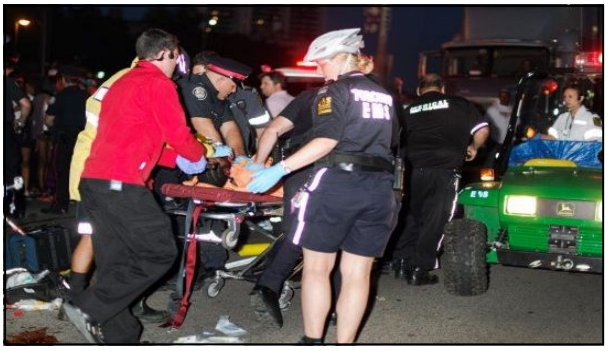


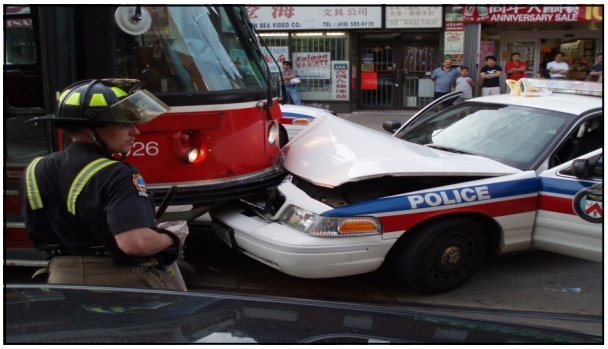
A Team Approach

First Aid and CPR

by: Mike H. Ichelson, EMCA Paramedic

First Aid Manual





CODE 8
Emergency Medical Response Teams

Emergency First Aid | CPR

Standard First Aid | AED

Rule No 1 - The Rescuer Goes Home

SCENE SURVEY Carefully Check For Hazards

No Gas	Affects Your Breathing
No Glass	May Cut You
No Fires	May Burn You
No Wires	Any Energy Source

Bio-Hazard Protection!

Always wear Nitrile Gloves
N95 Facemask
Disinfect Hands After Incident

Bio - Hazard Protection

What You Don't See May Harm You

Wear Nitrile Examination Gloves
Wear Eye & Face Protection
Use Appropriate CPR Mask
Use Antiseptic Hand Cleaner

Chest and Thigh Bones

Sucking Chest Wound
Seal 3 Sides With Plastic
Flail Chest
Stabilize With Patient's Forearm
Broken Thigh Bone
Stabilize Until EMS Arrives

Check Responsiveness

Sound	Yell In Both Ears
Pain	Pinch Underside Upper Arm

Patient Not Responsive

First	Activate Defibrillator Team
Then	Call 9 - 1 - 1

Catastrophic Bleeding

Use a Military Style Tourniquet
- Arms and Legs
Use Wound Packing
- Armpits, Groin, Neck

Check For Life Threats

What Will Kill This Patient Right Now?

Air Goes In And Out
Blood Goes Round And Round
Anything Else Is Bad

First Aid Team

Primary	- Life Threats & Physical Exam
Secondary	- Stabilize Head & Vital Signs
Leader	- Controls Energy & Directs Others
Note Taker	- Patient & Incident Notes/Diagram

Airway	Head-Tilt / Chin Lift Method
Breathing	5 Second Check
	Ineffective Breathing
	Gasping
Compressions	Not or Ineffective Breathing
	Start Compressions

	PUSH HARD - PUSH FAST
	30 Compressions : 2 Breaths
	Repeat 5 Times (2 Minutes)
	Switch Rescuers Frequently
Defibrillation	Attach AED
	Follow Voice Prompts

Patient Interview

Symptoms	- What The Patient Feels
Allergies	- Drugs, Foods, Environment
Medications	- Prescription, Over-The-Counter
Past History	- Diabetes, Heart Condition, Etc.
Last Meal	- Time, What, Quantity
Events Prior	- Exactly How Incident Occurred

Vital Signs

Pulse	- Rate, Rhythm & Volume
Respirations	- Rate, Rhythm & Volume
Skin Condition	- Temp, Colour, Dry/Wet
Pupils	- Size Equal & Reactive
Awareness	- Person, Place & Time

A Team Approach

Workplace First Aid

by: Mike H. Ichelson, EMCA Paramedic

Introduction to Workplace First Aid: A Team Approach

First aid trained individuals may be called upon to respond to an emergency situation at home, work or play. Each has different challenges. While this manual is primarily directed to the workplace First Aider, your knowledge and skills can be used anywhere and at any time.

Our focus in providing first aid in the workplace is creating, training and motivating a First Aid Team to respond to emergencies. The same concepts can be used by a lone First Aider, by themselves or by directing bystanders to help.

This first aid manual is designed to provide certified First Aiders with real guidance during a serious medical emergency. The manual is divided into three main sections:

1. Emergency Scene Management
2. Specific First Aid Treatments
3. Additional Information

The first section, Emergency Scene Management deals with identifying hazards to protect the rescuer, understanding mechanism of injury, how to handle life threats, treat non-life threatening conditions, provide appropriate and effective care until professionals take over.

The second section Specific First Aid Treatments provides detailed information on how to treat specific injuries/illnesses such as splinting or clearing an obstructed airway.

The final section Additional Information is a collection of ideas and recommendations to assist the First Aid Team in the performance of their duties, such as having the right equipment and an Emergency Medical Response Plan.

I hope that you and your First Aid Team will never have to provide care to a patient. I also hope to win a lottery some day. Both of these wishes are unlikely.

Realistically, a Workplace First Aid Attendant probably will respond to a variety of situations requiring rapid assessment and treatment. Keep this manual in your first aid kit so that you will have it available to help you on the emergency scene.

This is not cheating. You are not expected to remember everything. Rather, you are expected to find the information you need fast and to act together with the rest of your First Aid Team to help someone who suddenly becomes ill or has been injured in an incident.

Incident not accident. There is no such thing as an accident. By saying 'accident' we shirk our responsibility to work and live safely. Accident implies that the situation could not be avoided. Incident, on the other hand does not let us off the hook so easily. Admitting that it was not an accident forces us to examine what happened and make sure it never happens again. First aid is reactive. Safety is proactive.

First aid should be practiced during first aid training sessions. Safety should prevent the need to render first aid.

It Doesn't Hurt To Help

About This Manual.

This publication is not intended to replace a first aid course. We have built the concepts of Workplace First Aid: A Team Approach, around the material presented by our instructor's during an authorized first aid course.

Read this manual from time to time to review the basics of first aid. It is a good idea to have a copy of this manual in all first aid kits.

Biohazards

Section Three has important information about how you can protect yourself (and by extension your family) from potentially infected materials.

Always wear nitrile examination gloves when responding to a first aid call. Have an N95 mask and safety glasses with side shields in your first aid kit.

Never perform mouth-to-mouth breathing. Always use a CPR barrier mask.

Legalese

Identify yourself as a First Aider and ask permission to help. Casualties have the right to refuse help. Stop when told to.

Once you start, do not abandon the victim until professional help arrives. Of course, if there is a danger to your health and safety you must take care of yourself first.

Don't do more than you are trained to do. The First Aider's goal is to keep the victim alive until the paramedics take over.

Workplace First Aid: A Team Approach

Emergency Scene Management

Emergency Scene Management is a process. Regardless of the patient's condition, whether minor or severe, the process is the same. Every step is predetermined, based on following a logical plan of action.

With that in mind, this is our simple and easy to follow plan - tried and proven - because it puts first things first.

Code Eight Rule No 1 is 'the rescuer goes home tonight'. The casualty may never go home again: that is another story. We place a lot of emphasis on scene survey and safety. Only when the rescuers are safe can emergency care be provided to those needing help.

Our prime concern is saving life. Once your own safety is assured, carefully check to see if there is a threat to the victim's life. Anything that prevents the circulation of oxygen to the brain and vital organs is a life threat. Is the victim responsive? Are they breathing? Is there excessive bleeding?

Now that the life threats have been dealt with we look for other injuries or problems that must be attended to such as minor bleeding or scrapes, by performing a full body survey. Time permitting we also get a patient history by asking and writing down the answers to the S.A.M.P.L.E. questions. Also, check and record vital signs

A seriously ill or injured person's condition can deteriorate at any time. While waiting for professional medical help to arrive on the scene we continuously monitor the patient to see if a life threat has developed. Comfort and reassure the person that help is on the way and that we will not leave them.

The injury may be quite minor requiring nothing more than an antiseptic and bandage. Other times the patient will be sent to a doctor's office/clinic or hospital. In very serious situations 9-1-1 has been notified and we will hand the patient off to firefighters and paramedics. Community responders will need a copy of our notes.

A variety of chores remain to be completed after the casualty has been released from our care. Incident and other reports may be required by your company. Personal notes should be completed and filed away. The first aid kit and other equipment used must be checked/restocked. And the incident scene must be cleaned up.

The concept of Emergency Scene Management is to ensure that all aspects of casualty care is provided in the right order and at the right time. As you go through the steps keep in mind the fact that things are rarely what they seem and that the emergency scene changes all the time. Life is not static and neither is your victim.

You may progress all the way to the secondary survey when something happens rendering the scene unsafe. Or the patient may appear to be fine: smiling and joking with the rescue team. Without warning they have stopped breathing or are having a seizure.

Emergency Scene Management is not always a linear progression from step one through step five. By monitoring the patient and the emergency scene you will immediately know when to go backwards to a previous step. It may sound obvious, but it is important to remember that the victim is a person not a broken leg. It is very easy to get so involved with treating the injury that you lose sight of the fact that the injured leg is attached to a real person.

The excellent splinting job doesn't matter if the patient has stopped breathing and you didn't notice.

Implement The Plan - Don't Invent One

In his poem "If" Rudyard Kipling said

"If you can fill the unforgiving minute with sixty seconds worth of distance run . . ."

I'm sure he wasn't thinking of first aid - but it applies perfectly. Every incident involving serious illness or injury is extremely time sensitive. Eventual recovery, even survival, depends on the wise use of time by everyone involved in the patient's journey through the Emergency Medical System. First Aiders are a vital part of that system. How you use or misuse time has a definite impact on the patient's outcome. Providing first aid is really effective time management!

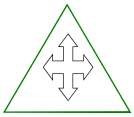
If we are to "fill the unforgiving minute" we must have a well thought out Emergency Medical Response Plan. I can't emphasize enough the importance of a written plan and running regular drill or practice sessions. Being prepared for a serious medical emergency is a lot more than having an appropriate first aid kit and taking a first aid course

Emergency Scene Management

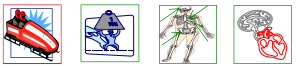
Scene Survey

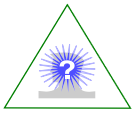
Hazards/Mechanism

Environment - Check Hazards



Mechanism Of Injury





Casualties Needing Care

Assistance Needed On Scene

Introduction

Suddenly and without warning an incident occurs. Someone is injured. You may have stumbled onto the scene yourself or, as a member of the First Aid Team, you have been called to respond to the emergency.

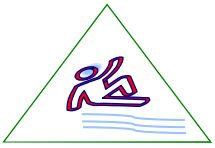
The situation looks serious. You rush to the victim's side desperately wanting to help. In your haste, you didn't notice that the victim has been electrocuted and is still in contact with a live 600 volt feed line.

At your funeral, friends and colleagues hail you as a hero. Are you a hero? Or are you just dead?

A trained First Aider does not rush into the scene. They stop, take a deep breath or two and start to critically observe the scene. A First Aider knows that they can't help anyone if they also become a victim. They also understand that other people may become injured on the scene and are concerned about everyone's safety. Additional casualties simply take away resources from the primary victim.

Performing a comprehensive scene survey does not take much time. It does provide the rescuer with a lot of helpful information. As you approach the scene you are literally bombarded with information. Stop. Absorb the data that is coming at you. Plan your actions.

Environment - Check Hazards

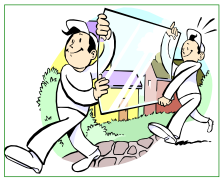


Immediately check gas, glass, fires and wires. As you stand on the perimeter of the scene, say:

"No Gas - No Glass - No Fires - No Wires"

No Gas reminds us to check for gasses such as gasoline and other flammables as well as gasses that could push oxygen from the environment.

One of the most dangerous gasses is carbon monoxide: a clear, odorless, tasteless gas produced by combustion. When two or more people are down, without an obvious cause, carbon monoxide may be the cause. Do not go to open windows. Evacuate! Get out and call 9-1-1. Unless you have the proper equipment and training, this is a rescue that must be performed by professionals.



No Glass means don't get cut. There are lots of things that could cut you on the emergency scene, including, of course, broken glass as well as knives, saws, banding material, metal and plastics. Even seemingly safe items such as cardboard can cause serious injury.

Box cutters are especially dangerous. People leave these tools open (blade exposed) in tool boxes, on shipping desks and counters, on the floor and just about everywhere else. Whenever you see an open box cutter, retract the blade.

No Fires simply means do not get burned. We are talking about a lot more than open flame. Heat sealing machines, lift truck engines, photocopier diffusers, even the coffee equipment can cause serious burns. Microwave ovens have been with us for about fifty years, yet people still get burned taking the plastic wrap off of food trays. Acids and other chemicals also fall under this classification.

No Wires is a bit trickier than the first three hazards. No wires tells us to watch out for energy sources including electrical, hydraulic, pneumatic, steam and kinetic energy. The most dangerous form of energy is people. There are times when an emergency situation may bring out the worst in people. And there is drugs/alcohol to consider.

"It is better to do something a hundred times safe than to be killed once - "
Mark Twain

Workplace First Aid: A Team Approach

Mechanism Of Injury

How did this incident happen? What forces were involved? What direction did the forces travel?

How did these forces impact on the victim's body? What injuries do we suspect may have occurred?

Once you have finished your hazard check and removed potential dangers, critically look at the scene. Where there forces involved? Perhaps the victim had a heart attack and simply collapsed on the floor. No forces here. Or there might be an overturned ladder. You notice tools strewn on the ground. Did the victim lose their balance, falling off the ladder, injuring themselves? Could they have had a heart attack causing the fall off of the ladder?

You really don't know much at this point. Taking a few seconds to observe the scene gives you a 'gut' feeling of what happened. Reports from bystanders and the victim, if conscious, help to fill in the gaps and give you a better picture.

Consider a single occupant incident. The car was travelling at 100 km per hour when the driver lost control and smashed into a tree, which was travelling at 0 km per hour at the time.

How many collisions occurred during this incident? Look away from the book for a moment. Close your eyes and picture the scene in your mind. Visualize the various forces and how they were resolved.

Bystanders may rush in, but as a trained First Aider, you know that stopping and observing the scene will give you vital clues as to what is really happening. You realize that the car was travelling at 100 km per hour when it struck the tree, rapidly reducing the speed to zero. The driver inside the car was also travelling at 100 km per hour when he struck the windshield or dashboard, abruptly reducing his speed to zero. Two collisions so far. The third collision is the killer. The driver's brain was travelling at 100 km per hour when it smashed into his skull. The driver's heart, lungs and major blood vessels were travelling at 100 km per hour when they smashed into his rib cage.

The driver gets out on his own. He is upset about the damage to his car. He's worried about rising insurance rates, or that 'Dad is going to kill me when he sees the car.' The driver has no idea that he is very sick. The tragic truth is that Dad will not get the chance to be angry. By the time Dad finds out about the incident, the son has already been pronounced dead. All of that hidden damage inside the body, if left untreated, leads directly to death.

A trained First Aider recognizes that the forces impacting on the body may have caused serious, even life threatening injury that others will not see. As a First Aider you do not have to be sure that there are internal injuries. You suspect there might be an injury and provide emergency care according to your suspicions. Trauma Centre doctors, with labs, x-rays, MRI's, CAT scans and a whole army of technicians will eventually catalogue the patient's true injuries.

All you have is your own intellect, knowledge gained from this and other courses, assistance from bystanders and any other resource available. Your job is to speak for those who cannot speak for themselves. Your goal is to keep the victim alive and viable until they are accessed into the Emergency Medical Services system.

Injuries may worsen with movement. The mechanism of injury leads you to suspect potentially serious injuries.

Before approaching identify yourself and tell the victim not to move.

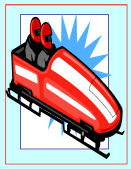
"My name is Mike, I'm on the First Aid Team Stay still - Don't move!"

If you are responding to a call for the First Aid Team you know that other team members are on the way. Otherwise, get the attention of bystanders.

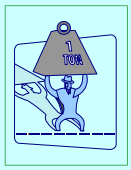
"Help! I'm going to

need some help here!"

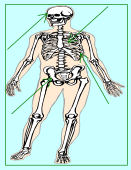
At this point you may be directing people to help you. You may need help with crowd control, directing traffic, sending someone to call 9-1-1. People generally want to help. Ask them - they will respond.



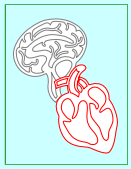
Consider the effects of speed.
What forces impacted on the body?
From what direction? Where on the body?



Consider the effects of weight.
Did something fall on the patient?
Did the patient fall down? How far?



Where did the force hit the body?
Are there obvious signs of trauma??
What injuries may not be obvious?



Could there be an impact on the brain?
On the heart, lungs/major vessels?
Could the neck or spine be damaged?

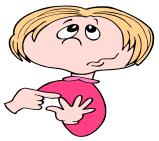
Any blow to the head could cause a concussion (brain injury). The injury can range from severe, resulting in unconsciousness and death to a mild headache. Concussions are complex injuries requiring immediate medical assistance. There are no simple rules for first aiders to follow when facing a possible concussion, Best practice is to arrange immediate transport to an emergency medical center.

Follow The Forces
Where Did They Impact
What Injuries Should You Suspect

Emergency Scene Management

Casualties Needing Care

How complicated is this incident?

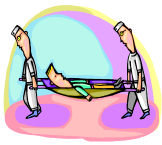


Are there multiple casualties?

How severe are the injuries? Where do you start?

By far the majority of workplace first aid responses are to help one individual. But not always. Although rare, you can get multiple injuries from almost any scenario if the conditions are right. Speed on the highway often results in multi vehicle collisions. People stampeding to the exits can result in fall and crush injuries. Exploding chemicals and fires can reach out and touch many people.

Prepare yourself for the worst incidents by remembering the truth of Murphy's Law: If something can go wrong it will.



Approaching the multi-casualty scene starts off the same as any response: Check the scene for hazards to yourself and others. Scenes with many people injured probably have a lot of different hazards that can impede the rescue and injure the responders.

While mechanism of injury is crucial to the one victim scenario, it may not be as vital in a situation where more people are injured than resources to look after them. Under these conditions the first person on the scene must count and classify (triage) those injured according to who needs urgent care, who can wait an hour or more and those who have minor injuries or are obviously dead.

We have three basic categories: The seriously injured (highest) walking wounded (second) and the dead and dying (lowest.)

We can only concentrate on the seriously injured because they may be saved.

The dead and dying are beyond hope - we can't help them. The walking wounded may have broken limbs and controlled bleeding so they have time. The seriously injured might be saved if we concentrate our efforts there.

Start by counting how many people are injured and get this information to 9-1-1 right away.

Who needs help right now and who can wait. Are there people around who can provide initial care? Once you have a good idea of how many are hurt and the extent of their injuries and if they are trapped, report back to 9-1-1 to update them.

Unless there is a compelling reason, do not move patients from where they fell. However, the walking wounded can be sent to a safe nearby spot to await care and transport.

Provide whatever assistance you can to community emergency responders like paramedics, firefighters, police etc.

Keep 9-1-1 updated as often as necessary.

Assistance Needed On Scene

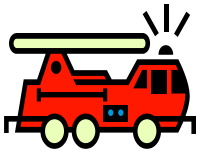
The 9-1-1 operator can't see you or the scene. Tell them what is happening.

Provide details: how many injured, extent of injury, trapped.

Tell them about hazards like falling wires, gas leaks or fire.

You may not always need outside help. Your facility may have highly qualified people on staff such as electricians and maintenance mechanics.

People who maintain an industrial machine generally have a wealth of knowledge about how to safely free the victim. Firefighters work hard to acquire and maintain their rescue skills, but they can't possibly know every machine in use today. So, they rely on people in the facility to help them effect a rescue.

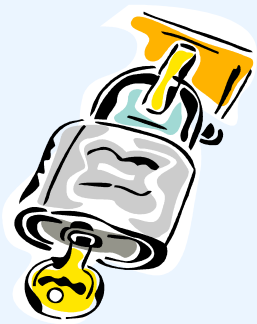


Always lockout any equipment at the incident scene and in the vicinity of the incident. Lockouts are to be engaged right back to the energy source. Once lockout devices are in place they are not to be removed until the police or Ministry of Labor officials authorize you to do so.

There is a wealth of highly trained and motivated professional responders ready to help you save life and reduce suffering.

Get these people on the way by rapidly calling 9-1-1. This is the single most important thing that the First Aider can do in an extreme life threatening emergency. While waiting for EMS, provide whatever first aid assistance you can. When community responders arrive follow their instructions.

Call 9-1-1 for extreme emergencies where life and limb are at stake: fire, medical emergency or to report a crime in progress.



Tag Out - Lock Out

Do you have a Tag Out - Lock Out program at your workplace? If not, get one started NOW!

Whenever maintenance is performed an a machine or during an emergency, all power to the machine must be shut off to ensure everyone's safety. This is more than common sense - it is the law.

The concept is very simple. The worker putting the machine out of service places a tag on the unit which tells who locked it out, when and why. Then the machine is locked with that worker's personal pad lock. There are no master or duplicate keys. To get the padlock off the device you must have either the only key or a pair of bolt cutters.

Workplace First Aid: A Team Approach

Scene Survey

Hazards/Mechanism

STOP! DO NOT ENTER THE SCENE BEFORE COMPLETING A SCENE SURVEY

Identify Yourself
Tell Victim Not To Move

→ Attract Attention
Yell Out - HELP! I NEED SOME HELP HERE!

No Gas → Two Or More Down Get Out! → Gas Spills - Flammable
Carbon Monoxide
Call 9-1-1

No Glass → Don't Get Cut → Remove Any Sharp Objects
Such As Glass, Knives Etc.

No Fires → Don't Get Burned → Turn Off Heat Source
Remove From Heat Source
Fire? Call 9-1-1

No Wires → Electrical, Hydraulic, Pneumatic, Steam, People → Turn Off & Lock Out Energy
Control And Utilize People

Mechanism: What forces were applied to the body? From What Direction?
At What Speed? What injuries May Have Occurred? Head? Neck? Spinal?

Casualties: How many people are injured? What is the extent of the injuries?
Mass Casualty: Sort by Walking Wounded - Seriously Injured - Dead or Dying

Assistance: What help is required on the scene? Maintenance Personnel?
Police? Fire? Hazmat? Paramedics? Utilities: Gas or Electric?

Emergency Scene Management

1 Primary Survey

Check Life Threats

Responsive, Breathing, Circulation

Gross Bleeding

Stop Bleeding

Chest Injury

Stabilize

Thighbone Injury

Stabilize/Stop Bleeding

Introduction

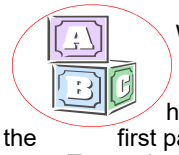
After completing the Scene Survey and removing or neutralizing threats to your safety, you carefully proceed to the victim. Check for life threats by doing a Primary Survey, which is an organized method of identifying life threats.

Life depends on the brain and other vital organs receiving a constant oxygen supply. A life threat interferes with the body's ability to obtain and use oxygen

Each of the steps in the Primary Survey is performed in exactly the same sequence. Once a life threat has been identified it is dealt with immediately. It is more important to stop severe bleeding than to worry about a sucking chest wound. Similarly, sucking chest wounds trump a broken thighbone.

In truth, you will never be finished the Primary Survey until EMS takes over. A patient can go into cardiac or respiratory arrest at any time, so continually monitor the victim and be prepared to take immediate action.

Responsive, Compressions, Airway, Breathing



When you see and hear the victim crying or screaming in pain you have already completed the first part of the Primary Survey. To cry the victim has an airway and is breathing. Of more concern is the victim who is lying absolutely still and quiet. Now it is up to you to consciously determine their status.

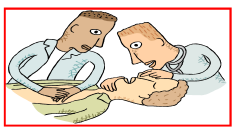
Is The Victim Responsive? Shout at the patient while shifting your weight from one foot to the other so that you are aiming the sound to both of their ears. The victim may be deaf in one or both ears. Is there a reaction? Does the patient move or is there a facial response to the noise. Gently shake or pinch the victim. Do they respond to the pain? Again, watch the body and face for movement.

Check breathing for no more than 5 seconds. Does victim appear to be breathing? Are they gasping or do you hear an escape of air with a gurgling sound (agonal respirations.) If yes get help and start compressions.

Call For Help! If the victim does not respond to sound or pain immediately call for help. **If available, use a cell phone, on speaker, to call 9-1-1.** Doing so allows the 9-1-1 dispatcher to offer assist the first aider in rendering effective care to the victim.

Start Compressions at 30 compressions for every two breaths (one cycle.) **Continual chest compressions, with minimal interruptions, is very important.**

Chest compressions should be about 60% of the total resuscitation time. If there is more than one rescuer, switch rescuers every two minutes. CPR, is very physical. As the rescuer tires, the quality of CPR deteriorates. Continue CPR until your Automated External Defibrillator or EMS arrives or the patient has regained consciousness/signs of life. Ideally, a CPR coach will observe the rescuers for signs of fatigue. Take care not to interrupt compressions when changing rescuers.



Open The Airway Only use the Head Tilt - Chin Lift method to open the airway. Don't worry about potential neck or head injury as airway always comes first. An unresponsive person's tongue often collapses over the windpipe preventing air from entering.

Give Two Breaths using a safe CPR barrier device such as the Vapor-Isolation -Valve mask or a Bag-Valve-Mask. The risk of disease transmission is statistically low, but it quickly becomes a very large factor if you are the one who gets infected. Each breath should last no more than one second: just enough to see the chest rise.

PUSH HARD AND PUSH FAST

Ventilate Over 1 Second

Very Little Air In

Complete Chest Recoil

Workplace First Aid: A Team Approach

Gross Bleeding

Gross or Severe Bleeding is an immediate life threat because the oxygen carrying blood is escaping from the body. As blood volume diminishes, less oxygen is available for the brain and other vital organs which slowly shut down resulting in death.

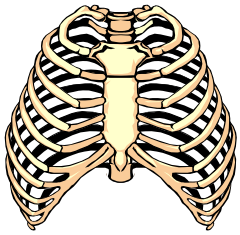
When blood is pumped from the body, the patient has nicked or severed an artery. Emphasis shifts from Responsiveness, Airway and Breathing to control of severe bleeding.

Ensure 9-1-1 has been notified. Wearing nitrile gloves, apply firm, direct pressure over the wound. As soon as possible, place an abdominal pad or pressure dressing on the wound and continue applying direct pressure until EMS arrives.

When there is profuse bleeding from a limb, that is not controlled by direct pressure and is considered to be life-threatening consider applying a tourniquet. Also use a tourniquet in multiple casualty situations, multiple injuries to a casualty, when the wound cannot be reached to apply direct pressure or when staying with a patient is not possible. **Additional severe bleed training: www.controlthebleedcanada.com**

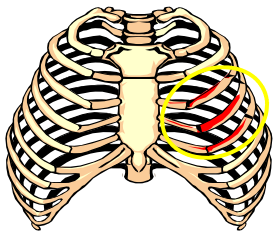
Chest Injuries

Anything that interferes with the chest's ability to bring air into the lungs is a potential life threat. Flail Chest and Penetrating Chest Wounds (Sucking Chest Wound) are common chest injuries. Both of these conditions challenge the chest's ability to properly function and are therefore very serious injuries.



First Aid measures are stop gap at best, call 9-1-1 fast. Only surgeons can repair this damage, so accessing the victim into the EMS system rapidly is essential.

Flail Chest occurs when three or more adjacent ribs, on the same side, are each broken in two or more places. The resulting flail section operates independently from the rest of the chest. When the victim tries to inhale, causing the chest to expand, the flail chest moves inward. When the patient exhales causing the chest to deflate, the flail section moves outward.



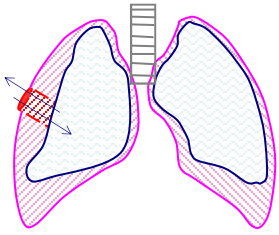
These 'paradoxical' movements skews the internal pressures required for the chest to do its' job: bringing oxygen containing air into the lungs.

The victim, if conscious, will be in significant pain and will almost certainly experience difficulty breathing. The flail segment can be supported by a thick, heavy pad such as a blanket, taped over the injury. Care must be taken not to tape around the victim's body because this could result in considerable restriction of the chest's ability to expand, therefore making it more difficult to breathe.

Another first aid measure is to fold the victim's arm over the chest so that the forearm is acting like a splint. The arm is strapped to the patient using a broad bandage around the chest. Care must be taken not to tie the bandage too tight because the restriction could limit the patient's ability to breathe.

Penetrating or Sucking Chest Wounds occur when the chest wall has been pierced. Air can now enter and leave the chest through this hole in the chest wall, increasing pressure within the chest and ultimately causing the lung to collapse.

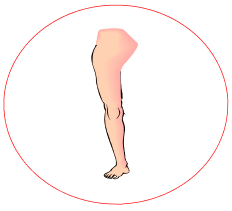
The victim will be in considerable pain, have difficulty breathing and the skin will probably become cool, damp and cyanotic (pale, grey, blue.) As pressure builds in the chest cavity it becomes ever more difficult for the victim to breathe.



<u>Do not apply an occlusive dressing over the wound, such as plastic.</u> An open chest wound should be left uncovered. Even a simple gauze pad could become so saturated with blood and other fluids as to trap air in the chest creating a tension pneumothorax.

Thighbone Injuries

Thigh Bones are the largest bones in the body. All bones produce blood cells. Being the largest bone means it produces a lot of cells and therefore requires a huge blood supply to bring in nutrients and oxygen and collect waste products and carbon dioxide. So, these bones are served by very large arteries and veins. If a large blood vessel were nicked or severed there is the potential for an enormous amount of bleeding. This definitely counts as a life threat.



A single thighbone fracture can result in the loss of approximately 1.5 liters of blood. Should both thighbones become broken the victim could lose more than half of their circulating blood volume.

The blood is trapped in the body, forming a large bruise over the injury. This internal bleeding has caused a serious reduction of circulating blood to the brain and vital organs.

Have the patient sit or lie in a position of comfort, stabilize the fractured leg/legs and access the patient into the Emergency Medical Services System as rapidly as possible.

Emergency Scene Management

STOP! DO NOT ENTER THE SCENE BEFORE COMPLETING A SCENE SURVEY

Check Responsiveness

Sound ?

Pain ?

Call For Help 9-1-1

Circulation Gross Bleeding

Sucking Chest Wound

Flail Chest

Thighbone Fractures

Stabilize The Head, Neck and Spine

Call For Help 9-1-1

Check Breathing For 5 Seconds

Not Breathing

Gasping

Agonal Respirations

Compressions

Compressions 30:2

Give Two Breaths

Continue For Five Cycles Approximately Two Minutes

Reposition Head Give Two Breaths

Look Inside Mouth
If Object Is Visible
And High Enough
Pinch And Pull It Out
Otherwise
Start Compressions 30:2
Recheck Every Minute
If Object Can Be Pulled Out

Maximum Per Rescuer Two Minutes Of CPR

Continue CPR Until:
Too Tired To Continue
Victim Conscious
Victim Moves Purposefully
The AED Team Arrives
Paramedics/Firefighters Arrive

Cover The Victim With A Blanket

Workplace First Aid: A Team Approach

2 Secondary Survey

Other Injuries/Information

Initial Contact

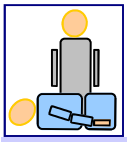
Name, Age, Chief Complaint

Patient Interview

S.A.M.P.L.E.

Record Vital Signs

Pulse, Respiration, Skin, Eyes



Physical Survey

Complete Body Examination

Introduction

We have checked the scene for hazards and identified and treated life threats. Only then can we continue to provide effective and appropriate emergency care to the casualty.

If the victim is conscious we introduce ourselves and ask them two or three questions to quickly establish their state of awareness. A series of important questions are asked prior to a physical examination in case the victim becomes unconscious.

Important physical data is observed and recorded such as the person's pulse, respirations, skin condition, pupils and level of awareness. If the equipment is available, and we have the appropriate training, we may also record blood pressure.

Finally, a complete body examination, (head-to-toe) is done in order to identify minor to moderate injury and treat what we find.

Information gathered by the First Aider is important - if it is written down. So, record everything, including any changes that you notice.

Initial Contact

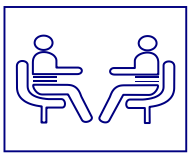
As you approach the patient remind them to stay still and not move, as they may have a head, neck or spinal injury. Introduce yourself again, if you think it necessary, telling the victim you know first aid and are here to help them. You now have either verbal or implied consent to proceed. Even so, whenever you need to touch the casualty, always ask permission first, explaining what you want to do and why.

Ask the victim their name and age. This provides a very rapid assessment of their awareness and their ability to communicate. Ask what is bothering them? Where does it hurt? This line of questioning establishes the Chief Complaint: what the patient perceives to be the problem.

Don't get sidetracked by what the patient identifies as the chief complaint. Things are rarely cut and dried. What you see isn't always what you get. Often, if you search, you will find other things which may prove to be far more serious than what the patient thinks is wrong.

Patient Interview

The victim of sudden illness or injury could lose consciousness. Now we can't ask and get the answers to some very important questions. Ask the questions now, while you still can!



S.A.M.P.L.E. is a simple and structured series of questions that ensures you touch on every major area. Unless you interview sick/injured people all the time, you are not likely to remember these questions, so use a pre-printed Workplace First Aid Form or keep a copy of this first aid book in your first aid kit.

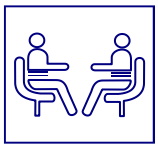
Signs and Symptoms A sign is something that the rescuer can see, smell hear, touch. A symptom is something that the victim feels, like nausea, dizziness, headache, pain or anxiety.

Allergies Some allergies are a minor irritation while others are life threatening. Is the victim allergic to any medications like penicillin? It is very important to record and highlight any drug allergies. They may be allergic to foods like peanut butter. Bee stings is an example of an environmental allergen.

Medications Knowing what medications a person takes helps the medical staff figure out what underlying, existing conditions the victim may have. Ask if the person is taking any prescription medicines. If so, write down what they are taking, the dosage, how and when they take it. When did they take it last? Are they talking any over-the-counter medications like cold or stomach remedies? Street drugs (marijuana, crack, cocaine etc.) used recently? When? How much?

Emergency Scene Management

Patient Interview (continued)



Previous/Pre-Existing Illness Although it appears that the victim fell off a ladder, that may not be the case. Perhaps the casualty has suffered a heart attack. Their being unconscious has nothing to do with the fall and everything to do with lack of circulation to the vital organs.

Knowing what previous medical conditions the victim has may be very helpful to the doctors who are trying to figure out what is really going on. The medications gives the first clue. Every time the victim tells you a medication they are taking, ask why do they take it. Ask which doctor prescribed it.

Ask the casualty if they have diseases such as, heart, lung/pulmonary, sugar/diabetic, epilepsy, asthma, arthritis, ulcers - in fact anything that you can think of. Write the information down.

Last Meal What and when they ate last may be as important as the fact that they have not had food or drink in a long time. Unless you suspect the problem is sugar related, never give anything by mouth, not even drops of water, because the person may require surgery.

Events Prior Can the victim tell you, in some detail, the preceding events leading to their present condition. Do they know precisely how the incident occurred? Or, are they foggy and confused as to what happened. This information helps you to assess the patient's mental status.

Suspect a head injury (trauma, stroke, TIA) if the victim has no recall of these precipitating events.

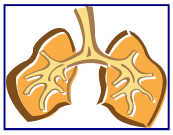
Head injury victim's often have no memory of a period of time (15 minutes or several days) prior to or after their accident.

Record Vital Signs

There are several objective observations that the First Aider can make and record which could prove very helpful to the medical professionals trying to help the patient. By writing down the time that you made the observation, you have created a comparative list of facts which can help determine if the patient is stable or deteriorating. It is not important that the First Aider understand the significance of any of the data that they collect. Just get it and write it down, preferably in a chart format. The time is listed on the left hand column and the observations are written across the top.

Pulse Count the pulse at the wrist, using your middle and index fingers. Do not use your thumb, as it has a pulse of its' own, which could lead to the wrong observation. The pulse is on the thumb side of the wrist just below the base of the thumb. Count fifteen seconds and then multiply by four to get beats per minute.

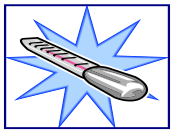
Try and describe the pulse in terms of very strong, strong, weak and very weak. Was the pulse rhythmical or did you notice that it would either skip some beats or speed up.



Respirations Count the number of times per minute that the victim breathes. You can count for fifteen seconds and multiply by four or (preferable) count for thirty seconds and multiply by two. The victim can't change their pulse rate, but they can and will change their breathing rate if they know you are checking their breathing. Ask the victim to fold their arm across their chest. Now locate the pulse with your middle and index fingers. Tell the casualty that you are checking their pulse but, instead, start counting their breaths. Since they think you are checking the pulse they breathe normally and you get a valid count.

Try and describe the quality of their breathing. Is it labored? Difficult? Painful? Irregular? Are they fighting for air, inhaling deeply or panting?

Skin Colour How would you describe their skin colour? Is it blue (cyanotic), grey, pallor, washed out or lifeless? Skin pigmentation can make it difficult to see the actual colour of the skin. If the patient is dark skinned you could press down on a fingernail and then when you let up count one, one-thousand. If it pinks up within one second the skin colour is okay. You can also check the inner lower lip or invert the eye lid and check the inside tissue. Is it blue/grey or pink.



Skin Temperature Is the skin hot, warm or cold. Use the back of your hand to feel the patient's forehead or cheek. The back of your hand has more heat receptors than the palm. It is not necessary or advisable to take off your nitrile gloves to check temperature.

Time	Pulse	Respirations	Skin	B. P.	Awareness	Pupils
10:50	120	28	Cool / Dry / Pale	/	Alert	Pearl
11:00	96	20	Cool / Damp / Ashen	/	Alert	Pearl
11:10	76	14	Cold / Sweaty / Grey	/	Resp. to verbal	Pearl
11:20	68	10	Cold / Sweaty / Bluish	/	Resp. to pain	Pearl / Sluggish
11:30	???	10	Same	/	No response	Not reacting

Workplace First Aid: A Team Approach

Record Vital Signs (continued)

Skin Dry/Wet Is the skin dry, moist or wet? Is the patient sweating profusely?

Skin condition is important because it is a major visual indicator of shock.

Blood Pressure If you are qualified to do so, and have the appropriate equipment, take and record the victim's blood pressure. Do not attempt analyzing the reading and do not tell the victim what you think it means. Simply get the numbers and record them.

Level Of Awareness Does the victim know who they are? Ask their name, age, address, where they work or what they do for a living.

Does the victim know where they are in terms of the physical address, plant number or any other indicator showing that they understand where they are currently located?

Does the victim know where they are in relation to time? Time of day? Day of week? Season? Year? Who is prime minister or president?

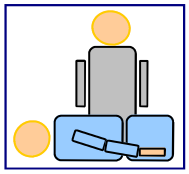
Pupils Using a penlight, shine the light into each of the patient's eyes for a few seconds. Watch the pupil (the black center part of the eye.) Do the pupils react to the light? They should get smaller since there is now more light. Are both pupils about the same size? Do they both react over the same approximate time span? Does one react and not the other?

All of these observations paint a picture of the patient at a given point in time. To be really useful, the paramedics and doctors require these observations to be repeated at regular intervals over a long period of time. So, observe and record vital signs approximately every fifteen minutes for a moderately ill and approximately every ten minutes, for a seriously ill person.

Modified Glasgow Coma Scale

Eye Response: Opens spontaneously	Verbal Response: Oriented and alert	Motor Response: Obeys commands
Opens to verbal/painful	Confused	Moves to pain
Does not open	Does not respond	Does not response

Head To Toe Survey



Not all injuries are immediately apparent, or for that matter, even expected. A person may simply faint. After a few minutes they seem fine - but are they? Could they have hit their head on something when they fell? The cause of the faint may have been stress upon hearing bad news. That condition has now passed, but the head injury remains. Our purpose in the physical examination is to uncover any hidden injuries and provide appropriate care.

I am a strong believer in keeping things simple. Start at the top of the victim's head and proceed downward to the soles of their feet. Mentally divide the victim into 1" (2.5 cm) horizontal strips and check each strip in an orderly fashion. Should you discover a problem either treat it immediately or ask someone else on the scene to take care of it as you continue the survey.

Just because you completed the Primary Survey doesn't mean the victim is out of danger. The casualty could stop breathing at any time. The patient may vomit or have a seizure. So, while we will continue to look for other injuries/problems we still monitor potential life threats and are prepared to immediately stop what we are doing and go back to the top of the decision tree: Responsive? Airway? Breathing?

As you get more involved in victim care there is a tendency to completely focus on the victim's needs. And, that is okay as long as it does not put you in danger. Just as you are constantly monitoring the victim for the development of a life threat, you are also monitoring your environment for the development of a hazard which could place you and the victim in danger.

You never really complete the Scene Survey or the Primary Survey.

These two acronyms will help you spot injuries:

DOTS:	Deformity	Open Wounds
	Tenderness	Swelling
CLAP:	Contusions	Lacerations
	Abrasions	Penetration

Ask the victim if what you are doing hurts. Look at the face and body to see if what you touched provoked a pain response, even in an unconscious casualty. Always tell the person what you are going to do and why you are doing it.

Do your best not to remove clothing, but if you must, ask for permission first. As soon as possible cover the patient to protect their dignity and modesty.

Write down everything you observe that is not normal and record the treatment you provided. You might write "long and deep cut on the left forearm - applied direct pressure - bandaged with an abdominal pad and roller gauze - bleeding is now under control."

Emergency Scene Management

DO NOT UNNECESARILY MOVE THE VICTIM
ESPECIALLY IF MECHANISM INDICATES
POSSIBLE HEAD NECK OR SPINAL INJURY

Feel and look at every body part for DOTS and CLAP:

Check the scalp. Is there bleeding, depressions, soft spots or deformity.

Check behind and inside the ears. Is there bleeding or bruising.

Check the forehead and the eyebrows.

Check the facial bones around the eyes.

Check the eyes with a penlight: **P**upils **E**qual **A**nd **R**eactive to **L**ight

Are the eyes around the same size?

Do they react equally to the light in terms of speed and size?

Check the cheek bones.

Check inside nose with a penlight.

Check inside mouth with a penlight for burns, foreign bodies such as broken teeth, gum? food?

Check the chin for deformity or bleeding.

Check, the neck for jugular vein distension, tracheal deviation, cuts and bruises.

Check, as much as you can without moving the casualty, the back of the head and neck for bleeding, soft spots and deformity.

Check the neck for deformity and tenderness.

Check the collar bone on both sides for tenderness and deformity.

Check, if you can, the spine and back by lifting the shoulders and sliding your hand under the spinal column. Feel for deformity or tenderness.

Check the upper arms, elbows, lower arms, hands and fingers, for bruising, cuts, swelling and deformity.

Can the victim push up against your hands? Down? Forward?

Check the chest. Compare sides. Can the victim inhale deeply? Is there bleeding or tenderness. Check for bruising, and fractured ribs.

Feel down both sides of the chest from the collar bone. On a female patient, check down to the top of the breast, then go under the breast, push the breast up and continue checking the chest.

Check abdomen. Divide the abdomen into four quadrants and check each one by gently pushing in as you move your fingers in a circular pattern. Is there pain, rigidity, bruising or bleeding?

Check the pelvis. Push in. Pull Up. Push Down.

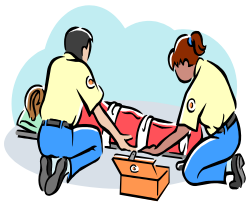
Check on both sides, the upper legs, knees, lower legs, feet and toes.

Can the victim push their feet up against your hands? Down? Forward?

Check for priapism, erection due to a serious spinal cord injury.

Summary

As you progress through the Secondary Survey you are gathering information that will help you in caring for the casualty immediately. What you find out may prove vital to the medical professionals who will provide definitive emergency care at the hospital.



You will uncover various injuries as you progress in a logical way down the body. The question is when do you provide first aid for the various problems you have uncovered. Good question, not many really good answers. You really have to use some judgment as you proceed.

If there are other Team Members or bystanders who can help you, then assign injuries as you find them.

When there are a lot if injuries it is hard to know that what you have just found is more important than an as yet undiscovered injury further down. If you stop at the first injury you find and start to provide first aid you may leave uncovered a much more serious injury that could become a life threat.

So, unless the injury you have uncovered is very severe, continue the Secondary Survey of the entire body, cataloguing and prioritizing the most immediate concerns first.

When someone is seriously injured there is a lot of work to do, often it is much more than one person can handle. Later in this manual we will talk about the Team Approach to first aid in the workplace. Using this concept will simplify the job because other team members will step in and know instinctively how to help you help the victim.

When you are away from your workplace you will not have the luxury of working together with other trained team members. Call out to bystanders and tell them how to assist the patient. Although these people may not be trained First Aiders, they can help if given clear instruction and ongoing supervision. In an emergency you want all the help you can get.

Written notes are very important. Have someone else, if possible, write notes as you dictate your observations.

Most importantly, continue to check airway and respirations regularly.

Workplace First Aid: A Team Approach

2 Secondary Survey

Other Injuries/Information

STOP! DO NOT ENTER THE SCENE BEFORE COMPLETING A SCENE SURVEY

NEXT! DO A PRIMARY SURVEY TO IDENTIFY & TREAT LIFE THREATS

Initial Contact

- Name and Age
- Chief Complaint

If confused about name & age: 9-1-1
Start to treat the chief complaint

Patient Interview

- Signs and Symptoms
- Allergies
- Medications
- Pre-Existing Illness
- Last Meal Eaten
- Events Prior To Incident

What do you see? What does the victim feel? Allergic to food, drugs, environment? Taking prescribed meds, over-the-counter meds or street drugs? When and how much did they last eat? Can they remember how they got into this situation.

Vital Signs

- Pulse
- Respirations
- Skin Condition
- Blood Pressure
- Level Of Awareness
- Pupils React To Light

Pulse & Respirations: rate, rhythm & volume. Is skin dry/wet, cold/hot? Does the victim know who they are, where they are and the appropriate time frame: year, day etc.? Do the pupils react to the penlight? At same speed? Same size?

Physical Survey

- Head
- Face
- Neck
- Shoulders
- Arms and Hands
- Chest
- Abdomen
- Pelvis
- Legs and Feet

Start at the patient's head and methodically work your way down to the patient's feet checking for:

Deformity	Contusions
Open Wounds	Lacerations
Tenderness	Abrasions
Swelling	Penetration

Provide treatment as you uncover injuries.

WARNING

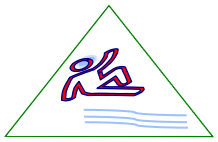
Monitor Life Threats

Emergency Scene Management

3 On-Going Care

Continually Monitor

Monitor Life Threats

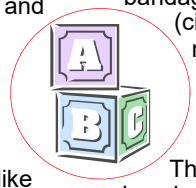


1. Scene Survey: Danger has a way of creeping up on you if you are not careful. Truth is, the scene is constantly changing. It is up to you to protect the patient and yourself from harm by constantly doing a scene survey.

2. Primary Survey: In a similar vein, the Primary Survey is never really completed until you hand the casualty over to a higher authority like paramedics or staff at the Emergency Room.

Carefully monitor the victim's breathing and be prepared to start CPR if necessary.

3. Level Of Awareness: Monitor and record changes to level of awareness. Any changes to level of awareness is significant. Is the casualty becoming more coherent? If yes they are improving. Are they no longer responding to verbal stimulus. If so, they are deteriorating. Watch for changes and be prepared to act.



4. Monitor Bandages: Make sure that bandages do not become too tight. After bandaging you checked for CSM (circulation, sensation and movement.) However, as time goes by the bandage may get tighter due to swelling. So monitor CSM and re-bandage if necessary.

The three sided non-porous dressing you placed on the victim's chest to treat a penetrating chest wound may have stuck to the chest on all four sides due to blood and other fluids, which will lead to a tension pneumothorax. Make sure the flutter valve is working properly. You may have to lift it up occasionally to let air escape.

5. Casualty Positioning: If the patient is conscious and alert and has no suspected abdominal injuries or head, neck and spinal injuries, consider placing the victim in the recovery position. Roll the victim onto their side and ensure that the airway is open.

When the patient has a suspected head, neck, spinal or hip injury and they are breathing without difficulty, leave the person in the position found and carefully monitor. However, if there is concern about blood, vomit or other fluids entering the airway, roll the person into the recovery position.

Otherwise, let the patient choose their own position of comfort.

Never seat a patient in a chair as they may lose consciousness and slide off the chair. Rather have the casualty sit on the floor and be supported by someone behind them.

Dry, Warm and Stabilized

Keep the patient warm with an equal number of blankets over and under the victim.

If a head, neck or spinal injury is suspected, tuck the blankets under the victim but do not move the victim to place the blankets.

Protect the patient from the elements as much as you can. Use whatever materials are at hand to keep the patient as dry and comfortable as possible.

If there is any suspicion of a head, neck or spinal injury due to the history, mechanism of injury or physical examination, maintain the victim's head and neck in the position found. Do not apply traction. Simply hold the head in place.

Airway always trumps a potential spinal injury. Should the airway be threatened, move the patient if necessary to ensure the airway remains open.

Oxygen Is Good

Oxygen may help and can't hurt the victim of sudden illness or serious injury.

Code Eight provides a supplemental program to train responders in the safe use and administration of oxygen.

Monitor and Record Vital Signs

Observe and record vital signs every ten to fifteen minutes.
Pulse - Rate, Rhythm and Volume.
Respirations - Rate, Rhythm and Volume.
Skin - Temperature, Colour and Condition (dry/wet)
Pupils - Equal and Reactive To Light
Level of Awareness - Alert / Voice / Painful / Unconscious

Workplace First Aid: A Team Approach

4 Care Transfer

Paramedics/Hospital/Clinic

Most workplace injuries are minor. The First Aider does whatever first aid is required, fills out a report and both the worker and First Aider go back to work.

Other times the victim will require further medical care. When the injury/illness is minor to moderate, try to take the casualty to a medical clinic rather than a hospital emergency room.

Hospitals are swamped with <u>real</u> emergencies. They just don't have time to take care of your little cut. Three or four stitches may be a big deal to the victim, but in the broader scheme of things, a few stitches doesn't even count.

Hospitals are dealing with a steady flow of life threatening conditions. So, they must utilize their resources based on the severity of the patient's current condition. A few stitches or a broken arm, while painful, can wait. A non-breathing person can't wait.

So, if you go to the emergency room be prepared to wait four, six, ten hours or more. Remember, in the emergency room the luckier you are the longer you wait. Real unlucky people go first!

Your company should see if there are any doctors or medical clinics in your area that would be willing to handle minor suturing, x-rays and casting as well as treating minor illness. It is far better to go to a medical clinic than the hospital.

You will be in and out of the clinic in lightening speed compared to the emergency room. The patient gets faster and often better care, because the doctors at the clinic are not overwhelmed by the cases waiting to be seen.

And an added benefit to the clinic is that you are helping to take the strain off of our hospital system by going elsewhere.

You may have no choice but to go to the hospital. There may not be a clinic in your area, or the clinic may not be open the same hours as your workplace.

Regardless of where you take the victim, the next problem is how do you transport them to medical care.

Code Eight suggests that you <u>never</u> drive the person to the clinic or hospital yourself, for a number of reasons.

1. The First Aider should be looking after the casualty not driving AND looking after the casualty.
2. You may be tempted to drive fast and perhaps go through stop signs and red lights if the victim deteriorates. Getting into a collision does not help the person who is already hurt and certainly is not appreciated by those you just injured by your careless driving.
3. There are a variety of potential legal concerns when you use your car to transport a non-relative or a worker to medical care.

Instead of driving them yourself we suggest you use a taxi company. Set up a charge account with a local cab service and call them if the situation does not warrant an ambulance.

The First Aider rides with to the clinic or hospital, registers the patient and then, depending on company policy, either hops in another cab back to work or waits until HR or a company representative arrives at the hospital/clinic.

In serious situations you must call 9-1-1 and have the victim treated and transported by paramedics.

Please do not call an ambulance for frivolous reasons. The theory that patients arriving at emergency in an ambulance are treated faster is simply not true. Everyone arriving at the emergency room is assessed according to their current medical condition and not the mode of transport.

If you are not sure whether to call a taxi or an ambulance - you need an ambulance. Always err on the side of caution. Discuss the situation with the dispatcher and they will help you decide if you need a paramedic response.

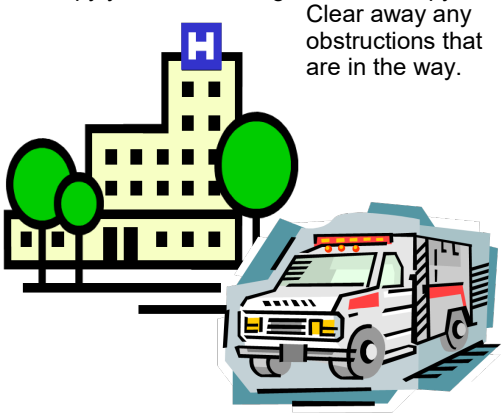
Many workplace phone systems require you to dial 9 to get a line out. You may not be able to call 9-1-1 directly. Find out in advance if your phone system requires you to dial 9 9-1-1.

Although the situation may be extremely serious, the paramedics will not run into the scene. Just like you, they will stop to do a scene survey first to make sure they do not get injured.

Turn off all noisy equipment in the plant before the paramedics arrive. They need to be able to calmly talk (not shout) to the patient and each other as well as hear their walkie-talkie radio and various pieces of equipment.

Give a <u>very</u> brief report when the paramedics arrive on scene. They may seem like they are ignoring you, but in fact they are listening as they continue their primary assessment. They will get to you and ask questions when they are ready.

While waiting for the paramedics, photocopy your notes and give them a copy. Clear away any obstructions that are in the way.



Emergency Scene Management

After Incident Investigation

Official Investigation

Anytime a worker is seriously injured there will be an official investigation.

The police will usually respond immediately, along with paramedics and fire fighters. The police role is to assist the other community responders with crowd control and other important functions during the rescue phase.

After the patient has been removed from the scene, the police must determine if this incident was simply a workplace 'accident' or was a crime committed.

After the police are through with their investigation, the Ministry Of Labour will conduct their own, to determine which, if any, occupational health and safety regulations were violated. Charges will be laid if the Ministry believes that the incident could have been prevented by the employer.

The Ministry wants to determine if the incident was the result of a design flaw in the equipment or process that the worker was using.

If so, the Ministry might order a recall of the equipment involved, place stop work orders or whatever other measures it deems necessary to prevent this incident from occurring again.

Clean Up Scene and Re-Stock Equipment

Once the police and the Ministry of Labour give the okay, you may clean up the scene. Any clean up that you do prior to obtaining official permission could be viewed as impeding the investigation, and charges could be laid.

When the injury is relatively minor, and the First Aid Team or the maintenance staff are comfortable with the procedure, the scene can be cleaned up 'in-house.' However, if the scene is particularly gruesome, you will want to seal the area off and call in a professional. Code Eight or your local funeral home can provide you with the names and numbers of organizations that specialize in cleaning potential biological hazards and making the scene safe again.

If you are cleaning the scene yourself you will need to use soap and water first to 'make it pretty.' The next step is to mix one part of household bleach with fifteen parts of water in a spray bottle. Spray the entire area, machines, tools etc with the bleach solution and allow to air dry.

As soon as possible clean all of your first aid implements, such as scissors with the bleach solution or alcohol.

Restock your first aid kits immediately. The next emergency response can happen anytime and you must be prepared to render care.

Critical Incident Stress Debriefing

On rare occasions, some of the First Aid Team members and other people who were involved in the incident may have a strong emotional response to the incident.

This is completely normal. Most of the time, people will have a little cry, get and give some hugs, and will be okay again in no time.

However, this is not always the

case. It is best to deal with your staff's emotional response early and try to head off problems, by having a critical incident stress debriefing. Ignoring the emotional fallout could lead to a serious condition called Post traumatic Stress Disorder (PTSD.)

PTSD is a very serious ailment which has the potential to wreak havoc on people's lives.

Deal with it - don't ignore it. This is a problem that does not go away on its' own.

Workplace First Aid: A Team Approach

NOTES



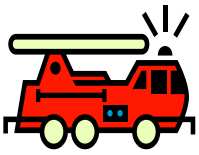
Introduction to Specific First Aid Treatments

It is easy for First Aiders, and professionals as well, to get so involved in providing care for a particular problem, that they forget the basics. Effective and appropriate first aid is more than bandaging a wound or making the perfect sling. Everything we discussed in Emergency Scene Management applies, to an extent, in every emergency response.

When you see the casualty profusely bleeding from a cut artery or crying in pain from a small burn on their pinky, the response is the same. Regardless of the severity of the injury, trained First Aiders never run into the scene. Stop on the perimeter of the emergency and do a Scene Survey, looking for the presence of gas, glass, fires and wires.

Take a few seconds to try and understand what happened on the scene.

Where there forces involved? If so, where did they go and how did they impact the victim? How many casualties need assistance? When calling 9-1-1 make sure you tell them about all of the people who need help, which ones may be a life threat and if any are trapped. Also look at the scene to determine what additional help may be needed such as Hydro, Gas Company, Police, etc.



The following Specific First Aid Treatments *ALL* start with the Scene Survey first. Once you are safe to proceed, continue with the Primary Survey looking for and correcting life threats.

After all life threatening conditions have been taken care of continue with the Secondary Survey, obtaining and recording information and providing first aid care to the best of your ability.

Providing Ongoing Care, turning the patient over to professionals, such as paramedics and completing paper work are all part of the response.

So, where do the Specific First Aid Treatments come in?

Throughout the response! The First Aiders needs to prioritize their actions. That is why the Primary Survey is so important: take care of urgent matters first.

Take the case of a person with a cut left forearm. As you arrive on scene you see the casualty standing, with his right hand providing direct pressure on the wound. The casualty is providing self first aid.

After introducing yourself and asking permission to help, you tell the victim to sit on the floor and maintain direct pressure.

You can ask questions, write down answers, take vital signs etc. The specifics of bandaging can wait an extra few minutes. However, if the artery was cut, "question period" can wait.

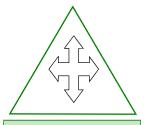
First Things First

Hazards

As soon as you are informed of a medical emergency, put your nitrile gloves on, while heading to the scene.

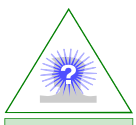
Grab your emergency equipment including first aid kit and if you have it a defibrillator.

After you have done a Scene Survey and made the area safe for you and the casualty, place your first aid kit where it will be both safe and handy.



Mechanism

Do not put first aid equipment above you, for example, on a desk. It could fall and hurt someone else. Don't forget to open the kit.



Casualties

Biohazard supplies like nitrile gloves and N95 masks should be at the top of the kit. Keep your instruments on top as well, preferably in a zip-lock bag. If no one else is there to help, use the Kelly Clamps to retrieve supplies from the kit.

Assistance

Start with a responsive check and then check ABC's. If not breathing get help and start chest compressions immediately.

A B C

If the victim is breathing, check for severe bleeding. Have the victim sit or lie down. Put lots of direct pressure on the wound with a pressure dressing or abdominal pad until the bleeding is under control.

Bleeding

Once you have bleeding under control check for life threatening chest injury, such as flail chest or penetrating chest wound.

Chest

Finally check if the thighbones are broken. Control external bleeding, if any and stabilize the leg.

Thighbone

Whenever you suspect a head, neck or spinal injury, stabilize the head in the position you found the victim.

Try to keep the emergency scene as clean as you can. Bandage wrappers etc. can present a fall hazard - so get these things out of the way.

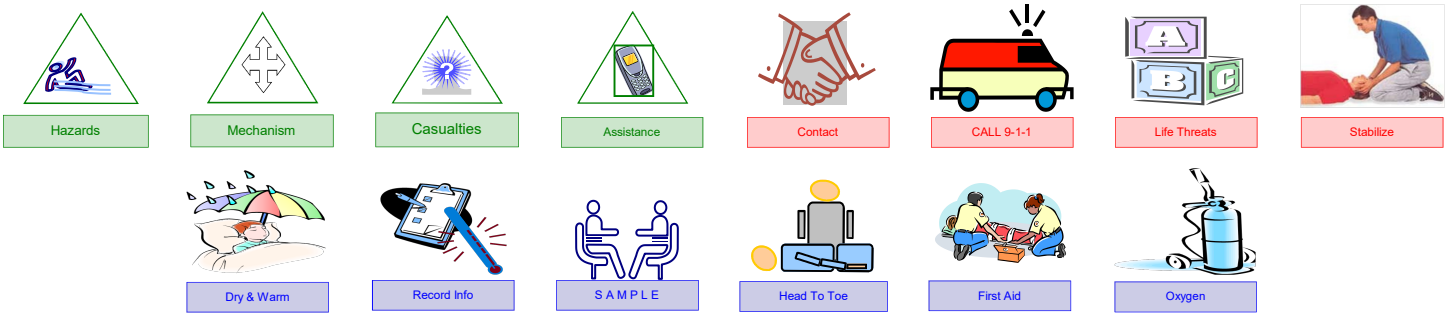
Keep a pen and your Workplace First Aid Report Forms in the kit. You will have to take notes detailing the victim's condition and the first aid you provided.

Workplace First Aid: A Team Approach

The basics never change. We need to use the components of Emergency Scene Management on every scene. Similarly, we need to perform a Primary Survey looking for life threats and then gather information and treat injuries and/or illness during the Secondary Survey.

What changes is the specifics of any given injury or condition. To put it another way, the particular problem we are addressing is very much like the filling in the sandwich. The bread on either side is the same, what goes between varies.

Especially with a seriously ill or injured casualty, things change constantly. No real scene will ever be like the 'book.' The first and foremost goal is to preserve life. Check the casualty often.



Shock

Shock is present, to some extent, with any illness or injury. The specific shock patterns do not, by themselves, define what is wrong with the victim.

Causes of shock (see next segment) are anything from bleeding to poisoning. Regardless of what prompted the shock process to start, the path it follows is predictable. If shock is not stopped and reversed the casualty will die. Death could occur in seconds, days or months, but shock kills unless properly treated.

We can observe the progression of shock by monitoring and recording vital signs. Some steps we can take to fight shock are: cover the victim with a blanket, give first aid for injuries and keep the casualty warm and dry.

Only medical professionals, such as surgeons, can provide the definitive care the casualty needs to survive.

It is not the injury or illness that kills. It is the resultant shock.

SIGNS OF SHOCK

INDICATOR		INITIAL (1st Stage)	WORSENING (2nd Stage)	LETHAL (3rd Stage)
PULSE	- RATE	Rapid	Rapid becoming slower	No detectable pulse
	- RHYTHM	Regular	Becomes Irregular	
	- VOLUME	Full	Thready	
RESPIRATIONS	- RATE	Rapid	Slows	No detectable respirations
	- RHYTM	Regular	Becomes Irregular	
	- VOLUME	Full	Shallow - Air Hunger	
SKIN	- TEMPERATURE	Warm	Cools	Cold
	- COLOUR	Pink	Pale - Ashen	White - Bluish
	- MOISTURE	Dry - Moist	Wet - Sweaty	Very Wet
PUPILS	- EQUAL	Yes	Depend on condition	Depends on condition
	- LIGHT REACTIVE	Yes	Not as quickly	No
AWARENESS	- ALERT	Yes	Confused	No
	- VERBAL	Yes	Slow to no	No
	- PAINFUL	Yes	Slow to no	No
	- UNCONSCIOUS	No	Possible	Yes
	- Person	Yes	Yes - Confused	No
	- Place	Yes	Yes - Confused	No
	- Time	Yes	Yes - Confused	No

Specific First Aid Treatments

CPR - Cardiopulmonary Resuscitation

Unconscious adults may be having a cardiac event. Check responsiveness by loudly shouting into both ears. If no response, gently pinch the victim's upper arm or shake them. If no response, activate the Response Plan and notify 9-1-1 that someone is unresponsive.

Open the airway using the head-tilt chin-lift method. Place one hand on the forehead and the other on the bony part of the chin. Lifting on the chin and pushing on the forehead, rotate the head back until the chin is pointing straight up. This maneuver lifts the tongue off the windpipe, allowing air in.

Non-breathing victims rarely have a head or neck injury. Without a patent airway, resuscitation attempts are futile. Even if spinal injury is obvious, the unresponsive person's airway must be opened using the head-tilt chin-lift method because it is the most effective.

Observe Breathing for five seconds. Place on hand on the forehead to keep the airway open. Look towards the chest: is it rising and falling? Does the victim appear to be breathing effectively? If the patient is not breathing normally or is gasping or you hear a gurgling/rattle kind of noise the victim needs immediate CPR. Push Hard and Push Fast on the centre of the chest for 30 compressions.

In the sixties, when CPR was a new procedure, ventilations were primarily performed mouth-to-mouth. The rescuer's mouth made a seal over the victim's mouth, the nostrils were pinched and air was blown into the lungs. From the rescuers viewpoint this is not a pleasant experience. Chances are that the victim already has vomited. If they haven't yet, they will, so the rescuer might get a mouth full of vomit.

Today rescuer's should be concerned about diseases such as HIV-AIDS, Hepatitis, SARS and the upcoming pandemic. Each rescuer must ask themselves: Am I willing to risk contracting a potentially fatal disease by doing mouth-to-mouth ventilations? Most say no.

Over the years many forms of CPR barrier devices have been invented and marketed. Most of these devices have no filtering capability and few had a quality one-way valve system. Since SARS the medical community has realized the importance of safely ventilating patients. Code Eight no longer considers the majority of these devices safe. We do recommend the Vapour-Isolation-Valve CPR mask. This is the only device we know of that has an effective hydrophobic/hydrophilic (wet or dry) filter and an excellent silicone one-way valve.

The Bag-Valve-Mask or B-V-M was designed to allow the rescuer to perform ventilations with no chance of exposure to the victim's air or body fluids. Typically, a BVM attached to an oxygen regulator set at 10 liters per minute, can provide up to 95% oxygen to the patient, provided that there is a good seal between the victim's face and the mask. Often this isn't the case and oxygen escapes.

We can solve this problem by adding a second rescuer to operate the BVM. The first rescuer holds the mask with two hands over the victim's face assuring a good seal. The second rescuer squeezes the bag with one hand to ventilate the patient forcing oxygen into the victims lungs.

Regardless of how the victim is ventilated, mouth-to-mouth, mouth to barrier mask or B-V-M, it is important to only provide sufficient air/oxygen to see the chest rise. Research has shown that even professionals (paramedics, doctors, nurses etc.) over-ventilate the patient. We now understand that over-ventilating the patient increases the positive pressure within the chest. This positive pressure prevents sufficient blood flow (pre-load) to the heart and consequently to the brain. By increasing negative pressure within the chest we increase the amount of blood that flows back into the heart during CPR.

Place the heel of one hand on the centre of the chest between the nipples. Place the other hand on the first hand and interlock your fingers, lifting them off of the chest wall.

Position your shoulders directly over the patient's midline and lock your elbows.

Spread knees for a solid working base.

Compress the chest approximately at least 2" (5 - 6 cm) thirty times and then provide two breaths with a barrier device or B-V-M. Each breath lasts no more than 1 second. Note: Compress chest of a child eight and under with one hand to a depth approximating 1/3 of the diameter of the chest from front to back). Infant CPR use two fingers to compress chest.

The target compression rate is at least 100 to 120 times per minute. Continue CPR uninterrupted for two minutes then change rescuers.

Performing CPR has always been a strenuous activity. The new guidelines of 30 compressions to two breaths for a full two minutes is very tiring and potentially dangerous to rescuers who are out of shape. If you feel dizzy, light-headed, short of breath or have chest pain, nausea or any other difficulty stop doing CPR.

Rescuers should only perform CPR compressions for two minutes and then change with another rescuer.

Ribs were never designed for the pressures your are exerting. It is common for ribs to break under the stress, so if you hear snap, crackle and pop don't worry about it - ribs heal.

Push Hard - Push Fast

Workplace First Aid: A Team Approach

Scene Safety

Make It Safe!

Responsive

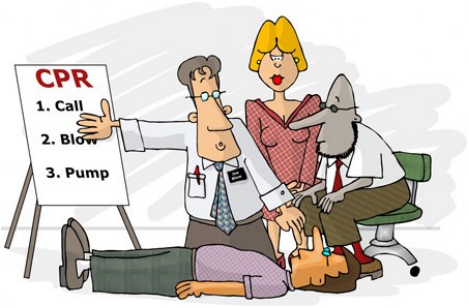
Call 9-1-1

Open Airway

Check Breathing

Start CPR
30 : 2

1. **Scene Safety** No Gas No Glass No Fires No Wires
2. **Approach Patient** Identify yourself.
3. **Check Responsiveness** Yell in both ears, if no response pinch patient on underside of upper arm.
4. **If No Response** ACTIVATE EMERGENCY MEDICAL RESPONSE TEAM AND CALL 9-1-1
5. **PATIENT MUST BE ON THEIR BACK** Roll if necessary.
6. **Open Airway** One hand on the forehead tilts the head back while the other hand is on the bony part of the chin, lifts up.
7. **Check Breathing for five seconds** Is the breathing effective? If not or if the victim is gasping give 30 compressions.
8. **Immediately Position Yourself To Start Compressions** Kneel beside the patient with your knees spread out. Place the heel of one hand in the centre of the breastbone, between the nipples. Place the other hand on top of the first hand and interlock your fingers. Position your shoulders directly above the patient's midline and lock your elbows.
9. **Push Down Forcefully**, at least 2", **thirty times**, then provide **two** breaths. Repeat this cycle five times and then rotate rescuers.



10. **Push Fast** at least 100 times per minute allowing full chest recoil.
11. **If Patient Is Not Breathing Provide 2 Breaths** if you are properly equipped to protect yourself. We recommend the Vapour-Isolation-Valve CPR mask or a B-V-M, unless you are willing to "share body fluids" with the victim. Only breathe out enough to cause the victim's chest to rise.
12. **Continue CPR Until AED or EMS Arrives On Scene**
13. **Apply The AED And Follow Voice Prompts**

We encourage all workplaces to have sufficient AED's to provide prompt emergency treatment for Sudden Cardiac Arrest. There is no requirement under WSIB Regulation 1101 to have an AED in the workplace.

Specific First Aid Treatments

<table>
<tr><th colspan="4">Emergency Response Guideline</th></tr>
<tr><td colspan="2">You Initiate Emergency Response</td><td colspan="2">First Aid Team Responds To Emergency</td></tr>
<tr><td>First On Scene - No AED</td><td>First On Scene With AED</td><td>Arrive On Scene With AED</td><td>Arrive On Scene - No AED</td></tr>
<tr><td colspan="4">Assess Scene For Hazards</td></tr>
<tr><td colspan="2">Call Out To Bystanders To Standby</td><td colspan="2">Ask Bystanders To Standby If Not Enough AED Team Members</td></tr>
<tr><td colspan="4">As You Walk Up To Patient Identify Yourself.
Tell The Patient Not To Move
Yell Loudly At Patient And Look For A Response</td></tr>
<tr><td colspan="4">Shake Or Gently Pinch Patient
If Patient Is Responsive Continue With First Aid Assessment</td></tr>
<tr><td colspan="4">If Patient Not Responsive</td></tr>
<tr><td>Call For Help:

Call 9-1-1 or (9) 9-1-1
Send Someone To Call
Have Them Report Back</td><td>Call For Help:
Activate AED Team First
Then:
Call 9-1-1 or (9) 9-1-1
Send Someone To Call
Have Them Report Back</td><td colspan="2">Team Members Assume Roles As Per Their Training:
1. CPR Coach - Ensure 9-1-1 Was Called
2. Compressions
3. Ventilations
4. CPR Mask & Control Airway
5. Operates The AED
Others Perform Compressions When Asked To Do So</td></tr>
<tr><td colspan="4">Open Airway Using Head-Tilt Chin-Lift Method Only</td></tr>
<tr><td colspan="4">Observe Effective Breathing For Five Seconds</td></tr>
<tr><td colspan="4">If Patient IS Breathing
Continue With First Aid Assessment</td></tr>
<tr><td colspan="4">If Patient IS NOT Breathing</td></tr>
<tr><td colspan="4">Administer 30 Compressions Immediately</td></tr>
<tr><td>Start Compressions
30 Compressions For Every
Two Breaths
Push Hard - Push Fast</td><td colspan="2">Turn AED ON And Follow Instructions
Prepare Chest:
Cut Away Clothing & Shave Chest If Necessary
Dry Chest Where Electrodes Will Be Placed
Check For And Remove Visible Medication Patches</td><td>Start Compressions
30 Compressions For Every
Two Breaths
Push Hard - Push Fast</td></tr>
<tr><td></td><td colspan="2">Have Someone Call 9-1-1
Advise EMS That Defibrillator Is Being Attached To Patient</td><td></td></tr>
<tr><td>Continue CPR
Rotate Rescuer Performing
Compressions Every 2 Min</td><td colspan="2">Attach Electrodes As Per Manufacturer’s Directions
Rotate Electrodes So They Will Not Be Over
An Implantable Device Such As A Defibrillator</td><td>Continue CPR
Rotate Rescuer Performing
Compressions Every 2 Min</td></tr>
<tr><td></td><td colspan="2">IF AED Says Shock Advised:
Say: I’m Clear You’re Clear Everyone’s Clear
Push Shock Button When Advised To Do So</td><td></td></tr>
<tr><td></td><td colspan="2">If NO Shock Advised Or After A Shock Is Delivered</td><td></td></tr>
<tr><td></td><td>Perform CPR For 2 Minutes
Ask Bystanders To Help</td><td>Team Performs CPR
Rotates Rescuer Performing
Compressions In 2 Minutes</td><td></td></tr>
<tr><td>Continue CPR
Until Paramedics Arrive Or
Patient Shows Signs Of Life</td><td colspan="2">Continue Shock/No Shock And CPR
Until Paramedics Arrive Or
Patient Shows Signs Of Life</td><td>Continue CPR
Until Paramedics Arrive Or
Patient Shows Signs Of Life</td></tr>
</table>

Workplace First Aid: A Team Approach

Foreign Body Airway Obstruction

Choking is almost always preventable. Simply following "Mom's Orders" ensures safety while eating: cut food into small pieces, slowly chew and swallow food, swallow food before any activity, avoid laughter and talking while eating and avoid excessive use of alcohol.

Mild airway obstruction occurs when the casualty is: coughing forcefully, talking, trying to clear their airway.

In these cases stand by in case it gets worse, but do not interfere because the victim's airway is still open.

Severe airway obstruction, on the other hand is a life threatening condition requiring rapid action. Signs of a complete airway obstruction include: casualty can't speak, is clutching their neck, is coughing ineffectively and their colour changes, indicating insufficient oxygen.

Introduce yourself to the victim and, as always, perform a complete scene survey. Activate EMS - call 9-1-1.

Provide abdominal thrusts. Standing behind the victim, place one foot between their feet and the other at right angles forming a triangle to keep you stable. Reach around the victim and place your fist, thumb side towards their belly button. Pull in and up sharply pushing the diaphragm up and forcing air out of the lungs and into the windpipe.

Provide Five abdominal thrusts. If this doesn't clear the airway provide five back blows. Lean the victim forward slapping the heel of one hand between their shoulder blades. Continue to alternate between abdominal thrusts and back blows.

You will know when the object has been dislodged because the patient starts to breathe and make noises. The object can shoot out of the mouth about eight feet when dislodged.

This procedure can potentially cause internal injury. The object that was obstructing the airway can cause irritation or injury to the tissues of the airway. Either event could lead to serious swelling inside the throat which could potentially completely obstruct the airway. Should this occur, only surgical intervention will save the victim. Therefore the patient should be advised to seek immediate medical care.

Should the airway remain blocked the victim will lose consciousness and collapse. If you are able safely control the victim's descent, go ahead and lower them to the ground. The victim will be dead weight. If you are not able to control that weight, you could find yourself under the victim, unable to breathe. Don't take chances, get help if available. Otherwise let the victim drop, but try and prevent their head from hitting the ground.

Once the victim is on the ground, roll them onto their back. Open the victim's mouth and look inside. Pinch and pull the object out if you can.

If you can't get the object out, and if you have the correct equipment (safety barrier device - preferably a CPR Mask with V-I-V or Hepa filter) open the airway and give two breaths. If the first doesn't go in, reposition the head and try again.

Next, perform CPR. Do 30 compressions, open the victim's mouth to see if the object is visible and high enough to pinch and pull out. If you have the right equipment, open the airway and deliver two breaths. If the first doesn't go in, reposition the head and try again. If you do not want to deliver the two breaths or if they do not go in, repeat the process of 30 compressions, look and pull or deliver two breaths and resume compressions until help arrives.

It is believed chest compressions for the unconscious victim, creates higher sustained airway pressure than abdominal thrusts with no risk of regurgitation.

If you are choking act fast as you will quickly run out of oxygen. First attract attention any way you can. Call 9-1-1 and leave the line open, hopefully they will figure out you need assistance.

Unlock doors if you can, to get responders to where you are quicker. Try to go to where rescuers can meet you, but stay out of elevators.

Keep coughing forcefully as you may dislodge the obstruction. If there are people around attract their attention. If no one knows how to perform abdominal thrusts show them what to do.

There is no evidence that back blows are better or worse than chest or abdominal thrusts. We teach only abdominal thrusts for the victim who is conscious to simplify the procedures. If someone tries to help you with back slaps do not resist.

If you are very obese or pregnant, place your fist, thumb side down, against the centre of your breastbone and walk into a wall with your head turned to one side.

Another method is to give yourself forceful abdominal thrusts by placing your fist, thumb side in, just above your belly button, and pulling in and up rapidly.

Or, use the back of a chair, a counter, shipping desk or any other object. Press your abdomen into the chair back as forcefully and as many times as you can.

Specific First Aid Treatments

Medical Conditions

Angina Pectoris

Angina Pectoris literally means chest pain arising from a cardiac problem as opposed to muscle pain. When the coronary arteries are blocked or are in spasm insufficient flow of oxygenated blood occurs causing chest pain.

Precipitating Factors: Attacks usually occur due to exertion, emotion or eating.

Types: Stable angina refers to a pattern which precipitates the event, such as over exertion.

Unstable angina refers to a condition where there is no predictable pattern and is more dangerous than stable.

Symptoms: Pain, pressure or discomfort in the chest, which may be severe or mild. The pain can radiate to either arm, jaw, neck or a combination.

The pain usually does not last very long.

The victim may be nauseous, might vomit, has some signs of shock and is anxious and frightened.

Vital Signs:

Respirations - short of breath

Pulse - may be weak and rapid

Skin - usually cool, pale and damp

Pupils - equal and reactive

Awareness - usually alert & oriented

Physical Survey: Unremarkable unless the victim fell or became injured

Ask: "Have you had this before?" If yes "do you have medication for this?"

Position: If conscious without injury position of comfort, usually semi-sitting. If unconscious place in recovery position.

First Aid: Have the casualty stop all activity and sit down.

Patient should chew 1 adult or 2 low dose aspirin unless there is a known allergy or bleeding disorder. Aspirin may not be kept in first aid kits. Follow advice of 9-1-1.

If they have their medication (probably a nitroglycerine spray) help them take it.

Keep the casualty warm and dry.

EMS: Call 9-1-1 immediately for unstable angina. Stable angina may clear up on its' own within a few minutes. If they are not feeling better four or five minutes after taking their nitro, call EMS.

Watch For: Respiratory/Cardiac Arrest. Deteriorating level of awareness.

Heart Attack

A heart attack or myocardial infarction occurs when a coronary artery has become blocked or so constricted that the restricted blood flow causes the death of the heart muscle below the blockage.

Precipitating Factors: May be due to exertion, emotion or eating but often just comes "out of nowhere.".

Types: N/A

Symptoms: Similar to angina but not relieved by medication. Severe pain, pressure or discomfort in the chest, which is often described as 'crushing' or like having 'elephants on my chest.'

The pain can radiate to either arm, jaw, neck or a combination. Women usually have less chest pain but more pain in the arms, jaw and neck.

Other combinations of symptoms include nausea, vomiting, pale, cool skin, often profuse sweating, short of breath, difficulty breathing, signs of shock, denial or impending sense of doom, fear and anxiety.

Vital Signs:

Respirations - short of breath,

Pulse - may be weak and rapid

Skin - cool, pale/bluish, clammy, sweaty

Pupils - equal and reactive

Awareness - usually alert & oriented

Physical Survey: Unremarkable unless the victim fell or became injured

Ask: "Have you had this before?" If yes "do you have medication for this?"

Position: If conscious without injury position of comfort, usually semi-sitting. If unconscious place in recovery position .

First Aid: Have the casualty stop all activity and sit down.

Patient should chew 1 adult or 2 low dose aspirin unless there is a known allergy or bleeding disorder. Aspirin may not be kept in first aid kits. Follow advice of 9-1-1.

If they have their medication (probably a nitroglycerine spray) help them take it.

Keep the casualty warm and dry.

Allow minimal movement.

EMS: Call 9-1-1 immediately if you suspect a heart attack. Powerful drugs administered in hospital may stop the attack and actually reverse damage to the heart if administered quickly enough.

Watch For: Respiratory/Cardiac Arrest. Deteriorating level of awareness and unconsciousness. Position the victim to protect their airway.

Congestive Heart Failure

Congestive heart failure results when the heart can not pump out enough blood.

One side of the heart has been damaged, probably from a previous heart attack. As a result that side can't pump as efficiently as the other side, resulting in congestion. The failure is the heart's inability to effectively pump blood.

Precipitating Factors: Attacks often come at night while the patient is sleeping. Also arises from low level exertion like walking, even short distances. The patient probably has had at least one heart attack which damaged the heart.

Types: Left sided from the lungs and right sided from the venous system..

Symptoms: Little or no chest pain, unless the victim is also having a heart attack. Patient anxious, usually in sitting position and leans forward trying to breathe.

Vital Signs:

Respirations - Short of breath. Rapid/shallow breathing. Moist gurgling respiratory sounds.

Pulse - Rapid and weak.

Skin - Pale, cool, profuse sweating

Pupils - usually equal and reactive.

Awareness - Usually aware and oriented

Physical Survey: Enlarged neck veins and swollen ankles.

Ask: "Do you have medicine for this?"

Position: IMPORTANT: The casualty must be sitting with their legs hanging down, for instance in a chair. This position helps relieve some of the person's symptoms. Do not place on the ground or in a lying or semi sitting position. Do not raise the victim's legs.

First Aid: Have the casualty stop all activity and sit down.

Make eye contact, place your hand on their shoulder or arm and help them calm down. Let them know you are here to help them.

EMS: Call EMS immediately.

Watch For: Respiratory/Cardiac arrest.

Workplace First Aid: A Team Approach

Medical Conditions (continued)

Stroke / T I A

A stroke or Cerebrovascular accident occurs when an artery in the brain either ruptures, is blocked or constricted to the point hat no or very little blood flows causing brain cell death.

Precipitating Factors: An artery may become blocked by a blood clot or an embolism. The artery may have ruptured due to disease such as an aneurism or from physical force such as a head blow.

Types: Stroke usually has permanent brain damage and accompanying loss of function on one side.

Transient Ischemic Attack (TIA) is the same as a stroke except that the blockage is temporary and will clear up on its' own, with no permanent damage.

Symptoms: Sudden onset sever headache, dizziness, confusion, trouble speaking, vision problems, numbness or paralysis on one side of the body, unequal pupil size, seizures

Vital Signs:

Respirations - May be short of breath
Pulse - Weak and rapid
Skin - May be pale
Pupils - May be slow or not reactive to light on one side. One side larger than the other.
Awareness - May be confused, not make sense,

Physical Survey: FAST

Facial Droop, Is one side of the face drooping. Can the victim give you a full smile showing teeth.

Arm Drift: Have the victim hold their arms straight out in front - can they not do this with one arm or does the arm/hand start to drift with a minute or less.

Speech Impairment: Can the victim speak clearly or are words slurred.

Transport to medical facility. Urgent that patient is in a stroke center within three hours of onset of symptoms. Call 9-1-1.

Do a complete head-to-toe survey - the victim may not able to feel or tell you that they are injured.

Position: The conscious victim may be seated and supported in their position of comfort. Place the unconscious patient in the recovery position affected side down

First Aid: Blanket

Make eye contact, place your hand on their shoulder or arm and help them calm down. Let them know you are here to help them.

They may not be able to talk but they can hear what you are saying.

EMS: Call 9-1-1 immediately if you suspect a stroke. Powerful drugs administered in hospital may stop the attack and actually reverse damage.

Watch For: Loss of consciousness, Cardiac/Respiratory Arrest. Drooling - airway obstruction/aspiration.

Asthma

Asthma is caused by a narrowing of the bronchial tubes due to exposure to a substance to which the person has developed a hypersensitivity.

Precipitating Factors: Triggers include exposure to dust, smoke, pollution, feathers, dog and cat hair, drugs such as aspirin, certain foods as well as exercise, stress and allergic reaction.

Types: A mild asthmatic episode may resolve once the person is calmed down and can control their breathing or on use of an inhaler with drugs such as Ventolin. A severe asthmatic episode is a life threatening condition where the person has extreme difficulty breathing and their inhaler brings no relief.

Symptoms: The casualty will be anxious and possibly exhausted due to the tremendous effort they have made to breathe. Some asthmatics will have definite chest pain which is due to the effort to breathe not a cardiac event. Of course an asthmatic might behaving a heart attack so you could see combined signs and symptoms.

Vital Signs:

Respirations - Extreme shortness of breath, wheezing, high pitched sounds, coughing. Breathing is usually rapid, shallow and labored.
Pulse - Rapid and weak.
Skin - Pale, cool, clammy and bluish.
Pupils - Usually equal and reactive
Awareness - Usually aware and oriented but can't communicate until their breathing is under control.

Physical Survey: Check for hives as the asthma may have actually been brought on by an allergy, in which case the patient requires immediate care.

Ask: Have you had this condition before? Do you have medicine for this?

Position: It is easier to breather in a semi-sitting or sitting position.

First Aid: Have the person stop all activity and sit down in a position of comfort.

Blanket

Make eye contact, place your hand on their shoulder or arm and help them calm down. Let them know you are here to help them. Help victim with medications.

EMS: If the episode is extreme contact EMS immediately. If not have the person take their inhaler and if the breathing does not improve consider calling EMS.

Watch For: Development of stridor (loud high pitched sounds) indicates the victim has deteriorated and needs immediate medical care. Patient may lose consciousness due to exhaustion and lack of oxygen. Respiratory and cardiac arrest.

Severe Allergic Reaction

Anaphylactic shock is an extreme response, by the body's immune system, to a substance to which the person has developed a hypersensitivity.

Precipitating Factors: Substances associated with this type of allergic response include, but is not limited to, foods such as peanuts, almonds, sesame and seafood. Drug allergies are often associated with penicillin based medications or drugs made with an egg serum. Allergen's may be injected by insects like bees or venom from animals like snakes.

Types: Mild allergic reaction may include hives, rashes and itching and possibly some minor breathing difficulties.

Severe allergic reaction is a life threatening condition in which the airway can swell shut in a matter of minutes.

Symptoms: Hives, rashes, itching, swelling in the airway, nose, lips and tongue, nausea, abdominal cramps, vomiting and diarrhea.

Vital Signs:

Respirations - Air hunger, struggling to breathe, rapid and shallow breathing, very labored. Wheezing. Tightness in chest.
Pulse - Rapid and weak
Skin - Cool, clammy, bluish
Pupils - equal and reactive at onset
Awareness - May be difficult to assess as breathing problems worsen.

Physical Survey: Hives (raised 'bumps,') rashes. Possibly a bee or other animal stinger is still in the skin.

Specific First Aid Treatments

Medical Conditions (continued)

Severe Allergic Reaction (cont'd)

Ask: Do you have an inhaler? Do you have an EpiPen? People with known severe allergies will carry an EPI Pen.

Position: Assist the victim into their position of comfort. Sitting or semi-sitting usually helps the victim breathe somewhat easier.

First Aid: Assist casualty with their medication (EpiPen and/or inhaler.) One dose of Epinephrine may not be enough. **Provide a second dose if symptoms are not relieved after five minutes. Call EMS.** (Note: Regulation 1101 does not permit drugs to be kept in first aid kits.) Make eye contact, place your hand on their shoulder or arm and help them calm down. Carefully monitor breathing and airway.

EMS: Call 9-1-1, this is a severe life threatening emergency. Ambulances all carry Epinephrine.

Watch For: Increased difficulty breathing, respiratory and cardiac arrest.

Seizures - Convulsions

Seizures result from a chemical imbalance in the bran or due to brain injury. There are dozens of different kinds of seizures, the most common, tonic - clonic (used to be called Grand Mall) is characterized by random muscular contraction resulting in flailing of the extremities and jerky movements.

Precipitating Factors: A seizure can be due to a number of factors including, Epilepsy, trauma, stroke, insulin shock, high fever and drug overdose.

Seizures are sometimes triggered by flashing lights, such as strobe lights or even fluorescent lighting.

Types: For more information call the Epilepsy Foundation of Ontario.

Symptoms: Usually preceded by an 'aura' a feeling, scent or sight that the victim experiencing before the onset of the seizure. Some people taste burnt toast or see a certain light show, giving them a bit of time to try and protect themselves and perhaps warn others that they will need help.

Victim will randomly flail arms and legs, have violent muscle contractions, froth at the mouth, turn blue due to lack of oxygen (they may stop breathing during the seizure - which can't be helped.)

Vital Signs:

Respirations - May stop breathing during the seizure.

Pulse -

Skin -

Pupils -

Awareness - Usually tired and disoriented after a seizure. May be aggressive, hostile, upset or 'not really there' for an hour or so after the seizure has ended.

Physical Survey: Patient may have lost bladder and bowel control. They will be pretty embarrassed. Do a complete secondary because the victim may have injuries from hitting their head on the floor or flailing their arms into solid objects with enough force to fracture bones.

Ask: Ask questions to help determine their mental status and level of awareness.

Position: Place the victim in the recovery position, to allow drainage of blood, saliva, vomit.

First Aid: During the seizure protect the casualty from further injury. Place your feet under their head so that they don't smash their head into the floor. Standing behind the victim's head, you could hold the victim's wrists during the seizure. Do not prevent movement or restrain the victim in any way, but try to guide their arms and elbows so that they don't hurt themselves.

Protect the victim's privacy as much as possible. They have probably soiled themselves.

First and foremost is to open the airway and check for breathing. Patients often stop breathing during a seizure. If the victim is not breathing start CPR. Check for injuries. Cover with a blanket . Make eye contact, place your hand on their shoulder or arm and help them calm down. Let them know you are here to help them. Carefully monitor breathing and airway.

EMS: If the patient has never had a seizure before or if it is the result of trauma, stroke, diabetic emergency, high fever or drug overdose, call 9-1-1 right away. Some epileptics may have dozens of seizures in a day. For them this is normal, although for you it might be terrifying. In these cases monitor the patient for at least one hour after the seizure. If their care giver says that the seizure was in any way different that previous seizures, call 9-1-1.

Watch For: Another seizure that starts after the first seizure has stopped and when there was no lucidity between seizures or when the seizure lasts several minutes. This could be a seizure called status epilepticus, which is a potentially fatal condition for about half of the people who develop it.

Monitor airway and breathing.

Fainting

A person who has fainted has temporarily lost consciousness. Usually they will regain consciousness within a few minutes. In the vast majority of cases fainting is not a serious medical condition. But, a faint could be a sign of a more serious underlying condition that should be investigated by a physician.

Precipitating Factors: An emotional (stressful) response to good or bad news, standing for long periods with little or no movement, like soldiers on parade, hunger, pain, fatigue, overheating, or more serious problems like diabetes, stroke, blood pressure or heart related problems. Another factor is anemia, or loss of iron, which may occur when a women is menstruating.

Types: Psychogenic Shock or medical problems.

Symptoms: Casualty suddenly loses consciousness and collapses. Dizziness, light headed, nauseous.

Vital Signs:

Respirations - May be weak and rapid

Pulse - May be weak and rapid

Skin - Pale/ashen, cool/clammy and sweaty

Pupils - Equal and reactive

Awareness - None until they regain consciousness. Usually fully alert and oriented within a few minutes.

Physical Survey: If chance of injury when they fell.

Ask: Has this happened before? How often? What usually causes the faint? Are you having your period? Has this happened before during your period?

Position: Recovery position to protect airway. Once fully conscious help them to their position of comfort.

Workplace First Aid: A Team Approach

Medical Conditions (continued)

First Aid: Check responsiveness. If not responsive call 9-1-1 and go through the ABC's. If responsive, loosen tight clothing at the neck, chest and waist. Provide fresh air. Complete Secondary Survey if history leads you to believe there might be an injury or more serious underlying cause.

Place in the recovery position. Carefully monitor airway and breathing.

EMS: A simple faint should regain consciousness within minutes and EMS will not be necessary. If there is a suspected underlying reason or the faint has lasted more than four or five minutes call 9-1-1.

Watch For: Continually monitor, responsiveness, airway, breathing and skin condition.

Diabetic Emergency

Life depends on the body receiving sufficient quantities of oxygen and sugar. Everything we eat is converted into a sugar that goes into the blood and is delivered to every cell, where it is metabolized with oxygen. A hormone produced in the pancreas, insulin helps the sugar to enter the cells. Without insulin no sugar can get into the cells and the cells stop working. Either too much or too little sugar can be fatal.

Precipitating Factors: Not following diet, not taking medication (pills or injection,) exercise, alcohol,

Types: Juvenile Onset (Type I), starts in childhood. The patient requires daily injections of insulin. Adult Onset (Type II) usually controlled by diet and pills but injection may also be necessary.

Symptoms: Two conditions might occur: Low sugar (insulin shock - too much insulin) or High sugar (diabetic coma.)

Since the signs and symptoms between the two can be very confusing we are going to only look at low sugar.

Vital Signs:

Respirations - Normal deteriorating to rapid and weak

Pulse - Rapid and weak

Skin - Pale, cool, sweaty

Pupils -

Awareness - Altered level of awareness, staggers, confused, disoriented, may act angry, bad tempered, appears drunk and sudden hunger.

Physical Survey: Not remarkable unless the victim has fallen or been involved in some other injury producing event: car collision, fell off ladder etc.

Ask: Do you have diabetes? Do you take medicine for this?

Position: Until the victim gets enough sugar they may be too agitated to position at all. Likely will refuse to sit down until they fall down. Try to get them still and in their position of comfort.

First Aid: GIVE SUGAR - IF THE VICTIM IS CONSCIOUS ENOUGH TO SWALLOW. Glucose Tablets, a non-diet soft drink, orange juice, honey, a mixture of sugar and water will all be absorbed into the bloodstream quickly. Peanut butter is too sticky and may affect the airway or the person may be allergic to peanuts. Similarly candy is not a good idea because it could get lodged in the airway.

EMS: Call 9-1-1 - this is a very definite life threat

Watch For: Unconsciousness, respiratory and cardiac arrest.

Giving sugar is the right because it may help if they need sugar and will not hurt if they do not need sugar.

Poisoning

Almost anything can be poisonous if taken in the right quantity. A women recently died from drinking too much water - water poisoning - as part of a radio contest.

Man-made poisons can be properly labeled and safely stored. Workplaces must have Material Safety data Sheets for every single chemical in their facility.

Natural poisons are all around us and they can't be labeled or stored safely!

Poisons can enter the body by ingestion (by swallowing,) injection (by hollow needle,) inhalation (by lungs,) and absorption (by skin and mucous membranes.)

WARNING: Whatever has poisoned the primary victim can also poison you. Use extreme caution when dealing with a potentially poisonous substance. If you are not sure or cannot protect yourself - get out and call 9-1-1)

POISON CONTROL CENTRE: Always contact Poison Control for advice on how to treat a suspected poisoning. (Ontario 1 - 800 - 268 - 9017.)

Start with a Scene and Primary Survey.

CALL 9-1-1 If the victim is unresponsive or has any breathing difficulty, then call Poison Control while waiting for EMS.

Call Poison Control if the person is responsive and breathing without difficulty.

The majority of calls to Poison Control are handled over the phone without EMS or hospital involvement. They will need to know

- the suspected poisonous substance,
- approximately how much taken
- victim's approximate weight
- how it was taken (swallowed, absorbed, injected or inhaled.)

As a general rule, unless told otherwise by Poison Control, never dilute the poison by drinking milk or water and never induce vomiting, because of the potential threat to the airway (aspiration.)

If possible have the container and Material Safety Data Sheet with you when you call Poison Control. DO NOT follow the MSDS sheet fist aid recommendations until it is verified by Poison Control.

Most accidental poisonings are taken by mouth. Non-accidental poisoning would include an attempted suicide or murder.

Ingestion

Most often the problem is food and improper storage. Many people store substances like anti-freeze in rum bottles. Numerous cases have been reported of children drinking what they thought was rum or a soft drink and it was actually wood alcohol, cleaning fluids, etc.

Precipitating Factors: Eating or drinking spoiled, improperly stored, cleaned or cooked food. Overdosing on medications or drug interactions. Some drugs must be swallowed whole, splitting or chewing the drug could lead to fatal consequences when the medication is 'time released.' Too much of anything can be dangerous especially alcohol. Some foods are inherently dangerous like the Japanese delicacy 'blowfish' which must be perfectly cleaned and prepared. Cleaning fluids and other chemicals cause poisonings, especially in curious children.

Specific First Aid Treatments

Poisoning (continued)

Types: Food, chemical, pharmaceutical, alcohol

Symptoms: Abdominal pain, cramps, nausea, burns or stains around and in the mouth, vomiting, diarrhea, drowsiness, seizures, unconscious. Check the scene for containers which may be poisonous.

Vital Signs: (vary depending on what poison was ingested)

Respirations - from normal to slow, irregular, shallow, abnormal

Pulse - normal to weak and rapid

Skin - normal to pale, cool, sweaty

Pupils - large or very small

Awareness - from alert and oriented to unresponsive

Physical Survey: Check the mouth and lips for signs of burns or discoloration, which may have been caused by chemicals like acids or caustics.

Ask: What have you taken? How much? What, where and when did you eat last? Did you try to harm yourself?

Position: Recovery position to protect airway if the victim vomits.

First Aid: Call Poison Control, answer their questions and follow their directions. Continually monitor airway, breathing and level of awareness.

EMS: Call if unresponsive, unconscious, difficulty breathing or on instruction from Poison Control.

Watch For: Decreasing and abnormal breathing to respiratory / cardiac arrest.

WARNING: If CPR is necessary use a proper and safe CPR barrier device. The patient may vomit and they may have traces of the poison in their mouth or on their face and lips.

Inhaled

Carbon monoxide, a clear, colorless and tasteless gas, produced as a byproduct of combustion, is the most common inhaled poison. Industrial gasses include cyanide, chlorine, ammonia as well as gasses in closed spaces like storage tanks and gasses from decomposition like methane. There are numerous gasses used in industry that are poisonous. The First Aider should be familiar with any potentially toxic substance in their workplace.

Precipitating Factors: Inhalation of a toxic substance.

Types: Explosive, non-explosive and corrosive.

Symptoms: (Vary dependant on the gas inhaled) Gases such as chlorine and ammonia will irritate respiratory tract causing violent coughing. Carbon monoxide poisoning symptoms include headache, nausea, vomiting, disorientation and unconsciousness.

When two or more people are sick with any of the above symptoms assume carbon monoxide poisoning and get out immediately. Call 9-1-1.

Vital Signs: Vary depending on the gas inhaled)

Respirations - Short of breath, difficulty breathing, painful breathing

Pulse - rapid and weak

Skin - pale, bluish or red, cool, damp

Pupils -

Awareness - Confusion, aggression

Physical Survey: Unremarkable

Ask: Do you know what kind of gas you inhaled? Were others in with you?

Position: Recovery position

First Aid: Remove the person to fresh air if you can do so safely. Otherwise wait for firefighters. Start CPR if not breathing.

EMS: Call 9-1-1. Make sure you tell them that this is an inhaled poison and that you will need the fire department.

Watch For: Deteriorating level of awareness and less effective breathing. Skin colour changes to pink is good and to grey/blue is definitely not good.

Injected

An injected poison enters the body through a sharp narrow tube such as from a snakebite, mosquito or other animal. Poisons could also enter the body from hypodermic needles either accidentally or as a criminal act.

Health care workers must be extremely careful around 'sharps' because of the very real danger of receiving a 'needle stick' injury.

Some industrial processes require workers to use the same needles as medical workers, except rather than administering drugs or drawing up fluids they are used to inject chemicals or draw air or liquid out.

Snakebites are extremely rare. In Ontario the only venomous snake is the Massassauga Rattler. So few cases have been reported that it is not a worry, other than in areas where they may be commonly found. And even there, deaths are few. Specific first aid for individual animals is not provided because of the wide variance in types of venom.

Anyone who will be going to an area known for snakes of any type would be wise to research the risks and first aid requirements for those particular animals.

As a general rule you should wash the area with soap and water and then apply a constrictive bandage above the insertion marks. Care must be taken not to apply the bandage tightly. You should be able to get your finger in the bandage without a problem. Swelling is a concern so the bandage should be checked frequently.

The limb could then be placed in a splint, as if fractured, to prevent movement.

Handle the victim carefully, moving them as little as possible. The calmer they are and the less they exert themselves, the slower the venom will travel.

In any event, never cut the bite or above the bite with a knife, and never, ever, try to suck the venom out with your mouth.

Absorbed

There is a wide variety of natural and man made poisons that can be absorbed through the skin. Poison ivy is one such example. As a general rule this poison produces skin rash and itching and is rarely a serious health threat.

Man made poisons, on the other hand, can definitely cause serious injury and must be immediately dealt with.

Whenever an absorbed poison is suspected the rescuer must exercise extreme caution that they do not become a casualty themselves. Wearing protective gear is a must.

When the patient is unresponsive, is not breathing or is breathing with difficulty call 9-1-1 first. Otherwise, in a workplace, consult your MSDS binder, locate the substance and call poison control for direction. If the occurrence was not at work, obtain the container and then call poison control.

Workplace First Aid: A Team Approach

Poisoning (continued)

As with animal bites, there are so many possibilities that it is difficult to provide first aid measures that will work in all cases. There are, however, some general principles we can offer.

Precipitating Factors: The poison may have been spilled or sprayed on the victim and could be liquid, powder/granular or gas. Powders and gas may affect the mouth, nose and respiratory tract as well as the skin. You need to know in advance if the substance is toxic, what protective equipment to wear, including breathing apparatus, and whether the material is flammable, explosive, caustic or acidic.

Types: Too numerous to mention.

Symptoms: Common symptoms of absorbed poisons include: nausea, vomiting, dizziness, shock, rash, itching, redness, breathing difficulties and chemical burns. (see section on burns.)

Vital Signs:

Respirations - May be rapid, shallow, difficulty breathing, short of breath

Pulse - May be weak and rapid

Skin - May be burned, cool, clammy, pale, red, rash, hives

Pupils -

Awareness - May be alert and oriented or unresponsive

Physical Survey: Look for rashes and hives as these symptoms could indicate an anaphylactic reaction (see severe allergic reactions.)

Do a complete secondary survey. Some substances will burn through clothes leaving little damage to the cloth but huge damage to the underlying skin.

Ask: How did this happen? What chemicals were you working with?

Position: Position of comfort, usually semi-sitting if breathing is a problem or consider the recovery position.

First Aid: Follow the advice of poison control. Usually we would want to wash the substance off of the person. However, some substances will have a potentially violent reaction with water.

If the substance is a dry powder you would want to brush the poison off of the skin before attempting to wash away the substance. Some dry products may become corrosive when water is added.

If rinsing is indicated a deluge shower is best, or a home type shower or using a hose. Caution: The victim will likely be already in shock. Being deluged with water may make the person dangerously hypothermic (lower body temperature.)

EMS: Immediately call 9-1-1 if there are any breathing difficulties, damage to the mouth, nose or upper chest or signs of burning, hives, allergic reaction.

Watch For: Carefully monitor breathing. Casualty could go into respiratory and cardiac arrest.

WARNING: The First Aider must exercise extreme caution around any suspected poison, especially inhaled or absorbed poisons because they can quickly incapacitate with no warning.

When in doubt, or if you have not had specific training and appropriate personal protective equipment for the materials in your workplace, evacuate and call 9-1-1.

Chest Injury

Any injury to the chest is a potential life threat, because of the possibility that the injury could impede breathing.

Two specific injuries, penetrating chest wound and flail chest are definite life threats and require an immediate EMS response. The third, broken ribs rarely constitutes a life threat.

Penetrating Chest Wound

A penetrating chest wound occurs when the chest wall has been pierced, allowing air into the chest cavity. This injury can be the result of criminal activity such as a bullet or a knife. However there are no shortage of ways to penetrate the chest. Prying with a screwdriver, towards yourself, is definitely taking a chance on piercing the chest (or abdominal) wall. Or as the result of a blast where objects are flying through the air at high velocity.

Regardless of the cause, the result is a definite life threatening injury.

Precipitating Factors: An object travelling at sufficient velocity or force to penetrate through the chest wall allowing air into the chest cavity.

Types: Hemothorax (blood in the chest cavity) pneumothorax (air in the chest cavity) and hemo-pneumothorax (air and blood in the chest cavity.)

Symptoms: Severe chest pain, especially when breathing in or out. Dizziness, faint, nausea, vomiting, anxiety.

Vital Signs:

Respirations - Slow (especially due to pain of breathing; victim may try to limit their breaths) and labored.

Pulse - Weak and rapid.

Skin - Pale, grey/ashen/bluish, cool, damp to sweaty.

Pupils - Equal and reactive at first

Awareness - Anywhere from alert and oriented to unconscious.

Physical Survey: Obvious hole in the chest wall. Gurgling sounds. Air bubbles in blood and lung fluids around the hole. Coughing up a red to pink frothy foamy fluid. Possible impaled object. Bleeding.

Ask: How did this happen? Are you having trouble breathing?

Position: Carefully assess mechanism and history. If sufficient force has been expended to pierce the chest wall, especially if the penetrating object (knife, bullet, fragments of metal, glass etc.) is inside the chest, there is a likelihood of spinal and internal injury.

If no spinal injury suspected and victim conscious, position of comfort to enhance respiratory efforts, probably semi-sitting to sitting. If spinal injury suspected, position found with stabilization.

First Aid: Blanket.

Make eye contact, establish trust. Head and neck stabilization if necessary.

Do not remove an impaled/embedded object. Provide support for the object (see embedded objects.)

Previously an occlusive dressing was recommended. Research has shown that these dressings, even when open on one side, can lead to a life threatening pneumothorax. Even a non-occlusive dressing can be so saturated with blood that it becomes an occlusive dressing. Therefore, it is recommended that the wound be left open to the environment.

EMS: Activate EMS rapidly.

Watch For: Constantly check dressing to ensure it is not sticking against the wound, preventing air release from inside the chest. If this happens, lift flap off the chest allowing air to escape.

Specific First Aid Treatments

Chest Injury (continued)

Penetrating Chest Wound (cont'd)

Flail Chest

Flail chest is when three or more adjacent ribs, on the same side of the chest are each broken in two or more places. This section of ribs (flail segment) is totally separated from and acts independently to, the rest of the rib cage.

The result of this separation is that the flail segment will move opposite of the remaining rib cage. During inhalation (breathing in) as the chest expands the flail section moves inwards. During expiration (breathing out,) the flail section moves outward, while the rest of the chest is moving inwards.

The victim's breathing efforts are ineffective in moving sufficient volumes of air into the lungs.

Precipitating Factors: Significant amounts of force must have been expended to break so many ribs in so many places. This injury occurs due to direct force applied to the chest, such as a driver hitting the steering wheel at full force during a highway crash; a worker hit in the chest with the forks of a lift truck; or the impact of debris hitting the chest from an explosion (blast injury.)

Types: Open chest injury is when the chest wall has been penetrated and the broken ribs are exposed. A closed chest injury is when the ribs are broken but the bones have not been pushed out of the chest.

In either case, the force could have been strong enough to not only break the bones but also cause the broken section of the bones to pierce vital structures such as the lungs, windpipe, great vessels and the heart.

Symptoms: Severe pain especially during respiration. Difficulty breathing. Very short of breath. Dizziness, light headed, nauseous, vomiting.

Vital Signs:

Respirations - Labored and difficult.

Pulse - Rapid and weak.

Skin - Cool, damp to sweating and ashen, grey, bluish.

Pupils - Initially equal and reactive, deteriorating to not reactive to light.

Awareness - Depends on other injuries as well. Could be alert and oriented or unconscious.

Physical Survey: Paradoxical chest movement, meaning that you can see the flail section moving independently of and opposite to, the rest of the chest.

Possible open chest injuries, and the ends of the ribs may protrude from the chest. Bruising on the side of the chest that has been injured.

Ask: How did this happen? Are you having trouble breathing?

Position: Carefully assess mechanism and history. If sufficient force has been expended to break so many ribs there is a likelihood of spinal and internal injury.

If no spinal injury suspected and victim conscious, position of comfort to enhance respiratory efforts, probably semi-sitting to sitting.

First Aid: Blanket.

Make eye contact, establish trust. Head and neck stabilization if necessary.

Do not remove an impaled/embedded object. Provide support for the object (see embedded objects.)

Place a pillow or blanket on the chest and either have the victim hold it in place or tape it to the victim. If taping, take care not to wrap it around the victim so that it is more difficult for them to expand their chest during inhalation.

Another method is to place your hand on the flail section and try to hold it in place while the chest moves.

If the patient is in a seated position you could try placing the victim's forearm again the chest and tie it place using triangular bandages wrapped around the body at the wrist and elbow. Exercise care not to tie the bandages too tight for the chest to expand.

EMS: Activate EMS rapidly

Watch For: Carefully monitor breathing. Casualty could go into respiratory and cardiac arrest.

Pneumothorax

Air in the chest cavity is a pneumothorax. This injury could be the result of force, as in a penetrating chest wound or flail chest. A spontaneous pneumothorax occurs on it's own without any energy impacting the body.

Regardless of the history or mechanism of injury, a pneumothorax causes increased pressure in the chest which could collapse one or both lungs. This is an obvious serious life threat.

Precipitating Factors: Considerable force applied to the chest or disease.

Types:

Symptoms: Difficulty breathing, dizziness, light headed, nauseous, vomiting.

Vital Signs:

Respirations - Difficulty breathing, short of breath.

Pulse - rapid and weak.

Skin - Cool, damp to sweating and ashen, grey, bluish.

Pupils - Initially equal and reactive, deteriorating to not reactive to light.

Awareness - Depends on other injuries as well. Could be alert and oriented or unconscious.

Physical Survey: Spontaneous pneumothorax - unremarkable.

Ask: How did this happen? Are you having trouble breathing?

Position: Carefully assess mechanism and history. Likelihood of spinal injury?

If no spinal injury suspected and conscious, position of comfort to enhance respiratory efforts, probably semi-sitting to sitting. If spinal injury suspected, position found with stabilization.

First Aid: Blanket.

Make eye contact, establish trust. There isn't much more a First Aider can do. This is a job for a surgeon to repair.

Broken Ribs

EMS: Rapidly activate EMS

Watch For: Carefully monitor breathing. Casualty could go into respiratory and cardiac arrest.

A simple rib fracture is generally not life threatening. The victim will be in considerable pain, especially when trying to breathe. Do not attempt to 'tape the ribs.'

The victim will find their own position of comfort. Complete a secondary survey as there may be additional hidden injuries.

Workplace First Aid: A Team Approach

Abdominal Injuries

Abdominal Wounds

Any force applied to the abdomen could rupture or otherwise damage, the internal organs, including the stomach, spleen, liver, kidneys, pancreas and both small and large intestines.

The resultant severe internal bleeding may be an immediate life threat. A longer term life threatening condition is the release of material from the digestive system which could cause further injury (stomach acids) or infection (material from the intestines.)

Any abdominal injury is potentially serious and should be assessed by a physician as soon as possible.

Closed Abdominal Injury

Abdominal injury may be caused by blunt force such as a punch or hockey stick to the gut, an object hitting the abdomen from a blast, falling onto an object or an object falling on the abdomen.

Should the skin be cut, but the abdominal wall has not been penetrated, the injury is treated like any other wound. However, suspect a possible closed abdominal injury.

Any of these situations could cause sufficient compression to perforate or burst a vital structure, like the spleen.

Precipitating Factors: A significant direct force to the abdomen.

Types: Internal bleeding and/or release of potentially toxic material from the digestive system.

Symptoms: Severe pain, tenderness, nausea, vomiting, anxiety.

Vital Signs:

Respirations - rapid and shallow (breathing may intensify the pain so the victim tries to control respirations to deal with the pain.)

Pulse - weak and rapid

Skin - pale, clammy, bluish, cool to cold, damp to very sweaty

Pupils - initially equal and reactive

Awareness - may be alert and oriented to unconscious

Physical Survey: Abdomen may be bruised, swollen, rigid (hard as a board, sign of internal bleeding,) coughing or vomiting blood (indicating bleeding from esophagus or stomach.) Stomach bleeding is usually dark brown and may look like coffee grounds.

Ask: How did this happen? Are you having trouble breathing?

Position: Carefully assess mechanism and history. Likelihood of spinal injury?

If no spinal injury suspected and victim is conscious, position of comfort. If spinal injury suspected, position found with stabilization.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

EMS: Call 9-1-1, victim needs rapid transport to a surgeon.

Watch For: Signs that shock is intensifying. Carefully monitor breathing. Casualty could go into respiratory and cardiac arrest. Vomiting which could threaten the airway.

Open Abdominal Injury

Any injury that penetrates the abdominal wall, creating an opening in the cavity is an open abdominal wound. Any wound brings with it infectious bacteria from the outside world into the body. Open abdominal wounds will have materials from the outside as well as contaminated materials released due to rupture of, or cuts to, the internal organs.

The penetrating object may have also caused severe damage to the internal organs, veins and arteries.

Precipitating Factors: Penetration and laceration of the abdominal wall by a foreign object such as a bullet, knife, tool, object flying through the air from a blast or explosion.

Types: Simple laceration or protruding abdominal organs.

Symptoms: Severe pain, tenderness, nausea, vomiting, anxiety

Vital Signs:

Respirations - rapid and shallow (breathing may intensify the pain so the victim tries to control respirations to deal with the pain.)

Pulse - weak and rapid

Skin - pale, clammy, bluish, cool to cold, damp to very sweaty

Pupils - initially equal and reactive

Awareness - may be alert and oriented to unconscious

Physical Survey: Obvious cut to the abdomen with or without protruding organs. Victim may be coughing or vomiting blood (indicating bleeding from esophagus or stomach.) Stomach bleeding is usually dark brown and may look like coffee grounds.

Ask: How did this happen? Are you having trouble breathing?

Position: If patient is conscious and on their back, raise and bend the legs at the knee. This position closes the wound. If the person can be supported so that they can also raise their head and shoulders, additional pressure will be added to further close the wound.

If the patient is unconscious and the airway may be compromised by blood and other fluids, place in recovery position.

It is vital to bend both legs at the knee to place pressure on the lips of the wound forcing them together and therefore helping to close the wound.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

If the wound is simple without protruding organs, cover with a large dressing such as a trauma pack (10” X 30” trauma dressing) or any thick pad such as a towel. Tape in place or wrap with triangular bandages.

If there are protruding organs, apply a trauma pack or towel. Pour saline onto the dressing too keep the organs moist and prevent them from drying out. Use drinking water is saline not available.

If there is an embedded object stabilize the embedded object by packing towels, bandage rolls or any other similar material around the object to prevent movement.

- DO NOT MOVE PATIENT TO WRAP THE DRESSING IN PLACE.
- DO NOT TRY TO REPLACE PROTRUDING ORGANS.
- DO NOT REMOVE OBJECT.
- DO NOT ATTEMPT TO CUT THE OBJECT DOWN TO A SMALLER SIZE.

EMS: Call 9-1-1 Victim needs rapid transport to a surgeon.

Watch For: Signs shock intensifying. Carefully monitor breathing. Casualty could go into respiratory and cardiac arrest. Vomiting could threaten airway.

Specific First Aid Treatments

Wounds

Major Wounds

A major wound is characterized by severe bleeding with likely damage to underlying structures.

An arterial bleed squirts blood, six or more feet away, potentially causing death in minutes. Bleeding from veins is not as dramatic but sufficient blood loss can also cause death.

Precipitating Factors: Contact with a sharp object, force from a blast or extreme pressure, falls and collisions.

Types: Laceration, incision, protruding bone, embedded object.

Symptoms: Pain, nausea, vomiting, anxiety, faint, dizziness

Vital Signs:

Respirations - rapid and shallow

Pulse - weak and rapid

Skin - pale, clammy, bluish, cool to cold, damp to very sweaty

Pupils - initially equal and reactive

Awareness - may be alert and oriented to unconscious

Physical Survey: Depends on situation. Was enough force exerted to have produced other injuries? If so, or if not sure, do a full head-to-toe examination.

Ask: How did this happen? If on wrist look for hesitation wounds. Suicide?

Position: Place in position of comfort or recovery position.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

Have the casualty stop all activity and sit down on the floor (if standing.) Remaining still and quiet uses less oxygen, slowing the heart, reducing blood pressure and, therefore the speed at which blood is lost.

Wearing nitrile gloves (and N95 mask) press very hard directly over the wound, preferably through an abdominal pad, pressure dressing or other thick pad.

- First Aiders should not attempt to clean or disinfect a wound that will receive further medical treatment at a clinic or hospital. Concentrate on controlling the bleeding only.
- Never remove the bottom dressings from the wound as this will disturb the blood clot and restart bleeding.

EMS: Call 9-1-1 if the wound is very large, deep in the body, organs or bones are protruding. Also call if the victim has ashen or bluish skin or feels faint.

Watch For: Decreasing level of awareness and increasing signs of shock, indicating considerable blood loss.

By definition a minor wound is not life threatening. In most instances the First Aider will be able to disinfect the wound and apply appropriate bandages.

Minor Wounds

Preventing infection is the most important goal. Properly cleaning the wound and bandaging is essential.

Precipitating Factors: Any sharp object can cause a minor wound including knives, box cutters, paper, cardboard and plastics.

Types: Laceration, incision and scrapes.

Symptoms: Pain at injury site.

Vital Signs: Usually very stable and within normal ranges. If vital signs are negatively affected, consider other causes - the wound is secondary to a possible serious illness/injury.

Physical Survey: Only necessary if other injuries suspected due to mechanism and history.

Ask: How did this happen?

Position: Comfort. Recovery if victim is faint or nauseous.

First Aid: Clean wound with an antiseptic (one-dose package), preferably BZK (Benzaklonium Chloride.) Dry skin and wound with a gauze pad. Apply appropriate adhesive strip, knuckle, fingertip or gauze roller bandage.

Puncture wounds can become seriously infected. First Aiders cannot clean deeply enough and antibiotics might be required. Also, the First Aider should be concerned with tetanus.

Puncture Wounds

Precipitating Factors: Nails, screws, slivers of wood, needles - any sharp thin object that enters the skin.

Types: Object embedded or not.

Symptoms: Pain at injury site.

Vital Signs: Usually very stable and within normal ranges. If vital signs are negatively affected, consider other causes - the wound is secondary to a possible serious illness/injury.

Physical Survey: Only necessary if other injuries suspected due to mechanism and history.

Ask: How did this happen?

Position: Comfort. Recovery if victim is faint or nauseous.

First Aid: Bandage and transport to a medical clinic / hospital.

An embedded object such as a knife can be very serious while a large sliver is generally not life threatening. In either event, the victim must be treated by a doctor.

Embedded Object

The First Aider will stabilize the object to prevent further injury and provide as much comfort as possible. The First Aider never attempts to remove the object.

Precipitating Factors: Blasts, explosions, equipment malfunction, improper use of tools, crime.

Types: Large or small object, thrust in deep or shallow, may affect internal structures such as organs or bones.

Symptoms: Can include pain at injury site and/or radiating from injury site depending on other structures involved. Nausea, vomiting, anxiety.

Vital Signs: Dependent on severity of injury. May be very stable if minor injury or expect signs of deepening shock.

Respirations - normal to rapid and shallow

Pulse - normal to weak and rapid

Skin - pale, clammy, bluish, cool to cold, damp to very sweaty

Pupils - initially equal and reactive

Awareness - alert/oriented to unconscious

Physical Survey: Complete physical survey if object or wound is large or suggested by mechanism and history.

Ask: How did this happen?

Position: Comfort or recovery/ depending on mechanism and history.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

Secure the object using a donut bandage or gauze bandage rolls on either side of the object.

EMS: Call 9-1-1 depending on severity.

Watch For: Decreasing level of awareness and increasing signs of shock, indicating considerable blood loss.

Workplace First Aid: A Team Approach

Wounds (continued)

Avulsion

An avulsion results when the skin has been cut causing a flap, such as when the top of the finger has almost been cut off and is hanging 'by a thread.'

Precipitating Factors: Very often the result of using a box cutter or similar sharp knife.

Types: Fingertip, ear, eyeball

Symptoms: Pain at injury site

Vital Signs: Usually very stable and within normal ranges. If vital signs are negatively affected, consider other causes - the wound is secondary to a possible serious illness/injury.

Physical Survey: Only necessary if other injuries suspected due to mechanism and history.

Ask: How did this happen?

Position: Comfort. Recovery if victim is faint or nauseous.

First Aid: If minor, clean wound with a one-dose (package) antiseptic, preferably Benzaklonium Chloride (BZK) and bandage. If large/deep avulsion, bandage and transport to medical clinic or hospital.

Considerable force must be exerted for

Amputations

a part to be completely separated from the body. In relative terms, an amputated finger is minor compared to a leg amputation above the knee, which may be life threatening.

Surgeons have successfully reattached severed body parts provided that the amputation is relatively clean cut and that the part has been properly cared for and rapidly transported, with the patient, to an appropriate emergency medical facility. Delays in transporting the part, as in additional time required to extricate it from a machine, lessen the chances of a successful reattachment.

Precipitating Factors: Significant pinching or tearing force such as a part caught in a guillotine or a moving chain.

Types: Clean cut or ragged.

Symptoms: Pain at and above injury site, nausea, vomiting, anxiety.

Vital Signs: Varied depending on severity of the injury. May be stable and within normal ranges or:

Respirations - Shallow and rapid

Pulse - Weak and rapid

Skin - Cool, clammy, grey, bluish, sweaty

Pupils - initially may be equal and reactive

Awareness - Alert and oriented to unconscious

Physical Survey: Depending on mechanism and history. If significant force has been extended and history suggests additional injury do a full physical survey.

Ask: What happened?

Position: Position of comfort or recovery depending on history/mechanism.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

Apply direct pressure to the stump through an abdominal or trauma pad or a large pressure dressing.

Place the amputated part in a clear plastic bag, labeled with the victim's name, date time and part description (left foot.)

Place the bag containing the part on a bed of ice (not in the ice.)

EMS: Call 9-1-1 for a serious amputation or when signs of shock indicate need for professional help.

Watch For: Bleeding may resume. Loss of awareness to unconsciousness. Vomiting may obstruct the airway.

Burns

Any application of heat to skin has the potential to cause burns. Injuries range from very minor to life-threatening.

First Aiders must carefully assess the scene prior to entry. Call 9-1-1 if there is fire, chemical spill or electrical activity such as downed wires.

Consider whether airway and breathing have been or are likely to be affected.

If burns are on the face, neck, chest or shoulders, carefully inspect the nostrils and mouth for signs of injury, which could indicate damage to the airway and lungs. Severe swelling could block the airway if the patient inhaled superheated gasses or swallowed a chemical.

Burns are classified as:

- First Degree: Skin surface affected, becomes red with some swelling and can be very painful.
- Second Degree: Blisters and definite swelling. Pain can be severe.
- Third Degree: Destruction of top layers of skin and structures below the skin such as blood vessels, nerves, muscle and even bone. Area appears white, grey or black. Due to destruction of nerves there is no pain with the actual third degree burn, however surrounding first and second degree burns may be excruciatingly painful.

Healthy skin keeps germs and bacteria out of the body, regulates body temperature and keeps fluids in. Damage caused by burns opens the body to serious infection which, depending on the surface area injured, may lead to septic shock and kidney failure.

Burns can be caused by:

- Direct contact with the heat source such as an open flame.
- Conduction such as contact with an object which has been heated.
- Indirect contact such as radiation, where the heat radiates out from the heat source.
- Chemicals such as acids
- Electricity

Precipitating Factors: Contact with fire/flame, heat, chemicals, electricity.

Types: First, Second and Third degree.

Symptoms: Victim may experience pain, nausea, vomiting, light headed, anxiety.

Vital Signs: Varies depending on type of burn, severity and area covered. May exhibit normal vital signs when injury is minor to difficulty breathing, rapid and shallow breathing, rapid and weak pulse, cool clammy, bluish skin.

Position: Position of comfort or recovery depending on history/mechanism.

First Aid: Specific first aid steps are provided below for common types of burns. Always monitor the burn victim's airway and breathing.

EMS: Call 9-1-1 if there is a large surface area burned, such as the hand and forearm. Call if victim is having any airway problem or difficulty breathing, vomiting or faint or in severe pain.

Watch For: Airway and breathing problems. Carefully watch bandages. Although they may have been applied loosely, swelling may have tightened the bandage creating a threat to circulation.

Specific First Aid Treatments

Burns (continued)

Thermal Burns

The burned area should be cooled by immersing the hand/foot in cool water or saline or covering the burned area with very loose sterile dressings soaked with cool water or saline.

If available, after the burn has been cooled, use a sterile water based gel dressing, loosely bandaged.

Hypothermia (lowering of body temperature) can be a serious threat when a large surface area has been burned. So, care must be taken in trying to treat these burns. Keep the victim as warm as possible.

DO NOT attempt to remove clothing stuck to the burned flesh.

DO NOT apply anything other than cool water, saline or sterile, water based gel burn dressings.

DO NOT break blisters.

DO NOT attempt to clean the wounds

DO NOT use anything that can stick to the burns such as cotton or tissue.

Chemical Burns

There are so many chemicals in use that it is impossible to provide accurate information in this manual on how to treat chemical burns.

Refer to the Material Safety Data Sheet and manufacturer for detailed directions.

The First Aider must exercise extreme caution not to become burned by the chemical as well. Wear suitable protective equipment.

Most chemicals can be washed away with water. However, some chemicals will react with water making the situation must worse.

In some cases the victim should be placed under a deluge shower, If you have this equipment, care must be taken to ensure that the temperature is appropriate (slightly cool) and that the water supply is clean. Essential maintenance includes running the water for at least five minutes every week.

If water is appropriate spray under very low pressure towards the injured area, so that the chemical doesn't affect the non injured area.

If the chemical is dry, then brush the chemical towards the injured area to protect the non injured area. If appropriate, spray with low pressure water.

Hydrofluoric Acid

WARNING: The First Aider must exercise extreme caution around chemical spills. Chemicals may cause irritation or serous damage to the airway, windpipe and lungs. Chemicals may be absorbed into the skin on contact. It is essential to wear appropriate personal protective equipment.

If you use hydrofluoric acid it is essential that you exercise extreme caution and plan first aid measures in advance.

A booklet is available from Honeywell, A major manufacturer of this product.

Electrical Burns

As electricity travels through the body heat is created which can cause severe burns. Every structure between the point of entry and exit can be damaged, such as nerves, blood vessels, muscle and even bones. However, the burns may not be the most serious problem as the electricity also causes violent muscle spasms which can fracture bones. Additional damage may occur if the victim is thrown to the ground or against an object, so expect serious internal injury.

As always a scene survey is a must. In the case of electrical injury the energy must be turned off and locked out all the way back to the source (electrical panels.)

Until locks are available, appoint someone to guard the switches to ensure they are not activated during the rescue. If you are not absolutely sure of which switches or panels to close then call the engineering/maintenance department or 9-1-1 prior to entering the scene.

Never use tools, poles, broom handles or pieces of wood to move potentially live wires. Even if the object is an insulator it can still carry electricity!

Once it is safe to enter check responsiveness, airway and breathing. Be prepared to administer CPR and use your AED. An electrical injury may have caused cardiac arrhythmias and heart damage.

Maintain spinal stabilization while performing a head to toe examination. Identify the entrance and exit wounds.

Treatment of the electrical burns is the same as for thermal burns.

WARNING: The rescuer risks severe injury and death by entering an unsafe electrical scene. Be absolutely positive that all electricity and other energy sources have been locked out all the way back to the source.

Bone, Muscle and Joint Injury

It is usually very difficult to be able to tell whether a bone has been broken or if the injury is to muscle, ligaments or tendons. First Aiders should treat all serious sprains or strains as a suspected fracture.

Regardless of whether the victim has a strain, sprain, fracture or dislocation the first aid treatment is basically the same: stabilize the injured part and arrange transport to medical care.

Whenever sufficient force has been applied to cause these injuries, always suspect there may be other, not as obvious, internal injuries. Do a complete head to toe examination to identify other, perhaps more serious problems.

Always consider spinal stabilization when you think there has been a fracture due to the forces involved. When in doubt always call 9-1-1.

Precipitating Factors: Bone, muscle and joint injuries are usually the result of extreme application of a direct blow or a twisting force. However, bone injuries can also result from disease process such as osteoporosis or cancer.

Types: There are four major classifications of muscle, bone and joint injury:

STRAINS - the tearing or stretching of the muscle or tendon.

SPRAINS - the tearing or stretching of a ligament.

DISLOCATIONS - the separation of bone surfaces in a joint resulting in improper alignment of the bones.

FRACTURES - a break or crack in the bone which could be open (bone protruding through the skin) or closed (no break in the skin.)

Symptoms: The victim may have moderate to extreme pain. Pain is increased on movement or when touching the injury site. Expect nausea, vomiting, anxiety.

Workplace First Aid: A Team Approach

Bone, Muscle and Joint Injury (continued)

Vital Signs: Usually very stable and within normal ranges. If vital signs are negatively affected, consider other problems such as internal or multiple injury.

Physical Survey: Depending history and mechanism.

Ask: How did this happen.

Position: Carefully assess mechanism and history. Likelihood of spinal injury?

If no spinal injury suspected and conscious, place patient in the position of most comfort, probably semi-sitting to sitting. If spinal injury suspected, position found with stabilization. If airway might be compromised by vomit or other fluids place in recovery position.

First Aid: Blanket. Make eye contact, establish trust. Head and neck stabilization if necessary. GIVE NOTHING BY MOUTH.

When 9-1-1 has been called do not attempt to apply splints. Paramedics have specialized splinting equipment.

When transport will not be by ambulance apply a splint to stabilize the part. Generally this means to use a well padded device such as a wood slat, rolled up newspaper or magazine, Quick Splint or Speed Splint. Carefully apply a padded splint which is long enough to cover above and below the injury site. Bandage the splint in place using triangular bandages (excellent for this purpose,) gauze rolls, or other suitable material.

If available apply cold packs for fifteen minutes and then remove for fifteen minutes. Repeat the cycle until medical help obtained.

CAUTION: Do not apply ice pack to bare skin, insulate with dressings or cloth first to reduce the chance of 'skin burn'.

EMS: Call 9-1-1 if head, neck or spinal injury suspected, or if there is a chance of internal injury. Ambulance transport is appropriate for leg injuries or where the victim is exhibiting signs of shock.

Watch For: Increased swelling may cause bandages to be too tight. Decreasing temperature below the injury may indicate restriction of blood flow either due to bandage/splint or damage to blood vessels. Monitor airway and breathing at all times.

In addition to the above, the protruding bone must be stabilized and the wound covered with a dressing.

Do not attempt to clean the wound.

Fractures - Open

See embedded object.

Almost always the patient will find their own position of comfort and not allow you to provide any additional care.

For a shoulder injury, if you can, apply a thick pad, such as a blanket, to the chest, resting the arm on the pad. Support the arm with a sling and gently swath the arm to the torso.

Never try to snap the bone back in place.

Dislocations

This injury requires medical care by a physician.

For a finger/toe dislocation, gently splint the hand/foot to limit mobility.

Ice packs might help reduce swelling and pain.

Miscellaneous Injuries/Conditions

Bee Sting

See severe allergic reaction page 28.

If the stinger is still embedded use a plastic edge (like a credit card) to scrape the stinger away including the attached sac, which is still pumping poison into the injury. A cold pack may help relieve pain and swelling.

Nosebleed

Nosebleeds may be a sign of a serious medical condition like high blood pressure or leukemia.

If the nosebleed was caused by trauma, consider stabilizing the head and check for additional injuries.

If it is a simple nose bleed, have the casualty lean forward to drain the blood away from the airway. The person should pinch the nose for ten minutes.

Medical assistance may be required if the nosebleed continues for more than twenty to thirty minutes.

Do not attempt to remove any object

Avulsed Tooth

embedded in the eye. Both eyes move in tandem with each other. As the person looks around they may be causing additional injury, so, loosely cover both eyes and arrange transport to a hospital.

Dust or tiny particles can be flushed with clean water.

Pick up the tooth by the crown (white part). Do not attempt to clean the tooth as this could cause tissue damage. Rinse the tooth in saline or water.

Place the tooth in egg white, whole milk or saline solution.

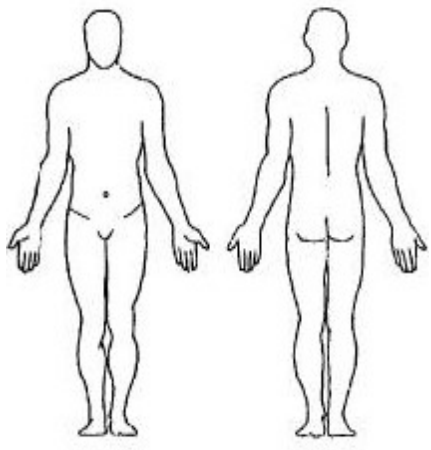
Control bleeding by having the casualty bit down on a sterile dressing, such as a rolled 4" X 4" gauze pad.

Best chances for successful tooth survival is re-implantation by a dentist.

Specific First Aid Treatments

WORKPLACE FIRST AID REPORT

Patient Name	Incident Date	Attendant 1
Age Sex	Incident Time	Attendant 2
Address	Employer	Attendant 3
City	Address	Attendant 4
Postal Phone	Incident Location	



Signs & Symptoms

Allergies

Medications

Past History

Last Meal

Events Prior

TIME	PULSE	RESPIRATIONS	SKIN	B. P.	AWARENESS	PUPILS
				/		
				/		
				/		
				/		

Physical Exam & Observations

Care Provided

Code 8
Emergency • Medical • Services

Oxygen	Flow Rate	LPM	Defibrillation No of Shocks
NRB Mask		CPR Mask	Certified Members
Bag Valve Mask			

Workplace First Aid: A Team Approach

NOTES	



Introduction To Additional Information

The first section of additional information is a look at biohazards and how to protect yourself by using personal protective equipment, like masks and gloves.

As important is how to clean up the incident scene to make it safe for others to return to work once the emergency has been taken care of.

Next we a very important section: Shock Trauma - The Golden Hour which explores the relationship between time and life saving.

Finally we consider the importance of having a coordinated response by a well trained and equipped First Aid Team and the community's Emergency Medical Services System.

The key is having an Emergency Medical Response Plan. Start working on yours today.

Biohazards

As a First Aider you can make a valuable contribution to your family, employer and community because you have acquired the skills that one day may save a life.

During every Code Eight course we are constantly reminding our First Aiders that Rule No 1 is "The Rescuer Goes Home Tonight." To ensure our own safety we do a careful scene survey prior to entering an emergency scene. Whenever we see a danger we eliminate it before going any further.

This is all very well for physical hazards like downed electrical wires or moving machinery. But how do you see HIV-AIDS or Hepatitis C? You can't, and that is the problem. You signed up to take a first aid course and join your First Aid Team. Your family didn't sign up for you bringing a dreaded disease home with you. You have a responsibility to those close to you to remain healthy.

The first step in biohazard protection is to understand and accept that the risk is real. Consider the West Nile Virus, SARS, Bird Flu and the resurgence of diseases such as tuberculosis and you start to get the idea that there are some very bad bugs out there.

And they are not going away anytime soon. New diseases will develop and threaten our health. That is a simple fact of life.

We invented our very own disease: SOBS - Some Other Biological Syndrome. We don't know where SOBS will come from but it will find its' way to Canada. We don't know how it will enter your body but it will. We don't know how it will make you sick but it will not be pleasant. We don't know if you will survive it or how many it will kill before scientists get it controlled.

And when SOBS strikes, the people at places like the Centers For Disease Control will give it a name and we will put SOBS right back on the shelf to wait for the next disease to come around. And it will.

The next disease may have a really good press agent and get a lot of media attention, even if it is not really a contender for "the big one." SARS fits this category. Only 44 people died of SARS in Canada and 880 died worldwide. As horrible as this sounds, the truth is that we kill 60 to 80 people on our highways every week in this country!

SARS isn't even close to being as dangerous as the commute home.

What worries me is that we seem to have forgotten all about the really big problems that have been here for a long time such as HIV-AIDS and hepatitis C.

AIDS will kill 40 million people in Africa alone. In Canada AIDS is rising and is inexplicably being diagnosed more often in women than men.

While SOBS is a real theoretical threat (oxymoron?) AIDS is actually here. No matter how well you think you know someone you really don't know them at all.

People might have contracted AIDS from sharing needles or unsafe sexual practices. Just as likely they got it from a blood transfusion or medicine made from blood products in the eighties.

The primary person who was directly infected had no idea that they were sick and went on to infect others. So, these diseases are solidly entrenched in every community across our nation.

Take the threat seriously.

In the early days of AIDS we were taught to practice Universal Precautions, which was based on knowing which bodily fluids were potentially infected. Scientists told us that blood, semen, vaginal secretions, pleural fluid, cerebrospinal fluid, synovial fluid and mothers milk could be dangerous. However, urine and saliva were safe: provided there was no injury to the mouth or blood in the urine. How could we possibly know this in an emergency response?

Code Eight recommends our First Aiders practice Total Bodily Substance Isolation instead. This is really simple to remember: any fluid or substance coming out of another person's body is potentially a threat to health.

The way to protect yourself and your family is to always use the correct personal protective equipment necessary.

Key word is Always! Every single time.

Workplace First Aid: A Team Approach

Biohazards (continued)

GLOVES: Only use nitrile examination gloves. (not vinyl because they rip too easily and don't get latex because, aside from easily being ripped they have a protein that could provoke a life threatening allergic reaction is some people.)

SAFETY GLASSES: Use visitor glasses with clear side guards. Make sure that the model you choose can be worn over eye glasses.

MASKS: Whenever the patient has a fever, is ill, has a relative or themselves who have recently been out of the country or who has an upper respiratory problem like sneezing, sniffling or runny nose, wear an N95 respirator type mask.

CPR BARRIERS: Unless you are willing to share body fluids with the victim, always use an appropriate CPR device such as the Vapor-Isolation-Valve mask, a mask with a Hepa filter or a Bag-Valve-Mask.

DISPOSAL: All of these personal protective devices are one-time use only. Once you have used gloves, mask, glasses or CPR device they must be thrown out.

To remove nitrile gloves, pinch the outer surface of the glove at the wrist and pull the glove off of your hand. The removed glove is now in your other hand which is still gloved. Without touching the removed glove, ball it up into the centre of your gloved hand. Place your ungloved fingers inside the wrist of the gloved hand and pull it inside out. The first glove is now inside the second glove and the inner surface of that glove is now facing out.

Immediately wash your hands with an alcohol based hand cleaner containing at least 60% alcohol and a moistening gel to prevent your skin from drying out.

Every year the Centers For Disease

Hand Washing

Control says that hand washing is the single most effective way to prevent the spread of disease.

Yet over 30% of the population does not wash their hands after using the washroom. Or they will think nothing of sneezing into their hand and then shaking yours!

Mount an ongoing campaign to teach your staff how to wash their hands properly and encourage them to bring these simple procedures home and teach their families. Your absenteeism rate will go down and their children will miss less time from school. Everyone wins.

Posters and other materials are available from your local health department.

Regularly wash and decontaminate work surfaces. A recent study shows that

Facility Cleaning

desks have 400 times more bacteria than public toilet seats.

Perhaps our next departmental lunch meeting should be held in the men's washroom!

Consider this: The boor who uses the toilet and doesn't wash their hands wanders over to your workstation, puts their contaminated hands on your desk and asks 'what are you doing this weekend?'

I'll be busy washing my desk, thanks.

Most companies having over two-hundred employees have a 'first aid' room. WSIB regulation 1101 mandates

First Aid Response

such a facility.

A worker cuts their finger and needs a 'band-aid.' So, they wander over to the first aid room or the first aid box and rummage around looking for a bandage and perhaps an antiseptic.

Heading to the first aid supplies they leave a biohazard trail. Drops of blood are on the object where they got cut and on other work surfaces, floors and door handles. Everything they touch is now potentially infected. How can you clean up the workplace when you don't even know where the biohazards are located?

Make your workplace safer by implementing a simple strategy: no matter how minor the wound, the worker will stay where they are until a First Aider responds.

The First Aider will clean and bandage the wound and fill out the appropriate report forms. Finally, the First Aider will then decontaminate the incident site.

Imagine that a worker gets a minor cut (stitches not needed but it gushed for a bit.) The blood hits cardboard cartons full of product destined for your largest customer. Your customer receives the blood spattered cases and cancels their contract with your firm. Ouch.

Change your thinking. Instead of a first aid room, have a 'Wellness Room." This is a clean, quiet room where someone who feels ill can go and rest. Have a migraine: go to the wellness room. Got cut: stay where you are.

Follow these simple directions:

1. Wear nitrile gloves, masks and eye protection.
2. Wash the incident scene down with

Cleaning The Incident Scene

soap and water and then dry with paper towels. Also wash down tools and equipment that might have been sprayed with potentially infected biological materials.

3. When you need it (not in advance) prepare a mixture of one part household bleach to fifteen parts water.
4. Use a plastic spray bottle filled with the bleach solution to spray the entire incident scene. Not just where you saw blood or bodily fluids, but in a wide arc from the center of the scene.
5. Allow the bleach solution to air dry.

It is now safe for workers to return to work without the risk of contracting a potentially serious biological disease.

Additional Information

Biohazards (continued)

Cleaning An Awful Scene

Hopefully this never happens at your workplace, but, what if the injury was horrific and there is a huge amount of really awful stuff to clean up?

First Aiders are not expected to clean up brain matter and other really gross human tissue. You need to call in the professionals for this cleaning task.

If this ever happens, call Code Eight or your local funeral home for a list of companies in your area that specialize in this type of work.

Cleaning Machinery/Equipment

A seriously injured worker who was entangled in a machine has probably left potentially infected material deep in the innards of the machine.

Call you maintenance department to take the machine apart to properly clean the inside parts or speak to the equipment manufacturer for advice. Remember, just because you do not see a biohazard does not mean it isn't there.

Getting Rid Of Potentially Infected Material

Gather up all items that may have been exposed to blood or other bodily fluids. This includes bandage wrappers, bandages and dressings, items that may have been sprayed, paper towels, etc.

Method One: Place all of the material, including used nitrile gloves, safety glasses, N95 masks and CPR barrier devices in a green garbage bag. Seal the bag and place it in another bag and discard it with the trash.

Method Two: If your employer has a license to store and dispose of biological material, follow established protocols.

Method Three: Soft supplies such as wrappers, soiled bandages and dressings can be disposed of in a feminine hygiene container supplied by companies like Cannon Hygiene. These firms are not permitted to take products dripping in blood. In the unlikely event that you have dressings etc that are dripping, simply roll in paper towels and dispose of in the container.

What you can't see - can kill you. Take biohazards seriously.

Shock - a momentary pause in the act of dying

Basically, shock is the body's inability to meet it's need for oxygen. Put it another way, shock results from insufficient oxygenation of the vital organs. Shock is a series of actions taken by the brain, in an attempt to protect itself.

A better definition of shock was stated by Dr. R Adams Cowley:

"Shock is a momentary pause in the act of dying."

Shock can come and go in an instant or develop over a period of hours, days and weeks. The body may successfully fend off shock quickly and all systems go back to normal.

Or, the shock can develop and follow a predictable progression leading to death. And that is the point: shock is a deadly disease. Everything that the First Aider does is directed towards minimizing the shock that develops from all injuries and illnesses.

People don't just "go into shock." Shock is a process that develops over time. Regardless of what started the process the result is always the same: unless effectively treated shock kills.

Types Of Shock

- Cardiogenic Shock - heart attack
- Hemorrhagic Shock - severe bleeding
- Neurogenic Shock - broken neck
- Toxic/Septic Shock - poisoning
- Anaphylactic Shock - allergic reaction
- Hypovolemic Shock - burns
- Psychogenic Shock - faint

As a rule psychogenic shock is not a killer. Usually the person gets a fright causing the first stage of shock. Blood rushes out of the head and the person briefly loses consciousness due to lack of oxygen in the brain. Once they fall the blood rushes back into the head and restores the flow of oxygen so they awaken, no worse for the experience.

The others however are definite killers. Each prevents the efficient use of oxygen by the body's various systems.

During a heart attack the 'pump' slows or stops preventing the delivery of oxygenated blood. Severe bleeding depletes the blood carrying the oxygen. Neurogenic shock results from a disruption in the nervous system between the brain and body. Someone with spinal cord injury may no longer be able to breathe on their own because nerve impulses to the chest and diaphragm are lost.

Toxic shock results from poisoning. When the kidneys no longer filter the blood it fills with toxins affecting the heart's critical electrolytes causing a deadly arrhythmia.

Anaphylactic shock is an acute reaction to an allergen which severely narrows the windpipe not letting oxygen enter. Only a rapid injection of epinephrine can save someone with this often fatal condition.

Hypovolemic shock results from a shift in the body's fluids.

Regardless of the cause the result is the same. The victim goes through one or more stages of shock.

Workplace First Aid: A Team Approach

Shock (continued)

Stage 1 - Compensatory Shock

Everyone has probably experienced the 'fight or flight' mechanism. Suddenly your brain perceives a threat. In an instant the brain marshals its' resources. Should you stand your ground and fight? Or should you post a hasty retreat and take flight away from danger?

This is the first stage of shock, referred to as compensatory shock because the body tries to make up for the loss of oxygen through a series of predictable actions.

When the brain perceives a threat all systems go into overdrive to protect the brain and vital organs from damage. The brain may not yet have determined what the threat is, but a battle has started.

First, blood is shunted away from the skin by reducing the size of blood vessels feeding the skin. As skin loses its' supply of bright red, hot blood, the person's skin becomes pale, chalky, bluish and becomes cold, clammy and sweaty.

As the brain's need for oxygen increases, the blood vessels to the arms and

Stage 2 - Decompensatory Shock

legs are shunted closed. The victim becomes unsteady on their feet, wobbly and may collapse.

Blood shunted from the skin, arms and legs is directed to the major organs. The heart beats faster to move oxygen to the brain quicker and the victim's respirations increase to bring more oxygen into the body faster.

Next the digestive system is starved of oxygen and closes down. The victim becomes nauseous, may vomit, become thirsty and are increasingly agitated.

The flight or fight mechanism usually self corrects when there is no real threat or shock progresses.

The brain, desperately trying to save itself, starts doing things that will ultimately make the situation worse: vital organs are starved of oxygen.

As the heart muscle is deprived of oxygen it can't beat as hard or as fast, so the pulse gets weaker and slows down. Next the diaphragm and accessory muscles of respiration get less oxygen, so the victim's breathing becomes labored and the rate slows down. As less oxygen is brought into the body, blood is no longer moving as quickly.

Blood shunted from the vital organs goes to keep the brain alive. However, as the supply of oxygen lessens the victim loses consciousness, becomes incontinent, pupils no longer respond to light and urine output is decreased.

The victim is critically ill and urgently needs medical care.

If it gets to this stage, shock is probably irreversible. There is little hope of survival. I call it the 'over and out' phase.

The kidneys, which control blood pres-

Stage 3 - Irreversible Shock

sure and filters out poisons from the blood, closes down. Changes in electrolytes leads to arrhythmia, making it harder for the heart to pump out the body's need for oxygenated blood.

Blood pressure crashes, the body fills with toxins, the lungs fill with fluids, the heart stops and the brain dies.

Shock is a downward spiral. Shock kills! That IS the point!

Every injury or illness will have some of the signs and symptoms of shock. Whether providing critical or ongoing care, the First Aider must be aware of the victim's status at all times and be

Treating Shock

prepared to intervene as needed.

The primary survey reveals life threats that must be dealt with first. Providing CPR is treating for shock, as is direct pressure on a serious wound. Both actions are designed to keep oxygenated blood coursing through the body.

Calm the victim with reassuring words. Tell them that you are here to help and you are not going to leave them. Let them know you have called 9-1-1 and professional emergency responders are on the way to take over care.

Have the casualty sit or lie down in a position of comfort and cover them with a blanket to maintain body heat. Tell the victim to remain still, especially if you suspect a head, neck or spinal injury.

As shock progresses the body closes down major muscle groups, like the large leg and thigh muscles. When this happens the victim will get wobbly and is likely to collapse. So, sit them on the ground rather than in a chair: they could fall off of the chair.

When you see clear signs of shock, provide oxygen, when available, through a non-rebreather oxygen mask at 10 liters per minute. Reassure them that the oxygen will help them feel better.

Provide first aid care for their injuries. Tell the person what you are doing and why it is necessary. Keeping the victim calm is important, so you must gain their trust and co-operation. Never lie. You don't always have to offer unsolicited truth, but answer their questions as honestly and tactfully as you can.

Most important is to listen to the patient, don't just talk. This is about them, not you. Talk to them about things that are of interest to them. You could talk about their children, hobbies, sports, job, schooling: the topics are endless. Talking about things other than the injury/illness, helps them by keeping their mind off of what is hurting/scaring them.

Monitor and record the victim's vital signs often. You now know what some of the observations mean. Initially, we would expect the heart and breathing rate to rise due to the first stage of shock. As the person's status declines we expect that their heart and breathing rate will go down. Seeing their skin go from a nice pink to a chalky white tells us that they are headed into the second stage of shock. Recording vital signs is, well, vital!

Unless you suspect diabetes, give nothing by mouth. Aside from possible surgery there is a risk of vomiting which is an airway threat.

Additional Information

Shock - Trauma: The Golden Hour

"Next to creating life the finest thing a man can do is save one"
– Abraham Lincoln

Dr. R Adams Cowley is often referred to as the father of modern paramedicine. His groundbreaking research and vision led to the creation of virtually the entire system of emergency care in use today throughout much of the world.

His journey began as a young cardiac surgeon with the United States Army in the European theatre after the war. He noticed how critically injured serviceman somehow managed to survive field surgery only to die days to weeks later.

His training led him to believe that these injured warriors had no chance at all. Surprised that they managed to make it off of the operating table he was perplexed as to why they would later die.

Working with dogs he withdrew an amount of blood from the dog and then noted how long until you returned the blood and nurse the dog back to health. In dogs he found that the maximum time was sixty minutes.

Years later he designed a study to observe how well patients did based on the time from when a person was injured until they were in an operating room. He noted a similarity with his dog research: sixty minutes.

His inquisitiveness and creative research led to the discovery of the Golden Hour - the first critical sixty minutes after an injury when definitive medical care is essential to the victim's survival.

Dr. Cowley had discovered that the injury didn't kill the patient - the resulting shock did the job.

Specifically, his research determined that if the victim had a pulse when the ambulance arrived, and if they could be in surgery within one hour of their injury, there was an 85% chance of survival.

After sixty minutes hope faded fast.

Single handedly, Dr. Cowley created the Emergency Medical Services System. The first statewide EMS system was in Maryland. All emergency providers including ambulance, fire and hospitals became part of a coordinated system throughout the state. Standardized training, equipment and communications linked all providers together as part of a cohesive program.

The first air ambulance service was formed when Dr. Cowley convinced the Maryland State Police to use police helicopters as ambulances to evacuate critically injured patients. Their Maryland State Police Aero Wing is still staffed by police officers who have been cross-trained as fully qualified paramedics.

Dr. Cowley was the first to train and authorize civilian 'ambulance drivers' in the use of advanced medical procedures and administration of restricted drugs.

Dr. Cowley founded the first hospital specializing in the treatment of trauma: Baltimore Shock-Trauma, since renamed in his memory the R Adams Cowley Memorial Shock Trauma Center.

From a 2 bed clinical trial, today Shock-Trauma consists of a 50 hospital network with 10 trauma centers, 450 ambulances, a multi-million dollar communications system and a $ 35 million dollar fleet of medical helicopters.

Prior to the changes implemented by Dr. Cowley, an injured person would have to wait in the emergency room until a surgeon could be found. More often than not, the delay from time of injury until a doctor would be available to operate was measured in hours. Dr. Cowley created a new medical specialist: Emergentologist.

These trauma surgeons are available in trauma centers 24/7 to immediately provide the rapid surgical support needed by seriously ill people.

Dr. Cowley said: "If I can get to you within one hour of your accident, and stop your bleeding, and restore your blood pressure, then I will probably save your life."

One hour. One crucial Golden Hour.

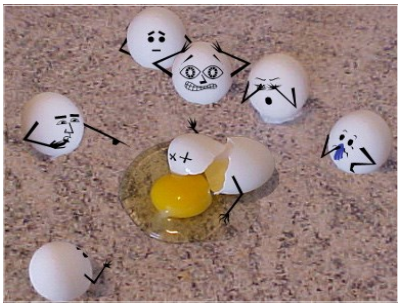
The actions taken by the First Aider will either wisely use the Golden Hour or let it slip away. Because the Golden Hour is controlled by you, the First Aider.

At Dr. Cowley's funeral, at Arlington National Cemetery, Maryland Governor Wm. D. Schaefer said "there will be an accident somewhere today, and a life will be spared, because of the system that Dr Cowley set up . . . He was a driven man, a perfectionist,"

Workplace First Aid: A Team Approach

Workplace First Aid - A Team Approach

First Aid Team



All too often an emergency scene is absolute chaos. People are running around not knowing what to do. While some are crying, others stare. Many will look away, frightened by the sight.

Few are working effectively together to help the injured or ill person. Individuals arriving on the scene are easily overwhelmed. What do you do first?

Code Eight suggests having a First Aid Team respond to every medical emergency. Emergency - not a cut finger. A minor situation can probably be handled by a single First Aider. However, a potentially serious incident calls for a different method - The Team Approach.

When a group responds everyone shares the load, contributing their knowledge and skills, working together to ensure superior patient care.

Each Team member performs a specific role based on when they arrive on scene. Because the roles were planned out and practiced during regular review sessions, everyone on the Team knows what to do and what is expected of them during a real emergency.

Primary Responder

The first person on scene is the Primary Responder who starts with a good scene survey.

Introduce yourself and ask if you can help. If the patient does not respond, get help and do a primary survey. If the patient has no immediate life threats proceed to the secondary.

As you find injuries deal with them yourself or have another responder take care of it while you move on.

Always prepared to go back to the primary survey if a life threat develops.

Next to arrive is the Secondary Responder who does their own scene survey.

The victim's head is immediately stabilized, while questions are asked to determine history and mechanism of injury. Continue stabilization unless history/mechanism of injury suggest this is unnecessary. Monitor life threats. Is the patient breathing? Colour changing? Losing/regaining consciousness?

If head, neck and spinal injury is a possibility, ask others, preferably first aid trained, to take over if you become too tired/ sore to continue stabilization.

Continually monitor the patient and keep your other Team Members apprised of the patient's status.

Note Taker

The third person to arrive is the note taker. Do your own scene survey. The Primary & Secondary may have just run in.

Taking and properly distributing notes is very important. In addition to notes about the victim we need a detailed drawing of the incident scene, photographs are even better, witness names and any other information that will assist the health and safety committee investigate the incident. Ministry of Labour investigators will also want detailed notes.

Assign bystanders to help. They can draw the scene while you obtain patient notes, for example.

Appropriate notes detailing injuries the victim has sustained and first aid rendered should be photo-copied and given to paramedics.

Incident Control

The fourth person is the Incident Control who oversees the entire rescue. Their first task is a personal Scene Survey. Once they know they are safe, they do not stop doing a Scene Survey.

Incident Control does no patient care. They concentrate on keeping the scene safe for everyone and directing people to ensure major tasks are performed, such as having someone at the street to wait for police, fire and EMS, making sure keys or pass cards are available, moving obstacles away from the route emergency workers will use to access the patient etc. In short, all scene activity is directed by Incident Control.

CPR Coach

Providing CPR is an exhausting procedure that could potentially put the rescuer's health at risk. As the rescuer tires, the victim receives less effective compressions. The CPR Coach monitors the rescuers health and CPR quality.

The CPR coach is going to time each rescuer to make sure they do not do more than two minutes of CPR. As compressions are given the Coach is going to monitor the depth and rate and offer advice on whether to push harder or faster.

Rescuers will be lined up to replace the person doing compressions after their two minutes or immediately if needed.

An emergency scene is dynamic rather than static.

Interchangeable Roles

The situation will change constantly requiring the First Aid Team to quickly react to the new situation.

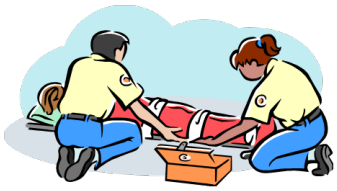
In our Team Approach, the rescuers will probably change often as the emergency unfolds. For example: The first person on the scene is the maintenance engineer who is now assuming the role of Primary Responder. Should a piece of equipment require locking out they may ask another Team member to assume Primary Responder duties while they attend to locking out equipment.

The trick is to communicate with each other. Not talk at each other but actively listen to each other. Your team will get you through this and you will help them.

Additional Information

Emergency Medical Response Plan

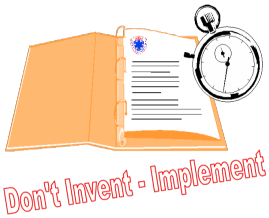
When a serious medical situation arises the victim is depending on you to get there quickly, with the right equipment and supplies to render effective and appropriate care. You can accomplish this goal by having an Emergency Medical Response Plan.



During our courses and while reviewing this book you have been told over and over that time is of the essence. A person who is no longer breathing has very little time. Within three minutes brain cells start to die. A seriously injured person has an hour - The Golden Hour - to get the definitive surgical care they need to survive.

How will First Aiders respond to the emergency if no one calls them? How can they help if they do not arrive on time? A first aid course, your first aid equipment and good intentions is meaningless if we don't deliver on time.

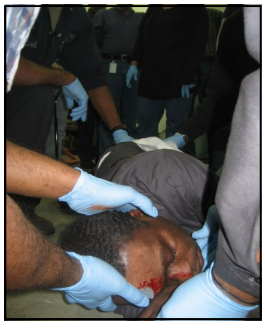
The answer is to plan for medical emergencies. When the real thing happens you implement the plan - not invent one.



Some of the many components to consider for your Emergency Medical Response Plan include:

1. Create a First Aid Team. Make sure you have enough trained First Aid Team members to cover every shift and every area of the facility.
2. Train The Team. The most common mistake people make when training First Aiders is that they think a certification course every two or three years is sufficient. It isn't. Remember that you initial training and subsequent recertifications are only starting points.
3. Continual Training. Set aside time every month for the First Aid Team to meet, discuss a first aid topic and then practice skills, such as bandaging.
4. Regular Scenario Training. After the Team meeting set up a scenario and have your Team respond. Best practice is to let the individual Team members take turns at running the monthly scenario.
5. Health And Safety Committee. After the scenario analyze how well the Team did and what was learned that may require a change in your emergency plan. Share the scenario with the Health and Safety Committee. Once a hazard was identified, which led to the scenario, steps should be taken to ensure that it never really happens.
6. First Aid Team Activation. Once an incident occurs, your colleagues, who are not on the Team, need to know how to get a fast first aid response. How do they get the First Aid Team mobilized? A paging system may work well in an office, but not in a noisy factory. What system can you use to rapidly notify everyone on the Team to respond?

7. Market The Team. The First Aid Team is like an organization within the company. You sell life saving and your prospects need to know you are in business to serve them. Use bulletin board and intranet messages, pay envelop stuffers, e-mails: whatever works to constantly remind everyone in the building that there is a First Aid Team.
8. Identify Team Members. Place signs above or at First Aiders workstations. Sew first aid badges on uniforms or have Team members where distinctive ID badges.
9. Incident Location. How do First Aid Team members find the victim? This is easy in a small shop with no walls. In a large facility too much time is lost trying to find the incident. Grid systems often works best. Every building post is identified with a large alphanumeric label. Rather than sending the Team to machine one they are sent to G-14. Machine one may be relocated elsewhere, however, the building columns always remain in the same place.
10. Incident Access. Increased security concerns since 9/11 have resulted in ever more locks and physical restrictions on where people may go. First Aiders need instant access everywhere. Find a balance between security and rapid response.
11. First Aider Facility Tours. Most people are very familiar with their department or area, however First Aiders can be called anywhere. Once every few months First Aiders should tour different areas and become familiar with things like hazards, entry and exit points and the location of the closest emergency equipment.
12. First Aid Kits and Equipment. Make sure there are enough first aid kits and other equipment available and that the kits are strategically located. The goal is to get the First Aid Team and their equipment to the incident scene within one to two minutes. Whenever possible place kits on an egress path so that they can be easily removed from the building during an evacuation. You can't go back into the building once it is evacuated and you may need you gear for real patients.
13. First Aid Kit Maintenance. Who ensures that first aid equipment is well stocked? Outside agencies will do this service for you, at a fee. What better way for the First Aider to learn what is in the kit and where it is located than for them to do the first aid kit checks. Design every kit to be exactly the same and have the First Aiders take turns at inspecting and refilling missing items (weekly/monthly.)
14. Management Support. Designing a plan is one thing making it work is quite another. Management must do more than pay lip service to emergency response. A management champion will ensure the Team's efforts and taken seriously and appreciated.



Workplace First Aid: A Team Approach

NOTES	

Death Is Reversible
Some Conditions Apply

Automated External Defibrillation (AED)

Our **"Death Is Reversible" logo** might sound tongue in cheek at first glance. Death IS reversible when certain conditions are present at the time of death. Between the onset of clinical death and the completion of biological death, there exists a brief window of opportunity. When the correct emergency care is provided quickly enough, it is possible to bring someone back to life after they have suffered clinical death.

The problem is time. Saving life in such an extreme emergency requires careful planning and the wise use of resources. All too often valuable time is lost as people gather around the victim in stunned silence not having a clue about how they can help.

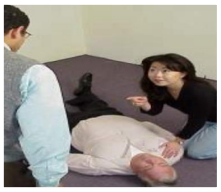
An emergency medical response

CALL 9-1-1

GET THE AED

RESPONDERS

GET HELP

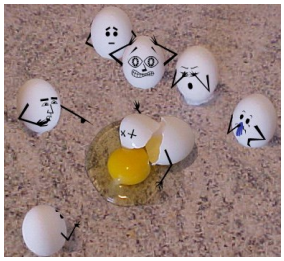


Activate your Emergency Medical Response Plan:
Call for Help, Get the AED, Assess and Attach AED,
Notify 9-1-1, Follow Voice Prompts

No such treatment exists for biological death, which is permanent. It is estimated that at least one hundred Canadians die every single day from Sudden Cardiac Arrest (SCA.) The tragedy is that more than half of these victims could have been saved had they received appropriate emergency care: CPR and rapid defibrillation.

Every second counts. Each six second increment from the time the heart stops pumping blood represents 1% of the victim's chance to survive. In only one minute the patient has lost 10% of their survival chance. In ten minutes it is over.

plan is every bit as vital as having the right equipment and training. The patient needs an electrical shock (defibrillation) within three to five minutes of collapsing. A well designed plan starts with educating everyone in the facility on activating the Emergency Medical Response Team. Signs, posters and bulletin board notices should be located throughout the facility. Every team member must be prepared to respond immediately when an emergency is declared. Part of the plan ensures that the emergency equipment is rapidly delivered to the scene. While the Team is providing appropriate emergency medical care, other employees are sent to the street to flag down firefighter responders and paramedics. Other workers are clearing a path to the patient by removing obstacles and ensuring scene safety. An emergency plan utilizes all available resources to save a life.

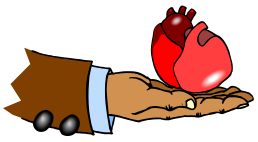


Dental and Medical offices also need a plan. You know your office, your equipment and your staff. You can probably find things blindfolded. Yet, when there is an extreme medical emergency, your office is no longer the same comfortable space you are so used to working in. Suddenly the operatory and examination rooms are full of hazards and problems to solve. The time to start solving problems is before the critical episode occurs. In an emergency situation the concept is to implement not invent. The enemy is time: your patient doesn't have any!

PARAMEDICS

Additional First Aid Skills

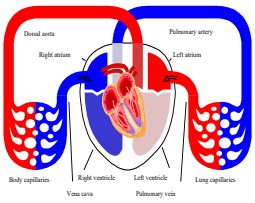
The Heart is a fist sized pump located in the centre of the chest between the breastbone and the spine. Every cell in the body requires fresh oxygen and nutrients in order to perform their function. The byproducts of cellular activity, carbon dioxide and waste materials, must be excreted for the cells to remain healthy.



Blood delivers the raw materials to and removes the garbage from the body's cells. The blood circulates throughout the body as a direct result of the heart's pumping action. Every minute the heart will beat 60 to 100 times. The result of this activity is the flow of four to six liters of oxygenated blood.

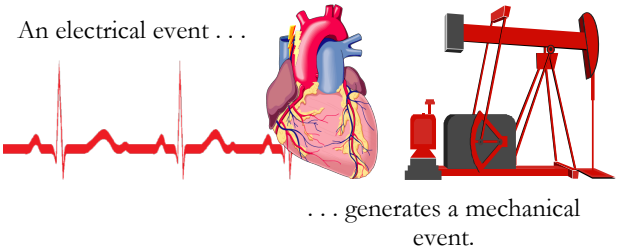
Blood returning to the heart is laden with carbon dioxide, which must be exchanged for oxygen. Blood returns to the heart via a network of veins, the largest of which are the inferior and superior Vena Cava, which empty into the heart's right atrium. The blood then travels through a valve into the right ventricle which pumps the carbon dioxide rich blood through the pulmonary artery into the lungs.

Air, containing approximately 21% oxygen enters the body through the mouth and nose and travels through the bronchial tubes into the lungs. Tiny blood vessels, called capillaries, pass very close to tiny air sacs in the lungs, called alveoli. As the oxygen from the air sacs enters the blood stream through the capillaries, the carbon dioxide leaves the blood and enters the air sacs.



After the exchange of gases takes place, the freshly oxygenated blood then returns to the left atrium through the pulmonary vein. From here the blood enters the powerful left ventricle and is pumped into the Aorta which is the largest artery. As the Aorta branches into several smaller arteries the blood travels to the cells with its' valuable cargo of life sustaining oxygen.

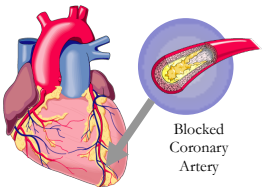
The heart's pacemaker cells generate a series of electrical impulses which tell each muscle group within the heart when to relax or contract. Each contraction squirts blood out of the heart and through the arteries. This organized electrical activity allows the heart to effectively pump blood to every cell.



The force generated by the powerful left ventricle is called blood pressure. Sufficient blood pressure is required to push the oxygen carrying blood throughout the arterial system to feed the cells. When blood pressure falls to a critical level the cells do not get the oxygen and nutrients they need, resulting in a dangerous condition called shock. Shock can be defined as the inability to perfuse the vital organs or, to put it another way, shock is a condition in which the vital organs do not receive enough oxygen to properly function. Shock kills.

Dr. R Adams Cowley, the father of modern paramedicine, defined shock this way: *Shock Is A Momentary Pause In The Act Of Dying.*

A heart attack occurs when the heart muscle is starved of oxygen by a restriction or total blockage of the coronary arteries. The damaged heart may continue to pump blood for minutes, hours, days or even weeks. The patient steadily deteriorates until the heart stops.

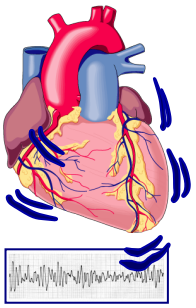


Patients experiencing a heart attack often complain of chest pain radiating to one or both arms. This pain is often severe and described as "my chest is in a vice", "there is an elephant" or "a ton of bricks on my chest." Other signs and symptoms include neck or jaw pain, sweating, shortness of breath, nausea and/or vomiting, pale, clammy skin, denial or an impending sense of doom.

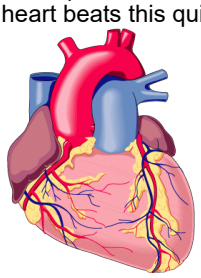
An arrhythmia is any cardiac rhythm which is not a normal rhythm. Many people have heart problems which result in an arrhythmia which for that individual is normal. Think of it as a normal abnormality. Or a regular irregularity. Most times these arrhythmia's can be treated with medications.

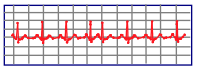
Sudden Cardiac Arrest (SCA) occurs when the heart's electrical system suddenly and without warning stops producing coordinated electrical impulses which result in no cardiac output. Three heart rhythms of concern are: Pulseless Ventricular Fibrillation, Pulseless Ventricular Tachycardia and Asystole.

Ventricular Fibrillation is the most common life threatening arrhythmia. Electrical signals are randomly generated. The heart muscle receives these jumbled signals and cannot react in a meaningful way. Imagine a can of live worms. Although there is a lot of activity - no useful work is being performed.



Ventricular Tachycardia refers to rapid firing of the pacemaker cells. The heart will be beating at 180 beats per minute or more. Usually, this is so fast that you will not be able to detect a pulse. When the heart beats this quickly, there isn't enough time between contractions to allow refill with blood, which is why there is no pulse. Since blood is not entering the heart, no blood can be pumped out.





Asystole is the most deadly condition, the patient's ECG tracing would be a flat line, indicating that the heart's pacemaker cells are not producing any electrical output. When the heart's electrical system malfunctions, oxygenated blood stops flowing to the brain and the victim will rapidly lose consciousness. Only the administration of appropriate emergency drugs can save this patient.

Ventricular Tachycardia (VT) and Ventricular Fibrillation (VF) can be treated with an appropriate dose of electricity, ideally within three to four minutes.

An electrical shock to the heart temporarily disrupts the killer arrhythmia, allowing the heart to re-start in normal sinus

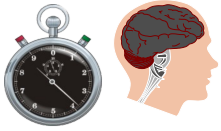
Introduction To AED

rhythm. The defibrillator actually stops the heart, allowing it to re-start on its own, somewhat like rebooting a hung computer. Once brain death occurs, no treatment is available - death is permanent.

Someone in cardiac and respiratory arrest is clinically dead. Clinic means to observe, so when you asses a person who is unresponsive and not breathing you are observing death.

Healthy Brain

Biological (brain death) occurs once a critical number of brain cells have been destroyed by a lack of oxygen. Brain cells start dying after three minutes, by six minutes too many brain cells have been destroyed resulting in brain death.



Brain Death

Organs die at different rates, which is why organ transplantation is possible. A heart can be harvested in Toronto, flown across the country to Vancouver, and be successfully transplanted there. The victim may have signed a donor card. Even if we can't save this soul, we may be able to honour their last wish by keeping organs viable for donation.

By now you may be getting a bit squeamish. That's okay, matters of life and death are not comfortable. CPR and defibrillation are terms used in resuscitation. The word resuscitation means "bring back to life." In other words, this entire topic is *first aid for dead people*! If the patient is not already dead we do not perform CPR or use a defibrillator.

Since the patient is clinically dead, there is absolutely nothing you can do to make the situation worse. From the very instant of the last heartbeat a deadly countdown has begun. Don't stand there - get to work!

Death Is Reversible, some conditions apply. If we are to rescue a person from clinical death we need Trained Responders who will immediately recognize the problem, activate the Emergency Medical Response Plan and start CPR. We need the First Aid Response Team to rapidly get themselves, the defibrillator and oxygen equipment to the scene and start to administer critical care. And we need a rapid EMS response by Advanced Care Paramedics who will provide Advanced Cardiac Life Support and emergency transport to an appropriate facility.

Automated External Defibrillators (AED) are portable, light weight, battery operated and simple to use. All medical decisions are made by the AED's on-board computer, leaving the rescuer free to concentrate on victim assessment and scene safety. The AED operator attaches the electrode pads and follows voice and visual prompts which will guides them throughout the rescue.

All AED's are rigorously tested by Underwriters Laboratories to ensure that they are safe and effective and they are regulated by Health Canada. On the ZOLL AED Plus all you have to do for maintenance is check the AED once per week to ensure that the status window shows a green checkmark. If it shows a red X the unit needs servicing.

Delivering any form of electricity to a patient is a controlled medical act. Licensed doctors (and dentists) are permitted to provide this therapy under the Ontario Regulated Health Professions Act and may delegate authority to First Aiders through a written set of orders called Medical Directives. Upon successful completion of this course you will be authorized to use the AED under the direction of our Medical Director if you are part of one of our workplace Code Eight Response Teams or by the doctor/dentist in your clinic/office.

Our medical director requires the following criteria be met for certification: Current Standard First Aid and Heartsaver CPR certificate, successful completion of this course, 80% score on the written test and for workplace teams, recertification every six months for the first two years and annually thereafter. Your doctor/dentist may have other requirements.

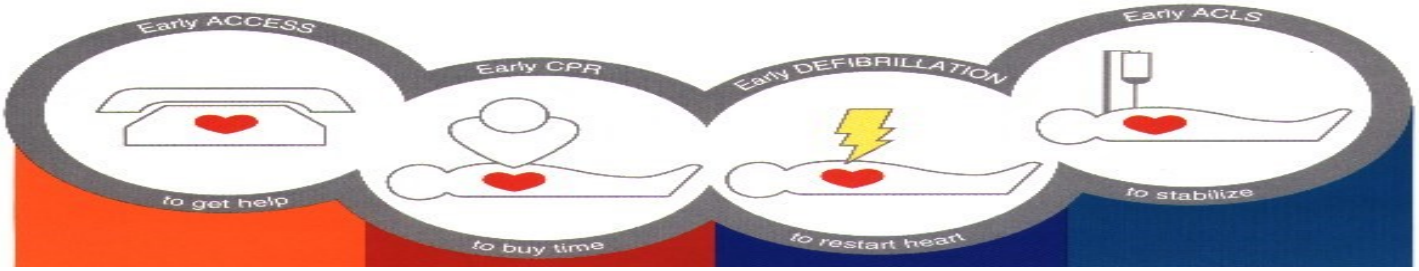
So far, the only lawsuits involving AED use have been for not having an AED available. Busch Gardens and Lufthansa Airlines were successfully sued because they did not have AED's available. In both cases the courts held that rapid defibrillation is the accepted standard of care.

CPR and AED's are first aid for dead people. Your defibrillator will assess the patient and make the shock/no shock decision: it will only shock if the patient needs a shock. You can not do anything wrong.

The Canadian Association of Emergency Physicians has stated that it is immoral and unacceptable not to perform CPR even if the rescuer has no CPR training. In Canada fewer than 10% of the people suffering out of hospital cardiac arrest will survive.

Additional First Aid Skills

The Chain Of Survival



Early Recognition - Activate EMS	To quickly access the victim of a sudden cardiac event into the Emergency Medical System
Early CPR - Circulate Blood	To buy an extra few minutes. Although not as effective as the heart, CPR does provide enough oxygen to keep the brain viable for an extra three or four minutes..
Early Defibrillation	To restart the heart. Only a defibrillator can correct a killer arrhythmia.
Early ACLS	To provide emergency cardiac medications to stabilize the heart muscle. Paramedics trained in Advanced Cardiac Life Support render the same emergency cardiac care that the patient would receive in the emergency room - only faster.
Integrated Post Cardiac Care	To use specialized treatment protocols to nurse the patient back to health.

Unfortunately, even perfectly performed, CPR only delivers approximately 30% of the oxygenated blood that the heart normally delivers. Since the brain is operating at 70% less oxygen than needed, brain cells start to die even with rapid CPR. CPR is still a critical part of the rescue process. It does buy us that precious extra few minutes. Unlike what you have probably seen on TV the victim is unlikely to get up and walk away after CPR alone.

Scene Survey

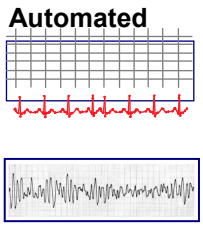
Code Eight's first and most important rule is "The Rescuer Goes Home Tonight." Regardless of how serious a situation may appear, there is never a good reason for the rescuer to risk his or her personal safety. By getting injured you complicate the rescue diverting valuable resources that should be used to assist the primary patient. Always assess the scene first for the following hazards:

NO GAS NO GLASS NO FIRES NO WIRES NO METAL SURFACES NO FLUID PUDDLES

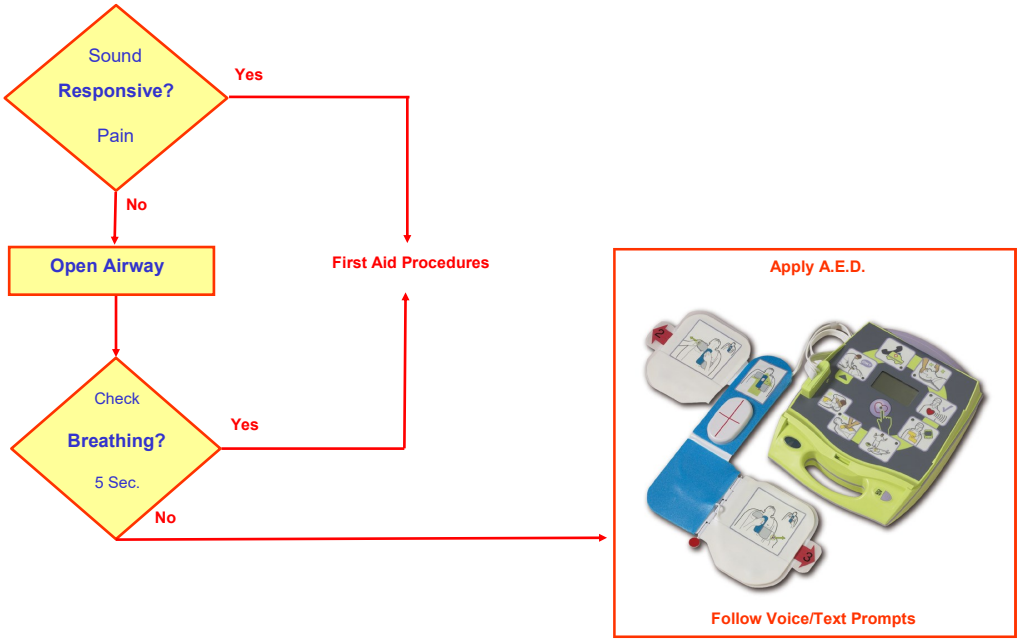
NO GAS	No gases present that could explode, ignite or prevent you from getting or using oxygen such as carbon monoxide which is clear, odorless and tasteless.
NO GLASS	No sharps on the scene that could cut you, such as broken glass, twisted metal, knives, etc. Medical professionals also have to be aware of potential needle stick injury.
NO FIRES	No open flame, hot objects or chemicals which could burn you.
NO WIRES	Lock out all energy sources, including Electricity, Pneumatic, Hydraulic, Motive, Kinetic or Steam energy. The most unpredictable energy source are people who may be mentally unstable, acting inappropriately due to injury, psychological shock, drugs or alcohol.
NO METAL	When using a defibrillator, also consider conductive surfaces such as metal floors, gangways and storage decks. Either move the patient or roll the patient onto an insulating sheet.
NO FLUIDS	Fluids could theoretically transmit the electrical energy. If the patient is in a puddle shared by the rescuer the patient must be moved.

Operating The AED

Safe and Effective Treatment



External Defibrillators only provide a shock to patients in Ventricular Tachycardia or Ventricular Fibrillation. The AED's computer analyzes the ECG and advises the operator if a shock is recommended. As the operator you will not be required to make any medical decisions. These devices are so good at deciding if a patient should be shocked that paramedics often let the AED make the decision for them freeing the paramedic to do other things for the patient.



Elements Of A Rescue

1. **Early Recognition** Every employee must know how to recognize a serious medical emergency and how to activate the Emergency Medical Response Team

2. **Early CPR** As many people as possible should be trained in basic CPR so that at least chest compressions can be started with as little delay as possible

3. **Rapid Defibrillation** The Emergency Medical Response Team must mobilize quickly, transport their rescue equipment including the AED and oxygen to the scene, assess the patient and deliver the first shock in three to four minutes, a daunting challenge in most workplaces.

4. **Early ACLS** Emergency Medical Services must be notified by calling 9-1-1 within seconds of activating the Emergency Medical Response Team. Time must be saved by having people wait on the street to flag down responding paramedics, hold elevators, have keys and pass cards readily available and clear a path directly to the patient.

All of these ideas sound easy until you have an actual emergency and realize just how fast three to four minutes goes by. The only solution is a written response plan and regular practice, just like a fire drill.

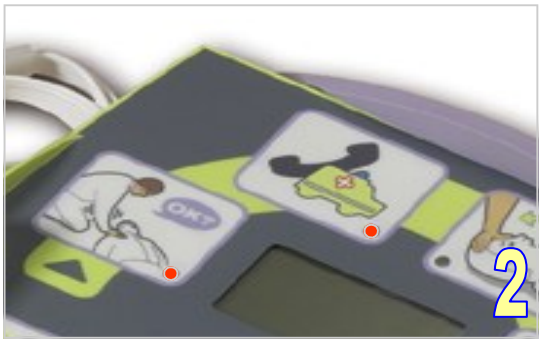
Additional First Aid Skills

The ZOLL AED Plus

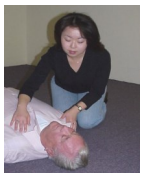
As you go through the rescue process, a red light is activated at each of the pictographs on the ZOLL AED Plus's Graphical Interface guiding you through every step of the rescue, increasing your confidence.

The ZOLL AED Plus is the world's first and only full rescue AED. The engineers at ZOLL understand that you have probably never had to resuscitate anyone and will probably be terrified should you be asked to respond to a life and death emergency. In this situation it is not at all unusual for people to forget part of their training and omit critical steps in the Chain of Survival. Knowing you are an infrequent rescuer, ZOLL comes to *your* rescue by putting a CPR instructor at your side. As soon as the AED arrives on the scene turn it on by pressing the grey on off button.

Once activated the AED will immediately do a self check. In seconds it will say:**"Remain Calm - Call for help - Check Responsiveness"**

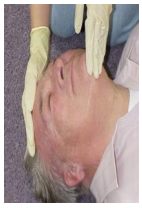


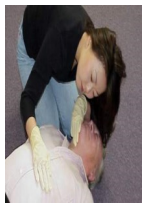
Roll the patient onto their back, shout shake and or gently pinch the patient to see if they respond.



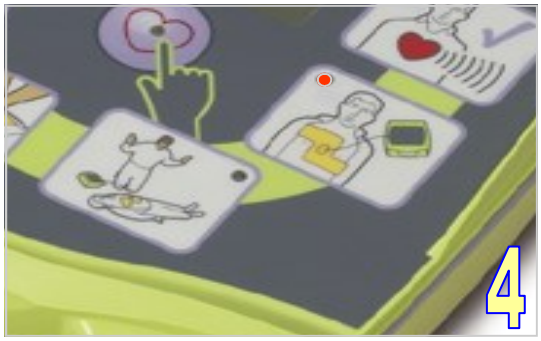
Call out. Have someone call 9-1-1 and report that you have an unresponsive person at your location.

Next **"Open the Airway"** Use the 'head tilt - chin lift' method.





This is a crucial because we can't check breathing if the airway is not open. Check breathing for five seconds. In your CPR course you were told that if the patient was unresponsive and not breathing effectively, the patient is clinically dead, so start CPR. If this was an unwitnessed arrest provide 2 minutes of CPR (30 compression to 2 breaths.) If you witnessed the arrest proceed with step 4.



Once you have determined that the patient is not breathing you will be advised to **"Attach Electrodes To Patient's Bare Chest"** Once attached to the patient the "Doc In The Box" takes over and immediately analyzes the patient's ECG to determine the presence of a killer arrhythmia. If VF or VT is found the AED Plus will charge up. If no killer arrhythmia is found you will be advised to start CPR.

It's just that simple!

Operating The AED

Preparing The Chest And Attaching The Pads

Inside the Lid of the ZOLL AED Plus is a white envelope with a cable that is plugged into the Defibrillator. Attached to the envelope is a clear plastic Zip Lock bag which contains the additional items you will need to prepare the chest for analysis and defibrillation. Inside you will find:

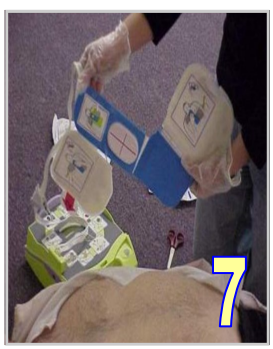
a) Rescue Shears b) Safety Razor Blade

c) Towel d) Vinyl Gloves

e) CPR Mask f) Antiseptic Wipes

Time is of the essence - do not unbutton or try to remove clothing - cut it off with the rescue shears. The chest must be completely bare. Most bras have wires so they must be cut off at the centre of the bra. Life is at stake - there is no time to worry about modesty. Once the electrode pads are in place a towel or blanket can be used to cover the patient. Necklaces etc. are usually not a problem. Slide the jewelry towards the neck so that they do not to touch any part of the electrode pad. Nipple rings do not have to be removed, however if they are connected by a chain the chain must be cut off.

Chest hair presents several problems. Hair is an effective insulator which may prevent the electrodes from picking up sufficient data for the on-board computer to analyze. The conductive gel of the electrode pad must be attached to bare skin, it will not adhere to hair. Finally, the hair may prevent the sufficient flow of the electrical shock being administered to the patient. Use your judgment to decide if shaving is necessary. A few wisps of fine hair is not a problem. Thick patches of hair will be obvious and must be removed. Shaving is only done where the electrodes will be placed: Under the right collar bone and above the left lower margin of the ribs. Once you look at the ZOLL CPR-D Padz it will quickly become obvious where to shave. Use the razor supplied with the ZOLL AED Plus to dry shave the area. That's right, no shaving creams, just your razor blade. Expect minor bleeding.

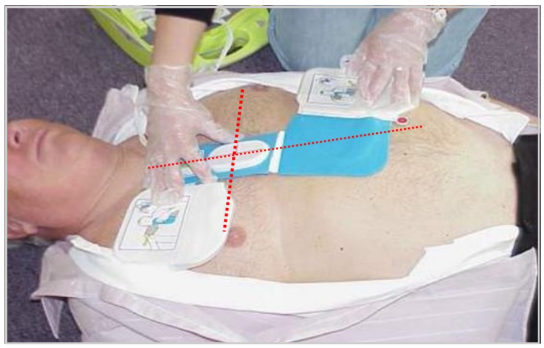


Open the electrode envelope, completely remove the electrodes and unfold the pads. The pads connector is already plugged into the ZOLL AED Plus.

ZOLL CPR-D Padz do more than conduct ECG signals from the heart to the AED computer and the defibrillatory shock from the AED to the chest. The pads are also designed to provide real time rescuer feedback to help you perform more effective CPR.

Additional First Aid Skills

ZOLL's one-piece electrode makes it easier to apply than two pad sets. Located in the centre of the pad set is a white sensor with a red cross-hair. Place the sensor between the nipples and on the middle of the patient's breastbone, in other words where you place your hands to perform CPR.



Press the sensor down with your right hand and pull on the red No 2 tab to remove the protective backing from the electrode. Smoothly tamp down the pad starting from the centre of the chest outward to ensure the electrodes firmly adhere to the chest.

Now press the sensor with your left hand and pull the red No 3 tab to remove the protective backing from the electrode. Again tamp down the pad starting from the centre of the chest outward to ensure the electrodes firmly adhere to the chest.

Some patient's have a defibrillator or pacemaker surgically implanted in their upper right chest. Should you see scars indicating a possible implanted device, angle the ZOLL CPR-D electrode pad slightly to avoid having the electrode directly over either device.

Ensure the CPR sensor remains in the centre of the breast bone. The fact that the patient is unresponsive and is not breathing indicates their implanted defibrillator or pacemaker may not be functioning. In this case place the electrodes as described and let the ZOLL AED Plus determine if the patient requires a defibrillatory shock.

If the patient has a very large abdomen separate the left lower electrode. Some models of CPR-D Padz have a Pull-Pin others have a perforation. In either case you can now extend the pad as far as required. If necessary lift the left breast and place the pad under the breast.

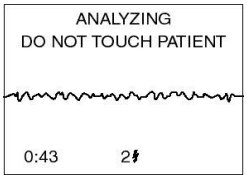
The electrode pads are now properly attached to the patient.

Whenever possible the ZOLL AED Plus and the rescuer are above the patient's head. The main benefit of this position is that it allows the operator to easily look down the patient's body to confirm that nobody is touching the patient or anything the patient is in contact with, such as oxygen tubing.

Operating The AED

Analysis And Delivering A Shock

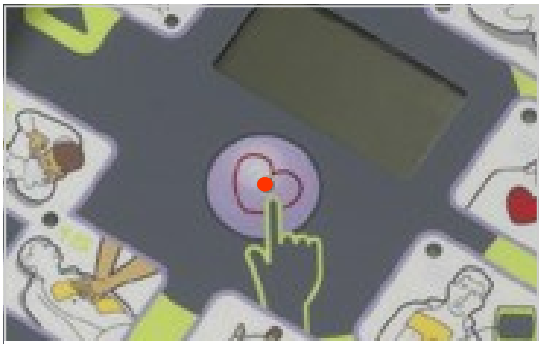
The ZOLL AED Plus starts analyzing the patient's heart rhythm as soon as the electrode pads are attached to the patient's chest. The ZOLL AED Plus will only provide a life sustaining shock if the patient is determined to be in Ventricular Fibrillation or Ventricular Tachycardia.



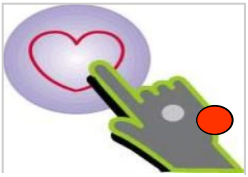
It is essential that no one touch the patient during analysis. Touching the patient may introduce another person's electrical activity which could result in an incorrect analysis of the patient's condition. The rescuer operating the AED will ensure that no one is touching by raising their hands away from the patient and telling other rescuers to do the same.

When the AED detects a killer heart rhythm that can be corrected by a shock the unit will say **"Treatment Advised - Charging."** At this point the rescuer operating the AED will ensure that everyone's hands are off of the patient. In a loud and clear voice the rescuer will say: "**I'm Clear - You're Clear - Everyone Is Clear."** The other rescuers will lift their hands away from the patient and reply **"Clear."**

When fully charged and ready the light on the shock button will be illuminated and a loud whistle sound will be emitted from the AED. The unit will say **Deliver Shock Now - Press The Orange Button Now"**



The rescuer operating the AED will locate the shock button and place their finger just above it while looking down the entire length of the patient's body to make sure no one is touching the patient. Once the operator is sure no one is touching they will push down on the button to deliver the shock.



Additional First Aid Skills

As soon as the ZOLL AED Plus has delivered a shock it will say **"Shock Delivered - Start CPR."** If the AED did not find that the patient needs a shock it will say **"No Shock Advised - Start CPR."**

One of the rescuer's will immediately start CPR compressions by placing their hands on the CPR sensor directly above the cross-hairs. The ZOLL AED Plus will now start to monitor the rescuer's compressions and assist you to stay at the correct rate and make sure you are pushing hard enough by providing real time CPR feedback.

First Aid Teams provide optimum care until paramedics arrive. Ideally one rescuer stays with the AED, another applies the CPR mask/B-V-M, a third rescuer uses the B-V-M, a fourth and fifth rescuer performs CPR and a sixth rescuer is the CPR Coach. The coach's ensures that rescuers who are performing compressions are rotated every two minutes. The coach carefully monitor's the person who is doing the compressions to make sure they are physically capable of continuing. CPR is a very strenuous activity, so make sure that we don't have a rescuer get into health difficulties such as shortness of breath or chest pain.

Once the patient starts to breathe on their own the lid of the ZOLL AED Plus can be placed under the patient's shoulder's to keep the airway open.

Do not take the CPR-D pads off of the patient because they could slip back into a life threatening arrhythmia at any time. The patient may now be provided with 10 liters of oxygen through a non-rebreather mask.

Carefully monitor the patient until paramedics arrive. Talk to the patient while providing calm reassurance. Keep the patient still and as comfortable as possible.

Tell the paramedics how many shocks were delivered and the elapsed time. This information appears on the ZOLL AED Plus text screen.

Operating The AED

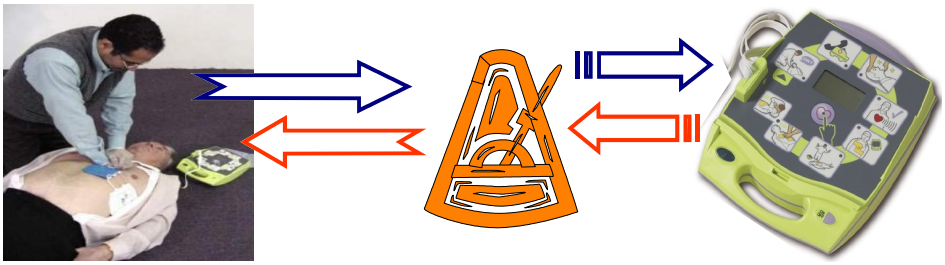
Real Time CPR Help

Effective CPR is essential for the victim of Sudden Cardiac Arrest. Defibrillator's are so easy to use that many people believe all you need is an AED. Not true! Every time the defibrillator analyzes the patient it will advise shock advised - push button - start CPR or start CPR. After delivering a shock you will be told to start CPR.

Research has shown even professionals like doctors and paramedics who perform CPR all the time do it poorly. Most of the time the rescuer does not press hard enough to circulate sufficient blood to the heart and brain. As two minutes of CPR drags on your body tires and your compressions become less effective. This is why we call it the ZOLL AED Plus. It is an AED **plus** an interactive CPR instructor which is electronically monitoring your effectiveness and feeding back information to you in real time to help you improve the quality of the CPR you are administering.

The Zoll AED Plus has a unique feature that no other defibrillator offers: real help in performing optimal CPR. The sensor on the CPR-D Padz sends vital information to the on-board computer during each CPR segment. While the ZOLL AED Plus monitors the patient's underlying rhythm, it is also monitoring the depth and rate of your compressions.

As soon as you place your hands on the cross-hairs the AED will start beeping. Every time you hear a beep PUSH HARD on the chest. As you are compressing a sensor is sending the rate of your compressions to the ZOLL AED Plus's interactive metronome. The timing of the 'beeps' immediately changes to get you on track and keep you there. The sensor is also monitoring the depth of your compressions. If you are not pushing hard enough you will hear **"PUSH HARDER - PUSH HARDER."** When you start to push hard enough you will hear **"Good Compressions."**



When used in a classroom setting the ZOLL AED Plus is quite loud and it is easy to hear the instructions. An emergency scene is usually anything but quiet, so you often will not be able to hear the AED voice prompts over the noise. The ZOLL AED Plus solves this problem with large size text that prints every instruction on the screen. The rescuer operating the AED monitors the Text Screen and repeats the prompts out loud allowing the other team members to know what is happening.

Not only is PUSH HARDER and GOOD COMPRESSIONS printed on the screen but there is also a status bar that visually shows the operator if the compressions are deep enough. Again, even in a noisy environment you will get all the vital data you need to perform the best CPR you can do.

As mentioned earlier, the ZOLL AED Plus has been programmed for two-minutes of CPR after every shock or no shock decision. At the end of two-minutes you will hear the voice prompt telling you to **"STOP CPR."** The unit then analyzes the patient's heart rhythm to determine if another shock is required or if you should immediately continue CPR.

Should firefighters arrive before paramedics they might want you to remove your AED so they can attach theirs. Inform the firefighters that our Medical Director wants you to hand the patient off to paramedics only. If the firefighters insist on taking over care they and not you are to remove the ZOLL AED Plus CPR-D pads from the patient's chest.

Most paramedic services in Ontario will respond with an advanced ZOLL defibrillator, such as the E Series. Many Fire Services are also switching to the ZOLL and may arrive with a ZOLL AED Pro or a ZOLL AED Plus just like yours. Should this be the case you can, if the firefighters insist, simply unplug the patient from your ZOLL and plug the pads into their ZOLL. ZOLL equipped paramedics are now using CPR-D Padz similar to yours.

Additional First Aid Skills

Medical Directives

The Regulated Health Professions Act governs the administration of electrical therapies in Ontario. Specifically defibrillation may only be performed by medical doctors (dentists exempted) or rescuers who have been trained on the medical directives as authorized by a licensed physician.

Training Requirements: Candidates for certification must have a current Standard First Aid and CPR certificate from a recognized training agency. Successfully complete the defibrillation course including skills demonstration to the instructor's satisfaction and achieve an 80% grade on the written test. To maintain certification successful completion of recertification courses is mandatory.

Medical Authorization: Medical direction and authorization will be provided to organizations without their own doctor or dentist. The authorization to use the ZOLL AED Plus will expire immediately with a lapse of certification or in the event that Health Canada issues a recall of the ZOLL AED Plus.

Scene Safety: Rescuers will not enter the emergency scene, nor will they permit others to enter the scene, until it is verified that it is safe to do so. Rescuers will complete a safety check considering the presence of gas, glass, fire, energy, conductive surfaces and fluid puddles.

Indications For Defibrillation: An AED certified member of the First Aid Team shall personally open the patient's airway using the head-tilt chin-lift method and will check for respirations for a full five seconds. Apply the ZOLL AED Plus if there are no respirations, ineffective respirations or if the patient is gasping.

Pediatric Patients: An AED programmed for an adult may be used for a child or infant in an emergency when pediatric electrodes are not available. In these cases apply one electrode to the chest and the other to the back.

Special Situations: Defibrillation should be attempted for pregnant or hypothermic patients in cardiac arrest.

Contra-Indications For Defibrillation. The patient is breathing and showing signs of life such as purposeful movement. There are obvious signs of death such as decapitation, transection or is in an obvious state of decomposition.

Chest Preparation: The patient's clothing (including bra) will be cut off using rescue shears to expose the chest. The chest will be dried with the towel provided and shaved if necessary with the safety razor provided. Remove any visible medication patches. If an implanted device is observed under the skin rotate the CPR-D Padz so that the electrode is not directly above the device.

Safety Precautions: The rescuer operating the ZOLL AED Plus shall ensure that no one is touching the patient or anything that the patient is in contact with during the analysis of the patient's heart rhythm. When the ZOLL AED Plus advises that a shock is necessary the rescuer operating the ZOLL AED Plus shall say, in a loud and clear voice "I'm Clear - Your Clear - Everyone Is Clear." The shock button will not be depressed until no one is touching the patient or anything in contact with the patient.

Incident Report: A Code Eight Patient Report Form and the downloaded data file shall be provided to Code Eight immediately after an incident for medical review.

A Final Thought

Unfortunately, despite our best efforts some patients can not be saved. Many times the patient was down for a long time before they were discovered. Or their injuries were too severe. Sometimes the underlying problem was not cardiac, for example an aortic aneurism or a brain aneurism. Perhaps poisoning or drug overdose is the cause of death. AED's will not be successful in these situations because the underlying problem wasn't electrical.

However, at the end of the day, you will have the comfort of knowing that you provided absolutely everything that first aid and modern technology had to offer the patient.

Supplemental AED Information

Warnings

1. Use the ZOLL AED Plus only as described in this manual and the Administrator's Guide that came with the ZOLL AED Plus. Improper use of the device can cause death or injury.
2. Always stand clear of the patient when delivering treatment (shock.) Defibrillation energy delivered to the patient may be conducted through the patient's body and cause a lethal shock to those touching the patient.
3. Do not touch the electrode surfaces, the patient or any conductive material touching the patient during ECG analysis or defibrillation.
4. Move patient away from conductive surfaces prior to the use of the ZOLL AED Plus.
5. 5. Do not use the ZOLL AED Plus near or within puddles of water or other fluids.
6. Keep the patient as motionless as possible during ECG analysis.
7. Do not use the ZOLL AED Plus near flammable agents (gasoline etc) oxygen-rich atmospheres or flammable anesthetics.
8. Avoid radio frequency interference from high power sources that might cause the defibrillator to interpret cardiac rhythms incorrectly by turning off cell phones and 2 way-radios.
9. Dry patient's chest before attaching electrodes.
10. Apply freshly opened and undamaged electrodes, within the electrode expiration date, to clean and dry skin to minimize burning.
11. Do not place electrodes directly over patient's implanted pacemaker. Pacemaker stimuli may degrade the accuracy of ECG rhythm analysis or the pacemaker may be damaged by defibrillator discharges.
12. Check labeling inside the ZOLL AED Plus cover before using the cover as a Passive Airway Support System (PASS) device. Ensure it is intended for this use.
13. Do not use the Passive Airway Support System if there is a suspected head or neck injury. Place patient on a firm surface before performing CPR.
14. Weekly check that there is a green check mark in the AED window. If a red X appears call Code 8.

After Using The ZOLL AED Plus

In the event that the ZOLL AED Plus has been used in a rescue attempt immediately contact CODE EIGHT or ZOLL Medical for instructions on how to download the medical data and reset the device. An infra red device on your computer or a palm pilot is required to perform the download. If you do not have an infra red device Code Eight will provide this service. The data must be forwarded to Code Eight for review by our medical director or to the dentist/doctor within your clinic who has authorized use of the ZOLL AED Plus defibrillator.

Check that the battery indicator light is not on (red X) which indicates battery replacement is needed. The ZOLL AED Plus electrode pads are one-time use and must be replaced with a new set. Clean the AED if necessary and return it to its' regular storage place once the electrodes have been replaced and the battery checked.

Complete all patient report forms and incident forms required by your organization.

Participating in, or witnessing, an attempted resuscitation can bring on very strong emotional responses. You and your team may need to participate in a critical incident debriefing within 24 to 48 hours after the event. If you do not have in-house resources call Code Eight or you Employee Assistance plan.

Code 8
Emergency • Medical • Services

NOT REQUIRED FOR ONLINE BLENDED TRAINING

Name: _____ Date _____

Emergency First Aid

1. First Aiders are trained individuals on the scene who will provide the most basic urgent care until emergency services workers take over. True ( ) False ( )
2. For First Aid an adult is someone who is 8 years old or older. True ( ) False ( )
3. First Aiders can render care even though victim says 'don't touch me.' True ( ) False ( )
4. Cardiovascular disease is a major cause of death in Canada. True ( ) False ( )
5. High Blood Pressure is a major health risk. True ( ) False ( )
6. Angina can result from too much exertion. True ( ) False ( )
7. A heart attack results from a blocked coronary artery. True ( ) False ( )
8. If symptoms of a heart attack do not go away the person should go to the emergency room within (Hours.) 1 ( ) 3 ( ) 8 ( )
9. What are three (3) signs or symptoms of a heart attack?

   _____ _____ _____
10. A stroke could result from a blow to the head. True ( ) False ( )
11. What are three signs of a stroke?

    _____ _____ _____
12. First Aid for a heart attack or stroke include calling 9-1-1, getting the person to stop all activity and rest and reassure them. True ( ) False ( )
13. Do not give aspirin if a heart attack victim has asthma or a recent head injury. True ( ) False ( )
14. Sudden Cardiac Arrest is an electrical problem. True ( ) False ( )
15. High quality CPR and rapid defibrillation saves lives. True ( ) False ( )
16. CPR is First Aid for dead people. True ( ) False ( )
17. Check responsiveness by throwing cold water on the victim. True ( ) False ( )
18. CAB is:

    (C) _____ (A) _____ (B) _____
19. Check breathing for (Seconds). 5 ( ) 10 ( ) 20 ( )
20. Using a CPR mask is not important as mouth-to-mouth is safe. True ( ) False ( )

21. Rescuers should blow as much air as possible in the victim's lungs. True ( ) False ( )

22. Compression to breath ratio is: 15:2 ( ) 15:3 ( ) 30:2 ( ) 30:3 ( )

23. A scene survey for hazards should include

_____ _____ _____ _____

24. A casualty with a suspected head or neck injury should be kept still while the First Aider stabilizes the victim's head. True ( ) False ( )

25. Severe bleeding can best be controlled by rest and exerting direct pressure over the wound True ( ) False ( )

NOT REQUIRED FOR ONLINE BLENDED TRAINING

Standard First Aid

Continue with the following for the Standard First Aid (two day) program

26. A broken thighbone can kill the victim. True ( ) False ( )

27. The secondary survey's primary purpose is to gather information. True ( ) False ( )

28. Fill in an example of a symptom _____ an allergy _____

a medication _____ a previous illness _____

29. For the secondary survey the best pulse is at the wrist. True ( ) False ( )

30. You should tell the victim you are checking their respirations. True ( ) False ( )

31. Once first aid has been rendered it is NOT important to continually monitor the victim because they are now stable. True ( ) False ( )

32. It is NOT necessary to worry about the unconscious victim's airway. True ( ) False ( )

33. A non-seriously injured or ill person should be transported by taxi. True ( ) False ( )

34. Call 9-1-1 if unsure of the severity of the injury or illness. True ( ) False ( )

35. Post traumatic stress disorder only affects emergency workers. True ( ) False ( )

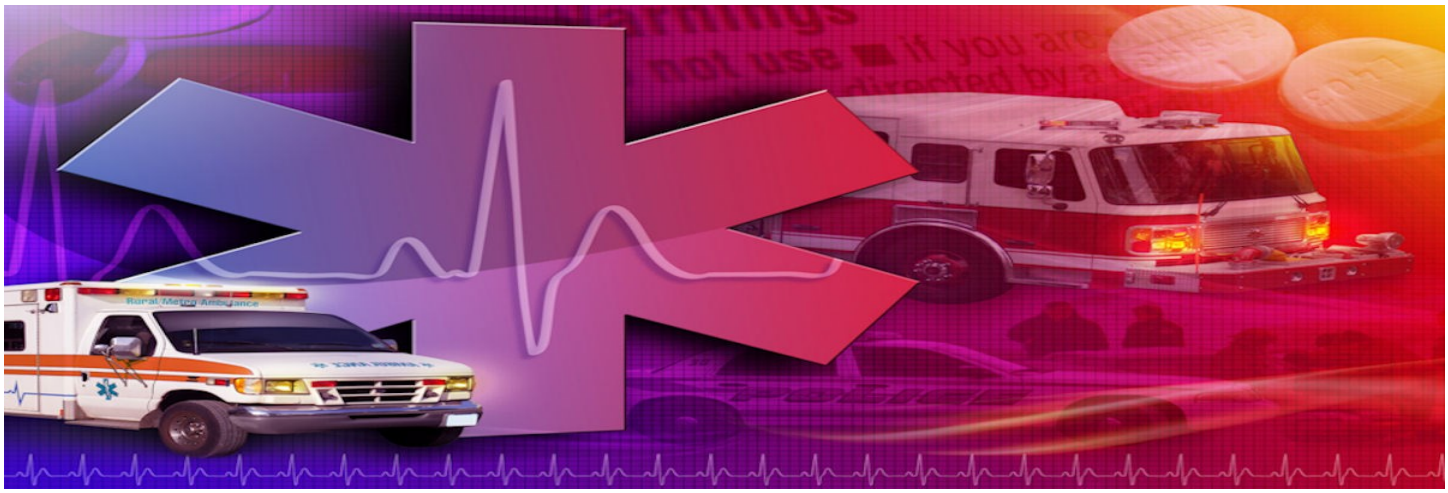
36. The Primary Responder checks for life threatening conditions. True ( ) False ( )

37. An amputated part should be thrust deep into ice or cold water. True ( ) False ( )

38. Tying a bandage too tightly could result in amputation. True ( ) False ( )

39. Only health care workers need be concerned with bio-hazards. True ( ) False ( )

40. Personal protective equipment should be used for every casualty. True ( ) False ( )



CODE 8 Emergency Medical Response Teams

Control The Bleed Canada

High-Quality First Aid Kits and Supplies for Work, Home and Play.

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Regulation and Custom Kits Available.

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