:

a. May cause fatal hyperoxia.
b. Can lead to an SpO2 reading of 95% or higher.
**c. Can force air into the stomach, causing vomiting and airway obstruction.**
d. Can decrease pressure in the chest, making chest compressions, when necessary, less effective.

### Ask For & Answer Questions Before Moving to the Next Lesson

### Share a Brief Safety & Health Tip

Do not use grease, oil, or petroleum products to lubricate or clean the oxygen regulator. Oils and grease can cause a spontaneous chain reaction in oxygen equipment, causing it to ignite and burn explosively.

lesson three

# KNOWLEDGE EVALUATION

## PREPARE

**Duration**
**20-30 minutes**

**Class Format:** Challenge
**Delivery Method:** Traditional Classroom or Virtual

## PRESENT

### What Students Should Learn

After completing this lesson, the participant should be able to:

- Demonstrate knowledge competency as indicated by obtaining a passing score of 73% or better on an 18-question EUMO, First Aid/CPR AED Provider Exam, or 72% or better on 20-question EUMO, BLS Provider Exam.

### Why This Topic Matters

An HSI EUMO certification card may not be issued unless the participant demonstrates knowledge competency for the Challenge class type you are offering.

### Instructional Notes

1. Please refer to “Part Three, Evaluation” for instructions on the Written Exams.

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