AED

Automated External Defibrillation

American Heart Association ©

FROM BLS FOR HEALTH CARE PROVIDERS

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This presentation is best viewed with the

volume

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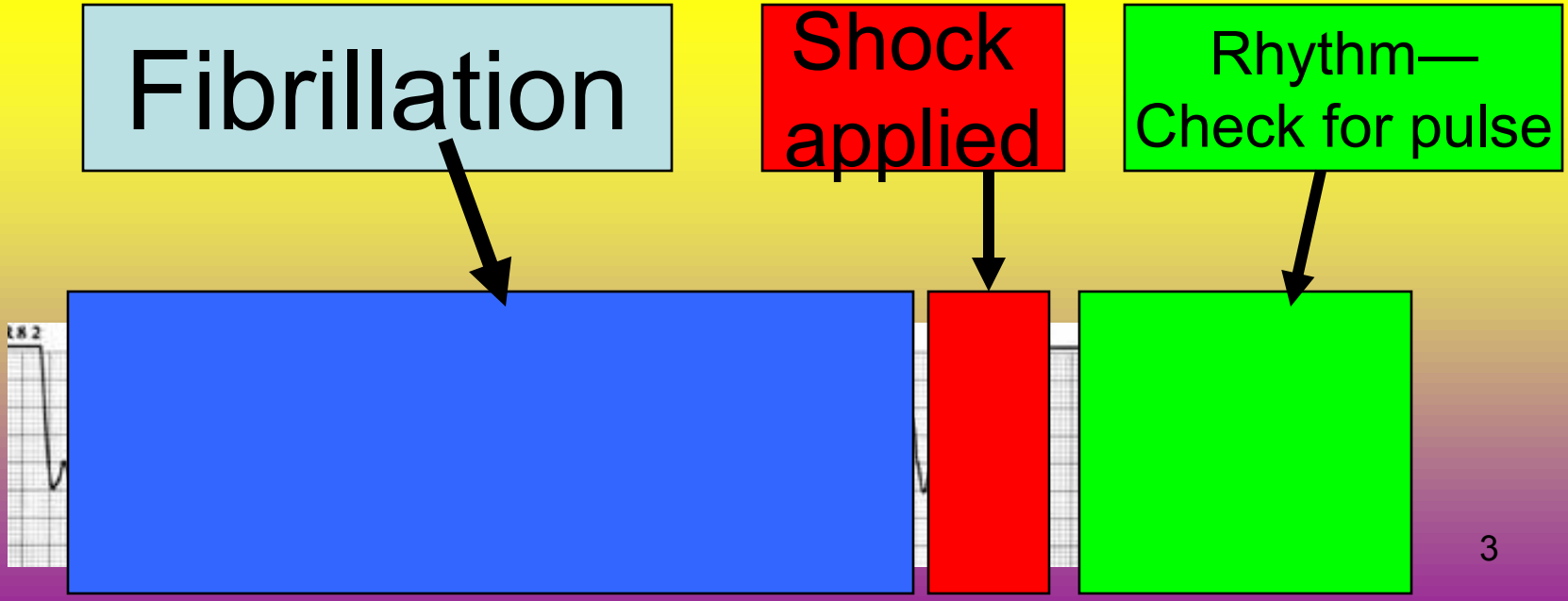
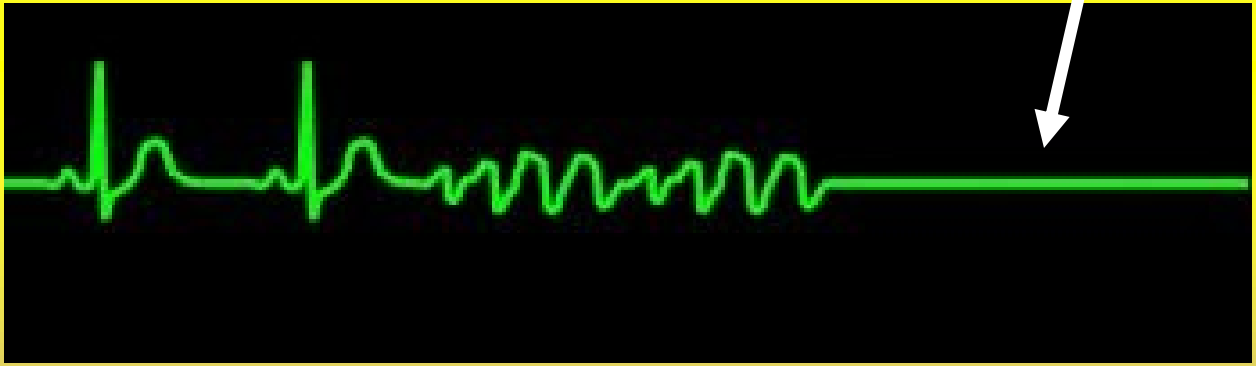
Important terms

1. ***Fibrillation*** is an abnormal, irregular heart rhythm that results in quivering of either the atria or ventricles. The result is inadequate oxygen and blood to the body.



Important terms

- **2. *Asystole*** is cardiac standstill or an absence of any electrical cardiac rhythm. ie. Flat line.

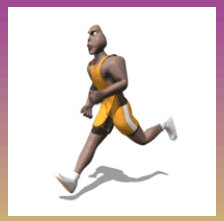


Normal rhythm strip

Important terms

- *3. A **defibrillator*** is an electronic device used to shock the heart and take it out of fibrillation.

The interval from collapse to defibrillation is the most important determinant of survival from cardiac arrest.

Quick  access to the defibrillator is super important.

With every minute the defibrillator is delayed survival declines 7% to 10%.

Early defibrillation is critical.

- 1. Ventricular fibrillation (VF) is the most frequent irregularity in witnessed cardiac arrest.
- 2. The most effective treatment for VF is electrical defibrillation.
- 3. Successful defibrillation declines over time.
- 4. VF can become asystole within minutes.

A rescuer uses and AED when all three of the following occur together:

1. The victim is unresponsive.
2. There is no effective breathing.
3. There are no signs of circulation.

Special situations for the AED.

- 1. The victim is 1 to 7 years of age.
- 2. The victim is near water.
- 3. The victim has an implanted pacemaker.
- 4. The victim has a transdermal patch where the AED should be placed.

Click 1 through 4 to review or skip

The victim is 1 to 7 years of age.

- If the victim is 1 to 7 years of age do CPR for 2 minutes.
- Then, if and AED is available use it.

CAUTION WATER

- 1. Remove the victim from freestanding water before defibrillation.
- 2. A shock delivered to a victim in water could conduct to innocent bystanders or rescuers.

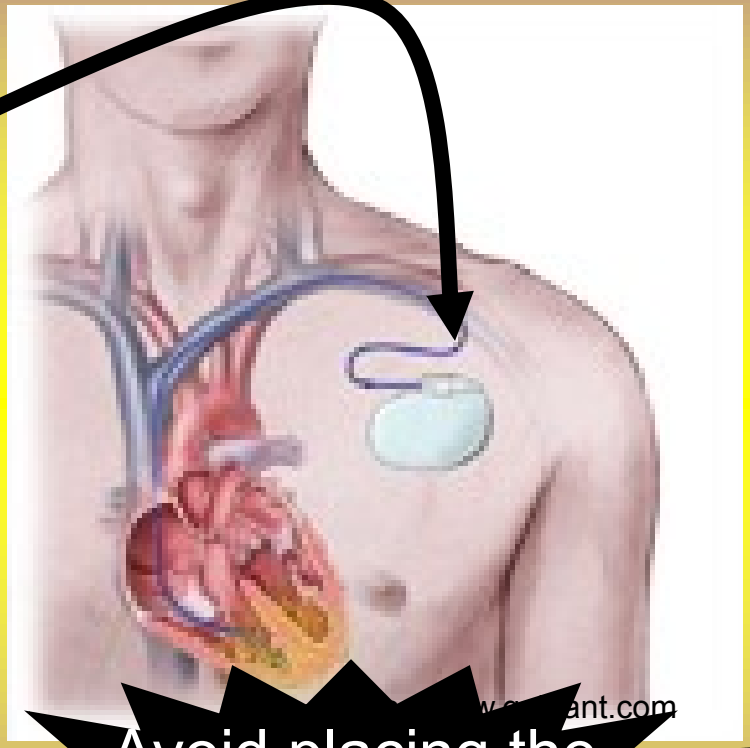
CAUTION WATER

- 3. THE MOST LIKELY EVENT IS WATER ON THE SKIN OF THE VICTIMS CHEST WILL PROVIDE A DIRECT PATH OF ENERGY FROM ONE ELECTRODE TO THE OTHER. THIS WILL CAUSE THE IMPULSE TO BYPASS THE HEART.

- 4. Always dry the chest of sweat or water.

Pacemaker

- 1. The pacemaker can be identified as a hard lump beneath the skin.
- 2. Place the defibrillator 1 inch from the side of the implanted device.
- 3. Then follow the normal steps for the AED.



Avoid placing the patch on top the pacemaker.

Transdermal Patch

- AED electrodes should not be placed on the medication patch.

Common Steps to Operate the AED.

- 1. Power ON the AED.
- 2. Attach electrode pads
- 3. Clear the victim and ANALYZE rhythm
- 4. Clear the victim and press the SHOCK button.

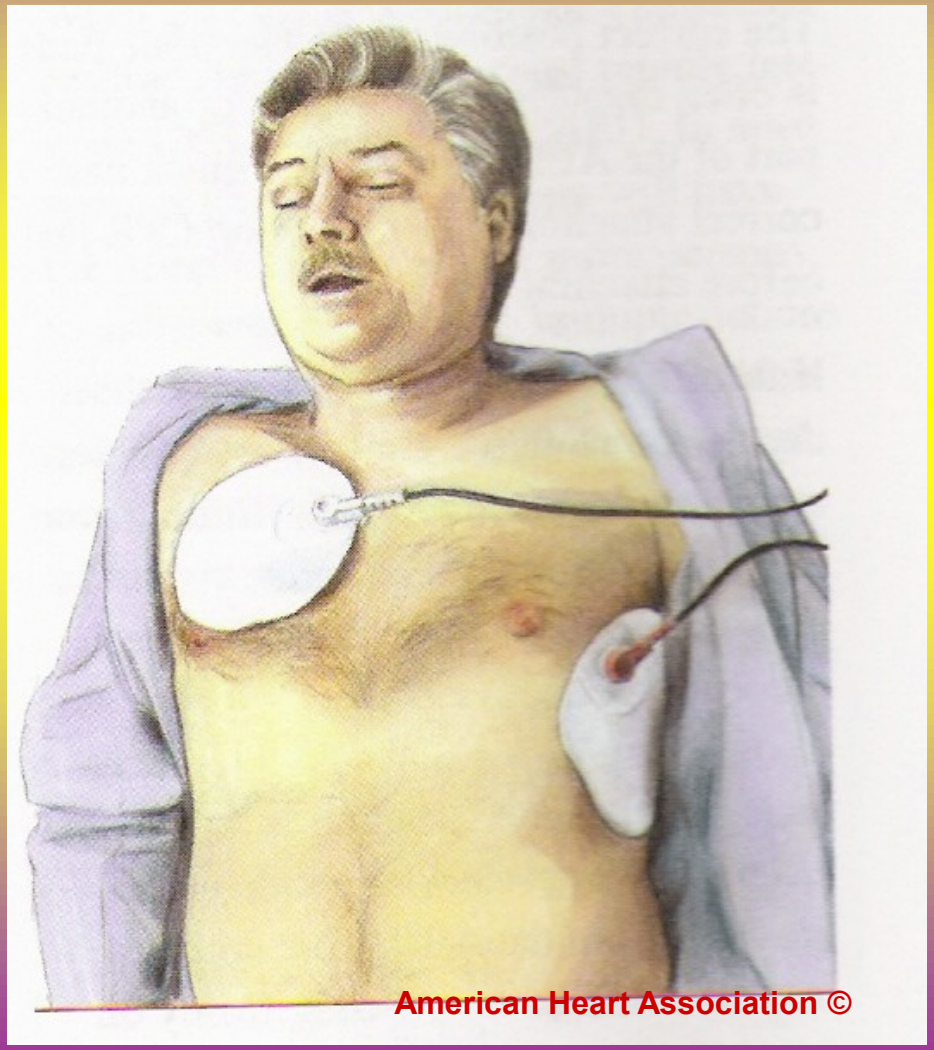
- Click 1 through 4 to review or skip.

Power on the AED.

- If the victim is determined to be in cardiac arrest place the defibrillator on the left side of the victim near his ear.
- Power ON the AED by pressing the power button or lifting the monitor cover up.

Attach Electrode Pads

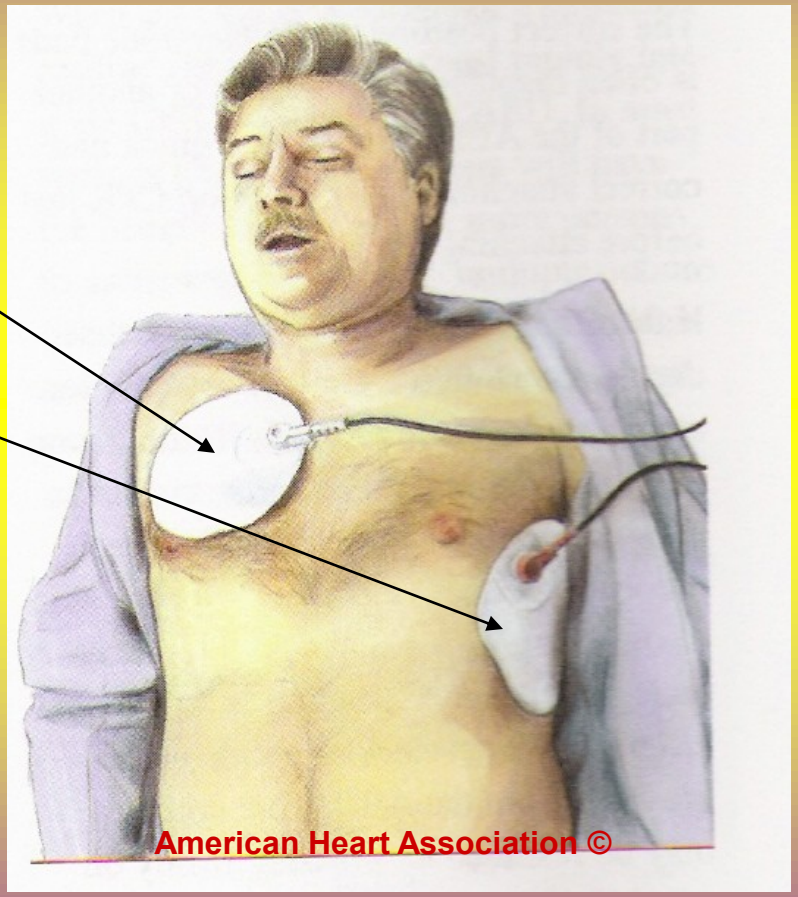
- 1. Attach self-adhesive electrode pads to chest.
- 2. Some models have already connected pads, cables, and AED. If not, you must connect them.



Attach Electrode Pads

- 3. Place one electrode in the upper right sternal border. And the other lateral to the left nipple.

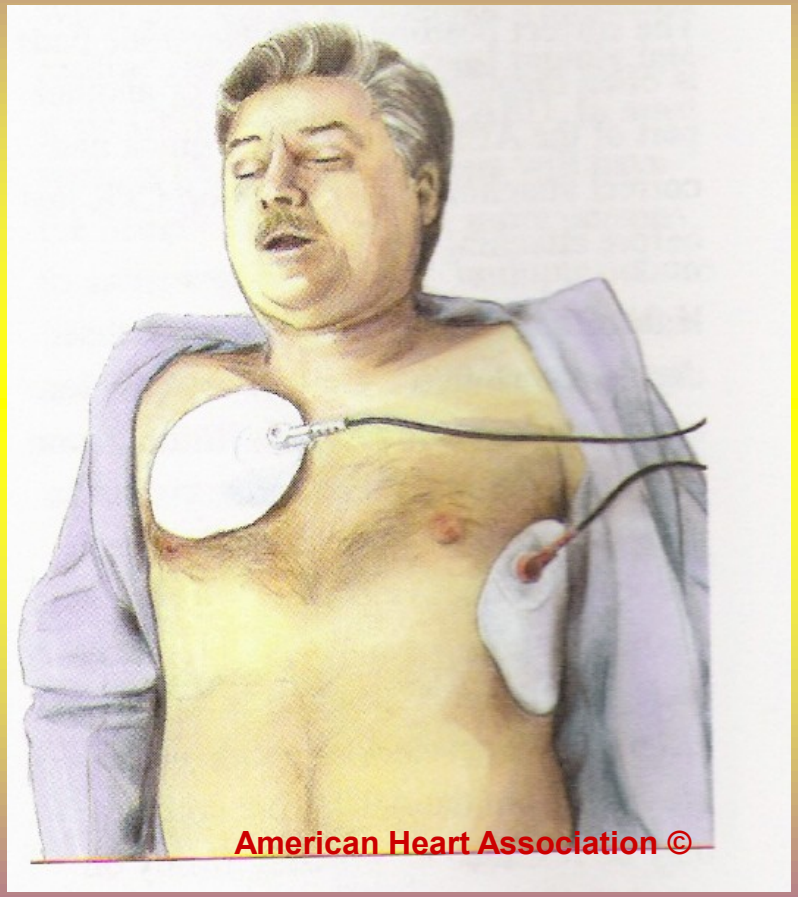
- 4. Continue CPR while attaching pads.



Attach Electrode Pads

- 5. If the victim is sweating, dry him before attaching pads.

- 6. If the victim has a hairy chest, remove the first set of pads and the hair will be removed as well. Replace in the same place with new pads. If still hairy, quickly shave with the razor supplied by the AED kit.



TRUE

Or

FALSE

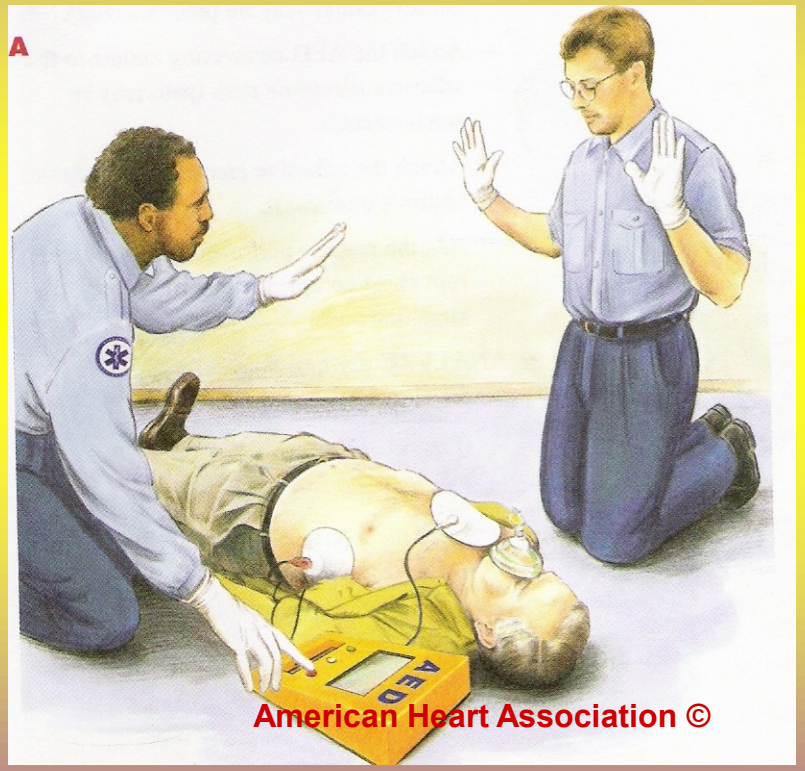
If the rescuer continues to get a “check pads or check electrodes” message it is likely the defibrillator is defective.

The correct answer is FALSE.

It is highly unlikely that the defibrillator is defective. Almost all instances of technical problems are the result of improper use of the AED.

“Clear” the victim and analyze the rhythm.

- 1. No one should be touching the victim while the AED is analyzing.
- 2. Movements affecting the patient during analysis will cause **artifact and false readings**.



“Clear” the victim and analyze the rhythm

- 3. The AED may require you to press “analyze” while others will do it automatically.
- 4. Rhythm assessment takes from 5 to 15 seconds.

“Clear” the victim and analyze the rhythm

- 5. If ventricular fibrillation is present the system will indicate “shock.”

TRUE

Or

FALSE

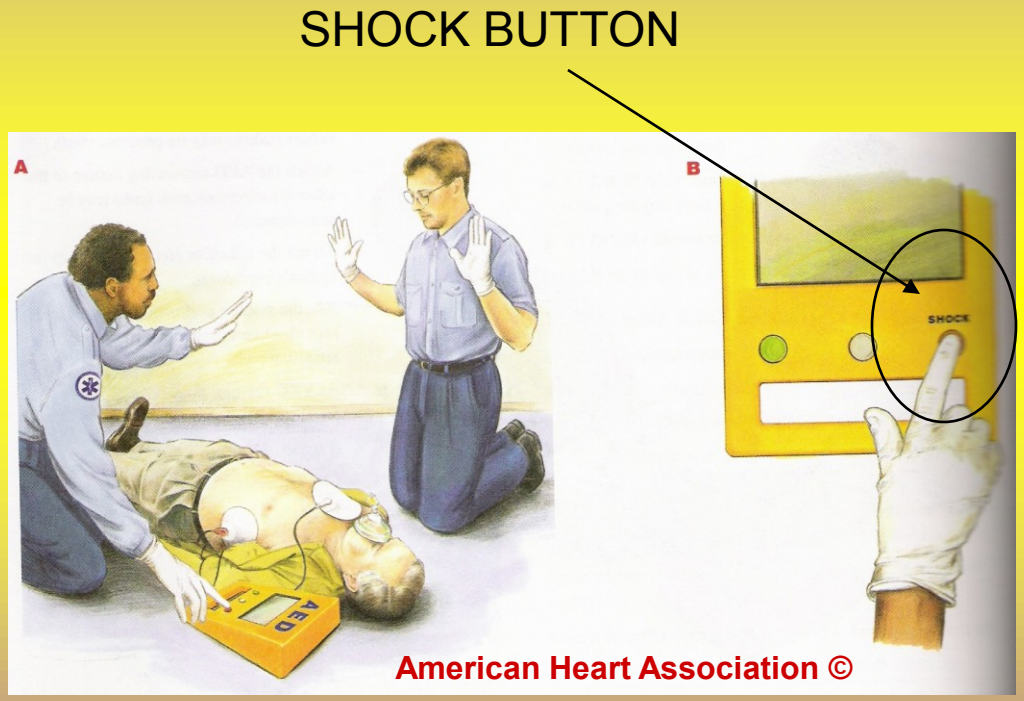
Everyone should “clear” the patient, even the person giving rescue breathes during analysis.

The correct answer is TRUE.

All persons should clear the victim during analysis and shock.

Clear the victim and press the “SHOCK” button.

- 1. If SHOCK is indicated, again “clear” the victim by saying “clear.” Also perform a visual check.



Clear the victim and press the “SHOCK” button.

- 2. After the first shock, *restart CPR*. Perform 5 cycles of CPR and re-analyze.
- 3. If fibrillation continues, the AED will indicate it. The charging of the AED and then SHOCK INDICATED sequence will then continue.

- 4. After each shock do five cycles of CPR.
- 5.If ***signs of circulation*** do not return, then rescuers without ACLS backup should resume CPR for five cycles and continue to let the AED analyze after cycles.

Special Situations

- Witnessed collapse vs. un-witnessed collapse has different management protocol for ***healthcare providers***.
- ***Layperson*** management does not have different protocol.

Layperson

- Regardless if cardiac arrest is witnessed or unwitnessed, laypersons will perform ABC's then attached AED and shock as indicated.
- Regardless if five minutes have elapsed or not, laypersons will perform ABC's then attach AED and shock as indicated.

Two healthcare providers during a ***witnessed*** arrest will:

- 1. verify unresponsiveness.
- 2. Activate EMS.
- 3. Perform ABC's.
- ***4. Attach AED and shock as indicated.***
- 5. After shock restart CPR, with chest compressions.

Two healthcare providers during an *un-witnessed* arrest will:

- 1. verify unresponsiveness.
- 2. Activate EMS.
- 3. Perform ABC's.
- ***4. Perform five cycles of CPR while attaching AED.***
- 5. Shock as indicated.
- 6. After shock restart CPR, with chest compressions.

Healthcare Providers arriving to scene of unresponsive victim ***within five minutes*** of collapse will:

- 1. Verify unresponsiveness.
- 2. Do ABC's
- 3. Attach AED and shock as indicated.

Healthcare Providers arriving to scene of unresponsive victim ***after five minutes*** of collapse will:

- 1. Verify unresponsiveness.
- 2. Do ABC's
- 3. ***Perform five cycles of CPR while attaching AED.***
- 4. Allow AED to analyze and shock as indicated.

One healthcare provider will:

- 1. Verify unresponsiveness
- 2. Activate EMS.
- 3. Perform ABC's
- 4. Attach AED and shock as indicated.

- It will be difficult for one healthcare provider in an out of hospital setting, to perform five cycles of CPR and then attach AED in a timely fashion. So they should follow layperson protocol.

Quick Review

- 1. If no signs of circulation, power on AED.
- 2. Attach electrode pads and then connect cables to AED if not done already.
- 3. “Clear” the patient and analyze rhythm.

Quick Review

- 4. If “SHOCK” is indicated “clear” the patient and press “shock.”
- 5. If AED indicates “NO SHOCK advised” then check for signs of circulation and resume CPR.
- 6. Resume CPR for 2 minutes and re-check for signs of circulation.

Quick Review

- 7. If no signs of circulation are present then press “analyze.”
- 8. Do as the AED tells you.
- 9. After shock restart CPR with chest compressions.

Review Questions

Early access, early CPR, early defibrillation, and early ACLS is collectively best referred as:

A. The Chain of Survival
B. Basic Life Support
C. CPR
D. Pre-ambulatory care.

A. The Chain of Survival

How much will the survival probability decline, if the AED is applied 3 minutes after collapse?

A. 15%

B. 30%

C. 45%

- B. 30%

- Recall that survival declines 7% to 10% every minute the defibrillator is delayed.
- 10 * 3 = 30

If alone when an adult collapses the correct sequence of action is:

A. Verify unresponsive, 1 minute CPR, call 911, check ABC's
B. Verify unresponsive, Check ABC's, call 911, CPR
C. Verify unresponsive, Call 911, check ABC.

C. Verify unresponsive, Call 911, check ABC.

What are the 4 steps required to operate an AED?

- A. Attach electrode pads, analyze, and deliver a shock if needed.
- B. Move victim to safe place, power on AED, attach electode pads, shock.
- C. Power on AED, attach electrode pads, analyze, shock if needed.

- C. Power on AED, attach electrode pads, analyze, shock if needed.

REVIEW

- If a healthcare provider arrives to an unresponsive victim that needs a defibrillator within 5 minutes of collapse, he should attach and shock.
- If a healthcare provider arrives to an unresponsive victim that needs a defibrillator after 5 minutes of collapse, he should do five cycles of CPR and then shock.

- A period of CPR before shock delivery will provide some blood flow (O2) to the heart.
- This will make a shock more likely to eliminate VF.

- This also will make it more likely for the heart to resume effective rhythm and pumping.

Did you know..

- A bi-phasic defibrillator will convert VF to a regular rhythm 90% of the time!
- After VF is terminated, many victims have a non-perfusing rhythm for several minutes.
- So regardless if VF is converted chest compressions should always follow shock.

Infants

- There is non-definitive research for use of AED, and its use is to the discretion of the healthcare provider.

Children 1-7 years of age.

- Regardless of witnessed or un-witnessed children should receive five cycles of CPR before shock.

Electrode pads

- Children should use child size pads and adults should use adult size pads.

- Click here to review

- This presentation was designed by Andrew Pizza, LSU medicine.
- Information was obtained from the American Heart Association's latest guidelines, 2005.
- Questions or comments contact apizz1@lsuhsc.edu.