

- Heart attack: blood supply to heart is suddenly reduced or blocked
- Cardiac arrest: heart stops pumping blood
 - Heart has stopped (Asystole) (Flat Line) – Not Shockable
 - PEA (Pulseless Electrical Activity) – Not Shockable
 - Ventricular Fibrillation (lower chambers quiver instead of pumping)*
 - Pulseless Ventricular Tachycardia (lower chambers beat too fast to pump)*
 - *Both V-fib and pVT (above) are shockable rhythms.
- CPR and AED are key interventions

- Heart attack:

Due to the lack of blood flow in that particular area of the heart muscle, tissue death can occur. This can interrupt the electrical circuit in the heart leading to:

Cardiac Arrest

Adult and Child CPR (1 of 12)

- If you see a motionless adult or child:
 - Scan for hazards – Scene Safety
 - Take standard precautions - PPE
 - Quickly control any massive bleeding!

Adult and Child CPR (2 of 12)

- **RAB-CAB** mnemonic to remember what to do when providing adult or child CPR :
 - **R = Responsive?** – An unresponsive person will need EMS, even if they are breathing, so we activate EMS for any unresponsive person
 - **A = Activate EMS** and get an AED
 - **B = Breathing?** – Check Breathing, If no breathing, we begin CPR.
 - Doing the “head tip/chin lift” when checking breathing may, in rare cases, cause the person to start breathing again.
 - **C = Compressions** – Begin with 30 compressions
 - **A = Airway** – open the airway (head tip, chin lift or jaw thrust)
 - **B = Breaths** – Give 2 breaths after 30 compressions

Adult and Child CPR (3 of 12)

- R = Responsive?
 - Tap the person on the shoulder and shout, “Are you okay?”
 - If the person responds, ask if you can help them, if they agree provide care as needed (SAMPLE History and/or DOTS)
 - If the person does not respond, continue to the next step, *A = Activate EMS and get an AED*

Adult and Child CPR (4 of 12)

- A = Activate EMS and get an AED
 - Shout for nearby help
 - If someone responds, have them call 9-1-1 and get an AED while you provide care.
 - If there is a group of people and you ask for help, understand:
“Diffusion of Responsibility”
 - If you have a phone, call 9-1-1 and follow the dispatcher’s instructions
 - If no one comes and you are alone with a child, **check for breathing and if not breathing**, give five sets of 30 chest compressions and 2 breaths before calling 9-1-1

Adult and Child CPR (5 of 12)

■ B = Breathing?

- Observe the person from the neck to waist for movement (rise and fall); take 5 to 10 seconds
 - Look, Listen and Feel for Breathing. Head tip/Chin lift when checking
- If breathing normally, place in recovery position (if no spinal injury) and stay with person until EMS arrives
- If the person is not breathing or is only gasping, continue to the next step, *C = Compressions*

Note: Basic First Aid does not do pulse checks, however this is a good skill to know.

Adult and Child CPR (6 of 12)

- C = Compressions
 - Place heel of one hand on center of person's chest on lower half of breastbone
 - For an adult: place other hand on top of first with fingers interlocked
 - Hold fingers off person's chest, pointed away from you



Figure 7-1

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Adult and Child CPR (7 of 12)

- C = Compressions (cont'd)
 - For a child:
 - Use one hand; using two hands may be necessary depending on size of child



Figure 7-2

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Adult and Child CPR (8 of 12)

- C = Compressions (cont'd)
 - Keep arms straight and elbows locked, with shoulders directly over your hands.
 - Push hard, fast (100 to 120/min), and smoothly.
 - Counting compressions out loud can help control your compression pace (one and two and three and four.....)
 - Or you can compress to the beat of the song "Stayin' Alive"
 - Or you can compress to the beat of "Another One Beats the Dust" 😞
 - Allow the chest to fully recoil after each compression.

Adult and Child CPR (9 of 12)

- A = Airway open
 - Open the person's airway using head tilt–chin lift or jaw-thrust maneuver (if spinal injury suspected)

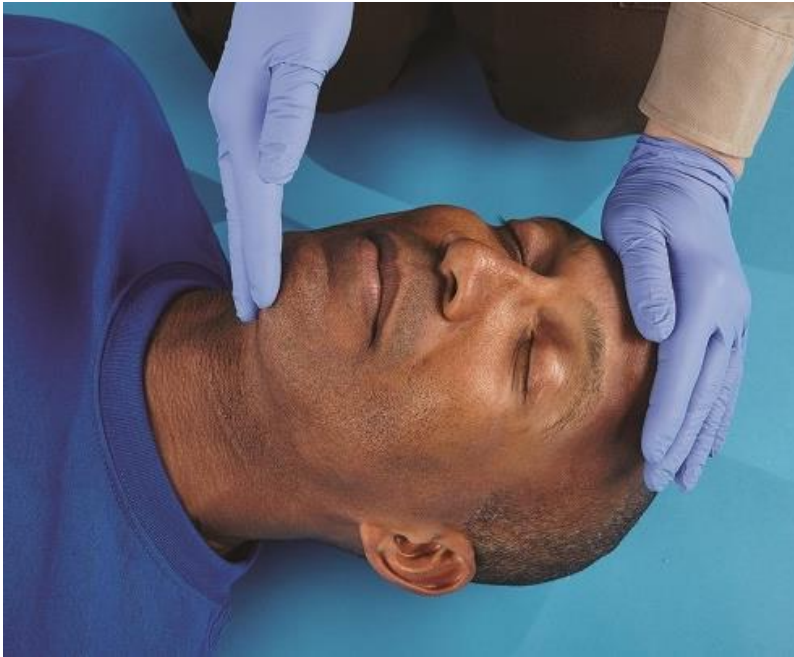


Figure 7-3

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Figure 7-4

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Adult and Child CPR (10 of 12)

■ B = Breaths

- Pinch the person's nose shut and make a tight seal with your mouth on the mouth-to-barrier device or the person's mouth
- Give two breaths, ***each lasting 1 second and just strong enough to raise the chest.***
- Watch for chest rise
 - If no chest rise, re-tilt head and attempt second breath
 - If still no chest rise, assume airway obstruction (discussed later) and continue compressions.

Adult and Child CPR (11 of 12)

- B = Breaths (cont'd)
 - If you cannot use mouth:
 - Seal mouth over nose and provide breaths, or...
 - Provide compression-only CPR
 - If person vomits:
 - Roll onto side and clear mouth using gloved finger or piece of gauze

Adult and Child CPR (12 of 12)

- Repeat cycles of CPR (30/2) until:
 - AED arrives
 - Person begins breathing
 - Another rescuer arrives, then work as a team:
 - Switch compressors every two minutes / every 5 cycles / each time the AED analyzes (which is every 2 minutes)
 - Another rescuer (with, or above your skill level) takes over
 - Scene becomes unsafe
 - You become physically exhausted and cannot continue

Compression-Only CPR

- CPR without breaths – “Hands Only” CPR

To perform: Follow **RAB-CAB** up to *C = Compressions*.

Continue to provide compressions until EMS arrives.

- In this situation we have eliminated the need to open the airway because we are not giving breaths, however, in rare cases, opening the airway is all it takes for someone to start breathing again.

Compression-Only CPR

- CPR without breaths – “Hands Only” CPR

For children and infants, giving breaths is critical because many times the reason they go into cardiac arrest is respiratory related.

Infant CPR

- CPR for infants (younger than 1 year) follows same RAB-CAB sequence as for adults and children, with some differences in technique
- We check responsiveness by tapping the bottom of an infant's foot, we do not tap the shoulders

Infant CPR

Two-thumbs encircling hands or heel-of-one-hand technique are used for infant compressions

○ Two-finger compressions are no longer recommended

- Compression depth is much less for an infant: (1.5" / 4cm)
- Tip the head to the “sniffing” position, not as far back as a child or adult. Tipping the head too far back can close the airway.

Infectious Disease and Cardiac Arrest

- A person can become infected from respiratory droplets when an infected person coughs, sneezes, or speaks
 - Presents dilemma for first aid provider who is concerned about compromising their own health and yet wants to give CPR
 - Perform compression-only CPR and cover the person's nose and mouth with face mask and first aid provider wearing a mask

Automated External Defibrillation (1 of 2)

- AED analyzes heart rhythm to determine if an electric shock, or defibrillation, is necessary
 - Will prompt rescuer to deliver shock (a semi-automatic unit)
 - Purpose of shock is to correct an abnormal electrical disturbance and reestablish a heart rhythm - essentially “Re-Booting” the heart
- Using an AED as soon as possible increases the person’s chance of survival
- An AED momentarily STOPS the heart in the hope the heart will start up again in a normal rhythm
- Not all rhythms are shockable, as mentioned earlier

Automated External Defibrillation (2 of 2)

- Many different AED models exist
 - The principles for use are the same for each, but the displays, controls, and options vary slightly
 - AED is attached to two adhesive pads that are attached to chest, which send electrical signal of heart to device for analysis and deliver shock
 - Most have voice prompts or visual displays
 - Some are automatic and will deliver the shock themselves
 - Some are semi-automatic and will require you to push the “Shock” button to deliver the shock.

Using an AED (1 of 3)

- Basic operation follows same sequence
- Turn on the AED and follow the voice prompts!

It will guide you to do the following:

- Attach the pads to the person's bare, dry chest, as shown on the pads

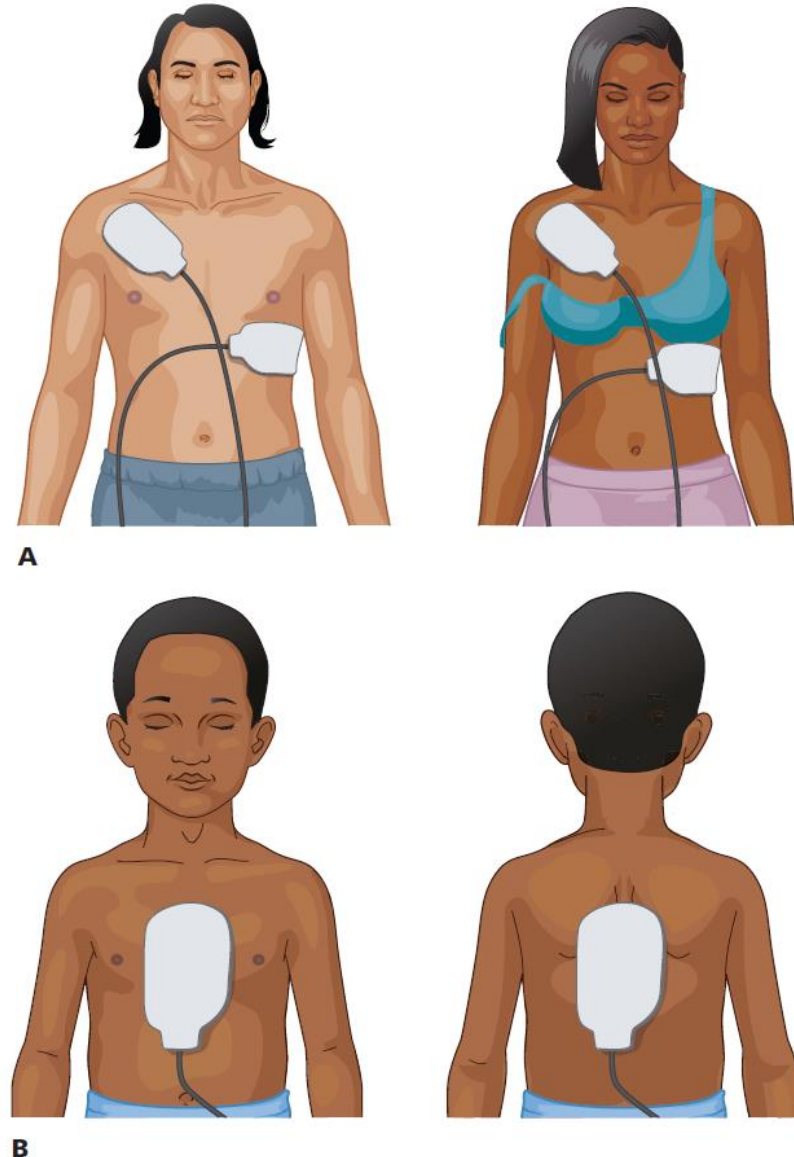


Figure 7-5

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Using an AED (2 of 3)

- Basic operation (cont'd)
 - Make sure cable is attached to AED and no one is touching the person
 - Stand “clear” for AED’s analysis
 - If no shock is advised, resume CPR immediately

Using an AED (3 of 3)

- Basic operation (cont'd)
 - AED will alert you to push a button to administer shock (semi-automatic model)
 - Ensure no one is touching person
 - Immediately resume CPR after shock and follow prompts
 - If shock is successful, person will begin to breathe or move
 - Assess breathing, place person in recovery position, and provide care until EMS arrives

AED Special Considerations (1 of 2)

What to Look For	What to Do
Wet skin, lying in shallow water, or on snow	- Move the person out of the water or off the snow. - Wipe the chest dry before attaching the pads.
Chest hair	Remove hair if it may prevent the pads from sticking to the skin. Do this by either: - Shaving the area where pads will be placed. The AED's case should contain a razor to use, or - Apply adhesive tape (eg, duct, masking, bandage) firmly onto the hair and rip the tape off. It may be necessary to repeat this several times. DO NOT use the AED pads to rip out hair.
Bra or other undergarment	Adjust its position only as much as necessary, such as moving the straps, instead of removing it. AED pads should only touch skin.
Medication patches (eg, nitroglycerin, nicotine, pain medication)	- While wearing gloves, or using a cloth or paper towel, remove the patch. DO NOT place an AED pad over a medicine patch.
Implanted devices (pacemaker or defibrillator)	Move the pad at least 2 inches (5 cm) away from the device. DO NOT place an AED pad directly over the implanted device.
Child or infant	The procedure is the same as for an adult. Some AEDs may have pediatric equipment, such as a pediatric attenuator device (reduces the energy of an electric shock to a level that is safe for a child) or pediatric pads (FIGURE 7-6). If pediatric equipment is not available, use the adult equipment. Avoid having the pads touch each other by placing one pad in the middle of the chest and the other pad on the back, between the shoulder blades.

AED Special Considerations (2 of 2)

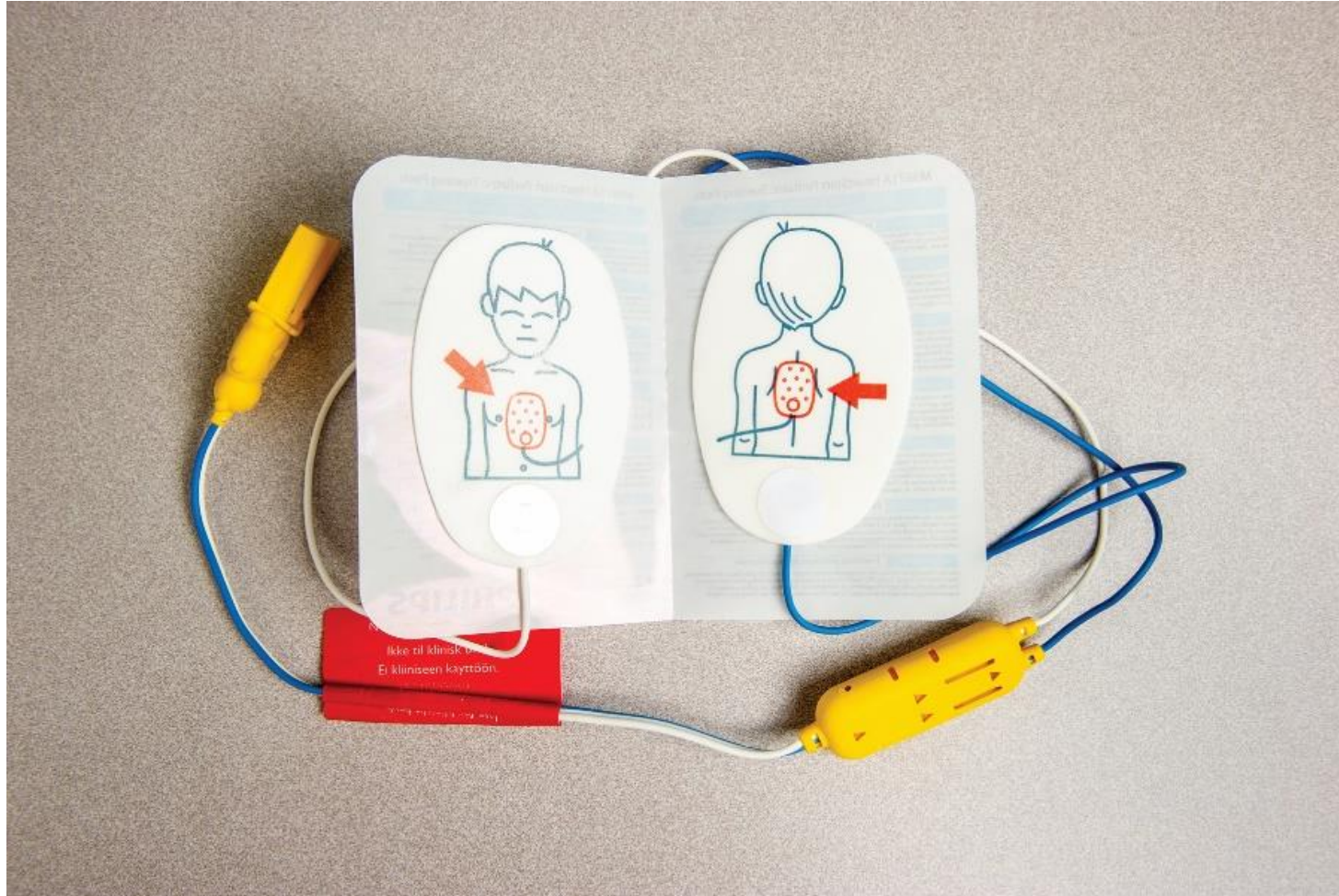


Figure 7-6. Child pads with a pediatric dose attenuator

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Airway Obstruction

- Signs of mild airway obstruction (choking):
 - Good air exchange
 - Able to make forceful coughing efforts
- Signs of complete airway obstruction:
 - Difficulty breathing
 - Unable to cough forcefully, breathe, or talk
 - Skin, fingernail beds, or lips turn blue/gray
 - Appears panicky and desperate
 - Points to mouth or grasps at throat



Figure 7-7

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Adult and Child Airway Obstruction (1 of 7)

If ...	Then ...
The person is responsive and shows signs of mild airway obstruction (choking): ■ Good air exchange is present. ■ Able to make forceful coughing efforts in an attempt to relieve the obstruction	■ Encourage continued coughing, but otherwise do not intervene. Aggressive treatment (eg, back blows, abdominal thrusts, chest compressions) may cause complications and could worsen the airway obstruction. ■ Monitor the person until they improve. If there is no improvement in a couple of minutes, call 9-1-1 because a severe airway obstruction can occur at any time.

Adult and Child Airway Obstruction (2 of 7)

If ...	Then ...
The person is responsive and shows signs of complete airway obstruction: ▪ Difficulty breathing ▪ Unable to cough forcefully ▪ Unable to talk ▪ Skin, fingernail beds, or lips turn blue or gray ▪ Appears panicky and desperate ▪ Points to their mouth or grasps at their throat (FIGURE 7-7) <i>Note:</i> It is important to distinguish choking from fainting, heart attack, seizure, anaphylaxis, and other conditions that may cause sudden respiratory distress or loss of responsiveness.	1. DO NOT ask them if they are okay. Instead, ask them if they are choking and if you can help them. If they nod “yes,” tell them you are going to help. 2. Have someone call 9-1-1. 3. Give back blows (SKILL SHEET 7-4): a. Stand to the side and slightly behind the choking person. If they are a child or in a wheelchair, kneel behind them. b. Support the person by reaching your arm either over their arm or under their armpit and placing it diagonally across the person’s chest. Place the palm of that hand on the person’s upper chest or shoulder. DO NOT keep the person in an upright or vertical position. If they are not bending over when the jolt of the back blow dislodges the object, the object may become stuck deeper in the airway. c. Give five hard back blows with the heel of the hand that is not supporting the person. Aim for the area in between their shoulder blades. DO NOT just pat them on the back; use hard blows (eg, like driving or hitting a nail into a thick board with a hammer). Each blow should be a distinct effort to dislodge the obstruction. d. Quickly check after each back blow to see if the obstruction has been dislodged. The goal is to relieve the object with a blow, not to necessarily give all five back blows.

Adult and Child Airway Obstruction (3 of 7)

If ...	Then ...
The five back blows fail to dislodge the airway obstruction.	Give abdominal thrusts (SKILL SHEET 7-5): 1. Stand behind the person or kneel behind a child or person in a wheelchair. If the person is significantly taller than you, have them kneel or sit. 2. Put one foot in front of the other foot; this provides stability during the thrusts and if the person becomes unresponsive and collapses, they can slide down your leg to the ground or floor. 3. Wrap your arms around the person's waist. Locate the person's navel (belly button) using two fingers (right-handed people will usually use their left hand). If your arms cannot encircle the person's waist (eg, pregnant woman, or a very large person and you are smaller than them), use chest thrusts (discussed later). 4. Make a fist with the other hand (right-handed people will usually use their right hand to make a fist). Place the thumb side of the fist just above the person's navel and below the tip of the breastbone (sternum). Grab the fist with the first hand. 5. Give up to five abdominal thrusts by quickly pulling of the fist inward and upward into the person's abdomen. Each thrust should be a separate and distinct effort to dislodge the object.

Adult and Child Airway Obstruction (4 of 7)

If ...	Then ...
The obstruction does not get dislodged and is still in place.	Repeat alternating between back blows and abdominal thrusts until one or more of the following occurs: ■ The person can cough forcefully, breathe, or speak. ■ The person becomes unresponsive. ■ EMS or someone with training takes over.
The person becomes unresponsive.	■ Support the person while carefully lowering them to the ground. ■ If EMS has not arrived or has not been called, call them immediately. ■ Begin CPR, starting with chest compressions. ■ After each set of 30 compressions and before giving rescue breaths, open the mouth, look for an object in the back of the throat, and if seen, remove it.

Adult and Child Airway Obstruction (5 of 7)

If ...	Then ...
The person is found unresponsive.	Follow the steps of CPR. ■ If the person's chest does not rise when the first rescue breath is delivered, retilt the head and try again. If the second rescue breath does not result in chest rise, an object may be blocking the person's airway. ■ After each set of 30 compressions and before giving rescue breaths, open the mouth, look for an object in the back of the throat, and if seen, remove it. DO NOT use blind finger sweeps in people with an airway obstruction.
Solid material or an object can be seen in the airway.	Remove the solid material or object only if seen. DO NOT use a blind finger sweep.

Adult and Child Airway Obstruction (6 of 7)

If ...	Then ...
The person is pregnant, in a wheelchair, or very large, or you are small.	Provide chest thrusts (FIGURE 7-8): 1. Position yourself behind the person. A choking person who is large or tall may need to kneel in front of you. 2. Put your arms under the person's armpits and make a fist with one hand (right-handed people will usually use their right hand). Place the thumb side of your fist on the lower half of the breastbone (sternum). Grab the fist with your other hand. 3. Pull your hands quickly back into the chest. This is similar to abdominal thrusts, except pull straight back instead of upward. 4. If the person becomes unresponsive, move them to a flat, firm surface and begin chest compressions.
The object has been dislodged and the person has a persistent cough or feels something is stuck in their throat.	Seek professional medical care because injuries may have occurred.

Adult and Child Airway Obstruction (7 of 7)



Figure 7-8

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Self-Administering Abdominal Thrusts

- If alone and choking:
 - Call 9-1-1
 - Use a steady, hard surface to self-administer abdominal thrusts
 - Can also use own hands, similar to administering abdominal thrusts to another person



Figure 7-9

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Infant Airway Obstruction (1 of 2)

- Give back blows and chest thrusts to responsive infant
- Support the infant's head with your hand and lay the infant facedown over your forearm
 - Brace your forearm and the infant against your thigh
 - Give five back blows between infant's shoulder blades

Infant Airway Obstruction (2 of 2)

- While supporting the head, roll infant faceup on your other thigh
- Using heel-of-the-hand positioning for CPR, give five chest thrusts
- Repeat alternating back blows and chest thrusts until object is removed or infant becomes unresponsive