



# **FIRST AID, CPR AND AED STUDENT REFERENCE MANUAL**



**Workplace Medical Corp.**  
*FIRST AID TRAINING AND AEDs*

# **STUDENT REFERENCE MANUAL**

# FIRST AID, CPR & AED REFERENCE MANUAL

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Thanks to:

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**Workplace Medical Corp. 2021**

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# GENERAL INFORMATION

*About WMC*  
*Training Procedures*  
*Introduction & Course*  
*Objectives*

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## ABOUT WMC

Workplace Medical Corp. First Aid Training (formerly Active Canadian Emergency Training Inc.) was established in 1992 when we recognized the need for paramedics and other pre-hospital care professionals to design and teach first aid and CPR programs. With this in mind, we were determined to set a new standard in first aid instruction with a less intimidating and more realistic approach to first aid, CPR, and new advances in Automated External Defibrillation (AED) training.

Our goal at Workplace Medical Corp. is to provide the highest level of emergency training possible. Courses are designed to increase the knowledge and proficiency of the general public, allied emergency responders, and healthcare professionals in the delivery of basic and advanced pre-hospital emergency care.

## INSTRUCTORS

At Workplace Medical Corp., many of our instructors are skilled pre-hospital care professionals who bring a wealth of knowledge and experience to our courses. This unique background allows them to instruct in a dynamic manner which is easy to understand and recall when an actual emergency situation arises. Instructors are largely professional First Responders with years of experience providing emergency care on a daily basis. Our instructors have also completed WMC's instructor-training program, which includes a component in adult education and applicable testing.

## TRAINING PROCEDURES

### Emergency Training Programs

Workplace Medical Corp. has developed and established programs to meet or exceed current provincial and federal government standards established for business, industry, general public, and emergency medical service systems.

All courses are taught with an underlying commitment to keeping content as realistic as possible. The purpose of our training courses is to have the participant leave with the confidence and knowledge to render lifesaving emergency care in a competent manner.

### Accreditation

#### **Federal**

Workplace Medical Corp. Standard, Basic, CPR and AED level courses meet the requirements of Health Canada and have been approved under the Canada Labour Code, Part XVI.

#### **Provincial**

Workplace Medical Corp.'s Standard and Emergency First Aid are recognized under the Workers Safety Insurance Board regulations for each respective province in Canada and in Ontario under the Ministry of Labour, Immigration, Training and Skills Development.

This First Aid training Material is designed for the workplace, and is Curriculum compliant with the CSA standard Z1210-17.

## Acknowledgements

Workplace Medical Corp. would like to acknowledge the **Canadian Guidelines Consensus Task Force** for reviewing the consensus on science completed by the International Federation of the Red Cross/Red Crescent (IFRC) and the International Liaison Committee on Resuscitation (ILCOR) in 2020.

Workplace Medical Corp. follows the 2020 Canadian Consensus Guidelines on First Aid and CPR.

## Questions

At Workplace Medical Corp., our dedication to pre-hospital emergency care and education doesn't stop with the end of the course. Students who have any questions about course concept and materials are encouraged to submit them to

[questions@workplacemedical.com](mailto:questions@workplacemedical.com)

## Trademarks

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## Notice of Liability

This manual serves as a reference and does not replace practical training. It is the reader's responsibility to maintain their current first aid, CPR and AED training. The material in this manual is "as printed" and carries no guarantee. Every effort has been made to ensure accuracy, but neither the authors, not the publishers, nor Workplace Medical Corp. shall have any liability to any part with respect to any loss or damage caused or alleged to be caused directly or indirectly by the instructions contained in this manual.

## INTRODUCTION AND COURSE OBJECTIVES

The objectives of Workplace Medical Corp. First Aid Training are:

- To understand **The Approach** in managing medical emergencies. Learning an approach to managing any medical emergency is the difference between being prepared to appropriately treat a patient and trying to remember what to do for a given emergency problem.
- To review and evaluate CPR and AED skills, and give each student the opportunity to learn and perform CPR/AED skills utilizing mannequins. We will also explain the process by first describing skills, then demonstrating them on the mannequin, then having students practice the skill(s) while the instructor evaluates and provides feedback on performance. These integrated skills will set the student up for success.
- To provide basic urban first aid information and discuss class-specific first aid treatments. Students will perform the skills necessary in recognizing and treating urban first aid problems.
- To discuss examples of current scene management problems with the class (i.e., fear of catching a disease, uncertainty on what to do, EMS arriving with no one to direct them to the patient, lack of communication to 911, etc.). We will also discuss the goal of learning and solving scene management problems throughout this course.
- To teach correct response and patient treatment in a medical emergency until Emergency Services arrives.

# CHAPTER ONE

*What Is First Aid?  
Role of the Lay Rescuer  
Emergency Scene  
Management  
The Law*

---

## WHAT IS FIRST AID?

First Aid is the rendering of care to a sick or injured person known as a patient. First aid is a limited set of techniques and procedures for:

- Care for minor injuries not requiring a doctor's care, such as small cuts, minor bruises and blisters.
- Use in the interval between recognition of a medical emergency and the arrival of professional help.
- Use in settings where professional help is significantly delayed.

## ROLE OF THE LAY RESCUER

A first aid provider (henceforth referred to as the lay rescuer or rescuer) is defined as someone with formal training in first aid, emergency care, or medicine who provides first aid. First aid assessments and interventions should be medically sound and based on scientific evidence or, in the absence of such evidence, on expert consensus.

### Objectives of the Lay Rescuer:

- Preserve life and promote recovery
- Prevent further illness or injury

### Role of the Workplace First Aider:

#### **Objectives of First Aid:**

1. Preserve life.
2. Do no further harm.
3. Prevent further injury or illness.
4. Promote recovery.

### **Bystander Help/Role:**

1. Call for additional help/911.
2. Control scene/make safe.
3. Reassure patient.
4. Take notes.

## EMERGENCY SCENE MANAGEMENT

Emergency Scene Management consist of these steps:

### **Scene Survey (The Approach):**

- You take charge of the situation, protect yourself, and make the area safe before you approach anyone.

### **Primary Patient Survey:**

- Once the area is safe, you make a quick assessment of the patient(s) and commence any life-threatening treatment.

### **Secondary Survey**

- Once life-threatening treatment is complete, if help will be delayed, or if more than one injury is suspected, a Secondary Survey is required.

### **Ongoing Casualty Care**

- After treating the patient, you stay in control with the patient until other help arrives.



## Emergency Scene Management:

### **Scene Survey (the Approach):**

- You take charge of the situation, protect yourself and make the area safe before approaching anyone

### **Primary Patient Survey:**

- Once the area is safe, you make a quick assessment of the patient(s) and commence any life-threatening treatment

### **Secondary Survey:**

- Only started after the life-threatening treatment is complete, help will be delayed, or more than one injury is suspected

### **Ongoing Casualty Care:**

- After treating the patient, you stay in control with the patient until other help arrives

## THE LAW

Some people express concerns about the legal ramifications of providing first aid, CPR, and AED care. Laws that protect volunteer or lay rescuers are formulated by provincial governments and vary in each province. The laws that govern your province can be found in most local libraries and/or on government websites. First aid providers should understand the following terms regarding provisions of rendering first aid.

## Consent

An injured or ill person must give consent for any proposed care. The injured or ill person agrees to accept care and gives the rescuer permission to provide care.

Minors under the age of 16 do not have the same rights to medical consent. Their parents or guardians hold this right for them. Lay rescuers should respect the wishes of the parents or guardians.

## Implied Consent

If a person becomes physically unable to provide consent, lifesaving treatments can be provided. The best example of this is a patient who is unresponsive or unconscious.

## Right to Refuse

Injured or ill people who are conscious may refuse treatment. If the lay rescuer is concerned about their injuries or mental state, it is highly advisable to activate Emergency Medical Services.

## Gross Negligence

The actions of a person are compared to those of a reasonable person. The question that the lay rescuer should consider is: "Would a reasonable person with similar training, experience, and background in a similar situation, act in a similar manner?" If a person acts or treats a patient as they are trained to do, and does not exceed that training, then the rescuer is not in a negligent position.

Gross negligence does not include errors made in good faith, nor deviations from expected practice that occur because of exceptional circumstances.

### • **Legislation/Acts/Codes**

- Good Samaritan Act
- Provincial Legislation/Acts:
  - » **British Columbia:** WorkSafeBC
  - » **Alberta:** Occupational Health and Safety
  - » **Saskatchewan:** WorkSafe Saskatchewan
  - » **Manitoba:** SAFE Manitoba
  - » **Ontario:** MLITSD
  - » **Quebec:** CNESST
  - » **Nova Scotia:** WCB
  - » **New Brunswick:** WorkSafe NB
  - » **Newfoundland and Labrador:** Service NFLD
  - » **Prince Edward Island:** Safe Workplaces
  - » **Northwest Territories and Nunavut:** WSCC

## Abandonment

Once the lay rescuer begins care, they may not stop until a person of equal or greater training assumes responsibility. As the lay rescuer, you may stop providing care when:

- Your personal safety is threatened
- You must leave to call for help
- When the patient no longer wants your assistance
- You are relieved by someone with higher training

## Legislation

Good Samaritan laws such as Ontario Bill 20 state that a lay rescuer cannot be sued for helping a person who is injured, provided the lay rescuer does not exceed his or her training. Good Samaritan lay rescuers should have an understanding that a Good Samaritan is a person who helps an injured person without being paid, and that the assistance a Good Samaritan provides should be given in good faith.



**A lay rescuer must not provide any type of advanced care that supersedes his or her knowledge and training.**

**Self-protection and common sense are the best advice.**

In Canada (excluding Quebec), you do not have a legal duty to help a person unless it is your job to help. There are exceptions such as lifeguards, nurses, paramedics, and police. Check your provincial Good Samaritan laws for clarification.

# CHAPTER TWO

*Understanding the Approach*

*Scene Survey*

*What is a Hazard?*

*Using Bystanders in Emergencies*

*Benefits of Using Barrier Devices*

*Mechanism of Injury/Illness*

*Conscious vs. Unconscious patients*

*SAMPLE history*

*Calling 911*

*Primary Survey*

*Airway Assessment*

*Breathing Assessment*

*Rapid Body Survey*

## UNDERSTANDING THE APPROACH

Medical emergencies can be a frightening experience for a rescuer, especially if you are not professionally trained to handle emergency situations. Common reactions may include panic and fear, caused by lack of knowledge and confidence, or preparedness.

Taking any emergency training course should be a satisfying and rewarding experience. Part of emergency training is understanding the source of injury and/or illness, recognizing

It, and treating it appropriately. Training will prepare you and give you the skills required to treat someone in an emergency. However, retaining information from any course can be a challenging task. There is so much material to absorb that you may find yourself hard pressed to remember what to do. When it's time to act in an emergency, will you remember what to do, at the right time?

From our years of pre-hospital experience, we at Workplace Medical Corp. believe that learning **The Approach** to managing emergencies is a better method than trying to recall specific steps. Rather than trying to remember what to do for a given emergency problem, rescuers trained by Workplace Medical Corp.'s emergency programs learn a checklist of items to manage any emergency situation. **The Approach** is as follows:

- **Scene Assessment/Protect Yourself**
- **Mechanism of Injury/Illness**
- **Identify Yourself/Obtain Consent**
- **Level of Consciousness**
- **Call 911**
- **Primary Survey**
  - **Airway**
  - **Breathing**
  - **Chest Compressions**
  - **Defibrillation**
  - **Deadly Bleed Checks**

This technique is easily retained and manages any emergency in a safe and appropriate manner. This is the same skill performed by paramedics on a daily basis.

**The Approach** is paramount in all of our emergency care programs, and remains the standard of practice in pre-hospital emergency care.



## SCENE SURVEY

The rescuer's own safety is the first priority. Before approaching an ill or injured person, the rescuer should proceed cautiously and perform a complete visual check of the surrounding area for any potential hazards, which may include:

- **Smoke and fire**
- **Toxic gas, chlorine, carbon monoxide**
- **Water and ice**
- **Broken glass, falling objects**
- **Electrical hazards**
- **Confined spaces**
- **Moving vehicles**
- **Possible violent situations**
- **Animals**
- **Unstable buildings and structures**
- **Airborne diseases**
- **Weather conditions**

Diseases are always present and can be transmitted through blood and other body fluids. Though the risk is small, to reduce the chances of exposure to diseases such as HIV (AIDS) or Hepatitis B and C, always wear nitrile (non-latex) gloves when treating an injured patient.

Because of the risk of severe allergies, please do not treat patients while wearing latex rubber gloves.

## Occupational Health and Safety

### Hazards:

- Safety
- Biological
- Chemical
- Ergonomic
- Physical
- Psychosocial



- **Safety Data Sheets (SDS)** are a standardized document containing occupational safety and health data. The International Hazard Communication Standard (HCS) mandates that chemical manufacturers must communicate a chemical's hazard information to chemical handlers by providing a Safety Data Sheet and treatment for each specific chemical.



**Always protect yourself and the patient by using appropriate Personal Protective Equipment (nitrile gloves and CPR mask).**

## WHAT IS A HAZARD?

Any source of potential damage, harm or adverse health effects on something or someone.

- **Safety:** slips/trips hazards, inappropriate machine guarding, equipment malfunctions
- **Biological:** bacteria, virus, insects, plants, birds, animals, humans, etc.
- **Chemical:** toxic gas, chlorine, carbon monoxide, etc.
- **Ergonomic:** repetitive movement, improper workstation setup
- **Physical:** noise, radiation, extreme pressures
- **Psychosocial:** stress, violence, bullying

### Hazards are Identified through a Risk Assessment

For information on first aid treatment for a specific product or chemical, refer to the Material Safety Data Sheet (MSDS)/Safety Data Sheets (SDSs).

The employer needs to provide training, supplies, transportation for medical treatment if required. Role of the first aider in the occupational health and safety management system is to provide first aid.

Risk assessment is a term used to describe the overall process or method where you:

- Identify hazards and risk factors that have the potential to cause harm (hazard identification).
- Analyze and evaluate the risk associated with that hazard (risk analysis, and risk evaluation).
- Determine appropriate ways to eliminate the hazard, or control the risk when the hazard cannot be eliminated (risk control).

A risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people. After identification is made, you analyze and evaluate how likely and severe the risk is. When this determination is made, you can next, decide what measures should be in place to effectively eliminate or control the harm from happening

*\*Information on risk assessment gathered from [https://www.ccohs.ca/oshanswers/hsprograms/risk\\_assessment.html](https://www.ccohs.ca/oshanswers/hsprograms/risk_assessment.html)*

## USING BYSTANDERS IN EMERGENCIES

A lay rescuer may also want to use bystanders – people who are not directly involved in the emergency situation. While the rescuer tends to the patient, a bystander can be sent to get medical help, call an ambulance, or control other bystanders by keeping them away from the scene of the accident.

It is important to give direct, simple instructions. An example is: “You, in the blue shirt, call 911 and advise them of this medical emergency. Please return to me when you are finished making the call.”

This type of communication identifies a specific person to make the call, which is more effective than simply calling out general instructions to the crowd. It is important that you direct the person to return to you after activating EMS.

Using bystanders helps by allowing you to tend to the patient right away. The lay rescuer should, if possible, try and involve bystanders in assisting them.

**Most people will help in an emergency; they may just need some direction.**

How to utilize bystander help:

### Use bystanders to:

- Call for help, such as 911
- Locate all patients
- Control crowds
- Reassure the patient and their relatives or friends
- Take notes
- Meet or direct Emergency Medical Services on arrival
- Bring the Automated External Defibrillator (AED) to the scene

Authorities such as the Roads Department and/or the local Hydro utility can assist in situations where applicable, such as fallen power lines.

## BENEFITS OF USING BARRIER DEVICES

- The possibility of disease transmission is reduced.
- A seal is created over both the victim's mouth and nose, allowing air to be delivered to the victim more effectively through both.
- The rescuer does not have to directly come in contact with the patient.

### Types of Barrier Devices/Personal Protective Equipment:

**Nitrile Gloves**



**CPR Mask**



**Bandages and Dressings**





## Removal of Nitrile Gloves

### Glove Removal

The process for step-by-step removal of nitrile gloves is as follows. Make sure you don't touch the outside of the gloves with your bare hands.

- Grasp the cuff on the outside of one gloved hand.
- Pull the cuff towards the fingers, turning the glove inside out.
- As the glove comes off, hold it in the palm of your other hand.
- Slide your fingers under the cuff of the other glove (do not touch the outside of the glove).
- Pull the glove towards the fingers over the first glove.
- Wash hands with soap and running water as soon as possible.
- If you tear the gloves while performing first aid take them off right away, wash your hands (if possible), and put on a new pair of gloves.

Always remember to dispose of the gloves properly by sealing them in a plastic bag if they must be put in regular garbage. Used gloves should ideally go into **Biohazard** waste bins.

Always wash your hands after assisting a patient, even when gloves have been worn.

If you are treating and assisting more than one patient, make sure to change your gloves between contacts. This will prevent the transmission of disease from one patient to another.



## Use of a Face Mask

A fabric mask can protect others around you. To protect yourself and prevent the spread of COVID-19, remember to keep at least 1 metre distance from others, clean your hands frequently and thoroughly, and avoid touching your face and mask.

- Clean your hands before touching the mask.
- Inspect the mask for damage or if dirty.
- Adjust the mask to your face without leaving gaps on the sides.
- Cover your mouth, nose, and chin.
- Avoid touching the mask.
- Clean your hands before removing the mask.
- Remove the mask by the straps behind the ears or head.
- Pull the mask away from your face.
- Store the mask in a clean plastic, resealable bag if it is not dirty or wet and you plan to reuse it.
- Remove the mask by the straps when taking it out of the bag.
- Wash the mask in soap or detergent, preferably with hot water, at least once a day.
- Clean your hands after removing the mask.

Barrier Devices should be cleaned with 10 parts water and one part bleach and allowed to Air dry completely, the filter should be disposed of and replaced everytime it is used. One time masks can be disposed of after use.

Worker should report if the site needs to be disinfected to reduce the amount of exposure to others. Please advised participants to follow policy and procedures on site with the maintenance of the emergency area disinfecting. All emergency sites may be disinfected differently due to the nature of the emergency.

## Common Routes for Transmission

- **Contact:** Most frequent mode, can be direct or indirect
- **Droplet:** Common causes – sneezing and coughing
- **Airborne:** Can be dust particles carrying infectious agents. Commonly seen with droplet exposure.
- **Common Vehicle:** Enters the body by ways such as food, water, medications

## MECHANISM OF INJURY/ILLNESS

It is important to identify the cause of the injury or illness (for example: is the issue medical in nature, chest pain caused by heart disease, or a trauma such as a fall?). Ask the patient or any witnesses about the events prior to you arrival – this is called the history. This will give you, as the lay rescuer, clues as to the injury and/or illness, and hopefully give you an idea of what treatment and medical assistance the patient may need.

The Mechanism of Injury/Illness is defined as the cause of an illness or injury. It is used to understand what potentially caused harm to the patient.



**Patients who are injured with suspected head or spinal injuries should be told to remain still. Rescuers should NOT move the patient unless there is immediate danger or inability to access the airway.**

- **What Happened:** The lay rescuer should evaluate what happened to the patient on arrival.
- **Witnessed or Unwitnessed:** The lay rescuer should determine if the patient's injury was witnessed by an independent observer. Do not discount different versions of the event. An independent viewpoint will help determine what may have happened.

- **Ask About Signs and Symptoms:** A *Sign* is something the rescuer sees on a patient. For example, the patient may look pale or they are clutching at their chest. A *Symptom* is something the patient feels and describes to the rescuer, saying things such as *"I feel nauseated"* or *"I feel short of breath"*.
- **Chief Complaint:** The patient's chief complaint is what they tell you what is bothering them the most (i.e., pain, shortness of breath, bleeding, feeling faint, etc.). However, this may not be the most life-threatening condition the patient has. A question that can be used to determine the chief complaint is *"Why did you call for help?"*
- **History of Illness/Injury:** This term assesses what potentially caused the injury or illness. For example, did the patient have chest pain? Are they short of breath? Are they in cardiac arrest? What hit them on the head to cause the head injury? Are they diabetic? Do they have a history of stroke or heart attack? Another important piece of information is *"How long has the patient felt this way? When did it start?"*

## CONSCIOUS VS. UNCONSCIOUS PATIENTS

The brain is the organ that is responsible for a patient's level of consciousness. A lay rescuer must first check the patient's responsiveness. This is done to determine if the patient is able to protect their Airway, their Breathing, and Circulation.

The brain relies on many factors for survival, like oxygen and sugar, and requires as much as 30% of normal blood flow to function efficiently. If any of these factors are depleted due to illness or injury, changes in the patient's level of consciousness may occur.

Assessment of the level of consciousness is the first step in identifying if the patient has a life-threatening emergency.

To identify what level of consciousness the patient has, look at your patient and determine if they are awake or not. If the patient is awake and/or alert, the lay rescuer can infer that the patient has an airway, is breathing, and has circulation without touching the patient. If the patient has ABC's, their injury/illness may not be immediately life threatening.

If the patient is not obviously alert, then the rescuer should carefully **Tap and Shout** *"Are you okay?"*. The acronym AVPU (**A**lert, **V**oice, **P**ain and **U**nresponsive) is an assessment tool used to identify what response you get when you **Tap and Shout**.

- **Alert:** Patient is awake, conscious and answers questions appropriately.
- **Voice:** The patient responds to your loud voice. If the patient is not alert, the rescuer will need to use their voice to try to stimulate them. Examples are: *"Hey are you ok? Wake up! Can you hear me?"* A gentle tap on the bottom of the patient's foot may also be used.
- **Pain:** A patient can be classified as only responding to pain when you must use a shoulder or earlobe pinch to wake them up.
- **Unresponsive:** A patient is considered 'unresponsive' when the patient does not respond to any verbal or painful stimulation.

**Tap and Shout: "Are you okay?"**

## HISTORY GATHERING (SAMPLE)

- **S**ymptoms (in the patient's own words)
- **A**llergies (both medication and other)
- **M**edications (prescription and others)
- **P**ast Medical History (Last time in hospital, what they see a doctor for, anything else)
- **L**ast Food (eating and drinking)
- **E**vents leading up to injury/illness

If at all possible, have a bystander record as much information about the patient as possible. Examples include:

- First and last name, date of birth
- Contact phone numbers to relatives
- Medical history and allergies
- Time of incident
- Time care started/time EMS activated
- Findings from **The Approach** and Secondary Assessment
- Treatments and Results

## Good Communication

- Introduce yourself
- Let the individual know your level of First Aid training
- Speak calmly
- Offer to help
- Identify that you are a first aider
- Make eye contact
- Be respectful of personal space

## Barriers to Communication

- Language barrier
- Distrust of the first aider
- Embarrassment in front of other people
- Fear
- Distress
- Culture
- Body language

## Level of Consciousness

### **Unresponsive**

- This patient is not responding to your voice
- They are not alert or verbal
- They are not responding to a pain stimulus
- Call 911 immediately
- Check ABC
- If breathing, provide ongoing patient care
- If NOT breathing start CPR

### **Some Causes:**

- Medical
- Fainting
- Diabetic emergency
- Anaphylaxis
- Stroke/seizure
- Overdose (use Naloxone, if trained)
- Cardiac arrest
- Low blood pressure
- Shock
- Trauma
- Internal/external bleeding
- Blunt injury to head/chest/abdomen/pelvis/limbs



**Under NO circumstances should a lay rescuer, bystander or anyone other than a Police Officer, Paramedic or Fire Fighter go through a patient's belongings searching for identification!**

## CALLING 911

The single most important skill that a lay rescuer can have is to know how and when to get help. Rescuers should learn how and when to access EMS and how to activate the on-site Emergency Response Plan.

Contacting Emergency Medical Services in North America is usually done by calling **911**. This automatic number will connect you with all three emergency services. This call does not cost any money with payphones, as no quarter is required.

The most important piece of information to provide is your location. This can be in the form of a street address, an intersection, or a highway location (e.g., *five minutes past the Trenton Road exit, heading towards Kingston...*). If calling from most landline (traditional) telephones, this information is automatically presented to the dispatcher.

Lay rescuers should be aware that cellular telephones do not always work the same way as a home phone. 911 Dispatchers will not necessarily receive the phone's location, or even an automatic display of the caller's cellular phone number. Be sure to clearly state your emergency and your location, and that you are **using a cell phone**.

When calling Emergency Services from a cellular phone, always allow the Dispatcher to hang up first. This ensures that they have all the information they need to assist you.

Be prepared to give the dispatcher some very quick information about the situation. Most dispatchers have a protocol they must follow. Wait for them to ask questions and provide short, accurate answers. **What happened** (e.g., a car accident)? **How many patients?** **What sort of injuries?** Often, all you will know at this time is that you have an unresponsive patient. This is more than enough information for the paramedics.

Some communities do not yet have 911 service. Make sure you know the appropriate emergency number where you are. In Canada, Emergency Services can also be contacted by dialing "0" and speaking with the operator.



**911 services are available in most (but not all) communities across North America; you should not need to dial an area code first. Make sure you know how to contact Emergency Services!**

## PRIMARY SURVEY

Determining the patient's level of consciousness in combination with their **A**irway, **B**reathing and **C**irculation status should take only moments, but can be crucial in providing the right treatment right away.

Most patients will respond to voice and/or pain, which indicates strongly to the lay responder that their airway is open, their breathing normal, and their circulation sufficient.

However, immediate CPR must be provided for those patients who are unconscious or unresponsive, and who are not breathing normally. Starting CPR immediately in these patients is absolutely essential.

The universal **Approach** algorithm below can be used to provide lay rescuers with guidance regardless of patient presentation.



If the patient is conscious, please ask the following:

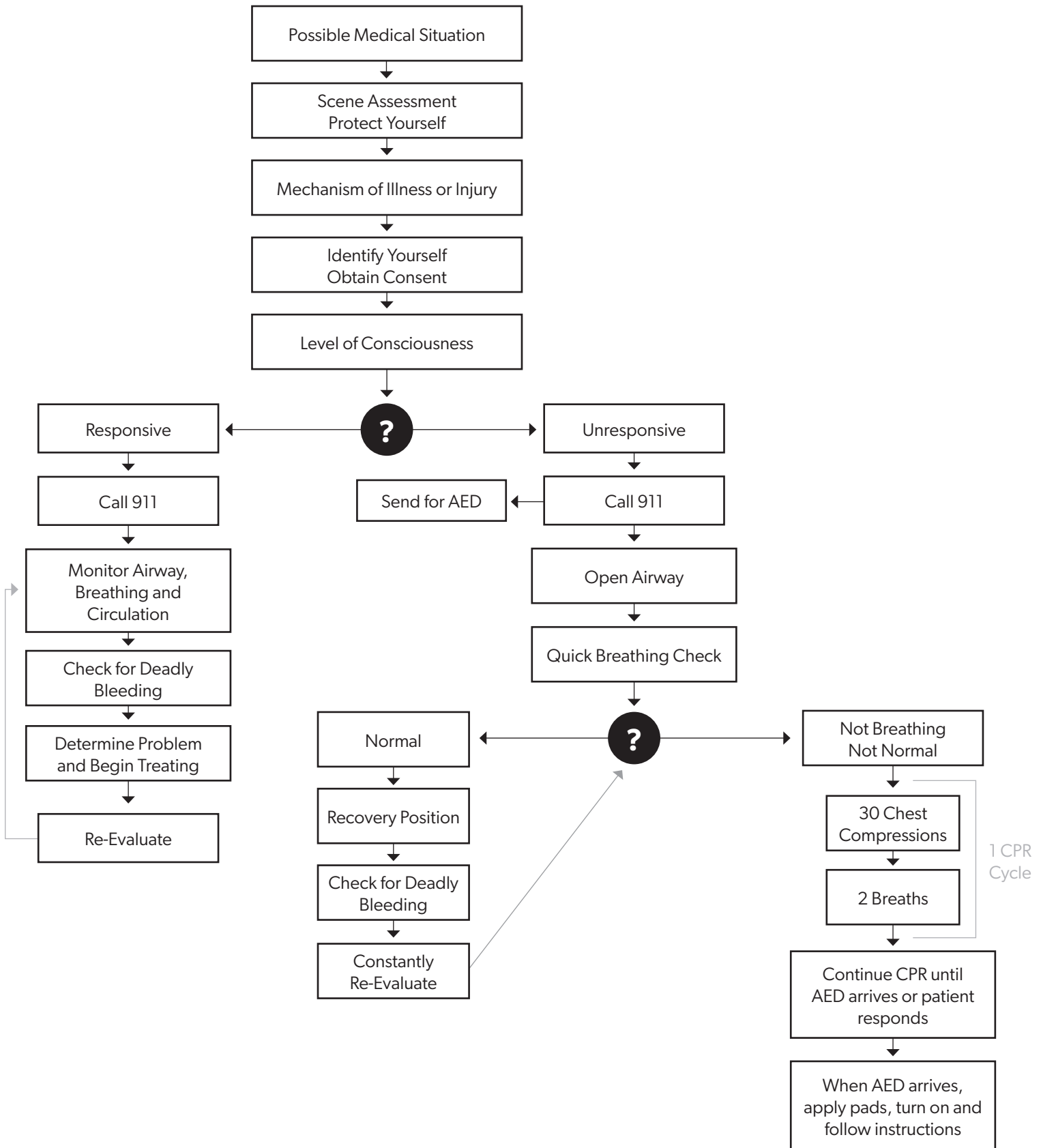
| Do you have any of the following symptoms:  |     |    |
|---|-----|----|
| • Fever (feeling hot to the touch or a temp. greater than 37.8°C)   | Yes | No |
| • Cough that is new or worsening  | Yes | No |
| • Shortness of breath/difficulty breathing  | Yes | No |
| • Difficulty swallowing   | Yes | No |
| • Sore throat   | Yes | No |
| • Runny, stuffy, or congested nose (not related to seasonal allergies or other known conditions)  | Yes | No |
| • Lost sense of taste or smell  | Yes | No |
| • Pink eye  | Yes | No |
| • Headache that's unusual or long lasting   | Yes | No |
| • Digestive issues like nausea/vomiting, diarrhea, stomach pain (not related to other known causes or conditions)                             | Yes | No |
| • Muscle aches that are unusual or long lasting   | Yes | No |
| • Extreme tiredness that is unusual   | Yes | No |
| In the last 14 days, have you been in close physical contact with someone who has tested positive for COVID-19?                               | Yes | No |
| In the last 14 days, have you been in close physical contact with a person who either:  |     |    |
| • Is currently sick with a new cough, fever, or difficulty breathing? OR  | Yes | No |
| • Returned from outside of Canada in the last 14 days?  |     |    |
| Have you travelled outside of Canada in the last 14 days? (this does not include essential workers who cross the Canada-US border regularly.) | Yes | No |
| Are you currently being investigated as a suspected case of COVID-19?   | Yes | No |
| Have you tested positive for COVID-19 within the last 14 days?  | Yes | No |

## Transportation of Ill or Injured Persons

- Check on-site Policy and Procedures
- Employers must ensure arrangements are in place to transport an injured or ill worker from the work site to the nearest healthcare facility
- A plan/policy may be in place outlining the proper protocol for transportation
- Employers must ensure there is means of communication at the worksite if 911 is needed (on-site phone, cell phone, etc.)
- It is best practice to send a first aider (if available) with the patient

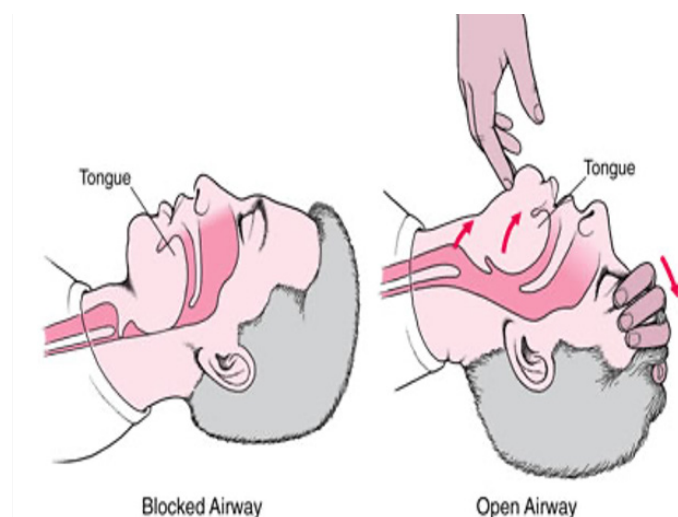






## AIRWAY ASSESSMENT

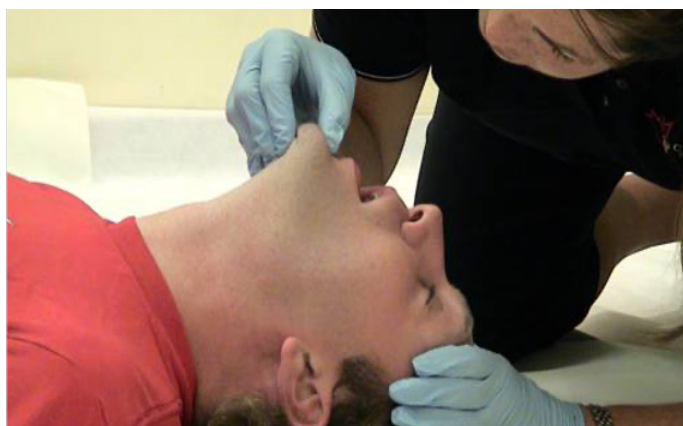
It is absolutely vital that the airway be checked immediately. A blocked airway can result in cardiac arrest within minutes. When a patient becomes unconscious, they very often lose control of their muscles, including the tongue. With deep unconsciousness, the tongue falls back against the back of the throat, closing it off.



Regardless of patient condition, the Head Tilt/Chin Lift should always be used to open the patient's airway.

### Head Tilt/Chin Lift

1. **Place the palm of one hand on the patient's forehead.**
2. **Place the first two fingers of your other hand under the patient's chin.**
3. **Simultaneously, pull up with the chin hand while pushing down with the head hand. This will tilt the patient's head up into a 'sniffing' position, opening their airway.**



## QUICK BREATHING ASSESSMENT

While maintaining an open airway, do a quick visual check for breathing for 5 to 10 seconds. **Normal** breathing in adults and older children is about 12 to 15 breaths per minute (1 every 4 to 5 seconds), the rhythm is regular, and the depth will be normal.

### Agonal Breathing

Agonal respirations in an unresponsive patient are an abnormal pattern of breathing characterized by shallow, slow (3 to 4 per minute), irregular breaths followed by irregular pauses. Agonal breathing is an extremely serious medical sign requiring immediate medical attention, as the condition generally progresses to complete respiratory arrest and indicates death.

Agonal respirations are the last breaths before death. Agonal respirations **are not breathing**. Agonal respirations are thought to be caused by random flashes of electricity from sick or damaged brain cells in the respiratory centre of the brain.

Agonal breathing can be present in up to 40% of pre-hospital cardiac arrests. It is extremely important that lay rescuers recognize agonal breathing and understand that it is **not normal breathing**. If in doubt, activate EMS and start CPR.

Agonal breathing in an unresponsive patient can sound like:

- Gaspings
- Snorting
- Snoring
- Gurgling
- Moaning
- Rattling



**It is far better to do CPR when not required than not do it when it is!**

## DEADLY BLEEDING CHECK

Having checked ABCs, rescuers should rapidly evaluate the patient from head to toe to ensure that there is no deadly bleeding occurring that could result in the patient going into cardiac arrest.

Deadly bleeds are those which present a severe risk of the patient bleeding to death within the next few moments. They are rare, but should be evaluated as part of The Approach.

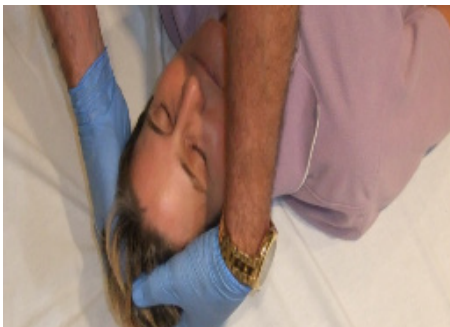
**Rescuers are cautioned that a patient in cardiac arrest may still have a deadly bleed present. HOWEVER, do not expect 'spurting' bleeding. Without the heart's pumping action, it is most likely to be a steady, severe leak.**

### Treatment – Deadly Bleeding

1. **Perform The Approach.**
2. **Activate Emergency Services.**
3. **Tap and Shout to check for responsiveness.**
4. **Put on Personal Protective Equipment (nitrile gloves).**
5. **Check head to toe rapidly and systematically.**
  - » Do not forget under head, back, behind legs/buttocks.
6. **Use Direct Pressure with clean dressings (if available) to stop bleeding. If possible, have a bystander assist with this.**

**Deadly Bleed Check**  
This is done to check for deadly bleeding:

  - » Establish responsiveness and breathing first
  - » Do not move the patient
  - » Start checking at the head, then neck, then check the rest of the body for deadly bleeding
  - » This survey should take about 30 seconds to complete
  - » Treat any deadly bleeding found immediately
  - » Advise the Emergency Services on arrival
  - » Ensure 911 has been called
7. **Continue with treatment, including CPR, if required.**
8. **Do not move this patient.**



# CHAPTER THREE

Ongoing Patient Care  
Recovery Position  
Log Roll

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## ONGOING PATIENT CARE

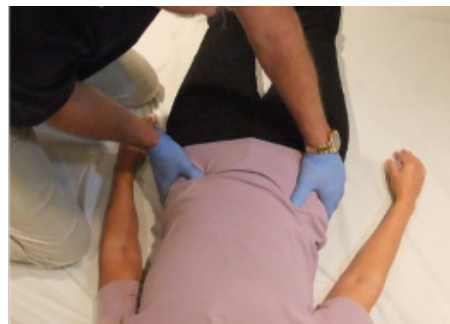
Ongoing Patient Care should include:

- Stay with the patient until additional help arrives. Stay in control of the situation and monitor the patient's breathing.
- Always treat for shock.
- Protect any personal belongings.
- Give nothing by mouth.
- If possible, make notes to give to EMC when they arrive.

## Deadly Bleed Check

This is done to check for deadly bleeding:

- Establish responsiveness and breathing first
- Do not move the patient
- Start checking at the head, then neck, then check the rest of the body for deadly bleeding
- This survey should take about 30 seconds to complete
- Treat any deadly bleeding found immediately
- Advise the Emergency Services on arrival
- Ensure 911 has been called





## Ongoing Patient Care

- Stay with the patient until help arrives and in control of the situation, monitor the patient (s) breathing
- Always treat for shock
- Protect any personal belongings
- Give nothing by mouth
- Make some notes to give when EMS arrive

## RECOVERY POSITIONS

There are three different recovery positions:

1. **Standard** Recovery Position
2. **Face Down to Face Up** Recovery Position
3. **Semi-sitting** Recovery Position

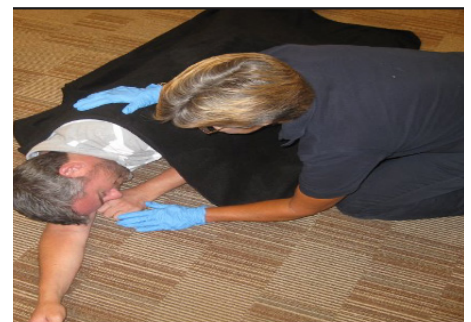
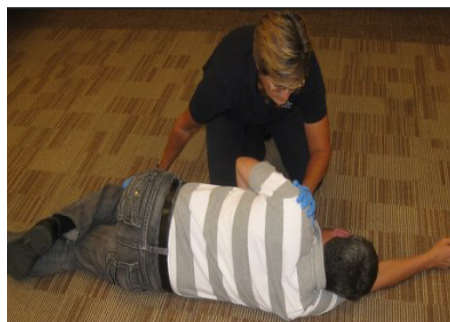
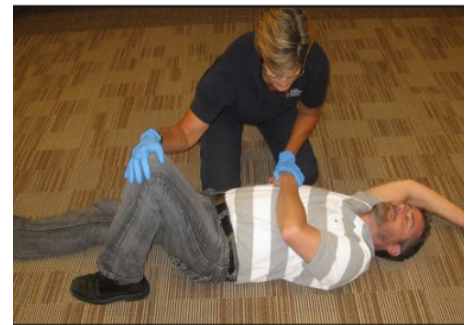
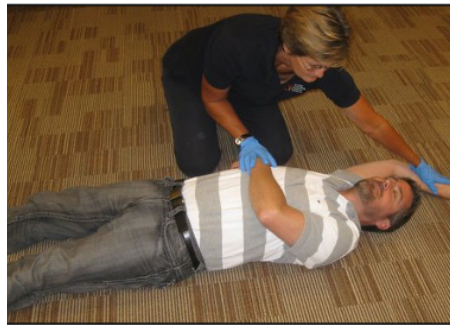
## Standard Recovery Position

1. Kneel at the patient's side and raise the arm closest to you above their head.
2. Bend the leg furthest from you up.
3. Gently support the patient's head and neck.
4. Grab the clothing at the hip area and roll the patient towards you.
5. Bend the patient's leg to stabilize, if you are leaving them in that position.
6. If possible, do not roll on the injured area.

This method is preferred in most cases as it gives the rescuer better control of the unconscious patient and a better visual to ensure the patient is breathing.

## Recovery Position

- Unconscious/semi-conscious
- Breathing on their own
- No suspected spinal injury



## Face Down to Face Up Recovery Position

Because of the dangers of further injuring the patient, rescuers should always attempt to treat the patient in the position found, and minimize any movement. However, situations exist where you need to roll a face-down patient face up in order to perform further treatment or CPR. This should only be performed on unconscious, face-down patients where you do not suspect a head, neck, or spinal injury.

1. **Position yourself beside the patient.**
2. **Kneel beside the patient and raise the arm closest to you above the head. The arm on the far side of the patient should be moved down to their waist.**
3. **Gently cross the leg furthest from you over the closer one at the ankles.**
4. **Take a firm grip on the patient's farthest shoulder and hip. Roll them towards you in one smooth motion. Generate strength by moving with your body, not just your arms.**
5. **As the patient comes over the vertical, smoothly and slowly lower them to the ground.**
6. **The patient will end up on their back. The rescuer can now perform additional required treatment. Monitor the airway carefully and do not forget to continually treat for shock.**





## SEMI-SITTING RECOVERY POSITION

The semi-sitting recovery position is an alternative recovery position that can be used with a conscious, fairly alert patient who has no difficulties maintaining their own airway. This position offers the advantage of allowing the patient to rest up off the ground, and also allows the sharing of body heat. Some patients and rescuers may feel uncomfortable with this degree of closeness, so let common sense guide you.

### Semi-Sitting Recovery Position

1. **Perform The Approach.**
2. **Ensure 911 has been called.**
3. **Explain to the patient what you would like to do. Get their consent.**
4. **Have the patient lean forward while sitting.**
5. **Seat yourself comfortably behind the patient. Prop your knees up on a 45-degree angle. Clothing can be used to pad over your legs.**
6. **Have the patient lean back and relax, using your legs as the back of a 'chair'. Ensure they are covered with a blanket and kept warm.**



**Regardless of recovery position chosen, it is ABSOLUTELY ESSENTIAL that patients be kept as warm as possible. Even in summer, a patient going into shock can get VERY cold, quickly. Use blankets, clothing, etc. to keep the patient warm, dry, and out of the wind.**



## LOG ROLL

- **Rescuer 1** stabilizes the head with hands firmly on either side.
- **Rescuer 2** holds on to the patient's hips and shoulder and prepares to follow the commands of **Rescuer 1**.



- Both rescuers roll the patient in a smooth, steady manner. With the patient flat on their back, **Rescuer 1** will retain control of the head, and will instruct and coordinate the checking of ABCs, the 911 call, CPR, AED, etc.

- **Rescuer 1** will make sure that both are ready to roll the patient. **Rescuer 1** commands the roll "Ready? 3... 2... 1... Roll."



# CHAPTER FOUR

*Fainting*  
*Head & Spinal Injuries*  
*Shock*

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## FAINTING

Patients who become unconscious do so for a number of reasons, including:

- **Trauma Injuries:** Trauma is when a force acts on the body from outside, causing injuries. Traumatic injuries range from mild to extremely severe. Anytime the patient has been exposed to the forces of trauma, such as falls, motor vehicle collisions or industrial accidents, they can sustain obvious injuries. However, there may be even worse hidden out of sight. Due to the hidden nature of many of these injuries, rescuers must be **extremely suspicious** of trauma injuries.
- **Medical Illness and Injuries:** Medical illnesses or injuries occur when something goes wrong inside the patient's body. These injuries can be very difficult to pin down, so rescuers must once again remain suspicious.
- **Fainting:** Fainting is also known as syncope. It is a sudden (and generally momentary) loss of consciousness, due to a lack of sufficient blood and oxygen reaching the brain. Factors that influence fainting can be too little food and fluids, low blood pressure, low blood sugar, too much physical exercise, or lack of sleep. Even standing up too quickly, standing or sitting for too long, or being in a hot room may cause fainting.

## Fainting Signs and Symptoms

- Dizziness
- Nausea
- Visual disturbances (tunneled vision/'graying out')
- Unsteady on feet
- Paleness
- Weakness
- Sweating and rapid pulse



## Fainting Treatment

- Perform **The Approach**.
- Place the person in the recovery position.
- Discourage patient from sitting up.
- Monitor the airway and breathing and circulation (ABCs).
- Check patient for injuries suffered during the fall.
- Request medical assistance for fainting as needed.

Some patients are at higher risk for fainting. Regardless of the cause, if there is any doubt on the part of the rescuer about the seriousness of the fainting episode, EMS should be called.

Other patients may also have a lengthy history of fainting (low blood pressure). Rescuers should encourage the patient to explain their history in terms of how often they faint, when they last fainted, how long they usually remain unconscious for. If the most recent episode varies from the given history, or if there are any concerns, once again, EMS should be called.



## HEAD INJURIES

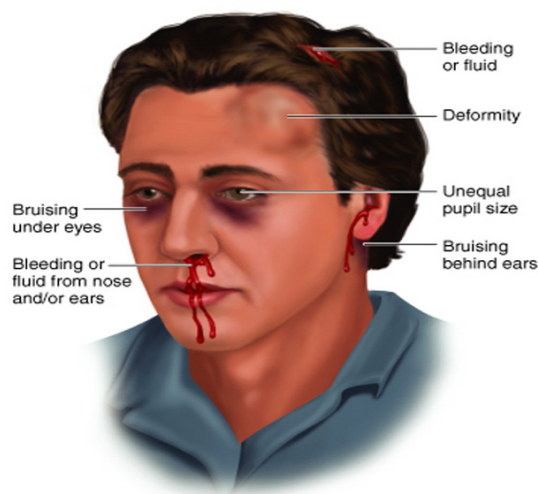
Head injuries are caused by an external blow to the head which leads to bleeding or bruising within the skull and/or brain. Permanent damage may result from a head injury. Furthermore, head injuries are often associated with neck injuries.

A concussion is the only head injury in which no bleeding occurs. The patient suffers only temporary loss of consciousness with no permanent damage. It is important to obtain as much history on the incident as possible, and also to use the mechanism of injury as your primary indicator for a potential head or spinal injury.

### Head Injury Signs and Symptoms

- A period of unconsciousness (may be brief)
- Loss or changes of consciousness followed by a return of consciousness, then loss again
- Loss of memory, confusion, dizziness
- Tingling, numbness in the extremities
- Loss of movement or weakness in the extremities
- Bleeding or bruising from an injury to the scalp
- Deformity or depression of skull
- Nausea and vomiting
- Pupils may be unequal and may not constrict to light
- Seizures (convulsions)
- Bleeding from nose and ears

**Area of bleeding inside skull, putting pressure on brain.**





## Head Injury Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Always suspect an associated spinal injury.**
6. **DO NOT MOVE THE PATIENT unless he or she is not breathing and you cannot access the airway, or there is danger.**
7. **Stop any bleeding from the scalp with direct pressure applied with a clean dressing. A bump on the head can be treated with indirect ice.**
8. **If movement is required, support the head and neck and roll the patient as a unit, doing your best to keep the head, neck, and spine in alignment.**
9. **Patient may vomit; be prepared to roll the patient over if unconscious.**
10. **DO NOT STOP BLEEDING FROM THE EARS. Lightly cover ears with a sterile dressing.**
11. **Try to keep the patient awake with constant conversation.**
12. **Reassure the patient. Keep the patient warm with a blanket.**
13. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**



## SPINAL INJURIES

These types of injuries can be very serious due to possible long-term consequences of an injury to the spinal cord. Falls, diving, and motor vehicle accidents are some of the causes of spinal injury. As with a head injury, the mechanism of injury may be your most important clue to the possibility of spinal injury.

## IF IN DOUBT, ALWAYS ASSUME SPINAL INJURY.

### Spinal Injury Signs and Symptoms (some or all may be present)

- Pain at the site of the injury
- Pain with movement
- Tingling or numbness in the arms and legs
- Weakness or loss of movement in the arms or legs
- Bruising and discoloration
- Swelling may occur

## Spinal Injury Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **DO NOT MOVE THE PATIENT unless they are not breathing and you cannot access the airway.**
6. **Monitor and reassure the patient.**
7. **Keep the patient warm using blankets, extra clothing, or anything else available.**
8. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**



**Any patient found without a witnessed mechanism of injury MUST be assumed to have a neck or back injury. Suspicion on the part of the rescuer can prevent the patient suffering a debilitating injury.**

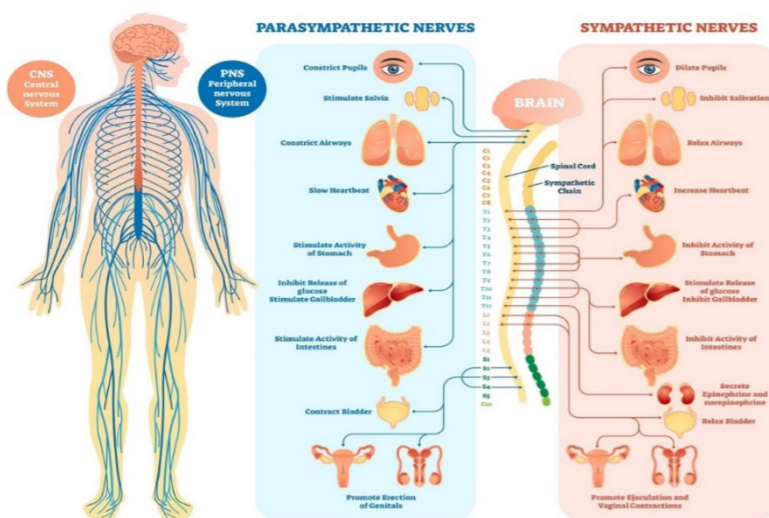
## Nervous System

The nervous system is made up of neurons that send signals between different parts of the body, and breaks down into two systems: the central nervous system (CNS) and Peripheral nervous system (PNS). The main functions of the nervous system include:

- **Sensory:** Collects input from the body and external environment
- **Integration:** Processes and interprets sensory input
- **Motor:** Responds to the body's needs

**For example:** The body feels cold (sensory); it interprets how it can get warmer (integration), and responds by shivering (motor).

## HUMAN NERVOUS SYSTEM



## Spinal Roll Procedures

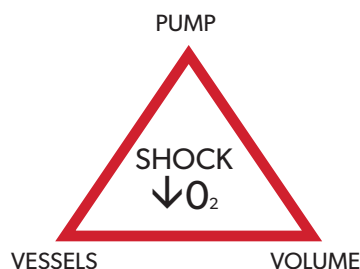
- **Rescuer 1** stabilizes the head with hands firmly on either side.
- **Rescuer 2** holds on to the patient's hips and shoulder and prepares to follow the commands of **Rescuer 1**.
- **Rescuer 1** will make sure that both are ready to roll the patient. Rescuer 1 commands the roll with "Ready? 3... 2... 1... Roll".
- Both rescuers roll the patient in a smooth, steady manner.
- With the patient flat on their back, **Rescuer 1** will retain control of the head and will instruct and coordinate the checking of ABCs, the 911 call, CPR, AED, etc.



**Patients with suspected spinal injuries should only be moved when there is danger to yourself or the patient, or when you CANNOT ASSESS ABCs!!**

## SHOCK

Shock occurs when an inadequate amount of oxygen is delivered to body tissues such as the brain. The circulatory system is divided into three components: the heart, blood vessels, and blood. If a problem occurs with any one of these components, the patient may go into shock as the body and brain are deprived of essential oxygen.



If the patient suffers a heart attack, the amount of blood **pumped** by the heart may be reduced and the blood pressure may fall. Less oxygen will then be delivered to the vital organs of the body and shock will occur.





If bleeding is the problem, blood loss can lower blood pressure. As bleeding continues, vital organs will receive less and less **blood volume** and therefore less oxygen, causing the patient to go deeper into shock.


Finally, some severe infections and spinal injuries can interfere with the body's ability to control the size of blood **vessels**. Without brain control, they will open up to the largest position. This results in a substantial loss of blood pressure, even though the patient isn't bleeding.

## Causes of Shock

- **Sepsis:** Infection (e.g., E-Coli. bacteria in the blood).
- **Bleeding:** Large amount of blood loss externally and/or internally.
- **Obstructive:** Airway obstruction (choking) or a chest wound causing a lung to collapse.
- **Cardiogenic:** Heart attack (e.g., sudden cardiac arrest).
- **Anaphylaxis:** Severe allergic reaction causing airway swelling, potentially leading to cardiac arrest.
- **Neurological:** Neurological system or spinal shock.


## Signs and Symptoms (depending on the degree of shock)

- Lightheadedness, dizziness, confusion
- Rapid pulse
- Anxiousness, restlessness, irritability
- Chills
- Cool, pale skin
- Nausea and vomiting
- Unconsciousness

 **Rescuers are strongly cautioned that signs and symptoms of shock often do not appear until the patient has fallen deeply into shock. Rescuers should NOT wait for signs and symptoms; assume the patient is in shock and treat as below.**

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Stop any visible bleeding with direct pressure.**
6. **If the patient is unconscious and there are no suspected spinal or head injuries, place them in the recovery position.**
7. **Monitor the airway, breathing, and circulation.**
8. **Reassure the patient.**
9. **Keep patient warm using blankets, extra clothing, or anything else available.**
10. **Continue to reassess the patient.**

 **Shock is a lethal, life-threatening concern. Its onset takes little to no time, and its effects can be fatal. Do NOT underestimate it. It is often more severe than the obvious, dramatic injuries.**

# CHAPTER FIVE

*Cardiovascular Emergencies*  
*CPR Skills: Adult/Child/Infant*  
*Automated External Defibrillator*  
*Skills*

---

## ANATOMY OF THE HEART

### The Blood

The blood transports oxygen, nutrients, antibodies, carbon dioxide and other waste products to and from all cells of the body. An adult weighing 70 kilograms has approximately 6 liters of blood in their body. In a resting adult, the normal heart rate is approximately 60 to 100 beats per minute, pumping approximately 5 litres of blood per minute.

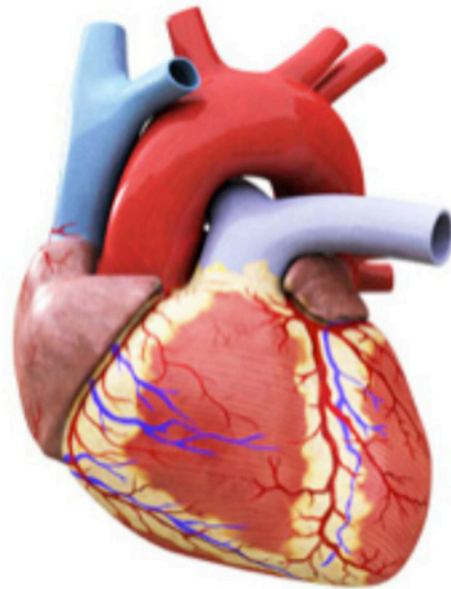
### The Heart

The heart is a hollow muscular organ about the size of a clenched fist. Its position is slightly to the left of the midline of the chest, behind the breastbone and in front of the spine. The heart is comprised of four distinct chambers equipped with valves that control the blood flow for two circulation systems.

The heart functions as a pump which, through its rhythmic pressure (caused by electrical impulses), moves blood from the heart throughout all parts of the body and back to the heart. Specifically, the blood is directed from the heart via the pulmonary artery to small capillaries and alveoli in the lungs, where it is oxygenated (by respiration).

Oxygenated blood returns to the heart through the pulmonary vein, travels through the left atrium and left ventricle of the heart, where it is pumped out to the body via the aorta and the corresponding series of arteries.

In this way, the body is provided with the life sustaining oxygen it needs. De-oxygenated blood is returned to the heart via the veins, through the right atrium and ventricle, where it is forced into the pulmonary artery, once again en route to the lungs, and the circuit starts over again. All cells of the body require oxygenated blood to function normally. If cells do not receive the proper levels of oxygen, cell injury and death will occur.



## ANGINA, HEART ATTACK, AND ARTERIOSCLEROSIS PECTORIS

| Angina<br>(Angina Pectoris)  | Myocardial Infarction<br>(Heart Attack)  | Arteriosclerosis   |
|--|--|--|
| <ul style="list-style-type: none"> <li>Angina pectoris translates to “pain in the chest”</li> <li>Results from the heart’s need for oxygenated blood, but the blood cannot be supplied to the area</li> <li>Often caused by tightening of the arteries (vasoconstriction)</li> </ul> | <ul style="list-style-type: none"> <li>Tissue death of a portion of the heart muscle from lack of oxygenated blood</li> <li>Commonly cause by formation of a blood clot in the arteries</li> </ul> | <ul style="list-style-type: none"> <li>A thickening, loss of elasticity, or hardening of the walls of the arteries from calcium deposits</li> <li>Commonly caused by high blood pressure, smoking, and high cholesterol</li> </ul> |

## CARDIOVASCULAR DISEASE

Cardiovascular disease is commonly referred to as Coronary Artery Disease. It is the leading cause of death and disability in North America. Some of the most common causes of Coronary Artery Disease are listed below.

### Hypertension

Hypertension is the medical term for excessively high blood pressure. Everyone’s blood pressure raises sometimes; for example, when people become excited or nervous. Hypertension refers to a person whose blood pressure is consistently higher than 140/90. If hypertension is left untreated or unnoticed, it can lead to tissue damage, decreased elasticity and an enlarged heart.

### Atherosclerosis

This results from an accumulation of fatty deposits (plaque) in the inner lining of the blood vessels and coronary arteries of the heart.

### Arteriosclerosis

Another contributor to the onset of Coronary Artery Disease is the hardening of the arterial walls, which is the result of both the calcification (build-up of calcium deposits) and degeneration of the blood vessel lining.

If one of the arteries of the heart or brain becomes completely blocked, a heart attack or stroke may occur. One factor that is related to the high mortality rate with patients of cardiac arrest precipitated by Coronary Artery Disease is **denial**.

Often patients experiencing related symptoms such as chest pain and shortness of breath deny the experience, the significance and/or the seriousness of the event. Furthermore, most delay calling for help until their pain is excruciating. As a result, between 60% and 70% of these patients die before ever reaching the hospital.

## RISK FACTORS

There are many risk factors which may contribute to the onset and occurrence of heart disease. These can be divided into two categories: those which you cannot control, and those which you can control with associated lifestyle changes.

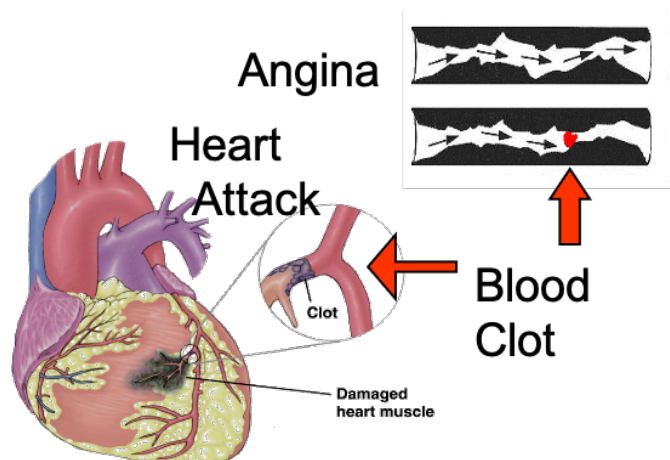
The following are risk factors that YOU may be able to reduce or control either on your own (through lifestyle changes such as diet and exercise), or with medical assistance (such as medications).

### Risk Factors That You Can Control

- High blood pressure
- High blood cholesterol
- Smoking
- Lack of regular exercise
- Diabetes
- Obesity
- Stress

### Risk Factors That You Cannot Control

- Gender
- Heredity/genetics
- Age



## ACUTE CORONARY SYNDROME

Each year, millions of patients around the world are evaluated for chest pain in Emergency Departments. Of these, approximately half will be diagnosed as having **Acute Coronary Syndrome (ACS)**. Of all patients with ACS, approximately half will die before reaching the hospital. ACS, or cardiac chest pain, is caused by a lack of oxygen to the heart muscle.

### Heart Attack (Acute Myocardial Infarction)

A **Heart Attack** occurs when some of the heart muscle dies because of a blockage of blood flow in the coronary artery(s). The location and amount of muscle involved will determine the severity of the heart attack. A patient suffering a heart attack may go into cardiac arrest, which stops normal heart activity, and therefore stops breathing and blood circulation.

### Angina

Angina also occurs in patients with ACS. While a heart attack occurs due to the blockage of an artery, Angina is caused by the **narrowing** of an artery.

At rest, the heart of a patient suffering from angina is usually able to get all the oxygen it needs and the patient looks and feels fine. However, if the patient exerts themselves (e.g., walking up a flight of stairs) they increase the pumping demand on their heart. Unfortunately, narrowed arteries are unable to supply the heart with the increased oxygen it needs, causing similar signs and symptoms of a heart attack.

Having the patient stop what they are doing and rest will lower the oxygen demand on the heart. The patient will usually start to feel better. Angina should never be taken lightly (even if the signs and symptoms subside) as it is a warning sign that the patient is at an increased risk of heart attack.

Due to the similarity in signs and symptoms the lay rescuer should treat both heart attack and angina the same way. If the patient has medication (nitroglycerin), the rescuer may carefully assist them with it, if required.

## Signs and Symptoms

Some or all may be present:

- Pain, pressure, squeezing sensation, dull ache in the chest
- Pain may radiate to the neck, jaw, arms, or back
- General weakness and lethargy (very common in women)
- Shortness of breath
- Nausea, heartburn, and vomiting (heartburn common in women)
- Abnormal colour
- Sweating
- **Denial** by the patient is a common reaction to heart attack/angina

You, as the lay rescuer, must take charge of the situation if the patient displays any of these signs and symptoms.

**Remember that time is heart muscle!!!**

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway, and quickly check for normal breathing.**
5. **Place patient in their position of comfort.**
6. **Keep patient warm with blankets or extra clothing.**
7. **If patient has ASA, suggest they take two low dose or one regular strength tablet. THEY MUST CHEW THE PILLS TO BE MOST EFFECTIVE.**

8. **If patient has nitroglycerin, be prepared to assist with it.**
9. **Be prepared to assist the patient if he or she becomes unconscious and unresponsive with no signs of circulation.**
10. **You may need to perform CPR and call for the AED.**



### NITROGLYCERIN

**Nitroglycerin is a drug that rapidly increases the size of the pipes feeding blood to the heart. It will cause a drop in the patient's blood pressure. Lay rescuers must ALWAYS MAKE SURE that the patient has NOT taken any:**

- **Viagra (12 hours between last pill and nitroglycerin)**
- **Levitra (12 hours)**
- **Cialis (72 hours)**

## CERBROVASCULAR ACCIDENTS

### Stroke

Stroke, or Cerebrovascular Accident, is a leading cause of death and brain injury in adults. A stroke occurs when a blood vessel becomes blocked, or a blood vessel ruptures within the brain. Coronary Artery Disease is often partly to blame for stroke patients as well as heart attack patients. 75% of strokes are blockages of blood vessels. 85% of strokes occur at home.

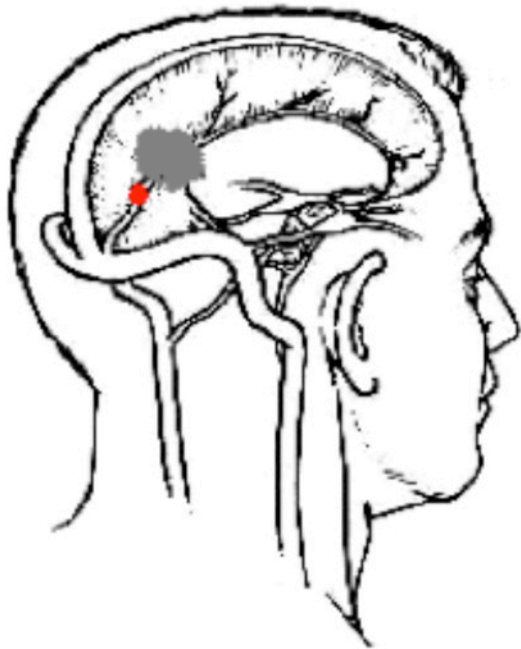
In a stroke, blood is prevented from reaching part of the brain and that part dies. The area of the blockage will determine the extent of the damage and the parts of the body that will be affected. If, for example, the blockage occurs in the brain's speech centre, then the patient will likely have their speech affected and may be unable to talk.



## Transient Ischemic Attack

A Transient Ischemic Attack (TIA) is a “mini stroke”. These are caused by reduced blood flow to the brain. TIA’s last only a couple of minutes to a few hours, after which the patient feels fine with no deficits within 24 hours. These mini strokes are often taken as warning signs, as there is a very high chance that the patient will have a complete stroke within six months if untreated.

Rapid access of the EMS system is essential as soon as signs and symptoms of a stroke or TIA appear. Treatment for both TIA and stroke is the same.



## Signs and Symptoms

Some or all may be present:

- Facial drooping (patient may be unable to smile)
- Inability to extend both arms upwards with eyes closed; called “arm drift”
- Inability to speak, or slurred speech
- Sudden headache with no relief
- Dizziness and/or confusion
- Weakness or paralysis on one side of the body or face
- Pupils may become uneven
- Nausea and vomiting
- Seizures and unconsciousness

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Reassure the patient.**
6. **Place patient in their position of comfort.**
7. **Keep patient warm with blankets or extra clothing.**
8. **Be prepared to assist the patient if he or she becomes unconscious and unresponsive with no signs of circulation.**
9. **You may need to perform CPR and call for the AED.**



**Remembering the FAST test can save your, or someone else’s life. The FAST test is:**

- **Face:** Have the patient smile. Does one side droop?
- **Arm:** Have the patient raise both arms. Does one drop faster, or drift away?
- **Speech:** Have the patient say something simple. Are they slurring their words?
- **Time:** Time to call 911

## THE CHAIN OF SURVIVAL

The highest potential survival rate from cardiac arrest can be achieved only when the Chain of Survival events occur as rapidly as possible. If any link is missing, the chance of survival is lessened, and the system is condemned to poor results. Each link must be strong throughout the community. This approach is consistent with the concept that the community is the “ultimate coronary care unit”.

The six links in the adult out-of-hospital Chain of Survival are:

- **Recognition** of cardiac arrest and **activation** of the emergency response system
- Early **cardiopulmonary resuscitation (CPR)** with an emphasis on chest compressions

- Rapid **defibrillation**
- Advanced resuscitation by Emergency Medical Services and other healthcare providers
- Post-cardiac arrest care
- Recovery (including additional treatment, observation, rehabilitation, and psychological support)

A strong Chain of Survival can improve chances of survival and recovery for victims of cardiac arrest.



## SUDDEN CARDIAC ARREST

Sudden Cardiac Arrest is the term used within the medical community to describe a patient suffering an unexpected cardiac arrest. Though Sudden Cardiac Arrest can be caused by any one of a number of different illnesses and injuries, the most common causes are **heart attack** and **stroke**.

Survival rates from Sudden Cardiac Arrest, especially outside a hospital, are not good. Historically the average has been between 2% and 4% in North America, though in recent years it has improved to up to 15%.

Sudden Cardiac Arrest is not the same as heart attack. Though a patient having a heart attack is at much higher risk for Sudden Cardiac Arrest, they still have circulation.

Patients in cardiac arrest no longer have the regular, rhythmic pumping action required to move blood around their body. This does not mean that their heart is completely still. One of the first things that happens in Sudden Cardiac Arrest is that the patient's heart will go into a chaotic, wildly irregular rhythm that does not pump blood. As long as they remain in this rhythm, there is **still every possibility to save their life**.

Lay rescuers potentially have far greater power to save lives than paramedics and doctors **because they are right there when it happens**. Prompt recognition, immediate activation of EMS, early CPR, and early AED can increase the survival rate to **80%**!

### Signs and Symptoms

- Patient is unresponsive and not breathing normally

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway, and quickly check for normal breathing.**
5. **Start CPR and Automated External Defibrillator (AED).**



## CARDIOPULMONARY RESUSCITATION

### What is Cardiopulmonary Resuscitation?

Cardiopulmonary Resuscitation, commonly referred to as CPR, is the provision of two basic life support techniques that are administered when a person's natural heart and lung actions have stopped. These two procedures are:

1. **Chest Compressions or Cardiac Resuscitation:** When a patient is in cardiac arrest, none of their muscles are working. This means that the leftover oxygen in their blood is enough initially to support their brain. That blood and oxygen, however, has to be circulated. By performing chest compressions, a lay rescuer can provide blood flow for an individual whose heart is unable to circulate the blood itself. Through the application of a rhythmic pressure to the lower half of the patient's breastbone (also called the sternum), blood is forced from the heart via the various blood vessels to the brain and vital organs.
2. **Rescue Breathing:** Eventually, the brain will use up the oxygen being pumped to it from chest compressions. This depends on the patient. Chest compressions are more important initially to the patient. Rescue breathing is the technique of supplying oxygen to a patient who is unable to breathe for themselves. By blowing air into the patient's lungs, the necessary oxygen is absorbed from your exhaled air into the patient's blood.

### Compression-Only CPR

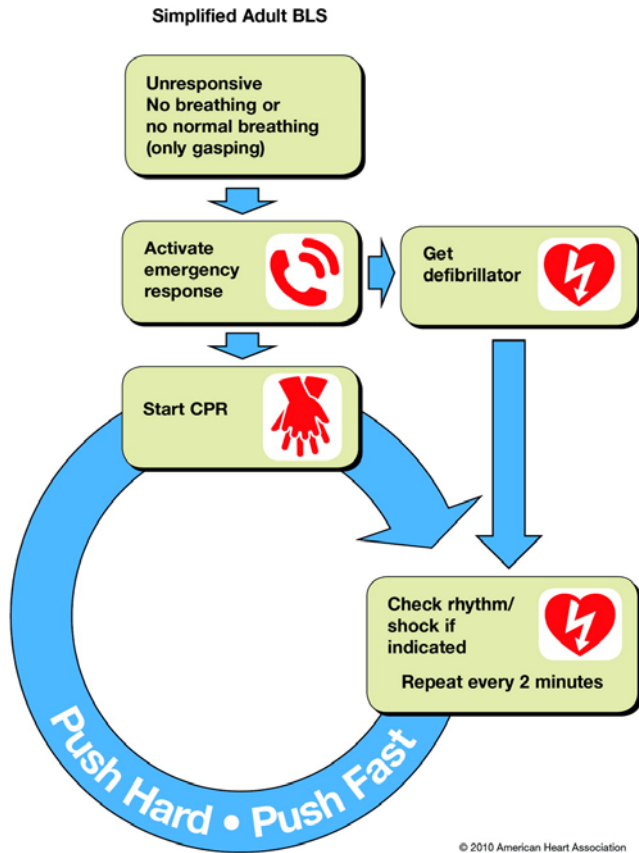
Rescue breathing is a safe and effective technique that has saved many lives. However, if a person is unwilling or unable to perform mouth-to-mouth ventilation for a patient, chest compression-only CPR should be provided rather than no attempt at CPR being made. Current evidence indicates that the outcome of chest compressions **without** mouth-to-mouth ventilation is **significantly better** than no CPR at all for cardiac arrest.

Although the importance of CPR and basic life support skills is undisputed, the efficiency of CPR in prolonged cardiac arrest is modest at best. The brain is most susceptible to lack of oxygen and can be irreversibly damaged, resulting in death or severe brain damage.

Therefore, it is extremely important that CPR and application of an AED is started immediately to provide the best chance of recovery for the patient.

## CPR NUMBERS AND RATIOS

|               | Age          | Ratio | Depth of Chest Compression           | Rate           |
|---------------|--------------|-------|--------------------------------------|----------------|
| <b>Adult</b>  | 8 +          | 30:2  | At least 2-2 1/2 inches or 5 to 6 cm | 100 to 120/min |
| <b>Child</b>  | 1 to 8 years | 30:2  | 1/3 depth of chest or 5 to 6 cm      | 100 to 120/min |
| <b>Infant</b> | 0 to 1 years | 30:2  | 1/3 depth of chest or 4 to 5 cm      | 100 to 120/min |



**!** Always landmark for chest compressions.  
● 5 cycles or 2 minutes of CPR



## CPR: STEP BY STEP

### Step 1: Tap and Shout

If patient is unresponsive:

- **Call 911**
- **Put on barrier devices, gloves, and face mask**
- **Send for the AED**

### Step 2: Quick Check for Normal Breathing

- **Head Tilt/Chin Lift**
- **Check for normal breathing for 5 to 10 seconds**

### Step 3: Chest Compressions

- **Ensure patient is on a firm, flat surface**
- **Landmarking: Heel of hand in the middle of the patient's chest**
- **Patient's nipple line should run through the middle of your hand**
- **Push hard and fast – at least 2 inches or 5 cm with both hands**
- **Provide 30 compressions at a rate of 100 per minute**
- **Push hard, push fast**

### Step 4: Rescue Breathing

- **Head Tilt Chin Lift**
- **Pinch nose closed**
- **Seal over patient's mouth**
- **Give first breath of 1 second or until patient's chest rises**
- **Allow air to escape**
- **Give second breath. Do not overinflate**

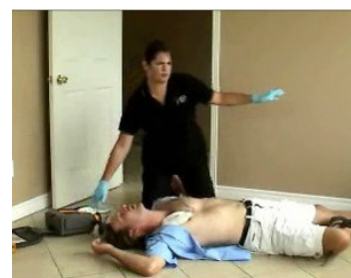
### Step 5: Using AED

- **Continue CPR (30:2) until the AED arrives, or EMS arrives on scene**
- **Turn on the AED, and follow the instructions**
- **Minimize interruptions to compressions**
- **Switch rescuers every 2 minutes if more than 1 person available**

It is important to allow complete chest rise after each compression. This ensures the heart is able to refill with blood.

### Skills for CPR: The 2 P's...

- **Push hard**
- **Push fast**
- **Ensure full chest recoil** (let the chest come up)
- **Minimize interruptions to chest compressions**
- **1 Cycle = 30 compressions, then 2 breaths**
- **Continue CPR until the AED arrives, EMS arrives, or the patient starts to respond**



## ONE-RESCUER ADULT CPR

1. **Scene Assessment and Level of Consciousness.**
  - » Tap and Shout “Are you all right?”
2. **Call 911 or the local emergency number for your area.**
  - » If you are alone, you must activate the emergency medical system. (Place the patient in the recovery position while you are gone.)
  - » If someone else is present, have them place the call, and then return to assist you.
3. **Open the Airway.**
  - » Head tilt/Chin lift.
4. **Quick Check for Breathing (5 - 10 seconds).**

### If the Patient IS Breathing Normally



Monitor patient & check for other injuries and wait until EMS arrives

### If the Patient is NOT Breathing Normally



Place the patient on a hard flat surface and begin 30 chest compressions

Follow with 2 rescue breaths (do not delay CPR waiting for face mask or gloves)

Start CPR when no normal respirations can be seen

Stop CPR when movement and normal breathing return or the AED arrives



## RESCUE BREATHING

Perform a Head Tilt/Chin lift. Take a normal breath. Seal your mouth over the patient's. Use two fingers to pinch their nose shut. Exhale into the patient's mouth slowly. Give two breaths of one second in duration with enough volume to visibly see the chest rise.



- ! The ideal position for the patient's airway is called the "Sniffing" position.
- This is similar to if the patient was smelling a flower. Be careful about tilting the head back too far as this can block the airway off. This is extremely important in children and infants!!

- ! Be very careful not to blow TOO much air into the patient: This will end up in the stomach and will cause them to vomit.
- 

## Other Breathing Techniques

### Mouth to Mask

Make a proper tight seal around the mouth with the barrier device.



### Barrier Device (Face Shield)

- Place the face shield over mouth
- Tilt the head back, lift chin up, pinch nose closed
- Give two normal breaths



## TWO-RESCUER ADULT CPR

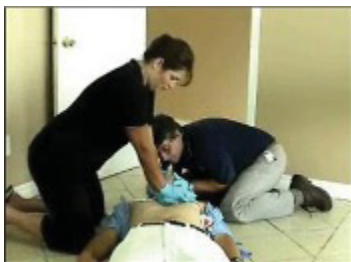
### Follow these guidelines:

If both rescuers come on scene at the same time:

- **Rescuer 1** will perform a full **Approach** to assess the situation and the patient. If the patient is unresponsive and not breathing normally, they will start CPR.
- **Rescuer 2** will ensure help (911) is on the way and find out if an AED is available.
- **If one-rescuer CPR is performed until a second rescuer arrives on the scene:**
  - **Rescuer 1** should finish a full round of 30:2 (pause as little as possible).
  - **Rescuer 2** should:
    - » Identify themselves as being CPR/AED trained and offer their assistance
    - » Ensure help is on the way and an AED has been considered
    - » Wait until a full round of 30:2 has been completed then smoothly begin the next round of compressions
    - » Continue CPR using the guidelines laid out below

### Two Rescuer Guidelines:

When two rescuers are performing CPR, one rescuer should be positioned at the patient's side and they should perform chest compressions. The second rescuer should be on the opposite side at the patient's head, maintaining an open airway and ventilating the patient (preferably with a barrier device). This positioning will allow the rescuers to switch positions easily and without interruption. Rescuers should switch often, as prolonged CPR is very tiring. Staying fresh means better CPR for the patient.



## CPR FOR INFANTS AND CHILDREN

### Introduction

This population includes infants from birth to 1 year of age, and children between 1 and 8 years of age. CPR and Basic Life Support should be part of a community-wide Chain of Survival that links the child to the best hope of survival following emergencies.

Sudden cardiac arrest in infants and children is much less common than sudden cardiac arrest in adults. Cardiac arrest in infants and children is rarely a sudden event, and non-cardiac causes are predominant. The cause of cardiac arrest in infants and children varies by age, setting, and the underlying health of the child. Recent research has highlighted asphyxia as a very common, but reversible, cause of cardiac arrest in children and infants.

More than 90% of deaths from Foreign-Body Airway Obstruction (FBAO) in children occur in those younger than 5 years of age. 65% of FBAO patients are infants. With the development of consumer product safety standards regulating the minimum size of toys and toy parts for young children, the incidents of foreign-body obstruction have decreased significantly. However, toys, balloons, small objects, and foods (e.g., hot dogs, round candies, nuts, and grapes) may still produce FBAO and should be kept away from infants and small children.

Cardiac arrest in the under 21 age group occurs most commonly under 1 year of age and during the teenage years. In the newly-born infant, respiratory failure is the most common cause of cardiac arrest. During infancy, the most common causes of arrest include Sudden Infant Death Syndrome (SIDS), respiratory diseases, airway obstruction, drowning, sepsis, and neurological disease.

Beyond 1 year of age, injuries are the leading cause of death. Cardiac arrest in children typically represents the terminal event of injuries or respiratory failure. Therefore, lay rescuers must detect and promptly treat early signs of shock, and respiratory and circulatory failure to prevent cardiac arrest. In children, early and effective bystander CPR has been associated with successful return of spontaneous circulation and neurologically-intact survival.



## CHILD CPR (1 TO 8 YEARS OF AGE)

1. **Scene Assessment and Level of Consciousness.**

» Tap and Shout “Are you all right?”

**!** If you are alone, continue with assessment and CPR if necessary for 2 minutes (5 cycles) and then call EMS.

2. **If someone else is with you, send them to call 911 or the local emergency number for your area.**

3. **Open the Airway.**

» Head Tilt/Chin lift

4. **Quick check for normal breathing.**

**If the Patient IS Breathing Normally**



Monitor patient & check for other injuries and wait until EMS arrives

**If the Patient is NOT Breathing Normally**



Place the patient on a hard flat surface and begin 30 chest compressions

Follow with 2 rescue breaths (do not delay CPR waiting for face mask or gloves)

Start CPR when no normal respirations can be seen

Stop CPR when movement and normal breathing return or the AED arrives

5. **If by yourself and EMS has not yet been called, call after 5 cycles of 30:2 or 2 minutes.**



## One Person Child CPR (30:2)

### Step 1: Tap and Shout

- If patient is unresponsive:
- Get a bystander to call 911
- Put on barrier devices, gloves, and face mask

### Step 2: Quick Check for Normal Breathing

- Head Tilt/Chin Lift
- Check for normal breathing for 5 to 10 Seconds

### Step 3: Chest Compressions

- Ensure patient is on a firm, flat surface
- Put the Heel of one hand in the middle of the patient's chest
- Patient's nipple line should run through the middle of your hand
- Push hard and fast – 1/3 of the depth of the chest, or 4 cm
- Provide 30 compressions at a rate of at least 100/minute
- Push hard, push fast

### Step 4: Rescue Breathing

- Head Tilt/Chin Lift
- Pinch nose closed
- Seal over patient's mouth
- Give first breath of 1 second or until patient's chest rises
- Allow air to escape
- Give second breath. Do not overinflate

### Step 5: Using AED

- Continue CPR (30:2) until the AED arrives, or EMS arrives on scene
- Turn on the AED, and follow the instructions
- Minimize interruptions to compressions
- Switch rescuers every 2 minutes if more than 1 person available



## Two Rescuer Child CPR

Two rescuer CPR for children is identical to that with one rescuer, with one major difference.

With another rescuer (or bystander) present, **do not wait 2 minutes** to activate EMS. As soon as the Approach/Primary Assessment reveals the child to be unresponsive and not breathing normally:

- **Rescuer 1 immediately begins CPR 30:2**
- **Rescuer 2 activates EMS, gets the AED (if available) and returns to the scene**

As with Adult 2 Rescuer CPR, it is important to work as a team and **switch positions frequently**. Exhausted rescuers will not provide good CPR.

## INFANT CPR (1 YEAR AND UNDER)

### 1. **Scene Assessment and Level of Consciousness.**

» Tap and Shout – Firm flick on bottom of foot



**If you are alone, continue with assessment and CPR, if necessary, for 2 minutes (5 cycles) and then call EMS.**



**The ideal position for an infant's airway is called the "Sniffing" position. This is as if the patient was sniffing a flower. Do NOT tilt the head back too far as this can block the airway off.**

### 2. **If someone else is with you, send them to call EMS or the local emergency number for your area.**

### 3. **Open the Airway.**

» Head Tilt/Chin lift

### 4. **Quick check for Normal Breathing.**

**If the Patient IS Breathing Normally**



Monitor patient & check for other injuries and wait until EMS arrives

**If the Patient is NOT Breathing Normally**



Place the patient on a hard flat surface and begin 30 chest compressions

Follow with 2 rescue breaths (do not delay CPR waiting for face mask or gloves)

Start CPR when no normal respirations can be seen

Stop CPR when movement and normal breathing return or the AED arrives

### 5. **If by yourself and EMS has not yet been called, call after 5 cycles of 30:2 or 2 minutes.**

## One Person Infant CPR (30:2)

### Step 1: Tap and Shout

- Flick bottom of feet for response

*If patient is unresponsive:*

- Put on barrier devices, gloves, and face mask
- Get a bystander to call EMS

### Step 2: Quick check for Breathing

- Head Tilt/Chin Lift
- Check for normal breathing for 5 to 10 seconds

### Step 3: Chest Compressions

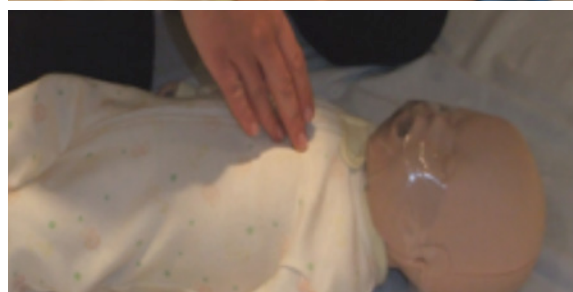
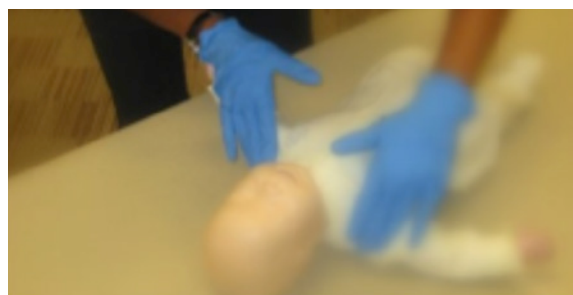
- Ensure patient is on a firm, flat surface
- Use 2 fingers, 1 finger width below nipple line
- Patient's nipple line should run through the middle of your hand
- Push hard and fast – 1/3 of the depth of the chest
- Provide 30 compressions at a rate of at least 100/minute
- Push hard, push fast

### Step 4: Rescue Breathing

- Head Tilt/Chin Lift
- Seal over patient's mouth and nose
- Give first slow, gentle breath of 1 second or until patient's chest rises (a 'puff of air only)
- Allow air to escape
- Give second breath. Do not overinflate.

### Step 5: Using AED

- Continue CPR (30:2) until the AED arrives, or EMS arrives on scene
- Turn on the AED, and follow the instructions
- Minimize interruptions to compressions
- Switch rescuers every 2 minutes if more than 1 person available



Recent restrictions on the use of AEDs on infants have been removed. For more detailed information on infant defibrillation, please see Section 5.

Those who work around children and infants are strongly advised to ensure they have appropriately-sized infant and pediatric pads for their AED.

## SPECIAL CONSIDERATIONS IN CPR

### Submersion or Near-Drowning

Patients of submersion may develop hypothermia. If the submersion occurs in icy water (below 5°C or 41°F), hypothermia may develop rapidly. It may be possible to revive a person even after they have been in the water for 30 minutes or more. Hypothermia may help the patient to survive. Start rescue breathing on the patient as soon as possible, even in the water. All patients of submersion who require resuscitation must be transported to hospital.

### Electric Shock and Lightning Strikes

A person may suffer electric shock from an electrical appliance or lightning. Most electric shock injuries occur in the workplace; most pediatric electric shock injuries occur in the home. Lightning strikes kill hundreds of people internationally every year; lightning injuries have a 30% mortality rate and up to 70% of survivors sustain significant morbidity. Accidental electrical shock can stop the heart from beating. This may lead to respiratory and cardiac arrest. The patient will have burns and may also be injured if he or she falls down as a result of the shock.

Do not touch the patient who is still connected to the source of electricity. Make sure the source of electricity is disconnected before touching a patient who has been electrocuted. Assess the patient's condition and start CPR if necessary. The treatment of choice is applying an AED as soon as possible to defibrillate the patient of an electrocution. Death is not always immediate.

### Pregnancy

When a cardiac arrest occurs in a pregnant woman, activate EMS first and start CPR as soon as possible. Put a pillow or some other wedge-shaped object under the right side of the woman's abdomen to shift the uterus to the left side. This will help blood return to the heart.

### Remote Areas

If you are in a remote area, make sure you give the EMS system operator very clear directions about how to find you. It is always difficult to know when to stop CPR if the patient is not responding, especially if EMS is far away. However, you should remember that most patients need advanced life support. CPR is rarely successful if it goes on longer than 10 minutes without advanced life support. To contact EMS anywhere in the Province of Ontario dial "0" and ask the operator for 911. For any other province, research the EMS number in your local phone book.

### Mouth to Nose and Mouth to Stoma Breathing

If the patient's mouth is injured and you can't use the normal technique of rescue breathing, another way to provide rescue breathing is through the patient's nose. As well, a person whose voice box (also called the larynx) has been removed may breathe through an opening at the base of the throat called a stoma. This orifice is an alternate way of providing rescue breathing to a patient that can't breathe through their mouth. A barrier device may be used.



## Guidelines for Stopping CPR

Once you start CPR you should continue until:

- An AED is available
- Trained emergency personnel arrive on scene to provide assistance
- You are too fatigued to continue
- It is unsafe for you to continue
- The patient starts breathing normally on their own



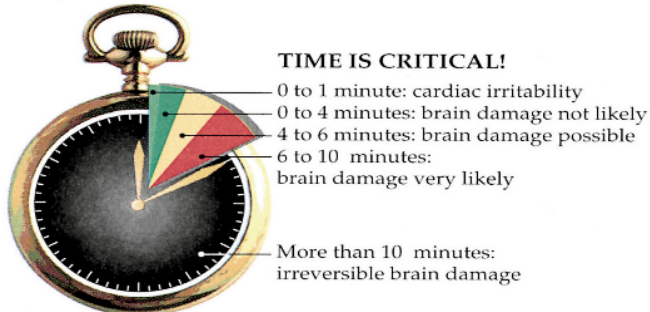
**CPR put simply:**

**“Push Hard and Push Fast!”**

**– American Heart Association**

## It's About Time

Brain death may occur in as little as 4 to 6 minutes without CPR. It is important to act quickly and confidently because every minute counts.

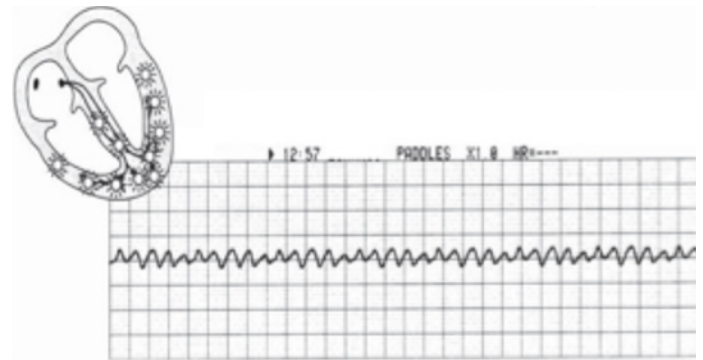


## CARDIAC ARREST VS. HEART ATTACK

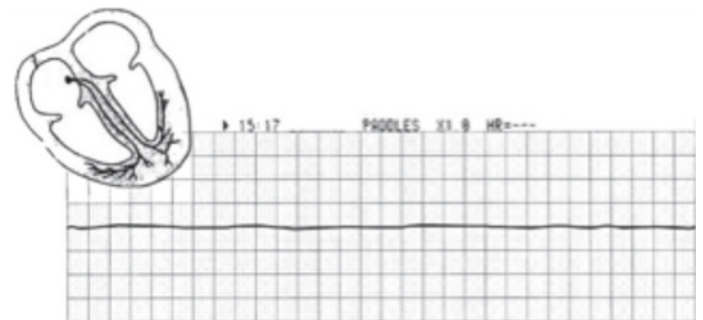
Coronary Artery Disease is a major cause of both heart attacks and sudden cardiac arrest. When someone has a heart attack, their heart may continue to beat, or they may suffer a cardiac arrest.

Sudden Cardiac Arrest means that the heart has stopped beating unexpectedly. As a result, the person stops breathing and has no pulse. Within seconds, the patient will lose consciousness. Sudden Cardiac Arrest can happen anywhere, at any time. More than two-thirds of cardiac arrests occur outside the hospital.

The most frequent lethal heart rhythm in a sudden cardiac arrest is ventricular fibrillation, or VF. This rhythm has no regularity to it and is often described as a “quivering heart”. The most effective treatment for VF is defibrillation. Early defibrillation is critical to survival from cardiac arrest.

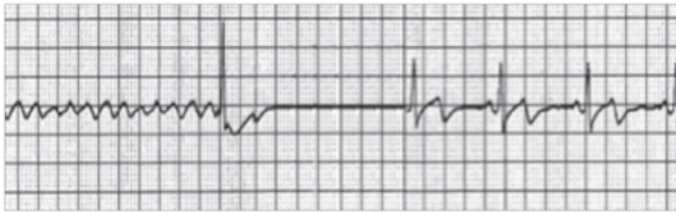


The probability of successful defibrillation diminishes rapidly over time. Many adults in VF can survive neurologically even if defibrillation is performed as late as 6 to 10 minutes after sudden cardiac arrest, with good CPR. Asystole (also known as a “flat line”) is defined as the absence of both electrical and mechanical activity of the heart and cannot be treated with defibrillation.



There are numerous causes of cardiac arrest, including:

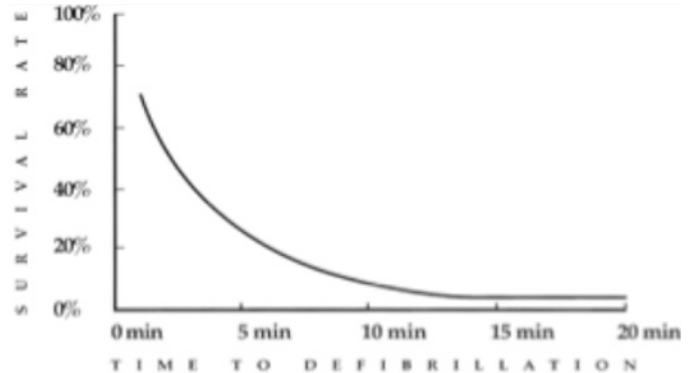
- Narrowing of the coronary arteries
- Chemical imbalances
- Trauma to the heart muscle
- Low blood oxygen levels (drowning, suffocation)
- Central nervous system damage
- Overdose of drugs and medications
- Electrocuting and lightning strikes
- Hypothermia



Every year over 20,000 Canadians suffer sudden cardiac arrest. Unless these patients are actually in hospital at the time of the arrest, most of them die. Less than 5% of people survive an out-of-hospital cardiac arrest. These statistics can be changed. Many of these deaths can be prevented if an automated external defibrillator (AED) is applied to the cardiac arrest patient within the first few minutes.

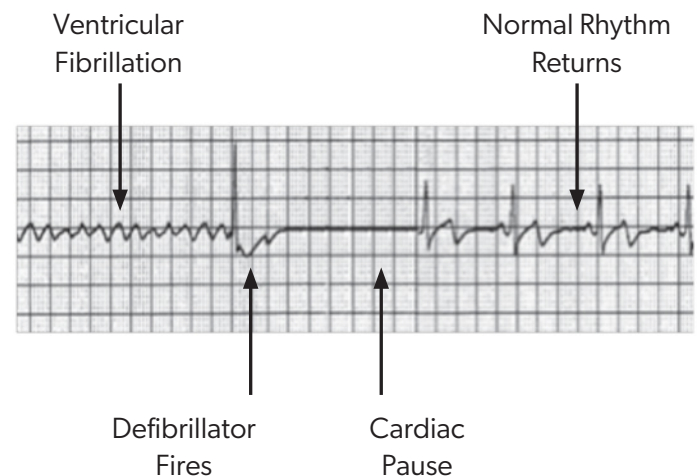


The speed with which defibrillation is performed is the major determinant of the success in a VF cardiac arrest. Hence, the earlier the AED is placed in the Chain of Survival, the better the outcome. Survival rates of beyond 50% have been seen in pre-hospital cardiac arrest. Survival rates in VF cardiac arrest decreases approximately 10% with every minute that defibrillation is delayed.



## HOW DOES DEFIBRILLATION WORK?

Defibrillation works by resetting the electrical activity of the heart, allowing the heart's natural pacemaker to re-establish an organized electrical rhythm. After the shock, the heart can regain control. The outcome of defibrillation is that the patient's heart should resume rhythmic muscular contractions.



Public Access Defibrillation (PAD) programs have been implemented with success by placing an AED in the hands of trained lay rescuers. AEDs are sophisticated, computerized devices that are reliable and simple to operate, enabling lay rescuers with cardiac arrest management training to administer lifesaving intervention. An AED incorporates a computer analysis system and a shock system. The AED advises a shock and the operator must take the final action (pressing the SHOCK button) to deliver the shock.

## SUCCESSFUL AED PROGRAM FACTORS

Extensive clinical experience has revealed that AEDs are safe, reliable, easy to use, and cost effective. Flight attendants, security personnel, police officers, fire fighters, lifeguards, family members, and many other trained lay rescuers have used AEDs successfully. Workplace Medical supports public access defibrillation programs, and is the leader in providing AED provider training to various corporate and government clients. At Workplace Medical, we train thousands of people every year in the use of AEDs throughout Canada.

There are three essential factors necessary to implement an AED program that will determine the success or failure of the program.

- Equipment
- Training
- Ongoing program support and medical direction

## Device Types and Locations

A number of reputable companies manufacture AEDs. There are differences in appearances and prompts, but the common theme of all AEDs is that they provide the power and technology to safely defibrillate a patient in cardiac arrest.



## SPECIAL SITUATIONS

Before attaching the AED, the operator should first determine whether a special situation exists that might complicate the use of the AED or require additional actions before its use.

### Patients in Water

Water is a good conductor of electricity and may provide a pathway for energy from the AED to rescuers. Water on the skin of the chest can provide a direct path of energy from one electrode pad to the other (arcing) and can decrease the effectiveness of the shock delivered to the heart. It is critical to quickly remove the patient from freestanding water and dry the patient's chest before using the AED.

## Infants

Cardiac arrest is less common in children and infants than adults. There are pediatric and infant pads for use on children under 8 years of age.

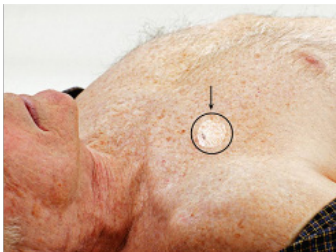
If these pads are not available it is acceptable to use adult pads on a patient under 8 years of age. It is important that the pads do not touch each other; therefore, placement of adult pads on the front and back of a small patient is suggested.

## Medication Patches

AED electrodes should not be placed directly on top of a medication patch (nitroglycerin, nicotine etc.), because the patch may block delivery of energy from the electrode pad to the heart and may cause small burns to the skin of the patient. The medication patch should be removed with a gloved hand and any residue wiped away quickly.

## Implanted Pacemakers/Defibrillators

Pacemakers and/or defibrillators have been implanted in patients by cardiac surgeons to aid in maintaining heart function. These devices create a hard lump beneath the skin of the upper chest or abdomen, usually on the patient's left side. The lump is about half the size of a pack of cards and usually has a small overlying scar. Placement of an AED electrode pad directly over an implanted medical device may reduce the effectiveness of defibrillation attempts. Instead, place the pad at least 1 inch (2.5 cm) away from the implanted device. Then follow the usual steps for operating an AED.



## Hairy Chest

Dry shave the patient's chest if needed to allow the AED pads to attach correctly.



## Hazards

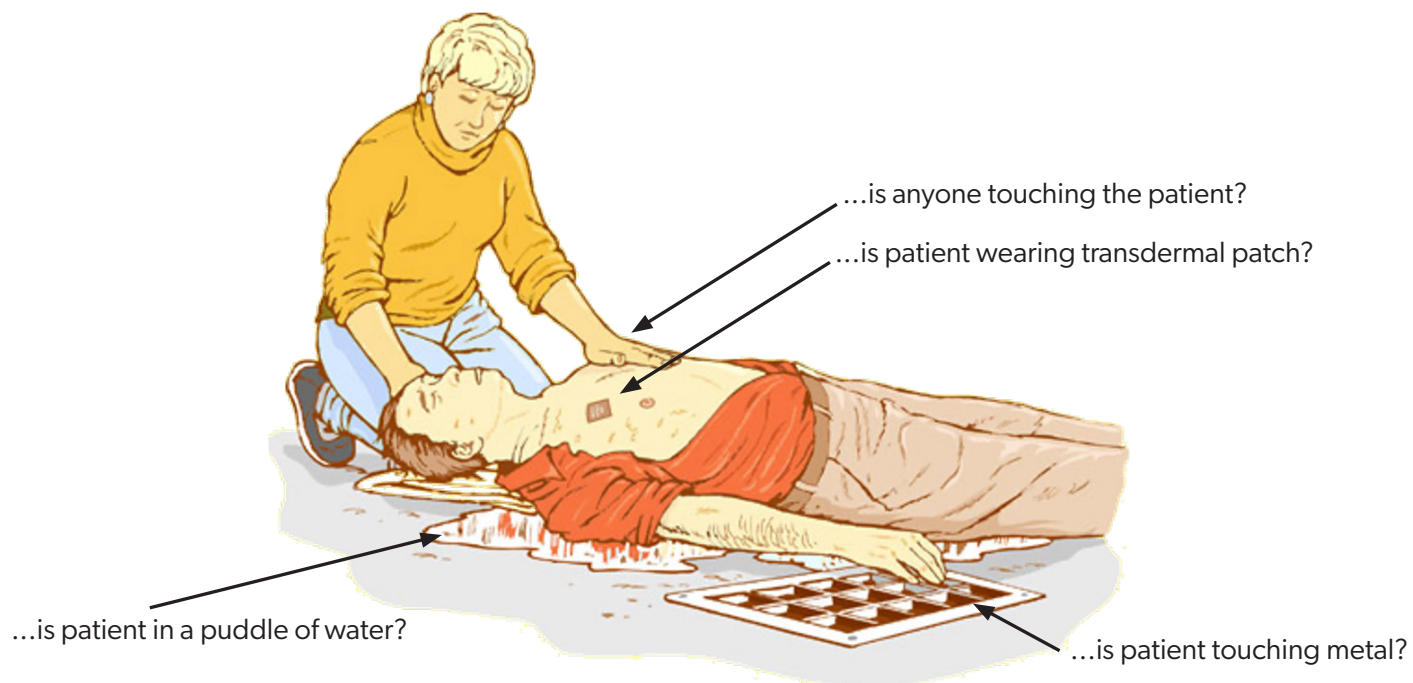
Check for hazards. Is the patient in water, or touching metal, is anyone else touching the patient, etc.

## Transdermal Patches

Look for transdermal patches – if the placement of the AED pad will be interfered with by a medication patch, remove the patch prior to placement while always wearing gloves.



## POSSIBLE SAFETY HAZARDS OF DEFIBRILLATION





## AED GUIDELINES – ADULT

### Signs and Symptoms

- Patient older than 8 years of age
- Patient is unresponsive and not breathing normally

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911, and get the AED.**
  - » If alone, you must activate the emergency medical system.
  - » If there is a bystander present, have them call and return with the AED.
3. **Open the Airway.**
  - » Head Tilt/Chin Lift
4. **Quick Breathing Check. (5-10 seconds)**
  - » Assess for normal breathing.
5. **If patient is unresponsive and not breathing normally:**

**Start CPR 30:2**
6. **Attach Electrode Pads (remove shirt/bra).**
  - » One pad to the right of the breast bone under the right collarbone of the patient
  - » Second pad lateral to the left nipple, mid-arm-pit area of the patient
7. **Power on the AED as soon as it arrives.**
  - » Some devices have an “on/off” button, or opening the lid will power on the AED
  - » Refer to instructions on the AED
  - » Pads cannot be touching

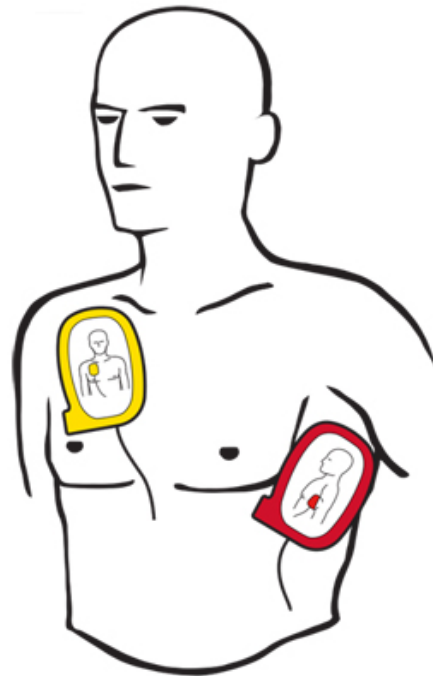
### 8. **Analyze the Heart Rhythm (some AEDs automatically analyze).**

- » DO NOT TOUCH THE PATIENT during analysis.
- » The AED will analyze the heart rhythm over 10 seconds and then prompt you.
- » Do NOT interrupt the “analysis” or “shock” modes for vomiting or choking.
- » Before pressing the SHOCK button, ensure no one is touching the patient.
- » Loudly call “Stand Clear!”
- » Perform a visual check, to ensure no one is in contact with the patient.

### 9. **Press the SHOCK button if advised.**

After every shock or a “No Shock Advised”, continue CPR.

- » If patient starts to breathe or move, place into recovery position, treat for shock and do NOT turn off the AED because the patient may re-arrest.



## AED GUIDELINES - CHILD/INFANT

### Signs and Symptoms

- Patient older than 30 days, up to 8 years of age
- Patient is unresponsive without normal breathing

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911, and get the AED.**
  - » If alone, you must activate the emergency medical system.
  - » If there is a bystander present, have them call and return with the AED.
3. **Open the Airway.**
  - » Head Tilt/Chin Lift
4. **Quick Breathing Check (5 to 10 seconds).**
  - » Assess for normal breathing.
5. **If patient is unresponsive and not breathing normally:**

#### **Start CPR 30:2**

6. **Attach Electrode Pads (remove shirt).**

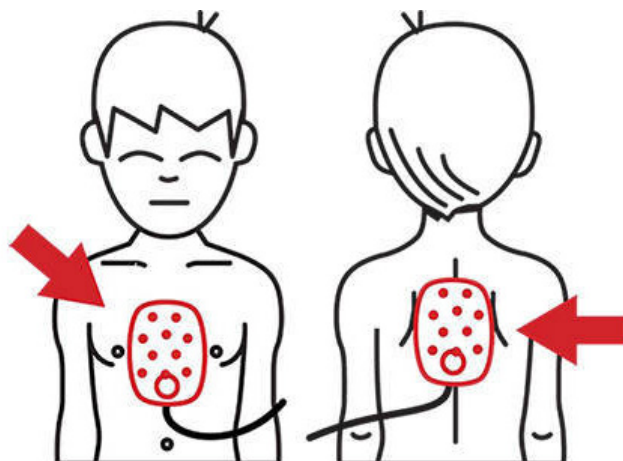
#### **Pediatric Pads:**

- One pad to the right of the breast bone under the right collarbone of the patient
- Pad lateral to the left nipple, mid-arm-pit area of the patient

#### **Adult Pads**

- Adult pads are more commonly found with AEDs than pediatric pads. However, because of their large size versus the patient's small chest – **they cannot touch each other!**

Place Adult pads on the pediatric patient as shown:



**Infant pads are placed in the same manner.**

7. **Power on the AED as soon as it is attached.**
  - » Some devices have an "on/off" button, or opening the lid will power on the AED.
  - » Refer to instructions on the AED.
8. **Analyze the Heart Rhythm (some AEDs automatically analyze).**
  - » DO NOT TOUCH THE PATIENT during analysis.
  - » The AED will analyze the heart rhythm over 10 seconds and then prompt you.
  - » Do NOT interrupt the "analysis" or "shock" modes for vomiting or choking.
  - » Before pressing the SHOCK button, ensure no one is touching the patient.
  - » Loudly call "Stand Clear!"
  - » Perform a visual check, to ensure no one is in contact with the patient.
9. **Press the SHOCK button if advised.**

After every shock, or a "No Shock Advised", continue CPR.

- » If the patient starts to breathe or move, place into recovery position, treat for shock and do NOT turn off the AED because the patient may re-arrest

## INFANT DEFIBRILLATION

For attempted defibrillation of infants and children 30 days to 8 years of age with an AED, the lay rescuer should use a pediatric dose attenuator system if one is available. Most AEDs are equipped with Adult pads only; however, infant/child pads with an attenuator can be ordered if required.

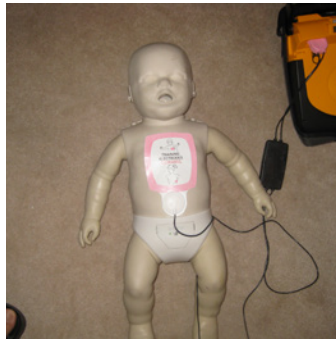
If the rescuer provides CPR to a child in cardiac arrest but the AED does not have pediatric/child pads with an attenuator system, **the rescuer should use a standard AED.**

For infants (under 1 year of age), a manual defibrillator is preferred (these are only carried by EMS). If a manual defibrillator is not available, an AED with pediatric/child pads with an attenuator is desirable. If neither is available, **an AED without an attenuator (adult pads) may be used.** Remember to place pads on the chest and back with infants and very small children.

**Infant (or Child)  
Posterior Pad**



**Infant (or Child)  
Anterior Pad**



## AED PROTOCOL

### A.E.D. Standing Order

- Must be unresponsive and not breathing, with no signs of circulation
- Over 30 days of age (pediatric pads for age 30 days to 8 years old)
- If over 8 years, use adult AED pads. Do not use child pads on an adult.
- If all conditions apply, attach the AED immediately!
- Give 1 shock followed by:
- 2 minutes of CPR; or
- Follow the prompts of the AED.

Continue CPR until EMS arrives, or the patient starts to breathe normally again.

## POST CARDIAC ARREST ISSUES

As an AED provider, the ability to restore spontaneous circulation (a pulse) following defibrillation is quite an achievement. You have performed a critical procedure in saving a person's life, but further care is essential. Once breathing and/or movement returns, you must:

1. **Maintain a clear airway.**
2. **Ensure adequate ventilation (1 breath every 5 seconds if the patient is not breathing).**
3. **Do NOT turn off the AED or remove the electrodes.**
4. **Keep the patient warm and treat for shock.**

### Transfer of Care

When EMS arrives, they will assume responsibility. Continue what you are doing until the EMS provider steps in or a natural break allows the crew to take over. Be sure to follow the direction of the EMS crew. You may be asked to continue performing CPR compressions.

## Post-Incident Procedures

Your work is not over when the cardiac arrest patient is transferred into the care of paramedics. We will assist you with the procedures listed below. Valuable data stored in the AED has to be transferred to the Medical Director and possibly the receiving hospital. Patient care forms must be completed and the AED, along with accompanying equipment used must be restocked, cleaned, and checked.

To start post-incident procedures, contact Workplace Medical Corp Inc. at **1-800-205-3278**.

Your site coordinator will direct you with simple step-by-step instructions for completing all necessary reporting requirements including:

- Completing and faxing the Patient Care Form
- Transferring data from your AED to Workplace Medical Corp Inc.
- Getting your AED and emergency response equipment ready for the next incident
- Participating in a critical incident stress debriefing (see Page 157)

## EMS REPORTING

When advanced responders (EMS and Fire) arrive, give them the following information:

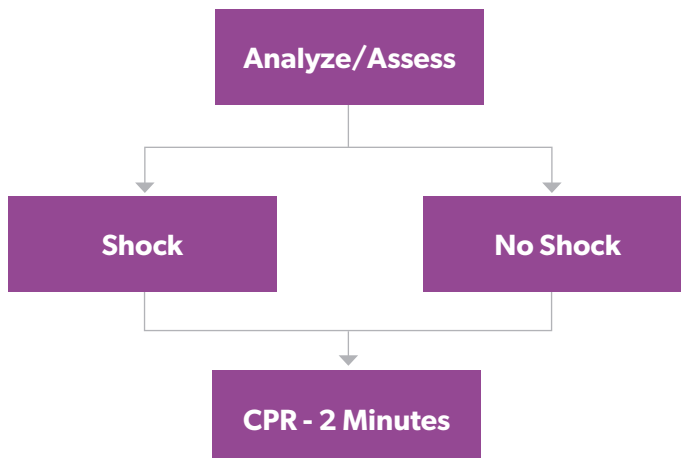
- The time the patient was found, and when CPR and AED were initiated.
- Whether the cardiac arrest was “witnessed” or “unwitnessed”.
- How many shocks (if any) were delivered.
- Approximate age, past medical history, and if the patient is on any medications.



## AED PROCEDURE

It is important to remember the following when using an AED:

- Leave the AED electrodes on the victim.
- Continue to reassess the patient’s breathing.
- Continue CPR with 30 and 2 until EMS arrives, or the victim begins to breathe again on their own.



# CHAPTER SIX

Choking Emergencies  
Respiratory Emergencies  
Asthma  
Allergies

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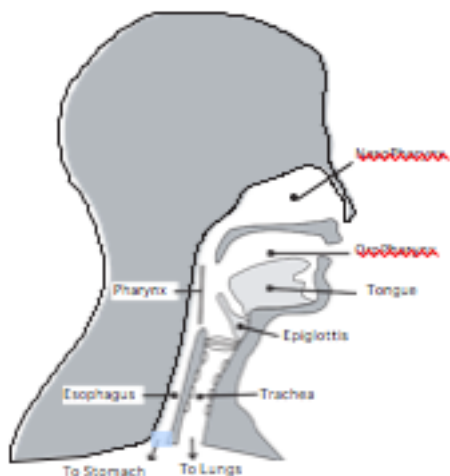
## ANATOMY OF THE RESPIRATORY SYSTEM

### The Airway

The airway is the passage from the outside world down into our lungs. At the top end, the two major airway passages are the *oropharynx*, which is the passageway that starts at the mouth, and the *nasopharynx*, which starts at the nose.

These two passageways meet up at the back of our mouth, where a common tube called the *pharynx* leads down. The *pharynx* is one of the most common sites for airway blockage, as it is used both to move air in and out, as well as for food.

The common pipe splits at the level of the larynx, also known as the vocal chords. The *trachea* leads down into the lungs and lies in front, while the *esophagus* leads to the stomach. During swallowing, the top of the *trachea* is blocked off by the epiglottis.



### Respiration and the Lungs

The lungs are the organs of respiration. Respiration is the process by which the body exchanges oxygen and carbon dioxide within its tissues. The lungs are located on either side of the heart within the chest cavity. The lungs supply the blood with oxygen inhaled from the air, and dispose of waste carbon dioxide in the exhaled air. Together, inhalation and exhalation form the process of respiration.

The lungs are composed of elastic tissue filled with interlacing networks of tubes and sacs carrying air and vessels carrying blood. Inhaled air travels from the mouth and nose through the trachea to the bronchi that extend into the lungs. Within the lungs, the bronchi branch out into many smaller tubes – the bronchioles – which culminate in clusters of tiny air sacs called alveoli. It is at this level that the gas exchange of oxygen and carbon dioxide occurs. Exhalation reverses the path of inhalation and removes the carbon dioxide waste product from the lungs.

- The air we breathe contains approximately 21% oxygen
- The air we exhale contains approximately 16% oxygen

The lungs and heart are protected within the chest cavity by the thorax. The thorax is comprised of the sternum (breast bone), 12 pairs of ribs and 12 thoracic vertebrae. The sternum, located at the front of the thorax, consists of the manubrium (top), the body (middle), and the xiphoid process (bottom).



Breathing is vital in all humans for several reasons, largely due to the brain damage that can occur just 4 to 6 minutes after the brain is starved of oxygen.

## Causes of Respiratory Emergencies

**Airway Obstruction:** An object blocking the passage of oxygen into the lungs. Food, foreign bodies and vomit can cause an airway obstruction.

**Hypoxia:** The body is not receiving enough oxygen to sustain life. An example is carbon monoxide poisoning.

**Cardiac or Pulmonary Malfunction:** The heart or breathing systems are unable to perform their normal function. Heart attacks, asthma attacks, and Sudden Cardiac Arrest are common causes of cardiac or pulmonary malfunction.

**Signs and symptoms that a patient is having difficulty breathing include:**

- Shortness of breath (S.O.B.)
- Anxiety
- Rate and depth are not normal (usually faster)
- Noisy breathing (wheezing)
- Cyanosis (skin tone is grey/blue around the mouth and nail beds)
- Confusion

## AIRWAY OBSTRUCTION

A patient can potentially suffer brain damage if they are deprived of oxygen for as little as 4 to 6 minutes and can possibly suffer brain death within 8 to 10 minutes if their airway is not maintained in an open position. An unconscious patient lying on their back may have an obstructed (blocked) airway due to the muscles in the airway relaxing, causing the tongue to fall back, covering the top of the airway.

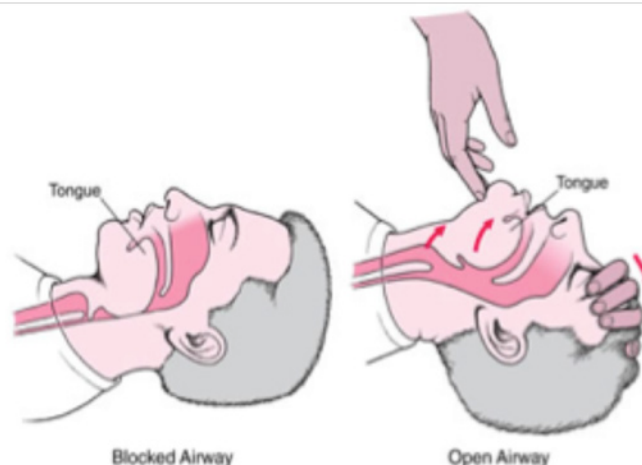
## Safety Measures to Prevent Choking:

- Keep any small objects out of reach from small children.
- Be sure to encourage small children to chew their food and discourage any talking or physical activity while eating.
- Use the recovery position to prevent airway obstruction caused by the tongue and epiglottis.
- The recovery position should also be used in patients that are vomiting.

## Mild Foreign Body Airway Obstruction

Airway obstructions are caused by anything that blocks air from entering and/or exiting the lungs. In the conscious patient, this is often caused by food, foreign bodies (especially with children), dentures, blood, and vomit.

The unconscious patient's airway obstruction is most often caused by the tongue. Prolonged airway obstruction can lead to confusion, cyanosis (pale or blue skin), unconsciousness, and death if untreated.



## ADULT

### Choking Adult: Mild Obstruction

A mild airway obstruction is when the patient is still able to cough, breathe and/or talk. Coughing is the body's attempt to clear its own airway.

Intervention here can interrupt the coughing reflex and cause an airway obstruction.

#### Signs and Symptoms

- Patient suddenly coughing
- Patient suddenly panicking
- Patient clutching at neck or throat
- Patient trying to leave while above occurring

#### Treatment

1. **Assess the scene, the mechanism of injury and the level of consciousness (The Approach).**
2. **Ask the patient: "Are you choking?"**
3. **Face the patient when doing this. Ask permission to help the patient.**
4. **If the person is coughing, talking, or breathing, encourage them to cough.**
5. **Lay rescuers should always monitor the patient's condition for changes to severe obstruction.**

**!** As long as the patient is **MAKING NOISE**, lay rescuers should only encourage their efforts. Do **NOT** physically intervene at this point.

**!** If you are able to force the obstruction out with abdominal thrusts or back blows, the patient should be **STRONGLY** advised to seek medical care immediately.

### Choking Adult: Severe Obstruction

If the patient cannot talk, breathe, or cough, or if these signs are getting worse, perform back blows and abdominal thrusts as follows:

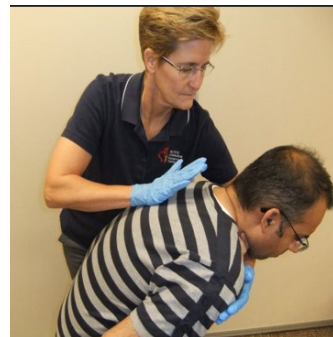
#### Signs and Symptoms

- Patient was previously a mild obstruction
- Patient is now not able to make any noise
- Patient not able to speak, breath, talk, etc.

#### Treatment

1. **Assess the scene, the mechanism of injury, and the level of consciousness (The Approach).**
2. **Ask the patient: "Are you choking?"**
3. **Face the patient when doing this.**
4. **Give 5 sharp back blows using the heel of your hand, striking between the shoulder blades.**
5. **Stand behind the patient and wrap your arms around their waist. Make a fist with one hand by placing the thumb side of your fist against their stomach in the midline, slightly above the navel and well below the ribs. Provide 5 abdominal thrusts.**
6. **Repeat back blows and abdominal thrusts until the object is expelled, or the patient becomes unconscious.**

#### 5 Back Blows



#### 5 Abdominal Thrusts



## Choking Adult: Unconscious

In the unlikely event that you are unable to get the airway obstruction out, or the more likely event that you find someone unconscious, treat as follows:

### Signs and Symptoms

- Patient found unconscious, no air entry with Rescue Breathing
- Patient who was previously mildly or severely obstructed goes unconscious

### Treatment

1. **Assess the scene, the mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911 or the local emergency number in your area.**
  - » If alone, you must activate Emergency Medical Services.
  - » If with a bystander, have them call and return to you.
3. **Start chest compressions immediately.**

### 30 COMPRESSIONS AND 2 BREATHS

#### Chest Compressions



#### Attempt 2 Breaths



4. **Check airway and for normal breathing.**
5. **Look into airway for obstruction before giving breaths. If obstruction is seen and can be removed, do so.**
6. **Head Tilt/Chin Lift, give 2 breaths until the chest rises. If no air entry, continue with CPR - 30 compressions and 2 breaths.**

**!** Depending on where the obstruction is, be very cautious that you are not blowing air into the stomach. (With the windpipe blocked, the esophagus may still be open.)

## Choking Adult: Found Unconscious

### **Treatment**

1. **Assess the scene, the mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911 or the local emergency number in your area.**
  - » If alone, you must activate Emergency Medical Services.
  - » With a bystander, have them call and return to you.
3. **Start chest compressions immediately.**

All unconscious choking patients receive CPR at a rate of:

### **30 COMPRESSIONS AND 2 BREATHS**

4. **Check airway and for normal breathing.**
5. **Look into airway for obstruction before giving breaths. If obstruction is seen and can be removed, do so.**
6. **Head Tilt/Chin Lift, give 2 breaths until the chest rises. If no air entry, continue with CPR - 30 compressions and 2 breaths.**

### ***If you have cleared the airway (object came out)***

7. **Continue CPR until the patient begins to breathe normally.**





## Choking Adult: Alone

### **Treatment**

If you find yourself severely choking, and you are alone:

- Get into an area with other people around
- Ensure that doors are unlocked
- Grab your throat to show others that something is wrong
- Try and attempt to cough
- If alone, dial 911 – even if you cannot speak. “Silent” 911 calls are not ignored; they are considered to be highest priority. Try to make yourself as visible as possible.

If you cannot get any one’s attention, or you are completely alone:

1. Place fist above navel while grasping fist with other hand. Leaning over a chair, countertop, or other hard object, drive your fist towards yourself with a hard upward thrust.



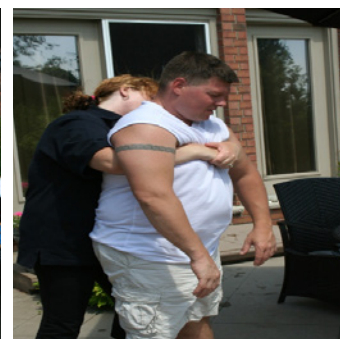
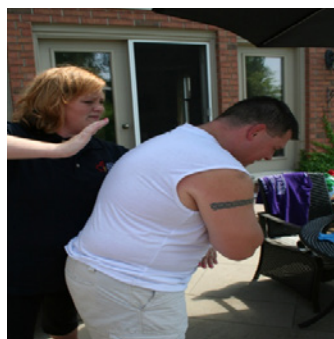
## SPECIAL SITUATIONS

### Conscious Choking: Pregnant or Obese

In the event that you find yourself presented with a patient where you cannot get your arms around their abdomen (pregnant, obese, and much larger than rescuer), consider attempting chest thrusts.

These chest thrusts are nearly as effective in rapidly forcing air out of the lungs to ‘pop’ the obstruction out. As with abdominal thrusts, significant force has to be used.

### **Treatment**



### **Five back blows**

Followed by:

- Place hands together on centre of chest between the nipple line, or one hand over the patient’s
- Landmark on middle of chest as for CPR
- Perform chest thrusts inward only
- Place hands together on centre of chest between the nipple line, or one hand over the patient’s
- 1. Landmark on middle of chest as for CPR.
- 2. Place hands together on centre of chest between the nipple line, or one hand over the patient’s one shoulder and the other arm comes under the patients arm.
- 3. Perform chest thrusts inward only.



## CHILD

### Choking Child: Conscious Signs and Symptoms

- The child may have high-pitched, noisy sounding breaths, or they may be wheezing
- Look for silent cough, increasing difficulty or not breathing, or unable to speak or breathe, pale or blue colored skin
- Patient not able to speak, breathe, talk, etc.

### Treatment

1. **Assess the scene, the mechanism of injury, and the level of consciousness (The Approach).**
2. **Ask the patient: "Are you choking?"**
3. **Face the patient when doing this. Ask permission to help the patient. If the parents are there, explain to them as well.**
4. **Give 5 sharp back blows using the heel of your hand. Strike between the shoulder blades.**
5. **Stand behind the patient and wrap your arms around their waist. Make a fist with one hand by placing the thumb side of your fist against their stomach in the midline, slightly above the navel and well below the ribs. Provide 5 abdominal thrusts.**
6. **Repeat abdominal thrusts and back blows until the object is expelled or the patient becomes unconscious.**

**5 Back Blows**



**5 Abdominal Thrusts**



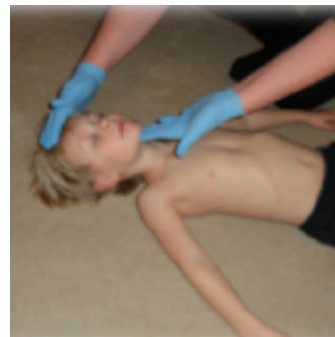
### Choking Child: Unconscious

1. **Assess the scene, the mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911 or the local emergency number in your area.**
  - » If alone, do 2 minutes of CPR, then call
  - » If with a bystander, have them call and return to you
3. **Start chest compressions immediately.**

All unconscious choking patients receive CPR at a rate of:

### **30 COMPRESSIONS AND 2 BREATHS**

4. **Check airway and for normal breathing.**
5. **Look into airway for obstruction before giving breaths. If obstruction is seen and can be removed, do so.**
6. **Head Tilt/Chin Lift, give 2 breaths until the chest rises. If no air entry, continue with CPR - 30 compressions and 2 breaths.**



**If you have cleared the airway (object came out)**

7. **Continue CPR until the patient begins to breathe normally.**

## INFANT

### Choking Infant: Conscious Signs and Symptoms

- High pitched breathing sounds, weak cry, bluish tinged skin, wheezing
- Infant pawing at face
- Infant may produce large amounts of thick, white spit



### Treatment

1. **If there are high-pitched breathing sounds, weak cries, bluish-tinged skin, or wheezing, give the infant back blows and chest thrusts.**
  - » Hold the infant with the head slightly lower than the chest on your forearm
  - » Deliver 5 back blows forcefully in the middle of the back between the infant's shoulder blades
  - » Turn the infant over, supporting the infant's head in your forearm
  - » Deliver 5 chest thrusts in the same location as chest compressions for CPR
2. **Repeat thrusts until the object is expelled, or until the infant becomes unconscious.**



## Choking Infant: Unconscious

1. **Assess the scene, the mechanism of injury, and Tap and Shout to determine the level of consciousness (The Approach).**
2. **Call 911 or the local emergency number in your area.**
  - » If alone, do 2 minutes of CPR, then call.
  - » If with a bystander, have them call and return to you.
3. **Start chest compressions immediately.**

All unconscious choking patients receive CPR at a rate of:

### **30 COMPRESSIONS AND 2 BREATHS**

4. **Check airway and for normal breathing.**
5. **Look into airway for obstruction before giving breaths. If obstruction is seen and can be removed, do so.**
6. **Head Tilt/Chin Lift, give 2 breaths until the chest rises. If no air entry, continue with CPR - 30 compressions AND 2 breaths.**



**If you have cleared the airway (object came out)**

7. **Continue CPR until the patient begins to breathe normally.**

## RESPIRATORY EMERGENCIES

Breathing difficulties can occur due to a variety of causes:

**Asthma** is a medical condition that causes narrowing of the airways and increased mucous production, making it difficult for the patient to breathe effectively.

**Bronchitis** is a buildup of mucous production in the lungs that can cause an infection.

**Inhalation of fumes** and other toxic gases can cause burns leading to swelling in the airways

**Drowning** is when water enters the lungs. Water may also touch the larynx, causing it to spasm and close completely.

**Anaphylaxis** is a severe allergic reaction that occurs when the body has a reaction to an item, such as insect bites, or foods such as peanuts or shellfish. When the patient is exposed to the item, their body produces a severe reaction that may cause swelling and closure of the airways.

**Injuries to the neck**, although the cause may differ, the signs, symptoms, and treatment are often similar.

### **Signs and Symptoms (some or all may be present)**

- Shortness of breath
- Gasping for air
- Great effort with breathing. Patient displays exaggerated use of abdominal and shoulder muscles to assist breathing.
- Positional breathing. Patients often sit upright and forward.
- Choking and coughing
- Redness and swelling around the neck
- Unable to speak between breaths
- Noisy wheezy breathing
- Skin may appear pale and/or bluish

## Treatment (Breathing Emergencies)

1. Assess the scene, mechanism of injury, and level of consciousness (The Approach).
2. Call 911 or the local emergency phone number.
3. Ensure the patient is responsive, has an open airway, and is breathing.
4. Remove patient from the location if it is dangerous.
5. Keep the patient sitting or in a comfortable position. Be prepared to assist the patient if they become unconscious.
6. You may need to perform CPR and call for the AED.
7. Continue to reassess and reassure the patient.
8. Ask the patient if they carry any sort of treatment for the illness that you can get for them. Examples of this would be a puffer or inhaler.
9. Reassure the patient. Assist patients with their inhalers if available and appropriate.

**!** As with all medication assistance, make sure that the inhaler belongs to the patient.

- Canister inhalers need to be shaken for 45 seconds before use.
- The inhaler mouthpiece goes in the patient's mouth.
- Press down on the canister as the patient inhales.
- Use an Aerochamber for children and infants.

**!** All breathing inhalers are colour-coded. The only ones that will help in an emergency are the blue/gray Ventolin (Albuterol, Salbutamol) inhalers.





## MEDICATION ASSISTANCE

Under certain circumstances, lay rescuers may need to assist patients with their own medication. While this is permitted under certain circumstances, it should be approached very carefully.

When assisting a patient with medications, the lay rescuer must make absolutely certain that the medication is the patient's own. Medication provided by a spouse, bystander, or other person that is not the patient's own is not to be used.

There are only three medications that are considered emergency in nature. These medications have the capability to prevent the patient's death within the next few minutes until the paramedics arrive. They are:

- **Nitroglycerin** (NitroDur, Nitro spray, tablets, pills, patches)
- **Ventolin Inhalers** (Salbutamol, Albuterol)
- **Epinephrine Injector Pens** (Epi-Pen, Twinject)



**Only patients who are conscious and responsive should be assisted with their medications and ONLY IF REQUIRED.**



All other medications (*Diabetic Medications, Insulin, Tylenol, etc.*) are not of immediate lifesaving potential and should not be administered – wait for the paramedics to arrive. They can administer the majority of these medications if required.

In addition, the lay rescuer must be sure of the **5 Rs** of medication administration.

- Right Patient
- Right Symptoms/Time
- Right Medication
- Right Dose
- Right Route

Some of these medications have significant side effects that the lay rescuer must understand. There are also some circumstances when they should **not** be assisted with (e.g., Nitroglycerin + Viagra).

## ALLERGIC REACTIONS AND ANAPHYLAXIS

Allergic reactions are a response to a substance that has entered or makes contact with the patient that they have a hypersensitivity to. The first time a person is exposed to the substance they very rarely have a reaction. It is the next time that the patient reacts and reactions have a tendency to get worse each time.

The allergic reaction is caused by uncontrolled release of a substance called histamine. This substance causes blood vessels to dilate, makes the vessels leak fluid, and causes breathing passageways to constrict.

Allergic reactions can develop into Anaphylactic Shock, which is a life-threatening condition.





## Common Causes

- Peanuts
- Insect bites
- Seafood
- Berries
- Medications
- Latex
- Patients can become severely allergic to ANY protein

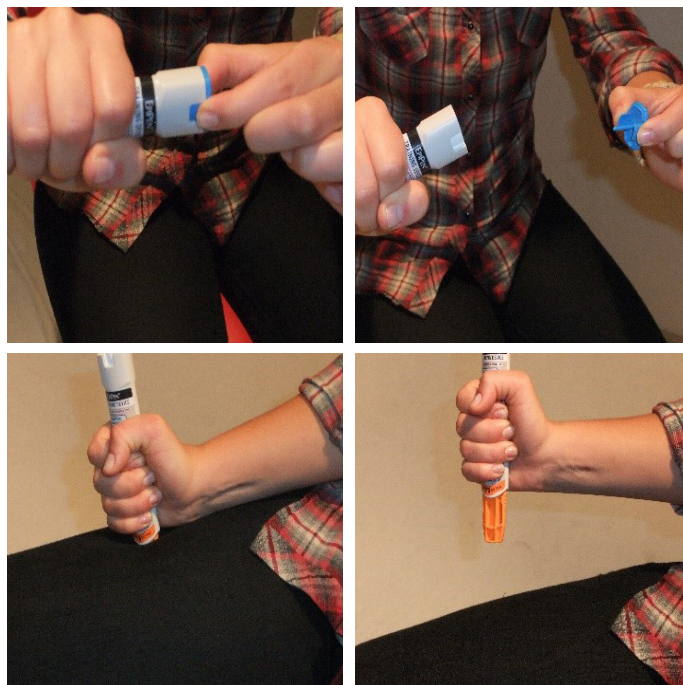
## Signs and Symptoms (some or all may be present)

- Difficulty breathing and/or wheezing
- Sensation of swelling in mouth, throat; face, neck, or lips may swell
- Tightness in the chest and throat
- Anxiety, restlessness
- Skin is itchy, with rash or hives (red raised patches) cramping
- Loss of consciousness

## Treatment (Severe Allergic Reactions)

1. **Assess the scene, mechanism of injury, and level of consciousness (The Approach).**
2. **Call 911 or the local emergency phone number.**
3. **Ensure the patient is responsive, has an open airway, and is breathing. Provide assistance as needed.**
4. **Remove patient from the agent causing reaction, if possible.**
5. **If a bee or insect sting is the cause, remove the stinger.**
6. **If swelling occurs around the neck, place cold packs on the side of the neck to help reduce swelling.**
7. **If swelling continues and breathing stops, begin CPR and call for the AED.**
8. **Place patient in a comfortable sitting position.**

9. **Find out if patient carries an Epi-Pen. If they do, assist them with it.**
10. **Be prepared to assist the patient if they become unconscious and stop breathing. You may need to perform CPR and call for the AED.**
11. **Continue to reassess the ABCs.**



Using an EpiPen or Twinject is very simple. Remove the gray cap and push into the side of the thigh with good force. Stabilize in place for 10 seconds, then remove and give to the paramedics when they arrive.

# CHAPTER SEVEN

Wound Types

Internal and External Bleeding

Bandaging and Soft Tissue Injuries

Abdominal Wounds

Animal Bites and Stings

Burns

## TYPES OF WOUNDS

**Major Wound:** Any injury that causes difficulties in a patient's ABCs.

**Contusions** or bruising is internal bleeding within damaged skin tissue. Both lead to swelling and discoloration. Ice is the best treatment for contusions and bruising. Do not apply pressure.

**Lacerations** are tears in the skin and underlying tissues.

**Abrasions** are scrapes to the surface of the skin. Treat lacerations and abrasions by washing the wound with clean running water for 5 minutes, or until the wound is free of foreign matter.

**Impaled wounds** are penetrations into the skin by foreign objects. Do not remove the penetrating object. Immobilize and treat by bandaging (stacking) the penetrating object in place.

**Amputations** are the loss of a limb due to external force. Partial or complete amputations are possible. Complete amputations are much more serious, as there is a greater potential for fatal blood loss (always monitor the ABCs).

**Oral Bleeding** such as the cheek, tongue, or gum can be treated with direct pressure with a clean dressing. Recommend the patient refrain from rinsing his or her mouth for several hours after the bleed has stopped.

## Signs and Symptoms of Wounds

- Minor or major bleeding at the site
- Pain at the site
- Discoloration at the site
- Swelling at the site
- Obvious wound

Laceration (open wound)



Puncture



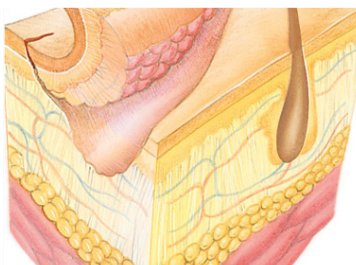
Contusion/Closed Wound



Abrasion



Avulsion

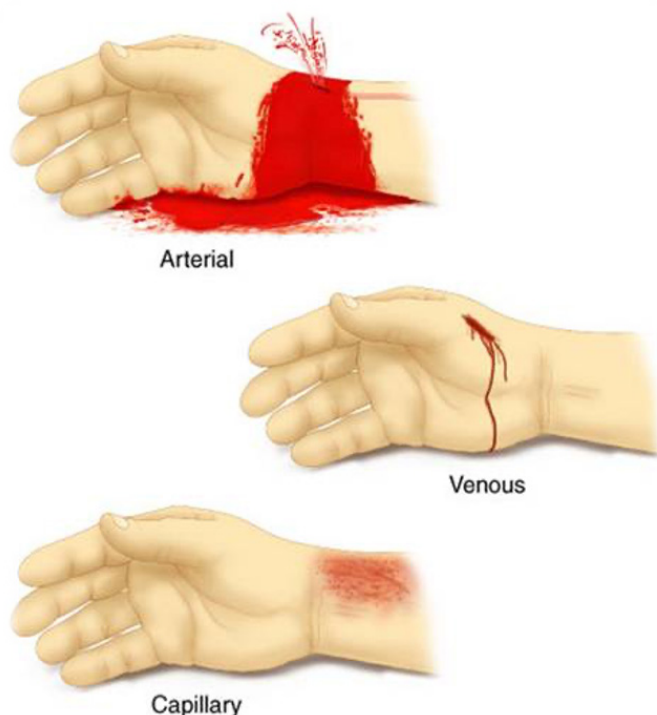


Incision Wound



## Treatment – General

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Encourage the patient to sit down in a position of comfort.**
6. **Apply direct pressure. Attempt to bandage and immobilize the site.**
7. **Monitor and reassure the patient.**



## BLEEDING

Loss of blood can cause many concerns in the body. It is important to remember that ABCs should always be dealt with first, regardless of how bad the injury or blood loss may seem.

**Internal Bleeding:** This is bleeding beneath the skin that is not always visible. The most common cause of an internal bleed is an external force hitting, twisting, or penetrating the body.

**External Bleeding:** This is a soft tissue injury caused by a cut, scrape, or puncture to the skin. Bleeding is categorized by the source:

- **Arterial Bleed:** Blood from an artery will be bright red and may be spurting from the wound. Additional pressure may need to be applied.
- **Venous Bleed:** Blood from a vein will be dark red and will ooze from the wound.

## Signs and Symptoms – Internal Bleeding

- Mechanism of injury (MOI) is often a rescuer's biggest clue
- Signs and Symptoms of Shock: cool, clammy skin, pale, anxious
- Bright red blood from the mouth, nose, or ears
- Pain and tenderness to the affected area

## Treatment – Internal Bleeding

There is no direct treatment for internal bleeding. Patients should be treated for developing shock (warmth, reassurance, recovery position), EMS must be activated, and patient's ABCs monitored continuously.



**General signs and symptoms for any bleeding will depend on the severity of the injury. Always consider the Mechanism of Injury and ALWAYS treat the patient for SHOCK.**



## Signs and Symptoms – External Bleeding

- Visible bleeding at the site
- Pain and tenderness to the affected area

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Clean wounds with running water and apply antibiotic ointment, if available, where the patient does not have allergies to antibiotics.**
6. **Place a sterile or clean dressing over the bleeding site.**
7. **Wrap dressings in place with a bandage.**
8. **Apply direct pressure to the site.**
9. **Attempt to immobilize.**
10. **Encourage the patient to sit quietly and rest. This reduces blood pressure and flow and will help control the bleeding.**
11. **Monitor and reassure the patient.**

If proper wound dressings are unavailable, articles such as clean clothing or blankets can and should be used.



**Consider the use of a tourniquet if life threatening bleeding from a limb cannot be controlled with standard bleeding control techniques.**

## Wound Dressing (Tourniquet Use)

A manufactured tourniquet should be used as first line therapy for life threatening extremity bleeding, and should be placed on as soon as possible after the injury.

- Used to control life-threatening bleeding (amputation/arterial bleed)
- Apply above the joint
- Needs to be tight
- Note the time it was applied
- Do not loosen
- 911 must be activated this is a life-threatening emergency



## BANDAGING

### Keys to Successful Bandaging

- Attempt to calm the patient and ask them to sit down.
- Check fingers or toes of injured extremities for movement.
- Bandage as necessary, taking care to move the injury as little as possible.
- Re-check injured extremities. If there is decreased movement, or loss of sensation found, loosen bandaging slightly.

### Bandaging Techniques

#### Sling

1. Unfold triangular bandage, hold the top in one hand and the corner in the other.
2. Match the angle from the top to the corner of the triangular to the angle of the injured arm.
3. Place the top over the patient's shoulder and the corner of the bandage at the elbow.
4. Let go of the triangular, walk around behind the patient and tie off the ends.



### Materials

#### Triangular Bandages, Slings, and Sterile Dressings



#### Gauze Wrap. (Kling)



#### Clothing used as an improvised sling using safety pins. *Improvise as required.*



Improvise Sling



## Bandaging Techniques – Scalp Injuries and Lacerations

1. As with all bleeding, always wear gloves.
2. Scalp injuries tend to bleed very significantly.
3. Clean water can be used to clean out the wound.
4. Use a thick, sterile dressing to apply pressure to the wound. Rescuers should be very cautious about other head injuries or skull fractures. When in doubt, EMS should be called.
5. If no concerns about spinal injuries, place in position of comfort or recovery position.
6. After bleeding has stopped, a large triangular bandage can be used to secure the dressing.



Wound  
Cleaned Water

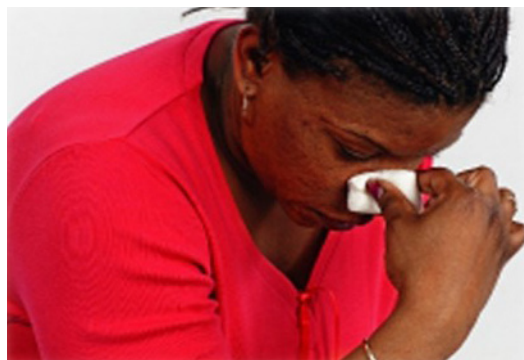


Sterile dressing held  
in place with large  
triangular bandage

## Bandaging Techniques – Nose Bleed

**Nose Bleeds** can be caused by trauma and a variety of other reasons.

1. Have the patient sit down and lean slightly forward. This minimizes the amount of blood swallowed.
2. Have the patient to squeeze the part of the nose below the bridge for approximately 10 minutes.
3. Provide a clean cloth or towel for the patient to spit blood into (gently).
4. If the bleeding doesn't stop in 10 minutes, or if the patient is older than 70 years of age, EMS should be called.
5. If injury indicates any concern for the neck or back, treat for a spinal injury.



## Bandaging Techniques – Lacerations

1. As with all bleeding, always wear gloves.
2. Apply direct pressure with a sterile dressing.
3. A broad bandage and multiple dressing can be used if the wound is large.
4. Wrap rolled gauze over the dressings to hold them in place and apply pressure.
5. Treat the patient for shock.
6. Always be on the watch for deadly bleeding. Do not hesitate to call EMS if required.



## Bandaging Techniques – Distal Circulation Check

Using bandages to apply direct pressure to control bleeding is a balance between enough pressure to stop the bleeding, but not too much.

Every time a rescuer applies direct pressure to control bleeding (either directly with a gloved hand, or with dressings), distal circulation must be checked. Distal circulation is blood flow that is “downstream” from where the pressure is being applied. Failure to check distal circulation can have significant implications for the patient.

### ***Distal Circulation Check***

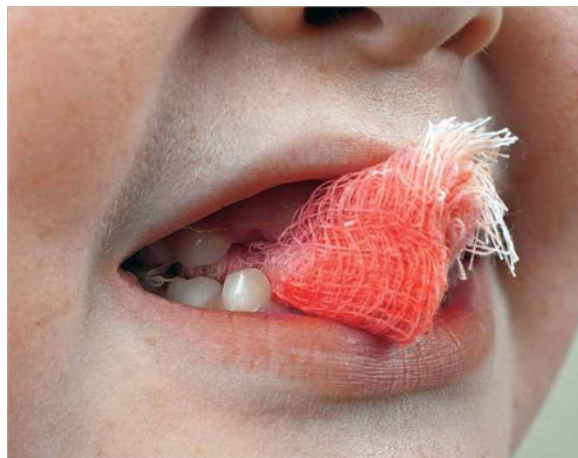
- Check pulses below the injury site.
- Check skin colour and temperature below the injury site.
- If no pulse, or the skin is pale or grey or cool compared to above the dressings, loosen them off until circulation is restored.
- Check fingers and toes for movement and sensation. If the patient cannot feel your touch, or is complaining of numbness or tingling, the bandaging is too tight.
- Jewelry should be removed and transferred to the other side, as swelling can occur.



## Bandaging Techniques – Avulsed Tooth

If a tooth is avulsed, or knocked out, first aid providers should use pressure with clean gauze to stop the bleeding. Rescuers should handle the tooth by the crown (not by the root that was in the gum) and should place the tooth in egg white, coconut water, or whole milk. If none of these are available, store the tooth in the injured person's saliva (in dressing or tissue). The patient should be taken to the dentist as soon as possible. Placing the tooth in water or milk may help preserve the tooth until a dentist can re-implant it.

The rescuer should not clean any tissue or debris from the tooth. The rescuer should not try to reinsert the tooth because it can injure the victim or harm the tooth. Lay rescuers are reminded to be very suspicious of other injuries when a patient has taken a blow to the head with enough force to knock out a tooth.



## Bandaging Techniques - Impaled Objects

1. As with all bleeding, always wear gloves.
2. Never remove the impaled/embedded object!
3. Use rolls of sterile gauze or large bulky dressings to build up around the object, providing it with support to stop movement ("Log Cabin" style).
4. Use broad bandages, sling material, or additional dressings to secure the structure in place.
5. Always check distal (downstream) circulation to ensure that the bandaging is not cutting off circulation.

### Stacked Dressings



## Treatment – Partial Amputation

1. Perform The Approach, as above. Use gloves!
2. Encourage the patient to sit down in a position of comfort.
3. Place partially amputated part back to its natural position, wrap the limb with a thick moist dressing, apply direct pressure to control bleeding, and bandage to secure.
4. Monitor and reassure the patient.

## Treatment – Complete Amputation

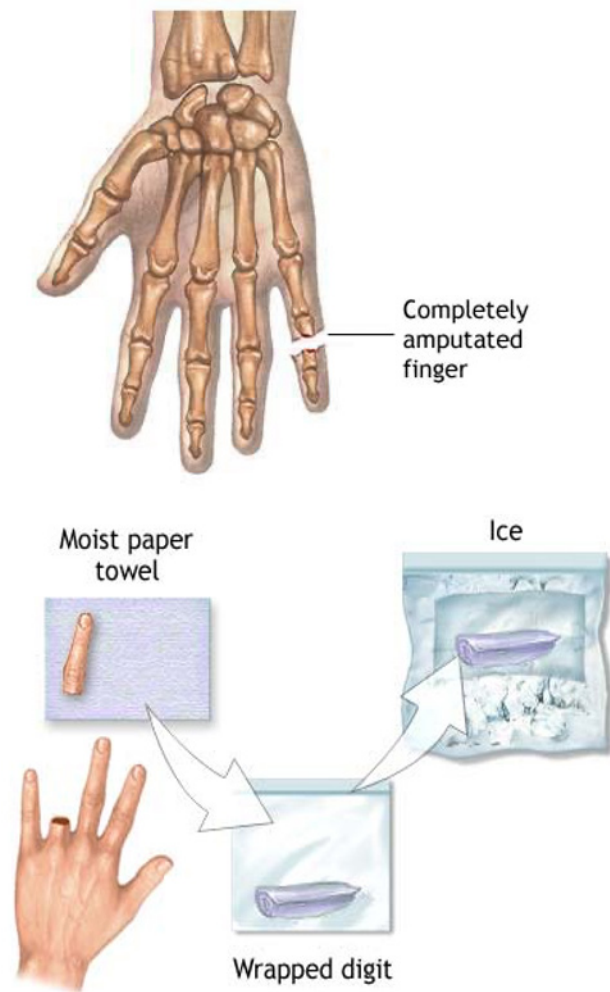
1. Perform The Approach, as above. Use gloves!
2. Encourage the patient to sit down in a position of comfort.
3. Apply significant direct pressure to the site of the injury. Wrap the amputated part in moist dressing.
4. Monitor and reassure the patient.

**!** Amputated parts should be placed in a clean plastic bag. That bag can then be placed in a second bag containing ice. Never put amputated parts **DIRECTLY** on ice, as this can prevent reattachment. Ensure the parts are transported to the hospital with the patient. Record when placed on ice.

## Care for Amputated Extremity

Follow The Approach:

- Control bleeding first/direct pressure – use your gloves.
- Cover the extremity in moist sterile dressing.
- Place extremity in a clean watertight bag/nitrile glove.
- Place in a second bag on ice.
- Attach a record of patients name, date, and time this was done.
- Do not put the amputated extremity directly on/in ice – you could further damage it.
- Take the amputated part with you to the emergency room.
- For partial amputation, gently apply direct pressure and leave in place.
- Call 911.



## ABDOMINAL/PELVIC INJURIES

Abdominal injuries are categorized into blunt or penetrating. Both types of injuries are difficult to assess because of the many organs included in the abdominal/pelvic cavity. Organs include the liver, spleen, kidneys, and pancreas, as well as many blood vessels and the intestinal tract.

**Blunt** abdominal trauma may be caused by direct force to the abdomen and may have few outward signs. Even bruises may take several hours to develop.

**Penetrating** injuries to the abdomen may result from knives, bullets, and a variety of other instruments.

Organs protruding from the abdomen (also known as **evisceration**) should be covered with a sterile moist dressing. Do not attempt to move or put the organs back in the abdomen.

**Pelvic** injuries can occur from direct forces such as car accidents and falls (especially in the elderly). It is also possible to damage the bladder in a pelvic injury. If this happens, the patient may have an urge to urinate and there may be blood in the urine.

In addition to the signs and symptoms listed below, a pelvic injury may cause one leg to be shorter than the other (dislocated pelvis) and/or the foot of the injured leg may be turned out. These patients should not be moved; they should be left in a position of comfort until EMS arrives.

### Signs and Symptoms (some or all may be present)

- Pain around the injury
- Tender to touch
- Guarding
- Internal/external bleeding
- Pain during urination
- Blood in urine



**Bleeding into the abdomen, pelvis or upper legs can be extremely severe!**

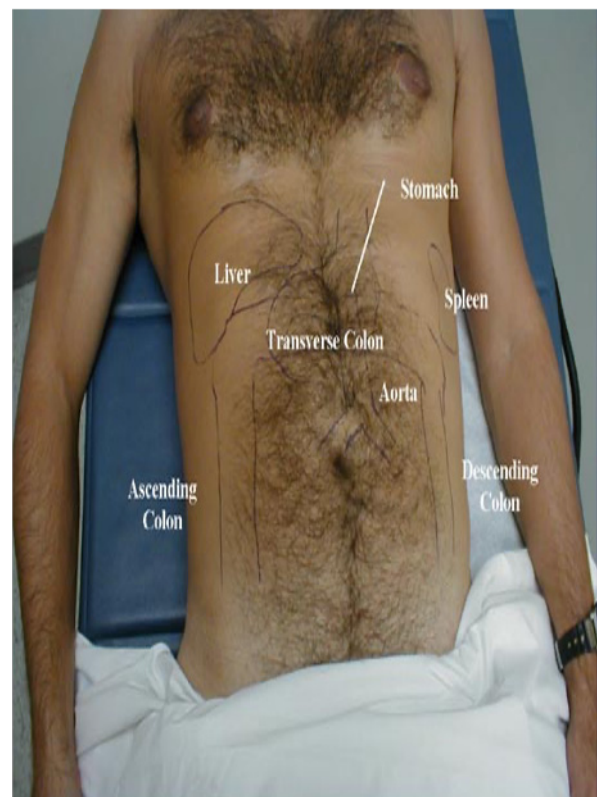
**Always consider Mechanism of Injury, and be very suspicious of hidden internal bleeding – especially for the patient spiraling into severe shock!**

### Causes:

- Blunt or penetrating trauma
- Car/bike accident
- Gunshot/knife wound

### Signs and Symptoms:

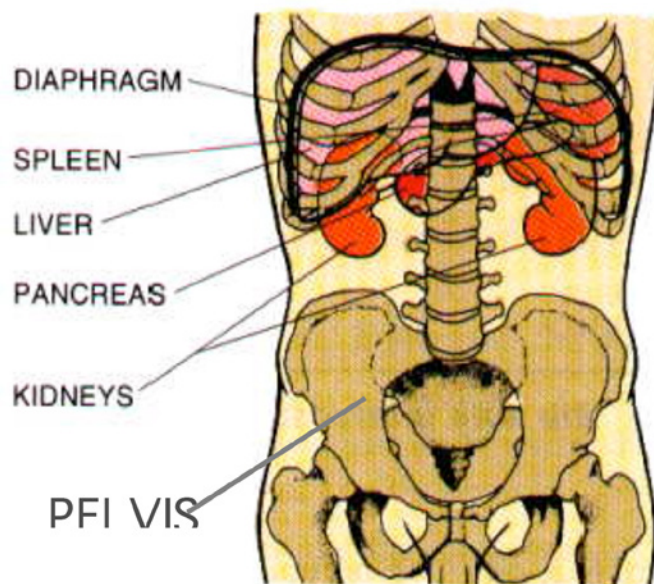
- Rapid heart rate, cool clammy skin
- Pain and tenderness to the affected area
- Guarding the area
- Distention of abdomen
- \*Possible internal/external bleeding





## Treatment

1. Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.
2. Ensure the use of personal protective equipment.
3. Call 911 or the local emergency phone number.
4. Ensure patient has an open airway and quickly check for normal breathing.
5. Cover wounds with appropriate bandages/dressings.
6. Reassure the patient and keep them warm (shock).
7. Keep the patient sitting, or in a comfortable position.
8. Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.
9. Constantly reassess and reassure the patient.



## ANIMAL INJURIES

Animal bites can be an extremely dangerous injury. The injury itself may be significant, plus there is significant worry about infection. The animal may have rabies and pass it on to the patient, or cause a wound that may become infected.

**Tetanus** is an infection that is often indicated by muscle spasms. If left untreated it can become fatal. Causes can include animal bites and wound exposure to soil, dust, or animal feces.

**Elapid** (Coral) Snake Bites: In addition to treatments below, the entire extremity should be immobilized by wrapping it with an elastic bandage that still allows one finger to fit under it.

**Human** bites, whether intentional or not, carry an extremely high rate of infection. Patients should be evaluated in hospital immediately.

### Signs and Symptoms

- Pain
- Bite marks on the skin, puncture wounds
- Bleeding from injury and swelling

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Move patient to a safe place.**
6. **Stop any bleeding with direct pressure.**
7. **Encourage the patient to rest.**
8. **Clean the wounds with water to prevent infection.**
9. **Reassure the patient.**
10. **All bites should be checked by a physician. If possible, the animal should be tested for rabies.**

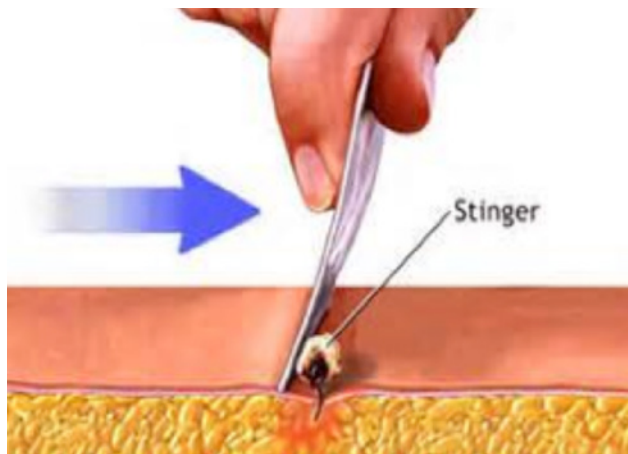


## INSECT BITES AND STINGS

Some insects sting the skin, such as bees and wasps. Insects that sting may leave a stinger in the wound. Some can be painful and some people can have a severe allergic reaction, which can lead to anaphylactic shock.

### Signs and Symptoms

- Pain at the site
- Itching at the site
- Stinger may be stuck in the skin
- Swelling, redness at the site
- Severe allergic reaction



### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Remove stinger.**
6. **Wash site with soap and water to prevent infection.**
7. **Put a cold pack on the site (not directly on the skin).**
8. **Reassure the patient.**
9. **In the case of a severe reaction, be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**

## JELLY FISH STINGS

Though rare in North America, jelly fish stings are much more common in other parts of the world. Envenomation can result in signs and symptoms ranging from mild irritation to paralysis and death. Great care is required by the lay rescuer to ensure that they do not also get stung.

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Jellyfish stings should be liberally washed with Vinegar (4% to 6% Acetic Acid solution) as soon as possible and for at least 30 seconds.**
6. **After the stingers are removed or deactivated, the pain can be treated with warm/hot (as hot as will be tolerated without burning) water immersion for 20 minutes.**

**Entering the water to get a panicked patient is extremely dangerous unless trained. Use poles, sticks, blankets, clothing, rope or anything else to reach your patient. Do not go in after them. You cannot help a patient when you are one as well.**



## BURNS

Burns can be very serious and are very painful injuries. In addition to respiratory distress, a burn can lead to hypothermia, infection, and cardiac arrest. The extent of damage due to a burn is determined by the size and depth of the burn.

- Thermal burns are caused by fire, touching a hot oven or stove, or hot steam. (Burns due to fire are often associated with smoke inhalation.)
- Chemical burns occur when chemicals such as acids, alkalis, oven cleaners, etc. come in contact with the skin.
- Electrical burns happen from live wires and should be additionally considered for other internal damages based on the path of travel. For example, a patient with electrical burns on both hands may go into cardiac arrest from the electricity that just passed through their heart. Electrical burns will have an Entrance and Exit wound that must be treated.
- Radiation burns most commonly occur from sun exposure. However, things such as welder's flash and radioactivity can also cause this type of burn.

## Signs and Symptoms

### **1st Degree Burns**

- Skin is red and tender to touch
- Pain

### **2nd Degree Burns**

- Skin is red, may have white patches
- Blisters are present
- Severe pain

### **3rd Degree Burns**

- Skin is charred and black
- Skin is flaking off
- No pain at site (nerves destroyed)

## Treatment (Burns)

### **1st Degree**

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number, if needed.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Use cool water only to cool off burned area.**
6. **Reassure the patient and keep them warm (shock).**

### **2nd Degree**

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Remove clothing around burned area.**
6. **Use MOIST sterile dressings or burn dressings to cover burn and pull heat from it.**
7. **Immediately reassure patient and keep them warm. Shock occurs very rapidly with severe burns.**
8. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**
9. **Constantly reassess the patient.**



### 3rd Degree

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Remove clothing around burned area. If clothing is burned into skin, cut around it, but do not try and remove it.**
6. **Use DRY sterile dressings or burn dressings to cover burn and pull heat from it.**
7. **Immediately reassure patient and keep them warm. Shock occurs very rapidly with severe burns.**
8. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**
9. **Constantly reassess and reassure the patient.**

### Additional Information

Burns are immensely serious injuries. Second and third degree burns carry very high mortality rates. Shock will affect the burn patient almost immediately, while infection is the long-term concern.

All 2nd and 3rd degree burns **MUST** be seen at the hospital. Two other burn locations require immediate hospital attention: airway burns and burns to the genitals.

Airway burns are deceptively easy to get. Inhalation of hot, toxic gases deep into the patient's airway and lungs presents a severe danger of airway obstruction due to rapid swelling. If there is any suspicion that a patient has sustained an airway burn (due to mechanism of injury), EMS should be immediately activated.

### Complications of Burns

- **Shock:** Caused by blood loss or infection
- **Infection:** Burned skin causing bacteria to start
- **Breathing:** Concerns if the patient has inhaled smoke, burning lungs and airway
- **Swelling:** Causing circulation issues (jewelry, clothes)



# CHAPTER EIGHT

Diabetes

Seizures

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## DIABETES

Insulin is a hormone produced in the pancreas. As levels of insulin change, so does the amount of sugar in the blood. The brain relies heavily on sugar and insulin distribution to function normally. Diabetes occurs when insulin levels are unable to appropriately regulate the level of sugar within the blood.

### Types of Diabetes

#### ***Insulin Dependent (Type 1, Child Onset, IDDM)***

This is the more severe form of the disease. Insulin-dependent diabetics either do not make any insulin at all, or what they do make does not work properly. These patients are required to take regular injections of insulin, either from needles or via an implanted pump.

#### ***Non-Insulin Dependent (Type 2, Adult Onset, NIDDM)***

This is the less severe form of the disease, but it is still significant. Non-insulin dependent patients still make insulin, but they do not make sufficient amounts of it. They control their sugar levels with a combination of what they eat, when they eat, and oral medications.

### Hypoglycemia/Hyperglycemia

#### ***Hyperglycemia***

Hyperglycemia (high blood sugar) occurs when there is not enough insulin to move sugar into the cells. Even though sugar levels in the blood are very high, they are extremely low in the cells of the body.

Hyperglycemia is not a significant concern for the lay rescuer, as it often takes days and weeks to develop.

Signs and symptoms of hyperglycemia include:

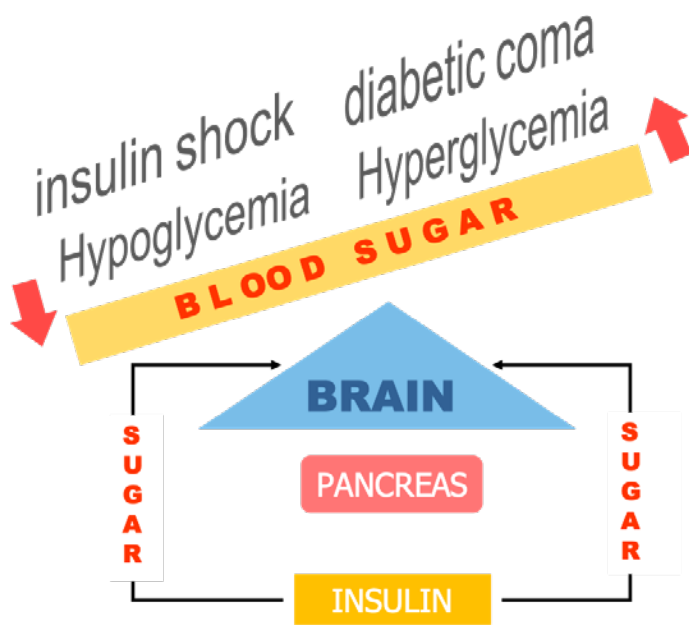
- Persistent weight loss
- Constant urination and continual thirst
- Patient becomes more and more tired and lethargic
- Patient eventually enters a diabetic coma

#### ***Hypoglycemia***

Hypoglycemia (low blood sugar) is of very significant concern to lay rescuers. It is the far more immediately life-threatening issue. Sugar levels in the blood fall very low, either because of a lack of sugar (not eating), or because of too much Insulin. Symptoms of hypoglycemia can appear within minutes and can result in a patient becoming unconscious and unable to protect their airway just as quickly.

## Signs and Symptoms

- Confused, weak, light headed
- Agitated and aggressive (patient appears intoxicated)
- Sweating, pale cool skin
- Rapid breathing and pulse
- Slurred speech, unresponsive
- Unconsciousness (insulin shock)
- Fruity odour on breath



**!** Lay rescuers should NOT give Coca-Cola or carbonated drinks to diabetics. Fruit juice or sugar water is preferred.

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Keep patient warm with a blanket, extra clothing, or anything else available.**
6. **Give glucose tablets if available and if patient is fully conscious and able to swallow. Other acceptable forms of sugar are glucose candy, sucrose candy, orange juice, or fructose such as fruit leathers.**
7. **Administration of glucose may be repeated if the symptoms persist after 10 minutes.**
8. **Place patient in a comfortable position and be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**
9. **Continue to reassess the ABCs and the patient's injuries.**
10. **Ensure that there is a responsible adult present if the patient refuses to go to the hospital (very common). The patient should see their doctor as soon as possible.**
11. **As the effects of the glucose may only be temporary, make sure that there is something present for the patient to eat. Examples are sandwiches and normal diet items that provide long-lasting sugars.**

## SEIZURES

Seizures are uncontrolled muscle contractions, associated with a loss of consciousness. The classic seizure is an epileptic seizure, which affects the total body. Epilepsy is a neurological disorder where patients can have reoccurring convulsive seizures, visual disturbances, odd behavior, and loss of consciousness. Some epileptics have all of these; some only have one or two.

### Causes

- Epilepsy
- Febrile (high body temperature, common in infants and young children)
- Head Injuries (including trauma and strokes)
- Diabetic conditions
- Illicit and prescription drug use/abuse
- Alcohol abuse and withdrawal
- Tumors (especially in the head and spinal cord)

### Signs and Symptoms

- Occasionally may be preceded by an aura (epilepsy only)
- Patient becomes unresponsive (unconscious) and their eyes may be open or may be fluttering
- Uncontrolled muscle contractions (twitching or jerking movements lasting seconds to minutes)
- Sweating with a red or blue tinge to the face
- Patient will be unconscious following an episode
- Seizure may continue for long period of time, resulting in inadequate breathing
- Suspect other injuries as a result of seizure activity like cuts and broken bones



## Treatment (Seizures)

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Do not try to put anything in the patient's mouth during a seizure.**
5. **Protect patient from further injury by protecting the head during and after the seizure.**
6. **Do not restrain arms or legs during the seizure.**
7. **When the seizure ends, ensure the patient's airway is open, and that they are breathing. Place patient in the recovery position to protect their airway.**
8. **Reassure the patient.**
9. **Treat any other injuries.**
10. **Be prepared to assist the patient if they become unconscious for a long period after the seizure.**



# CHAPTER NINE

*Approach Review*  
*Secondary Survey*  
*Transfer of Care*

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## APPROACH REVIEW

Medical emergencies can be a frightening experience for a rescuer, especially if you are not professionally trained to handle emergency situations. Common reactions may include panic and fear, caused by lack of knowledge, confidence, or preparedness.

Taking any emergency training course should be a satisfying and rewarding experience. Part of any emergency training program is the understanding of the source of injury and/or illness, recognizing

It, and treating it appropriately. It will prepare you and give you the skills required to treat someone in an emergency. However, retaining information from any course can be a challenging task. There is so much material to absorb you may find yourself hard pressed to remember what to do in an emergency. When it's time to act in an emergency, will you remember what to do, at the right time?

From our years of pre-hospital experience, we at Workplace Medical Corp. believe that learning **The Approach** to managing emergencies is a better method than trying to recall specific steps. Rather than trying to remember what to do for a given emergency problem, rescuers trained by Workplace Medical Corp.'s emergency programs learn a checklist of items to manage any emergency situation. **The Approach** is as follows:

- **Scene Assessment/Protect Yourself**
- **Mechanism of Injury/Illness**
- **Identify Yourself/Obtain Consent**
- **Level of Consciousness**
- **Call 911**
- **Primary Survey**
- **Airway**
- **Breathing**
- **Chest Compressions**
- **Defibrillation**
- **Deadly Bleed Checks**

This technique is easily retained and manages any emergency in a safe and appropriate manner. This is the same skill performed by paramedics on a daily basis.

**The Approach** is paramount in all of our emergency care programs and remains the standard of practice in pre-hospital emergency care.



## PRIMARY SURVEY

Determining the patient's level of consciousness in combination with their Airway, Breathing and Circulation status should take only moments, but can be crucial in providing the right treatment, right away.

Most patients will respond to voice and/or pain – which indicates strongly to the lay responder that their airway is open, their breathing normal, and their circulation sufficient.

However, for those patients who are unconscious or unresponsive and who are not breathing normally, immediate CPR must be provided.

Immediately starting CPR in these patients is absolutely essential.

The universal **Approach** algorithm on the following page can be used to provide lay rescuers with guidance regardless of patient presentation.

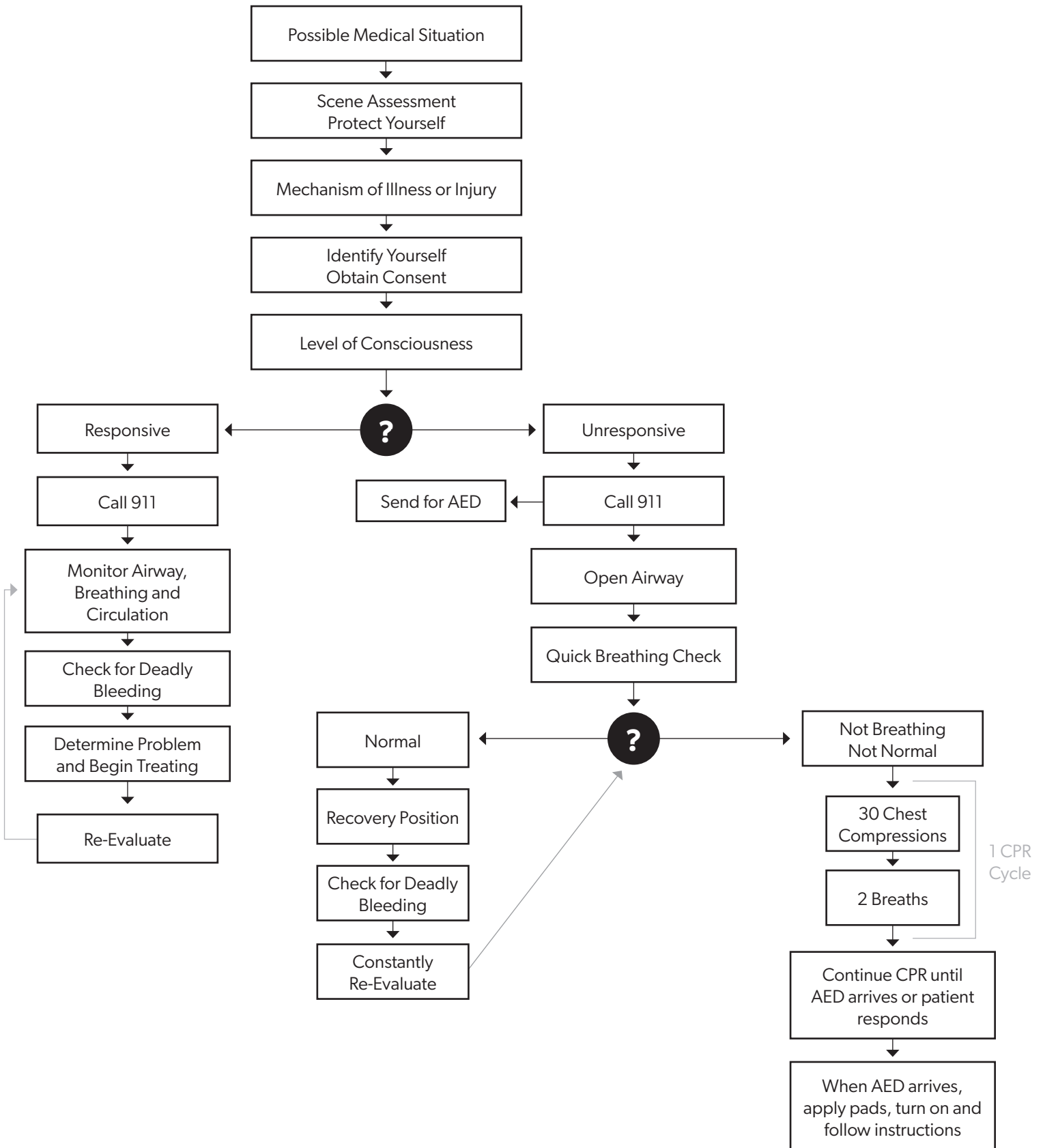
## SECONDARY SURVEY

In pre-hospital emergency care, the priorities of assessing a patient are based upon the degree of threat to the patient's life. Once **The Approach** has been completed, whether at a glance (for the conscious, alert patient) or after several steps of treatment (for the unconscious patient), you can move on to a Secondary Assessment. If any life-threatening problems are found (either during the Approach or Secondary Assessment), they must be treated **immediately**. If anything changes with your patient, immediately **re-evaluate** their Airway, Breathing, and Circulation.

The overall purpose of the Secondary Assessment is to narrow down conditions and injuries that may become more serious or even life threatening before they do. More specifically, the objectives of the on- going assessment are:

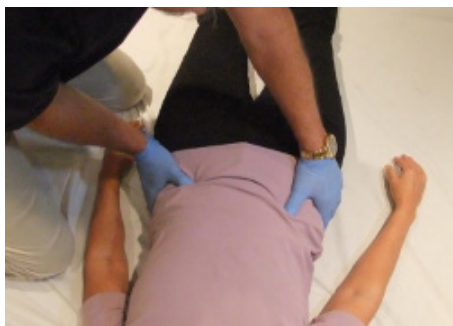
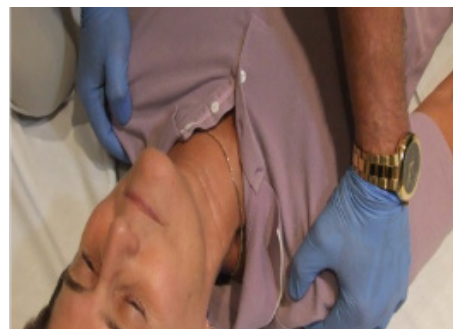
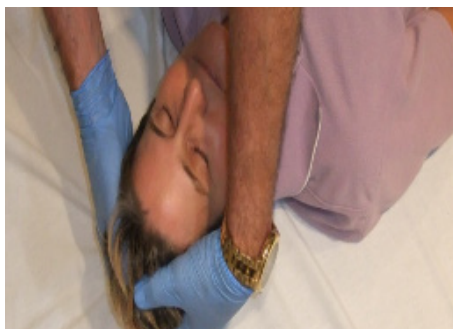
- To identify other (not immediately life-threatening) injuries and illnesses and to treat them in order of priority.
- To win the patient's confidence and thereby alleviate some of the anxiety contributing to their discomfort.
- To obtain information about the patient that may not be readily available at the time of the injury and/or illness, so you may relay it to EMS personnel or other applicable allied agencies.

## Universal Approach Algorithm



Once **The Approach** is completed, the Secondary Assessment consists of several phases:

- Head-to-toe examination in depth, looking for injuries such as:
  - Bumps
  - Bruises
  - Bleeding
  - Broken bones
  - Burns
  - Medic alert tags (bracelets, necklaces, watches, anklets, etc.)
- Treat for shock
- Constantly reassess level of consciousness and ABCs



## HISTORY GATHERING (SAMPLE)

- **S**ymptoms (in the patient's own words)
- **A**llergies (both medication and other)
- **M**edications (prescription and others)
- **P**ast Medical History (last time in hospital, what they see a doctor for, anything else.)
- **L**ast Food (eating and drinking)
- **E**vents leading up to injury/illness

If at all possible, have a bystander record as much information about the patient as possible. Examples include:

- First and last name, date of birth
- Contact phone numbers to relatives
- Medical history and allergies
- Time of incident
- Time care started/time EMS activated
- Findings from **The Approach** and Secondary Assessment
- Treatments and results

**Under NO circumstances should a lay rescuer, bystander, or anyone other than a Police Officer, Paramedic or Fire Fighter go through a patient's belongings searching for identification!**



When EMS arrives, continue treatment until paramedics take over. Do not leave. Move out of the way and be ready to answer the medics' questions in a few minutes when they have completed their own initial assessment.

**When giving report to Paramedics or Fire Fighters who have arrived on scene, please be brief. If at any time you are not certain about an answer, respond "I'm sorry, I don't know/didn't ask."**

**NEVER GUESS OR MAKE UP AN ANSWER!!**

## Vital Signs and S.A.M.P.L.E. History

While assessing the patient look for:

- ABCs
  - **A**irway, **B**reathing, **C**irculation
- Levels of Consciousness (AVPU)
  - **A**lert, **R**esponds to **v**erbal, **R**esponds to **p**ain, **U**nresponsive
- Respirations (breathing)
  - Depth and volume
- Skin
  - A normal colour, warm, dry
- Pupils
  - Reactive to light
  - Dilated/constricted

## For Conscious Patients

**S**igns and Symptoms

**A**llergies

**M**edications

**P**ast Medical History

**L**ast Ate

**E**vents (Prior History)

## TRANSFER OF CARE

When Emergency Services arrive, they will assume responsibility. It is important that you are able provide accurate information about the event or the patient.

Be prepared to explain:

- **WHAT YOU FOUND** (Scene Information, Signs and Symptoms, SAMPLE information, Vital Signs)
- **WHAT YOU DID** (What care did you or other responders provide?)
- **HOW THE PATIENT RESPONDED** (How did the patient change during the time you were with them. What caused these changes?)

Some specific information may be needed such as the number of shocks vs. non-shocks or whether an arrest was witnessed or not.

Be sure to follow the direction of the Emergency Responders. You may be asked to continue care until crew are ready to take over from you.

**When giving report to Paramedics or Fire Fighters who have arrived on scene, please be brief. If at any time you are not certain about an answer, respond "I'm sorry, I don't know/didn't ask."**

**NEVER GUESS OR MAKE UP AN ANSWER!!**





# CHAPTER TEN

*Bone and Joint Injuries*

*Chest Injuries*

*Eye Injuries*

*Pelvic Injuries*

## MUSCULOSKELETAL INJURIES

These injuries happen to bones and joints. There are four different categories of musculoskeletal injuries: strains, sprains, fractures and dislocations. These types of injuries can be caused by a fall and/or an impact like that which occurs in sporting and recreational events.

A **fracture** is a break in a bone. There are several different types of fractures:

- An **open** fracture is in which the bone has protruded through the skin. Treat the exposed bone as an impaled object.
- A **closed** fracture in which the bone is broken but the skin around it is still intact.

A **dislocation** is the separation of two bones at a joint. This usually happens at what is called a “ball and socket” joint; a long bone with a round head on the end of it is pulled or stretched, causing it to pop out of the bowl-shaped bone (or socket) it typically sits in.

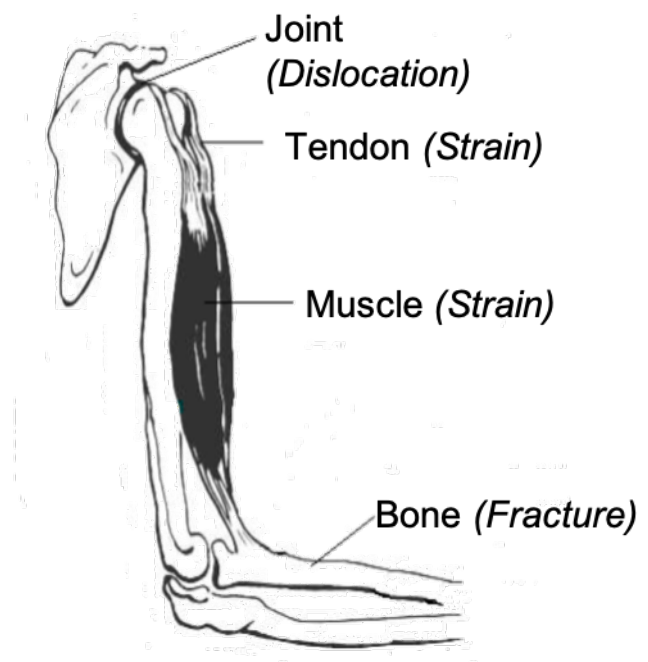
**Strains** are stretching or tearing of muscles and/or tendons.

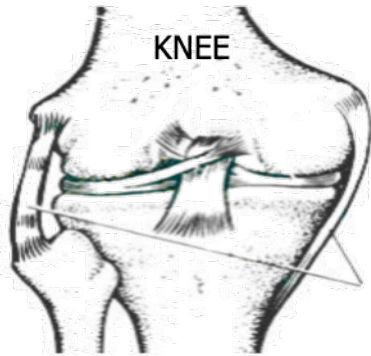
**Sprains** are the stretching or tearing of ligaments.

Without the use of x-ray equipment, it is difficult to determine the actual extent of the injury. The signs, symptoms, and treatment are very similar for each of these types of injuries.

## Signs and Symptoms

- Pain at the site of injury
- Extreme pain with movement
- Patient may hear a snapping or popping sound
- Grinding sound of broken bone rubbing together
- Possible bleeding at the injury site
- Deformity at site of the injury
- Bruising and discoloration of the skin
- Swelling





Ligaments (*Sprains*)

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Stop bleeding if present.**
6. **Place the patient in the most comfortable position. Do not move the patient if a spinal injury is suspected.**
7. **Attempt to immobilize the injured body part above and below the injury.**
8. **Place ice or cold pack over the site to reduce swelling. Do not apply ice for more than 20 minutes.**
9. **Monitor and reassure patient.**

## Femur Fractures

A femur fracture is a break in the bone of the upper leg. This fracture specifically is very dangerous and can be fatal. The femoral artery, one of the largest in the body, runs along the femur bone. If the broken bone damages this artery, the patient can lose a large amount of blood very quickly. The danger increases even more when both legs are broken.

The amount of force required to fracture a femur is significant. Rescuers should be very suspicious for other injuries, both external and internal.

## Signs and Symptoms

- Similar to other musculoskeletal injuries.
- Affected leg may be shorter than uninjured one.
- Affected foot may be rotated away from normal position.
- Extreme pain with movement.



Fractured Leg/Hip  
(Potential Blood Loss)

## ANKLE/JOINT INJURIES

Injuries to the joints are some of the most common injuries seen. A moment's inattention is often all it takes. Though these injuries generally are not severe, they can cause significant discomfort. Lower body joint injuries can take significant time to heal, as it is difficult to remain immobile for long periods of time.

### Signs and Symptoms

- Pain at the site of injury
- Extreme pain with movement
- Patient may hear a snapping or popping sound
- Deformity at site of the injury
- Bruising and discoloration of the skin
- Swelling



### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness if needed.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number if required.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Place the patient in the most comfortable position. Do not move the patient if a spinal injury is suspected.**
6. **Attempt to *immobilize* the injured body part above and below the injury. The use of pillow splints are ideal for ankle injuries.**
7. **Place ice or cold pack over the site to reduce swelling. The sooner ice is used, the less swelling. Ice should be applied for 15 to 20 minutes, then repeated again in an hour.**
8. **Monitor and reassure patient. If injuries are significant, patients should be encouraged to see their family physician.**

## EYE INJURIES

Eye injuries can be very serious and may cause impaired or permanent loss of vision.

There are three main causes of eye injuries: foreign body penetration, cuts/bruises, and burns (heat, chemical or light). Use of safety equipment such as safety glasses and face shields is always recommended.

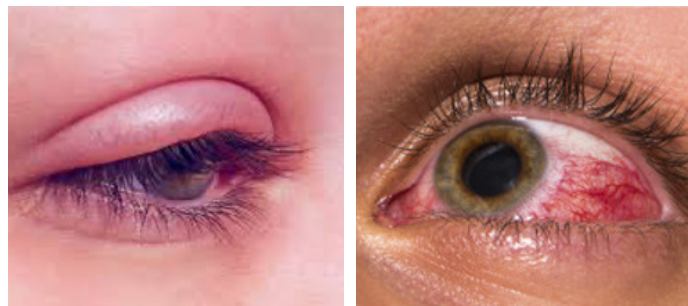
### Signs and Symptoms

#### **Foreign Body Penetration**

- Pain
- Decreased vision in the affected eye(s)
- Patient may be unable to open affected eye due to pain or swelling
- Tearing
- Bleeding from tissue surrounding the eye
- Visible particle on the surface of the eye

#### **Cuts and Bruising**

- Very painful
- Decreased vision in the affected eye(s)
- Patient may be unable to open affected eye due to pain or swelling
- Swelling or bleeding of eyelids
- Tearing of the eye
- The white of the eye may appear red
- Burns (chemical, etc.)
- Very painful
- Patient may be unable to open affected eye(s) due to pain or swelling
- Burns to skin around eyes



### **Extruded Eyeball**

This injury causes the eyeball to leave its socket. The eyeball will still be attached but dangling slightly from the socket. Use a sterile moist dressing to cover the eyeball and socket. Immobilize the patient's head with your hands to reduce movement. **There is a very high potential for head injury.**

### Treatment (Eye Injuries)

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Penetrating objects near or in the eye should be secured and not removed. Cover both eyes to prevent further irritation as both eyes move together.**
6. **For burns only, rinse the eye(s) with copious amounts of water.**
7. **Stop bleeding by lightly cover the eye(s) with sterile dressing(s) and lightly wrap to hold in place. Do not use direct pressure to stop bleeding from the eye.**
8. **Under no circumstances ever attempt to replace the eyeball in its socket.**
9. **Monitor and reassure the patient.**



Eye injuries are immensely painful and frightening. Rescuers are cautioned that attempting to cover both eyes may cause greater fear in the patient. Covering both eyes is preferred, but not absolutely required. Use common sense.



## CHEST INJURIES

Chest injuries can be extremely serious. There are two types of chest injury – open or closed. Both injuries can potentially cause shortness of breath that can be lethal in some cases. Shortness of breath can cause a patient to stop breathing completely and, if left untreated, can cause their heart to stop.

**Closed Chest Injury:** The chest wall is intact but there is injury beneath, such as fractured ribs and collapsed lung (or lungs).

**Open Chest Injury:** The chest wall has been penetrated by some object (e.g., knife, bullet, etc.).

A blast injury is caused by an explosion that has the potential to cause three separate injuries to the body:

- Injury from flying debris
- Injury from being thrown by the blast
- Injury to the lungs and other hollow organs caused by shock waves

### Signs and Symptoms (some or all may be present)

- Sharp pain associated with breathing or coughing
- Shortness of breath or difficulty breathing
- Possible bleeding and bubbling from the site of the injury
- Anxiety, fear, restlessness
- Coughing up blood may indicate lung injury
- Skin may appear pale or a bluish tinge may appear around the lips



## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Control bleeding with direct pressure.**
6. **Place patient in a comfortable position. If spinal injury is also suspected, do not move the patient.**
7. **If patient needs to lie down, lay patient on uninjured side, if possible.**
8. **Continue to monitor and reassure the patient.**
9. **Keep patient warm using blankets, extra clothing, or anything else available.**
10. **Be prepared to assist the patient if he/she becomes unconscious. You may need to perform CPR and call for the AED.**

### Treatment – Open Chest Injury

1. **In addition to the above, an open chest wound may be left exposed.**
2. **If bleeding is present and a dressing becomes saturated with blood, it MUST be changed.**
3. **Significant external bleeding should be managed with direct pressure to the chest and a non-occlusive dressing.**





## Flail Chest

A Flail Chest is caused when several ribs of the chest are fractured in two locations on the rib, creating a floating section.

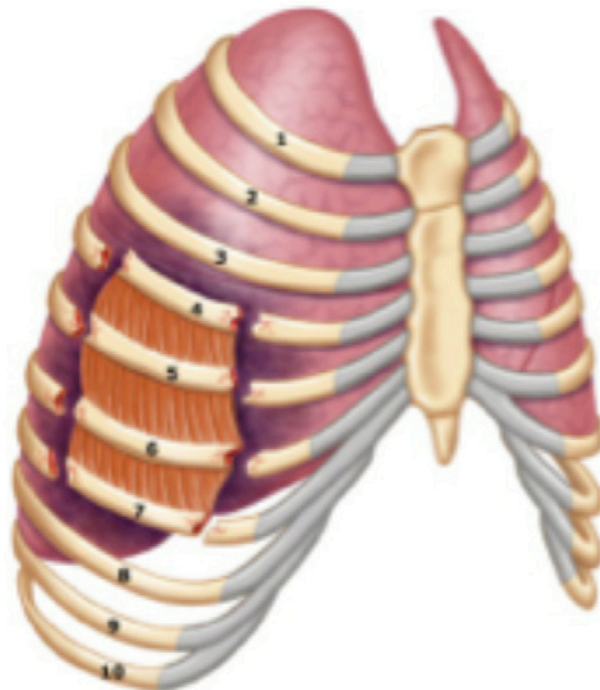
### Signs and Symptoms

- Extremely sharp pain associated with breathing or coughing
- Severe shortness of breath
- Possible bleeding and bubbling from the site of the injury
- Anxiety, fear, restlessness
- Coughing up blood may indicate lung injury
- Skin may appear pale or a bluish tinge may appear around the lips
- **Paradoxical Breathing:** The flail segment is no longer a rigid part of the chest wall, so it doesn't move normally during breathing. As the patient inhales the chest should expand, but the flail segment is pulled into the chest instead. As the patient exhales, the chest should move inward, but the flail segment puffs outward. This telltale movement is often not visible for 20 to 30 minutes after the injury due to muscle spasms.

### Treatment

1. Stabilize the flail segment by wrapping bandages (usually triangulars) around the torso to stabilize the paradoxical segment.
2. Be careful not to tie the bandage too tight, causing increased difficulty in breathing.

**!** Flail chest injuries are immensely painful. Be very aware of the patient's ABCs at all times. When tying off bandages, ask the patient to take in as large a breath as they are able when tying.



# CHAPTER ELEVEN

*Heat & Cold Emergencies*

*Poisoning Emergencies*

*Triage*

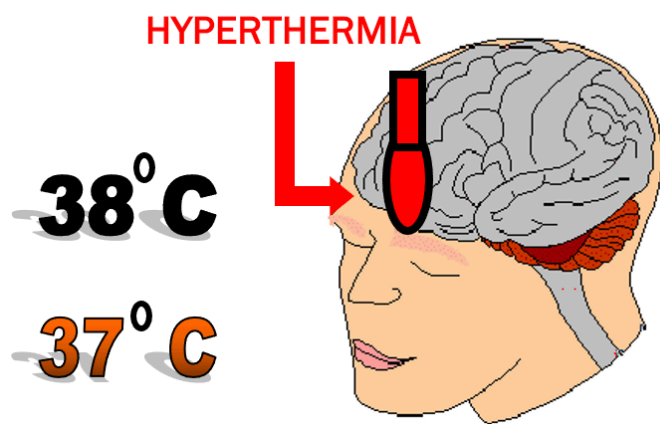
*Rescue carries*

## HYPERTHERMIA

Hyperthermia is the failure of the body to cool itself. This occurs when the patient is subjected to very hot temperatures and/or excessive exertion. Hyperthermia's true danger lies in dehydration.

### Signs and Symptoms

- Cramping of the muscles – especially abdominal
- Excessive sweating
- Heavy sweating followed by weakness, fatigue, dizziness, nausea, and cramping
- May lead to fainting or unconsciousness
- Skin is hot and dry
- Fatigue, confusion, decreased level of consciousness
- Unconsciousness and seizures



### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Remove patient from direct heat (move into shade).**
6. **Remove any excess clothing.**
7. **Place patient in sitting or lying position with legs elevated.**
8. **Do not massage cramping muscles.**
9. **Cool cloths may be used on the forehead, behind the neck, on the forearms, armpits, or groin, and behind the knees.**
10. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**



Be alert! If your cold patient stops **SHIVERING**, or hot patient stops **SWEATING**, their condition is very serious. Be cautious and gentle, however – the human body does **NOT** tolerate rapid changes in core temperature.

## HEAT STROKE

Heat stroke is the ultimate end of an untreated hyperthermia emergency. The very high core body temperatures in heat stroke ( $>41^{\circ}\text{C}$ ) can cause significant brain injury and death in a very short period of time.

Heat stroke tends to present as a result of one of two pathways. Exertional heat stroke occurs in young, fit, healthy athletes who overexert on very hot and humid days, often without drinking enough water. The combination of the environment (humidity defeats the body's ability to cool through evaporation) and the patient's own physical activity conspire to drive their temperature up very quickly.

Non-exertional heat stroke tends to affect the very young and the very old over a longer period of time. Though they may not be producing as much heat as the athlete, they also have minimal ability to cool their body.

### Signs and Symptoms:

- Similar to those listed for hyperthermia, only more severe
- Unconsciousness
- Severe seizures

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing. Be prepared to start CPR, if required.**
5. **Remove patient from direct heat (move into shade).**
6. **Remove any excess clothing.**
7. **Immerse the patient in cold or cool water. Ensure their head is supported above water, and their airway is protected.**
8. **Be prepared to assist the patient if they become unconscious. You may need to perform CPR and call for the AED.**



Because of the enormous heat in their bodies, the extreme measure of immersion is appropriate for a short time. Leaving a patient immersed too long can cause their body temperature to fall too low!

## HYPOTHERMIA

Hypothermia occurs when the body temperature is lowered under 35°C. This is often caused by exposure to cold air and submersion in cold water. Wearing warm, windproof clothes that hold moisture away from the skin, and keeping the skin dry are all ways to prevent hypothermia.

### Signs and Symptoms

#### **Mild**

- Skin feels cold to the touch
- Complaining of cold
- Shivering, chattering teeth

#### **Moderate**

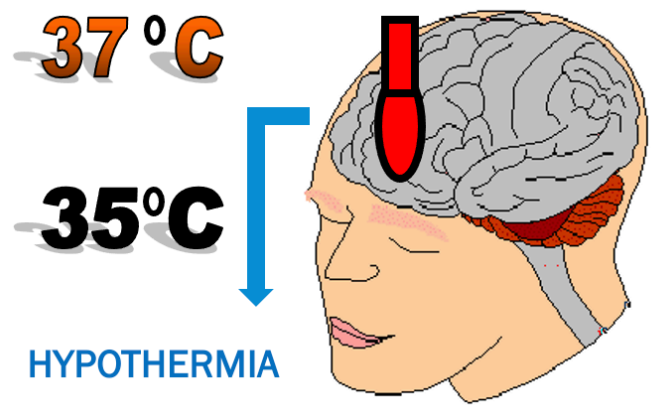
- Uncoordinated, clumsy
- Lethargic, apathetic

#### **Severe**

- Breathing and pulse are slow or absent
- Shivering stops
- Unconsciousness

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing. Be prepared to start CPR, if required.**
5. **Remove patient from the cold environment.**
6. **Remove wet clothing and replace with dry (wool is an excellent choice).**
7. **Warm patient with blankets and radiant heat.**
8. **DO NOT give alcohol, coffee, or cigarettes.**
9. **Avoid rough handling of the patient, as a hypothermic patient's heart can be very irritable.**
10. **Continue to reassess the ABCs and the patient's injuries. If patient is not shivering, handle carefully.**



## FROSTBITE

Frostbite is the **freezing** of body tissues, mainly the ears, nose, cheeks, fingers and toes. Frostbite is mainly caused by the exposure to the cold to the point that the body cannot keep itself or its parts warm. Air temperature, humidity, and wind all affect how the body maintains its temperature and how much exposure is needed before a body part suffers frostbite. There are two levels of frostbite:

- **Superficial frostbite** is when the full thickness of the skin is frozen.
- **Deep frostbite** is when the full thickness of the skin **and** the tissue underneath is frozen.

### Signs and symptoms

#### **Superficial:**

- White, waxy skin
- Skin is firm to the touch, but soft underneath
- Pain that may turn to numbness

#### **Deep:**

- White, waxy skin eventually progressing to a grayish-blue colour
- Skin is completely firm to the touch
- Complete numbness

## Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Remove patient from the cold.**
6. **Use warm water immersion (37°C to 40°C for 20 to 30 minutes.) Avoid use of chemical warmers. Prevent from refreezing.**
7. **Do not rub or massage.**
8. **Be prepared to assist the patient if he or she becomes unconscious.**
9. **Continue to reassess ABCs and the patient's injuries.**



## POISONING

Any substance that causes a patient to become sick when exposed to the body is a poison. Key pieces of information to know are:

- What is the substance they were exposed to?
- How much were they exposed to? When were they exposed?
- How did it enter the body?

### Ingested Poisons

Ingested poisons are those swallowed by mouth. Depending on the chemical, the effects can be rapid or may occur more slowly.

#### **Signs and Symptoms**

- Burning
- Stomach pain
- Nausea and possibly vomiting
- Unconsciousness

### Inhaled Poisons

Inhaled poisons are those that the patient has breathed in, such as toxic gases like chlorine, carbon monoxide, and ammonia, which can quickly cause breathing difficulties.

#### **Signs and Symptoms**

- Shortness of breath, respiratory distress
- Coughing, throat irritation
- Headaches, confusion
- Unconsciousness

### Injected Poisons

Injected poisons enter the body through a break in the skin. Examples are insect stings, animal bites, cuts from contaminated surfaces, etc.

#### **Signs and Symptoms**

- Swelling, redness, and itchiness at the point of entry
- Other signs will vary with different substances

## Topical Poisons

Topical poisons are those that are absorbed through the skin (e.g., liquid chemicals).

#### **Sign and Symptoms**

- Redness, swelling, blisters, burns, etc.
- Other signs will vary with different substances

#### **Treatment**

1. **Assess the scene, mechanism of injury, and level of consciousness (The Approach).**
2. **Call 911 or the local emergency phone number.**
3. **Ensure the patient has an open airway, is breathing, and has signs of circulation. Provide assistance as needed.**
4. **Call your local poison control centre for further direction.**
5. **Remove the patient from the poison source.**
6. **Follow instructions found on container. DO NOT MAKE THE PATIENT VOMIT.**
7. **Place the patient in a sitting position if they are conscious. Provide adequate air ventilation.**
8. **Continue to assess ABCs and treat for shock.**

When there is concern about a possible poisoning, rescuers can consider calling Poison Control. Victims should not drink anything (including milk or water) after ingesting a poison.

Rescuers should brush chemical poisons off the skin and then wash the skin with large amounts of water.

**(ONTARIO) POISON CONTROL (QUÉBEC)**  
**800-268-9017/800-463-5060**



**In a confirmed or highly-likely poisoning, rescuers should immediately call 911. Do not call Poison Control. Ensure that rescuers do not also become contaminated by the poison.**

## TRIAGE

**Triage** refers to the sorting of problems and/or patients according to their degree of seriousness. As soon as the number of victims is greater than the number of rescuers, a triage situation has arisen. In the situation of mass casualties, the purpose of triage is to accomplish the “greatest good for the greatest number”.

For that very reason, triage decisions are complicated and difficult, sometimes requiring that critically injured patients are bypassed altogether. Proper management of multiple casualties requires quickly assessing the needs of major versus minor injuries.

You must first identify any immediate life-threatening injuries/illnesses (ABCs) on each patient without actually beginning any treatment. Once all patients have been assessed, go back to any casualty with no spontaneous breathing. Patients who are conscious and breathing are bypassed at this time. Once casualties with illnesses and injuries are identified, categorize them in the following order:

1. **First to be Treated:** Typically any patient with an ABC illness or injury.
2. **Second to be Treated:** Conscious patients with injuries to head or trunk, or major bleeding.
3. **Third to be Treated:** Conscious patients with injuries to extremities.
4. **Last to be Treated:** Any patient who is unresponsive and not breathing.

## TRANSPORTATION OF THE ILL OR INJURED

### Guidelines

As a general rule, a patient should not be moved, but there are times when you should do so if:

- The area is unsafe for you or the patient – move the patient to a safe location.
- The patient is face down and needs CPR – turn the patient face up.
- The patient is unresponsive, has an open airway, and is breathing spontaneously – turn the victim onto his or her side (recovery position) with the patient’s hand in front. Be aware of the potential for nerve and vessel injury if the patient lies on one arm for a prolonged period; it may be necessary to roll the patient to the other side.
- You suspect that the patient might have a spinal injury – do not move the patient.
- The injured patient is unresponsive and has difficulty breathing because of vomiting, or if you are alone and have to leave the patient to get help – place the patient in a recovery position.

Lay rescuers must remember to treat the patient’s injuries where they find the patient lying. Never try to move an ill or injured person unless there is a further threat of harm to the rescuer and/or patient.

Employers are to ensure that arrangements are in place to transport an injured or ill worker from the work site to the nearest health care facility.



The following lifting techniques should be used for life threatening situations only.

### **Fireman's Carry**

To be utilized when there is only one rescuer and spinal injury is not a factor:

- Reassure the patient; explain fully the course of action you are taking.
- Pass your arm through the patient's legs and grasp their wrist. This will help to stabilize the patient on your shoulders and free your other hand to help you with extrication from the scene.



### **Fore and Aft Carry**

To be utilized with two rescuers:

- Reassure the patient; explain fully the course of action you are taking.
- The first rescuer passes their hand under the patient's armpits and grasps their wrists, crossing them over the patient's chest.
- The second rescuer crouches with his or her back between the patient's knees and grasps each leg just above the knees.



### **Chair Carry**

To be utilized with two to three rescuers:

- Reassure the patient; explain fully the course of action you are taking.
- The patient must be carried downstairs facing forward.
- A broad triangular bandage is used as a safety belt to secure the patient to the chair.
- A third person should be used as a guide to prevent loss of footing.



### **Log Roll onto Blanket**

To be utilized with three to four rescuers:

- The patient's extremities are immobilized with triangular bandages to protect against any possible fractures.
- Roll the blanket lengthwise for half its width, then place the roll along the patient's side.
- The first rescuer should be at the patient's head maintaining a firm grip, and will give the command to roll the patient.





- The second rescuer holds the patient's shoulders and hips.
- The third and fourth rescuers (if present) can be at the patient's hips and legs, to assist in rolling the patient. When the command is given the patient is rolled onto his or her side.
- When the patient is rolled, alignment of the body must be maintained without twisting the patient's body or neck and roll the patient as a unit. The blanket is then moved up against the patient's back.
- The patient is then rolled back over the roll of the blanket to the opposite side, the blanket is then unrolled. The four rescuers carry the patient at each corner of the blanket.

### ***Drag Carry***

The drag carry is used only in extreme circumstances when the patient must be moved quickly from danger. Hold onto clothing at the base of the neck near the trapezoid muscle, and drag the patient head-first to safety.

For patients in the sitting position with a suspected spinal injury who is not breathing, reach under the arms of the patient and use your hands to stabilize the head. Lift the patient from their armpits. A second person for this carry is best. If they are available, have them take the legs and move the patient to the ground.



# CHAPTER TWELVE

## *Emergency Childbirth* *Critical Incident Debriefing*

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### EMERGENCY CHILDBIRTH

Assisting in the birth of an infant is one of the situations in which the lay rescuer has the opportunity to participate in a happy event rather than a potentially sad one. Usually, Mother Nature ensures that childbirth is a happy event. However, sometimes assistance is required to produce a positive outcome. Ordinarily, a woman will need some assistance at some point during her labour.

Childbirth is not an “emergency” in the normal sense unless complicating factors are involved. In a normal delivery, the role of a lay rescuer is to provide support and assistance to the mother as she delivers her child, and to provide care and, if necessary, resuscitation to the newborn infant.

### The Three Stages of Labour

Labour refers to the mechanism by which the infant and placenta are expelled from the mother’s uterus, which occurs in three stages:

- **1st Stage:** Begins with the onset of regular labour pains occurring at intervals of 5 to 15 minutes. This labour serves to maneuver the infant into position.
- **2nd Stage:** Begins as the infant’s head enters the birth canal. The mother’s labour pain becomes more intense and more frequent, now occurring at intervals of 2 to 3 minutes. Crowning, which is the infant’s head bulging out of the vaginal opening, may occur in this stage. Delivery at this point is imminent.
- **3rd Stage (also known as the placental stage):** Starts after the infant has been delivered, and ends after the placenta has been fully expelled and the uterus has contracted.

### Signs and Symptoms of Impending Childbirth

- Contractions are five minutes or less apart
- The mother seems to be straining or pushing
- The infant’s head is showing
- The mother’s previous experience – “the baby is coming.”

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **Position the patient for comfort by laying her on her back with knees raised. Place a pillow or folded clothing under her head.**
6. **Place clean towels or a blanket under the patient’s buttocks. Remove underwear and any clothing in the way, but keep the patient covered for privacy.**
7. **Time the contractions and document, and reassure the patient.**
8. **DO NOT pull at the infant as it is delivered. Guide it with your hands instead.**



## Care During Birth

- As the infant's head emerges from the birth canal, support it with one hand; do not pull on the infant.
- If the umbilical cord is around the infant's neck, gently loosen and unwrap it.
- Protect the infant's airway by keeping the mouth and nose clear of mucus or fluids.
- Allow the delivery to progress, but support the infant as they can be slippery upon complete delivery.
- **Ensure the infant has an airway, is breathing (or crying) vigorously. If not, be prepared to start Infant CPR.**
- Thoroughly dry and wrap the infant in clean towels. Keep both baby and mother warm.
- Do NOT cut the umbilical cord.
- Deliver the placenta into a clean towel or container and ensure it is intact and not bleeding. Send with the mother to the hospital.
- If vaginal bleeding occurs after delivery, place dressings or feminine pads lightly over the vaginal opening. Do not pack the vagina.

## MISCARRIAGE

Miscarriage is the loss of a fetus before 20 weeks.

### Signs and Symptoms

- Vaginal bleeding
- Lower abdominal cramps
- Lower back pain
- Vaginal passage of tissue
- Signs of shock

### Treatment

1. **Assess the scene, mechanism of injury, and Tap and Shout to determine the level of consciousness.**
2. **Ensure the use of personal protective equipment.**
3. **Call 911 or the local emergency phone number.**
4. **Ensure patient has an open airway and quickly check for normal breathing.**
5. **If vaginal bleeding occurs, place dressings or feminine pads lightly over the vaginal opening. Do not pack the vagina.**
6. **Reassure the woman.**
7. **Keep the woman warm and treat for shock.**

## CRITICAL INCIDENT STRESS DEBRIEFING

Tragedies, deaths, serious injuries, and hostage and threatening situations are known as Critical Incidents. Sometimes an event is so traumatic or overwhelming that emergency responders may experience significant stress reactions.

The Critical Incident Stress Debriefing (CISD) process is specifically designed to prevent or mitigate development of post-traumatic stress among people who respond to emergencies.

The CISD process is considered one of the most important mechanisms to reduce the potential of Post-Traumatic Stress Disorder (PTSD). It allows people to verbalize their distress and form appropriate concepts about stress reactions before false interpretations of the experience are fixed in their minds.

The core focus of CISD is the relief of stress in normal, emotionally healthy people who have experienced traumatic events. Workplace Medical Corporation First Aid Training has conducted CISD and has helped many individuals in dealing with critical incident stress. Contact our head office at **1-800-205-3278** for more information.

## Signs and Symptoms – Post-Traumatic Stress

- Re-experiencing the trauma
- Flashbacks
- Nightmares
- Intrusive memories
- Exaggerated emotional and physical reactions to memory triggers
- **Emotional numbing**
- **Avoidance**
- Avoiding activities, people, or places that remind the person of the trauma
- **Increased arousal**
- Difficulty sleeping
- Difficulty concentrating
- Irritability
- Hypervigilance (being on guard)
- Exaggerated startle response

## Mental Health Awareness

### ***What can it look like?***

- Sudden change in mood
- Hearing or seeing things that aren't real
- Poor focus/concentration
- Foggy memory
- Lack of motivation
- Loss of appetite
- Varies for each individual

## How to Support



- Ask how you can help, and respect your coworker's wishes.
- Continue to include your coworker in the workplace's usual activities.
- Depending on your relationship, you can still keep in touch with a coworker who takes time off.
- When a coworker returns to work after time off due to mental illness, make them feel welcome and appreciated. Saying nothing because you're worried about saying the wrong thing can make your coworker feel worse.
- Advocate for healthy workplaces. Many wellness strategies are low-cost or no-cost, but they can still improve everyone's well-being and build inclusive spaces. Visit the Canadian Mental Health Association's Mental Health Works resource at [www.mentalhealthworks.ca](http://www.mentalhealthworks.ca) for ideas and strategies.

# NALAXONE MODULE

## First Aid for Opioid overdose

*First aid for suspected opioid overdose  
with or without the use of  
nasal Naloxone™*



### The Problem

- Opioid overdose deaths are rising
- Not just a “street problem”
  - 60% of overdoses occur in private residences
  - 29% of overdoses occur in public buildings, hotels, community centres, campuses
- Those at risk include regular and recreational users

## What are opioids?

- Heroin
- Illicit Fentanyl
- Opium



- Vicodin®
- OxyContin®
- Morphine
- Fentanyl
- Carfentanil
- Methadone
- Codeine



## Types of Fentanyl

### Fentanyl

- Prescribed in patch form as a painkiller
- 50-100x more toxic than morphine

### Illicit Fentanyl

- Being made illegally and sold on the streets
- Is mixed with other drugs (cocaine/heroin/crack)
- Being pressed into pills to look like oxycontin/Percocet/speed

### Carfentanil

- Opioid used by vets for large animals & NOT for human use
- 10,000x more toxic than morphine
- 100x more toxic than fentanyl

Source:

[www.ottawapublichealth.ca/en/public-healthtopics/fentanyl-and-carfentanil.aspx](http://www.ottawapublichealth.ca/en/public-healthtopics/fentanyl-and-carfentanil.aspx)



## Opioid OD – Methods of Exposure

- Dermal
  - Absorbed through the skin
- Airborne
  - Breathing in powder
- Mucus Membrane
  - Eyes/Nose/Mouth



## Opioid OD - Signs and Symptoms



## WHAT HAPPENS IN AN OVERDOSE

- Breathing slows and often stops
- Oxygen levels in the blood drop and the patient loses consciousness
- If breathing stops within minutes the heart will stop (cardiac arrest)
- Treatment
- **Nasal Naloxone and rescue breaths**

## OPIOID OVERDOSE RESPONSE

**Step 1:** Shake, Sternal Rub, Shout

**Step 2:** Call 911 – stay on the line!!

**Step 3:** Administer Nasal Narcan

**Step 4:** Provide rescue breaths

**Step 5:** If not waking up in 3 minutes – provide the second dose

If no signs of life start chest compressions

# Opioid Overdose

## Scene Safety

### Assessment Phase

- Drug paraphernalia
- Tablet wrappers around the person
- Powdery substance on the person or in the **environment**



### Action Phase

- Check for personal and scene safety
- Don available PPE before approaching suspected opioid patients



## Opioid OD – The Antidote



### Naloxone/Narcan (Nasal or IM)

- Used in the emergency treatment of a known or suspected opioid overdose
- IS NOT a replacement or substitute for emergency medical care, EVEN IF the person wakes up

## How it works

- **How does naloxone work?**
- Naloxone can restore breathing within 2 to 5 minutes. When you take an opioid, it affects certain receptors in your brain. Naloxone works by kicking opioids off the receptors in your brain and binding to those receptors instead. This reverses or blocks the effects of opioids on your body.
- Naloxone only works if you have opioids in your system, such as: fentanyl, heroin, morphine, codeine

## Is Naloxone safe?

- Naloxone is safe for all ages. It only works if you have opioids in your system. You cannot use naloxone improperly and does not create dependence. It is safe to keep a naloxone kit on hand.



## Opioid OD – Nasal Spray

### KEY STEPS TO ADMINISTERING NARCAN® NASAL SPRAY:

#### PEEL



Peel back the package to remove the device. Hold the device with your thumb on the bottom of the plunger and 2 fingers on the nozzle.

#### PLACE



Place and hold the tip of the nozzle in either nostril until your fingers touch the bottom of the patient's nose.

#### PRESS



Press the plunger firmly to release the dose into the patient's nose.

Source: [www.narcan.com](http://www.narcan.com)





## HOW DOES NASAL NALOXONE WORK

- Nasal spray directly enters the blood stream through the lining of the nose
- Restores breathing and consciousness reversing the effects of opiates
- Acts fast (usually within 5 minutes)
- Reversal effects last up to 90 minutes
- Very safe

## Why does naloxone only work temporarily?

- While naloxone is only active in the body for 20 to 90 minutes, the effects of most opioids last longer. This means that the effects of naloxone are likely to wear off before the opioids are gone from the body, which causes breathing to stop again.
- Naloxone may need to be used again, depending on the amount or type of opioid taken, or how the opioids were taken (for example: oral, injection).

## Opioid OD – Naloxone Available

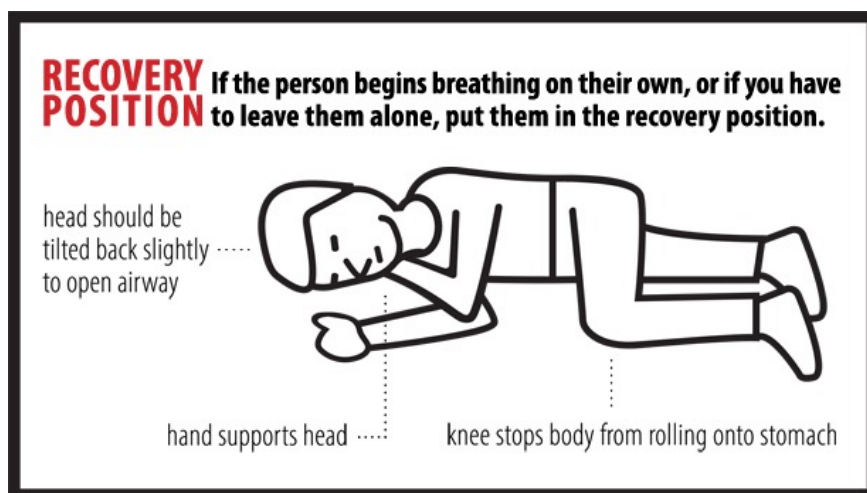
- **Call 9-1-1**
- Position individual on their back and open airway
- Not breathing = start CPR
- With a barrier device, give rescue breaths:
  - If you are alone, complete one full cycle of CPR prior to administering the first dose of Naloxone; or
  - If you are with someone, one first aider should perform CPR while the other administers Naloxone.
- Administer Naloxone Nasal Spray as trained
- **Continue care with CPR until EMS responds and takes over, or the person wakes up**

## Opioid OD – No Naloxone

- **Call 9-1-1**
- Position person on their back and open airway
- Not breathing = start CPR constant compressions
- With a barrier device, give two rescue breaths
- Continue CPR until:
  - EMS arrives and takes over; or
  - Surroundings change and unsafe to do so; or
  - Person wakes up; or
  - You physically can't continue



## Opioid OD – Breathing



Source: [www.ontario.ca/page/get-naloxone-kits-free](http://www.ontario.ca/page/get-naloxone-kits-free)