

Basic Life Support

BLS for Healthcare Providers and Professional Rescuers



**AMERICAN
SAFETY &
HEALTH
INSTITUTE**

A little about me...



- Emergency Services for 19 years
- EMT since 2005; Paramedic since 2014
- Assistant Chief at Good Fellowship Ambulance in West Chester
- Tactical Medic for West Chester Regional Emergency Response Team
- EMS Supervisor/PIO at Royersford Fire Department
- Public Information Officer for Royersford Borough Office of Emergency Management

- **Instructor for:**

- *PA Department of Health EMS*
- *American Safety Health Institute CPR/AED/First Aid*
- *Stop the Bleed*
- *ALERRT Civilian Response to Casualty Care*

- **SafeKids Child Passenger Seat Technician**



Sudden Cardiac Arrest (SCA)

Sudden cardiac arrest (SCA) can happen with little or no warning

- Victims unexpectedly collapse
 - Breathing stops
- Occurs when electrical pulses in heart become disorganized
 - Ventricular fibrillation occurs
 - Blood flow with oxygen it carries stops
 - Brain cell death starts



Cardiopulmonary Resuscitation (CPR)

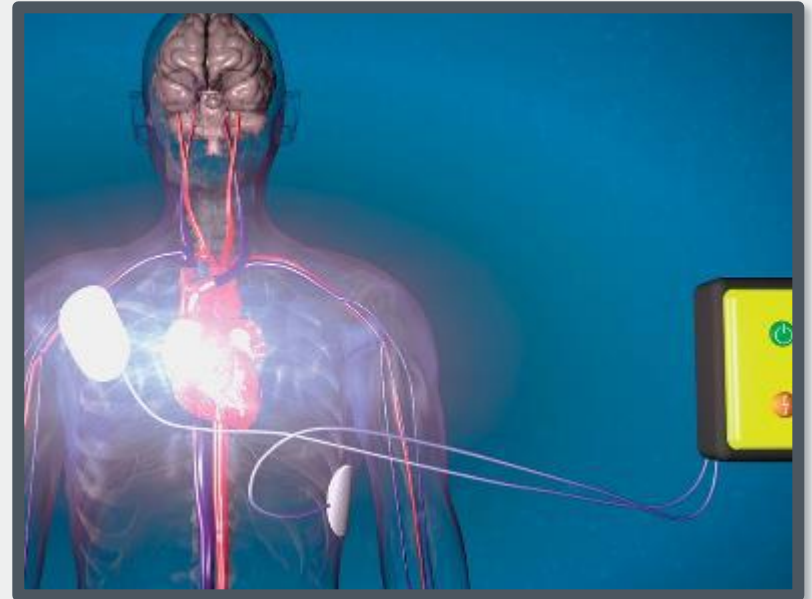
CPR is the immediate treatment for a suspected cardiac arrest

- CPR can restore limited oxygen to brain and other vital organs through:
 - Chest compressions
 - Rescue breaths
- CPR alone is not enough

Early Defibrillation

The most effective way to end fibrillation is defibrillation

- Shock is sent through heart to stop ventricular fibrillation, allowing normal activity to return
- Success dependent on how quickly defibrillation occurs
 - Each minute in cardiac arrest, chance of survival declines by ~10%
 - After as few as 10 minutes, survival is unlikely



Automated External Defibrillator (AED)

A small, portable, computerized device that is simple to operate

- Push power button
- AED provides voice instructions to guide attachment and use automatically
 - Analyzes heart rhythm
 - Determines if shock is needed
 - Operator pushes button to deliver shock when prompted by AED



Chain of Survival

(outside of a hospital)

The greatest chance for survival exists when all the links are strong:

- Early recognition/activation of emergency response protocol
- Immediate CPR with high-quality chest compressions
- Rapid defibrillation or electrical shock
- Effective basic and advanced EMS care and transport
- Effective post-cardiac arrest care at a hospital



Secondary Cardiac Arrest

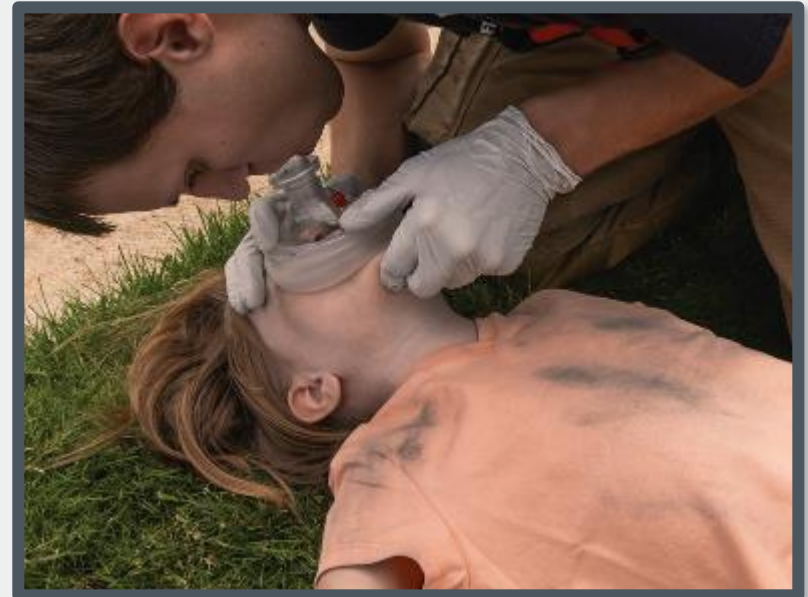
Cardiac arrest can also be the end result of a blocked airway or loss of breathing

- Hazardous breathing conditions in a confined space, drowning, and drug overdoses are all causes
- Without oxygen, heart weakens until signs of life become difficult or impossible to assess
- Immediate CPR, with effective rescue breaths, may be only chance to restore them



Children are more likely than adults to experience secondary cardiac arrest due to an airway or breathing problem

- Age groups in relation to CPR:
 - Infant is younger than 1 year of age
 - Child is 1 year of age until the onset of puberty
 - A person is considered an adult after the onset of puberty
 - Puberty can be identified by breast development in females and presence of armpit hair in males



The chain of survival for children and infants emphasizes:

- Prevention of airway and breathing emergencies
- Early CPR, with emphasis on effective rescue breaths, and, if needed, AED defibrillation
- Prompt activation of emergency response protocol
- Effective basic and advanced EMS care and transport
- Effective post-cardiac arrest care at a hospital

High-Performance CPR



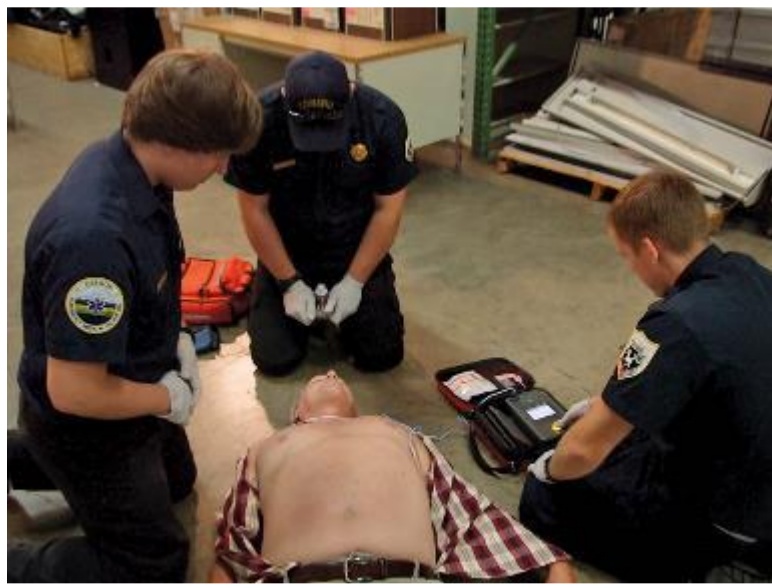
- Quality matters
- Improved chance of survival
- 2 key elements:
 - High-quality CPR skills
 - More efficient team approach to resuscitation

Narrow the gap between perfect skills and what you can perform

- High-quality CPR skills:
 - Begin CPR compressions within 10 seconds of determining cardiac arrest
 - Compress fast, at a rate of 100 to 120 times per minute
 - Compress hard, at least 2 inches for adult, and at least 1/3 depth of chest for children/infants
 - Allow for complete chest recoil at top of each compression
 - Minimize interruptions to compressions
 - Give effective rescue breaths that create a visible chest rise
 - Avoid excessive air on rescue breaths
- CPR feedback devices that measure skill performance in real time can be used to optimize CPR

Working as a Team

An effective team approach can significantly improve care provided



- Clearly defined roles
- Clear and effective communication
- Multiple treatment actions occur at the same time
- High-quality CPR by allowing team members to switch when tired
- Minimizes overall interruption times

High-performance CPR

Only way to develop high-performance CPR is through ongoing practice

- CPR skills can deteriorate significantly in as few as 3 months
- Shorter, more frequent, scenario-based retraining sessions are reasonable for maintaining skills

Protecting Yourself

Your personal safety is the highest priority

- Putting yourself in danger to help can make the situation worse
- Pause before approaching
- Look for obvious hazards
- Consider hidden dangers
- If not safe, do not enter until hazards minimized or eliminated



Standard Precautions

You can be exposed to blood or other potentially infectious body fluids

- Risk of contracting a disease is very low
- Must take simple measures to reduce exposure
- Common bloodborne diseases and pathogens
 - Hepatitis B
 - Hepatitis C
 - HIV
- Standard precautions are protective practices used when providing care whether or not an infection is suspected

Personal Protective Equipment (PPE)

Protective barriers worn to prevent exposure to infectious diseases

- Disposable gloves most common
 - Make sure readily available
 - Always use them
- CPR mask with a one-way valve or a bag-mask device should be used by emergency response personnel



Chest Compressions

Basic CPR skills to provide the most effective approach to cardiac arrest

- High-quality chest compressions
- High-quality rescue breaths using CPR mask or bag-mask
- Use of an AED
- Using a BLS assessment



External Compression

Increases pressure inside chest and directly compresses heart, forcing blood to move from chest to lungs, heart, brain, and the rest of the body

- Compress deeply, more than 2 inches
 - Likely you will not compress deep enough
 - Injury could occur from deeper compressions, but do not let fear affect depth
- Compress fast, between 100 and 120 times per minute
 - Do not let higher compression speed result in shallower depth
- Do not lean on the chest between compressions
- Allow chest wall to fully rebound at top of each compression
- Minimize interruptions when doing compressions

Compression technique for a child is similar to adult but less forceful

- Push deep, straight down 1/3 depth of the chest, or about 2 inches
- On small children, heel of one hand can be used to compress
- On large child, can use both hands
- On infant with 2 or more providers, encircle sides of chest with hands
 - Use thumb tips to compress lower third of breastbone
 - Push deep, at least 1/3 depth of chest or about 1 ½ inches



Opioid Overdose

Opioids, taken in excess, can depress and stop breathing

- Naloxone
 - Temporarily reverses life-threatening effects of opioids
 - Easy to administer with auto-injector device or aerosol sprayed into nose
- Suspicion of opioid use may present itself through questioning of bystanders, or by observation of person and location
- Initiate and establish BLS care prior to using naloxone



Automated External Defibrillation (AED)

AEDs are simple to use; voice, lights, and screen instructions guide you



- Open lid or press power to turn on
- Remove clothing, dry torso if wet
- Locate, pull out defibrillation pads
- Peel pads from backing and place as shown in pictures
 - One below right collarbone, above nipple, beside breastbone
 - Other pad lower on left side, over ribs, and few inches below armpit
- Make sure pads adhere well by pressing flat.

Automated External Defibrillation (AED)



- Allow AED to analyze heart rhythm
 - Most automatically analyze once pads in place
 - Stop CPR, movement interrupts analysis
 - Be certain no one is touching person
 - If defibrillation advised, AED will charge for shock delivery

Automated External Defibrillation (AED)



- Deliver shock if directed by AED
 - No one in contact with person
 - Press button to deliver shock
 - Once shock delivered, immediately resume CPR
- If shock not indicated, immediately resume CPR
- If person responds, stop CPR and place in recovery position
 - Leave AED on and pads attached in case cardiac arrest occurs again

Cardiac arrests involving children and infants are likely caused by the initial loss of the airway or breathing

- High-quality CPR with effective rescue breaths may be only treatment required for resuscitation
- Conditions can occur for which defibrillation of a child or infant is warranted
- Most AEDs have specially designed pads or mechanisms that reduce defibrillation energy to a level appropriate for smaller body size

Steps for using an AED on a child or infant are similar to an adult



- For smaller children and infants:
 - Place one pad on the center of the chest just below the collarbones
 - Attach second pad on center of the back between the shoulder blades
- If AED specifically equipped for use on a child or infant not available, an AED configured for an adult can be used

AEDs are designed to detect problems during use and guide corrective actions



- If a troubleshooting message occurs
 - Stay calm and follow voice instructions
 - CPR should be provided, without interruption, until problem corrected or another AED becomes available

The AED onsite at Regency at Providence



Recovery Position

- Helps protect airway, uses gravity to:
 - Drain fluids from mouth
 - Keep tongue from blocking airway
- Frequently assess and monitor the person's breathing
- Condition can quickly become worse and require additional care



Caring for Cardiac Arrest

Use AED immediately when it arrives

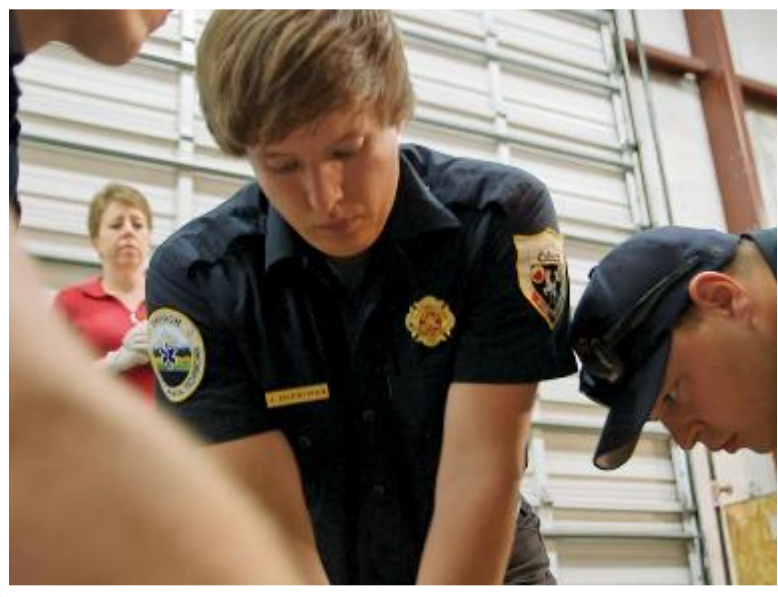
- Turn on AED, adhere pads to bare chest, allow AED to analyze heart
- If shock advised, make sure not touching person before delivering shock
- Immediately after shock, resume CPR starting with compressions
- Voice instructions and analysis by AED will guide you through care
- Don't stop until person shows signs of life, another BLS provider takes over, or you are too exhausted to continue
- If person begins to breathe, move, or respond, stop CPR and place in the recovery position

Caring for Cardiac Arrest

- Leave AED turned on and pads attached in case cardiac arrest reoccurs
- In cases where shock is not indicated by AED, immediately resume CPR
- Continue to follow the AED's instructions
- When performing CPR, do the best you can!
 - A person without breathing or circulation will not survive without help
 - Nothing you do can make the outcome worse

Multiple Provider Approach to CPR

High-performance CPR requires high-quality skills and efficiency of multiple providers working as team



- Common for multiple providers to respond to a cardiac arrest but resuscitation may start with a single provider
- Other providers can be integrated as they arrive

- High-quality compressions are tiring
- Before AED is attached, switch compressors every 2 minutes after rescue breaths at the end of a CPR cycle
- Clearly communicate details of switch ahead of time to prevent confusion
- If 3rd provider available, have him/her relieve the compressor while rescue breaths are being given to shorten interruption
- Once AED attached, switch compressors during pause in CPR when AED reanalyzes the heart, typically every 2 minutes

Orchestrating actions of 2 or more providers is necessary for high-performance resuscitation

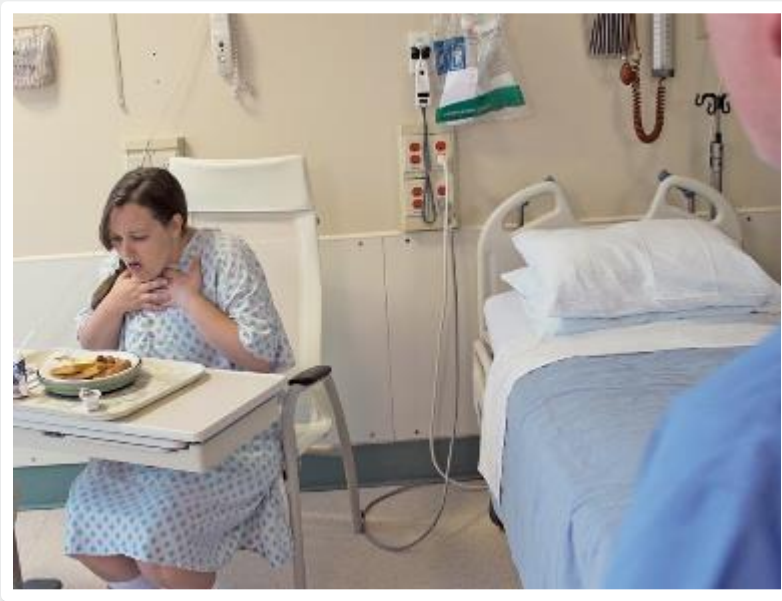
- Much like pit crew in a car race
- Effective team communication is essential
 - Speak calmly and in simple terms
 - Ensure the person you are talking to understands
 - If asked to do something, repeat it back to confirm and reinforce the instructions

After resuscitation, team members reflect on care provided

- Facilitated group discussion
- Identifies issues with skills, equipment, or established procedures
- Emphasizes and reinforces what was done well
- Can improve overall standard of care for future resuscitations
- Using realistic, scenario-based practices is an excellent way to prepare for team-based resuscitations
- Practice using a team approach

Additional Considerations

Choking



- A solid object enters narrowed part of airway and becomes stuck
- On inhalation, object can be drawn tighter into airway and block air
- A forceful thrust beneath ribs and up into diaphragm can pressurize air in chest and pop obstruction out
- Compression of chest over breastbone can also create enough pressure to expel an object

Be able to recognize the difference between mild and severe blockage

- Mild Obstruction
 - Person can speak, cough, or gag
 - Typically cleared by affected person naturally through forceful coughing
 - Allow person to try and resolve the problem on his/her own
 - Stay close and be ready to take action if things worsen
- Severe Obstruction
 - Person cannot take in enough air to dislodge the object
 - Very little or no air exchange, lack of sound
 - Inability to speak or cough forcefully
 - May hold hands to throat while attempting to clear the obstruction

Choking: Severe Obstruction

A person without air exchange requires your help to survive

- Repeated abdominal thrusts, while standing behind person can be extremely effective
- When someone is clearly pregnant or obese, use chest thrusts instead of abdominal thrusts
 - Position yourself directly behind the person, reach under armpits and place thumb side of fist on center of chest
 - Grasp your fist with your other hand and thrust straight backward; try to not put pressure on the ribs
- If choking and alone, try pressing abdomen quickly against a rigid surface; otherwise, attempt abdominal thrusts on yourself
- Anyone who has had these maneuvers used on them should be evaluated further to ensure there are no injuries

Choking: Children & Infants

Young children are at risk for choking because of small air passages, inexperience chewing, and tendency to put objects in mouths



- Might be easier to kneel behind a choking child to deliver thrusts
- Use less force on your thrusts
- More difficult to recognize choking in infants, sudden onset differentiates it from other breathing emergencies
- Signs include weak, ineffective coughs, and lack of sound

Thank you for being here and thank you for all you do!

Contact Information

