

HOW TO HANDLE BASIC MEDICAL EMERGENCIES

Abstract:

Most every healthcare worker assigned to an area of patient care will become exposed to an emergency situation. Emergencies can occur both within and outside of a controlled hospital or clinic setting. In the community an emergency can happen in a public place or even at one's own home or neighborhood. Being the first person on the scene at a medical emergency may require that the healthcare worker respond to individual(s) suffering from a stroke, heart attack, seizure, poisoning incidence or other critical condition. Being able to recognize common medical emergencies and to deliver the proper first aid or initial response in these situations are important skills that could be lifesaving.

Learning Goals:

1. Be able to recognize common medical emergencies.
2. Identify the proper first aid or intervention for common medical emergencies.
3. Identify national resources that provide quick emergency access or response through a toll-free number to assist in an emergency situation.

Introduction

Being the first person on the scene at a medical emergency will more than likely happen in the career of most healthcare workers. The emergency can be responding to someone suffering from a stroke, a heart attack, or seizure. Being able to recognize common medical emergencies and deliver the proper first aid in these situations are important skills. The interventions discussed in the following sections are basic but important lifesaving measures.

Basic Principles Of Responding To A Medical Emergency

Emergency situations may occur at home, in a public place or in a healthcare facility. In either case, the basic principles of responding to a medical emergency are outlined below.

Help: In many of these emergencies such as a cardiac arrest the first thing to do is to get help because adequate care cannot be provided by one person, and requires a team. When unsure, the healthcare worker should call for help.

Safety: Safety in healthcare refers to both the victim and the rescuer. One of the primary rules of medicine is "*First, do no harm,*" and one of the primary rules of emergency response is "*Don't make more victims.*" The goal of safety is to not do anything that will harm the patient, healthcare workers, or someone else.

Organization: Being calm and organized as much as possible is essential in an emergency response. There is almost always more time

than imagined and much of the pressure of an emergency is the pressure of how one responds or reacts to an emergency situation.

Allergic Reactions

An allergic reaction is defined as an abnormally strong immune system response to a substance that is usually harmless. Allergic reactions are also called hypersensitivity reactions and occur when someone comes in contact with an allergen. An allergen is defined as a substance that causes or stimulates an allergic reaction. Allergens can be chemicals, drugs, foods, insect venoms, personal care products, pet hair or dander. The range of substances that can cause an allergic reaction is almost limitless.

The severity of an allergic reaction can range from mild and temporary to potentially fatal. A life-threatening allergic reaction is called anaphylaxis. Anaphylaxis is a medical emergency, and recognition and treatment of anaphylaxis will be discussed at the end of this section.

The word immunity means *protection* and the immune system is one of the ways the body defends itself against infection with bacteria and viruses. The immune system also protects against intrusion of foreign substances that may be potentially harmful. The mechanisms of the immune system are very complex, but essentially it functions by:

1) recognizing potentially harmful, foreign substances or microorganisms, and 2) isolating and eliminating these potential threats.

The immune system is typically very efficient and effective. However, in an allergic reaction the process of recognizing what is potentially harmful and the process of isolating and eliminating this substance go

wrong. The body identifies something that is not basically dangerous, for example, a peanut, as a serious threat and the immune system produces a reaction that is far too strong and exaggerated. That is one reason why allergic reactions are also called hypersensitivity reactions.

Allergic reactions are individualized. For example, the great majority of people who are stung by a bee only have mild and temporary pain and swelling, but some people develop anaphylaxis. In most cases, it is not possible to predict who will be allergic to a specific allergen.

The first exposure to an allergen does not produce an allergic reaction but it *primes* the immune system so that when the allergen is reintroduced, an allergic reaction will occur. Recognizing the cause of an allergic reaction can be difficult because it only requires exposure to an extremely small amount of allergen to cause the reaction.

When an allergic reaction happens the body releases histamine and other immune substances. These substances help isolate and remove the foreign substance but they also stimulate the nerves, cause blood vessels to dilate, cause smooth muscles to constrict, increase the production of mucous, and cause inflammation. These reactions combine to produce the signs and symptoms of an allergic reaction.

Signs and Symptoms of an Allergic Reaction

Dyspnea

Histamine causes the smooth muscles in the bronchial passages and the larynx to constrict. It also increases mucous production in the lungs and larynx, which lead to dyspnea (shortness of breath).

Edema

An allergic reaction causes edema (swelling), typically (or at least most noticeably) in the face and throat. Edema in an allergic reaction is caused by dilation of the blood vessels and by the blood vessels “leaking” fluid into the surrounding tissues.

Hives

The medical term for hives is *urticaria*. Hives are red, raised bumps on the skin that are a frequently experienced sign of allergic reactions. These are caused by inflammation and dilation of the blood vessels.

Pruritus

Pruritus is a medical term that refers to itching, and it is common in allergic reactions. Hives and pruritus often happen together.

Allergic reactions happen very quickly after someone is exposed to an allergen they are sensitive to, and the onset of anaphylactic reactions is especially dramatic. Within several minutes someone who is suffering from an anaphylactic reaction will quite literally feel as if he/she is going to die.

In a *mild* allergic reaction, the victim will have hives and pruritus. *Anaphylaxis* causes dyspnea, edema, hives, and pruritus, and many people who are having an anaphylactic reaction will also feel dizzy and weak and have palpitations. If an anaphylactic reaction is not promptly treated airway closure and lack of oxygen can quickly be fatal.

Emergency Treatment of Anaphylaxis

Anaphylaxis is a medical emergency and 911 should be called immediately. Many people who have had anaphylaxis will be prepared and carry an oral antihistamine such as diphenhydramine (commonly called Benadryl) and an auto-injector that contains epinephrine. The following are steps that healthcare responders should implement in an emergency involving anaphylaxis.

- If the patient has an antihistamine help them take one. If the patient does not have his/her own medication for a severe allergy reaction, and one is available, medication can be offered; and, the patient should make the decision of whether to accept it.
- The epinephrine auto-injector is typically called by the common brand name EpiPen®. These are simple to use, but anaphylaxis often causes intense anxiety for the patient and anyone nearby, and it may be difficult for someone to use the auto-injector. It is important to remain calm and reassuring. Reassure the person that 911 has been called and that an auto-injector is being used and easy to do.
- There are many videos on-line that provide instruction on how to use an epinephrine auto-injector. Several points that should be remembered include: 1) the auto-injector should be used on the outer thigh, and 2) do not inject anywhere else. Clothing does not have to be removed to use an auto-injector. The auto-injector should be held in place for 10 seconds, and after using an epinephrine auto-injector, patient transport to an emergency room to be evaluated by a physician is mandatory.

Asthma Attacks

Asthma is one of the most common diseases of the lung and asthma is also the most common chronic disease among children. The Centers for Disease Control and Prevention (CDC) reported that in the United States there are approximately 18.4 million adults diagnosed with asthma and approximately 6.2 million children diagnosed with asthma.

Most cases of asthma are due to both a genetic predisposition to the disease and a predisposition to developing allergic reactions that is called *atopy*. Asthma attacks are typically caused by a trigger such as exposure to cold, dust, emotional stress, or a respiratory infection. During an asthma attack the bronchial passages become constricted and inflamed and there is an excess production of mucous. The respiratory passages are severely narrowed and breathing becomes quite difficult.

Asthma attacks can range from mild to life-threatening. A severe asthmatic episode is characterized by difficulty breathing while at rest. The patient can only speak in very short sentences or perhaps only in words. Wheezes are happening during inhalation and exhalation, and the heart rate is greater than 120. Lying down cannot be tolerated and the patient usually sits leaning forward; this allows the chest to expand with less effort. The oxygen saturation is abnormally low.

Imminent respiratory arrest is very dramatic. This type of asthmatic attack occurs when the bronchial passages are almost completely closed. The patient may be drowsy and confused (this is more likely in children), very diaphoretic, and the airways are so constricted that wheezes are very slight or even absent.

Death from asthma is very unusual. In 2015 in the United States less than 5,000 people (adults and children) died from asthma. At times the bronchial tubes become obstructed to the point that despite aggressive treatment the asthma attack cannot be reversed and the patient expires.

Emergency Treatment of Asthma Attacks

The majority of people who have asthma have an asthma attack plan. The asthma attack plan is provided by the patient's physician and it instructs the patient what to do in the event of an asthma attack. The typical asthma attack plan has three components.

Signs and Symptoms

The asthma attack plan lists the signs and symptoms of an asthma attack that are considered mild, moderate, or severe.

Peak Flow Assessment

A peak flow meter is a hand-held device that measures how well air is moving out of the lungs during exhalation. The peak flow meter shows the patient what his/her normal peak flow is and the peak flow level that indicates serious airway constriction. The asthma attack plan should instruct the patient what to do if the peak flow is at or below a certain level.

Rescue Inhaler

A rescue inhaler contains a bronchodilator such as albuterol that can very quickly dilate the constricted bronchial passages. Ventolin® and ProAir® are commonly used brands of albuterol rescue inhalers. The asthma attack plan will instruct the patient in how many times to use the rescue inhaler, and what to do if the rescue inhaler is not effective.

Case Example #1:

A 45-year old male patient has loud, audible wheezes and can speak in complete sentences. The peak flow reading is at 75% of the normal value. The signs and symptoms improve significantly after two uses of the rescue inhaler. The patient is having a *mild-moderate asthma attack*. There is no need to go to the emergency room but a physician should be notified and the patient should be closely monitored.

Case Example #2:

A 70-year old female patient from a nursing home is diaphoretic and can only speak in two or three word sentences. The wheezes are audible but very faint. The peak flow reading is less than 50% of the normal value, and the signs and symptoms have not improved after three uses of the rescue inhaler. She cannot tolerate lying down. The patient is having a *severe asthma attack* and should be evaluated in an emergency room. If a moderate or severe asthma attack occurs outside of the setting of a healthcare facility, 911 should be called.

Burn Injuries

Burn injuries can be caused by chemicals such as an acid, electricity, hot liquids, steam, sunlight, or a hot object. Burns are typically classified as first-degree, second-degree, and third-degree.

First-degree Burn

A first-degree burn only affects the epidermis, the outermost layer of the skin. A first-degree burn causes pain, redness, and minor swelling. These burns only require simple first aid and they will heal in several days.

Second-degree Burn

A second-degree burn affects the epidermis and the layer of skin below, the dermis. The skin will be red or white and the area of the burn can be moist. Blisters are commonly seen with a second-degree burn. If the second-degree burn is a full thickness burn pain sensation may be lost.

Third-degree Burn

A third-degree burn extends past the epidermis and dermis and into the fat layers. The appearance of the burn can be complex; it may be red, white, or even black if the burn is old. Blisters are present and there is no pain sensation.

Emergency Treatment of Burns

First-degree burns can be treated with simple first aid. The area should be flushed with cool or lukewarm water for 15-20 minutes. Do not apply ice or immerse the burned area in ice water. There is no need to cover the burned area with a dressing, gauze, or antibiotic cream unless the burn is in an area that may be constantly chafed. If needed, a dressing or antibiotic cream can be applied after the skin temperature has returned to normal. Covering the burn before then will simply trap the heat of the burn and cause further pain.

If a blister develops (blisters can occasionally occur with a first-degree burn) it is best to leave it alone. However, if the blister pops or begins to leak this is an open wound; the area should be covered and monitored for signs of infection and the patient's tetanus vaccination status should be reviewed. Do not apply butter or other home remedies to a first-degree burn.

Second-degree and third-degree burns should never be managed outside of a hospital or a physician's office. Flushing some second-degree and third degree burns with water could be harmful. It is best in these situations to simply apply clean clothes that have been moistened with cool water.

Burns on the face, feet, groin, or hands should always be professionally evaluated. Burns in these areas can affect function and have negative cosmetic consequences. A burn that covers > 10% of the body surface area can be considered serious.

Burns caused by chemicals, electricity, or by a house fire should always be professionally evaluated. Chemical burns should be flushed with water to remove any remaining foreign material.

Heart Emergencies

The heart is responsible for pumping blood and oxygen to the body and the vital organs, particularly the brain, the heart itself, and the kidneys will be permanently injured if their blood supply is drastically interrupted for more than a few minutes. The most common cardiac

emergencies caused by damage to the heart are cardiac arrest, angina, and myocardial infarction (heart attack).

Cardiac Arrest

Cardiac arrest occurs when the heart stops beating. A cardiac arrest is caused by an abnormal heart rhythm or a myocardial infarction. Someone who has had a cardiac arrest will be unconscious and will not have a pulse or respirations. The basic process for responding to a cardiac arrest or a suspected cardiac arrest is outlined by the American Heart Association (AHA) at the following website: <https://www.acls.net/bls-als-algorithm.htm>. The AHA 2018 guidelines for basic life support (BLS) is as follows:

*"When a victim is unresponsive to a tap on the chest (ask "Are you ok?"), then the healthcare provider should **observe the victim for breathing for 5 to 10 seconds**. If respirations are present, the victim should be attached to a cardiac monitor. Otherwise, the healthcare provider (HCP) should **activate EMS and retrieve the AED** [Automated External Defibrillator] by himself or by sending a second rescuer.*

*The pulse check is the third step in the algorithm. The pulse should be checked for no less than 5 seconds and no more than 10 seconds. **If there is a definite pulse, then rescue breathing should be done** for one second every six seconds with a recheck every 2 minutes.*

If the victim does not have a pulse, or there is a question as to whether it is present, then compressions should be

*initiated at the rate of 30:2, with 2 breaths every 30 compressions. Compressions should be provided at a rate of 100-120/min. When the AED or defibrillator is available, then the HCP should **check the victim's rhythm. If it is shockable, then 1 shock should be given** with immediate CPR instituted for 2 minutes, beginning rapidly (within seconds) of the shock."*

An automated external defibrillator (AED) is a portable medical device that diagnoses a patient's heart rhythm and if needed, the AED will deliver a strong electrical current that literally shocks a heart back to its normal rhythm.

An AED should only be used on someone who is unresponsive and not breathing. They are very easy to operate and quite safe as once the AED is applied and turned on there are voice prompts that tell rescuers exactly what to do.

Myocardial Infarction

A myocardial infarction (MI) happens when the blood supply to the heart is completely blocked and part of the heart muscle dies. People having an MI (which is more commonly called a heart attack) are pale, sweaty, short of breath, and have severe chest pain. The chest pain is often described as "pressure" or as "crushing." Someone having an MI can suffer serious complications and/or die if treatment is not provided quickly.

Emergency Treatment for a Myocardial Infarction

Call 911 immediately. Time is critical. If someone is having an MI, administering intravenous (IV) medications that open cardiac blood vessels must be given as soon as possible, preferably within 60 minutes from when the signs and symptom began. Administering heart medications will prevent further damage to the heart muscle and can dramatically decrease the risk of death.

In some areas, the Emergency Medical Response (EMS) crews have the capability to give these sophisticated, complex treatments en route to an emergency room, so calling 911 is always the first step. Unless there are exceptional circumstances, transporting someone who is having an MI to the hospital should not be tried and the person on the scene should call 911.

Aspirin:

If the patient has an 81 mg aspirin tablet available, have him/her chew the tablet. Aspirin prevents blood from clotting and can help keep the cardiac circulation intact. The 81 mg aspirin tablets are typically called baby aspirin.

The aspirin tablet should be chewed, not swallowed. Chewing gets the medication into the circulation more rapidly than if the tablet was swallowed.

Remain on the Scene:

The person first to arrive on the scene of a MI should stay with the patient until EMS personnel or other assistance arrives. If there is an AED available, it should be brought to the scene.

Encourage the Patient to Accept Help:

Many patients who are having an MI will deny that they are having a serious cardiac event. They are reluctant to go to an emergency room and they prefer to wait "until things get better." The patient should be informed that there is no risk to calling 911 and being evaluated in at a hospital but waiting to be treated can be dangerous.

Angina

Angina is chest pain that is caused by a partial blockage of the blood supply to the heart. The signs and symptoms of angina are similar to the signs and symptoms of an MI, but not as intense or dramatic. The patient having an angina attack will have chest pain and perhaps be short of breath, but he/she will often feel and appear uncomfortable but not in severe pain.

Many angina attacks go away by themselves or after using nitroglycerin, but some may progress to an MI.

Emergency Treatment of Angina

The requirements for responding to a person with symptoms of angina are similar to those for a person having a MI with the exception of recommended medication to treat the chest pain. As mentioned, nitroglycerin is the standard medication given for angina, and the following steps should be followed.

- Call 911: Do not try and decide if someone's chest pain is being caused by angina or an MI. If someone is having chest pain, call for help or call 911.

- Nitroglycerin: Nitroglycerin is an oral medication that increases blood flow to the heart and can completely resolve an angina attack. Nitroglycerin tablets are placed under the tongue (the sublingual route) and allowed to dissolve. If they are chewed or swallowed the medication will not be effective. Many patients who have angina are given instructions by their physician regarding how to use nitroglycerin. For example, the patient may be told that if the angina attack is relieved by two nitroglycerin tablets there is no need to go to a hospital. In these situations, it would still be prudent to call 911 and the patient can call the physician.
- Stay on the scene: Stay with the patient until EMS personnel or other assistance arrives.
- Encourage the patient to get help: Many patients who are having an angina attack will deny that they are having a serious cardiac event. They are reluctant to go to an emergency room or call a physician and they prefer to wait "until things get better." Inform the patient that there is no risk to calling 911 and being evaluated at a hospital but waiting to be treated can be dangerous.

Choking Victims

A choking emergency occurs when a solid foreign body is aspirated into the lungs. Someone who has aspirated a foreign body cannot breathe effectively and cannot talk. If the foreign body is not expelled the airway can be compromised.

Treatment of a Choking Emergency

Assess

If someone is breathing and can cough loudly and can make sounds, do not intervene. Wait and see if the object will be coughed out. If someone cannot cough, breathe or make sounds then help will be needed.

Stand behind the victim and wrap the arms around his/her waist. Make a fist with either hand and place it fist between the umbilicus (belly button) and the bottom of the sternum (breast bone). Place the other hand over a firm fist and quickly pull up and in with both hands. The goal is to try and forcefully contract the victim's lungs to force out the foreign body.

The responder assisting the choking victim should keep thrusting until the object comes out or the victim loses consciousness. If the victim is pregnant or very large, place the fist and hand should be placed over the patient's chest to perform the thrusts. The procedure is performed the same way for a child.

Choking infants should be placed face down with the head lower than the feet. Using the heel of the hand, five back slaps between the shoulder blades should be given. If the object does not come out, turn the child over and use two fingers to perform five chest thrusts, and repeat the chest thrusts as needed.

Diabetic Emergencies And Hypoglycemia

People with diabetes need oral medication or injectable insulin to keep their blood sugar at a safe level. Hypoglycemia occurs when the blood sugar drops below 70 mg/dL and because the brain essentially can only use blood sugar for energy, permanent brain damage can occur if

hypoglycemia is not quickly corrected. The signs and symptoms of hypoglycemia are confusion, disorientation, rapid pulse, sweaty skin, and weakness.

Emergency Treatment of Hypoglycemia

Glucose

If the patient is awake and conscious give some form of easily digested sugar such as candy, juice, fruit, or even table sugar. Many patients who have diabetes carry glucose tablets or glucose gel and these should be given if they are available. Even if the patient is not having a hypoglycemic episode there is no harm to giving glucose.

If the victim won't cooperate don't try and force him/her to eat. People who are hypoglycemic are often confused, they do not know what is happening, and they may become irritable or aggressive if someone insists they eat or drink. Remember the first rule of responding to medical emergencies: *don't hurt the victim and don't hurt yourself.*

Do not give someone who is hypoglycemic and unconscious food or fluid. If the patient is severely symptomatic call 911. If the symptoms are mild, the patient may be managed at home.

Measure the Glucose Level

The majority of people who have diabetes have a glucose meter and the blood glucose can be measured while someone is drinking or eating. Approximately 15 minutes after the supplemental glucose has been given re-check the glucose level.

Glucagon

Glucagon is a naturally occurring hormone that stimulates the liver to convert glycogen to glucose, thus raising the blood sugar. Glucagon injection kits are available and some people who have diabetes may have one. If there is a glucagon injection kit available, it should be used. Glucagon cannot be harmful to someone who is hypoglycemic.

The signs and symptoms of hypoglycemia can be mild and can be confused with other medical emergencies such as stroke. However, no harm will be done to someone by assuming he/she has hypoglycemia and giving glucose, even if the victim's blood sugar is very high.

Patients who have diabetes can also develop hyperglycemia and this can be quite serious, as well. Hyperglycemia can be a medical emergency but unlike hypoglycemia it does not develop rapidly and there are often warning signs and symptoms that begin days before hyperglycemia can be diagnosed.

Musculoskeletal Injuries And Lacerations

Musculoskeletal injuries that may be considered medical emergencies are dislocations, fractures, lacerations, and sprains. Some of these are obvious but some can only be detected by a physician's exam and an X-ray. There are too many different types of dislocations, fractures, and sprains to provide first aid information about them all. However, there are some basic first aid rules for treating these injuries that apply to them all.

Emergency Treatment

Do not Move the Victim

This rule may be relaxed with minor injuries, but with all other musculoskeletal injuries the victim must be kept immobile until help arrives. Common sense should be used.

Do not Move the Injured Part

This rule can also be relaxed in certain circumstances, but unless the injured part will obviously be damaged further by remaining where it is, do not move it.

Never move someone who has an injury to the head, neck, or back. There is one exception to this rule. If the victim has suffered a cardiac arrest and is lying face down, the person should be placed face up, but must be moved very carefully. The head, neck, and back should be moved together and they should be moved while in proper alignment with one another; this is called logrolling.

Do not Diagnose

A healthcare worker first to respond to an injury cannot determine if an injury is a break, dislocation, or sprain and it is not the healthcare worker's responsibility to do so.

Emergency Treatment of Lacerations

- Put on protective gloves.
- If the laceration is bleeding apply direct pressure to the area. The patient can do this while you are putting on gloves.
- If protective gloves are not available, use a gauze pad or a clean cloth that will not stick to the wound to apply pressure to a

bleeding laceration. If protective gloves are not available, it is preferable that the patient do this if possible to prevent the rescuer from being contaminated.

- Do not apply a tourniquet unless there has been a traumatic amputation.
- A simple abrasion (commonly called a scrape) or a scratch can be washed with tap water and covered with a non-adhesive bandage. The patient should consult with a private physician to review status of tetanus vaccination.
- Unless the wound is a simple scrape or scratch do not make the decision as to whether or not it should be sutured and what sort of treatment the laceration needs. Some lacerations need to be sutured, some need to be cleaned by a physician, some need to be treated by a plastic surgeon or a specialist, and some need antibiotics. Refer the victim to an ER or a physician.
- Lacerations on the face or in/around the mouth, lacerations in which a foreign body might be retained in the wound, lacerations of the hands, feet, or fingers, deep puncture wounds, lacerations that are over a joint, and needle stick injuries are all wounds in which a physician's evaluation is considered mandatory. Improper care of these wounds can have serious consequences.
- People who have been bitten by a domestic animal, especially a cat, should have the wound evaluated by a physician. If the bite was from a wild animal an evaluation by a physician is mandatory.

Poisoning Emergencies

Poisoning emergencies can be accidental or deliberate. Most accidental poisoning emergencies occur in small children who ingest prescription

or over-the-counter medications, household cleaners, or personal care products.

Deliberate overdoses occur in adolescents and adults who have ingested prescription and/or over-the-counter medications in an attempt to cause self-harm. There are an enormous number of drugs, chemicals, and household and personal care products. that can cause poisoning. Some are relatively safe and some are very dangerous; each one will cause specific signs and symptoms, and each one should be treated in a specific way. However, there are some basic rules that can be used to handle any poisoning emergency.

Poisoning Emergency Treatment

A poison control center can be reached anywhere in the United States by calling 1-800-222-1222. This number will connect individuals to the poison control center that is closest to their area. Poison control centers are staffed 24 hours a day and they can provide all the information that is needed to treat a poisoning emergency.

First Responder

The person who is the first responder at the scene of a poisoning emergency should find out what and how much the victim was exposed to and when the exposure occurred. If the victim will be transported to an emergency room, any medication containers or product containers related to the poisoning event should be taken along for inspection by the medical team.

Avoid Inducing Vomiting

Inducing vomiting by any means should never be done. It will not help and it may be harmful.

Nothing by Mouth

If something harmful was ingested, the victim should not be given anything by mouth until instructed otherwise. Contrary to popular belief, milk is not an antidote for a poisoning event.

Deliberate Overdoses

There should be a call for help or 911 call when an overdose is discovered. The victim must be transported to an emergency room.

Eye Exposures

The eyes should always be flushed for 15-20 minutes with lukewarm water when an exposure occurs. Sterile saline can be used but it is unlikely there would be enough on hand for 15-20 minutes of irrigation. It is necessary to irrigate for this period of time because irrigation with professional equipment is comparatively less effective. The poison control center should be called.

Some eye exposures are benign but others (*i.e.*, a splash of drain cleaner) can cause permanent eye damage and the patient needs evaluation by a physician.

Skin Exposures

The skin should always be flushed for 15-20 minutes with lukewarm tap water. Nothing else should be used. Do not try and apply anything to neutralize a substance on the skin.

The poison control center should be called. Some skin exposures are benign but others can cause serious burns or systemic effects.

Inhalation Exposures

When an inhalation exposure occurs, the victim should be moved to an area of fresh air. If that is not possible, open windows or fans, or anything to remove the offending agent and give the victim fresh air.

The need for an evaluation by a physician will depend on the substance and the patient's signs and symptoms. The poison control center should be called for advice.

Seizures

A seizure is a neurological event caused by abnormal brain waves. The most dramatic type of seizure is the grand mal seizure. Someone having a grand mal seizure will lose consciousness and motor control (the victim will not be able to stand or walk) and he/she will have very dramatic, rhythmic muscle contractions (convulsions) and may lose bladder control.

A grand mal seizure is very frightening, but the risk of death is extremely low. However, the victim has no warning that a grand mal seizure is going to happen; the victim will lose consciousness and has no motor control so falls and injuries are possible. There are many possible causes of seizures. Some of the more common causes are epilepsy, hypoglycemia, and hypoxia (lack of oxygen).

Emergency Treatment of a Seizure

When a seizure is witnessed to occur:

- Call for help or call 911.
- Place something under the victim's head and loosen restrictive clothing from around the neck.
- Do not try to restrain the victim.
- Do not give anything by mouth and do not insert anything in the victim's mouth; contrary to popular belief, people having a grand mal seizure will not swallow their tongue.

Cerebrovascular Accident And Transient Ischemic Accident

Cerebrovascular accidents (commonly called a CVA or stroke) and transient ischemic attack (commonly called a TIA) are neurological emergencies caused by a lack of blood supply to the brain. A CVA or TIA happens when a blood vessel in the brain ruptures or a cerebral (brain) blood vessel is occluded by a blood clot.

If a blood vessel in the brain ruptures and affects neurological function, this event is called a *hemorrhagic stroke*. When a blood vessel in the brain is occluded by a clot and neurological function is affected, this event is called an *ischemic stroke*.

A TIA is usually caused by occlusion of a blood vessel. A CVA will cause permanent loss of functioning brain tissue; whereas, a TIA does not. The brain is metabolically very active and it is very sensitive to oxygen deprivation. Lack of oxygen even for a very brief period of time can cause irreversible brain damage.

Strokes are often severe and can cause permanent damage. Transient ischemic attacks are milder and people often recover completely, but a

TIA is very often followed within days or weeks by a CVA. The signs and symptoms of stroke and TIA are very similar and they happen very quickly and with little warning. The victim seems confused and cannot speak, or his/her speech is garbled. One side of the victim's face sags or droops and he/she has serious weakness in the hands, arms, or legs.

One easy way to remember the signs and symptoms of stroke/TIA is through the acronym *FAST*:

- **F**ace - drooping, sagging
- **A**rm - weakness in the arm
- **S**peech - absent, garbled
- **T**ime (the aspect of time will be discussed later).

Emergency Treatment for CVA and TIA

Call 911

The importance of calling 911 cannot be overstated. Administration of intravenous medication that can dissolve a blood clot in the brain must be delivered as soon as possible after the onset of signs and symptoms of a CVA. If this care is given promptly brain tissue can be saved and neurological function preserved. If there is a delay in treatment past 60-90 minutes, the risks of a bad outcome increase significantly, which is why *Time* in *FAST* is critically important.

Signs and Symptoms

Confusion, dizziness, facial drooping, fainting/loss of consciousness, garbled or absent speech, and, weakness in the arms or legs are common signs and symptoms of a CVA. Some of these are also seen in

a TIA but to a milder degree. When these signs are observed, refer to the acronym *FAST*.

Risk Factors

Risk factors include individuals > 55 years of age, and who have diabetes, heart disease, hypertension, and obesity, which are some of the conditions that increase the risk for having a CVA or TIA.

Encouragement

Many people who are having a CVA or TIA deny that it is a serious event and they are reluctant to go to an emergency room. The patient should be informed that there is no risk for calling 911 and being evaluated at a hospital but waiting to be treated can be dangerous.

Summary

Most every healthcare worker assigned to an area of patient care will become exposed to an emergency situation. Emergencies occur both within and outside of a controlled hospital or clinic setting. In the community an emergency can happen in a public place or even at one's home or neighborhood. Being the first person on the scene at a medical emergency may require the healthcare worker to respond to someone suffering from a stroke, a heart attack, seizure, poisoning event or other critical condition. Being able to recognize common medical emergencies and deliver the proper first aid or initial response in these situations are important skills that could be lifesaving.

There are emergency algorithms or guidelines and toll-free numbers that a healthcare worker may rely upon to guide practice and initial

interventions, such as the administration of aspirin for chest pain thought to be a heart attack or for a stroke, and the administration of nitroglycerin for angina. The American Heart Association provides annual updates of the basic life support recommendations for individuals found to be unconscious with a lack of noticeable pulse or heart rhythm, such as the required steps to use an automated external device that detects the absence of a normal heart rhythm and delivers a shock to restore a normal rhythm.

Healthcare workers have numerous national resources to help guide practice and patient care, as well as health facility policies that employees are required to follow. It is important that all healthcare workers, including certified nursing assistants understand and follow required national guidelines for varied medical emergencies as well as the policies of the workplace.