

Providing Instruction of CPR/AED to High School Students

House Bill 432 was passed in the Spring of 2014. The requirements of this bill were:

- For grades 9-12, one-half Carnegie unit requirement in physical education or physical activity for graduation, shall include an instructional component on the proper administration of cardiopulmonary resuscitation (CPR) and the use of an automated external defibrillator (AED) as part of the physical education curriculum.
- The curriculum shall incorporate into the instruction the psychomotor skills necessary to perform cardiopulmonary resuscitation and use of an automated external defibrillator. The term “psychomotor skills” means the use of hands-on practicing to support cognitive learning. Cognitive-only training does not qualify as “psychomotor skills.”
- The instruction should include an instructional program developed by the American Heart Association or the American Red Cross. The instructional program should be nationally recognized and be based on the most current national evidence-based Emergency Cardiovascular Care guidelines for cardiopulmonary resuscitation and the use of an automated external defibrillator.
- A licensed teacher shall not be required to be a certified trainer of cardiopulmonary resuscitation, to facilitate, provide or oversee instruction for non-certification of students.
- CPR Certification is not required, but when seeking certification, the training **must** be taught by an authorized CPR/AED instructor.

Senate Bill 2185 provided for an amendment of the law to read:

CPR/AED; require to be taught as instructional component of physical or health education curriculum

- Would clarify that proper administration of cardiopulmonary resuscitation (CPR) and the use of an automated external defibrillator (AED) shall be included as an instructional component of the physical or health education curriculum.

Instructor Notes:

1. The teaching of CPR and AED is included in Unit 9 – Safety and First Aid Unit of the Contemporary Health Curriculum (page 60). It is covered under Competency 2: Discuss and demonstrate procedures for emergency situations. The American Heart Association’s Be the Beat website – <http://bethebeat.heart.org/> is listed as a reference for teaching CPR/AED. At that website, you can find the lesson plans described below, as well as these additional resources:
 - a. Hands-Only CPR handout
 - b. Only 1 in 3 handout

- c. Heart hero, rescued, ambassador and rescuer stickers
 - d. Certificates of completion
2. Go to American Heart Association's website: <http://bethebeat.heart.org/> to find lesson plans and resources. On this site you will find a featured lesson plan and a button that reads *download lesson plan and more lesson plans*. There are five lesson plans in all. Read below to gain an understanding of the plans and what they include.
- a. **Lesson #1 – Be the Beat: It's all About the Beat** highlights the importance of being physically active and the collection and interpretation of data for resting and working heart rates. The lesson plan would be excellent for the physical education classroom. It is tied to national health and mathematics standards.
 - b. **Lesson #2 – Be the Beat: Tell the Story** encourages students to advocate for and educate others about the simple steps to save a life: Call 911, push hard and fast in the center of the chest (Hands-Only CPR) and get an AED. This lesson is tied to health and language arts standards and provides students an opportunity to write with a purpose.
 - c. **Lesson #3 – Be the Beat: Imagining the Future** provides students with the opportunity to imagine a future technology that will help save lives during cardiac emergencies. Health and Technology (STEM) standards are addressed.
 - d. **Lesson #4 – Be the Beat: Plan, Promote, Prepare** highlights ways that students can advocate for a better prepared school community via the discovery of or creation of a Medical Emergency Response Plan. Health standards are addressed.
 - e. **Lesson #5 – Be the Beat: Joining in the Action** encourages students to plan and commit to ways of participating in regular physical activity and to help their families make similar commitments. National physical education/physical activity standards are addressed in this lesson.
3. If the plans listed above do not meet the instructor's needs, The Office of Healthy Schools is providing additional lesson plans that can be used to teach CPR/AED in order to fulfill the requirements of Senate Bill 2185 (Spring 2015). These plans are included on the following pages. Please feel free to use these as time and scheduling will permit.

Lesson #1 – Learn the Facts – Cardiac Arrest and CPR

Objective – Students to identify, assess, and learn to respond to a cardiac arrest emergency situation using cardiopulmonary resuscitation (CPR).

Materials Needed:

- Computer
- Projector
- Screen
- Student handouts (Only 1 in 3)

Lesson Introduction:

Anyone can learn CPR– and everyone should! That is what we will be doing for the next two days! Our lesson objective is that you will be able to identify, assess and respond to an emergency situation using CPR – cardiopulmonary resuscitation. You will also learn about an automated external defibrillator (AED) in class tomorrow.

Ask: Have any you ever used CPR or watched someone else use CPR to save a person’s life?

Lesson Information:

Use the musical video found at <http://handsonlycpr.org/> to create interest in the topic of CPR OR use this YouTube video featuring students on a playground or both – <http://www.YouTube.com/watch?v=GMjXrFig7M4>

Note: At the first website listed, you will find several videos. Use the one(s) that you feel are most appropriate. The Hands-Only CPR MASH-UP video is an interest catcher and might best be used in the introduction of the lessons. Others include: Two Steps for Staying Alive with Hands-Only CPR; Staying Alive with Ken Jeony; and Watch Hands-Only CPR in Action. All of these can be retrieved at the <http://handsonlycpr.org/> site and it is linked into the powerpoint for both lessons.

The second link above is a YouTube Video that shows students at a baseball field and their response to a student having sudden cardiac arrest. It is linked to one slide in the first lesson plan. Make sure that you check the availability of these BEFORE you start the lessons.

Risk Factors for Heart Disease:

Before we begin learning about CPR, let’s spend some time talking about the risk factors for Cardiovascular Disease.

Ask: Can you name a risk factor?

Several factors contribute to an increased risk of developing heart disease. Risk factors **that you cannot change** are as follows:

- **Heredity** – tendencies that appear in family lines
- **Gender** – Men have a higher risk, however, coronary heart disease is the leading cause of death in American men and women.
- **Age** – Over 80% of those who die of heart disease are 65 years or older.

Risk factors that **you can change** include:

- **Tobacco smoking**: Smokers have a two to four times greater chance of developing heart disease than nonsmokers.
- **High blood pressure**: This condition increases the heart's workload.
- **High cholesterol**: Too much cholesterol can cause a buildup in the walls of the arteries.
- **Diabetes**: This condition affects blood cholesterol and triglyceride levels.
- **Overweight and obesity**: Excess body fat, especially around the waist, increases the likelihood of developing heart disease. Being overweight affects blood pressure and cholesterol and places a strain on the heart.

Ask: Now that you know what the risk factors, can you suggest things that we can do to avoid the risk factors that we can change?

Why Should You Learn CPR?

Cardiac arrests are more common than you think, and they can happen to anyone at any time. Sudden cardiac arrest is not the same as a heart attack.

- Sudden cardiac arrest occurs when electrical impulses in the heart become rapid or chaotic, which causes the heart to suddenly stop beating.
- A heart attack occurs when the blood supply to part of the heart muscle is blocked. A heart attack may cause cardiac arrest.

Caring for Cardiac Arrest:

Few victims experiencing sudden cardiac arrest outside of a hospital survive unless a rapid sequence of events takes place. One way of describing the ideal sequence of care that should take place when a cardiac arrest occurs is to think about the links in a chain. Each link is dependent on the others for strength and success. In this way, the links form a **chain of survival**.

The five events (links) that must occur rapidly and in an integrated manner during cardiac arrest are as follows:

1. **Recognition and Action** – Recognizing the early warning signs of cardiac arrest and immediately calling 9-1-1 to activate emergency medical services (EMS).
2. **CPR** – The chest compressions delivered during **cardiopulmonary resuscitation (CPR)** circulate blood to the heart and brain. Effective chest compressions are critical to buying time until a defibrillator and EMS personnel are available.

3. **Defibrillation** – Administering a shock to the heart can restore the heartbeat in some victims. Time is a critical factor. The earlier the shock, the better the chance of success.
4. **Advanced Care** – Paramedics provide advanced cardiac life support to victims of sudden cardiac arrest. This includes providing IV fluids, medications, advanced airway devices, and rapid transportation to the hospital.
5. **Post-Arrest Care** – The hospital can provide life-saving medications, surgical procedures, and advanced medical care to enable the victim of sudden cardiac arrest to survive and recover.

Signs of sudden cardiac arrest:

- Sudden loss of responsiveness/not breathing or breathing abnormally
- No response to tapping on shoulders.
- Does nothing when you ask if he's OK.

If these signs of cardiac arrest are present here are the steps to follow:

1. **Yell for help**
 - Tell someone to call 9-1-1 or your emergency response number and get an AED (if one is available).
 - If you are alone with an adult who has these signs of cardiac arrest, call 9-1-1 and get an AED (if one is available).
2. **Check breathing:**
 - If the person isn't breathing or is only gasping, give **CPR**.
3. **Push hard and push fast**
 - Use an AED as soon as it arrives by turning it on and following the prompt.
4. **Keep pushing** until the person starts to breathe or move or someone with more advanced training takes over.

Who Can You Save with CPR?

The life you save with CPR is most likely to be a loved one.

- Four out of five cardiac arrests happen at home.
- Statistically speaking, if called on to administer CPR in an emergency, the life you save is likely to be someone at home: a child, a parent or a friend.
- African-Americans are almost twice as likely to experience cardiac arrest at home, work or in another public location than Caucasians, and their survival rates are twice as poor as for Caucasians.

Why Take Action?

Failure to act in a cardiac emergency can lead to unnecessary deaths.

“Effective bystander CPR” provided immediately after sudden cardiac arrest can double or triple a victim’s chance of survival, but only 32 percent of cardiac arrest victims get CPR from a bystander.

See a Video, Save a Life – Show the Hands-Only CPR instructional video included below:

You can prepare yourself to act in an emergency by simply viewing the [Hands-Only™ CPR instructional video](#).

- A study published in the March 8 issue of *Circulation: Cardiovascular Quality and Outcomes* showed that people who view a CPR instructional video are significantly more likely to attempt life-saving resuscitation.
- Hands-Only™ CPR (CPR with just chest compressions) has been proven to be as effective as CPR with breaths in treating adult cardiac arrest victims.

Don’t be afraid; your actions can only help. **If you see an unresponsive adult who is not breathing or not breathing normally, call 911 and push hard and fast on the center of the chest.**

Review what was taught today:

Ask:

1. What are risk factors for heart disease?
2. What are things that we can do to avoid risk factors that we can change?
3. What are five events (links) that must occur rapidly in cardiac arrest?
4. What are the signs that a person is in cardiac arrest?
5. What steps do you take to assist a person in cardiac arrest?

Prepare for Next Lesson:

Tomorrow in class, we will practice hands-only CPR skills and learn more about an automated external defibrillator (AED).

Lesson #2 – Practicing CPR Skills/Learning about an AED

Objective: Students will learn how an automated external defibrillator (AED) works. They will practice hands-only CPR skills.

Materials Needed:

- Laptop
- Projector
- Screen
- Student Handouts (Hands-Only CPR)
- CPR dummies
- Automated external defibrillator (AED) or AED demonstration kit

Lesson Introduction:

Begin class by showing the musical video found at <http://handsonlycpr.org/> to create interest in the topic of CPR OR use this YouTube video featuring students on a playground or both – <http://www.YouTube.com/watch?v=GMjXrFig7M4> (See notes accompanying Lesson Plan #1)

Yesterday in class, we learned facts about cardiac arrest and what you can do to assist a victim of cardiac arrest. We also covered risk factors of heart disease and explored ways that we can reduce your risk for having heart disease.

I showed you a short video that demonstrated the hand-only CPR method. Today, you will practice the hands-only CPR technique and you will learn about the automated external defibrillator.

Hands-Only CPR Demonstration

Remember that Hands-Only CPR should be administered as soon as possible to restore breathing and heartbeat. Hands-only CPR is used to deliver blood circulation to a victim who has suffered cardiac arrest. By delivering chest compressions, someone practicing Hands-Only CPR can aid the victim's body in delivering oxygen to the body's organs. If you see a person suddenly collapse and pass out, or if you find a person already unconscious, confirm that the person can't respond. Shout at and shake the person to make sure he or she isn't sleeping.

To perform Hands-only CPR: (teacher will demonstrate these steps)

- 1. Call 9-1-1 or have someone call 9-1-1. If two rescuers are present, one can provide CPR while the other calls 9-1-1 and gets the AED**
- 2. Do chest compressions**
 - a. Position your hands over the center of the person's chest.
 - b. Press down hard at a rate of 100 times per minute.

Each time the chest should be compressed at least two inches and then allowed to rise completely before it is compressed again. Do this continuously without stopping, using your body weight to press straight down.

Don't slow down or stop compressions until emergency services arrives or an automated external defibrillator (AED) is available and ready for use.

Hands-Only CPR Practice:

Allow students to practice Hand-Only CPR. Watch for correct technique and provide encouragement for them to learn through practicing.

Automated External Defibrillator

The automated external defibrillator (AED) is a rescue device that delivers a controlled, precise shock to the heart. An AED can restore the heart's electrical rhythm and heart beat in the event of a cardiac arrest.

AED's are user-friendly devices that untrained bystanders can use to save a life of someone having sudden cardiac arrest. Check the person's breathing and pulse. If breathing and pulse are absent or irregular, prepare to use the AED as soon as possible. If no one knows how long the person has been unconscious, or if an AED is not readily available, do 2 minutes of CPR. Then use the AED (if you have one) to check the person. After you use the AED, or if you don't have an AED, give CPR until emergency medical help arrives or until the person begins to move. Try to limit pauses in CPR. After 2 minutes of CPR, you can use the AED again to check the person's heart rhythm and give another shock, if needed. If a shock is not needed, continue CPR.

Steps in Using an AED:

1. Before using the AED, check for puddles of water near the person who is unconscious. move him or her to a dry area, and stay away from wetness when delivering shocks.
2. Turn on the AED's power. The device will give you step-by-step instructions. You will hear voice prompts and see prompts on a screen.
3. Expose the person's chest. If the person's chest is wet, dry it. AEDs have sticky pads with sensors called electrodes. Apply the pads to the person's chest as pictured on the AED's instructions.
4. Place one pad on the right center of the person's chest above the nipple. Place the other pad slightly below the other nipple and to the left of the ribcage.

Notes to use as needed: The AED has step-by-step instructions and voice prompts that enable an untrained bystander to correctly use the machine. Make sure the sticky pads have good connection with the skin. If the connection is not good, the machine may repeat the phrase "check electrodes".

Remove metal necklaces and underwire bras. The metal may conduct electricity and cause burns. Check the person for implanted medical devices, such as a pacemaker or implantable cardioverter defibrillator. (The outline of these devices is visible under the skin on the chest or abdomen, and the person may be wearing a medical alert bracelet.) Also check for body piercings. Move the defibrillator pads at least 1 inch away for the implanted devices or piercings so the electric current can flow freely between the pads.

5. Check that the wires from the electrodes are connected to the AED. Make sure no one is touching the person, and then press the AED's "analyze" button. Stay clear while the machine checks the person's heart rhythm.
6. If a shock is needed, the AED will let you know when to deliver it. Stand clear of the person and make sure others are clear before you push the AED's "shock" button.
7. Start or resume CPR until emergency medical help arrives or until the person begins to move. Stay with the person until medical help arrives, and report all information you have to the emergency crew.

Discuss with students where the closest AED is located at their school or in the community.

Review what was taught today:

1. What are the steps in administering Hands-Only CPR?
2. What is an automated external defibrillator?
3. What are the steps in using an AED?
4. Where is an AED located on our school campus or in the community?

Closing:

The goal of these CPR/AED lessons is that you are properly trained to provide assistance to a person who is experiencing cardiac arrest. Through these lessons you have learned to identify, assess and respond to an emergency situation using CPR – cardiopulmonary resuscitation. You have also learned about an automated external defibrillator (AED). Are there any questions?