

Introduction to Bag Valve Mask Ventilation Curriculum



Every effort has been made to trace the ownership of copyrighted material and to make full acknowledgement of its use. If errors or omissions have occurred, they will be corrected in subsequent editions, provided that notification is submitted in writing to the publisher.



© 2020, Realityworks, Inc. All rights reserved.

RealCare® is a registered trademark of Realityworks, Inc.

2709 Mondovi Road
Eau Claire, WI 54701 USA

800.830.1416

+1.715.830.2040

www.realityworks.com

(1057900-01)

Table of Contents

Curriculum Structure..... 4

Lesson Structure..... 5

Lesson One – Introduction to Bag Valve Mask Ventilation 6

 FOCUS: Anatomy and Empathy..... 7

 LEARN: Bag Valve Mask Slide Presentation..... 12

 REVIEW: Bag Valve Mask Activity 13

Sources 18

Introduction to Bag Valve Mask Ventilation Curriculum

This curriculum and accompanying products will help participants learn and practice the skill of facilitating bag valve mask ventilation.

Curriculum Structure

The Bag Valve Mask curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	FOCUS – Anatomy and Empathy	20 minutes
One	LEARN – Bag Valve Mask Slide Presentation	20 minutes
One	REVIEW – Bag Valve Mask Activity	20 minutes
	Total	1 hour

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table, which lists the lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Sections

The actual lesson follows the overview, which will contain some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a review of previous lesson information, or a demonstration. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Introduction to Bag Valve Mask Ventilation

Lesson Overview

In this lesson, participants will be introduced to and practice bag valve mask ventilation.

Lesson Objectives

After completing this lesson, participants will be able to:

- Explain the purpose of a bag valve mask
- Identify the parts of a bag valve mask
- Demonstrate the correct use of a bag valve mask
- Describe how to troubleshoot common bag valve mask problems

Lesson at a

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Anatomy Pre-Quiz</i> • <i>Anatomy Pre-Quiz – Answer Key</i> • <i>Empathy Activity</i> • <i>Empathy Activity – Answer Key</i>	1. Print/photocopy <i>Anatomy Pre-Quiz</i> and <i>Empathy Activity</i> (one per participant)	20 minutes
LEARN	• <i>Introduction to Bag Valve Mask Ventilation</i> slide presentation	1. Prepare <i>Introduction to Bag Valve Mask Ventilation</i> slide presentation for viewing	20 minutes
REVIEW	• <i>Bag Valve Mask Check-Off instructor resource</i> • <i>Bag Valve Mask Check-Off</i> • <i>Bag Valve Mask Quiz</i> • <i>Bag Valve Mask Quiz – Answer Key</i> • Bag Valve Mask Ventilation Trainer • Bag Valve Mask • PPE • Rigid suction catheter • Suction device • Oropharyngeal airway	1. Print/photocopy <i>Bag Valve Mask Check-Off</i> and <i>Bag Valve Mask Quiz</i> (one per participant) 2. Get the supplies ready for the lesson 3. Set up <i>Bag Valve Mask</i> simulator	30 minutes

Lesson One – Introduction to Bag Valve Mask Ventilation

FOCUS: Anatomy and Empathy

20 minutes

Purpose:

Participants will learn common anatomical terms of the respiratory system, along with therapeutic communication techniques.

Materials:

- *Anatomy Pre-Quiz*
- *Anatomy Pre-Quiz – Answer Key*
- *Empathy Activity*
- *Empathy Activity – Answer Key*

Facilitation Steps:

1. Distribute the *Anatomy Pre-Quiz* before or at the start of the class.
2. Have the *Anatomy Pre-Quiz – Answer Key* available for instructor reference.
3. Have participants complete the Pre-Quiz.
4. After completion, participants may pair up and compare answers, or the instructor may review the answers.
5. Distribute the *Empathy Activity* and have the answer key available for instructor reference.
6. Have participants complete the *Empathy Activity*.
7. After completion, participants may pair up and compare answers, or the instructor may review the answers.

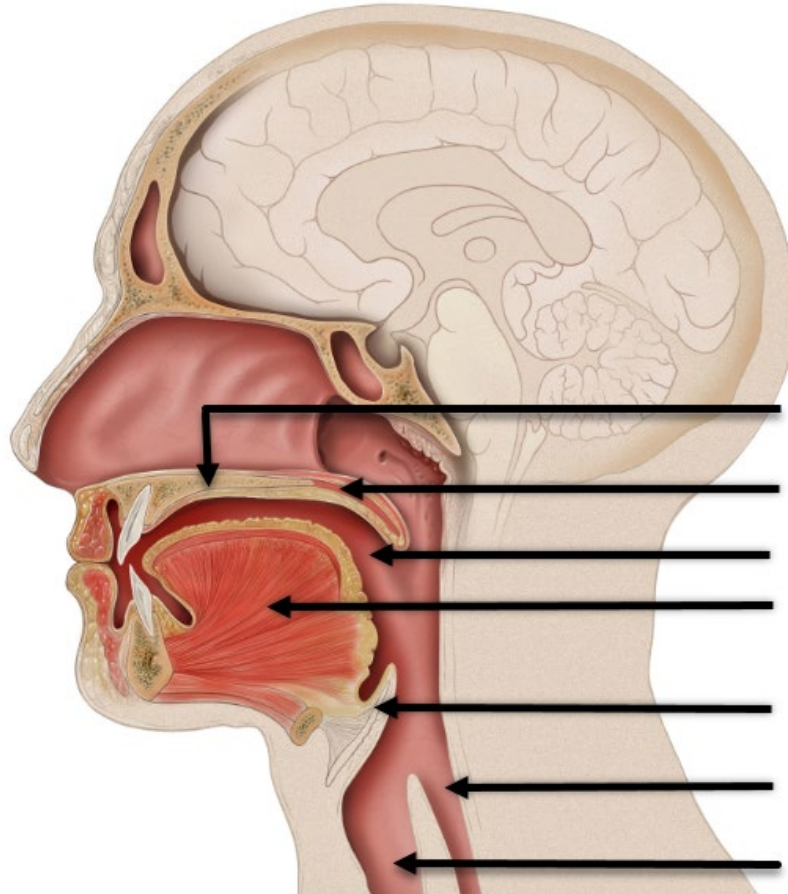
Name: _____ Class: _____

Anatomy Pre-Quiz

Label the diagram below with the correct anatomical term.

Terms:

- Tongue
- Hard Palate
- Epiglottis
- Soft Palate
- Trachea
- Oral Cavity
- Esophagus



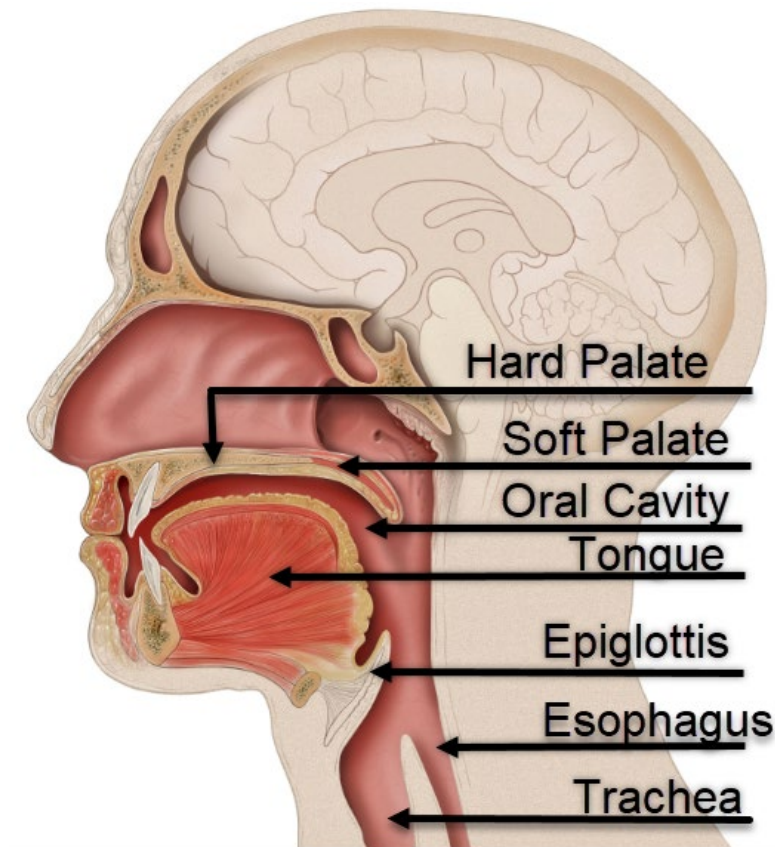
Modified from Patrick J. Lynch, medical illustrator / CC BY (<https://creativecommons.org/licenses/by/2.5>)
https://commons.wikimedia.org/wiki/File:Head_lateral_mouth_anatomy.jpg

Anatomy Pre-Quiz – Answer Key

Label the diagram below with the correct anatomical term.

Terms:

- Tongue
- Hard Palate
- Epiglottis
- Soft Palate
- Trachea
- Oral Cavity
- Esophagus



Modified from Patrick J. Lynch, medical illustrator / CC BY (<https://creativecommons.org/licenses/by/2.5>)
https://commons.wikimedia.org/wiki/File:Head_lateral_mouth_anatomy.jpg

Name: _____ Class: _____

Empathy Activity

You are an EMT and arrive on the scene of a motor vehicle accident. The passenger, a young female, has minor injuries. The driver, a male, is severely injured and unresponsive. You begin resuscitation efforts using a bag valve mask with two-person CPR. The young female is crying and asking questions.

Below is a list of her questions. In the columns to the right, write your response, and reflect on whether the response displays empathy. Empathy is an attempt to listen to, understand, and validate another person's feelings.

Passenger Questions	Your response	Is it empathic?
"What are you doing?"		
"Is he going to live?"		
"Can I help?"		

*Responses will differ.

Empathy Activity – Answer Key

You are an EMT and arrive on the scene of a motor vehicle accident. The passenger, a young female, has minor injuries. The driver, a male, is severely injured and unresponsive. You begin resuscitation efforts using a bag valve mask with two-person CPR. The young female is crying and asking questions.

Below is a list of her questions. In the columns to the right, write your response, and reflect on whether the response displays empathy. Empathy is an attempt to listen to, understand, and validate another person's feelings.

Passenger Questions	Your response	Is empathic?
"What are you doing?"	Responses will differ. May have participants share how they responded and discuss which one displays the most empathy.	Although there is no script for empathy, the responses may: • Acknowledge their pain • Show gratitude for the concern • Show interest • Be supportive
"Is he going to live?"		
"Can I help?"		

*Responses will differ.

Lesson One – Introduction to Bag Valve Mask Ventilation

LEARN: Bag Valve Mask Slide Presentation

30 minutes

Purpose:

Participants will learn about how chest tubes and drainage systems work, assessing patients with chest tubes, and common complications.

Materials:

- *Introduction to Bag Valve Mask Ventilation* slide presentation

Facilitation Steps:

Share the following information with participants as you show the slide presentation.

Slide 1: Introduction Slide

Slide 2: At the end of this lecture, you should be able to:

- Explain the purposes of bag valve masks
- Identify the parts of a bag valve mask
- Demonstrate the correct use of a bag valve mask
- Describe how to troubleshoot common bag valve mask problems

Slide 3: Total lung capacity is the volume of air after a full-forced inspiration. It consists of tidal volume, which is the volume of air inspired and expired in one breath. In a healthy young adult, the average tidal volume is about 500-750 mL of air. The inspiratory reserve volume and expiratory reserve volume is the extra volume beyond the tidal when a deep breath is taken. Air left in the lungs after expiration is the residual volume. Consider this: what would happen if the air volume forced into the lungs exceeded the vital capacity? *Over-ventilation occurs and air enters the stomach causing vomiting*

Slide 4: Bag Valve Mask (BVM) systems are used in emergencies to provide ventilation to patients with apnea or respiratory failure. It gives the ability to maintain the airway. BVM systems are also used to ventilate prior to and after intubation.

Slide 5: BVMs vary in appearance but have similar parts. The reservoir bag allows the patient to breathe in a higher concentration of oxygen. It should be inflated to over 2/3 full of oxygen at 15 L/min. The pressure release valve is a safety feature that vents

excessive pressure. *Show participants the BVM and point to the parts.*

Slide 6: It is necessary to recognize the need for ventilation immediately. Don personal protective gear and call for assistance. Check for breathing and pulse simultaneously for no more than 10 seconds. If the patient is apneic and/or unresponsive, proceed to ventilate.

Slide 7: Position the patient in a supine position and use the head-tilt, chin-lift method to open the airway. This method is contraindicated if head and neck trauma is suspected. In this situation, use the jaw thrust method to open the airway.

Slide 8: Suction the airway with a rigid suction catheter to remove any secretions or vomit. Insert a properly sized oropharyngeal airway for the patient to maintain the airway.

Slide 9: The correct size mask should cover the nares and mouth without gaps between the mask and face. The mask should not extend over the sides of the face. Assess if there may be difficulties ventilating. Use the mnemonic MOANS, which stands for “Mask seal, Obesity, Age (elderly), No teeth, Stiffness.” Beards can also result in the seal being loose.

Slide 10: Ensure that the mask is sealed correctly on the face and that ventilation is delivered within 30 seconds. A BVM device can be used unattached to oxygen or with BVM attached to a reservoir and oxygen. If oxygen is used, make sure the reservoir is filled with oxygen before use. Provide a high oxygen concentration of at least 85%, or 15 L/minute. The proper rate is at 10-12/minute or 1 ventilation every 5-6 seconds.

Slide 11: Troubleshooting needs to happen immediately if the patient is not being ventilated. Reposition the patient or mask, maintaining the seal. Prevent over-ventilating, hyper-ventilating, or hypo-ventilating by practicing steady breaths with correct volume to prevent gastric insufflation, inadequate oxygenation, and decreased cardiac output.

Slide 12: Closing Slide

Lesson One – Introduction to Bag Valve Mask Ventilation

REVIEW: Bag Valve Mask Activity

30 minutes

Purpose:

Participants will practice BVM ventilation on the simulator and then complete a quiz to assess mastery.

Materials:

- *Bag Valve Mask Check-Off (instructor resource)*
- *Bag Valve Mask Check-Off*
- *Bag Valve Mask Quiz*
- *Bag Valve Mask Quiz – Answer Key*
- Bag Valve Mask
- Bag Valve Mask Ventilation Trainer
- PPE
- Rigid suction catheter
- Suction device
- Oropharyngeal airway

Facilitation Steps:

1. Give participants the *Bag Valve Mask Check-Off (participant resource)*
2. Access the *Bag Valve Mask Check-Off (instructor resource)* page. Following the steps on the check-off page, demonstrate Bag Valve Mask ventilation on the simulator.
3. Answer any questions participants may have about using the BVM.
4. Following the steps on their *Bag Valve Mask Check-Off* participant resource page, have participants practice BVM ventilation on the simulator.
5. Hand out the *Bag Valve Mask Quiz* to participants. Give them a couple of minutes to complete it.
6. Have participants self-check or peer check their answers as you share them from the answer key.

Name: _____ Class: _____

Bag Valve Mask Check-Off

Instructor Resource

PREPARATION:

Supplies:

- Bag Valve Mask Ventilation Trainer
- Bag Valve Mask
- PPE
- Rigid suction catheter
- Suction device
- Oropharyngeal airway

After the demonstration, have participants practice bag valve mask ventilation on the ventilation trainer using the following steps:

Optional: Evaluate the participant's ability to complete bag valve mask ventilation using the following steps. May score via points or satisfactory/unsatisfactory.

1.	Takes or verbalizes appropriate PPE precautions	
2.	Checks responsiveness	
3.	Requests additional EMS assistance	
4.	Checks for breathing and pulse simultaneously for no more than 10 seconds	
<i>Instructor: Inform participant that the patient is unresponsive, apneic with a weak pulse of 58</i>		
5.	Opens airway properly	
<i>Instructor: Inform participant that the mouth is releasing secretions</i>		
6.	Prepares rigid suction catheter	
7.	Uses suction device properly	
8.	Inserts rigid suction catheter into mouth of simulator and suctions mouth	
<i>Instructor: Inform participant that the mouth and oropharynx are clear</i>		
9.	Opens the airway manually using head-tilt chin-lift	
10.	Inserts oropharyngeal airway	
<i>Instructor: Inform participant that no gag reflex is present and the patient accepts the oropharyngeal airway</i>		
11.	Ventilates the patient immediately (first ventilation is delivered within 30 seconds) using a BVM device unattached to oxygen or with BVM attached to reservoir and oxygen	
<i>Instructor: Inform participant that ventilation is being properly performed without difficulty</i>		
12.	Re-checks pulse for no more than 10 seconds	
13.	Attaches the BVM assembly (mask, bag, reservoir) to oxygen provide high oxygen concentration (at least 85%, 15 L/minute)	
14.	Ventilates the patient adequately with proper volume to cause visible chest rise (see simulator settings)	
15.	Ventilates the patient adequately with proper rate at 10-12/minute or 1 ventilation every 5-6 seconds (see simulator settings)	

Bag Valve Mask Check-Off

PART ONE: Practice bag valve mask ventilation on the ventilation trainer using the following steps:

Take or verbalize appropriate PPE precautions
Check responsiveness
Request additional EMS assistance
Check for breathing and pulse simultaneously for no more than 10 seconds
Open airway properly
Prepare rigid suction catheter
Use suction device properly
Insert rigid suction catheter into mouth of simulator and suction mouth
Open the airway manually using head-tilt chin-lift
Insert oropharyngeal airway
Ventilate the patient immediately (first ventilation is delivered within 30 seconds) using a BVM device unattached to oxygen or with BVM attached to reservoir and oxygen
Re-check pulse for no more than 10 seconds
Attach the BVM assembly (mask, bag, reservoir) to oxygen provide high oxygen concentration (at least 85%, 15 L/minute)
Ventilate the patient adequately with proper volume to cause visible chest rise (see simulator settings)
Ventilate the patient adequately with proper rate at 10-12/minute or 1 ventilation every 5-6 seconds (see simulator settings)

Name: _____ Class: _____

Bag Valve Mask Quiz

Select the best answer to the following multiple-choice questions:

1. Which term is used to describe the volume of air inspired and expired in one breath?
 - a. Tidal volume
 - b. Vital capacity
 - c. Total lung capacity
 - d. Residual volume
2. What is the purpose of the reservoir bag?
 - a. Protects the patient from too much pressure
 - b. Allows for delivery of a higher concentration of oxygen
 - c. Ensures accurate volume of oxygen
 - d. Collects excess carbon dioxide
3. Which patient needs to be ventilated?
 - a. An 18-year-old breathing 11 breaths/min
 - b. A 25-year-old who complains he is short of breath
 - c. A 61-year-old taking 7 breaths/min
 - d. A 32-year-old complaining of chest pain
4. What is the proper ventilation rate?
 - a. 10-12/minute or 1 ventilation every 5-6 seconds
 - b. 12-14/minute or 1 ventilation every 6-7 seconds
 - c. 14-16/minute or 1 ventilation every 7-8 seconds
 - d. 16-18/minute or 1 ventilation every 8-9 seconds
5. What happens if the lungs are hyper- or hypo-ventilated?
 - a. Decreased cardiac output
 - b. Inadequate oxygenation
 - c. Gastric insufflation
 - d. All of the above

Bag Valve Mask Quiz – Answer Key

Select the best answer to the following multiple-choice questions:

1. Which term is used to describe the volume of air inspired and expired in one breath?
 - a. **Tidal volume** – *Tidal volume is the volume of air inspired and expired in one breath. Tidal volume is about 500 -750 mL of air.*
 - b. Vital capacity
 - c. Total lung capacity
 - d. Residual volume
2. What is the purpose of the reservoir bag?
 - a. Protects the patient from too much pressure
 - b. **Allows for delivery of a higher concentration of oxygen** – *The reservoir bag allows the patient to breathe in a higher concentration of oxygen. It should be inflated to over 2/3 full of oxygen at 15 L/min.*
 - c. Ensures accurate volume of oxygen
 - d. Collects excess carbon dioxide
3. Which patient needs to be ventilated?
 - a. An 18-year-old breathing 11 breaths/min
 - b. A 25-year-old who complains he is short of breath
 - c. **A 61-year-old taking 7 breaths/min** – *Hypoventilation occurs with breaths less than 8 per min and volume less than 300 mL*
 - d. A 32-year-old complaining of chest pain
4. What is the proper ventilation rate?
 - a. **10-12/minute or 1 ventilation every 5-6 seconds** – *The proper rate is 10-12/minute or 1 ventilation every 5-6 seconds.*
 - b. 12-14/minute or 1 ventilation every 6-7 seconds
 - c. 14-16/minute or 1 ventilation every 7-8 seconds
 - d. 16-18/minute or 1 ventilation every 8-9 seconds
5. What happens if the lungs are hyper- or hypo-ventilated?
 - a. Decreased cardiac output
 - b. Inadequate oxygenation
 - c. Gastric insufflation
 - d. **All of the above** – *Prevent over-ventilating, hyper-ventilating, or hypo-ventilating by practicing steady breaths with correct volume to prevent gastric insufflation, inadequate oxygenation, and decreased cardiac output.*

Sources

1. Bucher JT, Vashisht R, Ladd M, & Cooper, J. (2020). Bag mask ventilation (Bag Valve Mask, BVM). *StatPearls*. <https://www.ncbi.nlm.nih.gov/books/NBK441924/>
2. EMTprep. (2018). NREMT practical exam skill sheets. <https://emtprep.com/extra/nremt-exams/nremt-practical-exam-skill-sheets>
3. National Registry of Emergency Medical Technicians. (2020). BVM ventilation of an apneic adult patient. <https://www.nremt.org/rwd/public/document/psychomotor-exam>
4. Rock, M. (2014). The dos and don'ts of bag-valve mask ventilation. *Journal of Emergency Medical Services*, 8(39). <https://www.jems.com/2014/08/08/dos-and-don-ts-bag-valve-mask-ventilation/>