Resources to Complete CPR Certification

Unit: General Skills

Problem Area: Certifications

Lesson: Resources to Complete CPR Certification

Student Learning Objectives.

Instruction in this lesson should result in students achieving the following objectives:

1. **Review the basic techniques for cardiopulmonary resuscitation (CPR) and any recent updates or revisions.**
2. **Identify the major steps in administering CPR and in removing a foreign body airway obstruction (FBAO).**
3. **Explain the differences in administering CPR and FBAO to infants, children, and adults.**

Resources.

The following resources may be useful in teaching this lesson:

"Cardiopulmonary Resuscitation (CPR): First Aid," *Mayo Clinic.com*. Accessed November 1, 2008. <http://www.mayoclinic.com/health/first-aid-cpr/FA00061>.

"CPR and Emergency Cardiovascular Care," *American Heart Association*. Accessed October 17, 2008. <http://www.americanheart.org/presenter.jhtml?identifier=3011764>.

"CPR-AED," *eLearning*. American Heart Association. Accessed October 17, 2008. <http://onlineaha.org/>.

"First Aid–CPR–AED," *eLearning*. American Heart Association. Accessed October 17, 2008. <http://onlineaha.org/>.

"Heart and Stroke Encyclopedia," *American Heart Association*. Accessed October 17, 2008. <http://www.americanheart.org/presenter.jhtml?identifier=10000056>.

"Learn CPR: You Can Do It!" *University of Washington School of Medicine*. Accessed October 20, 2008. <http://depts.washington.edu/learncpr/>.

Meeker-O'Connell, Ann. "How CPR Works," *HowStuffWorks*. Accessed October 20, 2008. <http://health.howstuffworks.com/cpr.htm>.

"2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care," *Circulation*, Volume 112, Issue 24 Supplement, December 13, 2005. American Heart Association. Accessed October 21, 2008. <http://circ.ahajournals.org/content/vol112/24_suppl/>.

Equipment, Tools, Supplies, and Facilities.

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials
- ✓ Manikin(s) and cleaning supplies
- ✓ Face shields

Key Terms.

The following terms are presented in this lesson (shown in bold italics):

- adult
- airway
- apnea
- automated external defibrillator
- cardiac arrest
- cardiopulmonary resuscitation
- child
- foreign body airway obstruction
- head-tilt/chin-lift maneuver
- healthcare professionals
- Heimlich Maneuver
- infant
- lay rescuers
- respiratory arrest

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situation. A possible approach is included here.

> *Several types of CPR courses are available to meet the training requirements of different jobs and the varying levels of maturity of the trainees. CPR courses range from a few hours to a weekend. This lesson reviews the basics of CPR and identifies resources one may use for certification.*

> *According to the American Heart Association, more than 300,000 cardiac deaths occur in the United States annually. Approximately 166,200 of those happen outside hospital settings. When CPR is effectively administered, a victim's chances of survival are doubled. For every minute of delay in administering CPR (or using an AED), the victim's chances of survival fall approximately 10 percent. CPR is a vital technique that can extend someone's life until first-responder help arrives. Anyone can learn to do it.*

> *To review the students' basic knowledge of CPR, have them take the online quiz at http://depts.washington.edu/learncpr/userquiz.html.*

SUMMARY OF CONTENT AND TEACHING STRATEGIES

Objective 1: Review the basic techniques for cardiopulmonary resuscitation (CPR) and any recent updates or revisions.

Anticipated Problem: What are the basic techniques for administering CPR? What recent revisions or updates have affected the guidelines?

I. ***Cardiopulmonary resuscitation*** (CPR) is a combination of artificial breaths and chest compressions used to treat victims of cardiac arrest and respiratory arrest. It is a first-aid technique to keep victims alive and prevent brain damage while medical help is on the way.

   A. ***Cardiac arrest*** is the lack of an effective heartbeat that quickly causes body-wide circulatory failure. Cardiac arrest is an extreme medical emergency. It takes only minutes for a lack of adequate oxygen to lead to multiple-organ injury. The most common cause is an electrical problem within the heart. Unless cardiac arrest is quickly corrected, it is fatal. Signs and symptoms include:

      1. Loss of consciousness
      2. Rapid, shallow breathing, progressing to ***apnea*** (absence of breathing)

3. Extremely low blood pressure (hypotension), with no pulse felt over major arteries
4. No heart sounds

B. ***Respiratory arrest*** is closely associated with cardiac arrest and occurs when breathing slows or stops from any cause; also called apnea. Prolonged apnea means the person has stopped breathing although the heart is still active. (When prolonged apnea is accompanied by a lack of cardiac activity and a lack of responsiveness, the medical condition is cardiac arrest.) Prolonged apnea is life threatening. Immediately seeking medical attention and calling 911 are essential when a person with any type of apnea has the following symptoms:
   1. Turns blue
   2. Has a seizure
   3. Becomes limp
   4. Remains drowsy
   5. Is unconscious

C. Chest compressions and chest ventilations
   1. Chest compressions consist of putting pressure on a victim's chest and artificially pumping the heart to provide blood supply to the heart, body, and brain. Complete chest compressions involve putting pressure on the chest and then releasing the pressure to allow the chest to return to its normal position.
   2. Chest ventilations are a way of breathing for a victim to ventilate the lungs and supply the victim with oxygen. Complete ventilations consist of creating a seal around the victim's airway and forcing air into the lungs until the chest rises and then releasing the seal and letting the chest fall.
      a. An adult requires only a mouth seal while the nose is pinched off.
      b. Both the mouth and the nose of an infant and often those of a child may be covered by an adult's mouth without difficulty.
   3. ABCs of CPR: airway, breathing, circulation
      a. Step 1: Airway is the first check of a victim. To check the airway, one must kneel and hold an ear to the victim's mouth while looking at the chest and feeling for a breath on a cheek.
      b. Step 2: Breathing is the second check of a victim. It is done by ventilating the victim first to check the airway. If the airway is blocked, the rescuer then breathes (ventilates) again to make sure the tongue was not blocking the back of the throat.
      c. Step 3: Circulation (pulse detection) is the third check of a victim. It is done by applying fingers to the carotid artery (next to the throat and under the jaw bone) of an adult or child or by applying fingers to the inside of the bicep of an infant. Note: Pulse detection is less important for nonprofessional rescuers, as they report a low occurrence of detection.

D. Current guidelines emphasize the need for lay rescuers and out-of-hospital personnel, as well as healthcare professionals and hospital personnel, to focus more energy on chest compressions.

1. Research shows that rescuers of both types did not adequately perform chest compressions.
2. New guidelines require the rescuer to pump on the chest more than before and to allow the chest to rise completely.
3. Earlier guidelines called for 15 compressions for every 2 breaths. New guidelines now require a 30:2 ratio. The new guidelines effectively double the number of compressions and greatly increase the likelihood of rescuers being able to supply enough blood flow for the heart, brain, and body.

Many techniques can be used to help students master this objective. Use the Web sites listed in the "Resources" section for further information and visual aids.

Objective 2: Identify the major steps in administering CPR and in removing a foreign body airway obstruction (FBAO).

Anticipated Problem: What are the steps in administering CPR? What are the steps in removing an FBAO to prevent choking?

II. CPR and choking both have similar steps

A. The 2005 guidelines sought to streamline the process of victim care for lay rescuers and hospital professionals.

B. The CPR sequence is designed to keep blood flowing throughout the body and keep air flowing in and out of the lungs. The rescuer should follow these steps:

1. Step 1: Check for responsiveness by shaking and talking to the victim. When there is no response, another person should call 911 or the rescuer should use the nearest phone without delay.
2. Step 2: Tilt the head, lift the chin, and check breathing. Check the airway by tilting the head back and lifting the chin. This action is called the ***head-tilt/chin-lift maneuver*** in rescue breathing (required for performing mouth-to-mouth and mouth-to-nose resuscitation). The steps include:
   a. Head tilt: Place one hand over the forehead and apply firm, backward pressure to tilt the head back. (Line from chin to jaw angle is perpendicular to the floor.)
   b. Chin lift: Place the fingers of the other hand under the bony part of the lower jaw near the chin to bring the chin forward and the teeth almost to occlusion. This supports the jaw and helps tilt the head back. The fingers must not press into the soft tissue under the chin, or they may create an airway obstruction. Be careful not to hyperextend the neck. Dentures are removed only if necessary.

3. Step 3: Give two breaths. If the chest does not rise, repeat step 2.
    a. If the breaths don't make the chest rise, then the victim may have choked on something, and the airway may be blocked.
    b. Continue to treat the person with CPR (to blow the food down the airway, to ventilate one lung, or to push on the chest to pump the food up the esophagus). If the chest rises, continue to feel for a pulse (some patients may not have a pulse or may have a very weak one). If a victim has a strong pulse, perform rescue breathing (usually one breath every five seconds) until advanced care arrives.
    c. Use face shields to prevent the spread of germs when giving mouth-to-mouth ventilations.
4. Step 4: Position hands in the center of the chest.
5. Step 5: Firmly push down 2 inches on the chest 30 times. Continue with 2 breaths and 30 pumps until medical help arrives.

C. An ***automated external defibrillator*** (AED) is a small machine that attaches to a victim's chest, analyzes the victim, and delivers electric shocks externally to stop the arrhythmia and reestablish an effective heart rhythm. A victim's survival rate declines 10 percent for every minute an AED is not used.

D. Being the victim of a ***foreign body airway obstruction*** (FBAO) is another way of saying choking and occurs when the person is actively or passively choking on something in the airway.
1. The ***airway*** consists of the throat, trachea, and bronchial tubes. The obstruction of any area by food or another object prevents the flow of oxygen and carbon dioxide the body must exchange to maintain consciousness.
2. The universal sign of choking is two hands crossed over the neck.
3. If someone is actively choking (choking but conscious), the ***Heimlich Maneuver*** may be used. It is a safe way to help an active choking victim. If the victim is pregnant, the rescuer's arms should be placed around the victim's chest instead of the abdomen. Bending the knees a little lowers the rescuer's center of gravity, providing more control over the victim if the victim passes out. The rescuer should follow these steps:
    a. Step 1: Stand behind the choking person, and place one leg between those of the victim.
    b. Step 2: Wrap arms around the victim's abdomen, and place one fist just above the victim's navel with the thumb against the abdomen.
    c. Step 3: Cover the fist with the other hand and thrust up and in with sufficient force to lift the victim off his or her feet. The food should be dislodged.
4. If the food is not dislodged, the victim may become limp and passive and lose consciousness. Gently lower the victim to the ground to control body position and to avoid any head or body injuries. Start CPR by first checking the airway.

5. The rescue technique for infant choking consists of back slaps and chest compressions between the nipple lines. While an infant is actively choking, tip the head down, and support the infant with one arm, the hand under the chin.
   a. Use the palm of the hand to deliver five back slaps between the shoulder blades while keeping the infant's head down and neck supported.
   b. Turn the infant over onto the other hand and deliver five chest compressions while maintaining the support under the back of the head and downward.
   c. Continue back slaps and compressions until the infant coughs up the object or becomes passive. If the infant becomes passive, begin CPR.

Many techniques can be used to help students master this objective. Display VM–A. Use VM–B, VM–C, and VM–D to show students the basic sequence of CPR. Use VM–E to show students the way to help an active choking victim and the positioning for the Heimlich Maneuver. Use the Web sites listed in the "Resources" section for further information and visual aids.

Objective 3:

Explain the differences in administering CPR and FBAO to infants, children, and adults.

Anticipated Problem: How is CPR administered to infants, children, and adults? How is choking aid administered to infants, children, and adults?

III. Classifying a victim is an important step in assessing the victim and ensuring effective care.

A. An ***infant*** is a newborn to the age of one. Some one-year-olds may be larger than an average infant and may qualify as toddlers (children). Consideration must be made of both the size and weight of the infant and the size and weight of the rescuer.

B. A ***child*** is aged one year until the onset of puberty. Some children may qualify as adults. Consideration must be made of both the size and weight of the child and the size and weight of the rescuer.

C. An ***adult*** is at the age of puberty or older.

D. CPR for infants, children, and adults
   1. Adult and child CPR is 30:2 compressions to ventilations.
   2. Infant CPR remains 30:2 compressions to ventilations when there is only one rescuer. When two rescuers are available, the ratio is 15:2. When possible deliver more oxygen and compressions for an infant than for an adult or child.

E. The depth of compressions is different for infants, children, and adults.
   1. Adult or child: Compress the chest 2 inches.
   2. Infant: Compress the chest one-third to one-half of its depth.

F. Ventilations during CPR
   1. Adult or child: Ventilations must make the chest rise and fall visibly.
   2. Infant: An infant's lungs need only a puff of air, not a full breath.

G. Miscellaneous CPR and FBAO information
   1. If a victim has a pulse but is not breathing, giving one breath every five seconds is necessary.
   2. Administer one cycle of CPR on an unconscious infant to ensure some oxygen and blood flow before calling 911.
   3. Although an unconscious victim may have some signs of breathing, gasping will not sustain life.
      a. Treat gasping as if the victim is not breathing at all.
      b. Gasping may also sound similar to short bursts of snoring.
   4. ***Lay rescuers*** (non-healthcare professionals who know the steps of CPR and FBAO) are often first responders to an emergency scene. First responders are very important in the chain of survival to "buy time" until advanced care arrives and to assess the victim's situation and call 911 when needed.
   5. ***Healthcare professionals*** (professionals in a hospital workforce) are important but may be in limited numbers and unable be everywhere a victim may need them. Lay rescuers are important to the victim's well-being as first responders to a scene.

Many techniques can be used to help students master this objective. Use VM–F to illustrate the difference between victims (adults, children, and infants). Ask students to classify the people in the photo according to Objective 3 definitions. (The infant is being held in the mother's left arm, the child is on the right side of the mother, and all other persons in the image are adults.) Use the Web sites listed in the "Resources" section for further information and visual aids.

- **Review/Summary.** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the ends of chapters in the textbook may also be used in the review/summary.

- **Application.** Use the included visual masters and lab sheets to apply the information presented in the lesson.

- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

Answers to Sample Test:

Part One: Matching

1. h
2. b
3. e
4. d
5. c
6. f
7. g
8. a

Part Two: Short Answer

1. The ABCs of CPR are airway, breathing, and circulation.
2. The general steps in administering CPR are:
   a. Step 1: Assess the situation, and call 911.
   b. Step 2: Tilt the head, lift the chin, and check breathing (head-tilt/chin-lift maneuver).
   c. Step 3: Give two breaths.
   d. Step 4: Position hands in the center of the chest.
   e. Step 5: Firmly push down 2 inches on the chest 30 times. Continue with 2 breaths and 30 pumps until medical help arrives.

Part Three: Completion

1. airway
2. cardiac arrest
3. Heimlich Maneuver
4. child
5. lay rescuers
6. head-tilt/chin-lift maneuver

Part Four: True/False

1. T
2. T
3. F
4. T
5. F

Sample Test

Name _____

Resources to Complete CPR Certification

Part One: Matching

Instructions: **Match the term with the correct definition.**

a. adult
b. cardiac arrest
c. infant
d. lay rescuers
e. respiratory arrest
f. foreign body airway obstruction (FBAO)
g. automated external defibrillator (AED)
h. cardiopulmonary resuscitation (CPR)

_____1. The best way to provide artificial oxygen and blood flow through a cardiac arrest victim's body until advanced care arrives

_____2. Lack of an effective heartbeat that quickly causes body-wide circulatory failure

_____3. A life threatening condition in which breathing stops

_____4. First responders

_____5. A newborn to the age of one

_____6. The universal sign is the hands crossed over the throat

_____7. A victim's survival rate declines 10 percent for every minute it is not used

_____8. A patient who is at the age of puberty or older

Part Two: Short Answer

Instructions: **Answer the following.**

1. What are the ABCs of CPR?

2. Describe the general steps in administering CPR.

Part Three: Completion

Instructions: **Provide the word or words to complete the following statements.**

1. When giving breaths through the mouth and/or nose of a victim, the _____ must be clear to allow the chest to rise.
2. CPR must be used quickly for _____ victims to supply the body with artificial blood flow and oxygen.
3. If a person is actively choking, many ways can help relieve the victim of the foreign body airway obstruction, but the _____ is preferred.
4. A _____ is aged one year until the onset of puberty.
5. Another name for first responders is _____.
6. The _____ opens the airway, allowing breaths to enter the lungs and making the chest visibly rise.

Part Four: True/False

Instructions: **Write *T* for true or *F* for false.**

_____1. Adult and child CPR is 30:2 compressions to ventilations.

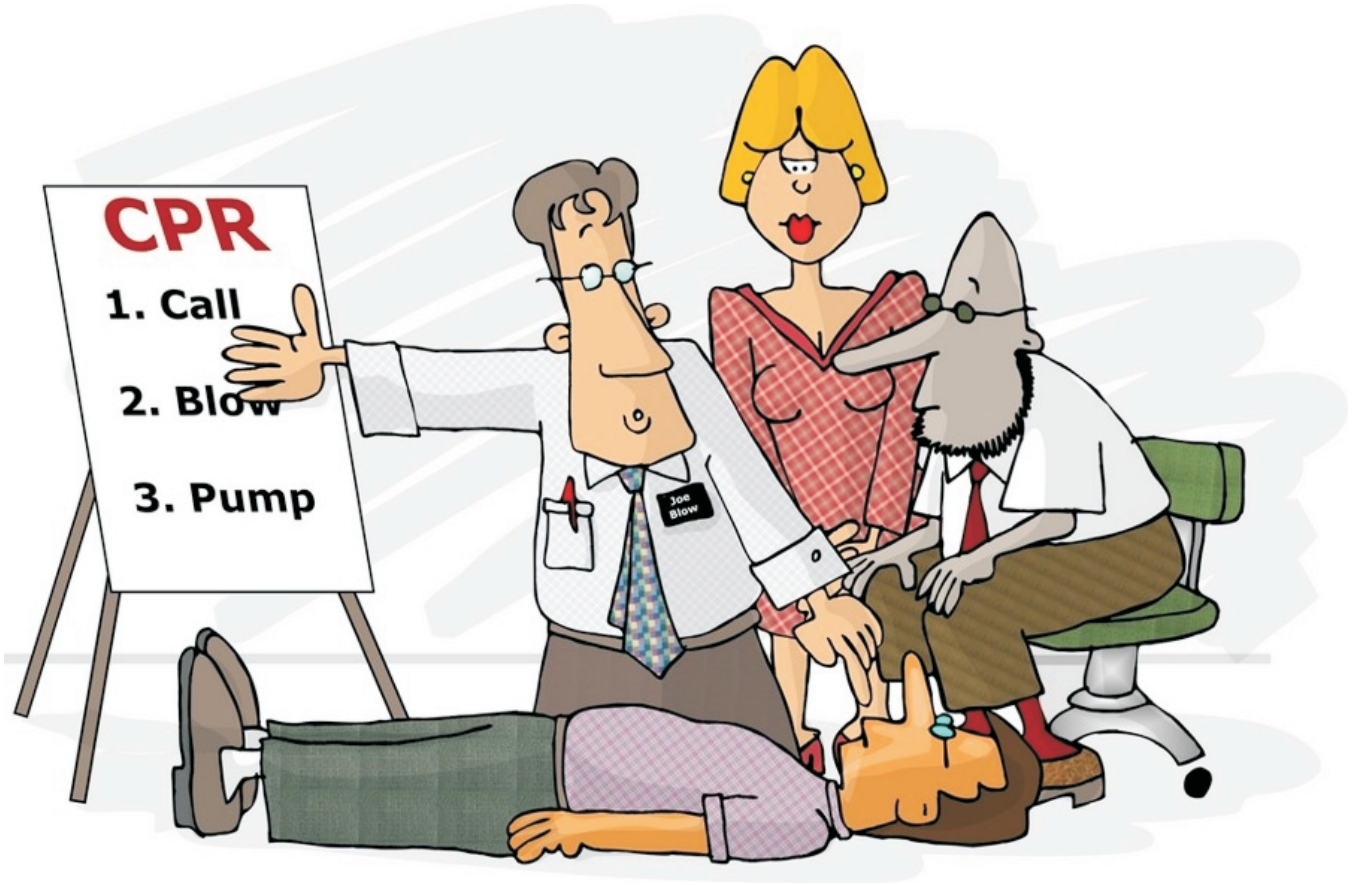
_____2. To assist a choking infant, you should administer five backslaps and five chest compressions until the victim is passive.

_____3. You should call 911 after several cycles of CPR if the victim doesn't revive.

_____4. You should use face shields to prevent the spread of germs when giving mouth-to-mouth ventilations.

_____5. You should not ventilate an unconscious victim gasping for breaths.

BASIC CPR TECHNIQUES



VM–B

CHECKING AN INFANT'S AIRWAY

VM–C

MOUTH-TO-MOUTH BREATHING TECHNIQUE

VM–D

CHEST COMPRESSIONS

VM–E

ACTIVE CHOKING: HEIMLICH MANEUVER

VM–F

POSSIBLE VICTIMS: ADULTS, CHILDREN, AND INFANTS

LS–A

Name _____

What Is the Role of a First Responder?

Purpose

The purpose of this activity is to review how to perform basic CPR lifesaving techniques and how to recognize the signs and symptoms of a victim who needs CPR.

Objectives

1. Watch an instructor demonstrate the proper procedures to administer CPR.
2. Recognize the signs and symptoms of a victim who needs CPR.
3. Identify the steps a first responder would take in an emergency situation.

Materials and Equipment

- lab sheet
- manikins
- face shields
- writing utensil
- scratch paper

Procedure

1. Watch an instructor demonstrate the proper procedures to administer CPR.
2. Review the following emergency situation.
3. Outline the next steps Johnny should take as a first responder, according to what you learned in the CPR lesson. In other words, what would give the older man the best

possible outcome and chance for survival? What symptoms caused you to determine the next steps you outlined?

4. Share your next steps with the class and the instructor.
5. Participate in the class discussion of first-responder skills and how to recognize a victim who needs CPR.
6. Turn in your written outline to your instructor.

Emergency Situation:

As Johnny is walking down the street, he witnesses an older man who is mowing a lawn let go of his mower and, clutching his chest, fall to his knees. Johnny runs across the street to the scene and shakes the man, checking for responsiveness. The older man is unresponsive. Johnny looks up as the man's wife comes outside, yelling the older man's name.

What Is the Role of a First Responder?

1. Divide the class into groups of three, and instruct each group to create a simulation of the emergency situation. (One person portrays the victim, one the spouse, and one the first responder.) A manikin may be used to substitute for the victim.
2. A simulation would enhance the impact of the exercise. Play out the scene with the victim and his wife being played by student volunteers and with each student taking a turn as the first responder to the scene.
3. Remind students: "You are the first responder to the scene." Ask: "What are the steps necessary to ensure the survival of the older man?"
4. Following each simulation exercise, offer constructive criticism to point out anything that may have been missed.

LS–B

Name _____

Active Choking Simulation: FBAO

Purpose

The purpose of this activity is to provide instruction and information on how to perform basic lifesaving skills. Relieving a victim of a foreign body airway obstruction is one of the basic lifesaving techniques that can be used by bystanders for victims who are choking. With this knowledge you will have the ability to save the lives of innocent people.

Objectives

1. Watch an instructor demonstrate the proper procedures to provide adequate relief to a victim choking because of an obstructed airway.
2. Recognize the signs and symptoms of a victim who needs foreign body airway obstruction (FBAO) relief.
3. Identify the steps a first responder would take in an emergency situation.

Materials and Equipment

- lab sheet
- manikins
- face shields
- writing utensil
- scratch paper

Procedure

1. Watch an instructor demonstrate the proper procedures to provide adequate relief to a victim choking because of an obstructed airway.
2. Review the following emergency situation.

3. Outline the next steps Pat should take as a first responder, according to what you learned in the CPR lesson. In other words, what would give Danni the best possible outcome and chance for survival? What symptoms caused you to determine the next steps you outlined? What actions should Pat take as Danni begins to leave the table?
4. Share your next steps with the class and the instructor.
5. Participate in the class discussion of first-responder skills and how to recognize a victim who needs choking relief.
6. Turn in your written outline to your instructor.

Emergency Situation:

Danni is eating at a restaurant, and her friend, Pat, is sitting across the table. Danni takes a bite of steak and begins chewing. Within seconds Danni puts one hand over the top of the other and clutches her throat. Danni then puts her hand up and begins making her way to the restroom after excusing herself, silently.

Active Choking Simulation: FBAO

1. Divide the class into pairs or groups of four, and instruct each pair or group to create a simulation of the emergency situation. (One person is the victim, and one the first responder.) A manikin may be used to substitute for the victim.
2. A simulation would enhance the impact of the exercise. Play out the scene with the victim and the first responder being played by student volunteers and with each student taking a turn as the first responder to the scene.
3. Remind students: "You are the first responder to the scene." Ask: "What are the steps necessary to ensure the survival of Danni?"
4. Following each simulation exercise, offer constructive criticism to point out anything that may have been missed.