Medical Emergencies ON THE JOB

Job-site safety is everyone's responsibility. But despite everyone's best planning, accidents still happen. When they do, the actions you take in the first few minutes can ease the victim's suffering, speed recovery, and even save a life.

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Good planning and fast action can save lives

In a short article like this, I can share a few tips from my experience as a paramedic responding to emergency calls before I became a doctor. But I can't train you in first aid. No magazine article is a substitute for good first-aid training. So my first tip is, get yourself and your people trained in lifesaving skills and first aid. Training courses are available virtually everywhere, are inexpensive, and usually take just a few hours. In an emergency, the skills you learn could keep a coworker or family member alive. That's a pretty good value for a small investment.

My second tip is expect accidents to happen, and be ready. Here's a brief list of things you can do before starting a job:

- ✓ Have a phone available, and make sure everyone knows where it is and how to use it. If you have a cellular phone, make sure everyone knows how to dial it.
- ✓ Post emergency phone numbers near the phone. Most but not all parts of the country use 911 for emergencies. Rural communities in particular may use a different number — make sure you know it and post it.
- ✓ Check to see that everyone knows how to call for help. If you have workers with limited English skills, make sure they can still call the emergency number and give an accurate location

Precautions to Prevent Blood-Borne Disease

A basic premise of rescuer safety is that you should not put yourself at risk in order to save someone else. This includes the risk of catching a respiratory or blood-borne disease, carried by germs (bacteria or viruses).

In general, the following recommendations for "universal precautions" are standard: When giving care, avoid coming in contact with any body fluid. You should wear rubber gloves, and if doing mouth-to-mouth, you should use a commercially available "face shield" to avoid direct contact (your job-site first-aid kit should include these items). Wash your hands before and after providing first aid, if time allows. Avoid directly touching blood or bloodied clothes and bandages if possible.

That being said, the risk of catching or transmitting a disease as you provide first aid is very small. In particular, the risk of contracting H.I.V. (the virus that causes AIDS) in the course of giving first aid is minimal. As a matter of fact, the only reported cases of health care workers (doctors and nurses) getting H.I.V. from patients involved the health worker getting stuck with a hollow needle (like a hypodermic or intravenous needle) that had H.I.V.-infected blood in it. No health care worker has yet gotten the virus in casual contact, from mouth-to-mouth, or from splashes of blood.

You don't want to catch something from the victim, and you don't want to infect them or contaminate a wound either. But when a person needs care, keep those risks in perspective. Bottom line: Use your judgment, and follow your conscience.

Cave-ins and Crush Injures

The scene of a cave-in is inherently unsafe, because one trench collapse can rapidly lead to others. Take steps to prevent yourself and others from getting caught in a subsequent collapse. Since first aid cannot be administered until after the rescue, it's important to get the victim out of the dangerous situation as soon as possible. If the victim has suffered a crushing injury, assume that they also have a neck or back injury. Crush injuries can also cause a great deal of internal bleeding, so treat for shock.

Smoke and Gases

Smoke, fumes, and gases cause problems with breathing. The important thing is to recognize when toxic fumes are around, because some gases, like carbon monoxide, are odorless and invisible, but they can build up in enclosed areas and kill you. Make sure all work spaces are well ventilated, and be careful about heating units used inside during the winter. If workers start to get headaches or become short of breath, get them outside into fresh air.

of your site.

- ✓ Try to have at least one person on each site who is trained in CPR and First Aid. Tell everyone on the site who that person is.
- ✓ Think ahead and identify your hazards — risks of electrocution or falls, water someone could drown in, hazardous materials, and so on.
- ✓ Access to the site is important in an emergency. Keep the driveway in good shape and become familiar with street names and route numbers. Find the nearest place a helicopter could land.
- ✓ Know your people and anticipate medical problems. Encourage an open environment for people to talk frankly about their needs. Many people need to take routine medications, or need to keep allergy medication handy. You can always have them bring a note from their doctor if you are unsure if they can safely work. You don't want to have the wrong person doing the wrong job at the wrong time.
- ✓ Finally, have a zero tolerance for inappropriate use of alcohol and drugs. Impaired workers more often than not cause harm to others as well as to themselves.

When Accidents Happen

First-aid courses will teach you a routine to follow in emergencies. At the risk of being repetitive: You should get that training and follow it. The lessons below, drawn from my own training and experience, are just to familiarize you with the general idea.

Rescuer safety first. This is what I call "Rule Number Zero" — the rule that comes before all others. Simply put, it means two dead bodies are worse than one. When an accident happens, take a moment to size things up. If a hazardous situation is at hand, don't take unnecessary risks. Eliminate the danger to yourself and others before assisting the victim.

You may have to decide which is better: to move a person away from a hazard, or to remove the hazard from the person. As a general rule, avoid moving injured people when at all possible. In cases such as fire,

toxic fumes, or live power, use your best judgment, preserve your own safety first, and call police and rescue personnel for help.

Know when to call. Not all injuries need emergency attention. But in many cases, time is critical. For major injuries, the most important factor is not what you do on site — it's the time it takes to get the injured person to a trauma center (a hospital with surgical staff ready to handle traumatic injuries at a moment's notice). When someone is having a heart attack, survival depends on how fast advanced medical treatment can be started. As a general rule, with any serious injury or illness, time is important, and calling the ambulance comes before giving first aid.

If the victim ...

- ✓ is not breathing
- ✓ is unconscious
- ✓ has no pulse
- ✓ is bleeding heavily
- ✓ may have internal injuries
- ✓ may be going into shock
- ✓ has heart attack symptoms

Call immediately.

When in doubt, pick up the phone and call Emergency Medical Services (EMS). Call early. Don't hang up until the operator tells you it's okay.

Secure the site. In my years as a paramedic, the thing that worried me the most about responding to job-site accidents was whether or not the scene would be safe. The EMS personnel may be experts at emergency medical care, but they may have no knowledge of construction at all. No one knows your job site better than you, so do everything you can to make the site safe for the EMS personnel as well as the victim.

Help us find you. Don't assume EMS workers will know where you are. Find them and lead them to where they need to be. If your job site is off the beaten path, send someone out to the main road to flag down the ambulance and guide it up to the site. Better yet, send more than one

Puncture Wounds

With a puncture wound, do not remove the object, because it will likely cause more damage coming out than it did going in. Small objects should be stabilized in place. If someone is impaled on something large, like a fence post or a piece of rebar, cut the object away from the victim, but not until the paramedics arrive: If you apply heat, vibration, or torque, you can make the injury worse. Instead, find any appropriate cutting equipment and be ready to assist.

Pain

Unexplained pain is common. The causes range from the trivial (like a stomach bug) to the tremendous (like appendicitis). If someone has sudden unexplained pain, call EMS, treat for shock, and don't give them anything to eat (food or drink could make things worse).

Hand Injuries

Even with minor injuries to the hand, it is very easy to receive damage to nerves that result in loss of normal function of the hand. At the site, it's not your job to determine which hand wounds are important — and have all hand injuries evaluated by a doctor immediately. For an obvious hand injury, have the victim taken to a facility that specializes in hand injuries.

Loss of Consciousness

A lot of things can make people feel weak and dizzy. The most common are dehydration or lack of food. Total loss of consciousness, however, is never normal. If someone actually passes out, even if only briefly, call 911 immediately and follow the ABC's.

If the victim is actually having a seizure — convulsing or shaking uncontrollably — keep things out of the way so they don't get hurt. Do not try to stick anything into the mouth of a seizing person; you'll just jeopardize their airway. Call 911 and wait. When the seizure stops, check their ABCs again.

If someone passes out, nearly passes out, or just seems dazed for no obvious reason, sit them down. If they can safely drink, give them something sweet to drink, like orange juice. Low blood sugar commonly causes confusion, but this is usually only seen in people taking medicine for diabetes.

Amputations

Most complete amputations don't bleed as much as you might think, because the severed blood vessels retract into the stump. But amputations should be treated the same as for bleeding. A tight pressure dressing at the end of the stump should be adequate. Save all severed body parts in a dry plastic bag, and put it in a cooler. Give the body parts to the EMS personnel, because a lot of limbs can be reattached if you hurry.

Trapped Under, On, or Between

When someone is trapped under, on, or between large objects, your best bet is to stabilize them right where they are. Carefully describe the situation to the 911 operator so that appropriate rescue equipment can be dispatched. In extreme conditions, doctors can perform on-site amputations to free trapped victims.

Heat

The first step in treating a burn is to put out the fire. Extinguish anything that's burning, and remove any smoldering clothes. Use large amounts of water to cool the burned area. Even small burns to the hand or face should immediately be seen by a doctor.

Burns vary in severity, from red and painful (like sunburn), to blistered and white (very painful), to completely charred and black (painless, because all nerves have been burned away). As a general rule, painful burns should be cooled with water. However, you can over-cool someone if too much of their skin is burned off. So if the victim's skin is charred and painless, don't pour cool water on it.

More common heat-related problems are heat cramps, heat exhaustion, and heat stroke. On a hot humid day, workers ability to get rid of body heat may not keep up with the rate at which they produce it and they can overheat. Muscle cramps in the heat are due to inadequate water and salt. The cramps will go away eventually with water and rest, but they should be a warning sign that workers are at risk for heat exhaustion.

Heat exhaustion is caused by dehydration. People will look like they are in shock (weak, dizzy, and pale). Give them rest and water. Heat exhaustion can be prevented by drinking plenty of water. As a general rule, on a hot day, urine should be abundant and clear. If workers don't need to pee when it's hot, they are not drinking enough water.

Sustained exposure to heat can result in heat stroke. The victim can turn bright red and pass out. If this happens, call 911, then cool the victim by any means available as quickly as you can. Ice water on the head and chest works fastest.

person — often, additional rescue vehicles will be following.

Make sure the access to the victim is clear. Stop work if possible. Keep the road free of traffic. Move things if you have to. Shut down unnecessary equipment. The less noise and commotion the better.

The ABCs of First Aid

So, let's say the scene is safe, and the victim is out of immediate danger from the environment. You've called 911, and EMS is on the way. Now what? There is a whole array of medical emergencies that can be immediately life-threatening. Fortunately, whether someone is injured or sick, the same principles of first aid and emergency care always apply:

The most important factors to worry about, in order, are:

A: Airway
B: Breathing
C: Circulation

Keep in mind that this article is by no means a substitute for a real CPR class.

Airway. The airway is the passage that life-giving air must go through to get into someone's lungs. First and foremost, the airway must be clear. If someone has vomit or food stuck in their mouth or throat, get it out.

The most common scenario is choking on food, which calls for the Heimlich maneuver. This is performed by wrapping your arms around the victim's waist, grasping your fist, and thrusting inward and upward until the object clears (do not slap them on the back). A similar technique to the Heimlich maneuver, "abdominal thrusts," can be done for unconscious people lying on their backs — using the heel of your hand, thrust firmly upward several times on the abdomen just above the navel, then use your fingers to clear the object from the mouth.

Unconscious people, when lying flat, sometimes block their airway with their tongue — the tongue slides back into the throat. To treat this, tilt the victim's head back, and lift their chin forward. If the victim is vomiting or you think they might,

you can position them on their side, so that everything will drain out rather than back into the throat.

Breathing. Once you know someone has an open airway, make sure that they are breathing. If they're not, they will soon be dead. The best thing for the victim is to start rescue breathing, also known as mouth-to-mouth resuscitation. You do this by pinching the victim's nose, forming a seal over their mouth with your mouth, and deeply exhaling into the victim's mouth. Repeat approximately every five seconds.

Circulation. Any problem with the body's heart, arteries, and veins can lead rapidly to death. In practical terms, you want to make sure that the victim's heart is beating, and you want to make sure that they aren't losing blood.

To make sure that the heart is beating, you should check for a pulse. Put your first two fingers on the victim's "Adam's apple" and slide down the side of the neck until your fingers rest in a groove. The carotid pulse lies here (it's easy to find on yourself — try it). If, after a good 5 to 10 seconds of checking you can't find a pulse, then the victim is dead. However, if you can give the victim adequate chest compression (that is, CPR) until the ambulance comes, the paramedics may be able to revive them. Here more than ever, time is critical. No one who needed CPR but had more than a four minute delay in receiving it ever lived without permanent brain damage.

Once again, I must stress that someone on the job site should be trained in CPR. The basic technique is to kneel beside the victim's chest, place the heel of one hand about an inch above the bottom of the breast bone, lace the fingers of both hands together, and push straight down about 1 1/2 to 2 inches. Do this 15 times and then give two rescue breaths as described above. Continue until help arrives.

Realize this: CPR will not revive the person. It may keep their brain alive until the ambulance comes, if that happens fast enough. So call first.

Stop the bleeding. Bleeding from any

Cold

The major problem with working in the cold is hypothermia. Workers in cool (not freezing), windy, and wet conditions are most susceptible. This combination will suck the heat right out of you. Be on the lookout for early signs: clumsiness, slurred speech, sluggishness, confusion. No one should be stupid in the cold. If they are, you need to get them someplace warm, and get them out of any wet clothes.

Frostbite occurs when flesh freezes. The most commonly affected body parts are fingers, toes, and the tips of your nose and ears. Look out for your buddies: If you see their noses turning white or blue, it's time for them to go inside. Likewise, if you can't feel your own toes or fingers, it's time to warm up. The worst thing you can do is to freeze, warm up, and freeze again. If you go into your trailer and find that your toes are numb and white, call it a day and go home.

Face and Eye Injuries

With any injury to the face, make sure that the victim's airway is safe. Watch for bleeding into the mouth, and turn the victim's head to the side if necessary to drain blood. Treat any facial injury as a neck injury as well, and don't twist the head.

If an eye is injured, discourage any eye movement. Cover both eyes with large, bulky bandages, because you can't move one eye without moving the other. If something has gotten into the eye, like sawdust or a chemical splash of any sort, flush the eye with lots and lots of water. Pour the water gently; don't use a hose under pressure. The water should flow "inside-out": that is, pour it from the center of the face outwards so that nothing flows into the good eye.

Heart Attacks

A heart attack is not synonymous with "cardiac arrest." In fact, some heart attacks are quite small with few or no symptoms. Any heart attack, however, can rapidly become fatal if untreated. It is important to recognize that someone may be having a heart attack, and to call for help quickly.

No one is too young to have a heart attack. Typically, men are at higher risk than women. Older, overweight, and less active people are also more likely to have a heart attack, as are people with high blood pressure, high cholesterol, and diabetes. Smokers have the highest risk of all.

The symptoms are subtle. Chest pain is common, but not always present; some people also have neck, arm, or shoulder pain. Also, shortness of breath, nausea, vomiting, indigestion, fatigue, and sweatiness are all signs of a heart attack.

Denial is common, and can be deadly. If someone at your job site has these symptoms, don't let them ignore it — get them to the hospital.

Head, Neck, and Back Injuries

Falls and blunt trauma (being hit by moving objects that don't penetrate) are common construction-related injuries. Injuries to the head or spine are not necessarily lethal, but suddenly moving a broken neck can cut the spinal cord, resulting in paralysis or death. Your best bet is to assume that everyone has a neck injury until proven otherwise.

The goal of treatment on the site is to prevent the victim from moving. Have someone hold the victim's head still to prevent any unnecessary movement. If someone has to be moved, either roll them like you would a log — from side to side as a single unit — or slide them lengthwise. Do not twist or bend the back or neck.

Chemicals and Hazardous Materials

Make sure everyone knows what materials are on site, and where records on toxic materials (like fertilizers, solvents, and fuel) are kept. If someone is exposed to a chemical hazard, give as much information as possible to the 911 dispatcher so that appropriate rescue equipment will be sent. The next step in treatment is to eliminate the exposure. If the toxin is on the victim's clothing, strip the clothes off. If something is burning, hose it off with lots of water. But be careful: Water can react explosively with some chemicals. Know what you're dealing with.

Broken Bones

Swelling, pain, obvious exposed bone, or severe limb deformities are all signs of fractures, or broken bones. Treat for any bleeding and for shock. Ideally, the broken limb should be splinted or otherwise immobilized. Practically speaking, just don't let anything move until help arrives.

Electrical Shock

Workers are rarely struck by lightning, but electric shocks are common on site. Severe electric shock, or electrocution, can cause the heart to stop beating. The good news is that there may not be any permanent damage, as long as the victim receives CPR until a paramedic can shock the heart back to life. Follow your ABCs and start CPR immediately if there is no heartbeat.

Electricity can also cause burns (see page 50). Unlike normal heat burns, electricity can burn on the inside, so look for signs of internal injury and treat for shock.

source can be rapidly lethal. The treatment is easy: Stop the bleeding.

When you can, cut away clothing so you can see the injury. Blood spreads rapidly, and you can be easily fooled if you don't find the exact spot where it is coming from.

To stop the bleeding, apply direct pressure. That means, if you have a major gash, squeeze it to stop the bleeding. Next, apply a pressure dressing. Use a rag or cloth, and wrap it tightly around the site of bleeding. If you can, wrap more than once and tie off, hand tight.

There are all kinds of wounds, and some of them call for different bandaging techniques. A simple pressure dressing works well for cuts on limbs. In a basic first-aid course, you'll learn more about bandaging.

Tourniquets are not typically useful, and often cause more damage than good.

Treating for shock. Medically speaking, shock is a condition of circulation failure, where the body can no longer get adequate blood to the brain and other critical organs. On the job site, shock can be caused by massive blood loss, either external which you can see, or internal which you can not, or by spinal cord injuries.

It is important to think of internal injuries, especially after crush injuries, falls, or heavy blows to the chest or belly. Internal bleeding can cause fatal shock. Whether the victim has visible wounds or not, watch for someone getting lightheaded, pale, or sweaty, and experiencing racing heartbeat, drowsiness, or rapid breathing.

Lay the patient flat on their back, and elevate their feet to keep blood flowing to the brain where it needs to be. The most important thing to do for shock is rapid transport to a trauma center. The faster they get there, the more likely that they will live. Don't dink around, move.

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