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Provider handbook

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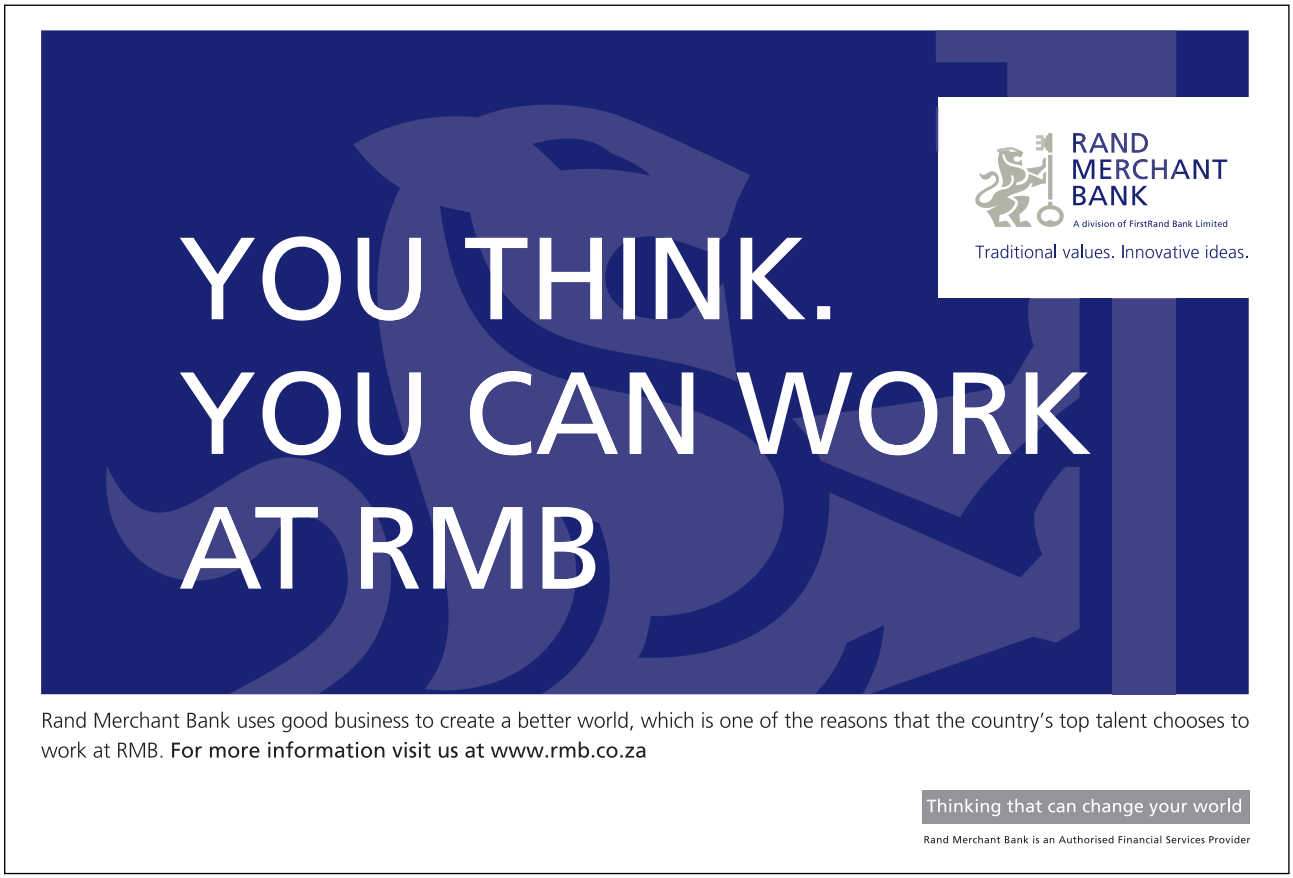

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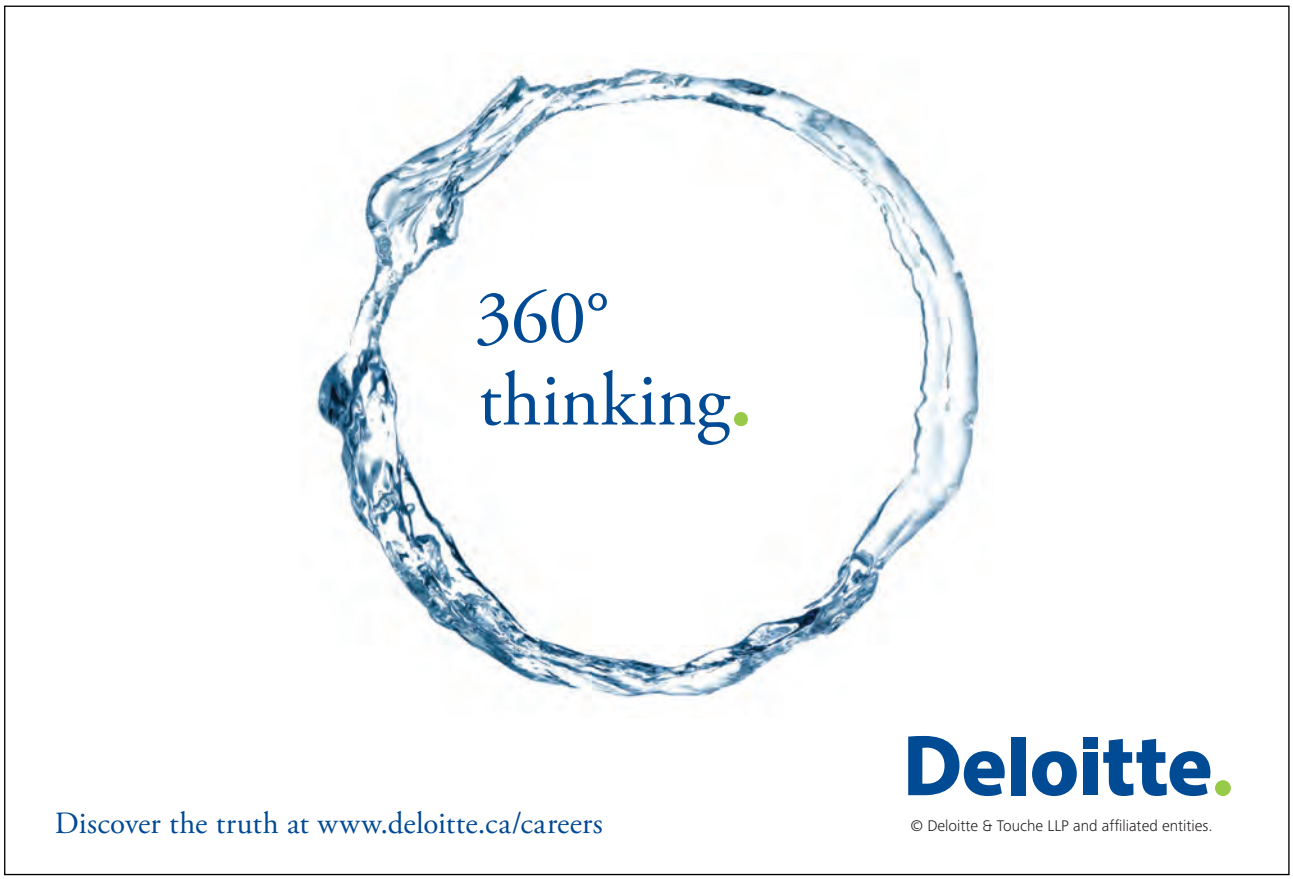

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1 First aid

This section covers first aid. First aid consists is the immediate care you should provide when someone is ill or injured. For minor conditions, first aid care may be enough. For more serious problems, first aid continues until more advanced care is available. The decision to act appropriately can mean the difference between life and death.

Begin by introducing yourself to an injured or ill person. Explain that you are a first aid provider and are willing to help. The person must give you permission to help them. Do not touch them until this is accomplished. If you encounter a confused person or someone who is critically ill, you can assume that he or she would want you to help them. This is known as "implied consent."

1.1 First aid basics

The first step in any emergency is the recognition of a problem and getting help. When in doubt always activate the emergency response system and call 911.

Err on the side of caution and activate 911 anytime someone is seriously ill or injured. If you're not sure, the operator will ask you a series of questions to determine the seriousness of the situation.

Remain on the line until more advanced help arrives or the 911 operator tells you to hang up. Emergency system dispatchers can guide you through the steps of performing CPR, using an AED or delivering basic care until additional help arrives.

At home, at work, or at school, know where the first aid kit and AED is kept and be familiar with its contents. Know how to activate the emergency response system. Be aware of any policies in the workplace regarding medical emergencies.

The best way to determine unresponsiveness is to tap the person and shout, "Are you okay?" After determining unresponsiveness, yell for help. Look for any medical identifications, such as a necklace or a bracelet. This may provide a valuable clue to the cause of the situation.

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1.2 Assess the scene for safety

Assessing the safety of the surroundings is critical when approaching any scene. You don't want to become another victim so look for any potential dangers. Remove the victim from any dangers danger such as water present at the scene if necessary. Be especially alert to avoid danger from automobile traffic.

1.3 Handwashing and personal protective gear

Handwashing is essential in prevention of disease and illness. Proper technique is fairly simple.

- Completely wet your hands and generously apply soap
- Rub vigorously for at least 20 seconds (Fig. 1a)
- Rinse your hands with plenty of running water
- Dry your hands with a towel or air dryer

Fig. 1a

Most hand sanitizers are alcohol-based and are a substitute when a sink is not available. Be sure to wash the victim's hands at the first opportunity. Wash your hands after each episodes of patient care and after taking off gloves.

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Personal protective gear is an important strategy to minimize the risk of blood and body fluid exposure. Always wear gloves and protective eyewear when giving first aid if the person is bleeding. A general rule of thumb is to consider that every person you treat has blood that is infected. Gloves protect your hands from exposure to blood and other body fluids while eye protection can prevent accidental exposure from splashing fluids. A pocket mask should be considered part of your personal protective gear and provides safety when giving rescue breathing.

When taking off the gloves, avoid touching the outer contaminated surface. Slowly pull one glove off while turning it inside out. (Fig. 2a) Place the glove in the palm of the other gloved hand (Fig. 2b) and then remove the second glove while turning it inside out. (Fig. 2c) Be sure to dispose of all equipment that has touched body fluids in a biohazard bag when available.

Fig. 2a

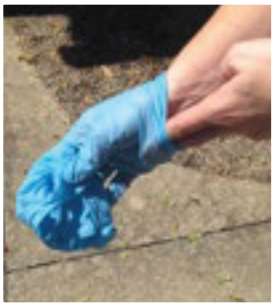

Fig. 2b

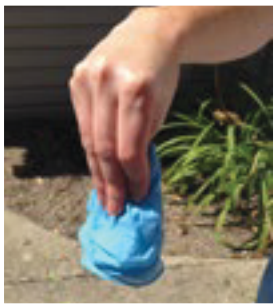

Fig. 2c

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1.4 The first aid kit

Consider purchasing a commercially available first aid kit or making your own. Having one available around the house, in your car and at your place of work is essential.

Common items found in a first aid kit:

- Gauze, bandages and tape
- Antiseptic wipes and swabs
- Absorbent compresses
- Antibiotic cream
- Burn ointment
- Mask for breathing (rescue breathing/CPR)
- Chemical cold pack
- Eye shield
- Eye wash
- Roller bandages
- Sterile gauze
- First aid reference guide including local phone numbers

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1.5 Self assessment

1. What is the first question you must ask before you respond to any first aid situation?
   a) Age of the victim
   b) Is the scene safe?
   c) Nature of the injury
   d) Time of the injury

2. Which of the following are considered personal protective equipment?
   a) Gloves
   b) Mask
   c) Eye shield
   d) All of the above

3. What is the recommended amount of time to wash your hands?
   a) 10 seconds
   b) 20 seconds
   c) One minute
   d) Four minutes

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Answers

1. B

Ensuring the safety of the scene is critical. Avoid adding yourself as another victim will not do anyone any good.

2. D

Personal protective equipment is essential when responding to any first aid or emergency situation. It is difficult to predict if a victim will vomit, is bleeding, or is seriously injured.

3. B

Vigorously rub your hands together using soap and water for at least 20 seconds and rinse thoroughly before and after every episode of care.

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2 Medical problems

Medical problems can range from very minor to life-threatening emergencies. The first aid responder must be prepared at any time to intervene and possibly initiate CPR. As a responder, if you are untrained in CPR, give "hands-only" CPR, that is, give continuous compressions, but do not give breaths.

2.1 Breathing problems

Problems can arise from underlying disease and illness such as asthma and pneumonia. Be aware that other medical conditions such as heart attack, stroke, seizure or anxiety can all result in breathing issues.

Signs of a breathing problem include fast or shallow breathing, noisy breathing, producing unusual sounds or the inability to talk due to breathlessness. Persons with asthma often make a "musical" sound when breathing heard as wheezing. High-pitched sounds during inhalation may suggest a partial blockage of the upper airway.

Persons with asthma and chronic lung disease are generally familiar with the use of their breathing medications. Common medications include albuterol and atrovent inhalers. The use of a spacer device can improve the effect of these medications. A person in severe distress may be unable to properly use their inhaler. Do not hesitate to call 911 if a person appears in significant distress.

Technique for using an inhaler:

1. Shake the canister
2. Place the opening of the inhaler into the spacer if available
3. Instruct the person to exhale fully
4. Place the spacer or inhaler into their mouth

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5. Simultaneously have the person inhale slowly and deeply while pressing down on the top of the inhaler canister
6. Instruct the person to hold their breath for up to 10 seconds if possible
7. Be prepared to repeat if respiratory problems persist
8. Stay with the person until the symptoms improve or emergency response arrives

2.2 Allergic reactions

Allergic reactions can arise from insect stings, illness or adverse reaction to foods and medications. Common triggers include nuts, eggs and fruits. Bee, wasp, or hornet stings can produce rapid and potentially fatal reactions. Symptoms may be mild such as itching and hives, or severe causing life-threatening swelling of the airway, lips and tongue.

Epinephrine can be a life saving medication and should be given at the first sign of a severe allergic reaction. Commercially available epinephrine pens (such as EpiPen®) are simple to use. The basic instructions are as follows:

1. Form a fist around pen and remove the safety release cap. (*Fig. 1a*) (*Fig. 1b*)

Fig. 1a

Fig. 1b

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2. Place the orange end of the pen against the outer mid-thigh (with or without clothing). (*Fig. 2*)

Fig. 2

3. Push down hard until a click is heard or felt and hold the pen in place for 10 seconds. (*Fig. 3*)

Fig. 3

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4. Remove pen and massage injection site for 10 seconds. (*Fig. 4*)

Fig. 4

5. Properly dispose of the used device in a sharps container.
6. Remember the time of injection
7. Seek medical care

Antihistamines such as diphenhydramine (Benadryl®) are also important in the treatment of severe allergic reactions. Be aware that epinephrine will wear off and persons receiving an injection should be evaluated at an appropriate medical facility.

2.3 Heart attack

For patients experiencing a heart attack, blocked blood flow to heart tissue results in muscle death. Remember the mantra – "Time Is Muscle". Prompt response and medical attention is critical to limit damage to heart muscle from a heart attack. Heart disease remains the leading cause of death in the United States. Your prompt actions can mean the difference between life and death.

Chest discomfort can be described as an ache, pressure, squeezing or crushing. Certain patients such as women and diabetics are less likely to have classic signs of a heart attack. These individuals may simply experience nausea or unexplained fatigue. Shortness of breath could be the only sign of an impending heart attack for some persons.

Denial often adds significant delay in seeking care. Many people argue that they are too young or too healthy to have a heart attack. Even those with minimal risk factors can suffer a heart attack.

Aspirin keeps blood clots from growing larger and may reduce the severity of a heart attack. Give aspirin if there is no true allergy to aspirin, no serious bleeding, and no signs that suggest a stroke.

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Follow these steps when caring for a person who may be having a heart attack:

1. Keep the person and yourself calm
2. Have the person sit or lie down
3. Activate the emergency medical system and call 911
4. Administer 2 baby aspirin tablets or ½ adult aspirin tablets to 4 baby aspirin tablets or full adult aspirin tablets. Make sure the aspirin is not enteric coated.
5. Be prepared to administer CPR. Heart attacks can be rapidly fatal.

Do not allow a person suspected of having a heart attack to drive themself to the hospital. Encourage them to wait until EMS arrives and if they refuse, find someone to go with them.

2.4 Fainting

Fainting, is a common reaction to a variety of conditions. Persons may faint at the sight of blood or during periods of intense emotional stress. More serious conditions can also cause fainting such as an abnormal or erratic heart rhythm. Severely dehydrated persons may also faint when standing up suddenly. The body's reaction to the decreased blood flow to the brain is to cause the person to pass out.
By assuming a lying position, blood flow to the brain is improved.

Follow these steps when caring for a fainting person:

1. Ensure safety of the scene
2. Help the person lie down
3. If rapid improvement does not occur or the person becomes unresponsive, call 911

A person can also faint while seated in a chair. Help them to the floor. Be aware of the potential for injury if a person has fallen. If the person does not rapidly regain consciousness, immediately call 911. Remember, fainting can be caused from a wide range of problems, some of which can be life threatening. If you are unsure of the cause of fainting, do not hesitate to call 911.

2.5 Low blood sugar in diabetic persons

Diabetes affects a person's ability to regulate blood sugar. Fluctuations in blood sugar in either direction can produce symptoms. Diabetic persons can experience low blood sugar due to illness, stress, skipping meals or taking too much insulin.

Low blood sugar can cause altered states of consciousness such as agitation, confusion and loss of consciousness. Very low blood sugar can result in excessive tiredness, weakness and even seizure-like activity.

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Follow these steps when dealing with a person suspected of having low blood sugar:

1. Give them a sugar-containing beverage such as fruit juice, milk or a soft drink
2. Encourage them to sit or lie down
3. Call 911
4. If their symptoms improve, encourage them to eat

Glucose gel and tablets are available and are a good way to increase blood sugar quickly. Alternatives to gels and tablets include packets of sugar, honey, or jelly from restaurants which may be readily available. Consider keeping this in the first aid kit.

If a diabetic person is unable to sit up or swallow safely, do not give them anything to eat or drink. This could result in choking or aspiration.

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2.6 Stroke

A stroke, sometimes called a "brain attack" is a medical emergency caused by a blocked blood vessel or bleeding in the brain. Persons experiencing a stroke will have noticeable neurologic deficits that can include the following:

- Slurred or unintelligible speech
- Facial droop
- Numbness
- Weakness of one side of the body
- Difficulty walking or maintaining balance
- Loss of vision
- Severe headache
- Loss of consciousness

Stroke is a neurologic emergency and time is critical. Do the following if you suspect a person is having a stroke:

1. Call 911 Immediately
2. Help the person sit or lie down
3. Retrieve an AED and first aid kit
4. Record the time that neurologic symptoms were noted and the last time the patient was free of symptoms.
5. Be prepared to perform CPR if needed

2.7 Seizures

Seizures result in abnormal body motion due to an irregular electrical discharge in the brain. Epilepsy is a chronic medical condition resulting in seizures.

Seizures can involve one or both sides of the body. Many seizures result in rhythmic jerking motions, but some seizures may result in a blank stare type of behavior. A person having a seizure may fall to the ground, bite their tongue and lose control of bowel and bladder. Seizures are often accompanied by a brief period of unresponsiveness.

Causes of seizures or seizure-like activity include epilepsy, low blood sugar, head injury or trauma, heart disease, heat-related illness or ingestion of a toxin.

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Follow these steps when caring for a person experiencing a seizure:

1. Help them to the ground if needed
2. Clear the area around them to prevent injury
3. Place a small pillow or towel under their head
4. Call 911

After the seizure is over, do the following:

1. Feel their pulse. Remember that heart problems can cause seizure activity
2. Patients may throw up after a seizure. By laying them on their side it helps reduce their chance of choking on vomit.
3. Stay with them until help arrives

Do not attempt to restrain a person having a seizure. Also do not try to pry open their mouth or put anything between their teeth.
A person experiencing an absence or staring-type seizure will have their eyes open but not respond to you. These episodes are generally brief and not associated with jerky body motion or loss of consciousness. This type of event should be treated like any other seizure and a medical evaluation is warranted.

2.8 Shock

Shock can be caused by overwhelming infection, blood loss, severe allergic reaction, severe dehydration, or heart problems. When bloodflow is significantly reduced, the body does not receive an adequate supply of oxygen, and shock occurs. Persons experiencing shock may lose consciousness or fail to respond.

Signs and symptoms of shock include:

- Poor skin color that is pale, gray or bluish
- Dizziness and lightheadedness
- Nausea or vomiting
- Behavior change such as agitation, confusion or unresponsiveness
- Clammy skin

Take the following actions when confronted with a person in shock:

1. Activate the emergency response system – Call 911
2. Help the person lie down and elevate legs
3. Cover the person with blankets to keep them warm
4. Be prepared to perform CPR
5. Stay with the person until help arrives

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2.9 Self assessment medical problems

1. Which of the following signs is most consistent with a stroke?
   a) Confusion
   b) Chest pain
   c) Facial droop
   d) Nausea

2. You notice that a victim has experienced a significant amount of blood loss, has pale skin color, and is becoming confused. What is the most likely cause?
   a) Seizure
   b) Stroke
   c) Low blood sugar
   d) Shock

3. Which of the following is not appropriate when caring for a seizure victim?
   a) Clear the area
   b) Immediately call 911
   c) Protect them from injury
   d) Place an object between teeth to prevent tongue biting

Answers

1. C

Facial droop, slurred speech, numbness and weakness are all focal neurologic signs that are consistent with a stroke.

2. D

This is a classic presentation of shock because of blood loss and is a medical emergency. Other causes of shock include infection, severe allergic reactions, severe dehydration, and heart problems.

3. D

Do not attempt to pry open the mouth or place anything between the teeth. This may result in injury to the victim or rescuer.

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3 Injuries and trauma

First aid providers are often called to assist with injuries and trauma. Knowing how to respond to a variety of situations is important. First responders are valuable in providing initial care and assisting more skilled providers in delivering care to seriously injured persons.

3.1 Controlling bleeding

Blood loss often gets the most attention. Many times the amount of bleeding is overestimated and draws attention to wounds when more serious injuries should be dealt with first. Whenever confronted with bleeding, perform a quick overview of the person to make sure something more serious is not being overlooked.

Always use personal protective equipment prior to caring for an injured and bleeding person. The victim can be instructed to perform some self care while you put on your protective gear.

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Applying direct pressure is the most effective way to stop bleeding from a wound. Use a dressing and your gloved hand to apply firm and direct pressure to the injured area. Continue holding pressure until the bleeding stops. If there are multiple wounds, apply pressure dressings to the worst injuries first before progressing to lesser bleeding. The victim may be able to assist by temporarily holding pressure to some areas.

Very small wounds such as scrapes can heal more rapidly by using an antibiotic salve. Ask the person if they have any allergies before applying. Thoroughly wash minor scrapes and abrasions with soap and water before bandaging.

Massive bleeding can occur due to extremity injuries such as open fractures or deep lacerations. When direct pressure does not control bleeding, a tourniquet may be required. Tourniquets can consist of a blood pressure cuff, belt or premade versions. If none is available, one can be quickly made using a piece of cloth and stick-like object. Understand that application of a tourniquet is painful, but may be necessary to prevent life-threatening blood loss. Tourniquet use is difficult and can be dangerous if done incorrectly. Direct pressure should be applied first. Commercially prepared tourniquets are more effective than improvised ones.

Follow these steps to apply a tourniquet:

1. Put on personal protective gear
2. Apply tourniquet approximately 2 inches above wound
3. Tighten until the bleeding stops
4. Record the time the tourniquet was applied
5. Call 911
6. Stay with the victim and do not release tourniquet until more advanced help assumes care

Certain situations may produce massive internal bleeding that is not visible when examining the person. This may occur from trauma, falls from a height, car accidents or crush injuries. Penetrating injuries from a knife or gunshot may produce devastating internal bleeding with very little external blood loss. Call 911 immediately whenever these injuries are suspected. Help the person lie down and remain still.

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Check for signs and symptoms of shock. You may need to cover the person to keep them from getting cold. Stay with them until more advanced help arrives.

3.2 Tooth injuries

Teeth may be broken, chipped or completely knocked out of the mouth. Always use gloves when handling another person's tooth.

Sometimes teeth can be re-implanted and should be transported with the person to the dentist or medical facility. Always handle the tooth gently and avoid touching the roots. Gently wash the tooth with clean water, but never scrub the tooth or roots. A tooth can be taken in milk, saline solution or under a cooperative victim's tongue. The victim must see a dentist or medical provider immediately.

If a tooth is simply loose, have the person bite down on a piece of gauze and call their dentist. Chipped or cracked teeth can be quite painful. If blood is visible at the crack, prompt dental care is required to prevent loss of the tooth. Injured teeth may later begin to turn color. This suggests an injury to the nerve and a visit with the dentist is warranted.

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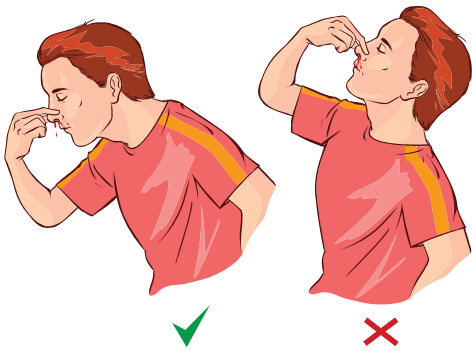
3.3 Nosebleeds

Nosebleeds can be quite dramatic and are often messy. Be sure to wear personal protective equipment and eye protection. Persons with nosebleeds often swallow a fair amount of blood and this may result in vomiting; therefore, you should prepare for the worst.



After ensuring the scene is safe and protective equipment is on, press both sides of the nostrils just below the bony portion of the nose for a minimum of 5 to 10 minutes. If bleeding continues, try holding pressure for an additional 10 minutes. If bleeding continues after this, seek further medical care. If the person has trouble breathing or show signs of severe distress, call 911.

3.4 Punctures and impaled objects

Puncture wounds and impaled objects pose special risk to the injured person. Puncture wounds may penetrate deeper than is apparent and injure sensitive structures such as nerves, muscle, tendon or blood vessels. Bleeding from puncture wounds should be controlled with direct pressure and then further medical attention sought. Puncture wounds may carry germs deep within a wound and may result in serious infections. For this reason, any serious puncture wound should be evaluated by a professional as soon as possible.

Impaled objects must be left in place. It is important to understand that the object may pinch off a blood vessel and removal of the object may result in massive blood loss from an injured blood vessel. Stabilize impaled objects with gauze and dressings and transport victim to the emergency department.

3.5 Eye problems

Common eye injuries can result from direct blows, foreign bodies or inadvertent scratching of the eye. Symptoms include immediate pain, tearing, changing vision and redness. Bruising and bleeding can occur. More serious injuries include punctures and lacerations.

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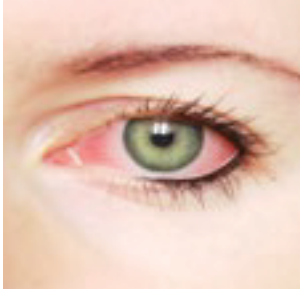
Simple irritants such as dust or debris can be flushed using water. Any chemical exposure to the eye should be flushed with copious water while also contacting 911. Special equipment can be required to adequately irrigate the eye: seek professional care.



If a more serious injury to the eye is suspected, protect both eyes with a bandage or eye shield and contact 911. Because the eyes work in pairs, leaving one eye uncovered causes both eyes to move when the good eye tracks objects. Covering both eyes minimizes movement of the injured eye, however leaves the victim effectively blind. This can be dangerous and frightening to the victim. Never leave a victim with both eyes bandaged alone. They will require verbal cues about their environment around them as well as reassurance. A physician skilled in eye care must evaluate these injuries.

3.6 Head Injuries

Head injuries can accompany any traumatic event. Signs and symptoms of a head injury or traumatic brain injury include the following:

- Confusion
- Headache
- Nausea and vomiting
- Memory loss
- Sleepiness
- Loss of balance and coordination
- Seizure
- Loss of consciousness

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A person demonstrating any of the above should be further evaluated by a physician. Head injuries can be devastating and have lifelong consequences resulting in loss of function and decreased productivity. Permanent disability can occur in more severe cases. Protect the victim from further injury by stabilizing the head and neck manually and prepare them for transport to advanced medical care. Observe closely for changes in condition. Be prepared to start CPR if the patient becomes unconscious.

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3.7 Spinal injuries

Spinal injuries can occur from a fall, diving injury, car accident, sporting event or almost any other physical activity. Head injuries may accompany spinal injuries. A high index of suspicion must be maintained and efforts made to protect against further injury to the spine and spinal cord.

The following increases the risk of a spinal injury:

- Age greater than 65
- Bicycle or motorcycle crash
- Car accident
- Fall from heights
- Pain in the midline of the neck or back overlying the bony prominences
- Numbness, tingling or weakness
- Intoxication or substance use
- Other distracting painful injuries

Injuries to the spine can be unstable. Unnecessary movement of the victim can result in spinal cord injury and permanent paralysis. When performing first aid on a person with a suspected spinal injury avoid bending, flexing or twisting the person's head or neck. If they begin to vomit, stabilize their head and neck by placing both hands on the side of the head and neck, and assist them to their side. Maintain stabilization until more advanced help arrives. 911 should be called as soon as possible.

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3.8 Bone and joint injuries

Bone and joint injuries are common occurrences in daily life. Physically active people such as those participating in sports are more likely to suffer these types of injuries. The elderly and infirm are also at high risk for fall related sprains, strains, and breaks. Not just young healthy athletic people. Sprains occur when excessive force or abnormal motion stretches a joint beyond a normal degree. The result is pain, swelling and even bruising. It is impossible to rule out a fracture without an x-ray. The first aid care for both sprains and broken bones includes the following:

1. Ensure the scene is safe and wear personal protective equipment
2. Apply gauze to any open wounds
3. Apply an ice pack to the injured area for up to 20 minutes
4. Encourage further evaluation by a healthcare provider and avoiding use of the injured part

911 should be contacted if any of the following are present:

- Open wound over a joint
- Abnormal position or bent extremity
- Obvious joint dislocation

The following special circumstances deserve discussion. An open or compound fracture occurs when the bone breaks through the skin. Do not attempt to push the bone back in and/or straighten the extremity. Bones that are in an abnormal position or bent should be splinted in place. Do not attempt to manipulate or correct an abnormally positioned bone or joint.

A splint can protect injured extremity. A splint can be made by using magazines, wood or rolled up towels. Pad the injured extremity if possible, by using a towel or cloth. Place splint material on either side of the injured extremity and secure in place using tape or gauze. Make sure the splint is not too tight. The fingertips or toes in a splinted extremity should remain warm and pink. Seek immediate care in a medical facility.

Amputations occur when part of the body is accidentally cut off. Because surgeons may be able to reattach an amputated part, it should always be transported to the hospital with the patient.

Perform the following steps when dealing with an amputation:

1. Ensure scene safety, get the first aid kit and put on personal protective equipment
2. Activate the emergency response system by calling 911
3. Apply direct pressure with gauze to the bleeding area
4. Locate the amputated body part and care for it as instructed below
5. Stay with the injured person until more skilled providers arrive

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Caring for an amputated part involves the following:

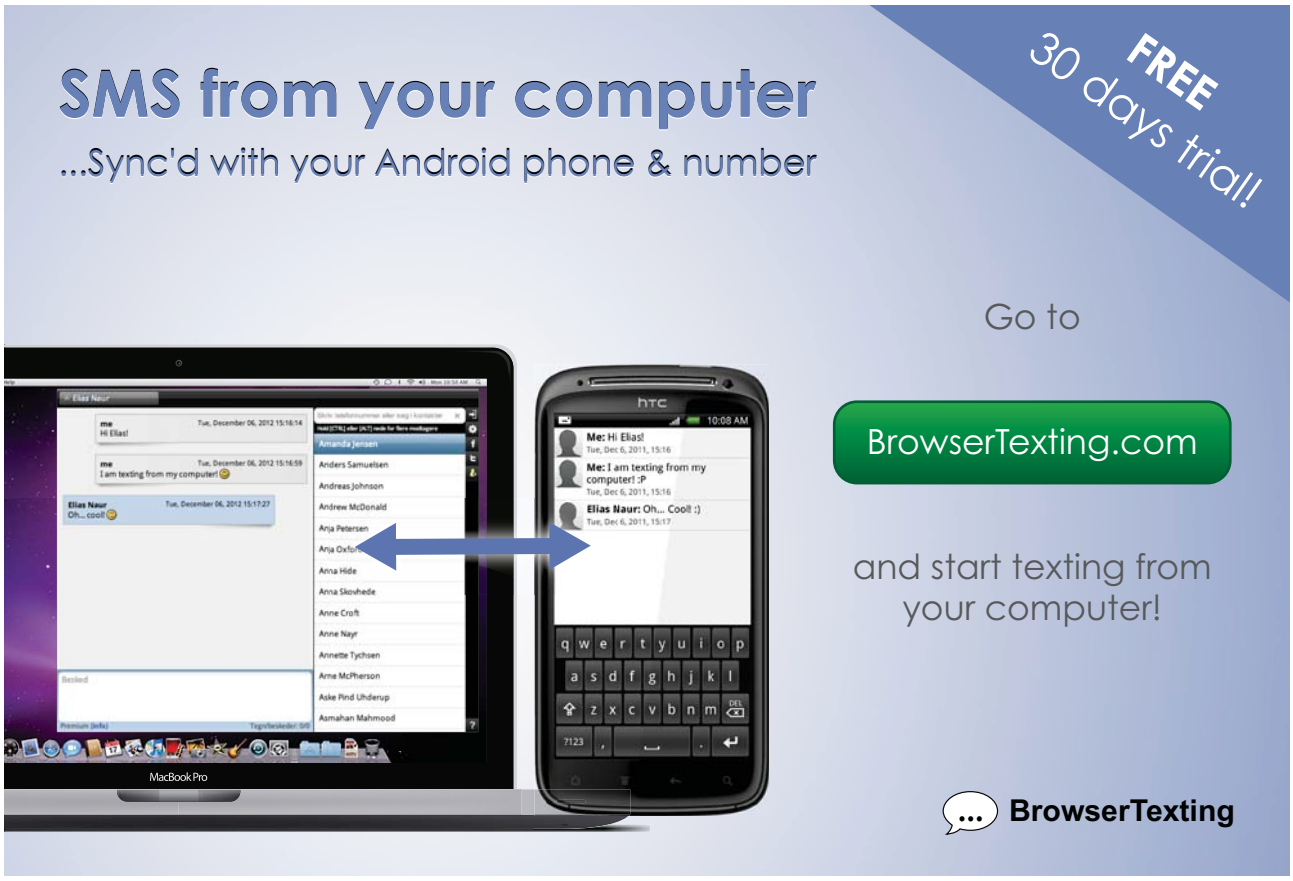
1. Wear personal protective equipment
2. Locate the amputated part
3. Gently rinse with clean water
4. Wrapped in gauze and place the amputated part in a plastic bag and seal
5. Fill another bag with ice and place the first bag with the amputated part in this bag and seal
6. Write the person's name on the bag
7. The amputated part and person should be transported together to the hospital 19

3.9 Burns and electricity

Burns can occur from direct contact with any heat source, electricity and certain chemicals. Burns can vary from minor superficial burns to very deep burns that damage muscle, tendon, nerve, and even bone. High-voltage electrical injuries can produce devastating injuries and can be fatal. Any person sustaining an electrical injury requires evaluation in the emergency department.

Small burns can be treated with first aid by doing the following:

1. Ensure that the source of the burn has been dealt with and the scene is safe
2. Wear personal protective equipment and get the first aid kit
3. Rinse the burn in cool or cold water



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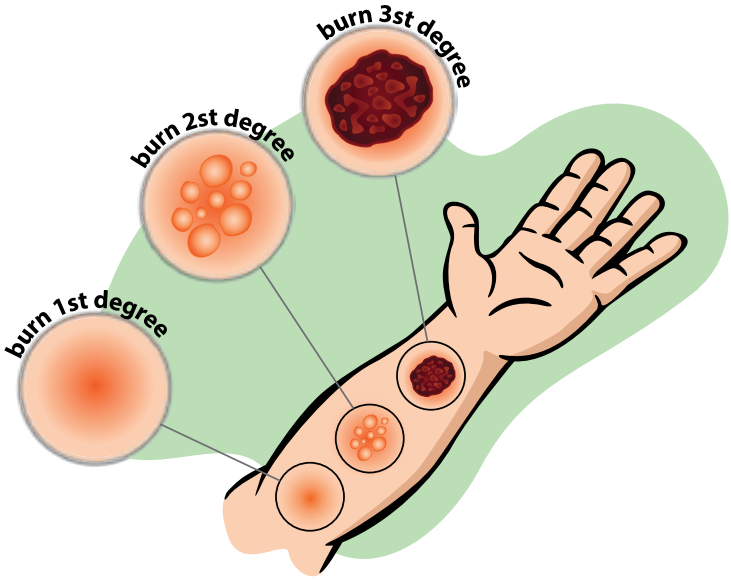
4. Apply antibiotic or burn cream if no allergy exists
5. Cover with a clean, dry nonstick dressing
6. Have the victim follow up with a healthcare provider



Do not apply ice to a burn. This technique will result in a cold injury on top of a burn and cause further tissue damage.

911 must be contacted when the following occur:

- A large burn
- Facial burns to the face, hands, or genitals. Burns to skin over joints such as the backs of the knees also require special treatment as constant motion will make healing more complicated.
- Difficulty breathing
- A fire
- Possibility of carbon monoxide exposure

Stop, Drop, and Roll is the best way to put a fire out. You can also smother the person with a wet blanket to extinguish the flames. Remove the blanket after the fire is out.

Caring for a person with a large burn involves the following steps:

1. Ensure that the scene is safe
2. Call 911
3. Put on personal protective equipment and get the first aid kit
4. Remove the victim's clothing and jewelry if possible

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3.10 Self assessment injuries and trauma

1. You are treating a victim with a large laceration to the arm. Direct pressure is not controlling the bleeding. What is the next step?
   a) Apply tourniquet
   b) Go for help
   c) Start an IV
   d) Await additional help

2. A 20-year-old person dove off the end of their dock. Upon reaching the surface of the water, they do not appear to be moving. What is the likely cause?
   a) Heart attack
   b) Low blood sugar
   c) Neck injury
   d) Mammalian diving reflex

3. You respond to an archery range due to an injury. The victim has an arrow impaled in their groin. Which of the following is the best option?
   a) Push the arrow through the other side of the leg and remove
   b) Stabilize in place
   c) Remove arrow and apply direct pressure
   d) Apply tourniquet and then remove arrow

Answers

1. A

Severe bleeding that is not controlled by direct pressure must be dealt with quickly. A tourniquet it is a temporary control measure and may be life saving.

2. C

Diving into shallow water is a common cause of cervical spine injury and potential paralysis. The mammalian diving reflex occurs in very cold water and results in a slowing of the heart rate.

3. B

Impaled objects must be left in place. Attempts at removal in the field can lead to uncontrollable hemorrhage and death. Stabilize the object in place. The victim is then transported to a hospital for further care.

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4 Environmental injury and illness

Our growing quest for outdoor adventure often leads to injury and illness as a result of specific factors related to the environment. This section discusses a variety of conditions that frequently require first aid care.

4.1 Insect problems and animal bites

Insect bites and stings are a common and annoying occurrence. Most bites are minor but the potential for a serious allergic reaction does exist.

Be alert in any signs or symptoms of a severe allergic reaction, as this must prompt immediate 911 notification. Remove the bee stinger if visible by scraping it away. Wash the area with cold water and apply ice. Stay with the person for at least 30 minutes as some allergic reactions can be delayed in onset.

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Stings or bites by insects such as spiders, scorpions and fire ants can cause local reactions, but on occasion more serious systemic reactions can occur. (*Fig. 1*)

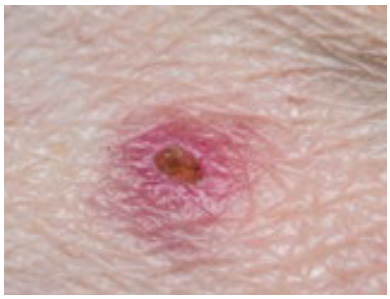

Fig. 1

Signs and symptoms that suggest a more serious reaction include:

- Nausea or vomiting
- Severe pain at the site
- Abdominal pain
- Difficulty breathing
- Muscle rigidity
- Headache
- Decreased responsiveness

The black widow spider bite is known to cause severe abdominal pain in children that can mimic appendicitis.

Ticks carry a variety of diseases and one must be vigilant for signs and symptoms for up to one month after exposure. (*Fig. 2*) Signs of a tick- borne illness include fever, headache, joint pain, and skin rash. To remove an attached tick, grasp it by the head with a tweezers and pull straight out. Clean the area with soap and water or an alcohol swab. If the tick bite occurred in a geographic area where tick-borne disease occurs, seek medical attention for possible prophylactic antibiotic therapy. Lyme disease can produce a distinctive "bull's eye" rash. Seek medical treatment.

Fig. 2

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A bite from an animal such as a raccoon, bat, skunk, fox, or coyote carries the highest risk of rabies. Always make sure the scene is safe when giving first aid to any animal bite victim. Contact the emergency response system as an animal control officer may be able to capture the animal and determine the risk of rabies. Clean the wound with soap and water and control bleeding by applying direct pressure. Animal bites are prone to infection and can cause further injury due to the puncture nature of the wound. Seek medical care by a qualified healthcare provider for any bite that breaks the skin or if there is concern about rabies or other infection.

Snakebites require medical attention. If the pain is getting worse, swelling occurs, bruising develops or systemic signs such as nausea and vomiting develop, a poisonous snakebite has occurred. Call 911 and do not delay medical attention. Make sure the scene is safe and the snake is no longer a threat. Keep the person calm and try to avoid moving the extremity that was bitten. Remove any constricting clothing and jewelry from the affected area. Gently wash with soap and water if available. Additional care is required in a hospital setting. Do not apply a tourniquet.

4.2 Temperature related illnesses

Heat-related illness can occur due to extremes of temperature, particularly in the elderly, and during vigorous exercise. Illnesses include heat cramps, heat exhaustion and heat stroke.

Heat cramps result in painful muscle spasms of the extremities, the back, and the stomach. Sweating and headache may accompany the cramps. Symptoms most often resolve with rest, cooling-off drinking water, a sports drink, or similar electrolyte solution. Light stretching and massage can also be helpful.

Heat exhaustion is more serious and signs include dizziness, vomiting, muscle cramps, fatigue, increased sweating and lightheadedness.

Move the person immediately to a cooler environment if possible. Have the victim lie down and loosen or remove as much clothing as possible. Use cool water to spray them and fan if available. A cool damp cloth can be used as an alternative. Encourage them to drink water or a sports drink. Remain with them until the emergency medical response arrives.

Heat stroke is life-threatening and immediate action is required. Signs and symptoms of heat stroke include confusion, loss of consciousness, dizziness, muscle cramps, vomiting and seizures. Call 911 immediately.

Take the following immediate actions when treating a heat stroke victim:

1. Assess scene safety, wear protective equipment, obtain first aid kit and AED
2. Rapid cooling is imperative. Use a spray bottle with cold water and a fan if available
3. If the victim is able, encourage them to drink water, a sports drinks or electrolyte solution
4. Continue to cool the victim until their behavior returns to normal or advanced help arrives

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4.2.1 Sunburn

Exposure to the UV radiation from sunlight can result in sunburn. Sunburn can be minor or result in blistering and sloughing (*Fig. 1*) of skin. Avoidance of additional sun exposure is key. Encourage hydration and drinking of extra fluids. Topical aloe vera can provide symptomatic relief. If not allergic, ibuprofen can also help alleviate some of the discomfort.

Fig. 1

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4.2.2 Frostbite

Exposure to cold can result in frostbite and is most common in extremities such as fingers, ears, nose and toes. Wind chill increases the risk of frostbite. In severe frostbite cases, ice crystals form in tissues and destroy cells causing permanent damage. The skin will appear waxy and white or yellow-gray. The area will be cold and numb and may feel like a "block of wood". The tissue will be firm and will not move or compress easily when squeezed.

Take the following actions to provide first aid for frostbite:

1. Get the person to a warm place
2. Call the emergency response number 911
3. Remove any constricting clothing and all jewelry from the affected body part
4. Remove all wet clothing
5. Redress in dry warm clothing and cover with a heavy blanket
6. The frostbitten extremity should be rapidly rewarmed in hot water (104°F)

Do not rub, squeeze or slap the affected extremity as this may increase tissue damage. Do not rewarm a frozen extremity if there is a risk of refreezing. Seek further care from a healthcare professional.

4.2.3 Hypothermia

Hypothermia is a potentially life-threatening condition when the body temperature falls dangerously low. Hypothermia can develop even in non-freezing temperatures.

Signs and symptoms of hypothermia are:

- Behavior change (confusion or lethargy)
- Paradoxical undressing
- Shivering
- As hypothermia worsens, shivering stops
- Muscle stiffness
- Cold skin
- Decreased respiratory effort
- Progression to unresponsiveness and death

Rapid action is required to care for a hypothermia victim. Call 911 immediately and perform the following actions:

- Remove the person from the cold and get them into a warm environment
- Remove any wet clothing and dry the person
- Redress in dry warm clothing and cover with a blanket

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- Cover the head as this is a source of significant heat loss
- Be prepared to perform CPR
- Stay with the victim until advanced help arrives

4.3 Toxin and poison exposure

The list of toxins and potential poison exposures is extensive and beyond the scope of this resource. Some basic concepts will be presented here that are universally applicable for first aid providers.

A material safety data sheet (MSDS) is required to be available where chemicals are in use in businesses and institutions. The sheets provide information about the composition of various chemicals and are useful when contacting poison control.

The following actions apply to providing first aid in these situations:

1. Call 911
2. Ensure the scene is safe and wear personal protective equipment
3. Get the first aid kit and AED
4. Tell the dispatcher the chemicals involved if possible
5. Remove the victim from the toxin or poison if possible. Seek a well-ventilated area if possible
6. Remove saturated clothing if present
7. Follow any recommendations from the 911 dispatcher or MSDS sheet
8. Stay with the victim until advanced help arrives
9. If CPR is required, ensure a mask is used if possible

4.4 Self assessment environmental injuries

1. child was bitten by something and now complains of severe abdominal pain. What is the most likely cause?
   a) Black widow spider
   b) Hornet sting
   c) Fire ant
   d) Tick

2. You are treating a frostbite victim. What is the best way to warm up their feet?
   a) Soak in hot water
   b) Rub vigorously
   c) Slap and then massage
   d) Room temperature water

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3. A factory worker is sprayed in the face by unknown chemical. Which of the following actions is time critical?
   a) Contacting their personal physician
   b) Having them sit down
   c) Copious irrigation of the eyes
   d) Prophylactic CPR

Answers

1. A

Black widow spider bites can produce systemic signs and symptoms. A rigid abdomen is classic for this type of poisonous bite in children and can even mimic acute appendicitis.

2. A

Soak the affected extremity in hot water of approximately 104°F. Avoid rubbing, slapping, squeezing or vigorously massaging as this may cause further tissue damage.

3. C

The eyes should be flushed with copious amounts of water when a chemical exposure occurs. Acids and alkaline solutions are particularly caustic and can lead to permanent vision impairments or loss.

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5 CPR & AED for adults

Cardiopulmonary resuscitation, or CPR, is a vital and essential skill that can save the life of a victim. The two key elements are pressing on the chest, also called compressions, and providing breaths. Any child past puberty is treated with adult CPR. Young children and infants require special considerations for CPR.

5.1 Adult CPR

CPR is comprised of chest compressions, airway and rescue breathing. Quality CPR rapidly beginning high quality chest compressions, as these are considered the most important aspects. Compressing the chest circulates blood to the brain and heart. High quality chest compressions are delivered at a rate of at least 100 per minute and at a depth of at least 2 inches.

5.1.1 Compressions

Chest compressions have the greatest significance for success and survival. Many rescuers fail to push hard or fast enough. Contrary to general belief, it is unlikely that a victim will be seriously injured from compression. If you're not breaking ribs, you're not pressing hard enough. Especially in the elderly. High quality chest compressions have the greatest chance to save a life.

Chest compressions should always be given at the rate of at least 100 compressions per minute.

CPR always begins with compressions before administering breaths. Rescuers who are uncomfortable performing mouth-to-mouth and do not have a mask may perform hands-only CPR and give compressions at a rate of 100 compressions per minute.

Perform the following tasks for chest compressions:

1. Place the victim on their back on a firm and flat surface
2. Remove or open up clothing at the neck and chest area
3. Feel for the end of the breastbone (sternum) (*Fig. 1*)

Fig. 1

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4. Place the heel of one hand on the lower half of the breastbone. Avoid pressing down on the very end of the breastbone as the bony tip, called the xyphoid process, may break off and slash the liver causing internal bleeding. Put the other hand on top of the first. (*Fig. 2*)

Fig. 2

5. Press straight down at least 2 inches and perform compressions at a rate of at least 100 a minute. (*Fig. 3*)

Fig. 3

6. Let the chest recoil completely between compressions

Performing proper CPR is often tiring. Ask to switch positions when tired if another rescuer is available to help. Remain encouraging towards each other, and continue to perform compressions properly a rate of at least 100 minutes and at least 2 inches in depth.

5.1.2 Giving breaths

Giving breaths during CPR can help maintain a supply of oxygen in the lungs. This is in turn circulated to the brain and vital organs by chest compressions. The preferred method is to use a mask; however, mouth-to-mouth can also be performed. A correctly executed breath will cause the victim's chest to rise.

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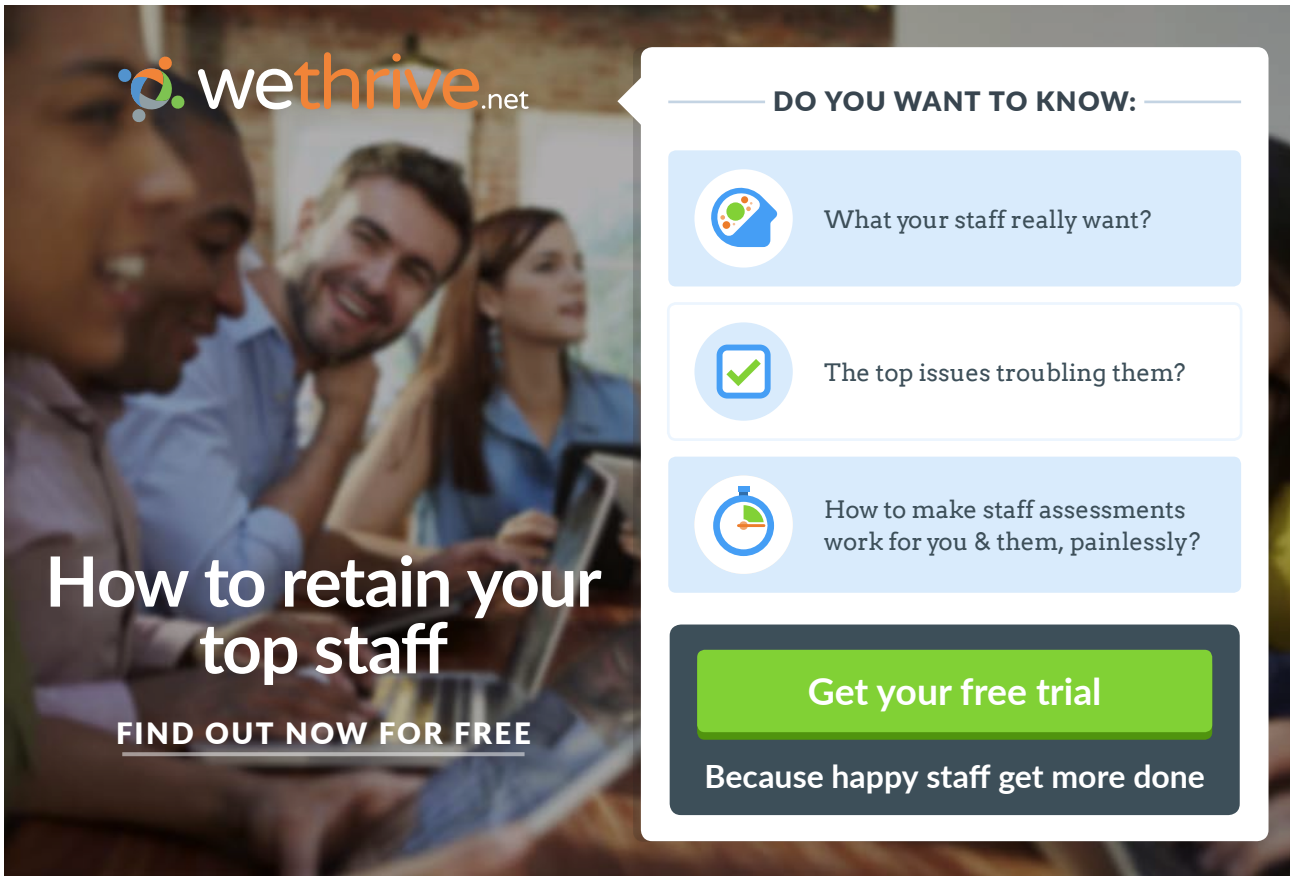
Follow these steps to open the victim's airway:

1. Put one hand on their forehead (*Fig. 1*)

Fig. 1

2. Place your fingers on the bony part of their chin (*Fig. 2*)

Fig. 2



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3. Gently tilt the head back while lifting the chin (*Fig. 3*)

Fig. 3

Now you are ready to give breaths. Perform the following actions:

1. Hold their airway open as above and pinch thier nose shut (*Fig. 4*)

Fig. 4

2. Take a deep breath and seal your mouth around the victim's mouth (*Fig. 5*)

Fig. 5

3. Blow into their mouth for one second and watch their chest rise
4. Repeat with a second breath

If the chest doesn't rise, reposition the airway. Let their head go back to a normal position and repeat the head-tilt/chin-lift maneuver. Then give another breath and look for the chest to rise.

Perform the chest compressions without interruption. It should take no longer than 10 seconds to give two breaths. If the victim's chest fails to rise within 10 seconds, begin chest compressions again.

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5.1.3 Mask use

CPR, including giving breaths, is generally safe. If a mask is available, it should be used. The mask fits over the victim's mouth and nose. Most masks (*Fig. 1*) have a pointed end and in this should go over the bridge of the victim's nose.

Fig. 1

Follow these steps when using a mask to give breaths:

1. Place the mask over the victim's mouth and nose (*Fig. 2*)

Fig. 2

2. Open their airway by performing the head-tilt/chin-lift maneuver
3. Ensure a good seal between the mask and their face
4. Give a breath over one second and watch the chest rise
5. Deliver the second breath

5.2 AED use in adults

When the heart doesn't work properly a victim may collapse. An automated external defibrillator or (AED) can deliver a shock to help restart the heart. These portable units have a computer that analyzes the heart rhythm and determines if a shock is needed Starting CPR immediately and quickly using an AED, improves the chances of survival.

The AED is very simple to use. Follow the diagram or voice instructions given by the AED. Apply the pads properly and let the computer determine if and when a shock is needed. Make sure no one is touching the victim if the AED advises you to push the shock button. If an AED is not quickly available, begin CPR and send someone to locate one.

An AED should be used any time a person collapses, fails to respond and is only gasping or barely breathing. Press the on button and then follow the prompts you see and hear.

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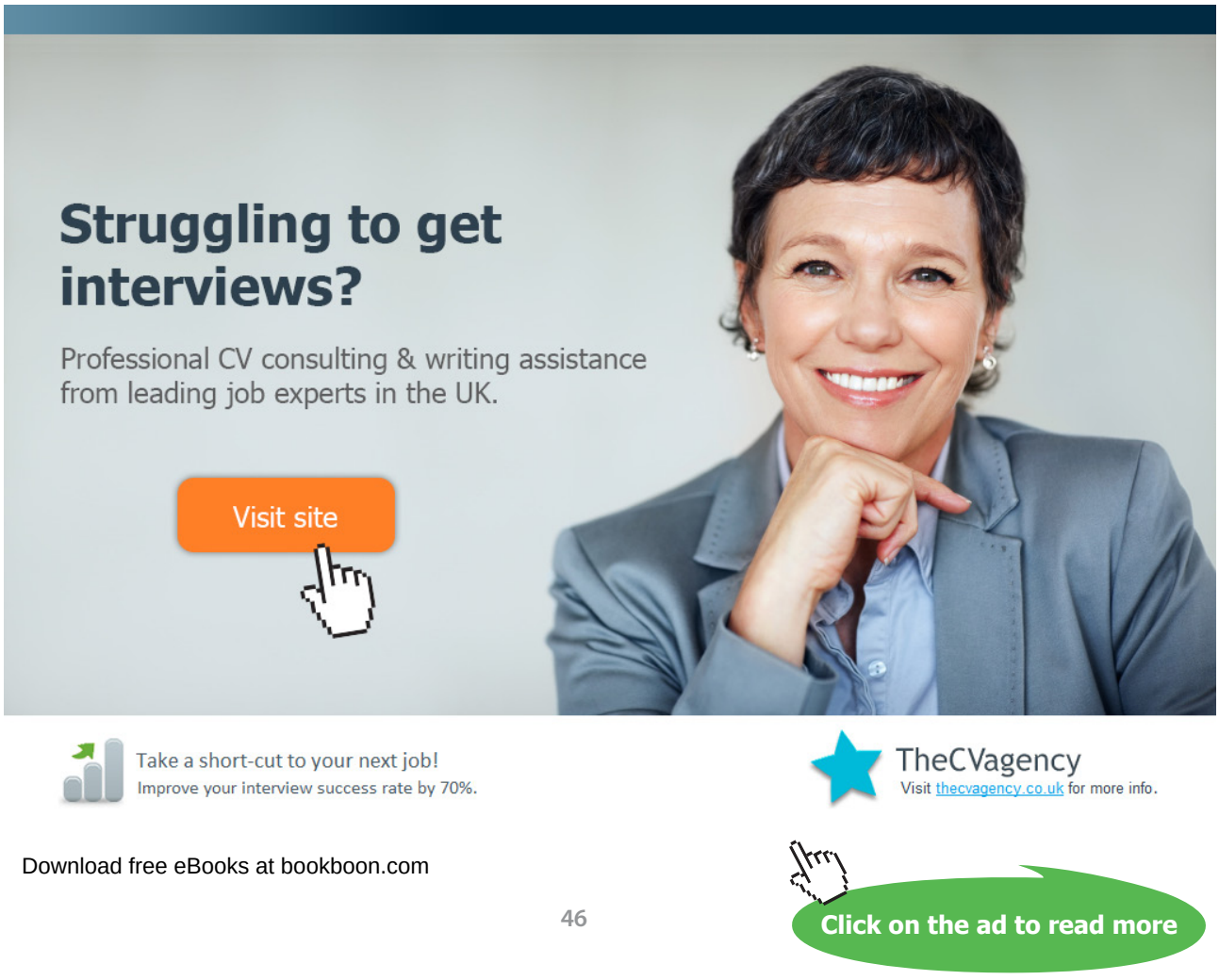
Follow these steps to use an AED:

1. Power on
2. Expose chest (*Fig. 1*)

Fig. 1

3. Apply pads to victim (*Fig. 2*)

Fig. 2



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4. Connect pads
5. Clear patient (*Fig. 3*)

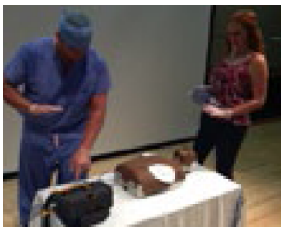

Fig. 3

Fig. 4

6. Analyze rhythm
7. Follow prompts: Shock Advised, No shock advised, check connection, etc.
8. Resume CPR with compressions

NOTE – If a victim has a medication patch on their chest, remove it before applying the AED pads. Also, if there is a bulge under the skin of their chest, a pacemaker may be present. Avoid placing the AED pads over this device and adjust placement accordingly.

If the AED malfunctions or does not work, continue performing CPR until additional help arrives.

5.3 Calling EMS / 911

When encountering a victim who is unresponsive, barely breathing, or not breathing quickly call 911 – or better yet send a second person to activate EMS for you. Rapid activation of EMS by dialing 911 or the appropriate emergency number is the first link of the chain of survival.

Always make sure the scene is safe when approaching a victim. If you become injured or disabled, you will be unable to help the first victim and create a second victim for rescuers.

Tap the victim and shout – "are you okay?" If they fail to make any response or reaction, they are considered unresponsive. Yell for help and send somebody to call 911. Send someone to get an AED if possible.

Stay on the phone until the 911 dispatcher tells you it's okay to hang up. The dispatcher can help you make decisions and will not delay the arrival of additional help.

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After determining that the victim is unresponsive, check their breathing. If they are barely breathing or only gasping, begin CPR. Gasping may be forceful or weak, but is generally ineffective. This is an abnormal sign and often occurs in cardiac arrest. Immediately begin CPR.

If the victim is breathing normally but not responding, roll them onto their side. This can help keep their airway open and prevent them from choking on vomit. You need to monitor their breathing and be prepared to start CPR if their condition worsens.

5.4 Putting it together

Unresponsive AND no breathing or only gasping for air EQUALS give CPR

Use the following steps when giving CPR to an adult:

1. Make sure the scene and area around the adult is safe
2. Tap and shout – "Are you okay?"
3. Yell for help – You or someone else needs to Call 911 and get an AED
4. Check breathing
5. If not responding, not breathing, or only gasping, start CPR
6. Give 30 compressions at a rate of at least 100 per minute and remember each compression must be at least 2 inches. Let the chest rise back up before you start your next compression
7. Open the airway and give two breaths
8. Continue giving compressions and breaths until the AED arrives, more advanced help arrives and assumes care, or the person begins to respond

5.5 Choking in adults

Choking is a preventable cause of death that occurs when food or another object becomes stuck in the throat. The airway becomes blocked and immediate action is needed. The victim typically only has a few minutes before they pass out. The universal sign of choking consists of holding the neck with one or both hands.

Choking can be mild or severe. The chart below will help determine whether mild versus severe choking is present.

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DEGREE OF OBSTRUCTION	RESPONSIVENESS	RESCUER ACTIONS
MILD OBSTRUCTION	• Victim is breathing but may also be wheezing • Victim is coughing and making noise	• Stay with victim; try to keep them calm • Encourage them to cough • Call EMS if they do not rapidly clear the obstruction
SEVERE OBSTRUCTION	• Clutching the neck (universal sign of choking) • Weak or no cough • Not able to make noise or talk; may make high-pitched noise • Little or no breathing • Victim may be cyanotic (blue around lips and finger tips)	• Use abdominal thrusts (Heimlich maneuver) to attempt to remove obstruction • Call EMS • If victim becomes unresponsive, begin steps of CPR

5.5.1 Relief of choking

Abdominal thrusts (Heimlich maneuver)

The Heimlich maneuver is used on adolescents and adults.

How to do the Heimlich maneuver:

1. Stand behind victim and wrap your arms around their waist under their ribcage. (*Fig. 1*)

Fig. 1

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2. Put your fist above the victim's navel in the middle of their belly. (*Fig. 2*)

Fig. 2

3. With your other hand, hold the first fist and press forcefully into the abdomen and up toward their chest. (*Fig. 3*)

Fig. 3

4. Continue performing thrusts until the obstruction is relieved or the victim becomes unresponsive. If the victim becomes unresponsive begin CPR.

Very large victims or pregnant women can be treated with chest thrusts. Wrap both arms around the victim, similar to the Heimlich maneuver. Pull your arms straight back to deliver the chest thrusts.

If a person has passed out due to choking, help them to the ground. Use the heel of one hand to perform abdominal thrusts above the navel. Continue this until the food or object comes out or advanced help arrives.

5.5.2 Self assessment CPR, AED & choking

1. What age is considered an adult for CPR purposes?
   a) 2
   b) 4
   c) 6
   d) Puberty

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2) What does AED stand for?
   a) Automatic Energy Delivery
   b) Automated External Device
   c) Automated External Defibrillator
   d) Autonomous Energy Defibrillator

3. When are breaths given?
   a) After EMS arrives
   b) Before compressions
   c) With compressions
   d) After compressions

4. What does CPR stand for?
   a) Continuous positive response
   b) Caring prevention reaction
   c) Cautious proactive resuscitation
   d) Cardiopulmonary resuscitation

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5. A college student turns blue and collapses while eating chicken wings at a bar. What is the most likely cause?
   a) Cardiac arrest
   b) Alcohol poisoning
   c) Choking
   d) Drug ingestion

Answers

1. D
   Any person who is at puberty or older is considered an adult for CPR purposes.

2. C
   AED = Automated External Defibrillator. The other choices are incorrect. Note that AICD refers to automated implantable cardioverterdefibrillator and is similar to a pacemaker, but can also deliver a shock (defibrillate).

3. D
   Chest compressions are always given first. Breaths are performed afterwards. Give two breaths for every 30 chest compressions.

4. D
   CPR consists of pushing on the chest (compressions) and giving breaths (ventilation).

5. C
   The color change suggests that he is choking. Patients who are intoxicated are at increased of choking and aspirating food contents.

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6 CPR and AED for children

In this section you'll learn how to preform CPR on a child and how to use an AED on a child appropriately.

6.1 Child CPR (age 1 to puberty)

CPR in children is very similar to that in adults. The main goals are early institution of CPR, pushing hard and fast on the chest and giving breaths. Children are those who are older than one year of age but have not yet reached puberty. Some children appear adult-size and can be treated as such for the purposes of CPR.

The term, "unresponsive" or "not responding," includes any child who does not move, make a sound or speak, blink or otherwise react to your efforts to awaken them.

6.1.1 Compressions

Rescuers may be afraid to perform chest compressions out of fear of hurting the child. It is important to remember that without CPR the result will be death.

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Perform the following actions:

1. Position the child on their back on a firm hard surface
2. Move any clothing away from the chest
3. Place the heel of one hand on the lower half of the breastbone (*Fig. 1*)
4. Push straight down approximately 2 inches at a rate of at least 100 compressions per minute
5. Let the chest recoil to its normal position after every compression

Fig. 1

Fig. 1

Either one-handed or two-handed compressions can be used in child CPR. (*Fig. 1 and Fig. 2*) Performing CPR can be tiring. If someone is available to help, change roles every two minutes and work to minimize the pause in compressions.

6.1.2 Giving breaths

Unresponsiveness in children is frequently caused by breathing problems, not heart problems. Prevention of choking or severe breathing problems due to untreated illness is the most effective treatment. Giving breaths during CPR can help the child victim. Severe breathing problems from a respiratory illness can cause cardiac arrest in children. Most children who need CPR have had a breathing problem that caused the heart to beat irregularly or stop. Signs of ineffective breathing include slow breathing, very shallow or sporadic breathing, or absence of any breaths at all. Give rescue breaths to children who appear to be struggling to breathe.

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A good breath will cause the victim's chest to rise.

Follow these steps to open the victim's airway:

1. Put one hand on their forehead (*Fig. 1*)

Fig. 1

2. Place your fingers on the bony part of their chin (*Fig. 2*)

Fig. 1

3. Gently tilt the head back while lifting the chin (*Fig. 3*)

Fig. 3

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Now you are ready to deliver breaths. Perform the following actions:

1. Hold their airway open as above and pinch the nose shut (*Fig. 4*)

Fig. 4

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2. Take a deep breath and seal your mouth around the victim's mouth (*Fig. 5*)

Fig. 5

3. Gently exhale into their mouth for one second using just enough force to cause the chest to rise.
4. Repeat for a second breath

6.1.3 Mask use

Giving breaths in CPR is generally safe, however if a mask is available it should be used. This device fits over the child's mouth and nose. Many masks have a pointed end and this should go over the bridge of the victim's nose. Make sure the mask fits properly; if it is too large, a proper seal can't be obtained and efforts to deliver breaths will be ineffective.

Follow these steps when using a mask to give breaths:

1. Place the mask over the victim's mouth and nose (*Fig. 3*)

Fig. 3

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2. Open the airway by performing the head-tilt, chin-lift maneuver (*Fig. 1*)

Fig. 1

3. Ensure a good seal between the mask and face
4. Give a breath over one second and watch the chest rise (*Fig. 2*)

Fig. 2

5. Deliver the second breath

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6.2 AED use for children

An AED can be used on children, and should be used as early as possible but should not interfere with CPR. The steps for using an AED in a child are the same as those in an adult. Check the AED when it arrives on the scene. Pediatric pads should be used if the victim is less than eight years old. (*Fig. 1*) Standard (adult) pads may be used if pediatric pads are not available. If using standard pads, DO NOT let the pads overlap each other. You may need to put one of the pads on the child's back if the child is small.

Fig. 1

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Some AEDs have a switch that can be set to deliver a pediatric shock. If available, turn this switch on when using for children less than eight years old. (*Fig. 2*) If the AED cannot deliver a pediatric shock, an adult shock should be given. Be sure to start CPR. If using adult pads on a pediatric victim be sure the pads do not touch.

Fig. 2

Follow these steps to use an AED:

1) Power on (*Fig. 3*)

Fig. 3

2) Expose chest (*Fig. 4*)

Fig. 4

3) Apply pads to victim. Ensure pads do not touch. (*Fig. 5*)

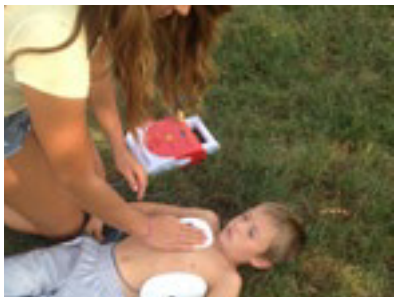

Fig. 5

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4) Connect pads (*Fig. 6*)

Fig. 6

5) Clear patient
6) Analyze rhythm
7) Follow prompts: Shock Advised, No shock advised, check connection, etc. (*Fig. 7*)

Fig. 7

8) Resume CPR with compressions

6.3 Calling EMS / 911

Always make sure the scene is safe when approaching a child victim. If you become injured or disabled, it will only make the situation worse.

Tap the victim and shout – "are you okay?" If they fail to make any response, they are considered unresponsive. Yell for help and send somebody to call 911. Send someone to get an AED if possible.

After determining the victim is unresponsive, check their breathing. If they are barely breathing or only gasping, begin CPR. Gasping maybe forceful or weak, but is generally ineffective. This is an abnormal sign and often occurs in cardiac arrest.

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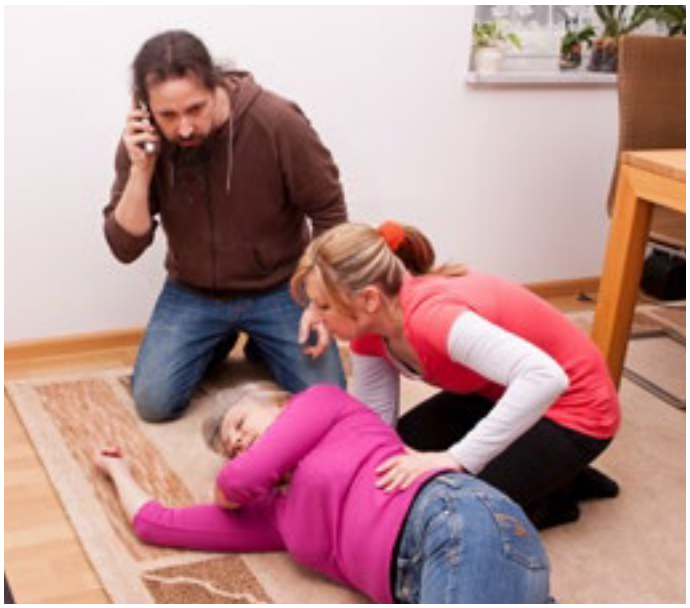
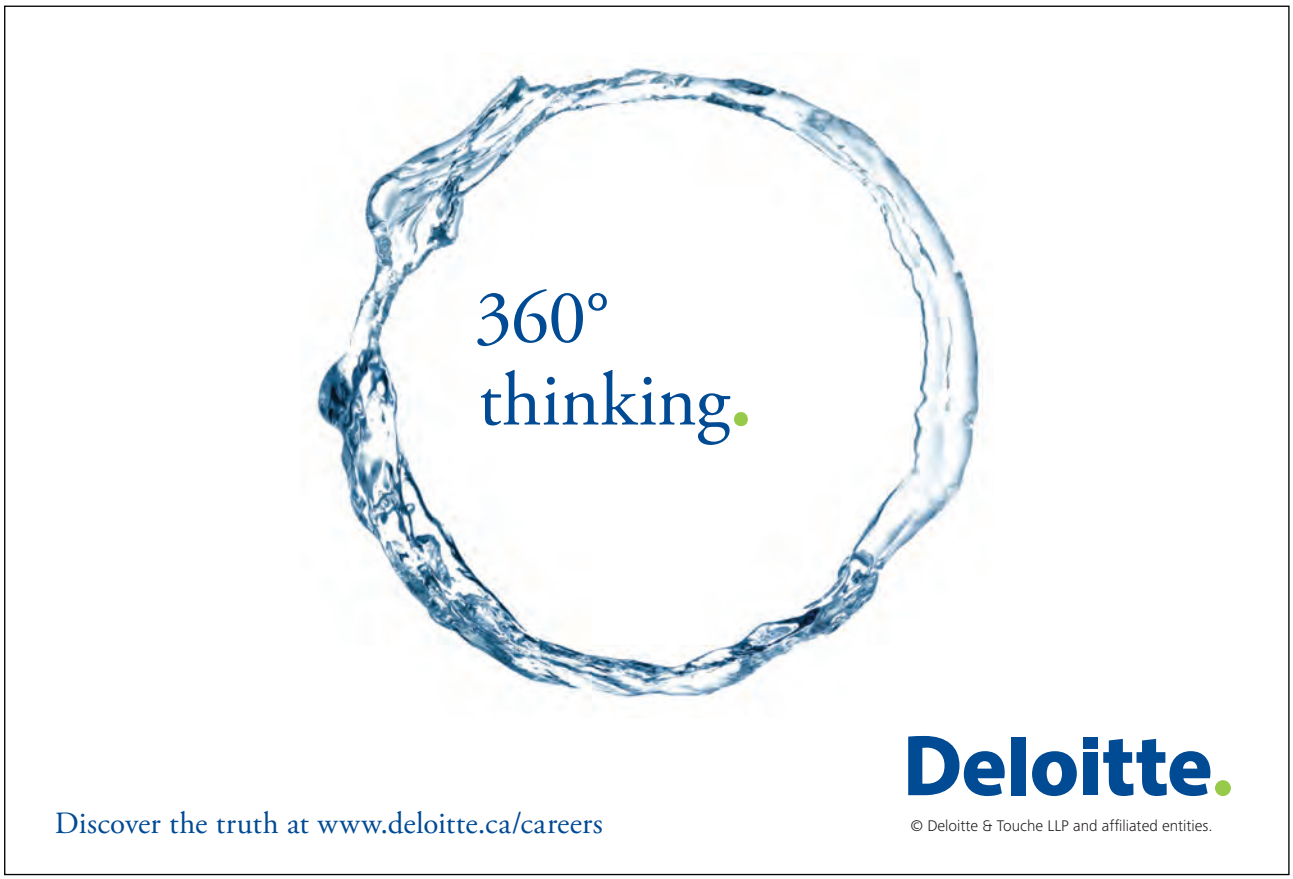
If you are alone, give 5 sets of compressions and breaths before calling 911.





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6.4 Putting it together

Children have breathing difficulties more often than they have actual heart problems. For that reason it's important to begin CPR quickly and perform five sets of CPR before going to get additional help. One set of CPR consists of 30 compressions and two breaths.

If someone else is available, send them to call EMS/911 and to find an AED. When they return, have them follow the AED prompts, apply AED pads and help with CPR.

Unresponsive child AND no breathing or only gasping for air EQUALS give CPR

Use the following steps when giving CPR to a child:

1. Make sure the scene and area around the child is safe
2. Tap and shout – "Are you okay?"
3. Yell for help
4. Check breathing
5. If not responding, not breathing or only gasping, then give five sets of 30 compressions and two breaths
6. Call 911 and get an AED
7. Resume CPR and give compressions and breaths

6.5 Choking in children

Choking can be mild or severe. If the child can make sounds and cough, the airway is mildly blocked. Stand near them and encourage them to cough. Call 911 early if you are worried about their breathing.

Severe signs of blockage include the inability to breathe, coughing without making a sound, inability to speak or the universal choking sign. Immediate action is required.

The chart below will help determine whether mild versus severe choking is present.

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DEGREE OF OBSTRUCTION	IF THE CHILDREN IS:	WHAT YOU SHOULD DO:
MILD OBSTRUCTION	• Child is breathing but may also be wheezing • Child may be coughing and making noise	• Stay with the child; try to keep them calm • Call EMS/911 if they do not rapidly clear the obstruction
SEVERE OBSTRUCTION	• Weak or no cough • Not able to make noise; may make high-pitched noise • Little or no breathing • Child may be cyanotic (blue around lips and finger tips)	• Act Fast • Follow the infant choking steps

6.5.1 Relief of choking – children

Use the Heimlich Maneuver learned in the adult section for children who are choking.

Take the following steps to relieve choking in a child:

1. Ask if they are choking. (*Fig. 1*)

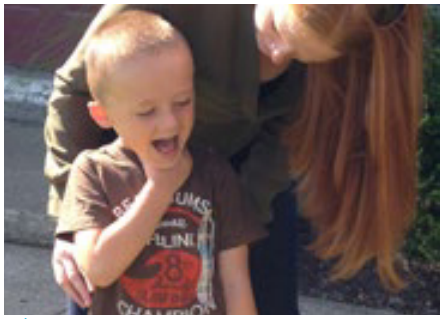

Fig. 1

2. Tell them you will help.
3. Stand behind them and wrap your arms around their body below the rib cage.

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4. Make a fist with one hand and place it just above the belly button. (*Fig. 2*)

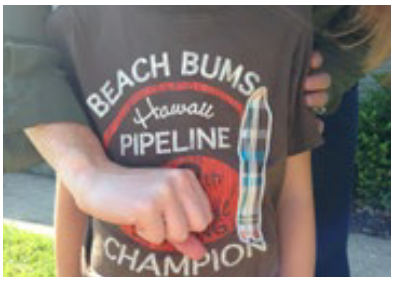

Fig. 2

5. Grab the fist with your other hand and deliver quick upward thrusts. (*Fig. 3*)

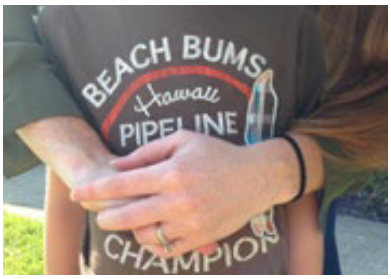

Fig. 3

6. Continue until the object comes out and breathing is possible, coughing or speaking is restored, or until the child stops responding.

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If you can see a foreign object in the victim's mouth and can easily remove it, do so. Avoid blindly sweeping the mouth with a finger as it may push a foreign body deeper into the airway. Watch and feel for breathing to begin. If the victim does not respond or begin breathing, continue to provide CPR until help arrives.

Obese children may require chest thrusts if you can't wrap your arms fully around the waist. Perform the Heimlich with your fist on the breastbone.

Any child who has had a severe choking event should see a doctor.

If the child becomes unresponsive

If the child stops responding, lay them down and yell for help. Check for breathing and begin CPR. After 30 compressions, open the airway and look for a foreign object. If visible, remove it and attempt to give a breath. Continue CPR until the victim recovers or more advanced help takes over.

6.6 Self assessment child CPR, AED & choking

1. What is the main difference in care when finding an unresponsive adult versus an unresponsive child?
   a) No difference
   b) Perform CPR first in an adult; go for help in a child
   c) Perform two minutes of CPR in a child then go for help; call immediately for adults
   d) Depends on the age of the child

2. You are a daycare provider and find a 3-year-old child unresponsive. She had laid down for a nap because she was not feeling well and when you checked on her, she was not breathing and appeared blue. You are by yourself. What is the first step in managing this case?
   a) Back blows
   b) Blind finger sweep
   c) Activate 9-1-1
   d) Deliver 2 minutes of CPR.

3) You are concerned that this child may have choked. What is the best method to clear a foreign body from the airway?
   a) Heimlich Maneuver
   b) CPR
   c) Back blow/chest thrust
   d) Blind finger sweep

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4) You are performing CPR on a six-year-old child. The AED arrives. Which of the following is most appropriate?
   a) Use adult pads
   b) Use child pads
   c) Cannot use an AED in a six-year-old
   d) Wait for EMS to arrive

Answers are on following page.

Answers

1. C
   When coming upon an unresponsive child who requires CPR, deliver five sets of compressions and breaths before going for help. For an adult victim requiring CPR, go summon help and then return to the victim and begin CPR.

2. D
   If you are alone, unwitnessed arrest in a child requires 2 minutes of CPR before activating EMS. If assistance is available, send them to activate 911 while you begin CPR. Back blows are indicated for infant foreign body/choking. Do not perform a blind finger sweep as it may push a foreign body farther into the airway.

3. B
   Abdominal thrusts are not chest compressions. Chest compressions are delivered to the unresponsive during CPR. The AHA recommends chest compressions without a pulse check in the child who becomes unresponsive in a choking emergency.

4. B
   Child pads should be used when available. If using adult pads, make sure they do not touch each other. Do not delay the use of an AED.

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7 CPR for infants

In this section you'll learn how to preform CPR on a infant .

7.1 Infant CPR (under 1 year old)

CPR for children and infants is almost identical. An infant that does nothing when you tap or shout is considered unresponsive and CPR needs to be given.

7.1.1 Compressions

Push hard and fast just as you would in a child or adult receiving CPR. Placing the infant on a firm hard surface makes giving CPR easier.

Perform the following actions:

1. Position the child on their back on a firm hard surface
2. Move any clothing away from the chest
3. Place 2 fingers of one hand on the breastbone just below
4. the nipple line
5. Push straight down approximately 1½ inches at a rate of at least 100 compressions a minute

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6. Let the chest recoil to its normal position after every compression

Performing compressions correctly is essential to effective CPR and can be physically tiring. If another person can help, switch off every two minutes while minimizing interruptions in compressions.

7.1.2 Giving breaths

Giving breaths during CPR can help the infant victim. Like children, many cases of cardiac arrest in infants are primarily due to respiratory problems. Giving breaths and administering chest compressions are important for infants receiving CPR. A good breath will cause the infants's chest to rise.

Follow these steps to open the victim's airway:

1. Put one hand on the forehead
2. Place your fingers on the bony part of the chin
3. Gently tilt the head back while lifting the chin

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Fig. 1

Fig. 2

Be careful not to tilt the head too far back as this can also block the airway. Be sure to press on the bony part of the chin and not the soft part under the chin as this may also block the airway.

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Now you are ready to give breaths. Perform the following actions:

1. Hold their airway open as above by gently pressing forehead back and lifting chin with one finger. (*Fig. 1*)
2. Take a deep breath and seal your mouth around the infants' mouth & nose (*Fig. 2*)
3. Blow for one second and watch the chest rise. Remeber to gently exhale a tiny puff of air. Very little volume or force is required to inflate an infant's lungs. Blowing too much or to hard will damage an infant's lungs.
4. Repeat for a second breath

If your mouth is too small to cover both the infants mouth and nose, give breaths through the infants nose while holding their mouth closed.

If the chest does not rise after the first breath, let the head go back to normal position and then re-open the airway by tilting head and lifting the chin. Try to get a breath in while watching for chest rise. Do not interrupt compressions for any more than 10 seconds when giving breaths.

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7.1.3 Mask use

Giving breaths in CPR is generally safe for the rescuer. However, if a mask is available, it should be used. This device fits over the infant's mouth and nose. Many masks have a pointed or tapered end and this end should go over the bridge of the victim's nose. Make sure the mask fits properly; if it is too large, a proper seal can't be obtained and efforts to deliver breaths will be ineffective.

Follow these steps when using a mask to give breaths:

1. Place the mask over the victim's mouth and nose (*Fig. 1*)

Fig. 1

2. Open the airway by performing the head-tilt, chin-lift maneuver
3. Ensure a good seal between the mask and face
4. Give a breath over one second and watch the chest rise

7.2 Calling EMS / 911

1. Always make sure the scene is safe when approaching a victim. If you become injured or disabled, it will only make the situation worse.
2. Tap the victim and shout to determine if the infant is unresponsive. If they fail to make any response or reaction, they are considered unresponsive. An unresponsive infant will not move when you touch them; they won't cry or make any sounds and their body will be limp.
3. Yell for help and send someone to call 911.
4. If you are alone, begin 5 cycles CPR before calling 911.

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7.3 Putting it together

Infants more often have a breathing problem than an actual heart problem. For that reason it's important to begin CPR quickly and perform five sets of CPR before going to get additional help.

If someone else is available, send them to call 911 and to find an AED. One set of CPR consists of 30 compressions and two breaths. When they return, have them follow the AED prompts, apply AED pads and help with CPR.

Unresponsive infant AND no breathing or only gasping for air EQUALS give CPR

Use the following steps when giving CPR to an infant:

1. Make sure the scene and area around the infant is safe
2. Tap and shout – determine if unresponsive
3. Yell for help. If a second person is available have them dial 911 and get an AED
4. Check breathing
5. If not responding, not breathing or only gasping, then give five sets of 30 compressions and two breaths
6. Call 911, if a second person has not already done so
7. Resume CPR and give compressions and breaths

7.4 Choking in infants

Choking occurs when food or a foreign object is stuck in the throat and blocks the airway. Infants often put small objects in their mouth and are at an increased risk of choking. Severe choking requires quick action. Immediately perform back slaps and chest thrusts.

The chart below will help determine whether mild versus severe choking is present.

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DEGREE OF OBSTRUCTION	IF THE INFANT:	WHAT YOU SHOULD DO:
MILD OBSTRUCTION	• Is breathing but may also be wheezing • Is coughing and making noise	• Stay with the infant; try to keep them calm • Call EMS/911 if they do not rapidly clear the obstruction
SEVERE OBSTRUCTION	• Has weak or no cough • Is not able to make noise; or is makeing a high-pitched noise • Has little or no breathing • Appears cyanotic (blue around lips and finger tips)	• Act Fast • Follow the infant choking steps

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7.4.1 Relief of choking in infants

Back slaps and chest thrusts are used in infants who are choking.

Perform the following actions:

1. Hold the infant in your lap.
2. 2. Put the infant face down and their head lower than their chest; they should be resting on your forearm. Put your forearm on your thigh.
3. Support the child's head and neck with your hand and be sure to avoid putting pressure on their throat.
4. Give 5 back slaps between the child's shoulder blades with the heel of your hand. (*Fig. 1*)

Fig. 1

5. Using both hands and arms, turn the child face up so they are now resting on your other arm; this arm should now be resting on your thigh.
6. Using 2 fingers in the same spot as for CPR, provide five quick chest thrusts. (*Fig. 2*)

Fig. 2

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7. If the obstruction is not relieved, turn the infant face down on your other forearm and repeat the process.
8. Continue until the infant begins to breathe or becomes unresponsive.

Try to keep the infant's head lower than the rest of the body when performing back slaps and chest thrusts.

If you can see a foreign object in the victim's mouth and can easily remove it, do so. Avoid blindly sweeping the mouth with a finger as it may push a foreign body deeper into the airway. Watch and feel for breathing to begin.

If the infant stops responding, place the victim on a firm flat surface and yell for help. Check for breathing and begin CPR. After 30 compressions, open the airway and look for a foreign object. If visible, remove it and attempt to ventilate with 2 breaths.

If the infant become unresponsive

If the infant does not respond or begin breathing, continue to provide CPR until help arrives. You will know an infant has become unresponsive as they will stop moving and squirming in your arms and their body will become limp. In this case, begin CPR immediately with chest compressions followed by giving breaths.

7.5 Self assessment infant CPR & choking

1. The generally accepted age of an infant is less than:
   a) 1 year old
   b) 2 years old
   c) 3 years old
   d) 4 years old

2. You are attempting to relieve choking in an infant. The infant now becomes unresponsive. What is the next step?
   a) Leave to get help
   b) Blind finger sweep
   c) Begin CPR
   d) Abdominal thrusts

3. What is the most common cause of cardiac arrest in infants?
   a) Heart problems
   b) Respiratory problems
   c) Diabetes
   d) Poisoning

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4. You come across an infants who is not responsive. When should you call 911?
   a) Immediately
   b) After 5 cycles of CPR
   c) After giving two breaths
   d) After 30 chest compression

Answers

1. A
   Infants are considered to be less than one year of age. A child is between one year and puberty.

2. C
   If an infant becomes unresponsive during attempt to relieve choking, lie them on a firm flat surface and begin CPR.

3. B
   Respiratory problems usually precede cardiac arrest in both infants and children.

4) B
   Give 5 cycles of 30 compressions and two breaths in an unresponsive infant before going to call 911. If someone is available to help, send them immediately to call 911.

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Review questions

1. CPR steps are:
   a) Airway, Breathing, Check Pulse
   b) Chest compressions, Airway, Breathing
   c) Airway, Breathing, Chest Compressions
   d) Airway, Check Pulse, Breathing

2. Critical characteristics of high-quality CPR include which of the following?
   a) Starting chest compressions within 10 seconds of recognition of cardiac arrest
   b) Allowing complete chest recoil after each compression
   c) Minimize interruptions of CPR
   d) All of the above

3. At what age is it necessary to use the child AED pads, if available?
   a) 17
   b) 16
   c) 14
   d) Up until puberty

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4. The compression to ventilation ratio for the one-rescuer giving CPR to victims of ANY age is:
   a) 30:1
   b) 30:2
   c) 15:1
   d) 15:2

5. Where on an adult requiring CPR should chest compressions be delivered?
   a) On the upper half of the breastbone
   b) On the lower half of the breastbone
   c) On the center of the chest
   d) Over the abdomen

6. An AED can be used safely in all of the following situations EXCEPT:
   a) Victim lying in the snow
   b) Victim with an implanted pacemaker
   c) Victim with a transdermal medication patch on
   d) Victim lying partially in water

7. You are alone when you encounter a patient in what appears to be cardiac or respiratory arrest. What are the first three steps you should take to stabilize the patient? Check for danger, _____, and send for help.
   a) Establish IV access
   b) Insert an advanced airway
   c) Check for response
   d) Start CPR

8. What is the proper depth of chest compressions for adults during CPR?
   a) 1 inch
   b) 2 inches
   c) 4 inches
   d) 6 inches

9. The proper steps for operating an AED are:
   a) Power on the AED, attach electrode pads, shock the patient, analyze the rhythm
   b) Power on the AED, attach electrode pads, analyze the rhythm, shock the patient
   c) Power on the AED, analyze the rhythm, attach electrode pads, shock the patient
   d) Power on the AED, shock the patient, attach electrode pads, analyze the rhythm

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10. What is the preferred method to relieve choking in infants?
    a) Finger sweep
    b) Abdominal thrusts
    c) Back slaps and chest thrusts
    d) Back slaps alone

Review question answers

1. B
   Chest compressions, Airway, Breathing

2. D
   All of the above

3. D
   Use child pads for victims who have not yet reached puberty

4. B
   30:2

5. C
   CPR is delivered in the center of the chest on the lower half of the breastbone but above the xyphoid process.

6. D
   Victim lying partially in water

7. C
   Check for response

8. B
   2 inches

9. B
   Power on the AED, attach electrode pads, analyze the rhythm, shock the patient

10. C
    Back slaps and chest thrusts

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Notes