

2023  
EDITION

# It's What You Know

First Aid Matters...  
For a Second Chance



**It's what everyone should know...  
A quick reference guide for FIRST AID & CPR**

**Includes a 20 page injury prevention section**

NAME: \_\_\_\_\_

COURSE: \_\_\_\_\_ DATE: \_\_\_\_\_

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Poison and Drug Information Service (PADIS) - Alberta	1-800-332-1414
Poison Control – Out of Province	1-844 POISON-X (764-7669)
Alberta Health Link	811
Health Link - Out of Province	1-866-408-5465
Doctor:	
Dentist:	
Allergies:	
Medical Info:	



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***Our back foldout  
provides the  
quickest reference  
for CPR and  
Choking Emergency  
Responses***

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# It's What You Know

First Aid Matters...  
For a Second Chance

*A First Aid & CPR manual by:*  
**Apex Training Solutions Inc.**

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*Medical Advisors:*  
Dr. Kevin Harris, M.D. CCFP(EM) - 2011 to 2020  
Dr. Maria F. Martinez Jaraba, M.D. FRCPC - 2021 to present

The procedures and steps outlined in this manual are based on current medical recommendations, and have been provided as a supplement to participation and completion of a CPR or first aid course. As each casualty and emergency situation is different, Apex Training Solutions Inc., Dr. Kevin Harris, Dr. Maria Martinez Jaraba and Cindy L. Joly make no guarantee as to, and assume no responsibility for, the correctness, sufficiency or completeness of the contained information or recommendations or the performance of suggested procedures. As such, neither the publisher, author or medical advisor afore named shall be liable for any loss or damage associated with the contained advice. Note that information and procedures in this document are not intended to be a substitute for expert medical advice or treatment - it is provided to allow you to make informed decisions. When in doubt, consult a medical professional. There are no warranties that extend beyond the descriptions in this paragraph.

## CONTRIBUTORS

### *Dr. Kevin Harris M.D., CCFP(EM)*

Dr. Harris was the medical supervisor on this project and reviewed the text prior to printing. As an Emergency Specialist and current practicing physician, his contributions were invaluable.

Dr. Harris graduated from the University of Toronto Medical School in 1995 and completed his emergency medicine training at the University of Alberta. He has worked in urban emergency departments in Toronto and Edmonton, and has provided rural relief coverage to hospitals throughout Alberta and the Northwest Territories. He is currently an Assistant Clinical Professor in the Department of Emergency Medicine at the University of Alberta.

### *Cindy L. Joly, B.Sc. Psychology*

With her extensive background in marketing, writing and design, Cindy Joly used her creative and technical abilities to research and write *It's What You Know*. She also designed the format for the layout, typeset the text and illustrations and served as project manager, along with Pierre Schaaf. Her company, Fine Lines Marketing and Communications, specializes in creative and corporate writing and design.

### *Mitch Fortier* ([www.mitchkraft.com](http://www.mitchkraft.com))

Mitch Fortier is the talented illustrator who brought KIT and PAL to life. His suggestions and informative and colorful creations helped pull the book together and give it personality. Mitch has provided illustrations for a wide range of educational and children's resource materials.

### *Stacy Wegner, Dreamline Arts & Illusions*

It was important to provide tasteful, yet educational images of some of the injuries described in this book. Stacy Wegner, a talented artist who owns Dreamline Arts & Illusions, spent an entire day creating simulated injuries for our photo shoot. These images help depict realistic scenarios for students taking a class or readers of this book.

### *Bluefish Studios* ([www.bluefishstudios.ca](http://www.bluefishstudios.ca))

Photography throughout this book by Bluefish Studios of Edmonton. Thanks to Darren Jacknisky for his expertise, talent and patience.

*NOTE: Several images by Apex Training Solutions - noted alongside photos.*

### *Models and Reviewers*

Thanks to all our models who spent the day at our photo shoot, some of whom subjected themselves to "Dreamline-induced" injuries (random order): Telly Demetrius, Perry Lyttle, Sarah Montes, Tophie Davies, Jonathan Sharek, Toscha Turner, Lisa Hendersen, Chris Howe, Joyce Wong, James Dawson-Edwards, Agathe Joly, Daniel Blais, Lyndsay Blais, Chuck Joly, Margo Joly-Buehrer, Ken Hakes, Jill Thomas, Janice Davies, Ben Krenzke, Stacy Wegner, Nic Boucher, David Boucher, Gerry Boucher, Tracy Lyttle, Colleen Schaaf, Alex Schaaf, Matthew Schaaf, Cindy Joly, Danielle Joly, Cateline Joly, Nicolas Joly.

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## FOREWORD

Our recognition as an independent training provider in 2005 launched a new era for Apex Training Solutions Inc., as we introduced our innovative program and manual to the first aid industry. We are very excited about the fifth edition of *It's What you Know! First Aid Matters for a Second Chance*. This latest edition features the implementation of CSA Standard Z1210-17 (R2021).

This manual also includes several heart-warming stories of second chances from very unique perspectives, practical safety and prevention information throughout, as well as our Community Connections Program. Whether you are sitting in a first aid course at this very moment, picking up this book out of curiosity or intending to take a course, we hope you will consider the value of first aid and CPR training. Because you never know when you might need it!

At Apex Training Solutions, we believe that retention is improved when material is learned in a hands-on, stress-free and relaxed environment. In our courses and throughout this manual, we will introduce you to some innovative teaching tools to help you remember important information, as well as methods to encourage a review of skills and knowledge on a continual basis. We will take you through a logical journey, where you will learn useful lifesaving skills and be able to apply them at any given moment.

This manual contains important information you need to know to help someone who is ill or has been injured. Having a solid knowledge base is the first step in reacting to an emergency. Knowing the proper skills is what will ultimately help promote a casualty's recovery. We cannot stress enough the importance of having both the skills and knowledge to be an effective first aider. This manual was prepared as a supplemental teaching guide to our various first aid and CPR (cardiopulmonary resuscitation) courses. The best way to prepare yourself for any medical emergency is to take a course with a certified Apex provider and master both the knowledge and skills of first aid treatment. Once you are a trained first-aider, this manual can then be a useful guide for future reference.

One of the methods employed by Apex is to take familiar objects that everyone encounters on a daily basis – like traffic signs – and adapt the shapes and symbols to various applications of first aid training. The acronyms will help you remember the steps to take, seeing those visuals everyday will keep the information fresh and current in your mind.



*Meet KIT™. KIT™ will appear throughout this manual with pointers and as a guide to direct you to our back foldout for common emergency procedures.*

*Whenever you see KIT™ pointing, refer to our back foldout. It is a quick reference guide for CPR and Choking, as well as our emergency scene management system - the Sign of Life™.*

*Keep the STOP! Sign of Life™ panel folded out as you go through the manual. You need to refer to the Sign of Life™ at the beginning of most injuries or illnesses. KIT will remind you to review this information and other important material referenced on this back page.*

## INTRODUCTION

At some point in our lives, we may all come across an emergency situation. It may involve a total stranger, a co-worker or a loved one. Medical emergencies can be brought on by health issues or as a result of an accident. Unless we are trained professionals accustomed to dealing with traumatic situations, it is human nature to react initially by panicking. Our body responds naturally to any stressful event by releasing hormones, which prepare the body for fight or flight. If we don't know the steps to take to help a casualty, we continue to panic. However, if we are confident in the skills and knowledge we have gained from first aid and CPR training, we can transform our heightened sensitivity into focused action, and turn what may potentially be a life-threatening event into an opportunity to give someone a second chance. Apex Training Solutions Inc. strives to provide you with that confidence.

## NAOMI'S STORY

My name is Naomi. At 25, I look forward to creating a lifetime of memories with my two beautiful sons, Jonah, 4, and Micah, 9 months, and to growing old with my husband, Ryan. In addition to my family, my faith is a central part of my life, as is teaching elementary school and music lessons, as well as coaching sports teams. I consider myself a fighter and thrive on new challenges. Most of all, I love to laugh. There is one more thing that I would like to share with you. Though it doesn't define who I am, it has had more of an impact on my life than any single event possibly could...

On November 18, 2005, I nearly died. In fact, clinically speaking, I was dead. For ten entire minutes, my heart stopped beating and I had no vital signs. The only reason I am alive to tell my story is because four people who were trained in CPR and first aid took my life in their hands; and I thank God every day for their courage, their conviction and for having taken the time to learn life-saving skills.

While I have no memory of the day, it must have been a very anxious morning for me. I was to teach my first solo babysitting course, then lead my first music session at church that evening. I had been working up to these tasks, and teaching was not new to me. Nonetheless, this was a big day. The stress of these two events, plus a pre-existing medical condition, (which I was not aware of at the time) is what doctors determined caused my heart to stop beating.

My schedule was tight. I had to wrap up the babysitting course a few minutes early in order to make it to my evening commitment. I did manage to fit in a quick supper with my family, who recall nothing strange or unusual about my health or behavior during our meal together or the drive to church. Apparently I welcomed the congregation, then after the first line of the first song, bent over and collapsed.

Within seconds, four people from the congregation rushed over to help. Finding no pulse, they immediately began 2-person CPR. A nurse, who had thankfully just completed a six-week emergency medical course, took charge of my care while bystanders called 911. By the time the ambulance arrived, I had been without a heart beat for ten minutes. (As you will learn in this book, brain death begins at 4 to 6 minutes without CPR intervention.)

After defibrillation by the paramedics, I flatlined and was rushed to the local hospital. There, I had a seizure and was airlifted to the University of Alberta hospital. I spent three days in the intensive care unit and a total of two weeks in the hospital. My first memory of this incredible ordeal was waking up in my ward after one week. I could hardly believe what I was told...

Long QT Syndrome (LQTS) is an infrequent, hereditary disorder of the heart's electrical rhythm that can occur in otherwise healthy people. It can cause fainting or an irregular heart rhythm. Some arrhythmias can be fatal, as was mine.

I had unknowingly experienced symptoms of LQTS throughout my life – various fainting episodes before the age of 10, elevated blood pressure, startling easily and others - but they never caused my family or I reason for alarm or medical attention. On November 18, 2005, an acute arrhythmia caused my heart to stop beating.

After my diagnosis, doctors implanted a defibrillator in my chest, which monitors my heart rate and protects me from future arrhythmias. In the past six months, I have been “shocked” three times.

I am eternally grateful to God and to the individuals who came to my rescue that November day, and for all the love and support from family and friends. I look forward to resuming a “normal” life someday soon and am glad to share my story if it helps others realize how valuable first aid and CPR skills really are.

My baby was four months old when my heart stopped. I can't wait to celebrate his first birthday! I strongly encourage everyone to take a CPR and first aid course. You can't ever predict when or even if you will ever need it, but you just never know... You could give someone a second chance at life!



## SECOND CHANCES

### TIES THAT BIND

A joyous wedding reception quickly turned to a panic scene when one of the guests collapsed beside a dessert table. Fortunately, Karla and her husband were in the same room as 59-year old Hector and his wife. Karla had just completed her yearly CPR refresher two weeks before, and her husband was a police officer who maintained current first aid status. They tried desperately to arouse the unconscious stranger. When they found no pulse, they immediately began two-person CPR.

Karla describes their motions as “autopilot” – there was no hesitation or doubt about what to do. She felt empowered and confident and had no second thoughts about taking charge of this emergency situation. She does vividly recall remembering words repeated by the instructor – “when someone’s heart stops from a heart attack, you can’t make them worse – the person is already dead”. The one complication Karla was not prepared for was the locking of Hector’s jaw. There was the smallest opening in his mouth and it was impossible to open the airway any further. The rise and fall of Hector’s chest, however, assured them that air was getting in.

The pair continued CPR until the ambulance arrived and set up an AED (Automated External Defibrillator). By this time, Hector had been without a pulse for ten minutes. As the paramedics took over, they thanked the rescuers for a job well done, but suggested that Hector’s survival chances were not good. At the moment that Karla was relieved of her life-saving efforts, the adrenaline and fire that gave her strength and courage suddenly gave way to an overwhelming emotional meltdown. Aside from the magnitude of the situation, the reality that he may not make it was almost too much to bear. As Karla and others were being comforted and Hector was wheeled out on a stretcher, the room fell silent when Hector called out. He asked for his wife...

Hector knew he was a candidate for heart failure before his near fatal attack. In the hospital, doctors performed a quintuple bypass and Hector has enjoyed a complete recovery.

Karla also went through a lengthy recovery period. Involvement in such an extraordinary experience – regardless of the outcome – is very traumatic and the rescuer needs time to heal as well. Several memories of the ordeal stayed with her – a distinct odor and gurgling sound, in addition to flashbacks for about a week. Karla struggled with feelings of responsibility, denial and an incredible range of other emotions. She accomplished her healing through talking with others.

Hector and Karla have developed a special relationship and make an effort to unite their families on a regular basis, despite living across the country. Karla has received several awards, including the Canadian Bravery and Recognition Award, an Honorable Testimonial Award and recognition from the Royal Canadian Humane Association.

## SO MUCH AT STAKE

Supper at the in-laws can be a memorable experience for a variety of reasons. For Dave, the night that will forever stand out was when his father-in-law said goodnight, then thanked him for saving his life.

It was a typical family gathering. The dining room was busy with chatter and the clanking of dishes. The only person who heard the odd sound – almost a combination of a hiccup and a burp - from Pat, was his son-in-law, Dave, who sat beside him. Pat was always a fast eater and continued hastily with his meal. Dave watched with growing anxiety as Pat drank water and struggled with his breath. It was obvious that Pat was growing more uncomfortable. When he got up to go to the sink, Dave immediately followed him and asked if he was choking. Pat turned to him with red desperate eyes and nodded his head frantically.

Dave had taken his first aid training three years before and returned every year for updates. He really didn't think about what he needed to do, he just did it. Practicing on a classmate was very different than performing abdominal thrusts on an actual choking casualty. With his first two attempts, nothing happened. In the meantime, Pat was becoming more and more distressed. The third aggressive thrust lifted Pat off the floor, and finally the food became dislodged. Pat took a welcome breath and recovered quickly.

The evening could have ended in a very different manner. One of Dave's brothers-in-law was quite shaken by the event and said he would have had no idea what to do to help.

Dave plans to keep up with his first aid training and was just happy to be at the right place at the right time.



*(While Pat didn't follow up by going to a doctor after his choking episode, a choking casualty should always seek medical attention.)*

## LEGAL ISSUES

During Apex courses, instructors hand out the Workplace Health and Safety Bulletin, which outlines several acts and regulations that protect first aiders who act in good faith. This document also provides information about completing and keeping First Aid Records. If you are not enrolled in a first aid course, but would like information about legal issues, contact our office.



If you do nothing else in a medical emergency or life-threatening situation, **ACTIVATE EMS.**

Getting trained personnel to the aid of a casualty as soon as possible may be the difference between life and death!

### **Always obtain consent!**

If a casualty is unconscious, you may assume consent.

If the casualty is a child or infant, ask a parent or care giver.

Tell the casualty what you are doing and going to do.

It will help make them more comfortable and confident in your actions.

## **ROLES AND RESPONSIBILITIES**

As a first aider, your role is to take charge of an emergency situation and help a casualty who is injured or suffering until trained emergency medical personnel take over. Remember, first aid is not medical help (medical help is performed or supervised by a medical doctor). First aid is assistance that may promote recovery and quality of life. As a first-aider, your priorities are to:

- maintain an airway
- ensure effective breathing / circulation
- control bleeding
- and prevent further injury

When your job description identifies it, you may be obligated to respond in an emergency situation at your workplace. In general, however, as a bystander, you have the right to decide whether or not to act. There are several pieces of legislation that protect first aiders when they provide help, to the best of their abilities, using principles and procedures of recognized basic first aid.

Keep in mind that, as a first aider, you must:

- **Obtain consent** before assisting a casualty. Introduce yourself and indicate that you are trained in first aid. Ask if you can help. The casualty has the right to refuse care. Once the casualty gives consent, you may proceed. Tell them what you are doing and going to do. It will help make them more comfortable and confident in your actions. If a casualty is unconscious, they obviously cannot respond. In this case, you may assume consent.
- **Act reasonably and responsibly**, according to the skills and knowledge you have learned in a CPR or first aid course.
- **Not be negligent** in your actions.
- **Continue providing aid** unless 1) relieved by another trained person or medical professional, 2) your life is in danger or 3) you are too exhausted to continue. Never abandon a casualty you have started to treat.

## **LOOK AFTER YOURSELF**

Assisting in a medical emergency can be a very traumatic experience. It is not uncommon for a first aider to suffer some post-trauma symptoms. Your feelings may range from satisfaction and pleasure, to confusion and doubt, to anger and sadness. Remember to take care of yourself and take time to recuperate. Talking about your experience with a trained professional (family doctor, professional therapist, etc.) or an organized support group will also help bring closure to the event.



### **WHEN PERFORMING FIRST AID, DO:**

- **Activate EMS** if required.
- Obtain consent.
- Monitor vital signs.
- Use common sense and skills you have learned.



### **DO NOT:**

- **DO NOT** move a casualty unless **ABSOLUTELY NECESSARY** (ie: for CPR, safety reasons or to transport.)
- **DO NOT** abandon a casualty you have started helping.
- **NEVER** attempt any unorthodox treatment you may have heard about or seen on TV.

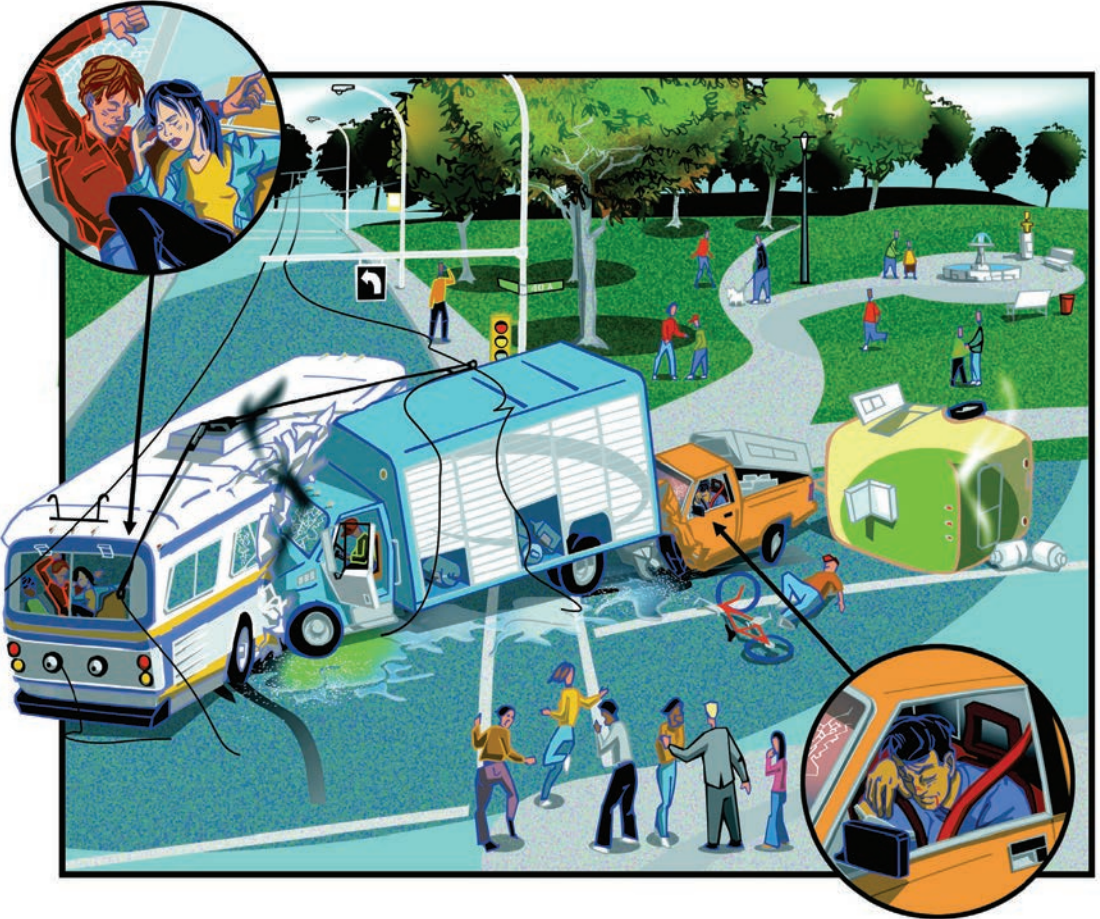
## ROAD BLOCKS TO ACTION

When faced with an emergency situation, your first decision is whether or not to help. There may be a number of issues racing through your mind. Your concerns are real and valid. Consider the following...



### 1. Hazards to your own personal safety or health

Be aware of the casualty's surroundings. Assess the scene for dangers such as FIRE, WIRE, GAS, GLASS, TRAFFIC. The only way to help someone in distress is to first protect yourself. If a physical or environmental threat exists, you may become a casualty as well. Therefore, it is very important to ensure you are not at risk while providing aid. If possible and absolutely necessary, you may need to move the casualty to a safe environment (see page 10).



Check the scene for debris - remember FIRE, WIRE, GAS, GLASS, TRAFFIC!

**Be safe!**

Bystanders can:

- **Activate EMS**, report back
- Get an AED
- Meet and direct medical personnel
- Help if asked to do so
- Provide comfort to family or friends
- Keep the area safe
- Obtain supplies



Barrier devices include gloves and mouth-to-mouth barriers of various sizes and functions

After a workplace incident, be aware of the policies and procedures regarding proper clean-up of your work environment.

## 2. Fear of making a mistake

Panic may be your first reaction in an emergency situation. That burst of energy or anxiety can be channeled into productive energy, if you are trained in first aid. Once you decide to act, trust that your training will come back to you. As long as you are acting reasonably and responsibly, you will be helping.

## 3. In a crowd, there may be someone more qualified

Unless you are a trained professional, you may initially have a fear of stepping up, but if you take charge, know that you may be helping to save a life. Show confidence and control in your actions and decisions. You can also help coordinate the rescue efforts with other bystanders.

## 4. Disease transmission

You should never put yourself at voluntary risk of harm or potential exposure to diseases such as human immunodeficiency virus (AIDS), E. coli infection, hepatitis, herpes, meningitis, mononucleosis, etc. First aiders should follow universal precautions and assume that everyone they come in contact with may be infected. Carry a mouth-to-mouth barrier and pair of gloves on your keychain, in your purse, in a fanny pack, or in your pocket.

- Always **use a barrier device for delivering breaths** when performing CPR. There is a very real chance a casualty may vomit during CPR. Mouth-to-mouth barrier devices have a one-way valve and/or filter to protect you from potential exposure to blood/body fluids.
- Always **wear gloves** during first aid treatment. This helps prevent direct contact with body fluids and germs. Do not remove the gloves until you have properly disposed of soiled bandages and dressings, etc.. Wash your hands well with soap and water after you remove your gloves.
- **Take note of glass, needles or other sharp objects.** A cut on your skin could leave you vulnerable to infection from a contaminated object or the casualty. Take appropriate precautions.
- **Wash your hands** immediately after any contact with a casualty. Lather vigorously with warm soapy water for 30 seconds. The most important part of hand washing is the rubbing action. Turn off the tap with a paper towel. Alcohol-based hand rub can be used if hands are not grossly soiled.

Being aware of potential road blocks to action helps prepare you mentally for an emergency situation.



Grasp the outside of one glove. Be careful not to contaminate the inside of the glove.



Peel the glove down your fingers and hold the discarded glove in the other hand.



Slide 2 fingers under other glove and turn it inside out covering both soiled gloves.



Be careful not to touch any contaminated surface. Discard gloves and wash hands well.

## 5. Normal Complications

As mentioned above, a casualty may vomit while you are performing CPR. This is one of the reasons using barrier devices is so important! Delivering breaths too fast or with too much force can cause air to go into the casualty's stomach.

If a casualty vomits during treatment, immediately turn their entire body toward you onto their side to allow for drainage. With gloves on, clean out the casualty's mouth by doing a finger sweep, then resume treatment or place in recovery position (page 22). Reduce the likelihood that the casualty will vomit by breathing more slowly and giving just enough air for the chest to rise in a normal breathing rhythm.

It is also possible to break ribs or the sternum while delivering chest compressions or chest thrusts. To be effective, you need to compress at least 2" (5 cm) in depth on the sternum of an adult casualty. Pay careful attention to the correct placement of your hands. Remember, if you are performing the skills correctly, you will be doing more good than harm.

## WHAT IS EMS?

Dialing 911 anywhere in Alberta activates the Emergency Medical Services system. Your call is connected to a trained dispatcher who will determine if professionals are required at the scene. In addition to summoning appropriate help, the dispatcher may offer guidance in assessing the casualty and providing first aid. This system is much more than the operator who answers the call and the ambulance that responds to the scene. It is a coordinated network of trained personnel that includes you as the first aider, dispatchers, police officers, fire fighters, ambulance attendants and medical professionals at the hospital.

IMMEDIATE RECOGNITION

+

EARLY ACTIVATION OF EMS

+

EARLY CPR

+

EARLY DEFIBRILLATION

+

EARLY ADVANCED LIFE SUPPORT

=

BEST CHANCE FOR SURVIVAL



*Reduce the chance of a casualty vomiting by taking 1 full second to deliver each breath.*

*When you call 911:*

- Know where you are (street address, building name, room number, etc.)
- Describe the situation and casualty's condition as fully and accurately as possible
- Give the phone number where you are calling from
- Remain on the line until the dispatcher hangs up
- Remain as calm as possible

*Remember when telling a bystander to **activate EMS** / Call 911, use clear directions like:*

- Go call 911
- Get an AED
- Do you understand?
- Are you coming back?

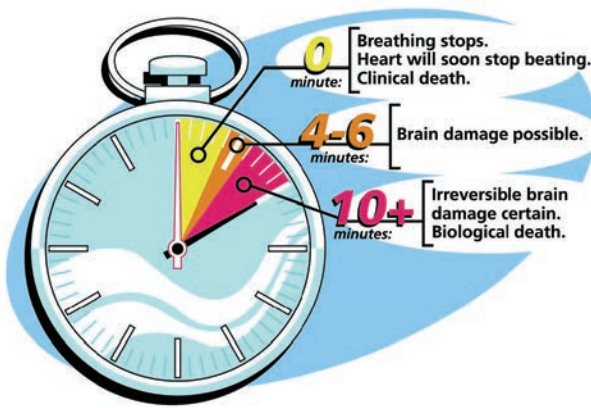
## DOING YOUR PART

Once you decide to help, you need to respond quickly. If a casualty is conscious, begin by introducing yourself and indicating that you are trained in first aid. Be sure you obtain consent, then proceed. If you are helping a child or infant, you need to obtain consent from a parent or guardian, if they are present. Remember, **unconsciousness implies consent**.

**Unconsciousness  
is a  
Medical Emergency**  
**ACTIVATE EMS!**

If you witness a serious accident or injury, it may be quite obvious that the situation is a medical emergency, and that the proper authorities need to be dispatched. If, however, you find someone injured and disoriented, you need to determine if the situation is a medical emergency. **Any time a casualty is unconscious, this is a medical emergency! Activate EMS immediately.**

Look for environmental clues that may indicate what events preceded the incident. If the casualty is conscious, he or she may be able to tell you what happened. Then determine if advanced medical help is required.



In cases where someone's heart or breathing has stopped, cells begin to deteriorate and brain damage can occur within 4-6 minutes. Performing proper CPR can help slow the effects of brain damage and increase the casualty's chance of recovery. When trained medical personnel arrive, they then take the steps to ensure the casualty gets the best possible care.

## MOVING A CASUALTY

There are many factors to consider when providing care in an emergency situation. One of the first is to ensure the safety of the casualty and yourself. Always assess the casualty and provide care in the position found unless:

- the immediate environment is or becomes unsafe
- you need to move one casualty in order to help another who is more seriously injured
- the casualty shows no signs of breathing and you need to reposition him or her to perform life-saving CPR

If you have determined you **must** move them and the casualty is conscious...

- and able to walk, support them by placing one arm around their waist and holding one arm around your shoulder
- but unable to walk, and 2 rescuers are available, carry the casualty by supporting under their thighs and behind their back; the casualty should place their arms around the rescuers for stability

If you have determined you **must** move them and the casualty is unconscious, pay special attention to the alignment of the casualty's head, neck and spine (see also head/spinal injuries, page 23) and move their body as a unit.

- securely clutch the casualty's clothing under the neck. Firmly but gently pull the casualty to safety
- or from behind, carefully drag the casualty backwards by cradling under their arms and supporting their head



*If a casualty is found lying face-down and has no signs of breathing, you will need to roll them onto their back to perform CPR.*

## ROLLING A CASUALTY FROM FRONT TO BACK

You should always attempt to determine breathing and provide first aid in the position found. If breathing is not evident and you need to turn the casualty onto their back to perform life-saving first aid, pay careful attention to the alignment of the head and spine. You can also perform this maneuver to position the casualty onto a blanket and remove from a dangerous environment.

*If you suspect a neck or back injury, this procedure may threaten the casualty's spinal cord, but is necessary to restore breathing and a heartbeat. You must pay special attention to the alignment of the head and neck. If possible, two or three people should perform this task, so that one rescuer is responsible only for stabilizing and supporting the head and neck. See Log Roll page 26.*



*Tuck the casualty's arm in close to their body. Grasp the clothes at the waist or the casualty's arm furthest from you.*



*While supporting the head and neck, carefully roll the casualty toward you.*



*Pay special attention to the alignment of the head and body as you gently pull the casualty toward you.*



*Carefully position the casualty into a position where you can perform life-saving skills.*

## DEFINITIONS

### Terminology

In this manual, **casualty** refers to the injured person or persons who may require assessment and possibly treatment.

### First Aider / Health Care Provider

The bulk of information provided in this manual applies to the **first aider**, a lay person or a designated first responder in the workplace who receives basic training in first aid and CPR. **Health care providers** are trained professionals (doctors, nurses, paramedics, etc.) who have more extensive knowledge of physiology and first aid than a basic rescuer. The two groups use a different definition of "child" and "adult" as well as varying levels of care. We provide additional information for health care providers starting on page 82.

### Adult, Infant, Child

In first aid, people of different ages and sizes require modifications in treatment (i.e. in CPR - depth of compressions, etc.). For the **first aider**, an **infant** is under one year of age; a **child** is 1 - 8; and an **adult** is any casualty over the age of 8. Once you learn the techniques for treating people of various ages, use these ages as a guideline. The size and shape of the casualty will also help determine which category someone falls in.

Infant	0-1 years of age
Child	1-8 years of age
Adult	Over 8 years of age

### Signs and Symptoms

The overview of various medical conditions and emergencies throughout this manual includes a brief description or definition, the associated signs and symptoms, prevention and procedure tips, and first aid treatment. For the purpose of this training manual, signs and symptoms are used interchangeably, but it is important to understand the difference.

- **Signs** are visible cues that **you** see, hear, feel and smell. They include skin color and temperature, level of consciousness and chest rise and fall, to name a few.
- **Symptoms** are sensations that **the casualty** will describe – pain, nausea, thirst, weakness, etc..

If you understand the basic physiology of various conditions, the signs and symptoms will make sense to you.

For example, several medical emergencies result in low blood oxygen. The casualty's body will respond by desperately trying to take in more air, thus breathing will be rapid and distressed. The reduction of oxygen in the brain can cause confusion. Also, because the body is low in bright red oxygen-rich blood, the skin will appear bluish-gray.

Signs and symptoms happen for a reason. Understanding underlying causes will better help you recognize conditions and provide effective first aid.

### Triage

When there are multiple casualties, triage is determining which casualty needs the most urgent care and which casualty needs the least, depending on the situation.

## SAFER, HEALTHIER, HAPPIER FAMILIES

Many injuries can be prevented if appropriate safety precautions are taken at home, at work and at play. Likewise, making healthy lifestyle choices will promote good health and can reduce the chances of developing cardiovascular disease and other medical conditions.

Our world has become very fast-paced and our attempts to “keep up” can take its toll on our bodies. Take care of yourself first, and encourage others to do the same. Set an example for your family and friends by your actions and your healthy outlook on life.

- Exercise regularly.
- Eat a well-balanced diet.
- Avoid foods that are high in salt, fat and cholesterol.
- Drink plenty of water.
- Monitor your blood pressure periodically.
- Don't smoke.
- Limit your caffeine and alcohol consumption.
- Try to minimize stress.
- Manage your diabetes or other medical conditions.
- Wear a medical alert bracelet if you have a serious medical condition.
- See a doctor and dentist regularly.

Physical activity is one of the best ways to take care of yourself. Exercising your heart, lungs and muscles makes them stronger and more efficient. Activities such as walking, swimming, playing sports, etc. all help maintain healthy blood pressure, weight and cholesterol levels. They also help fight infections, reduce stress and contribute to positive mental health.

- If you don't exercise now, start with small changes.
- Park at the back of the parking lot instead of looking for the spot closest to the door.
- Take the stairs instead of the elevator.
- Walk or bike short distances instead of driving.
- Stretch or exercise while watching TV.
- Take a yoga or meditation class and learn how to relax.

### **If you have any health issues, be sure to check with your doctor before starting any exercise program.**

Unfortunately, many accidents and injuries happen at home. Make safety a priority in your everyday activities. Protect your family and yourself by being aware of dangers and being pro-active in maintenance and safety procedures.

- Lock up medicines and poisonous cleaners and chemicals.
- Check your heating and cooling systems regularly.
- Test your smoke detectors often and change batteries twice a year (with the time change).
- Install a fire extinguisher where it is easily accessible.
- Teach your children when and how to **activate EMS** and post emergency numbers by the phone.
- Don't leave heating appliances unattended (i.e. iron, curling iron, portable heaters).
- Lower temperature in water heater (refer to [www.acicr.ca](http://www.acicr.ca))
- Have a fire escape plan and practice it often with your children.
- Install a carbon monoxide detector in your home.

*For more information on healthy living and injury prevention, see our Prevention & Safety section, starting on page 91.*





*Reduce the spread of germs by washing your hands often. Lather vigorously with warm soapy water for at least 30 seconds from wrists to fingertips. Turn off the tap with a paper towel.*

Here are a few other general suggestions:

- Wear your seatbelt when traveling.
- Play and work safe (wear a helmet, goggles, gloves, etc.)
- Wash your hands often.
- Be prepared and plan ahead.
- Buy and carry a mouth-to-mouth barrier and gloves at all times.
- Whenever you enter a building, be aware of the emergency exits.
- Have a first aid kit at home, in the car, and at work.
- Take advantage of vaccinations for all ages.

## FIRST AID KITS

A first aid kit is a necessity in every home, vehicle and office. First aid kits come in various sizes and forms, with the contents tailored for different sizes of groups and purposes. A basic first aid kit is suitable for any home or vehicle. Larger kits are available for offices, sports teams, community groups, etc.. Invest in the safety of your friends and family. You may never need more than a band-aid, but if you ever did come across a major emergency - these supplies are invaluable.

*First Aid Kit Contents:*

- gloves
- mouth-to-mouth barrier device
- pressure bandages
- adhesive and non-adhesive bandages
- gauze pads
- triangular bandages
- wound dressings
- adhesive tape
- scissors
- other items tailored to your needs



**NOTE:** Including medication in a workplace first aid kit may be outside the scope of industry standards.



By making healthy choices at home, on the go, or at work, you can help reduce the occurrence of accidents and illnesses. If however, you do come across a medical emergency, this manual, in conjunction with our first aid and CPR courses, will give you the knowledge and skills to give someone a second chance...

## SIGN OF LIFE™

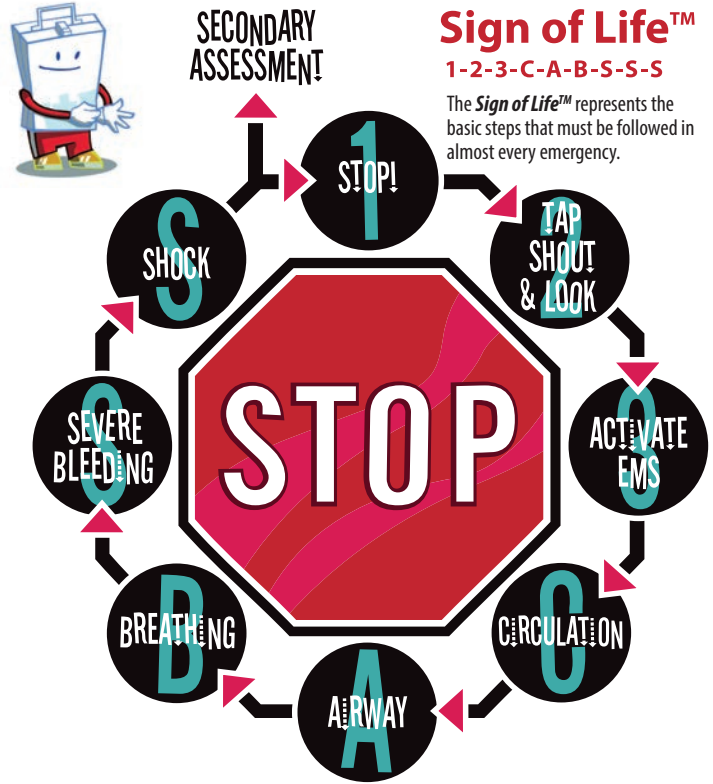
Death can occur within minutes of a medical emergency or accident if the casualty's breathing and circulation stop, and the depletion of oxygen in the vital organs can be the result of a number of causes. Regardless of the circumstances, your immediate concern is to restore adequate circulation of oxygen in the body, particularly to the brain.

The steps to take in an emergency are universally recognized. They help you analyze the situation and determine how to help. This procedure will be referred to in almost every scenario in this book and is one of the fundamental topics in first aid and CPR training. Apex Training Solutions has created the Sign of Life™ to help you remember the steps. Each of its 8 sides represents a stage in the sequence. Proceed clockwise around the octagon as each step is verified.

*Depending on the situation, you may proceed around the entire octagon upon your primary assessment. Other times, your first aid treatment will be focused on the CAB's of this symbol.*



*Flip to the STOP! Sign panel on the back foldout now so you have a quick reference as you go through the manual.*



### 1. Your first action is to STOP!



**Survey the scene** and check for hazards to yourself and the casualty. A physical or environmental threat (of fire, live electrical wires, traffic, poisonous or toxic fumes, broken glass or needle) could endanger your own health OR LIFE! Never enter a dangerous environment. Call for help.

**Take charge** of your emotions and the situation. Coming across an unexpected emergency may arouse fear, anxiety, panic, excitement and other emotions. Turn panic into focused energy and control.

**Observe and assess** the casualty and the surroundings — What happened? Is this a true emergency? Is the casualty wearing a medical alert indicator? Look for clues around the casualty to try to piece together the events preceding the incident. Be aware of the casualty and the environment.

**Protect yourself** and the casualty before, during and after treatment. Enter the scene only if safe. Use barrier devices (mouth-to-mouth barrier or face mask, gloves, etc) and take all necessary precautions while providing aid. Wash your hands immediately after the event and give *yourself* time to recover.



Check for responsiveness by tapping and shouting. In addition, look down the casualty's body to see if they appear to be breathing.

## 2. Tap, Shout and Look for Breathing

If the casualty is unconscious or lying on the ground, tap his or her shoulders and shout in both ears to check for a response. The bones of the shoulders are quite sensitive. If the casualty is sleeping, this will wake them. As you tap and shout, look down the casualty's body with emphasis on the chest to see if the casualty appears to be breathing effectively. Take **no more than 5-10 seconds** to perform this step. If the casualty is conscious, introduce yourself and ask if you can help.

## 3. Activate EMS - Adult casualty:

Send someone to call 911 and have them bring back an AED (Automated External Defibrillator). If you are alone, go yourself.

## Activate EMS - Infant/Child casualty:

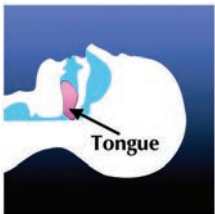
When another person is present, send them to call 911 and get an AED right away. If you are alone without access to a phone, and the arrest was unwitnessed, assess the child/infant and do 2 minutes of CPR (if necessary) before calling 911 and obtaining an AED. If the arrest was witnessed, call 911 immediately, then begin treatment including CPR if needed.

If the casualty is conscious and you have been granted consent, explain what you are doing as you provide aid. It will help reassure and calm the casualty.

## PRIMARY ASSESSMENT

Once you have taken control of the situation, perform an initial assessment of the casualty's condition. Determine if the casualty's life is in danger and if there is a possibility of a neck or spinal injury. If the spinal cord is threatened (i.e.: fractured neck, etc), it is imperative that you only move the casualty if it is absolutely necessary (see page 10). Your primary assessment includes checking for:

- responsiveness / look for breathing
- **C** - Circulation  
(CPR - cardiopulmonary resuscitation if breathing is absent)
- **A** - Airway
- **B** - effective Breathing
- **S** - Severe bleeding
- **S** - Shock



Closed airway



Open airway

## Circulation

When a casualty is not breathing effectively, CPR will circulate blood and maintain life-sustaining levels of oxygen in the tissues of the body and the brain. Irregular breathing or "gaspings" (agonal breathing) does not constitute effective breathing; treat as non-breathing. If the casualty is not breathing effectively on his or her own, begin CPR (cardiopulmonary resuscitation). [See back foldout.](#)



It is recommended to continue delivering compression only CPR if you do not have a barrier device.

If casualty has signs of effective breathing, circulation will be present; advance to "S" - Severe Bleeding on next page.

## Airway - Open the Airway

With an unconscious casualty, you need to ensure an open airway. Place one hand on the casualty's forehead and gently push down while lifting under the bony part of the chin with the fingertips of the other hand. This will allow the tongue to be pulled away from the throat and create a better opening for air exchange. This is called the **head-tilt chin-lift**. *Note: the tongue is the most common cause of airway obstruction in an unconscious casualty - see bottom of previous page.*

## Breathing

Deliver 2 rescue breaths (approximately 1 second in length) using the head-tilt chin-lift method, watching for chest rise to ensure proper ventilation. Use only enough volume to see chest rise.

If the casualty is not breathing, you must breathe for them. Once you have opened the airway, use a barrier device to deliver 2 rescue breaths. If the first breath does not go in, the airway may be obstructed. Reposition the head to re-open the airway and try a breath again. The breaths ensure an open airway, and introduce oxygenated air into the casualty's body.

There may be special circumstances where mouth-to-mouth breathing is ineffective or not possible.

### Mouth-to-Nose

Perform mouth-to-nose rescue breaths using a barrier device if:

- you cannot open the casualty's mouth
- you cannot completely cover the casualty's mouth with yours
- the casualty has suffered an injury in or around the mouth (i.e. poisoning, burns).

The procedure is the same as for mouth-to-mouth, except hold the casualty's mouth closed and deliver breaths through the nose. Between breaths, allow air to leave the lungs through the casualty's mouth and nose.

### Mouth-to-Stoma

A stoma is a surgical opening at the base of a person's neck. Stomas are inserted when part of the trachea has been removed. To perform rescue breaths on a casualty with a stoma, pinch the casualty's nose and close the mouth while you deliver breaths. Let the air escape from the stoma between breaths.

If casualty is breathing:

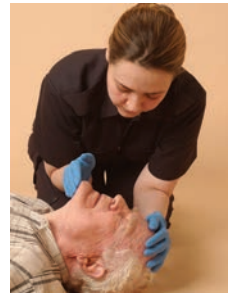
## Severe Bleeding

In addition to CAB, a primary assessment includes checking for severe bleeding and shock. Do a quick head to toe examination to detect severe external bleeding. Severe bleeding must be controlled immediately. Internal bleeding is not as easy to detect, but you will learn about this assessment later (page 55). Excessive internal or external bleeding is a very dangerous condition that reduces fluid and oxygen levels in the body and can lead to shock.

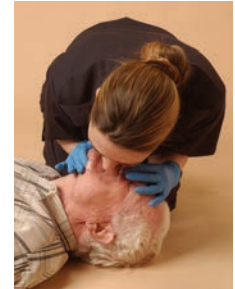
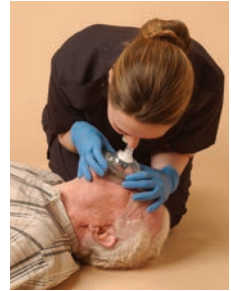
## Shock

A casualty who is in shock (medically) will look and feel very ill. A description and treatment for shock is described on the following page.

If the casualty's condition is stabilized and you are waiting for EMS to arrive, place the casualty in the recovery position and continue monitoring their condition (vital signs). See page 22.



Open the airway with the head-tilt chin-lift.



With an open airway, deliver 2 breaths. Use a barrier device like a pocket mask or face shield (shown above) and ensure a good seal.



If a casualty has dentures, **DO NOT** remove them unless they are loose and blocking the airway, or are affecting your ability to deliver effective breaths. (Dentures provide support to the casualty's mouth and cheeks.)

## SHOCK

Shock is a serious condition associated with inadequate circulation of oxygenated blood to the body's cells. The body responds initially to shock by redirecting blood flow from the extremities and non-essential organs to the vital organs. The absence of oxygenated blood in the extremities causes cell death and strain on the heart, as it has to work harder to compensate. This cascading effect can continue until the system breaks down and the casualty dies.

### Common Causes:


This failure or collapse of the circulatory system can result from:

- excessive internal or external bleeding
- serious injury to the head or spine
- heart attack
- severe allergic reactions
- serious infections
- loss of other bodily fluids through burns, severe diarrhea or vomiting

### Signs & Symptoms:

- cold, pale, clammy skin
- restlessness, anxiety, confusion
- weakness, dizziness
- nausea, vomiting
- thirst
- rapid, shallow breathing
- eventual unconsciousness

### Treatment:

- 1 STOP!** Go through the Sign of Life™. **Activate EMS.** See back foldout. 
- 2** Provide first aid treatment for any obvious cause (i.e. major bleeding)
- 3** Keep the casualty warm, but do not overheat. Place a blanket under (if no head or spinal injury suspected) and over the casualty to prevent heat loss, if possible.
- 4** Monitor vital signs closely until EMS arrives.



Keep the casualty warm and comfortable. Watch for any change in condition.



#### DO:

- Treat obvious cause
- Continually reassure the casualty
- Keep casualty from losing body heat
- Consider the casualty's comfort and condition when choosing a recovery position



#### DO NOT:

- Allow casualty to eat or drink
- Leave the casualty unattended
- Try to warm casualty with direct sources of heat

## SECONDARY ASSESSMENT

Once you have proceeded through the Sign of Life™ and are confident you have treated all life-threatening conditions, you should perform a secondary assessment. This second look allows you to treat other medical issues. You would move on to this secondary assessment only if no ongoing treatment for airway, circulation or severe bleeding is required and the casualty is stable and you are waiting for EMS.

Your primary assessment would uncover major life-threatening injuries and provide treatment. If the casualty had an obvious severely fractured leg, for example, it would not be a priority if breathing was absent. If, however, all vital signs were stable, you could then provide first aid for the leg injury while waiting for EMS.

**1. Interview the casualty or a bystander** to help piece together their medical history and events that lead to the incident. Begin with “SAMPLE”.

- S** signs & symptoms
- A** allergies
- M** medications
- P** past medical history
- L** last intake of food / fluid
- E** events leading up to the emergency

SAMPLE questions to ask:

- Does anything hurt? How were you feeling just before the incident?
- Do you have any known allergies?
- Do you take any medications? Prescribed or over-the-counter?
- Do you have any medical conditions?
- Has this happened before?
- When and what did you last eat or drink?

If possible, and time allows, take note of the answers to these questions as well as signs and symptoms. EMS will require this information to ensure the casualty receives the best possible care.

### 2. Monitor vital signs.

You must continue monitoring the casualty's vital signs about every few minutes until help arrives - the casualty's condition could change or worsen.

**Vital signs** include:

- **consciousness** - watch for changes in awareness, alertness, responsiveness
- **breathing** - presence or absence, quality, effectiveness
- **tissues** - is skin warm or cold? dry or clammy? normal color?

### 3. Head-to-Toe Assessment.

To complete the secondary assessment, perform a hands-off head-to-toe for a casualty who is conscious and alert, or a hands-on head-to-toe if the casualty is unresponsive.

The purpose of this examination is to help determine the extent of the casualty's injuries and how you can be of further assistance. Perform this step only once your primary assessment is complete and the casualty's condition is stable. Continue monitoring the casualty's vital signs every few minutes and provide first aid immediately if the vital signs change.



*During a secondary assessment, look for a medical alert indicator such as: a chain, bracelet, anklet, watch strap, or tattoo.*

*If present it may provide clues as to the nature of the problem.*

*Normal Breathing Rates*

*(per minute):*

*adult - 12 - 20*

*child - 20 - 40*

*infant - up to 60*

*Continue to monitor the casualty's vital signs:*

- *consciousness*
- *effective breathing*
- *tissue color, temperature, etc.*

*If emergency is a result of:*

- *an illness, do steps 1 & 2.*
- *an injury, do all 3 steps.*



**NOTE:** If during the Sign of Life™, you suspected a spinal injury, you would not perform a hands-off head-to-toe assessment.

Immobilize the casualty's head and neck and monitor their vital signs. If a second rescuer is available, they can perform a hands-on head-to-toe assessment.

## HANDS-OFF HEAD-TO-TOE ASSESSMENT

Help reassure the casualty by explaining what you are doing through each step. Ask them to remain still unless you request them to move. If the casualty is experiencing pain in any specific area, avoid touching the area or having the casualty move that area. You do not want to cause further discomfort or injury. During this assessment:

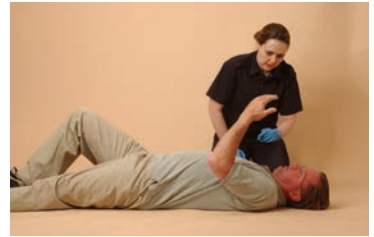
- look for signs of blood, fluid, or abnormalities (i.e. obvious dislocations)
  - check for bruising or unusual skin color (i.e. cool, moist, pale skin could indicate shock)
  - when checking specific areas, watch the casualty's face for grimaces of pain or discomfort and listen to his/her voice for strains or weakness
  - continue to reassure the casualty and provide comfort.
- 1 Perform a visual examination of the casualty's entire body. The color and condition of the casualty's face may give clues about problems (i.e. breathing difficulty, shock, etc.). Feel the casualty's forehead with the back of your hand for temperature.
  - 2 Under your guidance, ask the casualty to do a self-examination by slowly moving one part of their body at a time. See photos below.
  - 3 If the casualty has no pain and shows no signs of injury, assist them to a sitting position and have them rest for several minutes. Verify that the casualty's condition and vital signs have not changed.
  - 4 If the casualty is stable and able, help them stand, staying close by for reassurance and support. Recheck vital signs and determine if further first aid is required and if EMS should be activated. Suggest that the casualty seek medical attention if there is any change in their condition.
  - 5 Encourage the casualty to loosen tight clothing at his/her neck, chest and waist.



Start with the head. As the casualty checks for injuries, watch for grimaces of pain or discomfort. Look for blood or fluid in the ears, nose and mouth.



If the casualty is not experiencing any neck pain, have them gently turn their head from side to side.



Have the casualty shrug their shoulders and check their hands and arms, one at a time.



Ask the casualty to take a deep breath then exhale slowly to determine if there is any injury to the chest or abdomen.



Have the casualty check for injuries on their hips, legs, etc.



If the casualty has no pain and shows no signs of injury, assist them to a sitting position and have them rest for several minutes. Verify that the casualty's vital signs have not changed.

## HANDS-ON HEAD-TO-TOE ASSESSMENT

A hands-on assessment is only performed on an unresponsive or unconscious casualty once you have proceeded through the Sign of Life™ (primary assessment) and the casualty requires no further life-saving treatment. If you suspect a neck or spinal injury, you would only perform a hands-on head-to-toe assessment if a second rescuer is supporting the casualty's head and neck and maintaining an open airway.

Since the casualty is not able to respond or move, an evaluation will need to be made by the first-aider.

- 1 Look and feel for any blood, bruising, deformities or abnormalities (color, temperature, position, swelling, depressions, etc.).
- 2 Carefully check the casualty's head & neck, shoulders, chest / ribs, back, abdomen (is it soft or rigid), hips, legs, arms.
- 3 Take note of anything unusual and provide first aid if required. Continue monitoring the casualty's vital signs.
- 4 Loosen tight clothing at the casualty's neck, chest and waist.

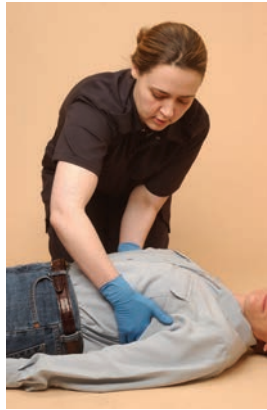


*If you suspect a pelvic injury, **DO NOT** move the casualty or perform a hands-on head-to-toe-assessment. Stabilize and support the casualty's pelvis and treat for shock. (See page 25.)*

**NOTE:** Blood or clear fluid in the ears, nose or mouth could be a sign of a serious head injury! Handle the casualty carefully and **activate EMS!**



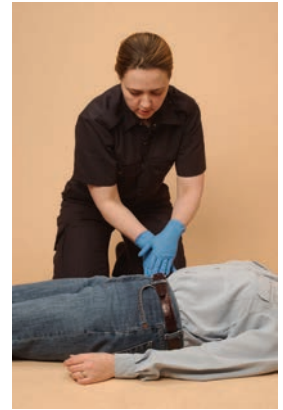
*Gently check the casualty's head and neck for abnormalities.*



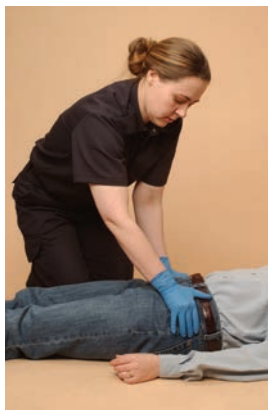
*Feel the casualty's shoulders, ribs and chest for deformities.*



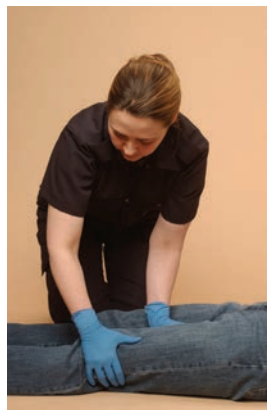
*Without lifting or moving, carefully reach under to assess the casualty's back.*



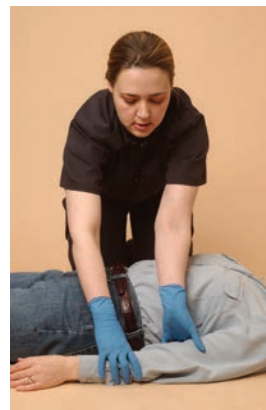
*Is the abdomen soft or rigid?*



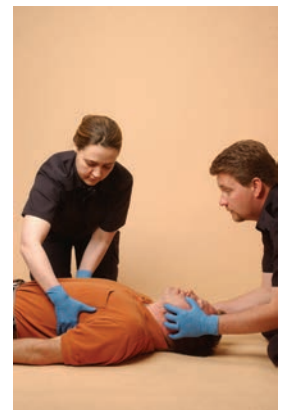
*Apply gentle pressure to check the hips and pelvis.*



*Assess the condition of both legs (one at a time).*



*Check both arms for signs of injury.*



*If 2 rescuers are available, one supports the head while the other performs an assessment.*



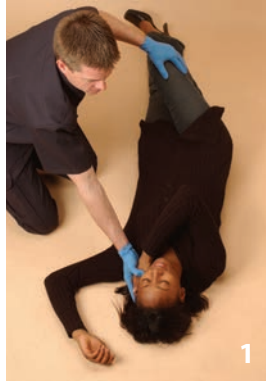
Ensure the casualty has no sharp or bulky items in pockets before placing them in recovery position.

## RECOVERY POSITION

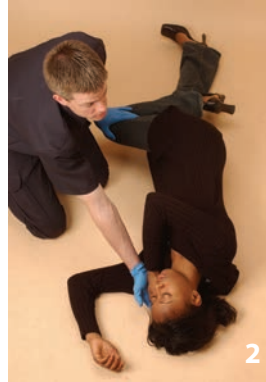
During first aid treatment, you may need to place the casualty in the recovery position. Use this position if the casualty meets all the following criteria:

- is unconscious
- is breathing
- is not suspected of having a head or spinal injury
- has no severe bleeding or broken bones

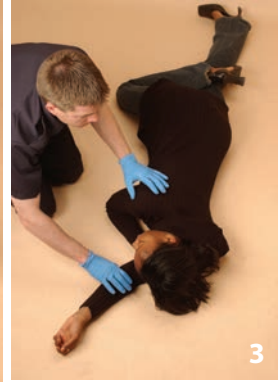
The recovery position allows for drainage of fluids from the mouth (i.e. vomit, blood, saliva) and helps keep the tongue from falling back and obstructing the airway.



*Gently place the arm closest to you in a comfortable position above the casualty's head. Hold the casualty's other hand cradling their cheek. Bend the leg furthest from you at the knee, keeping the foot flat on the ground.*



*While providing support to the head and neck, roll the casualty toward you until they are resting on their side. Their head should rest comfortably on their hand.*



*Ensure casualty has an open airway (may need to tilt head back slightly). Place their top leg at a right angle for stability.*



*Continue to monitor vital signs until EMS arrives - the casualty's condition could change or worsen.*



**Recovery Position**

# FIRST AID PHYSIOLOGY/ANATOMY

As a basic first aider, it is not necessary to learn every detail about the body's physiology and anatomy, but it is important to understand the general workings of several systems. A review of each system will help you identify associated emergencies and provide effective treatment.

## NERVOUS SYSTEM

The nervous system is highly developed. Our brain controls the functioning of all systems. It supports our senses (sight, hearing, smell, taste, touch), motor control (movement of muscles and limbs), and our power to think, reason, feel and remember. A complex network of nerves throughout our body transmits messages from and to our brain, controls movement, breathing and consciousness, and unconsciously controls many other body systems, such as circulation and digestion.

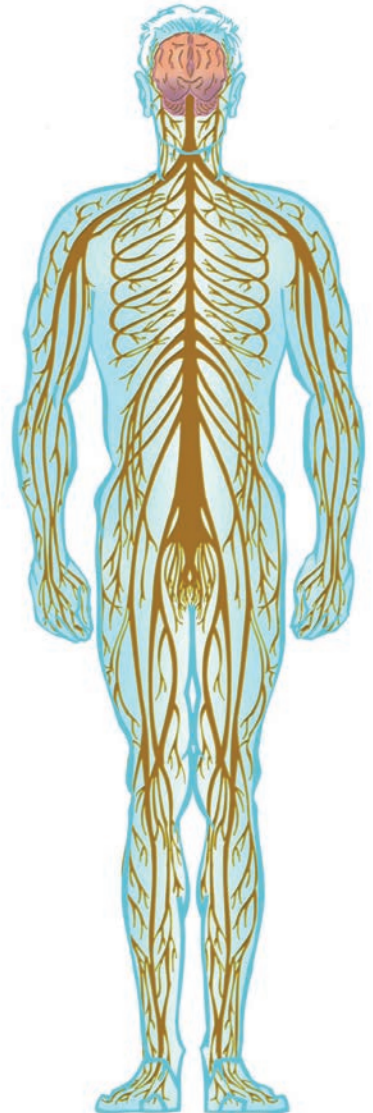
The components of the nervous system are the **central nervous system** (CNS), which includes the brain and spinal cord; and the **peripheral nervous system** (PNS), which consists of motor and sensory nerves. The PNS is further divided into the autonomic, somatic and enteric nervous subsystems. The **autonomic nervous system** controls involuntary bodily functions such as heart rate, breathing, body temperature and digestion.

## HEAD & SPINE INJURIES

The skull and spine are bones that protect the brain and spinal cord. Injuries to the head, neck or back can result in serious brain or spinal dysfunction. Providing careful and proper first aid for suspected injuries can increase a casualty's chance of survival and prevent further or permanent disability. It is impossible for anyone (including a physician) to diagnose the extent of spinal injuries without specific investigation. For this reason, always treat a suspected injury as a probable injury. Remember, any head or neck movement of a casualty with a head or spinal injury could lead to life-long disability or even death.

Because the skull is not expandable, any swelling from injury to the brain or surrounding tissues and blood vessels will cause an increase in pressure in this confined space. Likewise, injury to the vertebrae, or intervertebral discs, which make up the spinal column, can compress or cut the spinal cord. All these conditions are very critical and can lead to physical and mental difficulties, including paralysis, speech impairments, memory problems, or behavioral disorders.

Please see the following pages for treatment of a casualty with a suspected head, neck or spinal injury.





When in doubt about the extent of injury, treat casualty as though they have a head, neck or spinal injury. Keep them still and **activate EMS!**

## HEAD & SPINE INJURIES (CONT.)


### Common Causes:

- motor vehicle collisions
- falls
- severe blow to the head or torso
- diving accidents

### Signs & Symptoms:

- unconsciousness or altered consciousness, including confusion
- severe pain or pressure in the head, neck or back
- loss of movement or tingling and numbness of the extremities
- obvious lumps or bruising on the head
- blood or fluid from the ears or nose
- nausea or vomiting
- breathing and vision difficulties
- unequal size of pupils
- severe headache

### Treatment:

- 1 **STOP!** Go through the Sign of Life™. **Activate EMS.** See back foldout. 
- 2 Tell the casualty to remain still. Immobilize the head and neck in the position found. If casualty is unconscious, you will need to assess responsiveness, look for breathing and start CPR if needed.
- 3 Help stabilize the head and neck until EMS arrives. If a bystander is available, have them support the casualty's feet to minimize movement.
- 4 Perform a secondary assessment (page 19) if appropriate and provide first aid to control bleeding, etc.
- 5 Continue to reassure the casualty. Treat for shock (page 18) if necessary. Keep the casualty warm.



If the casualty is involved in a motor vehicle collision, tell him or her to remain still. Securely support their head (from behind if possible) until EMS arrives and takes over.



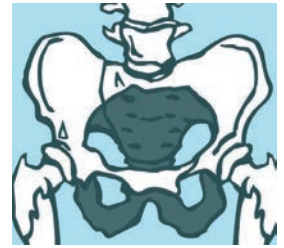
Hold the casualty's shoulders still while bracing his or her head with your forearms.



Or use pillows or padding snugly against the casualty's head as you wait for EMS. Try to reassure and calm the casualty.

## PELVIC INJURIES

The pelvis is made up of several large bones that form a protective girdle at the base of the spine. It also houses the bladder, part of the large intestine, reproductive organs and major arteries and nerves. It usually takes a great force to damage the pelvis, but a fractured pelvis can be as serious as a neck or spinal injury. In addition to spinal cord damage, other complications are possible, such as bladder injuries and severe internal bleeding.



### Common Causes:

- falls
- motor vehicle collisions
- crushing injuries

### Signs & Symptoms:

- signs of shock or internal bleeding
- inability to stand or walk
- severe pain

### Treatment:

As with head and spine injuries, first aid for a pelvic injury must include protecting the spinal cord.

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Do not move the casualty unless it is absolutely necessary. Support the pelvic area by placing padding or blankets on either side of the pelvis.
- 3 Help calm and reassure the casualty until help arrives.
- 4 Be prepared to treat the casualty for shock (page 18).



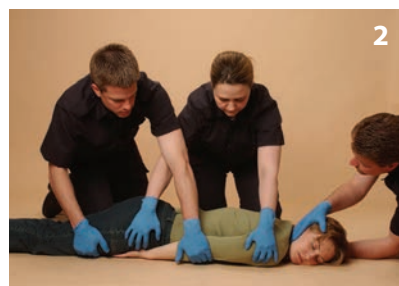
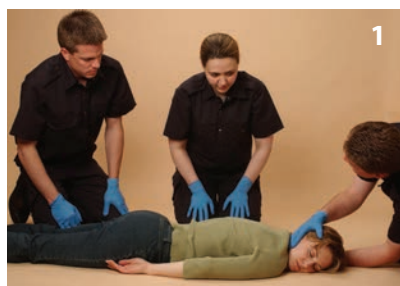
## LOG ROLL

*If a casualty is found lying face-down and **has no signs of breathing**, you will need to roll them onto their back to perform CPR.*

*If you suspect a neck or back injury, this procedure may threaten the casualty's spinal cord, but is necessary to restore breathing and a heartbeat. You must pay special attention to the alignment of the head and neck. If possible, two or three people should perform this task, so that one rescuer is responsible only for stabilizing and supporting the head and neck.*

If it is absolutely necessary to move a casualty with a suspected head, neck, back or pelvic injury (to resuscitate, open the airway, remove from a life-threatening situation or to transport to hospital), you must support the casualty's neck and keep the casualty's head, trunk and toes aligned at all times. We described how to roll a casualty from their front to their back on page 11; here we outline the log roll manoeuvre. You should have at least 3 people to perform this task (4 is ideal). All rescuers kneel on the same side of the casualty.

- 1** The team leader positions themselves at the top of the casualty's head. They will maintain spinal motion restriction by manually stabilizing the head and neck so the motion of the head, neck and spine is minimized before turning or moving the casualty. It is important not to pull on the casualty's neck, only provide stability throughout the manoeuvre.
- 2** The second and third rescuers space themselves alongside the casualty, crossing arms in the middle for stability.
- 3** The fourth rescuer, if available, positions their hands at the casualty's feet and ensures the entire body is aligned at all times.
- 4** The leader directs the group to "roll" toward the rescuers on the count of 3 and the casualty's body is turned as a single unit onto their side. On the count of 3 again, the casualty is laid down gently onto their back.
- 5** If transporting the casualty onto a board for transport, the same practice and care is taken to lay the casualty back down. Make sure the casualty is safely secured to the board before transport.



# DISORDERS OF THE NERVOUS SYSTEM

## UNCONSCIOUSNESS

When the brain's normal activity is interrupted, control of other body systems can be affected. A casualty who is unconscious is unaware of their environment and unresponsive to pain and other stimuli.

### Common Causes:

Many injuries and illnesses can result in unconsciousness. Some possibilities include:

- motor vehicle collision
- sports injury
- fall
- head injury
- stroke, heart attack
- poisoning
- epilepsy
- low or high blood sugar, low oxygen levels

### Signs & Symptoms:

- unresponsive, casualty may be laying on the ground or slumped over
- casualty may or may not be breathing

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Perform a head-to-toe examination (see page 21).
- 3 Place the casualty in the recovery position if you do not suspect a spinal injury.
- 4 Continue to monitor response level and vital signs while you wait for EMS to arrive.



Unconsciousness is a medical emergency - **Activate EMS!**

**Unconsciousness or "altered consciousness" is a medical emergency!**

**ACTIVATE EMS!**



*Any time a casualty loses consciousness or experiences "altered consciousness" (state of confusion, dazed, or in and out of consciousness), they should be seen by a physician. Even if they seem to recover quickly, they should be seen by a doctor for examination.*

*Never assume a casualty has simply fainted! There could be a serious underlying cause, such as a heart attack or severe shock. Assess all possibilities and have the casualty seek medical attention.*



**CAUTION:**

*If you suspect the casualty is having a heart attack, have them rest in a comfortable position while waiting for EMS. **DO NOT** follow presyncope treatment steps.*

**NOTE:** *If a casualty who is pregnant feels faint (and would prefer to lie down rather than sit), place a pillow under her right hip to shift the uterus to the left and off the large vein in the abdomen. This will assist with blood flow returning to the woman's heart. An unconscious pregnant casualty may also be placed in the recovery position.*

## FAINTING (SYNCOPE AND PRESYNCOPE)

Syncope, better known as fainting, is a partial or complete loss of consciousness that can last up to one or two minutes. Fainting is the result of reduced blood flow to the brain. Presyncope is the feeling that you are about to faint.

### Common Causes:

- emotional trauma (fear or anxiety)
- pain, illness or injury
- lack of fresh air
- exhaustion or standing for a long time
- hunger, fatigue
- sudden change of position

### Signs & Symptoms (Feeling Faint/Presyncope):

- nausea, weakness, dizziness
- pale, clammy skin, sweating
- casualty feels “light headed / faint”, confused
- visual disturbances (seeing black spots)

### Treatment (Feeling Faint/Presyncope):

- 1 Move the casualty to a safe place and have them sit or lie down.
- 2 Ensure a fresh air supply and loosen tight clothing.
- 3 Encourage the casualty to contract the muscles in their upper and lower body to try to raise their blood pressure.
- 4 If the casualty's condition worsens or doesn't improve within a few minutes, **Activate EMS**.

### Treatment (Casualty has Fainted/Syncope):

- 1 **STOP!** Go through the Sign of Life™. **Activate EMS** if the casualty doesn't respond to “tap and shout”.
- 2 Place the casualty in the recovery position.
- 3 If the casualty recovers quickly, reassure them and monitor vital signs while they rest comfortably.

## CONCUSSION (HEAD INJURIES)

A concussion is a temporary brain disturbance caused by a blow to the head or neck. Diagnosis is only possible after complete recovery, since the effects, by definition, are temporary.

If a head injury goes unnoticed or untreated, it can result in a more serious condition, a traumatic brain injury (TBI). A TBI can have a temporary impact on brain cells or can have long-lasting, moderate to severe physical or psychological effects. Head injuries can be very serious and should always be evaluated by a doctor.

### Common Causes:

- motor vehicle collisions
- falls
- sports or recreational injuries
- blow to the head

### Signs & Symptoms:

- confusion, memory loss
- partial or brief loss of consciousness
- dizziness, nausea and vomiting
- casualty “sees stars”
- headache

### Treatment:

- 1 STOP! Go through the Sign of Life™. If the casualty loses consciousness, **activate EMS**.
- 2 If the mechanism of injury suggests a possible head or spinal injury, treat accordingly (see page 23).
- 3 Watch the casualty closely once he or she regains consciousness. Be aware of changes in responsiveness. Discourage the casualty from returning to strenuous activity (i.e. sports, etc.).
- 4 If EMS has not been activated, encourage the casualty to see a doctor.

*Any time someone suffers a serious blow to the head, they should seek medical attention.*



## RESPIRATORY SYSTEM

### Normal Breathing Rates

(per minute):

adult - 12 - 20

child - 20 - 40

infant - up to 60

The respiratory system consists of the nose, mouth, epiglottis, trachea, lungs and pulmonary blood vessels. Respiration is the process of drawing air in through the nose and mouth and the exchange of gases in the lungs. When we breathe in, air travels through our trachea into our lungs. Oxygen is diffused into our blood at the same time that carbon dioxide is released back into our lungs and expelled as we breathe out. Our brain continuously monitors these levels in our blood. When the levels drop, the brain sends signals to change our breathing and heart rate patterns to regain a healthy balance. The diaphragm is a large muscle that, along with the rib cage, coordinates the movement of air and allows our lungs to expand and contract.

The air we breathe contains 21% oxygen. Since the air we exhale still contains 17% oxygen, rescue breaths are very effective in helping to restore oxygen levels in a casualty who has stopped breathing.

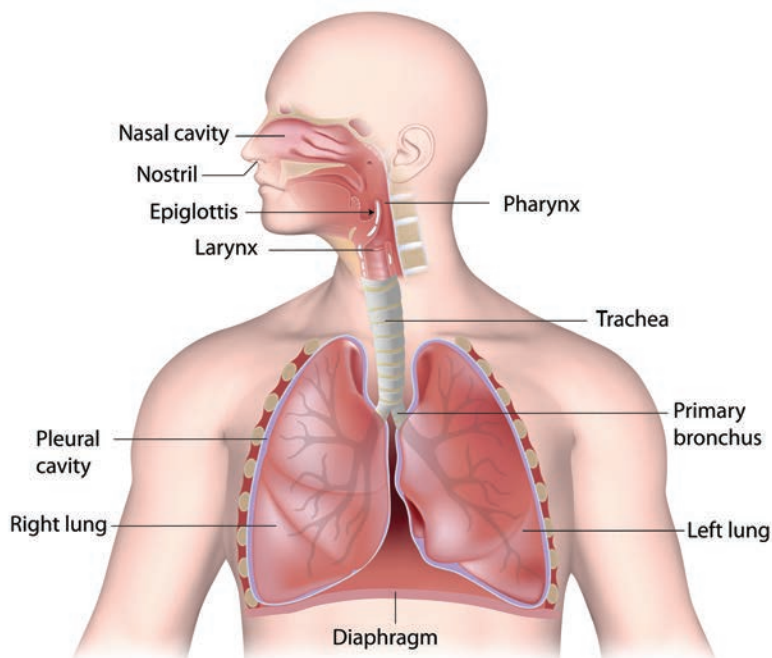


When we breathe in (inhale), our lungs expand as air travels in. Our diaphragm (red) tightens.



Our diaphragm relaxes and pushes air out of our lungs when we exhale (breathe out). Our flexible rib cage returns to its rest position.

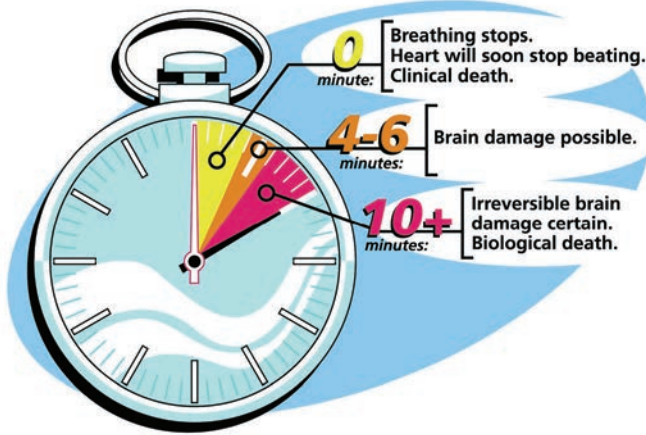
### The Respiratory System



# RESPIRATORY ARREST

Respiratory arrest is a medical emergency! A casualty who has stopped breathing is in respiratory arrest and in need of immediate assistance. When the casualty is not taking in oxygen, the heart may soon stop beating.

The most critical factor in this situation is TIME. If the brain does not receive oxygen within 4 - 6 minutes, the casualty is in danger of suffering permanent brain damage. Many disorders discussed in this section can lead to respiratory arrest.



## Common Causes:

- blocked airway due to foreign object
- tongue relaxing back in unconscious casualty's throat
- drowning
- asthma / anaphylactic shock
- electric shock
- suffocation
- trauma to the head, chest or lungs
- poisoning
- drug overdose

## Signs & Symptoms:

- unconsciousness
- no signs of effective breathing / occasional gasp for air (agonal breathing)
- pale or bluish skin

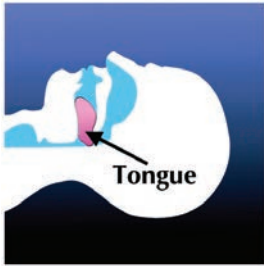
## Treatment: CPR

Cardiopulmonary resuscitation (CPR) is an effective means of providing oxygen to the heart, lungs and brain to slow down the effects of brain damage.



See back foldout.

For more information on choking prevention, see our Prevention & Safety section, starting on page 91.



The airway can become blocked by a foreign object, food, vomit, blood or the tongue (shown in red). The tongue may block the opening to the trachea if it is swollen from a reaction or if it relaxes back in an unconscious casualty.

It is common for a choking casualty to be embarrassed or uncomfortable in public. They may want to go off by themselves to “work it out”. Ensure they are never alone!



**DO NOT** attempt to dislodge an object if a choking casualty is still coughing and breathing. Encourage coughing and stay with them.

## AIRWAY OBSTRUCTION

An airway obstruction is a breathing emergency. When air does not reach the lungs, the body becomes deficient in oxygen and tissues will soon die.

### Common Causes:

The airway can become blocked by:

- the tongue (when a person is unconscious, the tongue relaxes and may fall back, closing the airway)
- food or a foreign object
- vomit, blood or mucus
- swelling of the airway due to an allergic reaction, smoke inhalation, injury to the head, chest or lungs, etc.

### Prevention:

- cut food in small, manageable pieces and chew well before swallowing
- avoid eating while walking or doing other physical activities (especially for small children)
- keep small toys, objects, balloons away from infants and small children

### Signs & Symptoms:

- respiratory distress
- partial blockage – coughing, sputtering, gagging, redness in the face
- complete blockage – no sounds, grayish-blue face/lips, high-pitched wheeze

**Treatment will vary according to the severity...**

## PARTIAL OBSTRUCTION - ADULT / CHILD / INFANT

A person who is choking is either experiencing a partial or complete obstruction. With a partial obstruction, the casualty is still able to breathe. Encourage them to attempt to dislodge the object by coughing. It is imperative that the airway be restored as soon as possible, or the casualty may become unconscious.

### Signs & Symptoms:

- coughing, wheezing, gagging
- clutching throat with hands
- difficulty speaking and breathing
- congested, flushed face (redness)
- casualty looks scared, anxious, visibly distressed

### Treatment:

- 1 Ask “Are you choking? Can I help?”
- 2 Quickly determine if the casualty is drawing in enough air.
- 3 As long as the casualty is coughing and their tissue color is normal, simply encourage him or her to continue coughing.
- 4 Reassure casualty and remain calm yourself.
- 5 If coughing or breathing becomes ineffective, treat as a complete obstruction (see following pages).

## COMPLETE OBSTRUCTION - CONSCIOUS ADULT

The universal sign for choking is to grasp one's throat. Once you determine that a casualty has a complete obstruction, you need to act quickly.

### Signs & Symptoms:

- no breathing or ineffective breathing (may be high-pitched wheezing)
- no coughing
- not able to speak
- face turns pale blue
- may become unconscious

### Treatment:

- 1** Ask "Are you choking?", introduce yourself and indicate that you are trained in first aid; ask if you can help. Obtain consent before proceeding. Use a combination of abdominal thrusts and back blows to clear the airway.
- 2** Move to behind the casualty, bracing yourself by putting one leg between the casualty's legs. Pull them in toward you while positioning your hands. Landmark by determining the bottom of the rib cage or top of the hips. Move your hands forward to the middle of the abdomen. You should be on or slightly above the belly button, but well below the breastbone.
- 3** Create a fist with one hand and place the thumb side against the casualty's abdomen. Cup the other hand around the fist. With moderate to strong force, thrust inward and upward (form of a "j"). Deliver 5 thrusts.
- 4** Stand beside the casualty. Support the upper body while they are leaning forward and deliver 5 back blows between the shoulder blades using the heel of your hand.
- 5** Alternate between abdominal thrusts and back blows with increasingly more force until the object is dislodged or the casualty becomes unconscious. To proceed, turn to page 35 or [see back foldout](#).



A choking casualty will typically grasp at their throat.



Motion is in and up.



For abdominal thrusts, create a fist with one hand and place the thumb side against the casualty's abdomen. Cup the other hand around the fist.



Support the upper body while the casualty is leaning forward and deliver 5 back blows between the shoulder blades using the heel of your hand.



For more information on choking prevention, see our Prevention & Safety section, starting on page 91.

## COMPLETE OBSTRUCTION CONSCIOUS CHILD (1-8 YRS)

For a child, use the same procedure, but lower yourself to the height of the child and the force used will vary according to the size of the casualty.

## COMPLETE OBSTRUCTION CONSCIOUS INFANT (0-1 YRS)

Very young infants do not have a strong mechanism for coughing. As a result, they are less able to dislodge a foreign object on their own by coughing and may need assistance to clear their airway.

### Signs & Symptoms:

- gasping for breath / difficulty breathing
- coughing, wheezing
- congested face / gray / bluish lips and gums
- wide eyes

### Treatment for Complete Obstruction:

- 1 STOP! Support the infant **face down** on your forearm – head slightly lower than the chest, cupping the infant's head in your hand. Be careful not to cover the infant's mouth. Holding your arm close to your body or resting it on your thigh will provide further security and support.
- 2 Using the heel of the other hand, give 5 sharp back blows between the infant's shoulder blades.
- 3 Turn the infant over, still supporting the head and neck, and check infant's condition. If still choking...
- 4 Place two fingers on the middle of the chest, just below the nipple line. Give 5 chest compressions  $\frac{1}{3}$  the depth of the infant's chest or about 4 cm (1  $\frac{1}{2}$ ").
- 5 Continue this sequence of chest compressions and back blows until effective. If infant becomes unconscious, [see page 36 or back foldout](#).

### TIPS:

- **DO NOT** use abdominal thrusts on an infant!
- You may be more comfortable and stable if you sit or kneel when assisting an infant.
- Obtain consent if not your child/infant.



### CAUTION:

Take special care when administering back blows and chest compressions on an infant.

You must securely support the infant's head to prevent serious injury (i.e. whiplash or Shaken Baby Syndrome).



Deliver 5 back blows while carefully supporting the infant's head and neck. Ensure the infant is face down and the head is lower than the body.



Turn the infant over and check condition. Give 5 chest compressions  $\frac{1}{3}$  the depth of the infant's chest or about 4 cm (1  $\frac{1}{2}$ ").



# COMPLETE OBSTRUCTION UNCONSCIOUS ADULT/CHILD

If the casualty loses consciousness in your arms, gently guide them to the floor, while supporting their head. It is now a medical emergency!



## 1 Activate EMS. Put on your gloves!

2 If there are no obvious signs of breathing, place the heel of one hand in the middle of the person's chest on the lower half of the breast bone. Place the other hand on top. With arms straight and your shoulders directly above the casualty, do **30 compressions. Push hard, push fast and allow the chest to recoil** completely between compressions. Compressions should be at least 5 cm (2") in depth. **Count out loud** to help stay on track.

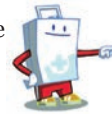
3 **After one set of compressions, check for object.** Open the mouth with tongue-jaw lift. Place your thumb on the casualty's tongue and cup your fingers under the bony part of the chin... **Look in the mouth.** ONLY if you can see the object, finger sweep to remove.

4 Attempt to ventilate. If the breath does not go in, reposition the casualty's head and attempt to ventilate again. If breaths are not successful...

5 Repeat cycles of compressions, look in mouth and breaths (steps 2, 3 and 4) until object is removed, ventilations are successful, casualty begins breathing effectively, or EMS takes over.

6 Once breath goes in, give a second breath. If there are no visible signs of effective breathing, begin CPR. [See back foldout.](#)

7 If the casualty begins breathing effectively, place them in recovery position and monitor their vital signs.

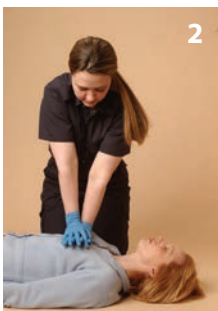


*If at any point the casualty begins breathing, place them in the recovery position (page 22) and monitor their vital signs.*

*After successfully assisting a choking casualty, encourage them to see a doctor. Injuries may have occurred from the abdominal or chest thrusts or from the foreign object itself.*



*For chest compressions on a child, use **1 or 2 hands and depress 1/3 the depth of the child's chest or about 5 cm (2").** **Perform 30 compressions.** Push hard, push fast and allow chest to recoil after each compression.*



adult depth: at least 5 cm (2")



ONLY perform finger sweep if object is visible.



Give breath. If unsuccessful, reposition airway and attempt another breath.

## CHOKING - UNCONSCIOUS INFANT (0-1)

Unconsciousness is a medical emergency. **Activate EMS!**

### INFANT SKILLS:

#### Breath:

Give gentle breaths (1 second in length) until chest rises

#### Compressions:

Place two fingers on the middle of the chest, just below the nipple line

#### Depth of Compressions:

1/3 the depth of the infant's chest or about 4 cm (1 1/2")

#### Compression Speed:

Push hard, push fast and allow full chest recoil at a rate of 100-120 compressions a minute

#### Ratio:

30 compressions to 2 breaths

### Treatment:

- 1** STOP! Go through the Sign of Life™. **Activate EMS.**
- 2** Lie infant on their back on a firm surface.
- 3** If there are no obvious signs of breathing, begin **chest compressions**. Place 2 fingers on the middle of the chest, just below the nipple line. Perform 30 compressions 1/3 the depth of the infant's chest or 4 cm (1 1/2"). Push hard, push fast and allow the chest to recoil between compressions. Maintain an open airway while performing chest compressions.
- 4** Open the infant's mouth and check for the object. If you see the object, use a finger sweep to remove (hooking action with your smallest finger). Be very careful not to push the object further in.
- 5** **Open the airway** using head-tilt chin-lift (to a natural, sniffing position.) Cover the infant's nose and mouth with your mouth and **attempt to ventilate**. Your breath should be a gentle puff of 1 second - just enough to see the infant's chest rise. If the breath does not go in, re-position infant's head and attempt the breath again.
- 6** Repeat steps 3, 4 & 5 until object is dislodged. If you see the object, use a finger sweep to remove, ensuring you do not push it into the throat again.
- 7** Once object is removed and if infant is still not breathing effectively, perform CPR until the infant is resuscitated or EMS arrives. If you notice any change in the infant's condition, stop CPR and reassess vital signs.

### NOTE:

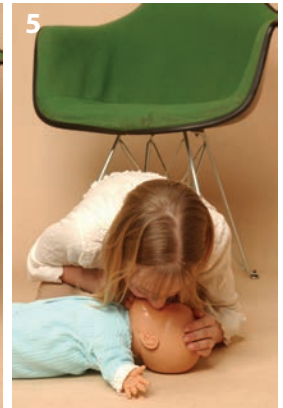
Photo numbers correspond to treatment steps.



Begin chest compressions (see step 3 above).



Open the mouth and check for the object. If visible, carefully remove it using a finger sweep.



Attempt 2 breaths (see step 5 above). If breaths are not successful, repeat steps 3,4,5. Continue until object is dislodged and casualty starts breathing or EMS arrives.

## CHOKING ASSISTANCE - VARIATIONS

When a choking casualty is considerably taller than you, have them kneel so you can administer abdominal thrusts and back blows. For a casualty whose abdomen is too large for you to encircle with your arms, or for a woman who is pregnant, you need to use chest thrusts instead of abdominal thrusts.

### Treatment:

- 1 Ask “Are you choking?”. Introduce yourself and indicate that you are trained in first aid; ask if you can help. Obtain consent before proceeding.
- 2 Use a combination of chest thrusts and back blows to clear the airway. Stand behind the casualty, bracing yourself by putting one leg between the casualty’s legs. Pull them in toward you while positioning your hands. Reach under the arms. Make a fist. Place thumb side against the middle of the sternum.
- 3 Grasp your fist with your other hand and pull straight back in deliberate thrusts towards you. Deliver 5 chest thrusts.
- 4 Stand beside the casualty and support the upper body while they lean forward. Deliver 5 back blows between the shoulder blades using the heel of your hand.
- 5 Alternate between chest thrusts and back blows until object is dislodged or the casualty becomes unconscious.



See back foldout for unconscious choking.



*Have you ever thought about what you would do if you were choking and alone?*

*Dial 911 and put your phone on speaker mode.*

*Next bring attention to yourself (i.e. go outside or into hallway, etc.) with a chair.*

*Then attempt to dislodge the foreign body by using the back of the chair to simulate abdominal thrusts (or perform thrusts on yourself).*

*Act quickly!*



*When a casualty is much taller than you, have them kneel down so you can perform abdominal thrusts and back blows at your level.*

*You can also modify this technique to help someone choking in a wheelchair or who is seated and cannot stand up.*



*If you need to assist a pregnant woman or a casualty who is too large for you to reach around their abdomen, chest thrusts will achieve the same goal. Reach under their arms and pull with force on the sternum.*



*Support the upper body while the casualty is leaning forward and deliver 5 back blows between the shoulder blades using the heel of your hand.*



**CAUTION:**  
**DO NOT** perform abdominal thrusts on any woman past her third month of pregnancy. Use **chest thrusts**.



Avoid drowning emergencies by taking appropriate precautions. Supervise children around water and ensure they follow the rules (i.e. no diving in shallow water, etc).

A drowning casualty will take in less water than is commonly thought. Your priority is to ensure or restore breathing. Any water in the lungs will be dealt with by medical professionals.

Hyperventilation can be associated with certain medical conditions. Advise the casualty to seek medical advice if this is a recurring condition.



Calm and reassure the casualty. **DO NOT** have them breathe into a paper bag.

## DROWNING

Drowning is a respiratory emergency because the lungs are not receiving oxygen. Water either suffocates the casualty or can cause throat spasms up to several hours later, also referred to as secondary drowning. Secondary drowning is when water enters the lungs, causing irritation and swelling in the lungs.

### Signs & Symptoms:

- casualty's head is low in the water
- mouth at water level
- gasping or hyperventilating
- panicking in water
- uncontrollable movements

### Treatment:

- 1 **STOP!** Remove casualty from the water and lay them down on their back (on a warm surface if possible). If head or spine injury is suspected, handle with extreme care (see page 23).
- 2 Go through the Sign of Life™. **Activate EMS** if the casualty is unconscious.
- 3 Perform a primary assessment (page 16). If no signs of effective breathing, start CPR. **See back foldout.**
- 4 If the casualty vomits during resuscitation attempts, turn them onto their side, clean out the mouth, roll them onto their back and reassess breathing. If no breathing, continue CPR. If casualty begins breathing, place them in recovery position (page 22).
- 5 If the casualty recovers and you do not suspect a head or neck injury, turn them onto their side. Monitor their vital signs. Keep casualty warm. Have them rest comfortably while you reassure them.



## HYPERVENTILATION

Hyperventilation is a respiratory disorder whereby a casualty suffers from rapid, shallow breathing.

### Common Causes:

Hyperventilation can be brought on by stress and anxiety. This condition causes an upset in the balance of oxygen and carbon dioxide in the body and can make the casualty dizzy.

### Signs & Symptoms:

- more than 30 (adult), 40 (child), 60 (infant) ventilations per minute
- tightness in throat, shortness of breath
- dizziness / anxiety
- numbing or tingling of hands, feet or face

### Treatment:

- 1 **STOP!** Go through the Sign of Life™. Remove casualty from the cause of their anxiety (if relevant).
- 2 Reassure and attempt to calm the casualty.
- 3 Have the casualty try to control their breathing by taking slow, deep breaths. Coach them to breathe in through the nose, hold it briefly, then exhale slowly.
- 4 Normal breathing should be restored within a few minutes. If it is not, or if the casualty becomes unconscious, **activate EMS** and see page 27.

# ASTHMA

Asthma is a medical condition which affects the airway. Following a triggering event, the air passages in the lungs become narrow due to swelling and spasms and tightening of muscles in the airway. The symptoms of asthma can be alleviated by the use of special medication that is breathed in through an inhaler. Asthmatics are typically children or young adults who often carry inhalers/medication at all times.

## Common Causes:

- allergy / a cold
- a drug / cigarette smoke
- physical exertion / stress

## Signs & Symptoms:

- difficulty breathing, wheezing during exhalation
- distress & anxiety
- rapid pulse
- tightness in the chest

## Treatment:

- 1 STOP! Go through the Sign of Life™. Remove casualty from anything that may have triggered the attack.
- 2 If the attack is mild, reassure the casualty and try to calm them.
- 3 Help the casualty to rest comfortably – preferably sitting, leaning forward and supported.
- 4 Assist with casualty's inhaler to the prescribed dosage, if required.

A **severe asthma** attack can be fatal.

- 1 STOP! Go through the Sign of Life™. **Activate EMS** if the casualty has no history of asthma, carries no medication, medication is not effective, or the casualty requests an ambulance.
- 2 Remove the casualty from the environment if the trigger is still apparent. Reassure the casualty and have them sit comfortably.
- 3 Assist with casualty's inhaler to the prescribed dosage, if required.
- 4 Monitor breathing. If the casualty loses consciousness and stops breathing, perform CPR if necessary. *See back foldout.*



## PREVENTION:

*Asthma attacks can be triggered unexpectedly, but taking precautions can help decrease the number of incidents (avoid triggers, carry medication).*



*Inhalers come in different shapes and sizes.*

*If the casualty is unable to administer their own medication, you may assist them as they take the correct dosage of their medication. See note on page 40.*





Dreamline Arts & Illusions

A severe allergic reaction can cause swelling to the face or eye.



If you have serious allergies, ask your doctor about anti-allergic medication and carry it with you at all times. Wear a medical alert indicator.



Anti-allergic medication is often carried by people with severe allergies and asthma.

Some anti-allergic medication comes with two doses. Consult EMS before assisting with second dose. If this is not possible and casualty continues to experience symptoms, a second dose of medication may be given.

## ANAPHYLACTIC SHOCK

Although mild allergic reactions can cause swelling, redness, hives or a rash, and will subside with treatment or on their own, severe allergic reactions can constrict air passages and lead to anaphylactic shock.

Anaphylactic shock is a collapse of multiple body systems. It affects the airway and is a life-threatening medical emergency.

### Common Causes:

Anaphylactic shock can be triggered by:

- ingesting a sensitizing food or medication
- an insect sting / bite (see also page 66)
- injection of a drug
- coming into contact with an allergen (substance which causes an allergic reaction - i.e. plants, chemicals, etc.)

### Signs & Symptoms of Anaphylaxis:

- coughing, difficulty breathing, wheezing, shortness of breath
- tightness in the throat and chest, hoarse voice, trouble swallowing
- nausea, vomiting, diarrhea
- dizziness, altered levels of consciousness, passing out
- hive-like rash or other allergy symptoms, paleness or blueness of skin
- swelling of the face, neck, anxiety, feeling of impending doom

### Treatment:

- 1 STOP! Go through the Sign of Life™. If the casualty is having difficulty breathing... **Activate EMS** immediately.
- 2 Remove casualty from trigger, if possible.
- 3 Assist the casualty with the use of their anti-allergic medication. Detailed directions for use are found on the container and the device  
*NOTE: Using this medication only provides temporary relief (10 - 15 minutes). If symptoms persist despite use of auto injector, seek medical advice before helping with a second dose. In unusual circumstances, when advanced medical assistance is not available, a second dose of epinephrine may be given.*
- 4 Help the casualty into a position that is comfortable and helps them breathe easier.
- 5 Treat for shock. Monitor vital signs until EMS arrives.
- 6 If the casualty becomes unconscious, [see back foldout](#).



**NOTE:** Certain work environments have certain protocols and policies in place regarding the administration of medication, like auto-injectors or inhalers and provide specific additional training. These individuals may take more control in the administration of the said medication if it is not feasible to simply assist.

## INHALATION INJURIES

Breathing in hot air or fumes can have various detrimental effects on the body. Excessive heat, smoke, carbon monoxide or other poisons can enter the body through the lungs and cause a respiratory emergency.

### Signs & Symptoms:

- difficulty breathing, coughing
- confusion, dizziness
- unconsciousness
- headache
- chest pain
- burns on the face, mouth & nose

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 If possible, remove casualty from unsafe environment. Reassure casualty and help them rest in a comfortable position.
- 3 Loosen restrictive clothing.
- 4 Monitor vital signs.
- 5 If casualty loses consciousness, *see back foldout.*



## COPD

COPD, or chronic obstructive pulmonary disease, is a progressive inflammatory lung disease that makes it hard to breathe. Two main types of COPD cause shortness of breath and a stubborn cough. In **chronic bronchitis**, swollen and irritated airways become coated with a thick mucus. With **emphysema**, air sacs in the lungs become damaged and reduce the exchange of oxygen. Less oxygen in the blood can also make a casualty tired and struggle to do everyday activities, like walking, climbing stairs or even getting dressed.

Both diseases are most often caused by smoking, or from long-term exposure to air pollution, dust, chemicals, as well as asthma. COPD can get worse over time. Seeing a doctor for a diagnosis and monitoring is very important. Treatment for COPD is similar to that for asthma. Medications may even be the same.

### Signs & Symptoms:

- shortness of breath, especially during physical exertion
- persistent cough that may produce mucus
- tightness in the chest
- wheezing
- chest congestion, especially first thing in the morning
- lack of energy
- edema (swelling of the ankles, feet or legs)

### Treatment:

- 1 STOP! Go through the Sign of Life™.
- 2 Help the casualty into a position that allows them to breathe easier.
- 3 Assist them with their medication (typically inhalers – bronchodilators and/or corticosteroids; or sometimes oral medications, including antibiotics).
- 4 Monitor vital signs.



*Never enter an unsafe environment.  
Call for help - **Activate EMS!***



*Burn marks around the mouth and nose may accompany an inhalation injury.*

### PREVENTION:

*To manage COPD so that symptoms **DO NOT** worsen over time, a casualty should stop smoking, practice healthy eating habits, and get regular exercise.*



### CAUTION!

*If the casualty's symptoms worsen or they become unconscious, **Activate EMS!** See back foldout.*





**CAUTION:**

If the casualty has an embedded object in his or her chest, **DO NOT REMOVE IT!**

Place dressings around the object and attempt to support it without disturbing the object or the wound.

If dressing becomes saturated, remove it and apply new dressings. Doing so will possibly prevent a tension pneumothorax.

## PENETRATING CHEST WOUND

Chest injuries can result in serious breathing emergencies. An open chest injury is easy to detect as the casualty's skin will be broken and a visible wound obvious. When an injury results in air or blood getting into the chest cavity, it is possible that a lung could collapse (see illustration below). This penetrating chest wound needs immediate first aid.

### Common Causes:

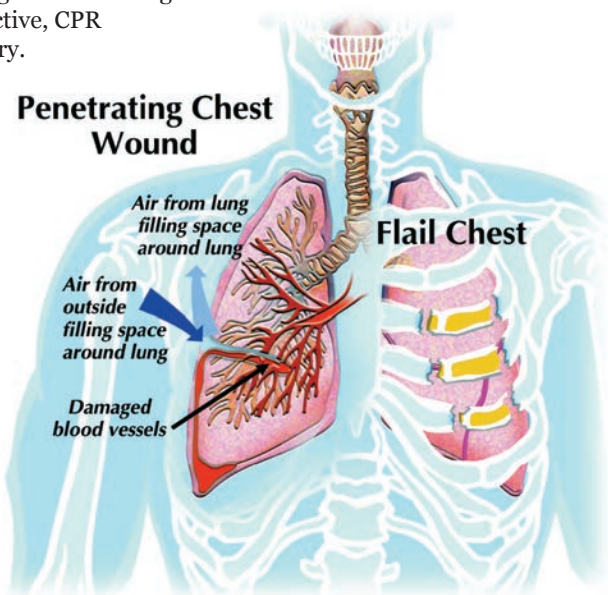
- gunshot
- stabbing
- puncture wound
- motor vehicle collision

### Signs & Symptoms:

- pain
- difficulty breathing
- blood-stained bubbles around wound
- sucking or gurgling sound from injury site
- bleeding

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Attempt to leave the chest wound open.
- 3 If bleeding is uncontrolled, place a clean and sterile dressing on the wound to absorb blood.
- 4 Help the casualty rest in a comfortable position that makes breathing easier. If no spinal injury is suspected, help the casualty to a semi-seated position or have them lay down leaning toward injured site. This protects the uninjured side by allowing it to expand freely.
- 5 Monitor vital signs. If breathing becomes ineffective, CPR may be necessary.



## FLAIL CHEST

A crushing injury or forceful blow to the chest may cause a **flail chest** injury, whereby several ribs in one area are broken and the chest wall becomes unstable. When the casualty breathes, the injured portion of the chest moves independently (opposite) to that of the rest of the rib cage (i.e. on inhalation, the flail portion gets sucked in). This injury is very painful since pieces of broken ribs cause tissue damage and may even puncture a lung.

### Common Causes:

- motor vehicle collision
- fall
- crush injury or severe blow

### Signs & Symptoms:

- abnormal movement of chest wall
- difficulty breathing
- bruised, swollen chest
- severe pain at specific site
- localized pain when coughing, breathing, moving

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Immobilize the casualty. Explain the importance of keeping still.
- 3 Attempt to stabilize the loose chest wall by placing your hand on the injury site for support. Apply a bulky dressing and use a bandage to hold in place.
- 4 Monitor vital signs closely until EMS arrives.



Apply a bulky dressing to stabilize a flail chest wound. Bandage in place.

### FYI:

**pneumothorax** - air in chest cavity  
**hemothorax** - blood in chest cavity  
**tension pneumothorax** - air in the chest cavity that becomes trapped  
**sucking chest wound** - a hole in the chest allows air to escape from the chest cavity

Average Heart Rates:  
(at rest / per minute)

adult 60 - 100 beats

child 80 - 100 beats

infant over 100 beats

## CIRCULATORY SYSTEM

The heart and blood vessels make up our circulatory system. Blood flows through the body by the regular pumping action of the heart. The circulatory and respiratory systems work together to send oxygen to all the cells in the body. **Arteries** carry bright red oxygenated blood away from the heart.

**Veins** carry dark red de-oxygenated blood back to the heart and lungs, where it picks up more oxygen and then is re-circulated back to the body. The exchange of oxygen and carbon dioxide occurs in the smallest blood vessels - the **capillaries** (fine blood vessels that link the arteries and veins), as well as in the lungs.

## DISORDERS OF THE CIRCULATORY SYSTEM

Our remarkable circulatory system continuously moves blood throughout our body. Active living and healthy eating helps encourage the proper working of this efficient system. However, accidents causing severe bleeding, or cardiovascular disease (disease of the heart & blood vessels) can interfere with the proper functioning of the circulatory system. (Severe bleeding will be addressed in the next section.)



### Risk Factors for Cardiovascular Disease

Several risk factors can lead to cardiovascular disease. However, if the following factors make us a candidate for cardiovascular disease, we can adjust our lifestyle to reduce the likelihood of developing heart problems.

Risk factors may include:

- Age
- Heredity (family history of heart disease, diabetes, etc.)
- High Blood Pressure
- High Blood Cholesterol
- Smoking
- Substance Misuse (i.e. alcohol)
- Obesity
- Lack of Exercise
- Poor Diet
- Diabetes
- Stress

Being aware of our current situation and making healthy choices can help us live longer, healthier lives.

Cardiovascular disease has many associated disorders...

## HIGH BLOOD PRESSURE

In a healthy person, blood pressure naturally increases in response to stress or excitement, but returns to normal after the stimulus has passed. High blood pressure (hypertension) is a condition in which the pressure exerted against the walls of blood vessels remains elevated at all times. Hypertension eventually causes damage to the blood vessels and results in thickened, hardened arteries (arteriosclerosis) and an enlarged heart. **High blood pressure can go undetected for some time, because a casualty usually feels no symptoms.**

When blood pressure becomes extremely high, some people may experience symptoms. These are serious and should be discussed with a doctor as soon as possible.

### Symptoms of severe high blood pressure:

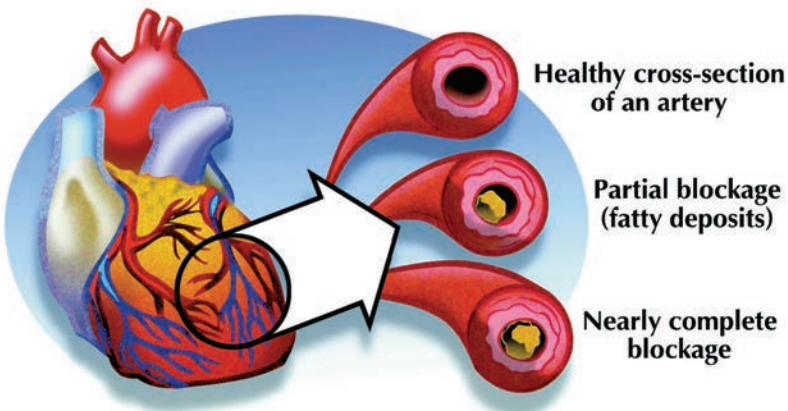
- feeling of pounding in the chest, head or ears
- irregular heartbeat
- chest pain
- dizziness or light-headedness
- vision problems
- shortness of breath
- nosebleeds

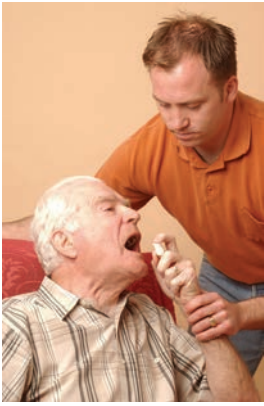
## ARTERIOSCLEROSIS

Arteriosclerosis is hardening of the arteries. The vessels lose their elasticity and become thickened. The result is a decreased blood supply. Atherosclerosis is a kind of arteriosclerosis.

## ATHEROSCLEROSIS

Fatty deposits that build up inside the arterial walls can also affect the health of arteries. This narrowing of the arteries, called atherosclerosis, restricts blood flow and reduces the amount of oxygen reaching the heart. Angina (heart-related chest pain), heart attack, congestive heart failure, stroke and cardiac arrest may be the result of artery disease.





## ANGINA

When **coronary arteries** (arteries that carry blood to the heart muscle) become narrow and hardened, the heart works harder in an attempt to obtain proper amounts of oxygen. This increased work load, coupled with insufficient levels of oxygen, causes a constricting feeling in the chest. In effect, a casualty feels pain from the relative “starving” of the heart muscle of oxygen. Angina episodes are brief but painful.

### Common Causes:

- cardiovascular disease
- arteriosclerosis / atherosclerosis
- high blood pressure
- physical exertion or excitement



### Signs & Symptoms:

- pain, pressure in chest (may radiate to neck, jaw, shoulders and arms)
- difficulty breathing / nausea / anxiety, fear, denial
- pale, bluish skin, perspiration
- casualty describes pain as “heartburn” or “indigestion” (sometimes)
- pain alleviated by rest or medication
- symptoms last less than 10 minutes



Assist the casualty to take ASA (one adult or two low-dose tablets). **DO NOT repeat!**

### ASA - What you need to know:

- ASA (Acetylsalicylic acid) has anti-clotting properties, which help to prevent angina and heart attacks. If a casualty is experiencing a heart attack, ASA can reduce the risk of death.
- Make sure a casualty is not allergic to ASA or has been told by their doctor not to take it. Then only **assist** them in taking it.
- The casualty should be alert, and be able to chew up and swallow 2 low-dose (80 mg), or 1 adult dose (325 mg) non-enteric coated tablets of ASA.
- Ibuprofen or acetaminophen ARE NOT substitutes for ASA. **DO NOT** suggest these medications!
- If you are unsure about the signs and symptoms the casualty is experiencing, **DO NOT** suggest ASA.

### Nitroglycerine – What you need to know:

- A casualty who is **diagnosed with angina** will carry this prescribed medication.
- Nitroglycerine can take the form of a small tablet that is placed under the tongue, a spray (inhaler), or a patch that is placed on the chest.
- Nitroglycerine works very quickly to help increase blood flow to the heart by dilating blood vessels.
- **The casualty should not take Nitroglycerine if they have taken Erectile Dysfunction medication within the last 24-48 hours.** The combination of these medications can negatively affect the casualty’s blood pressure.
- Ensure to **assist** a casualty in taking their Nitroglycerine. They can take a maximum of 2-3 doses in a 15-minute period (one dose every 5 minutes).
- **Activate EMS** as soon as possible if you suspect the casualty is having a heart attack. **If the casualty cannot take their Nitroglycerine, Activate EMS!**



photo by Apex Training Solutions

## HEART ATTACK

Heart muscle tissue that is deprived of oxygen can die. The most common cause of a **heart attack (acute myocardial infarction)** is a sudden complete blockage by a blood clot or fatty deposit in one of the heart's coronary arteries. This causes deprivation of oxygen and eventually death to heart tissue. When significant tissue death occurs, the heart could stop beating - cardiac arrest.

Medications are available that can dissolve a blockage or thin the blood, therefore immediate medical attention is crucial to recovery.

### Common Causes:

- cardiovascular disease
- arteriosclerosis / atherosclerosis
- high blood pressure
- physical exertion or excitement, but may also occur at rest

### Signs & Symptoms:

- from slight discomfort to severe chest pain (may be described as heartburn or indigestion); pain may radiate to abdomen, shoulders, arms, neck/jaw, back
- difficulty breathing
- pale, bluish skin, perspiration
- nausea, vomiting
- denial (casualty will dismiss pain as heartburn) / fear / anxiety

The difference between angina and heart attack is that during a heart attack, the pain does not subside with rest or medication.

### Treatment for Angina and Heart Attack:

- 1 STOP!** Go through the Sign of Life™. **Activate EMS** if:
  - This is the **first time** the casualty is experiencing this pain. It could be a heart attack!
  - If the casualty has angina, but the attack is different than others experienced in the past.
  - If the pain does not immediately subside with rest, or you suspect the casualty is having a heart attack.
- 2** Have the casualty rest in a comfortable position, and ask the SAMPLE questions. (Secondary Assessment; page 19) Try to determine:
  - Was the pain caused by exertion or trauma to the chest?
  - Do they have an allergy to ASA or any medical reason not to take it?
  - Are they diagnosed with angina? Do they have prescribed medication for their chest pain?
- 3** If the chest pain wasn't caused by an injury, the casualty has **no known allergy to ASA**, and **has not** been told by their doctor not to take it, encourage an **alert adult casualty to chew and swallow 2 low dose (80 mg) or 1 adult dose (325 mg) non-enteric coated ASA tablets.**
- 4** If the casualty is **diagnosed as having angina**, assist them with their prescribed medication (Nitroglycerine) to a maximum of 2-3 doses in a 15-minute period (one dose every 5 minutes).
- 5** Comfort and reassure the casualty. Monitor vital signs. Be prepared to perform CPR. **See back foldout.**



*Chest pain is a common symptom, but not all heart attack casualties experience chest pain. For example, women may have pain in their abdomen, upper back, neck or jaw.*



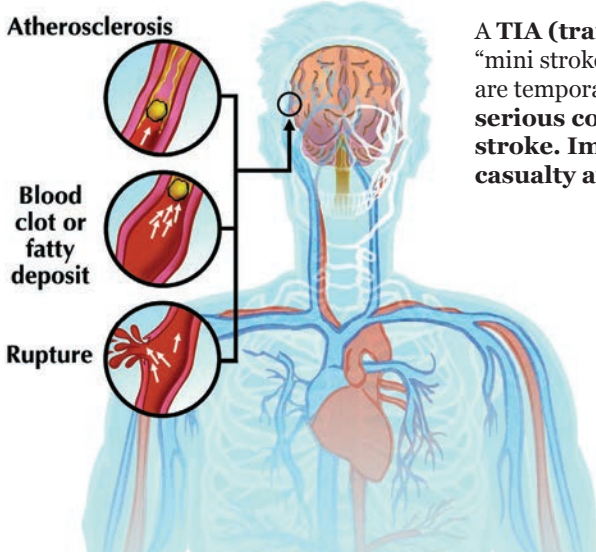
### CAUTION!

- **DO NOT** administer medication – only assist the casualty.
- Ensure no allergy to ASA or no other medical reason to avoid its use.
- **DO NOT** repeat a dose of ASA.
- **DO NOT** give ibuprofen or acetaminophen.
- If the casualty has taken erectile dysfunction medication in the past 24 – 48 hours, **DO NOT** recommend nitroglycerine, as it may affect the casualty's blood pressure.
- **DO NOT** drive the casualty to the hospital. You may need to resuscitate. **Activate EMS!**

## STROKE

A **stroke** or **CVA (cerebrovascular accident)** is a “brain attack”. Similar to a heart attack, it is caused by a blockage or rupture of a blood vessel in the brain. Brain tissues die when they do not receive adequate amounts of oxygen. This results in brain damage or death.

Because the brain controls our nervous system, movement, coordination and other functions (speech, vision, etc.) may be affected.



A **TIA (transient ischemic attack)** can be referred to as a “mini stroke”. It is similar in nature to a stroke, but the effects are temporary (last a few minutes to 24 hours). **A TIA is a serious condition, because it often occurs before a stroke. Immediate medical attention may help the casualty avoid a severe attack.**

### Common Causes:

- blood clot or fatty deposit lodged in brain
- high blood pressure
- ruptured blood vessel in the head/brain
- atherosclerosis (narrowing of arterial openings)

Using a stroke assessment tool such as F.A.S.T. (Face, Arms, Speech, Time) can assist a first aider in recognizing a stroke sooner.

### Signs & Symptoms:

- Face - vision problems, one side of the face drooping
- Arms - lack of coordination, numbing or weakness on one side of the body
- Speech - speech impairment, drooling
- Time - note when the signs and symptoms began
- Other signs and symptoms may include: headache, dizziness, confusion and an altered level of consciousness

### Treatment:

A first aider cannot distinguish between a stroke or TIA, so treatment is the same for both.

- 1 **STOP!** Go through the Sign of Life™. **Activate EMS.**
- 2 Have the casualty sit down and rest comfortably (semi-sitting is best, but choose a position most comfortable for the casualty). Loosen restrictive clothing and reassure the casualty.
- 3 If the casualty becomes unconscious, assess CAB's and place in the recovery position. If paralysis is evident, lay them on the unaffected side; this provides protection for the blood vessels and nerves on the affected side and promotes effective breathing.
- 4 Monitor vital signs until EMS arrives.
- 5 Be prepared to perform CPR. **See back foldout.**



**DO NOT** allow a stroke/TIA casualty to eat or drink. Moisten lips with a wet cloth if thirsty.

A casualty's recovery chances are best when they get to a hospital as soon as possible. Medications are available that can help lessen or even reverse the effects of a stroke. However, medical tests are needed to determine the best treatment.

**DO NOT** give ASA to someone who may be having a stroke.

# CARDIAC ARREST

Cardiac arrest literally means “heart stop”. This is a serious medical emergency and requires immediate attention! When the heart is not pumping blood through the body, our vital organs are starved of oxygen. They can only survive for a few minutes before they die. CPR (cardiopulmonary resuscitation) must be started as soon as possible to increase the casualty’s chances of survival.

Effective CPR serves to circulate blood through the body by the mechanical pumping of the heart and introduces oxygen through the process of artificial respiration. After activating EMS, use an AED (Automated External Defibrillator - see page 50) if the machine and a trained rescuer are available. This device can actually reset a heart. When an AED is not available, CPR is the first critical step in caring for cardiac arrest; second is defibrillation; third is advanced medical care.

*CPR will typically not “restart” a heart. CPR serves to circulate blood and oxygen through the body until EMS takes over.*

## Common Causes:

- heart attack
- stroke
- suffocation / drowning
- electrical shock
- drug overdose or reaction
- motor vehicle collision

## Signs & Symptoms:

- sudden unconsciousness, following the signs & symptoms of angina or heart attack
- no signs of effective breathing

## Treatment:

CPR - Adult / Child / Infant - See back foldout.



## PREVENTION:

*Healthy Life Choices:*

- proper diet
- regular exercise
- taking appropriate safety precautions at home, work and play
- controlling risk factors (i.e. hypertension, etc.)

**NOTE:** Employers are responsible for ensuring regular inspections and maintenance of workplace AEDs. This includes verifying the status, cleaning, replacing batteries, AED pads, accessories, etc., as needed.



**DO NOT touch the casualty while the AED is analyzing or delivering a shock.**

## AUTOMATED EXTERNAL DEFIBRILLATION (AED)

A casualty who has suffered cardiac arrest has the best chance of revival and recovery if defibrillation is performed as soon as possible. If a casualty is unconscious and has no pulse, an AED can “reset” a heart. A trained rescuer turns on the AED, and is guided through the process of connecting adhesive electrodes to the chest of the casualty. The defibrillator then analyzes the heart rhythm. If it detects VT (**ventricular tachycardia** – heart’s ventricles are contracting too fast) or VF (**ventricular fibrillation** – an irregular rhythm causing quivering of the heart muscle), the AED delivers an electric shock. The shock briefly stops all electrical activity in the heart and allows it to become “re-programmed”.

An individual who has been trained on the use of an AED will follow the steps below. **NOTE: CPR will be interrupted to start AED protocol as soon as it arrives.**

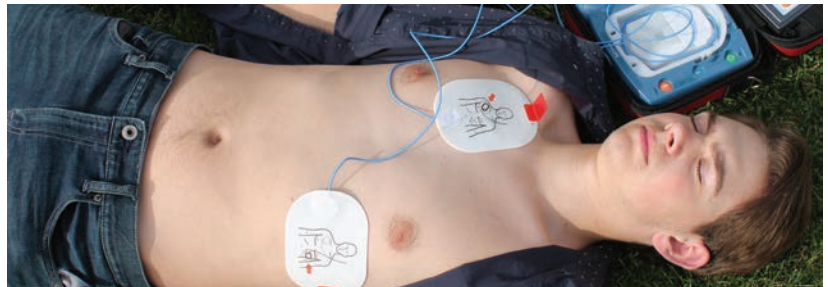
### Treatment Steps:

- 1 Ensure you are in a dry area. Turn the AED on. Remove any clothing and other objects that may come in contact with the pads.
- 2 Ensure that the chest is dry and free of excessive hair so that the pads will stick. Shave the area if needed. Attach pads as directed by the AED and place the pads exactly as shown in the pictures on the pad.
- 3 Follow the AED prompts. Ensure no one is touching the casualty while the AED is analyzing. If prompted to shock, ensure area around the casualty is clear (no one is touching the casualty) before pressing the shock button.
- 4 Once one shock is delivered, resume CPR starting with chest compressions. After 2 minutes of CPR, the AED will re-analyze and may prompt another shock. This cycle may be repeated depending on results of AED analysis.



### AED USE FOR CHILDREN AND INFANTS

AED's can also be used on children and infants. Use a child/infant enabled AED capable of delivering a child appropriate shock and/or child/infant AED pads if available. Otherwise, use standard equipment. If spacing between pads is less than 2.5 cm (1") for a child or infant, place one pad on the front of chest and the other on the child's back.



### Special Considerations:

- If the casualty is wearing a medication patch where the electrodes are to be attached, it should be removed. (Wear gloves to protect yourself from the medication).
- If the casualty has a small scar and lump on his or her chest, they may have a pacemaker. Position the electrode one inch away.
- An AED may be used on a pregnant woman or someone with serious injuries.
- AED's are most successful if a shock is delivered within 4 minutes of cardiac arrest. As time progresses, all electrical activity usually stops (no VR or VT), and an AED will not deliver a shock. Continue CPR as directed.

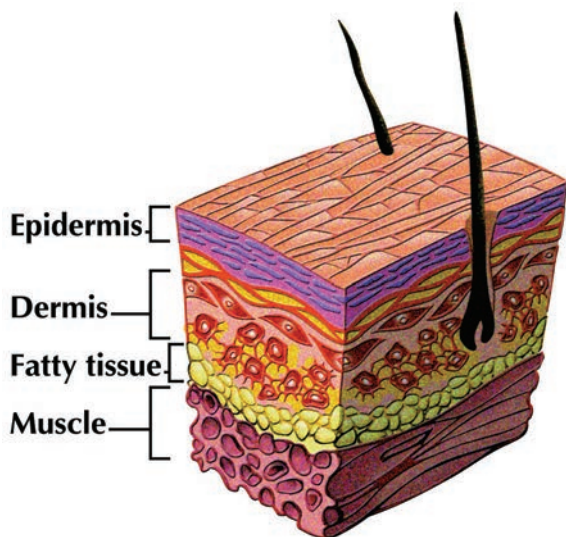
## WOUNDS & BLEEDING

If you never come across a major medical emergency in your lifetime, you will most definitely have to deal with some form of soft tissue injury. Minor cuts, bruises and scrapes are common occurrences that typically don't need special treatment. However, there are many types of serious wounds and bleeding injuries that require first aid. Understanding the physiology of blood vessels, soft tissues and how different types of wounds affect them can help you provide proper treatment and care.

*For more information on injury prevention, see our Prevention & Safety section, starting on page 91.*

### Soft Tissues

Layers of skin, fat and muscles make up our **soft tissues**. This outer covering of our body serves to protect our internal organs from germs, regulate body temperature, and house nerves, sweat glands, oil glands and blood vessels. Trauma to these layers results in varying degrees of soft tissue injuries.



Wounds, or soft tissue injuries, can cause **external bleeding** – loss of blood from an opening on the surface of the body, or **internal bleeding** – where blood escapes from tissues inside the body.

Bleeding is classified according to the vessel affected.

**Arterial bleeding** is life-threatening since the bright red oxygenated blood is under direct pressure from the heart and flows in strong spurts. It will be difficult to control arterial bleeding because the blood does not flow slowly enough to clot easily. First aiders may need to use a tourniquet to control this life-threatening bleeding.

Venous blood is darker red and flows steadily. When veins are cut, they often collapse, and blood clots may form. **Venous bleeding** is usually easier to control (with elevation and pressure) unless veins are damaged deep within the body. These may cause extensive bleeding and threaten the casualty's life.

Bleeding from **capillaries** is most common and also most easily controlled. Capillaries are narrow and under low pressure, therefore clotting may occur without intervention.



Always use sterile (from a first aid kit) or clean (if improvised) dressings to cover open wounds!

**Hemostatic dressings** (pictured below) are z-folded dressings which may also be treated with a substance that aids in clot formation. Use when bleeding isn't easily controlled. Packing the wound using fingers on both gloved hands while continuously applying direct pressure will help stop or slow bleeding and aid in clot formation.

The dressings can be used when tourniquets cannot be applied, like on a casualty's neck, armpit, or groin. You can use these dressings alongside a tourniquet, but they should not be used in place of a tourniquet when one is available and can be applied.



**Dressings** include band-aids, gauze pads, clean cloths, etc.

Examples of **bandages** are gauze rolls, tensor bandages, triangular bandages, pressure bandages, etc.

## DRESSINGS AND BANDAGES

A **dressing** is a protective covering for an open wound. It serves to absorb blood, control bleeding and prevent the entry of bacteria into the body. An effective dressing must be:

- dry and clean (a sterile commercial dressing is ideal)
- large enough to cover the entire wound
- absorbent
- made of lint-free material that will not stick to the wound

A **bandage** may have several purposes:

- to hold a dressing or splint in place
- to apply pressure to a wound (control bleeding)
- to provide support to an injured limb or joint (i.e. sling)
- to immobilize a body part

### When applying dressings and bandages:

- 1 Keep the injured part positioned comfortably.
- 2 **DO NOT REMOVE** if they become soaked with blood. Add more dressings and bandages on top of the existing ones, applying pressure to control bleeding.
- 3 Assess for proper circulation by checking the color and temperature of the skin, asking if the casualty feels any tingling or numbness, and pressing on the nail bed and ensuring the color returns promptly.



## EXTERNAL BLEEDING

External bleeding is easier for a first-aider to identify than internal bleeding. However, the visible loss of blood and its associated injuries can be more distressing and can distract you from noticing a more serious underlying problem. Whatever situation you are faced with, your priorities are always the same:

- **Protect yourself** and the casualty by wearing gloves. **DO NOT** touch the wound. Use clean dressings and bandages. Wash your hands after any contact with a casualty.
- **Control bleeding** (severe bleeding can be life-threatening).
- **Prevent infection.** (see page 54)
- If required, ensure the casualty receives **medical attention** as soon as possible.

### In general, treatment for external bleeding is direct pressure:

- 1 Have the casualty rest and relax.
- 2 Apply direct pressure with your gloved hand using a clean dressing or a pressure bandage. Direct pressure will help reduce blood flow and encourage clotting.
- 3 Check for circulation above and below the injury site. (The temperature of the skin should be warm and equal on both sides and skin should not be purple, blue or white.) You can also compare temperature and color to the other limb.
- 4 If bleeding persists and the dressing becomes blood-soaked, **DO NOT REMOVE**. Add a second dressing and bandage tighter to control bleeding. You will need to use a **tourniquet** to control bleeding if direct pressure is not adequate. Hemostatic dressings may also be used.

### First Aid for Severe External Bleeding

#### (Bleeding that is life-threatening, with Signs of Shock):

- 1 **STOP!** Go through the Sign of Life™. **Activate EMS!**
- 2 Apply direct pressure using hemostatic dressings and/or sterile dressings pressed over the wound with your gloved hand or the casualty's (gloved) hand.
- 3 Bandage the wound, maintaining pressure on the dressing.
- 4 Apply a manufactured tourniquet:
  - At least 5-10 cm (2-4") above the injury. **DO NOT** apply on a joint, such as the elbow or knee. If there is a joint above the injury, secure the tourniquet 2.5 cm (1") above the joint.
  - Manually tighten the tourniquet as much as you can by pulling firmly on the end strap.
  - Twist the rod in one direction to increase the pressure, until the bleeding stops.
  - Using the clip, secure the rod in place so that it does not unwind.
  - Note the time that you applied the tourniquet (write it down). **DO NOT** remove the tourniquet for any reason once it is applied.
- 5 Continue to monitor the casualty and treat for shock (page 18) until EMS arrives.



PROTECT YOURSELF!  
WEAR GLOVES!



#### CAUTION!

Using a tourniquet involves a level of risk, and should only be used in the following situations:

- It is a life-threatening bleed, and direct pressure alone cannot control the bleed.
- The casualty's injured limb is trapped in a confined space, and direct pressure cannot be used.
- You must move the person and you are unable to maintain direct pressure while doing so.



Wrap an amputated part in a dry, sterile dressing. Place in a plastic bag and lay on a bag of ice. **DO NOT** place directly onto ice or cover with ice as this could damage nerves and tissues.

## AMPUTATION

An **amputation** is the loss of a portion or an entire limb. It causes intense bleeding and pain and can lead to shock. Re-attachment may be possible. You must take proper care of the casualty as well as the amputated limb.

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Control bleeding with direct or indirect pressure. Keep damaged limb covered.
- 3 Treat for shock (page 18).
- 4 Retrieve the amputated part and wrap in a dry, sterile dressing. Place in a plastic bag and lay the bag on ice. Do not cover the body part with ice as it could damage the nerves and tissue (i.e. frostbite).



## INFECTION

Open wounds may become infected if germs enter the tissues. Always clean a wound thoroughly and keep it clean. First aid treatment for minor infections may relieve the symptoms, but if in doubt, or the symptoms are severe, seek medical attention - antibiotics may be needed.

### Common Causes:

- improper cleaning of an open wound
- transmission of germs from first aider to casualty (gloves protect both parties)
- germs that become embedded deep within a wound (deep injury)

### Prevention:

- All open wounds are susceptible to infection.
- Always use **sterile or clean** dressings and bandages.
- DO NOT cough or breathe directly onto a wound.
- DO NOT leave a wound exposed. Cover with a sterile dressing or bandage.

### Signs & Symptoms:

- wound becomes red & swollen
- affected area becomes sensitive or painful
- affected area may feel warm
- presence of yellow or white fluid (pus)

### Treatment:

- 1 Clean the wound with sterile or tap water.
- 2 Apply warm, wet compresses and antibiotic ointment, if available.
- 3 Seek medical attention.

# INTERNAL BLEEDING

Internal bleeding occurs when blood is lost from arteries, veins or capillaries and flows into tissues and cavities inside the body. Internal bleeding can also be evident when blood exits the body through the mouth, nose, ears, rectum or vagina. Whenever you detect external blood loss, also consider the possibility of internal bleeding as well, and treat accordingly.

## Common Causes:

- motor vehicle collision / falls
- blunt force applied to the body
- deep open wound (i.e. stabbing or gunshot)
- closed fracture (organs / vessels are damaged by bone fragments)

## Signs & Symptoms:

- bruising or unusual coloration of skin (i.e. cool, moist skin)
- breathing difficulties
- swelling, tenderness, rigidity of injured area
- drainage from nose or ears
- excessive thirst / nausea and vomiting
- weakness and dizziness

## Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Treat life-threatening injuries.
- 3 Help the casualty rest and relax in their most comfortable position. If unconscious and no head or neck injury is suspected, place the casualty in the recovery position.
- 4 Continue to monitor vital signs.
- 5 If casualty loses consciousness, [see back foldout](#).



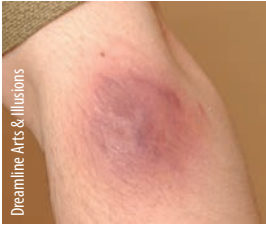
*The loss of a large volume of blood, either internally or externally, can lead to shock since vital organs become starved of oxygen.*

*With severe blood loss, monitor vital signs closely and be prepared to treat the casualty for shock.*



*Bruising may or may not be evident with internal bleeding.*

## CLOSED WOUNDS



### BRUISE

A **bruise**, also called a **contusion**, is a closed wound that can be caused by a blunt force or a fall. When the soft tissue layers beneath the skin's surface are damaged, blood vessels break and leak into the surrounding tissues.

Blood and other fluids collect in the affected area and the surface becomes discolored and swollen. A strong force will affect deeper layers of vessels and tissues.

#### Treatment:

Minor closed wounds usually do not require medical attention. You can offer relief by performing the following:

- 1 Apply a cold compress to the wound (**for no more than 15 minutes every hour**) while pain persists. Protect the area by placing a towel or cloth between the skin and the ice pack.

For severe bruising, consider the possibility of a serious injury to internal organs or muscles. If you suspect a major injury, have the casualty seek immediate medical attention.



Wrap a cold pack in a towel and apply to a bruise for 15 minutes every hour to lessen pain and swelling.



If you come across a crush injury where the casualty is still trapped, **ACTIVATE EMS IMMEDIATELY**. Removing the object could trigger a bleeding emergency and shock. The dispatcher will help you determine the best course of action.

### CRUSH INJURIES

Crush injuries occur when a great force is applied to the body (motor vehicle collision or industrial accident, a fall, or debris from a natural disaster). Only a doctor can determine the extent of injuries caused by the force (i.e. internal bleeding, fractures, etc.), so immediate medical attention is imperative.

If a casualty remains trapped by a heavy object for a period of time, the affected area may have impaired circulation. Removing the object could trigger a bleeding emergency and shock. **Activate EMS** and have the dispatcher help you determine the best course of action.



## OPEN WOUNDS

Open wounds break the skin's surface and create a port for the entry of germs into the body.

### ABRASION / SCRAPE

The most common open wound is an **abrasion**, in which the outer layers of skin are scraped away. Abrasions may have little or no blood loss, but are painful because nerve endings can be torn and exposed. Dirt or debris may be embedded in the wound and cause infection, so a thorough cleaning is important.

#### Treatment:

- 1 For minor wounds, clean the area with soap and water (for 5 minutes, if possible), using a clean dressing or swab and minimal scrubbing. An over-the-counter antibiotic ointment may be applied.
- 2 Cover the wound with a clean dressing and/or bandage.

### LACERATION / CUT

A cut or tear from a sharp, smooth or jagged edge can cause a **laceration**. The skin splits and excessive bleeding may result. Severe lacerations can affect deeper layers of soft tissue.

Cuts over joints, on the hands or face should probably be seen by a doctor, even if they appear small.

#### Treatment:

- 1 Apply pressure to the area to control bleeding.
- 2 Bandage the wound with a clean, sterile dressing. Stitches or special care may be required if:
  - the wound gapes
  - bone or deeper tissues are visible
  - wound is over a prominent area (i.e. face)
  - wound is over a joint (and is likely to be stretched open)

If unsure, or for major wounds, seek medical attention.



To treat a large laceration, apply pressure to control bleeding.



Bandage the wound and have the casualty seek medical attention.



For any large wound, the casualty should seek medical attention to ensure proper cleansing and to control pain.



If stitches are required, it is important to seek medical care immediately after an injury occurs.

Stitches serve to:

- speed healing
- reduce the risk of infection
- reduce scarring



PROTECT YOURSELF!  
WEAR GLOVES!



### CAUTION!

If a wound is bleeding severely, **DO NOT** attempt to clean it. Priority is to control bleeding. Washing the area may destroy a blood clot and extend blood loss.

## AVULSION / TEAR

An **avulsion** occurs when a piece of skin is torn away or torn back, with a “flap” still attached. Since several layers of tissue are usually affected, this wound can bleed profusely.

### Treatment:

- 1 If a flap is still attached, reposition it and apply direct pressure to control bleeding.
- 2 To determine if medical attention or stitches are required, use the following criteria: if the wound is large, gaping, you can see bone or underlying tissues, is on a joint or if debris may be trapped, the casualty should see a physician.
- 3 Cover with a clean dressing or bandage.



## PUNCTURE WOUND

When a sharp or pointed object, like a nail, piece of glass, or tooth pierces the skin, a **puncture wound** results. Puncture wounds usually have a small point of entry that closes up, but can cause severe damage internally. The greatest concern with a puncture wound is infection, since dirt and germs can be carried into the body.

### Treatment:

- 1 Remove clothing covering the wound.
- 2 Allow small puncture wounds to bleed to “wash” away debris and germs. Small wounds should slow or stop after about 5 minutes. Severe bleeding must be controlled.
- 3 If the object is impaled (remains in the wound), **do not attempt to remove it**. Stabilize the object and bandage the wound with the object securely held in place.
- 4 If bleeding is excessive, apply indirect pressure and dressings and seek immediate medical attention.



**DO NOT** attempt to remove an impaled object. Bandage securely and seek medical attention as soon as possible.

*NOTE: Any open wound caused by a dirty object may lead to tetanus (lockjaw). Tetanus is a bacterial infection which is characterized by severe muscle spasms and may be potentially fatal.*

*A casualty who has suffered an open wound should be encouraged to seek medical attention for a possible tetanus booster.*



**DO NOT** attempt to remove an embedded object. Control bleeding and securely bandage in place. Seek medical attention as soon as possible.

## BLEEDING FROM THE SCALP

The scalp is rich in blood vessels, but lacks the protective padding of muscle and fat; therefore, a scalp injury can cause severe bleeding. Consider the mechanism of injury to determine whether a skull fracture, or even a spinal injury, may be possible.

### Treatment:

- 1 STOP! Go through the Sign of Life™.
- 2 If a spinal injury is suspected, **Activate EMS**. Instruct the casualty not to move his or her head. Have a bystander provide support in the position found until EMS arrives. Attempt to control bleeding.
- 3 If a spinal injury is not suspected, apply direct pressure to the wound and bandage.
- 4 If the mechanism of injury is an embedded object or blow to the head which may have caused a possible skull fracture, do not apply direct pressure. Secure a pad around the object and maintain indirect pressure.
- 5 Encourage the casualty to seek medical attention if EMS has not been called.

## BLEEDING FROM THE EAR

Bleeding from the ear can have several causes. A soft tissue injury inside the ear (with an evident cut or scrape) can be treated by a first-aider. An injury to the eardrum or from a skull fracture, however, is a medical emergency! Watery drainage (blood that is thin and watery and contains yellowish fluid) is cerebrospinal fluid and a sign of a serious head injury.

### Common Causes:

- explosion
- foreign body in the ear (i.e. insect, toy, etc.)
- blow to the head
- sport or recreational injury
- motor vehicle collision

### Signs & Symptoms:

- drainage from the ear
- hearing loss
- pain
- loss of balance

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS** if necessary.
- 2 If blood or clear fluid is draining from the ear canal (and it is not an obvious cut or scrape), **do not apply direct pressure**. Use a sterile dressing and lightly cover the ear to absorb the drainage. If no head or spinal injury is suspected, have the casualty semi-sit with their head tilted towards the injured side to allow for drainage.
- 3 Have the casualty seek medical attention if EMS has not been called.



Apply direct pressure to control bleeding and bandage a scalp injury. If there is a suspected skull or head injury, encourage the casualty to seek medical attention.



### INDIRECT PRESSURE

When it is not possible to apply direct pressure (i.e. fracture, impaled object, wound with glass embedded, etc.), **indirect pressure** may be applied to the surrounding area to control bleeding.

Pressure on the skin all around a wound may help slow blood loss and encourage clotting.

### If a foreign object is lodged in the ear canal:

- Only attempt to remove the object if it is visible and you can easily grasp it without pushing it further into the ear canal.
- Take the casualty to a doctor if the object is not easily removed.



**DO NOT** apply pressure to an ear injury. Lightly cover the ear to absorb drainage.



*DO NOT bandage the uninjured eye.*



*Flush away from uninjured eye.*

**NOTE:** Workplaces are required by the Occupational Health and Safety Code to have emergency eye wash stations or showers in areas where hazardous chemicals are used.

### Signs & Symptoms:

- mild to severe pain usually starting a few hours after the incident
- bloodshot, watery eyes or sensation of something in the eye
- light sensitivity
- blurred vision

## EYE INJURIES

The eye and soft tissues surrounding the eye socket are very sensitive and require special attention and treatment. Eyelids also have many blood vessels and can bleed profusely. **Never apply direct pressure to the eye.** This can cause permanent damage. Injuries to the eye can include a foreign object in the eye (i.e. dust, metal, sand, glass), an injury to the soft tissue around the eye, an embedded object in the eye or a chemical spill or splash to the face. Also consider the potential for an inhalation injury.

### Treatment for a soft tissue injury near the eye:

- 1 STOP! Go through the Sign of Life™. **Activate EMS** if necessary.
- 2 Apply a dressing to the wound to control bleeding. NEVER apply direct pressure to the eye.
- 3 Encourage the casualty to seek medical attention if EMS has not been called.

### Treatment for a foreign body in the eye:

- 1 STOP! Go through the Sign of Life™.
- 2 Encourage the casualty to blink. The casualty's tears may wash out the object. If the object is visible on the white part of the eye, gently remove with a moist tissue. You can also have the casualty lean over a bowl or sink and flush the eye with cool water.
- 3 If you cannot remove the object safely, place a sterile dressing over the casualty's closed eye and bandage. Encourage the casualty to seek medical attention immediately.

### Treatment for an embedded object in the eye:

- 1 STOP! **Activate EMS** if necessary.
- 2 Have the casualty lie down and encourage them to keep still.
- 3 Never attempt to remove an impaled object. Apply a sterile dressing around the object and support in place without disturbing it. Use layers of gauze to prevent movement of the impaled object.
- 4 Have the casualty seek medical attention immediately if EMS has not been called.

### Treatment for a chemical splash to the eye:

See **Chemical Burns to the Eye**, page 64.

## ARC FLASH

A flash burn is a painful inflammation of the cornea, which is the clear tissue that protects the front of the eye. An arc flash burn occurs when a casualty is exposed to bright UV light. While all types of UV light (direct sunlight, reflection off water or snow, etc.) can cause this injury, welding torches are the most common. Flash burns are like sunburn in the eye and can affect both eyes. Fortunately, the eye can repair itself in one or two days, and usually heals without leaving a scar; however, if the flash burn is not treated, an infection may occur. This can be serious and may lead to some vision loss.

### ARC FLASH Treatment

Protect eye(s) from light, apply cool wet compress and seek medical attention.

## MOUTH INJURIES

An injury to the mouth or jaw can cause breathing difficulties or vomiting if the airway is obstructed by blood, or if blood is swallowed. It is important to first determine if the mechanism of injury could have resulted in a head or spinal injury. If possible, treat for spinal injury (see page 23).

### Treatment:

- 1 If no spinal injury suspected, have the casualty sit with his or her head leaning forward to allow blood to drain.
- 2 Using a sterile dressing, apply direct pressure to the injured area. If the pad becomes blood-soaked, add a new one and continue pressure. Do not remove the first pad, as this may disturb the clot.
- 3 Do not wash out the mouth, as this may dislodge a clot and bleeding will resume. Have the casualty seek medical attention if EMS has not been called.

### If a tooth is knocked out:

- 1 Control bleeding with direct pressure on the gums. You may have the casualty bite down on a swab. Do not put ice next to the gums, as this could damage the nerve endings and prevent re-implantation.
- 2 Place the tooth in milk, coconut water, egg white, saline solution, or the casualty's own saliva. It may also be covered with plastic wrap. **DO NOT** put the tooth in tap water. Pick up a tooth by the crown – not the root – to avoid damaging it.
- 3 Bring the casualty and the tooth to a dentist as soon as possible. A tooth may be re-implanted if treatment is sought soon after the injury.

## NOSEBLEED

There are many blood vessels in the nose, which can rupture easily when damaged.

### Common Causes:

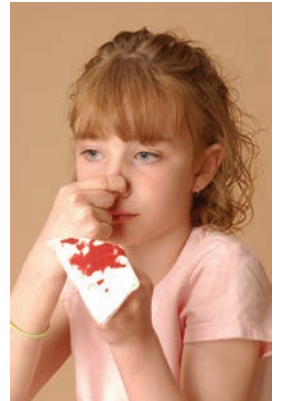
- blowing the nose
- injury to the nose or head (or fractured skull)
- high blood pressure
- changes in air pressure (i.e. altitude)
- object in the nose (including a finger!)
- dry nose

### Treatment:

- 1 **STOP!** Go through the Sign of Life™. If the mechanism of injury suggests a possible skull fracture or spinal injury, instruct the casualty to stay still. Straw-colored fluid mixed with the blood also indicates a serious head injury. **Activate EMS** and help stabilize the head and neck in the position found (see page 23).
- 2 If no head/spinal injury suspected, have the casualty sit down and lean forward, while pinching the soft part of the nose under the bridge for 5-10 minutes. Have the casualty hold a dressing to catch the blood. Do not allow the casualty to tilt their head back – this causes blood to drain down the throat and could cause choking or vomiting.
- 3 After the bleeding has stopped, ensure the casualty does not blow or rub their nose for several hours. This could cause bleeding to resume.
- 4 If the bleeding continues for more than 10-15 minutes, seek medical attention.



Place the tooth in milk, coconut water, egg white, saline solution, the casualty's own saliva or cover with plastic wrap. **DO NOT** put the tooth in tap water!



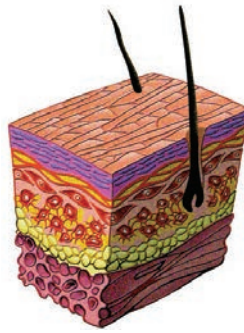
Have the casualty pinch the soft part of the nose just under the bridge. Catch the blood with a dressing.

For more information on burns prevention, see our Prevention & Safety section, starting on page 91

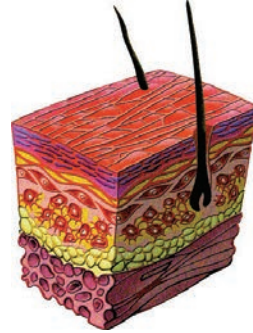
## BURNS

Burns are injuries to soft tissue layers that are caused by heat (fire, hot objects, steam, friction), chemicals (acids, cleaners), radiation (sun, x-rays, arc welder's flash) or electricity (lightning, electric shock). The number of layers of skin that are affected determines the severity of a burn. The respiratory system and the eyes can also be damaged in burn injuries.

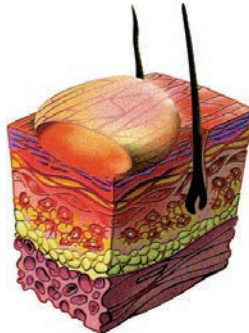
The skin has 2 layers – the **epidermis** and the **dermis**. Under the dermis lies a layer of fatty tissue, then muscle tissue. Burns are classified as 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> degree, with 1<sup>st</sup> being superficial and 3<sup>rd</sup> damaging the epidermis and dermis.



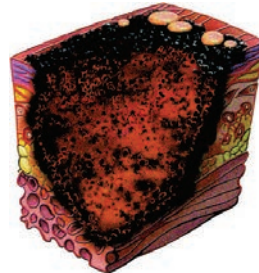
Skin layers - no injury



1<sup>st</sup> Degree Burn



2<sup>nd</sup> Degree Burn



3<sup>rd</sup> Degree Burn



First aid treatment for a mild sunburn is reducing the skin temperature and the burning sensation. Submerge the area or cover with a wet, cool cloth.

### 1<sup>ST</sup> DEGREE BURN

A 1<sup>st</sup> degree burn affects only the epidermis. Sunburns and steam burns are typically 1<sup>st</sup> degree burns that heal in 5-6 days without scarring.

#### Signs & Symptoms:

- red, dry skin
- pain, tenderness
- slight swelling

#### Treatment:

- 1 Remove the source of injury - get the casualty out of the sun.
- 2 Cool the burn by immersing in cool (not cold) water or covering the area with a cool wet cloth. This helps to reduce the temperature of the skin, lessen tissue damage and pain and may prevent blistering, swelling and infection. Continue cooling until burning sensation has stopped.

## 2<sup>ND</sup> DEGREE BURNS

2<sup>nd</sup> degree burns damage both the epidermis and part of the dermis. Heat, severe sunburns and chemical burns can cause 2<sup>nd</sup> degree burns. These injuries may take 3-4 weeks to heal. 2<sup>nd</sup> degree burns can severely affect the function of body parts (i.e. face, hands, etc.) and can even be life-threatening if extensive. If left untreated, if treated roughly, or if they get infected, 2<sup>nd</sup> degree burns can “transform” into 3<sup>rd</sup> degree burns. Proper first aid and prompt medical attention is imperative!

### Signs & Symptoms:

- red, mottled skin with white/moist patches
- blisters
- severe pain
- swelling

## 3<sup>RD</sup> DEGREE BURNS

3<sup>rd</sup> degree burns are the most serious as all layers of skin are damaged and cannot grow back. Fires, explosions, extreme heat, electrical burns or lightning can cause 3<sup>rd</sup> degree burns. The casualty's life may be threatened due to extensive fluid loss and shock. First aid priorities include rapid cooling of the casualty's skin and ensuring effective breathing. Seek immediate medical attention!

### Signs & Symptoms:

- skin looks charred (black) or waxy white with outer edges dry and leathery
- little or no pain (nerve endings are destroyed)

### Treatment for 2nd and 3rd degree burns:

- 1 STOP! Go through the Sign of Life™. **Activate EMS** if necessary.
- 2 Look for signs of burns around the casualty's mouth and nose. This could indicate damage to the casualty's air passages and lungs.
- 3 Perform a secondary assessment to assess burns and other injuries.
- 4 Loosen or remove anything near the burn which is restrictive such as clothing and jewelry. Do so **ONLY** if it does not stick to the skin.
- 5 Cool the burn immediately by immersing in cool water or covering the area with a cool wet cloth. This helps to reduce the temperature of the skin, lessen tissue damage and pain and may prevent blistering, swelling and infection. Continue cooling until burning sensation has stopped.
- 6 Cover the area with sterile non-stick bandages or special burn dressings. Burn dressings are pre-moistened to provide cooling to the affected area.
- 7 Help the casualty rest in a comfortable position until EMS arrives or have the casualty seek immediate medical attention. If the casualty loses consciousness, **see back foldout**.



Dreamline Arts & Illustrations

### CAUTION!

- **DO NOT** break blisters.
- **DO NOT** apply oily dressings or ointments



Dreamline Arts & Illustrations

### CAUTION!

**DO NOT** cool the casualty too much as this may cause them to go into shock. Once the affected area has been cooled, keep the casualty warm and look for signs of shock.



**DO NOT** apply ointments or oily dressings to any burns.



*Wearing gloves, remove all chemical from the skin. Consult SDS for appropriate first aid and provide to medical professionals.*



***NOTE:** Workplaces are required by the Occupational Health and Safety Code to have emergency eye wash stations or showers in areas where hazardous chemicals are used.*

*Rinse eye thoroughly (15 minutes) to remove all of the chemical. Ensure the chemical does not affect the uninjured eye.*

**POISON and DRUG INFORMATION**  
SERVICE 1-800-332-1414 (AB)



**CAUTION!**

*If a vehicle is in contact with a live electrical wire, tell the occupants to stay in the vehicle until EMS arrives.*

## SPECIAL CONSIDERATIONS FOR CHEMICALS BURNS

A chemical in contact with the skin will continue to burn until it is completely removed.

- 1 **STOP!** Go through the Sign of Life™. Call the Poison and Drug Information Service (PADIS) for guidance in treatment and advice on whether to **activate EMS**. Wear protective gloves!
- 2 Remove any clothes that came into contact with the chemical. If chemical is a dry powder, gently brush it off the skin with a dry towel or cloth.
- 3 Consult the SDS (Safety Data Sheet) label for appropriate first aid procedures. This is crucial as specific treatment will vary from one chemical to another. Most procedures will suggest flushing continuously with a gentle stream of water for 15 – 20 minutes to clean a burned area.
- 4 Cover the affected area with a sterile dressing. If the burning sensation continues, flush again.

## CHEMICAL BURNS TO THE EYE

The eye is very sensitive and requires special attention to prevent permanent damage from a chemical burn. As a precaution, always wear eye protection when working around hazardous chemicals to avoid contaminating yourself.

### Treatment:

- 1 **STOP!** Go through the Sign of Life™. **Activate EMS**. Put on gloves to protect your skin. Consult PADIS or SDS for proper treatment.
- 2 If flushing is recommended, take the casualty to the eye-wash station or have the casualty lean over a sink or basin. Protect the uninjured eye from contact with the chemical by flushing **AWAY** from the injured eye. Flush with cool running water for 15 minutes, or until EMS arrives. You may have to hold the eye open.
- 3 The affected eye will be very sensitive to light. Cover with sterile dressing.
- 4 Seek medical attention if EMS has not been activated.
- 5 Complete a first aid record, including amount of time area was flushed.

## ELECTRICAL BURNS

A casualty of an electrical burn (from live wires, lightning, etc.) may or may not show visible signs of injury. External injuries may include an entry and exit wound. Internal injuries can stop or affect the heart and respiratory system. Fractures or spinal injuries may also result from electrical shock.

### Treatment:

- 1 **STOP!** Ensure the environment is safe. If a power source is the mechanism of injury, be sure it is turned off before approaching the casualty. The ground surrounding the power source may be “live” - keep a safe distance!
- 2 Go through the Sign of Life™. **Activate EMS**.
- 3 Perform a primary assessment. Watch for breathing problems or sudden cardiac arrest.
- 4 Treat visible injuries and help the casualty rest in a comfortable position until EMS arrives.
- 5 If the casualty becomes unconscious, [see back foldout](#).



## POISONS

A poison is a foreign substance that harms the tissues and cells of the body. The effects can range from minor skin irritations to breathing problems to death. Immediate first aid is required to reduce the degree of injury and increase the casualty's chance of recovery and survival. Poisons can enter the body by:

- ingestion - chemicals, cleaners, misused medications, drugs, plants
- injection - needles, animal bites, insect stings
- absorption - plant toxins, chemicals
- inhalation - fumes, gases, inhaled drugs

### Signs & Symptoms:

The signs and symptoms of poisoning vary depending on the mode of entry and the type of poison. The body's reaction to a poison may be immediate or delayed. Your first priority is to determine that a poisoning has occurred. Survey the scene for signs of a cause (i.e. smoke, odors, empty or spilled containers, etc.)

### Effects on the Body:

- brain activity may be affected (confusion, seizures, unconsciousness)
- eyes may be burned from chemical splashes
- lips, mouth, throat may be burned from smoke or fire
- heartbeat may be altered or absent
- breathing may be labored, distressed or not present
- ingested poisons can cause vomiting, nausea, abdominal pain or diarrhea
- skin may be burned, sensitive, itchy, sweaty
- liver and kidneys can suffer temporary or permanent damage

### General Treatment for Poisoning:

- 1 STOP! Survey the scene. Ensure your safety first! Remove the casualty from the source of injury if possible.
- 2 Go through the Sign of Life™. If the casualty is unconscious, **activate EMS**. If casualty is not breathing, be prepared to perform CPR. [See back foldout.](#)
- 3 If the casualty is conscious, contact the Poison and Drug Information Service (PADIS) for assistance with all types of poisoning and proper treatment procedures.
- 4 Perform a secondary assessment, if possible. Treat other injuries.
- 5 Monitor vital signs. Reassure casualty and help them rest comfortably. Casualty should seek medical attention.

### SPECIAL CONSIDERATIONS FOR INGESTED POISONS:

Do not induce vomiting or give the casualty anything to drink unless directed to do so by Poison and Drug Information Service (PADIS). You may think these treatments would serve to remove or dilute the poison, but they may actually cause further harm to the casualty. Have information ready about the substance as well as the casualty when you call.

**POISON and DRUG  
INFORMATION SERVICE**

**1-800-332-1414**

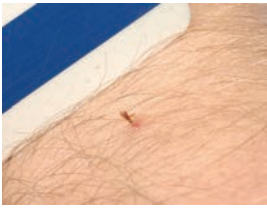
(Alberta)

**Most poisonings can be prevented by taking appropriate precautions:**

- Keep children safe by locking up chemicals, cleaners and keeping other harmful substances (poisonous plants, etc.) out of reach.
- Teach older children about poison and danger signs on bottles.
- Never refer to any kind of medicine as candy.
- Use chemicals in a well-ventilated area and wear appropriate safety gear (i.e. mask, gloves, coveralls, safety glasses).
- Only take medication prescribed to you.
- Wear long-sleeved shirts and pants when walking in the woods.
- At work, be trained in WHMIS (Workplace Hazardous Materials Information System). Pay close attention to warning labels, signs and tags (including SDS - Safety Data Sheets), which outline safety measures and emergency treatment.



If you suspect the casualty is suffering from an opioid overdose, **Activate EMS immediately!** If you are trained in the administration of Naloxone (a safe and effective drug that reverses the effects of an overdose, namely, respiratory depression) then you may administer Naloxone to the casualty. **It is vital to perform CPR for the casualty if they are not breathing effectively!**



Use a credit card to scrape out stinger. **DO NOT** use tweezers!

## SPECIAL CONSIDERATIONS FOR INJECTED POISONS:

### Sting (insects/marine animals):

- 1 Carefully remove the stinger (if visible and easily removed) by gently scraping the skin with a fingernail or credit card. Be careful not to squeeze more of the poison into the skin.
- 2 Wash the affected area and use an ice pack or cold compress to reduce swelling and irritation.
- 3 Watch for signs of an allergic reaction, such as severe swelling or redness of affected area, difficulty breathing, etc. See anaphylactic shock (page 40) and **activate EMS** if necessary.



All bites require medical attention!

### Bites (dogs/animals/snakes/spiders):

**All bites require medical attention!** Animals may carry diseases such as rabies. Insects may inject venom which can be fatal to humans.

- 1 Minor wounds should be washed thoroughly and covered with a dressing. Have the casualty seek medical attention.
- 2 For major wounds - control bleeding, apply a dressing and have the casualty seek medical attention.

## SPECIAL CONSIDERATIONS FOR ABSORBED POISONS:

- 1 Protect yourself - Wear gloves!
- 2 Remove casualty from the source of injury and remove any affected clothing.
- 3 For plants: rinse affected area thoroughly with soap and water.
- 4 For chemicals: gently brush off any visible residue. Refer to SDS (Safety Data Sheet) for proper first aid or contact the Poison and Drug Information Service (PADIS) for proper treatment procedures.
- 5 Send of copy of the SDS with the casualty to medical care.



photo by Apex Training Solutions

If you come into contact with a poisonous plant, remove clothes and rinse the area well with soap and water.

If this is a workplace incident, complete a first aid record, including the amount of time the affected area was flushed.

**POISON and DRUG INFORMATION SERVICE 1-800-332-1414 (AB)**

## SPECIAL CONSIDERATIONS FOR INHALED POISONS:

- 1 Your first priority in assisting a casualty with an inhalation injury is to protect yourself! Never enter a dangerous environment - **Activate EMS!**
- 2 Remove the casualty from the source of injury. Fresh air may make a noticeable difference in the casualty's condition.
- 3 Monitor the casualty's vital signs. If the casualty becomes unconscious, see back foldout.



# MUSCULOSKELETAL SYSTEM

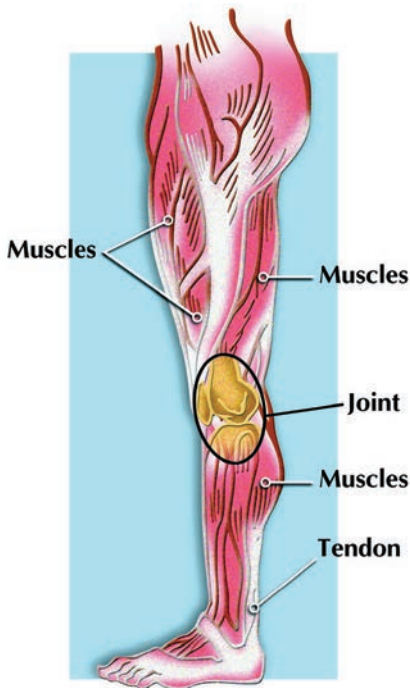
Our bones, ligaments, muscles and tendons make up our musculoskeletal system. This system coordinates movement, provides support throughout our body, and protects internal organs. Injuries to bones, joints and muscles are usually not life-threatening, but can be very painful. Prompt and proper first aid can protect a casualty from further injury or permanent disability, promote recovery and help lessen the pain. Of course, injuries to the head, back and pelvis are of special concern because of possible damage to the spinal cord. These injuries have been discussed previously.

## BONES, JOINTS AND MUSCLES

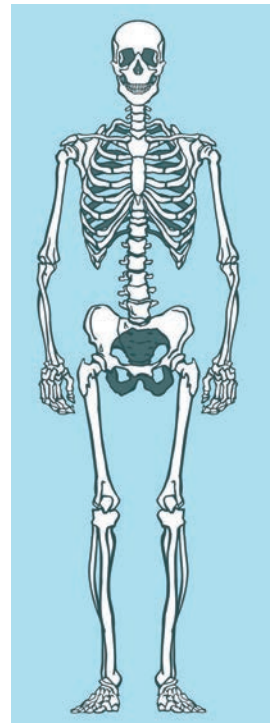
**Bone** is composed of 2 layers of tissue – a dense rigid shell and a porous inner layer of marrow and blood vessels. For this reason, bone injuries can bleed considerably.

Where bones meet, **joints** are formed. Bones are held together by **ligaments**, and the joints between them allow smooth movement. **Tendons** attach bones to muscles.

**Muscles** are strong bands of soft tissue which provide power for movement by lengthening and shortening. **Skeletal muscles** are controlled consciously and contract and relax during movement. **Smooth muscles** operate internal organs. Their continuous coordination is involuntary (not controlled by conscious thoughts or actions).



The 4 basic types of bone, joint and muscle injuries are fractures, dislocations, sprains and strains.



### INTERESTING FACTS:

- The human body is made up of 206 bones.
- There are more than 600 muscles in the human body.
- Some of the most common injured tendons are the rotator cuff, tendons of the thumb, hamstring tendons, quadriceps tendon and the Achilles tendon.
- There are over 200 movable and semi-movable joints in the human body.



PROTECT YOURSELF!  
WEAR GLOVES!

## FRACTURES

A **fracture** is a traumatic injury to a bone, and can take the form of a break, a chip or a crack. Bones typically bend when subjected to gentle and moderate forces. When struck or twisted with a great direct or indirect force, an open or closed fracture can occur.

**Closed fractures** are most common. The skin around the broken bone is intact, but damage to underlying tissues can cause visible swelling and bruising. In an **open fracture**, either the force of the injury causes damage to the skin directly, or the broken bone breaks through the skin. Open fractures pose a danger of infection, since the bone and exposed tissue are vulnerable to bacteria.

Fractures are usually not life-threatening. However, a break in a large bone such as the femur (thigh bone) may lead to severe arterial bleeding and shock.

For more information on injury prevention, see our Prevention & Safety section, starting on page 91.



A closed fracture can be an obvious protrusion or an internal injury with no visible damage. If a casualty has suffered a serious injury and is experiencing significant pain, seek medical attention.



In an open fracture, the skin is broken and tissues and even bones are exposed. Your priorities are to immobilize the injury (page 71), control bleeding and protect the exposed area.

See page 70 for treatment steps...



Immobilize a dislocation and seek medical attention.

**DO NOT** attempt to re-position.

## DISLOCATIONS

A **dislocation** is a displacement of a bone from its normal position at a joint. Severe twisting of a bone, a fall, or a severe blow are common causes of a dislocation. The movement of the bone injures the joint and sometimes results in a fracture. Surrounding ligaments, blood vessels and nerves can also be affected, restricting circulation and movement.

Dislocations are often easy to detect because of obvious deformities. The injury may even lock a limb in an abnormal position. These injuries are most common in the shoulder, knee, elbow, wrist, ankle, thumb, finger or jaw.

See page 70 for treatment steps...

## SPRAINS

A sprain is a traumatic injury to a ligament (the band of tissue that connects bones to bones over a joint). Sprains are the result of an excessive force or the violent movement of a joint beyond its normal range of motion. These injuries can be mild (stretched), moderate (partially torn), or severe (completely severed). A casualty will feel pain that is more extreme with movement of the joint or may not be able to move the joint at all. Swelling and bruising may also be evident. The most common sprain injury is the ankle, but can also occur in the knee, wrist, thumb and back.

See page 70 for treatment steps...



*A fall may result in a mild to severe sprain, fracture or dislocation.*

## STRAINS

A sudden, straining or unusual movement that causes stretching or tearing of a muscle or tendon (tissues that connect muscles to bones) is called a strain. Strains occur most often in the neck, back and legs. Symptoms may include muscle spasm, swelling, limited mobility and pain and limited range of motion in the joint.

See page 70 for treatment steps...



*For more information on injury prevention, see our Prevention & Safety section, starting on page 91.*





**NEVER** move an injured part in order to immobilize it!

#### HOT OR COLD?

Apply **cold** to a new injury. This will help lessen the pain and reduce swelling.

After 2-3 days, **heat** may be applied to stimulate blood flow and healing.

Treatment for closed bone, joint and muscle injuries is **RICE**:

**R** - Rest

**I** - Immobilize

**C** - Cold

**E** - Elevate



**PROTECT YOURSELF!  
WEAR GLOVES!**

## OVERVIEW OF BONE, JOINT AND MUSCLE INJURIES

As we have discussed, many parts of the body are susceptible to bone, joint and muscle injuries. As always, your job as a first aider is to prevent further injury, lessen the pain, promote recovery and seek medical attention.

### Common Causes:

- sports injuries
- falls
- excessive lifting
- motor vehicle collisions
- violent muscle contractions

### Signs & Symptoms:

- pain or tenderness in the affected area
- loss of mobility or function
- swelling and bruising
- deformity or an open wound

### Treatment:

- 1** STOP! Go through the Sign of Life™. **Activate EMS** if necessary. Perform a primary assessment and treat life-threatening injuries.
- 2** If you suspect a head, back or pelvic injury, do not move the casualty. Take the appropriate precautions (see page 23).
- 3** Do not try to manipulate the injury immediately. Use the mechanism of injury and visible clues to determine the type and extent of tissue damage. Compare the injured side to the uninjured side. Look at the shape, position and appearance of both.
- 4** Apply sterile dressings to any open wounds to prevent infection. Control bleeding by applying indirect pressure around the fracture/dislocation.
- 5** Provide support to obvious fractures and dislocations in the position found.
- 6** Immobilize the injury and help the casualty rest in a comfortable position.
- 7** Apply a cold compress to reduce swelling on a closed fracture or injury. Always use a layer of cloth between the compress and the skin. **Apply cold for no more than 15 minutes every hour.**
- 8** Without disturbing the injured area or causing discomfort to the casualty, elevate the injured body part to reduce blood flow and minimize bruising.
- 9** If choosing to transport the casualty with a suspected bone, joint or muscle injury, ensure that the injured part has been properly immobilized and supported. If medical treatment is not required, have the casualty rest until symptoms subside. Beware of complications, such as shock. If the condition worsens, seek medical attention.

## IMMOBILIZING AN INJURY

Immobilizing an injury to a bone, joint or muscle is very important. It serves to make the casualty more comfortable by reducing pain, preventing further tissue damage and controlling bleeding. Use a splint, sling or a bandage to provide support above and below the injured area. If a first aid kit is not available, use clean items to improvise. Be sure to check for proper circulation before and after your bandage is in place. Ask the casualty if they feel pressure from the bandage and check for circulation by pressing on the nail bed. Rapid capillary refill will indicate adequate circulation. If the color does not return immediately, the bandage should be loosened and then checked periodically.

You can use soft, rigid or anatomic splints to immobilize an injury. **Soft splints** include slings, bandages, small cloths, blankets or pillows.

Examples of **rigid splints** are padded boards, air splints or folded magazines.



Use an **anatomic splint** - the casualty's body - for a shoulder, leg or finger injury. Bandage the arm to the chest to protect the shoulder or tie an injured leg or finger to the uninjured leg or finger for stability.

*The following page shows various methods for bandaging and immobilizing bone, joint and muscle injuries.*

*When immobilizing an injury, remember to:*

- *Move the area as little as possible.*
- *Bandage in a position most comfortable for the casualty.*
- *Apply and secure dressings to any open wounds.*
- *Pad rigid splints so they are more comfortable and functional.*
- *Splint in the position found.*
- *Check for adequate circulation below the injury site often.*
- *Splint well above and below the injury.*



*Bandaging an injured finger to an uninjured finger provides support and creates an anatomic splint.*

## BANDAGING / SPLINTING



To immobilize and stabilize an arm or wrist injury, use a padded rigid splint.



Wrap the arm securely to the splint, then create a sling with a triangular bandage.



Tie the sling around the casualty's neck and check for proper circulation.



For a shoulder injury or dislocation, immobilize with a tubular sling.



Wrap a triangular bandage snugly around the casualty's arm and neck and secure.



After bandaging, always check for proper circulation by depressing the nail bed. Look for color to return quickly.



Securely wrap an ankle injury in the position found. Use bulky dressings.



Anatomic soft splint for an upper or lower leg injury. The uninjured leg and padding provides stability.

## COLD EMERGENCIES

Normal body temperature is 37°C (98.6°F). Our body systems function best when this temperature is kept constant. To help achieve this balance, we have built-in mechanisms that help regulate our body temperature – such as sweating, which cools our body when we get hot; and shivering, which serves to warm us up in the cold. Dressing appropriately, regulating air temperature and drinking fluids helps keep us comfortable and our bodies running optimally.

Extreme heat and cold can affect our entire body, as in the case of heat stroke and hypothermia, respectively, or can cause localized problems, such as sunburn or frostbite. Young children and seniors are most susceptible to the harmful effects of heat and cold, since their bodies are not as efficient in regulating body temperature. The face, hands and feet are most commonly affected by extreme cold.

### In treating heat and cold emergencies, your goals are to:

- remove or protect the casualty, as well as yourself, from the unsafe environment
- restore normal body temperature

## FROSTNIP

Skin that is exposed to the cold is susceptible to freezing. The layers of tissue that are affected determine the degree of frostbite. In frostnip (superficial frostbite), only the epidermis is frozen. The skin appears white and waxy, may feel firm and numb, but recovers quickly with re-warming. The casualty may feel tingling as heat is restored.

### Treatment:

- 1 STOP! Go through the Sign of Life™. Ensure your safety first!
- 2 Move the casualty to a warm environment, or if not possible, protect from harsh elements.
- 3 Re-warm the frostbitten areas with warm hands. Have the casualty breathe on their hands to warm them, or place them under their armpits or near their groin. If using water to re-warm, ensure that temperature does not exceed 40°C / 104°F.

## SNOW BLINDNESS

Unprotected exposure to the reflection of snow, ice, sand or water can cause a burn or inflammation of the cornea (the clear tissue on the front surface of the eye). UV light rays are responsible for this condition, called snow blindness. This injury can occur on cloudy, as well as sunny days.

### Signs & Symptoms:

- mild to severe redness, itching or pain in the eyes
- swelling of eyelids
- sensitivity to light and/or headache
- blurred vision or temporary loss of vision

### Treatment:

- 1 Remove the casualty from the irritating environment and minimize exposure to bright lights.
- 2 A cool, damp cloth over the eyes can help to relieve symptoms.
- 3 If the casualty is experiencing vision problems, seek medical attention.



For more information on cold injury prevention, see our Prevention and Safety section starting on page 91.

For heat and cold emergencies, your goals are to:

**REMOVE & RESTORE**



### CAUTION!

**DO NOT** rub the affected area with anything - including hands.



Frozen tissues will be cold and hard. The skin may be white and waxy, and will turn grayish blue as frostbite progresses. Re-warming is critical!

#### PREVENTION OF COLD EMERGENCIES:

- Wear warm clothes and cover susceptible areas (head, neck, fingers, toes) from the wind and cold.
- Frequently check exposed areas of family members and others with you.
- Keep up your energy by eating and drinking warm fluids.
- **DO NOT** remain in the cold for long periods of time. Re-warm the body by going into a warm environment periodically.
- **DO NOT** drink caffeine or alcohol. They contribute to heat loss.

#### TRENCH FOOT

*DID YOU KNOW* that, during WW1, tens of thousands of soldiers died from a condition known as trench foot, or immersion foot syndrome? Sadly, prolonged fighting in cold, wet trenches caused circulation and nerve dysfunction, and eventually death.

## DEEP FROSTBITE

Deep frostbite refers to the freezing of several layers of tissue. As the water in our tissues freezes and thaws, it causes swelling. This in turn damages or destroys neighboring cells, sometimes to the bone. This condition is very serious!

### Signs & Symptoms:

- numbness in affected areas
- skin is white and waxy, turns grayish blue as frostbite progresses
- skin feels hard and cold

### Treatment:

Deep frostbite requires immediate attention!

- 1 STOP! Go through the Sign of Life™. Remove the casualty from the cold.
- 2 If condition is serious, **activate EMS**.
- 3 Remove clothing from the affected area. Handle frozen tissue very carefully. Rubbing or touching the area may cause further damage.
- 4 Do not apply direct heat! Re-warm the area by immersing in warm water (no warmer than 40°C / 104°F) until the skin is warm and red. Do not allow frozen area to touch sides of the container. You may need to add warm water as it cools. Re-warming may take up to 40 minutes.
- 5 Prevent further heat loss by gently covering with a sterile dressing or cloth.
- 6 The thawing process can be very painful. Continue to reassure the casualty.
- 7 Gently pat the area dry. Bandage with a dry, sterile dressing. Place cotton or gauze between frostbitten fingers and toes. Keep the affected area warm.
- 8 Casualty must seek medical attention.



Re-warm the frostbitten area by immersing in warm water (not warmer than 40°C / 104°F). **DO NOT** allow frozen area to touch the sides of the container.

## HYPOTHERMIA

Frostbite is an injury to a specific body part. Hypothermia is the lowering of the body's core temperature, whereby the entire body cannot produce enough heat to stay warm. The four major areas of heat loss are the head, neck, sides of torso and the groin. As these areas lose heat, body temperature can fall. Hypothermia can be life-threatening because the body's systems cannot function properly when the core temperature drops several degrees (less than 35°C / 95°F).

The body's initial reaction to heat loss is shivering. This action serves to generate heat. Next, the blood vessels in the extremities contract as blood is moved to the core to keep the internal organs warm and functioning. As heat loss continues, all systems begin to slow down – musculoskeletal and nervous systems, then eventually the circulatory and respiratory systems. Thinking, movement and consciousness become altered as the temperature lowers. Early recognition of these signs and symptoms is important for intervention and recovery.

### Stages of Hypothermia:

- early signs: shivering; slurred speech
- breathing slows; shivering stops; movement is jerky and clumsy; pupils become dilated; skin is bluish; casualty is dazed or sleepy
- casualty may show signs of poor judgment (i.e. removing clothes)
- late stages: breathing erratic or absent; no movement, casualty is unconscious

### Treatment:

- 1** STOP! Go through the Sign of Life™. Protect yourself! **Activate EMS.**
- 2** Prevent further heat loss by moving casualty to a warm environment and removing any wet or restrictive clothes. Re-warm the casualty by:
  - Covering with warm blankets - especially the head. Use an aluminum foil blanket in addition to other blankets if available
  - Apply warm packs to core areas of the body (groin, abdomen, small of back, neck, armpits, chest), if available
  - If the casualty is fully alert, give warm fluids to drink (no caffeinated drinks or alcohol, which can increase heat loss)
  - If the casualty is not fully alert, then do not give anything to eat or drink
- 3** Handle the casualty very gently and warm the casualty slowly, trying to warm the body core first rather than the extremities. A hypothermic heart is very sensitive and can stop beating easily.
- 4** Place the casualty in the recovery position. Monitor vital signs.
- 5** If the casualty loses consciousness, [see back foldout](#). Monitor vital signs. Be prepared to react if vital signs are absent.



*Help re-warm a cold casualty by:*

- removing wet clothes
- covering with blankets
- giving warm fluids to drink (no caffeine or alcohol) if the casualty is fully alert

## HEAT EMERGENCIES

Just as the cold can cause serious health problems, so too can extreme heat or strenuous activity in a warm environment. Once the body's temperature begins to rise, it can be difficult to control, so early intervention is very important. Too much body heat can lead to **hyperthermia**. Stages are heat cramps, which progress to heat exhaustion or even heat stroke.

When our body temperature rises, our systems compensate by removing heat through the skin in the form of sweat and radiation. Sweating is the evaporation of water from the skin's surface. Radiation happens when heat radiates from our body into the cooler air around it. Blood vessels expand to move blood away from the core and cool the body. However, if the air is very warm or humid, sweating and radiation are not effective means of cooling the body.

As with cold emergencies, the very young and very old are most at risk for heat-related illnesses, as are people with poor circulation, heart problems and those who work and exercise outdoors for long periods of time.

## HEAT CRAMPS

Heat cramps are painful muscle contractions felt in the legs or abdomen. They are the result of fluid and salt loss from excessive sweating.

### Common Causes:

- strenuous exercise
- excessive work in a hot environment

### Treatment:

- 1 STOP! Go through the Sign of Life™. Ensure your safety first!
- 2 Move the casualty to a cool area.
- 3 Have the casualty rest and drink plenty of cool water or sports drinks.
- 4 Lightly massage and stretch the affected area.
- 5 Once the cramps pass, the casualty can resume his or her activity, but remind them to continue to drink fluids and rest if the symptoms reappear.



# HEAT EXHAUSTION

Heat exhaustion is a more generalized condition that develops gradually when exercising or working in a hot environment. In an attempt to cool the body, circulation is increased in blood vessels near the skin and reduced to vital organs. Salt and water is lost through sweating and results in low blood volume.

## Signs & Symptoms:

- excessive sweating; cold, clammy red skin
- muscle cramps
- dizziness, headache
- physical exhaustion

## Treatment:

- 1 STOP! Go through the Sign of Life™.
- 2 Move casualty to a cool or shaded environment.
- 3 Give the casualty plenty of cool water or sports drinks. Have them drink slowly.
- 4 Remove or loosen tight clothing.
- 5 Fan the casualty or use cool water to cool the casualty's skin.
- 6 A casualty of heat exhaustion should not resume their activities. They need time to let their body recover.
- 7 If the casualty loses consciousness, [see back foldout](#). Monitor vital signs. Be prepared to react if vital signs are absent.



*Remove the casualty from the sun. Have them stop their activity and drink water while you cool them. Monitor vital signs closely.*



*When someone is suffering from heat stroke, you must reduce their body temperature. Cool them with a hose, a cool cloth, or by fanning. Monitor closely.*

*The single sure sign of heat stroke is that the casualty's behavior and state of awareness changes! Other signs and symptoms may be subtle.*



*When treating a casualty with heat stroke, it is best to wet their lips with water or sports drinks versus having the casualty drink quickly. Drinking a lot of fluid quickly may cause the casualty to vomit.*

## HEAT STROKE

Heat stroke is a medical emergency! If the symptoms of heat exhaustion are ignored, a casualty can develop heat stroke, where the body cannot cool itself and body systems cannot function properly. As this condition progresses, sweating may stop. At this point, the casualty has lost his or her cooling mechanism and body temperature will rise rapidly. This trend will continue until the vital organs shut down.

### Signs & Symptoms:

- high body temperature (above 41°C / 106°F)
- skin feels hot and is sometimes dry
- restlessness, dizziness, nausea
- rapid, strong pulse at first, but gets weaker as condition progresses
- fainting, eventual loss of consciousness

### Treatment:

Lowering the casualty's body temperature is paramount!

- 1 **STOP! Activate EMS.**
- 2 Move the casualty to a cool area.
- 3 Remove excess clothing.
- 4 Cool the casualty immediately by immersing their entire body up to the chin in cold water. If this is not possible, you can cool them using a garden hose, dousing or sponging with cold water, a wet sheet and a fan, ice packs, ice sheets or towels, cooling vests or jackets, or a combination of these techniques. Continue cooling the casualty until their body temperature is less than 39° Celsius, or until EMS arrives.
- 5 Monitor vital signs. Be prepared to react if vital signs are absent. [See back foldout.](#)



Aside from the various system disorders already discussed, there are many other sudden medical conditions that require first aid treatment. Some of the more common emergencies, such as diabetic complications, convulsions/seizures and emergency childbirth, are addressed in the following pages.

## DIABETES

A healthy person's body produces insulin, which regulates the level of sugar in the blood, which in turn, is used as an energy source. **Diabetes** is a medical condition whereby the body either does not produce enough insulin or cannot use insulin effectively. The danger to the diabetic is that too much or too little sugar alters the functioning of the brain and can be life-threatening. Diabetics must carefully monitor their diet, exercise and medication to avoid serious illness.

**Hypoglycemia**, or **insulin shock**, occurs when the casualty's sugar level becomes too low. This rapidly affects brain function, which will affect the casualty's awareness and ability to react. If left untreated, it will lead to unconsciousness. Insulin shock can happen very quickly.

In **hyperglycemia**, the effects are opposite – too much sugar can cause a severe acid imbalance, causing serious injury to all body systems. Hyperglycemia may take several hours or even days to develop.

Hypoglycemia and hyperglycemia are diabetic emergencies and require immediate first aid. Although some of the signs and symptoms of these two emergencies are different, as a first aider, look for the following:

### Signs & Symptoms:

- dizziness, confusion, drowsiness
- rapid breathing
- altered level of consciousness or unconsciousness
- casualty looks flushed, visibly ill
- slurred speech and other signs similar to drunkenness
- irritable behavior

### Treatment:

Your priority in treating a diabetic emergency is first to recognize the problem, and second to respond quickly, before the condition worsens. Determining whether the casualty is hypoglycemic or hyperglycemic is not as important as quick intervention.

- 1** STOP! Go through the Sign of Life™. If the casualty is unconscious, **activate EMS**, place them in recovery position and monitor vital signs.
- 2** If conscious, ask the casualty if they are diabetic, or check for a medical alert indicator.
- 3** If the casualty can easily swallow, give them something sweet to eat or drink (sweet fruit juice is best). If their blood sugar is low, it will help them recover; if their blood sugar is high, it will not hurt them.
- 4** If the casualty has experienced these symptoms before and does not recover in less than 5 minutes from ingesting sugar, **activate EMS**. If the casualty is diabetic and has not experienced these symptoms before, **activate EMS** immediately.
- 5** Monitor the casualty's vital signs. Reassure the casualty.



Check for a medical alert indicator, such as: a chain, bracelet, anklet, watch strap, or tattoo.



### CAUTION!

*NEVER administer insulin to a casualty!*

*In a diabetic emergency, give the casualty something sweet to eat or drink (i.e. sweet fruit juice, chocolate bar, cookie, etc.) or a snack the diabetic may have with them (i.e. glucose bar/tablets).*

*Avoid foods or beverages containing artificial sweeteners. These will have no effect on a diabetic emergency.*



**DO NOT** attempt to stop or control the seizure. **PROTECT** the casualty from harm and monitor closely.

If seizures are common for the casualty, encourage them to seek their physician's advice - maybe a change of medication is needed.

Any child that has experienced febrile convulsions should be seen by a physician as soon as possible.



**DO NOT** put anything in the casualty's mouth!

## SEIZURES / CONVULSIONS

A **seizure** is irregular electrical activity in the brain. Certain illnesses, high fever or head injuries can trigger a seizure. The result may be a loss of or altered consciousness and **convulsions**, which are uncontrolled muscle contractions. Epilepsy is a nervous system disorder that causes frequent seizures and convulsions. Mild convulsions may cause a casualty to simply blackout; a very serious episode can lead to the violent uncontrolled shaking of the entire body. Medication can help control the frequency and severity of the seizures, but does not always eliminate their occurrence. As a first aider, your goal is **not** to stop the seizure or convulsions – it is to ensure the safety of the casualty.

When an infant or young child develops a very high fever (over 38°C/100°F), they may be at risk for **febrile convulsions**. The sharp rise in body temperature over a short period of time causes an imbalance in the electrical activity of the brain. Febrile convulsions are usually short in duration and not dangerous to the child, but are disturbing for a care giver. Taking care to monitor and reduce a fever (with medication, cool compresses or a lukewarm bath) should help avoid febrile convulsions.

### Signs & Symptoms:

- a strange sensation (sound, smell, taste, hallucination) experienced by the casualty; referred to as an aura
- uncontrolled muscle contractions, sometimes involving the entire body
- loss of consciousness, casualty may fall to the ground
- frothy saliva from the mouth
- irregular breathing
- loss of bladder or bowel control

### Treatment:

- 1 **STOP!** Go through the Sign of Life™. If the cause of the seizure is unknown or the casualty has not experienced a seizure before, **activate EMS**.
- 2 Remove any sharp objects that could cause injury to the casualty and place a soft blanket or pillow under the casualty's head.
- 3 Perform a secondary assessment to make sure the casualty was not injured during the seizure.
- 4 Monitor the casualty's vital signs.
- 5 Help the casualty rest comfortably by placing them in recovery position. Cover with a warm blanket and reassure the casualty. Continue monitoring vital signs.
- 6 If the seizure has occurred in a public place, the casualty may be embarrassed (i.e. loss of bladder control). Help ensure their privacy by keeping bystanders away.
- 7 Most seizures last less than 2 - 3 minutes. **Activate EMS** if the seizure lasts longer than 3 minutes, if the casualty has repeated convulsions, is injured during the seizure or fails to regain consciousness, or if the casualty is pregnant, diabetic, an infant or a child.

## EMERGENCY CHILDBIRTH

Occasionally, a woman may have an emergency delivery before she is able to get to a hospital. In order to provide first aid, you will need to know a few basics of childbirth. Your role is to help take care of the mother and infant before, during and after the birth.

The infant develops inside an amniotic sac full of amniotic fluid in the uterus. The placenta is a large organ that nourishes the fetus through the umbilical cord. Contractions will push the infant through the cervix and vagina as delivery progresses. In a normal delivery, the infant is born head first.

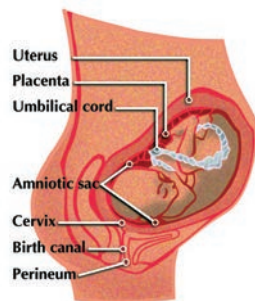
Labor can take several hours for a first-time delivery, but subsequent deliveries may take much less time, and varies from woman to woman. Emergency childbirth usually occurs when a woman has had children before. If a woman has had a child before, she will know if childbirth is impending.

### Signs & Symptoms of delivery:

- contractions are 2 minutes or less apart and very intense
- the woman feels the need to push
- the infant's head is visible in the perineum (vaginal opening)

### Treatment:

- 1 STOP! Go through the Sign of Life™. **Activate EMS.**
- 2 Take the woman to a private, comfortable spot, if possible. Locate clean blankets, towels and a pillow or improvised clean materials.
- 3 Contact her partner if not present. If possible, have another woman present to provide support, assistance and comfort.
- 4 Protect yourself, the infant and the mother by washing hands thoroughly, wearing gloves and ensuring the birthing area is as clean as possible.
- 5 Keep the woman warm and provide privacy by covering her legs except while the infant is being delivered.
- 6 Be encouraging and supportive.
- 7 As the infant's head is delivered, support it gently and securely. Do not try to pull the infant out.
- 8 If the amniotic sac is still intact and covering the infant's head, tear it gently with your fingers and ensure the infant's nose and mouth are clear.
- 9 If the umbilical cord is looped around the infant's neck, carefully lift the loop up and over the infant's head or shoulder.
- 10 Once the infant is out, hold him or her carefully face-down with feet slightly elevated. The infant will be slippery.
- 11 Gently wipe the infant's nose and mouth to clear away any mucus or other fluids.
- 12 If the infant is not breathing, gently massage his or her back or tap the bottom of the infant's feet. If still no response, assess following the Sign of Life™ and treat according to **back foldout**.



### AFTER THE DELIVERY:

- Wrap the infant in warm, clean blankets and let the mother hold him or her - if the cord allows it. **DO NOT** pull on or cut the umbilical cord. Clamp it with clean tied strips of cloth 4 and 6 inches from the infant.
- Keep the mother warm. Help with the delivery of the placenta by supporting it as it is delivered. **DO NOT** pull hard! There may be quite a bit of blood delivered with the placenta. Keep it intact, clean, and elevated above the level of the infant. The doctor will need to examine it.

# HEALTH CARE PROVIDERS

**NOTE:** This section is intended for health care providers.

infant 0-1 year of age  
child 1 to puberty  
adult puberty & older

## HEALTH CARE PROVIDERS

**Health care providers** are trained professionals (doctors, nurses, paramedics, etc.) who have more extensive knowledge of physiology and first aid than a basic rescuer. The health care provider is required to have additional information in order to assist a casualty in their care. This section outlines topics such as the jaw thrust method, artificial respiration (rescue breathing), 2-rescuer CPR, bag valve masks and advanced airways, opioid overdose symptoms and treatment methods, as well as advanced AED procedures. For Health Care Providers, there is an increased emphasis on the team aspect of providing CPR. When you have a team of trained people, different treatment tasks can occur simultaneously.

### ADULT, INFANT, CHILD

For a **health care provider**, an **infant** is birth to 12 months, a **child** is 1 to the onset of puberty and **adult** is anyone exhibiting the signs of puberty and older. These signs include breast development in females and the appearance of facial, chest or underarm hair on a male.

### SIGN OF LIFE™

The Sign of Life™ (see back foldout and page 15) applies to first aiders as well as health care providers, with slightly different applications for each.

- 1 S-T-O-P™.** *Survey the scene, Take charge, Observe & assess and Protect yourself™.* This must be performed for all emergencies outside of a hospital setting.
  - 2 Tap, Shout & Look for Breathing.** Check for responsiveness and look for signs of effective breathing. Gasping or agonal breaths do not constitute normal breathing. If casualty does not respond...
  - 3** Whether you are alone (see note below) or with someone else, **activate EMS** and get an AED if available.  
*NOTE:* If you are alone without access to a phone and the casualty is a child/infant and there are no vital signs, attempt 2 minutes of resuscitation, then **activate EMS**.
- C** Check for **Circulation** for no more than 10 seconds (carotid pulse for an adult; carotid or femoral for a child; brachial or femoral on an infant).  
*NOTE:* In a hypothermic casualty, pulse check should last 30 - 45 seconds because the heart rate and breathing may be very slow.



Check for carotid pulse on an adult or child for no more than 10 seconds.



Perform a brachial (shown here) or femoral pulse (inner thigh) check on an infant.

**If pulse is present, perform artificial respiration (see next page)...**  
**If pulse is absent, perform CPR, starting with compressions (see next page)...**

# HEALTH CARE PROVIDERS

**A** Open the **Airway** using the head tilt-chin lift (see back foldout) or the jaw thrust method if you suspect a head, neck or spine injury.

## JAW THRUST

If you suspect a head or neck injury, do not move the casualty unless absolutely necessary (see moving a casualty page 10). Open the airway using the jaw thrust. Cup both sides of the casualty's jaw and lift (the jaw only) upward while anchoring your hands on the cheeks. The casualty's head should not move during this manoeuvre. Deliver breaths while maintaining an open airway.

**B** Breaths are delivered during artificial respiration or during CPR at the rates described below...



Use the **jaw thrust method** for opening the airway if the casualty was involved in a motor vehicle collision, a fall or subjected to a mechanical force.

Average Heart Rates:  
(at rest / per minute)

adult	60 - 100 beats
child	80 - 100 beats
infant	over 100 beats

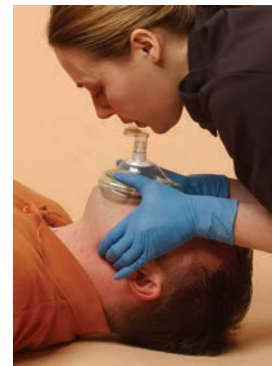


Open the airway. Using the head tilt, chin lift technique and a barrier device, deliver 2 breaths. Ensure a good seal

## ARTIFICIAL RESPIRATION (PULSE DETECTED)

**Adult:** Give 1 breath every 5 - 6 seconds. Breaths should last no longer than 1 second (just enough volume to see chest rise). Re-check pulse every 2 minutes.

**Child/Infant:** Give 1 breath every 2 - 3 seconds. Breaths should last no longer than 1 second (just enough volume to see chest rise). Re-check pulse every 2 minutes.

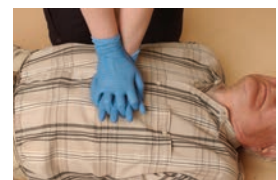


Delivering a breath while maintaining an open airway using the jaw thrust technique (if head or neck injury is suspected).

## CARDIOPULMONARY RESUSCITATION (PULSE NOT DETECTED)

**Adult:**

- 1 Place hands on the centre of the chest between the nipple line, interlocking fingers.
- 2 Perform 30 compressions, depressing the chest at least 5 cm (2"). Push hard, push fast at a rate of 100-120 compressions in a minute. Allow the chest to fully recoil between compressions.
- 4 After 30 compressions, open the airway and deliver 2 breaths (as described above). Continue to perform compressions and breaths at a ratio of 30:2 until AED arrives, EMS takes over or the casualty starts to move.



Adult CPR:  
30 compressions to 2 breaths at least 5 cm (2") in depth; breaths 1 second in length

# HEALTH CARE PROVIDERS



## Child CPR:

one or two hands  
30 compressions to 2 breaths  
1/3 the depth of the chest - about 5 cm (2")



## Infant CPR:

30 compressions to 2 breaths  
1/3 the depth of the baby's chest or about 4 cm (1 1/2")



## CARDIOPULMONARY RESUSCITATION (CPR)

### Child:

- 1 Place **one or two hands** on the centre of the chest between the nipple line. If using two hands, interlock fingers. If using one hand, place the other hand on the child's forehead to maintain an open airway.
- 2 Perform 30 compressions, depressing the chest 1/3 the depth of the chest - about 5 cm (2"). Push hard, push fast at a rate of at 100-120 compressions in a minute. Allow the chest to fully recoil between compressions.
- 3 After 30 compressions, deliver 2 breaths (1 second in length with just enough volume to see the chest rise). Continue to perform compressions and breaths at a ratio of 30:2 until AED arrives, EMS takes over or the casualty starts to move.



Child CPR: one or two hands

### Infant:

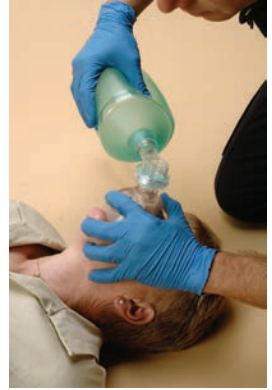
- 1 Place **two fingers** on the breastbone just below the nipple line. Place the other hand on the child's forehead to maintain an open airway.
- 2 Perform 30 compressions, depressing the chest 1/3 the depth of the chest - about 4 cm (1 1/2"). Push hard, push fast at a rate of 100-120 compressions in a minute. Allow the chest to fully recoil between compressions.
- 3 After 30 compressions, deliver 2 breaths (gentle breaths 1 second in length until the chest rises). Continue to perform compressions and breaths at a ratio of 30:2 until AED arrives, EMS takes over or the casualty starts to move.

## AED (AUTOMATED EXTERNAL DEFIBRILLATION)

See page 50 for general AED protocol. Additional special considerations for health care providers:

- If the health care provider is alone with a casualty who has collapsed suddenly, they should **activate EMS** and get an AED, then return to the casualty to begin CPR and use the AED.
- *NOTE: This course of action changes if the casualty is a child/infant and the health care provider did not witness the arrest. In these cases, the rescuer would perform 2 minutes (5 cycles) of CPR before activating EMS and getting an AED.*
- If spacing between pads is less than 2.5 cm (1") for a child or infant, place one pad on the front of chest and the other on the child's back.
- A hypothermic casualty should be limited to one shock followed by resumption of CPR and attempts to re-warm.

## HEALTH CARE PROVIDERS



Use an E-grip to support the valve and maintain an open airway



2-rescuer CPR on an adult or child using a bag valve mask.



Use 2 thumb encircling hands technique for 2-rescuer CPR on an infant. Ratio is 15 compressions to 2 breaths for an infant or child.

## BAG VALVE MASK

When you have access, a bag valve mask may be used instead of a barrier device to deliver breaths. Training and practice are essential in order to ensure an open airway and tight seal on the face.

- 1 Place the mask over the casualty's mouth, using a C-grip to hold it in place.
- 2 Perform a head-tilt chin-lift and use your free fingers (E-grip) to maintain an open airway by supporting the casualty's jaw.
- 3 Squeeze the bag with your other hand for 1 second to simulate a rescue breath. Watch for the chest to rise and fall.



2 person artificial respiration with a bag valve mask.

## 2-RESCUER CPR

If two health care providers are on the scene and trained in 2-person CPR, the tasks are divided up and the casualty receives more efficient circulation of blood and oxygen. One rescuer is the ventilator, the other is the compressor. Each rescuer should have their own mouth-to-mouth barrier device or share a bag valve mask.

### Procedure:

- 1 **STOP! Sign of Life™. Activate EMS** and get an AED. Once the AED arrives, begin AED protocol (see page 50).
- 2 The ventilator remains at the casualty's head and gives 2 breaths after each set of compressions - 30 for an adult, 15 for a child or infant, while maintaining an open airway.
- 3 Rescuers should switch positions every 2 minutes, while maintaining rhythmic cycles. It is important to minimize interruptions in compressions during each switch over - take less than 10 seconds to change positions.

On an **adult**, switch after every 5 cycles of 30:2.

On an **infant or child**, switch after every 10 cycles of 15:2.

*NOTE: During 2-rescuer CPR, if an **adult** casualty has an advanced airway in place, such as an endotracheal tube, esophageal-tracheal combitube or laryngeal mask airway (LMA), deliver 1 ventilation every 6 seconds during uninterrupted compressions. When performing CPR for **infants or children** with an advanced airway in place, deliver 1 ventilation every 2 – 3 seconds. Ventilations should be delivered without pausing chest compressions.*

## OPIOIDS AND THE HEALTH CARE PROVIDER

Opioids are pharmaceuticals with analgesic effects that are used to manage and treat both chronic and sudden pain. Common opioids include morphine, codeine, oxycodone and fentanyl. Unfortunately, misuse and overdose of opioids has become a crisis. Recognizing the signs and symptoms of an opioid poisoning and knowing what steps to take can save a life.

### Signs and Symptoms of an Overdose:

- grunting or not breathing at all (respiratory depression: decreased breathing rate with shallow breathing or agonal/ineffective breathing)
- bluish lips and nailbeds (lack of oxygenated blood)
- drowsiness (difficult to wake) to unconscious (decreased level of consciousness)
- pale skin, profuse sweating
- extremely small pupils

### Treatment:

If a health care provider suspects an opioid overdose and the casualty has a definite pulse, they should begin artificial respiration and administer Naloxone.

If the casualty does not have a pulse, the health care provider should begin CPR and use an AED. Additionally, they can administer Naloxone.

For a casualty known to be in cardiac arrest, in the absence of a proven benefit from the use of Naloxone, standard resuscitative measures should take priority over Naloxone administration, with a focus on high-quality CPR.

*Naloxone (Narcan) is a safe and effective drug that is used to reverse the effects of an opioid overdose. Naloxone can restore breathing within 2 – 5 minutes, and is active in the body for 20 – 90 minutes. The effects of most opioids will last longer than the effects of Naloxone, which means the health care provider may have to administer a second dose of Naloxone.*



# COMMUNITY CONNECTIONS

Apex Training Solutions Inc. is proud to introduce our **Community Connections Program**. In our efforts to create safer and caring communities, we have developed relationships with key community groups and service providers.

The following pages introduce our Community Connections affiliates and provide important information about their valuable services. We encourage you to take the time to read the stories and give some thought to how you can do your part in making your community a better place to live.

## Our Community Connections affiliates include:



HOPE - Human Organ Procurement Exchange Program  
CTC - Comprehensive Tissue Centre



Poison & Drug Information Service  
**1-800-332-1414**  
[www.padis.ca](http://www.padis.ca)

### Kathy's Story

Imagine going from being a healthy, active university student to having your kidneys fail — all in a matter of days. That's what happened to Kathy, who was diagnosed with a virus that destroyed her kidneys. She spent the next six-and-a-half years on dialysis awaiting a transplant. Then, she got the phone call that changed her life forever. Because a generous donor and family had consented to donation, Kathy was given a second chance at life. In 1997 at the World Transplant Games in Sydney, Australia, she won two bronze medals in the long jump and relay, and captured the silver medal in the high jump. Kathy is living proof that transplants work. She'll be forever grateful someone made the decision to be an organ donor.

### COORDINATING ORGAN AND TISSUE DONATION

If families express interest in donating their loved one's organs or tissues, coordinators with Alberta Health Services Human Organ Procurement Exchange (HOPE) Program arrange organ donation while tissue specialists with the Comprehensive Tissue Centre (CTC) coordinate tissue donation. By working together, these professionals help the family carry out their loved one's decision to donate and ensure final wishes are respectfully met. When consent for donation is granted, medical staff complete an assessment that measures the donor's tissue and organ health, and rules out the risk of infections diseases. If the assessment is favorable, the donor is taken to the operating room for surgical recovery of the organs and tissues. The organs are matched to transplant recipients waiting in Edmonton, or elsewhere in Canada, based on their level of sickness, blood type and size. The donated tissues are cryopreserved (frozen at very low temperatures) at the CTC until they are required for transplantation at medical facilities across Canada.

Following the donation, the HOPE coordinator and/or CTC tissue specialist continues to provide bereavement support to the family and, for at least the following year, provide them with anonymous communication - often thank you letters - from the transplant recipients they helped.

### DONATION FACTS

- Heart, lung, kidney, liver, pancreas, small bowel and islets are organs that can be donated.
- Eyes, skin, heart valves, bones, tendons, amniotic membrane, connective tissue, vascular tissue and islet cells are tissues that can be donated.
- Almost anyone 80 years and under can donate at least some tissues. For organs to be viable for transplant, however, a patient must experience brain death. Brain death only occurs in about 2-3% of all deaths.
- One person's organs and tissues used for transplantation can help up to 80 people.

### ARE YOU A DONOR?

Becoming a donor requires three steps:

- Make your decision
- Sign your donor card
- Share your decision with your family or legal representative



### Understanding Organ and Tissue Donation

#### For more information about:

24 hour toll free  
donor referral  
1-866-407-1970

Tissue donation, call  
Alberta Health Services  
Comprehensive Tissue  
Centre office  
780-407-7510

Organ donation, call  
Alberta Health Services  
HOPE program office  
780-407-8411

Alberta Health Services  
Regional Transplant  
program office  
780-407-2183



## It took almost 500 blood donors to save my life - Liz Furber

I know first-hand what a huge impact blood donors have on patients. They had a huge impact on me in fact, blood donors saved my life.



In November 2005 I suffered severe complications from E Coli and Campylobacter, two common forms of food poisoning. The innocent act of eating a hamburger literally changed my life forever.

Unlike most people with food poisoning who might feel unwell for a couple of days, my body reacted in a way that's quite rare for young adults and I developed Hemolytic Uremic Syndrome, or HUS.

I was so ill by the time I was airlifted to the University of Alberta hospital in Edmonton that the doctors told me that when they looked at my blood under a microscope, it looked like someone had put it through a blender.

HUS caused my blood to destroy itself and this, in turn, clogged my kidneys to the point where I was in complete renal failure. Physicians told my parents to contact whoever might need to say goodbye. I was yellow from the kidney failure and I had terrible bruising due to burst blood vessels under the skin.

This is where Canadian Blood Services entered my life. Over 28 days of intense treatment I received many bags of red blood cells, plasma and platelets. It took 498 units of blood products to save my life - blood from 498 donors.

The blood was made possible by ordinary people who generously took time to help save my life. I'm healthy now, but I will spend the rest of my days grateful to those who donated blood to make sure it was there when I needed it.

## Save more lives as a team: Join partners for life

If a single donor can save three lives with each donation, imagine what your organization can achieve if everyone donates blood together. *Partners for Life* is a nationwide program for corporate and community organizations that give back to the community by giving blood.

When your organization joins *Partners for Life*, everyone works together to make a set number of blood donations within a calendar year. Giving blood together is an opportunity for team building among colleagues, and it makes a great addition to your organization's community relations and/or health and wellness programs.

### For more information:

Visit [www.blood.ca/partnersforlife](http://www.blood.ca/partnersforlife)

Call 1-888-246-5004

## PLEASE CALL

**1 888 2 DONATE**  
**(1-888-236-6283)**

for donor eligibility information or to book an appointment to give blood.

Visit  
Canadian Blood Services  
at [www.blood.ca](http://www.blood.ca)



### **John's Second Chance**

After playing catch with his 12 year old child, John decided to polish his brand new aluminum tire rims using a product he brought home from work. He spent about 2 hours polishing his rims to a bright shine using nothing more than gloves made of cloth for protective equipment. About 60 minutes after using the product he noticed that his finger tips were painful and slightly red. Because he brought the product home from work, he didn't have the product label. He called the Poison and Drug Information Service (PADIS) at 1-800-332-1414.

He was advised to flush his fingers with water and find out from work as soon as possible the name of the product and the product's contents and call back. Heather, the Poison Specialist, was suspicious of the contents of the product because it sounded like an aluminum brightener. Heather's concern was that the product might contain hydrofluoric acid.

Hydrofluoric acid is unique in that it is an extremely strong acid that can penetrate very deeply into a person's tissue before causing burns. The end result is that people whose skin has been exposed to hydrofluoric acid can look relatively normal on the surface, but can be literally burning from the inside out.

The patient called his workplace and got the name of the product as well as the MSDS sheet with the product's contents and called PADIS back. John told Heather that the product contained hydrochloric acid and sulfuric acid. Heather was uncomfortable with this because the symptoms didn't fit. However John insisted that those were the right ingredients. Because the symptoms didn't fit hydrochloric acid, Heather had John spell the name of the acid and only then did she discover that it was what she had suspected, Hydrofluoric acid. That patient was sent to the hospital.

Heather advised the hospital staff to use a specialized mixture called calcium gluconate gel, which was applied to John's hands over the next few days.

As a result of the specialized treatment recommended by PADIS, John was able to keep his fingers and did not have to undergo any reconstructive surgery. Without PADIS's help, John may never have had the chance to play catch with his son again.



### **Recognize a Poisoning!**

**Anything can be a poison and can hurt your body when it:**

- gets in your eyes
- contacts your skin
- is breathed in
- is swallowed

**Common poisons include:**

- chemicals
- household cleaners
- medications
- bleach
- plants
- pesticides
- mushrooms
- snake bites
- carbon monoxide

**If you're not sure...  
If you're concerned...**

**Call PADIS at  
1-800-332-1414**

# PREVENTION AND SAFETY

**The following information is intended to help individuals and families increase their level of safety at work, home and play.**

**Apex Training Solutions Inc. would like to thank the following organizations for permission to reproduce the information contained in this section.**

## **Parachute®**

[www.parachutecanada.org](http://www.parachutecanada.org)

- How to create a child-friendly home:
  - playtime
  - mealtime
  - bath time
  - sleep time
- Wheeled Activities
- Ice Factors
- Drowning Prevention

## **Injury Prevention Centre**

[www.injurypreventioncentre.ca](http://www.injurypreventioncentre.ca)

- Take Action to prevent falls
- Take Action to prevent head injuries
- Take Action to prevent poisonings
- Take Action to prevent ATV injuries
- Take Action to prevent bicycle injuries
- Take Action to prevent firearms related injuries
- Take Action to prevent pedestrian injuries
- Take Action to stop distracted driving
- Take Action to prevent sport and recreation injuries
- Take Action to prevent suicides

## **Mental Health First Aid**

- Occupational Stress Injury and Self Care

# HOW TO CREATE A CHILD- FRIENDLY HOME

## FALL PREVENTION

### SAFETY GATES

### WINDOW SAFETY

## FALL PREVENTION

### HOW TO PROTECT YOUR BABY FROM FALLING

- Stay close to your baby.
- Keep one hand on your child while they're on the change table.
- Place car seats, carriers, and rockers on the floor.
- Bolt safety gates to the wall at the top and bottom of the stairs.
- Place cribs, beds and other furniture away from windows and balconies.

### SAFETY GATES KEEP KIDS SAFE

- Install safety gates properly.
- Use the correct gates.

For more information on gates visit Consumer Product Safety, Health Canada at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1-866-662-0666.



### PROTECT YOUR CHILD FROM WINDOW AND BALCONY FALLS

- Keep your young child away from open windows and balcony railings.
- Use window guards and stops on windows above the first floor.
- If you live in an apartment, landlords may be required to provide window stops or guards.

### WINDOW SAFETY DEVICES

Window guards act as a barrier, like a gate, in front of the window and can be found at hardware and specialty stores. They are available with both horizontal and vertical bars. Make sure to purchase window guards that have a release mechanism so that they can be fully opened in case of an emergency. Window guards have bars spaced no more than 10 cm (four inches) apart.

Window stops are small devices that prevent a window from opening more than 10 cm (four inches), so that a child cannot fall out. Wide varieties of window stops are available and can be found at hardware stores. Check your local hardware or home renovation store for window guards and stops. An internet search will also find online stores that can ship the products to you.

## **WINDOW BLIND OR CURTAIN CORDS**

- Cut the cords short and tie them out of reach.
- Cribs, beds, high chairs and playpens should not be placed by window blind or curtain cords.
- Use cordless window coverings.

## **LOCKS AND LATCHES**

- Check your locks and latches.
- Ensure the appropriate placement of locks and latches.

## **PREVENT YOUR TELEVISION FROM TOPPLING ONTO YOUR CHILD**

- Keep televisions on low, sturdy furniture.
- Use safety products to secure the television set.
- Remind children not to climb on the furniture.

## **KEEP YOUR CHILD AWAY FROM FIREPLACES**

The glass barrier on your fireplace can heat up to over 200°C (400°F). For gas fireplaces this can occur in about 6 minutes during use. It takes an average of 45 minutes for the gas fireplace to cool to a safe temperature after the gas fire is switched off.

- Place a barrier around your fireplace.
- Supervise your child.
- Teach children about the dangers of fire, along with supervision.

See [www.parachutecanada.org](http://www.parachutecanada.org) for more detailed information on scalds and burns, as well as the first aid section of this manual.

## **POISON PREVENTION TIPS**

Keep all potential poisons locked up and out of reach of children. See [www.parachutecanada.org](http://www.parachutecanada.org), as well as page 65 and page 104 of this manual for more detailed information on poison prevention.

## **SMOKE AND CARBON MONOXIDE DETECTORS**

Carbon monoxide detectors can save your child's life.

- Install smoke detectors on every level of the home and in each sleeping area.

### **LOCKS & LATCHES**

### **TELEVISIONS**

### **BURN PREVENTION**

### **POISON PREVENTION**

# SAFE PLAY FOR YOUR CHILD

## TOYS

## MAGNETS

## DROWNING PREVENTION

## BABY WALKERS

## ACTIVITY CENTRES

## TIPS WHEN CHOOSING AND USING TOYS

- Examine all toys.
- Choose age-appropriate toys.
- Supervise your children when they are playing with balloons.
- Check for product recalls.

Health Canada's Consumer Product Safety website lists products, including toys, which have been recalled by the manufacturer due to concerns with safety. Visit their web site or call 1-866-662-0666. You can also call this number if you are out shopping and see a product you think is a concern or is banned, like yo-yo balls or baby walkers.

For more information on lead poisoning, visit [www.aboutkidshealth.ca](http://www.aboutkidshealth.ca).

## KEEP SMALL MAGNETS AWAY FROM CHILDREN

- Keep magnets out of reach.

For more information on the hazards of small magnets visit Health Canada, Consumer Product Safety at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1 866-662-0666.

## DROWNING PREVENTION

- Stay within sight and reach of your child when in, on or around the pool and the bathtub.
- Install a 1.2 m (4 ft) high, four-sided fence with a self-closing, self-latching gate around your home pool.

For more detailed information see the drowning prevention section at [www.parachutecanada.org](http://www.parachutecanada.org).

## BABY WALKERS

- Baby walkers are dangerous.
- Baby walkers are banned.

The ban applies to the sale of both new and second-hand baby walkers sold through flea markets, garage sales or thrift stores. Modified baby walkers with the wheels removed are also banned.

For more information on the hazards of baby walkers visit Health Canada - Consumer Product Safety at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1 866-662-0666.

## STATIONARY ACTIVITY CENTRES

- Supervise your child at all times.
- Keep away from dangerous items.

The stationary activity centre needs to be far away from stairs, doors, windows, coffee tables, fireplaces, blind cords and all other items that are dangerous. Your child can grab or fall onto these items. This has caused serious injuries. Make sure the toys on the activity centre are not broken or loose. Sharp points can cut. Small pieces can be swallowed.

## **LET BABY JUMPERS BE FUN INSTEAD OF DANGEROUS**

- Choose the right jumper.
- Set up the jumper correctly.
- Supervise your baby at all times.

For more information on baby jumpers or to see if the product has been recalled, visit [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1 866-662-0666.

## **HOME PLAYGROUND EQUIPMENT**

The play structures in your backyard may be smaller and shorter than those at the park or in the school playground, but your children can still be injured. In Canada, there is a set of standards created by the Canadian Standards Association (CSA) for safer playground design. The CSA standard does not apply to home playgrounds, but similar rules can be applied to designing safer play spaces at home.

Visit [www.parachutecanada.org](http://www.parachutecanada.org) to more detailed information on home playgrounds.



## **TRAMPOLINES**

- Do not use backyard trampolines.

Jumping on a trampoline is a high risk activity with the potential for significant injury to children and youth. Every year, more than 500 Canadian children suffer trampoline-related injuries, which is equal to more than 15 classrooms full of children. The most common types of trampoline-related injuries include fractures and dislocations, with the possibility of paralysis and death from cervical spine injury.

Given the nature of the injuries, supervision by adults or even trained spotters is ineffective in preventing serious trampoline injuries to children.

Parachute agrees with the Canadian Paediatric Society and the Canadian Academy of Sports Medicine. We recommend that parents not buy or use trampolines at home (including cottages and summer residences) for children and youth.

# SAFE AND HAPPY MEAL, BATH AND SLEEP TIME

## CHOKING HOT LIQUIDS BATH TIME CRIB SAFETY

### PREVENT YOUR CHILD FROM CHOKING ON FOOD PRODUCTS

- Keep choking hazards away from children under four years old. These include:
  - small objects/toys – any object that can fit through a toilet paper roll
  - latex balloons
  - hard, round, sticky foods, such as hard candies, nuts, marshmallows, popcorn, etc.
- When introducing solids to infants (around six months of age), mindfully offer and prepare foods that prevent choking:
  - choose safe options
  - cut in small pieces
  - remove pits, etc.
- Always be diligent in supervising infants and young children while eating.

See [parachutecanada.org](http://parachutecanada.org) for more tips and information.



### THE DANGERS OF HOT LIQUIDS AND HOW TO PREVENT ACCIDENTS FROM HAPPENING

- Keep your child away from hot liquids.
- Reduce the hot water temperature in your home.
- Keep your child safely out of the way when you are cooking.
- Use a cup with a tight-fitting lid, like a travel cup, for hot drinks.
- Keep cords from your kettle and other appliances out of your child's reach.

### MAKE BATH TIME A SAFE AND HAPPY EXPERIENCE FOR YOU AND YOUR CHILD

- Bath seats and bath rings are not safe.
- Always check the temperature of the water before bathing your child
- Supervise at all times.
- Don't rely on older siblings.
- Lower your tap water temperature.
- Consider installing 'anti-scald' or 'shut-off' devices or tap guards.

For more information on how to check the temperature of your tap water and on how to change the setting on the thermometer, please refer to [www.parachutecanada.org](http://www.parachutecanada.org).

### CHOOSING A SAFE CRIB

- Do not use a crib made before 1986.
- Make sure your crib has no loose, missing or broken parts.
- Make sure the crib mattress fits tightly within the crib.
- Do not use a crib that does not have a label, or is homemade.

## USING YOUR CRIB SAFELY

- The safest place for your baby to sleep or nap is alone in a crib.
- After placing your baby on his or her back in the crib, always lock the sides of the crib in the upright position.
- Keep your baby's crib away from windows, curtain or blind cords. Children can fall out of the window or get caught in curtain or blind cords.
- Provide a safe crib environment that has no toys or loose bedding (use only a fitted sheet.)
- Make sure your baby does not have a bib, necklace, or anything tied around his or her neck when in the crib.
- Put your baby to sleep in a crib next to your bed for the first six months.
- Move your child into a low bed when they reach 90cm (35 inches) tall.

For more information on cribs or safe sleep for infants, visit [www.healthy Canadians.gc.ca/index-eng.php](http://www.healthy Canadians.gc.ca/index-eng.php) or Health Canada's website at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1-866-662-0666.



## BUNK BEDS

Here's how to help reduce the risk to your child:

- Buy a bunk bed that meets current US standards. Look for "ASTM F1427" on the label.
- Ensure your top bunk bed has guard rails on all four sides; even if the bed is placed against a wall.
- Assemble and use bunk beds as indicated in the manufacturer's instructions.
- Keep children under six off the top bunk.
- Put carpet under the bunk bed.

## SLEEPWEAR

- Dress children in actual sleepwear.
- Check for product recalls on children's sleepwear at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php).

This Health Canada - Consumer Product Safety website lists products, including children's sleepwear, which have been recalled by the manufacturer due to concerns with safety. Visit their web site or call 1-866-662-0666.

## SAFE AND HAPPY SLEEP TIME

CRIB SAFETY

BUNK BEDS

SLEEPWEAR

For more information on bunk beds, visit Health Canada - Consumer Product Safety at [www.hc-sc.gc.ca/cps-spc/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/index-eng.php) or call 1-866-662-0666

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## WHEELED ACTIVITIES

Refer to [www.parachutecanada.org](http://www.parachutecanada.org) for more information on:

- Helmet FAQs
- Bike Carriers and Trailers
- Safe Cycling
- Safe Inline Skating
- Safe Scooter Riding
- Safe Skateboarding

## TOP FIVE TIPS TO PROTECT YOUR CHILD'S HEAD

- Ensure your children wear a helmet every time they ride.
- Get the right kind of helmet. Choose a bicycle helmet for cycling, inline skating and scootering. Skateboarders need a special skateboarding helmet that covers more of the back of their head.
- Ensure the helmet fits your child. The helmet should rest two finger widths above the eyebrow. The side and chin straps should be snug.
- People of all ages should wear a helmet when they ride. Remember: you are your child's best role model.
- Children under 10 should not ride on the road. They do not have the physical and thinking skills to handle themselves safely in traffic. Children over 10 need to practice before they can ride on the road.



## ICE FACTORS

Refer to [www.parachutecanada.org](http://www.parachutecanada.org) for more information on:

- Helmet FAQs
- Bike Carriers and Trailers
- Safe Cycling
- Safe Inline Skating
- Safe Scooter Riding
- Safe Skateboarding

## ICE FACTORS

Many factors affect ice thickness including: type of water, location, the time of year and other environmental factors such as:

- Water depth and size of body of water currents.
- Tides and other moving water chemicals including salt.
- Fluctuations in water levels.
- Logs, rocks and docks absorbing heat from the sun.
- Changing air temperature.
- Shock waves from vehicles traveling on the ice.



## ICE COLOUR

The colour of ice may be an indication of its strength:

- Clear blue ice is strongest white opaque or snow ice is half as strong as blue ice. Opaque ice is formed by wet snow freezing on the ice. Gray ice is unsafe, the grayness indicates the presence of water.

Did you know ice thickness should be:

- 15 cm (6 inches) for walking or skating alone; 20 cm (8 inches) for skating parties or games; 25 cm (10 inches) for snowmobiles

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## DROWNING PREVENTION

Swimming, bath time and water play can be a lot of fun for children. Safe Kids Canada wants families to enjoy swimming and water play as part of a healthy active lifestyle.

Drowning is the second leading cause of injury related death for Canadian children. Every year almost 60 children drown. This equals to more than two classrooms full of children. Each year another 140 children must stay in the hospital because they nearly drowned. Near-drowning can result in long-term health effects. It can affect the way a child thinks, learns and plays.

But there is something you can do to keep children safe. Active supervision of children when they are around or in the water, proper pool fencing, the use of lifejackets, adult training in first aid and CPR (cardiopulmonary resuscitation) and children's swimming lessons can help prevent drowning.

## DROWNING RISKS

Among all age groups, boys are more likely to drown than girls. This may be because parents accept more risk taking in boys than in girls.

### Children under five years of age

All children are at risk for drowning, but young children under five years of age are at special risk because:

- They are attracted to water but cannot understand the danger.
- They can walk but they cannot swim.
- Their lungs are smaller than adults' and fill quickly with water.
- They can drown in as little as 2.5 cm (one inch) of water.

### Children five to 14 years of age

Older children are at risk because they may overestimate their own skills, underestimate the depth of the water or strength of the current, or respond to a dare from a friend. Physical strength develops throughout childhood. Even a good swimmer can get into trouble, especially in unfamiliar water or environments.

*Refer to the Parachute website for more information on the following:*

- *Drowning Prevention Tips*
- *Lifejackets and Personal Floatation Device*
- *Bathtubs*
- *Backyard Pool*
- *Backyard Rivers*
- *Safety Around Open Water*
- *Playgrounds and Water Features*

## TAKE ACTION TO PREVENT FALLS

## TAKE ACTION TO PREVENT FALLS

### Take action to prevent falls in babies and children:

- Keep one hand on your child while they're on the change table or other furniture.
- Place car seats, carriers and rockers on the floor.
- Always use the crotch safety straps when your child is in a swing, highchair or stroller.
- Install sturdy, wall-mounted gates at the top of stairs. Install wall-mounted or pressure gates at the bottom of stairs.
- Place cribs and other furniture away from windows and balconies. Install window guards.
- Only let children 6 years of age or older on the top bunk bed. Put carpet under the bunk bed.

### Keep the fun in outdoor play. Reduce the risk of serious injury:

- Check the playground: Look for deep, soft surfacing like sand or woodchips. For high places, look for handrails, barriers or railings.
- Stay close to your child and teach playground safety rules like: hold on to railings; wait your turn; don't go up the slide ladder until the other person has gone down the slide; slide down feet first; sit down on swings and slides; keep away from moving swings and the bottom of slides.
- Always wear a helmet when bike riding. It's the law for anyone under 18 years old.

### Take action to prevent falls around the house:

- Keep pathways, halls and stairways well-lit and free of clutter.
- Use handrails when going up or down stairs.
- Watch out for ice, cracks and uneven surfaces while walking.
- When using a ladder, stand it on flat ground. Keep off the highest two steps of the ladder.
- Do not reach to the side or push or pull anything while on the ladder.
- Limit your alcohol intake.

### Anyone can fall, but as you age the risk increases. The good news is that you can take steps to prevent falls:

- Have your doctor or pharmacist review all medications that you are taking every year. The way some medications affect you can change as you age.
- Keep active to increase strength and improve balance. Do at least 30 minutes of activity every day. You can break that time up into three sessions that last 10 minutes each.
- Watch your step wherever you are. Wear shoes that support your feet.
- Have your eyes checked every year.
- Avoid rushing and doing too many things at once.
- The Seniors Programs and Services Guide lists programs that help adults live on their own, safely.

Some programs help pay for equipment or home changes. Visit the Alberta Supports Contact Centre or call 1-877-644-9992 for more information. You can also find the guide on the internet at: [www.alberta.ca/financial-assistance-health-disability.aspx](http://www.alberta.ca/financial-assistance-health-disability.aspx).

## TAKE ACTION TO PREVENT FALLS

Sport activities are fun and good exercise for all ages. Keep it fun by preventing falls:

- Get trained for your activity. Learn and practice basic skills before trying more difficult moves.
- Avoid aggressive play or stunting.
- Do not use alcohol or drugs before or during your activity.
- Protect your head -wear a helmet!

Different helmets are made for different activities. Wear the right kind of helmet for bike riding, skateboarding, skiing/snowboarding, sledding, snowmobiling, riding ATVs, motorcycling, horseback riding, and for playing contact sports like hockey, football, and boxing. Make sure the helmet has an approved sticker from a testing agency like CSA, ASTM, Snell, ANSI, BSI or SM.



### **For more information about head injury prevention and support,**

visit [www.parachutecanada.ca](http://www.parachutecanada.ca)

Which helmet for which activity?

[www.parachutecanada.org/injury-topics/item/wheeled-activities1](http://www.parachutecanada.org/injury-topics/item/wheeled-activities1)

### **For more information on preventing falls contact:**

Health Link Alberta at 1-866-408-LINK (5465)

Finding Balance Alberta: [www.findingbalancealberta.ca](http://www.findingbalancealberta.ca)

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## TAKE ACTION TO PREVENT HEAD INJURIES

## TAKE ACTION TO PREVENT HEAD INJURIES

### DID YOU KNOW:

Every year, over 2,200 Albertans are hospitalized because of a major head injury.

Alberta males between the ages of 15 and 29 have the highest number of hospital admissions.

4 out of 5 bike related head injuries could have been prevented if every cyclist wore a helmet.

### The main cause of head injury in infants, toddlers and children is falls.

- Keep one hand on your child while they're on the change table or other furniture. Place car seats, carriers and rockers on the floor.
- Always use the crotch safety straps when your child is in a swing, highchair or stroller.
- Install sturdy, wall-mounted gates at the top of stairs. Install wall-mounted or pressure gates at the bottom of stairs.
- Install window guards. Place cribs and other furniture away from windows and balconies.
- Only let children 6 years of age or older on the top bunk bed. Put carpet under the bunk bed.
- Check the playground . Look for deep, soft surfacing like sand or woodchips. For high places, look for handrails, barriers or railings . Stay close to your child and teach playground safety rules.
- Always wear a helmet when bike riding. It's the law for anyone under 18 years old.

### The main cause of head injury in 15 to 44 year-olds is motor vehicle crashes.

- Use a seatbelt every time you ride in a vehicle.
- If you have used alcohol or drugs, don't drive. Don't be a passenger of someone who has used alcohol or drugs.
- Drive at the posted speed limit and obey all traffic signals and signs.
- Driving needs your full attention at all times. Avoid distractions like cell phones, MP3 players, reaching for objects, and personal grooming.

### The main cause of head injury in older adults is falls.

- Have your doctor or pharmacist review all medications that you are taking every year. The way some medications affect you can change as you age.
- Keep active to increase strength and improve balance.
- Watch your step wherever you are. Keep pathways, halls and stairways well-lit and free of clutter. Wear shoes that support your feet.
- Have your eyes checked every year.

## Protect your head - wear a helmet!

- Different helmets are made for different activities. Wear the right kind of helmet for bike riding, skateboarding, skiing/snowboarding, sledding, snowmobiling, riding ATVs, motorcycling, horseback riding, and for playing contact sports like hockey, football, and boxing.
- Make sure the helmet has an approved sticker from a testing agency like CSA, ASTM, Snell, ANSI, BSI or SM.

## Concussion is a type of serious head injury.

A concussion is a bump, blow, or jolt to the head or face that can change the way the brain normally works. Concussions can also happen from a fall or a blow to the body that causes the head and brain to move quickly back and forth.

Most people with a concussion get better in 7 to 10 days. If you have had a concussion in the past, the risk of another concussion is higher and healing may take longer.

You do not need to lose consciousness (get knocked out) to have a concussion.

## Watch for these signs for possible concussion:

- Thinking problems or memory loss
- Blank stare / glassy-eyed
- Headaches
- Vomiting
- Slow to answer questions or follow instruction
- Confusion and easily distracted
- Slurred or poor speech
- Stumbling or not able to walk in a straight line
- Strange emotions / personality changes
- Any period of loss of consciousness or unresponsiveness

If you think someone has a concussion, stop all activity. Do not leave them alone. Take them to a doctor as soon as possible on that day. If they are unconscious, call 911 for an ambulance.

## For more information about head injury prevention and support, contact:

Think First Canada: [www.parachutecanada.org/thinkfirstcanada](http://www.parachutecanada.org/thinkfirstcanada)

Which helmet for which activity?

[www.parachutecanada.org/injury-topics/item/wheeled-activities1](http://www.parachutecanada.org/injury-topics/item/wheeled-activities1)

Brain Injury Association of Canada: [braininjurycanada.ca](http://braininjurycanada.ca)

Wipe Out: Stories of Brain Injury:

[www.knowledge.ca/program/wipe-out-stories-of-brain-injury](http://www.knowledge.ca/program/wipe-out-stories-of-brain-injury)

# TAKE ACTION TO PREVENT POISONINGS

## TAKE ACTION TO PREVENT POISONINGS

### DID YOU KNOW:

Every year in Alberta, there are over 12,900 emergency room visits due to poisonings.

Each year there are over 1,400 hospital admissions due to poisonings in Alberta.

Alberta children 1 to 4 years of age have the highest rates of emergency room visits.

Medicines cause the most poisonings in all age groups.

### For Babies and Children

Many poisonings occur when people disrupt their routines. Others happen during times of household stress.

- Store poisons carefully. These include medicines, vitamins and cleaning products. Store them in cupboards or boxes you can lock.
- Storing poisons in high places is not good enough. Children can climb.
- Child-resistant packages don't protect children. They just slow them down.
- Never call medicine "candy." Lock up medicines that taste good to children. These include chewable vitamins and fruit-flavored syrups.
- Each time you give medicine, read the label. Check the dosage in a well-lit room.
- Don't take medications in front of children. Then they won't imitate you.
- Make sure visitors store purses and bags out of your child's reach.
- Sometimes you must answer the phone or door while you are taking medicines or vitamins, or using cleaning supplies. Take the poisons with you.
- Clean up ashtrays and leftover alcoholic drinks right away.
- Store creams, powders, and medicines away from baby change tables.
- Keep children away from indoor and outdoor poisonous plants.

### For Adults and Seniors

Do you take over-the-counter or prescription medicines? Read the label carefully every time.

- Turn on lights when taking or giving medicine at night. Wear required glasses or contact lenses to read labels.
- Use the proper dose for medicines. Never take someone else's medicine. Some medicines cannot be taken safely with other medicines or alcohol. Ask your doctor or pharmacist for advice.
- Use a medicines reminder, dosette box, or daily pill container. Then you'll take the right medicines at the right time.
- Use the original container to store poisons. These include pesticides, auto fluids and cleaning supplies. Never transfer them into drinking containers such as pop bottles. If you must transfer poisons to new containers, label the new container clearly. Write down the name of the poison and its hazards.
- Don't store poisons around food or drinks.
- Never mix different cleaning products or chemicals together.

## Prevent Carbon Monoxide Poisoning

- Idle your car outside the garage. Close the garage door.
- Each year, get a professional to check your house for carbon monoxide hazards. Ask them to check and clean:
  - fuel-burning appliances
  - furnaces
  - wood-burning stoves
  - fireplace vents.
- Install carbon monoxide detectors on all levels of your home near sleeping areas.

## Do you think someone has been poisoned?

**Call the Poison and Drug Information Service right away.**

Do not wait for the person to look or feel sick. The Poison and Drug Information Service will explain what you can do to help. The call is free in Alberta. You can call 24 hours a day, seven days a week

- **Call 1-800-332-1414**
- Take the poison container with you to the telephone
- Be prepared to tell them the person's age, weight, sex and present condition
- Tell how much poison was taken and when
- **Call 911 if the person is:**
  - unconscious
  - having a seizure
  - not breathing

## For more information on preventing poisonings, contact:

The Poison and Drug Information Service: [www.padis.ca](http://www.padis.ca)

Alberta Emergency Management Agency  
(for carbon monoxide poisoning prevention):  
<http://aema.alberta.ca/documents/carbonmonoxide.pdf>



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## TAKE ACTION TO PREVENT ATV AND BICYCLE INJURIES

### TAKE ACTION TO PREVENT ATV INJURIES

- Protect Children and Youth -use the appropriate sized ATV and always have adult supervision
- Protect your Head - Wear a Helmet
- Drive Sober -Alcohol, drugs and ATVs don't mix
- Protect Yourself - only have a passenger if the ATV is meant to carry another person
- Get Trained

#### For more information on ATV safety:

The North American Guidelines for Children's Agricultural Tasks  
NAGCAN: [www.nagcat.org](http://www.nagcat.org) (enter search word, ATV)

Canadian Off-Highway Vehicles Distributors Council: [www.catv.ca](http://www.catv.ca)

U.S. Consumer Product Safety Commission: [www.atvsafety.gov](http://www.atvsafety.gov)

### TAKE ACTION TO PREVENT BICYCLE INJURIES

#### DID YOU KNOW:

Every day in Alberta, there are about 19 emergency room visits and one hospital admission due to bike injuries

Wearing a bike helmet reduces the risk of brain injury by up to 85%

Brain injury can cause seizures, problems with thinking and memory, personality changes, permanent disabilities and death.

- Use the right helmet
- Wear it well (make sure it fits) Check your bike
- Be seen and be heard while riding
- Be alert and follow traffic rules

#### For more information about helmets and bike injury prevention, contact:

Bike Helmet Safety Institute: [www.helmets.org](http://www.helmets.org)

National Highway Traffic Safety Administration (United States):  
[www.youtube.com/watch?v=jdrxrIpQpt4](http://www.youtube.com/watch?v=jdrxrIpQpt4)

Health Canada's Physical Activity Guide to Health Living for Older Adults: 1-888-334- 9769 or [www.phac-aspc.gc.ca/pau-uap/paguide/older/index.html](http://www.phac-aspc.gc.ca/pau-uap/paguide/older/index.html)



## TAKE ACTION TO PREVENT FIREARM INJURIES AND MOTOR VEHICLE COLLISIONS

### TAKE ACTION TO PREVENT FIREARM INJURIES

- Know and follow the laws on storing firearms safely Protect children from firearms related injuries:
  - Don't take chances -even if you think your child knows better.
  - Keep your firearms unloaded and locked up when they are not in use.
- Know and follow the rules for safely transporting non-restricted firearms.

#### For more information on firearm safety and getting a firearms license, contact:

The Canada Firearms Centre: [www.cfc-cafc.gc.ca](http://www.cfc-cafc.gc.ca); 1-800-731-4000

The Alberta Hunter Education Instructors' Association: [www.aheia.com](http://www.aheia.com)

### TAKE ACTION TO PREVENT MOTOR VEHICLE COLLISIONS

#### DID YOU KNOW:

In Alberta, a traffic crash occurs every 5 minutes costing us about \$12 million every day.

On average there is one death per day related to motor vehicle crashes in Alberta.

Most deaths occur on rural roads.

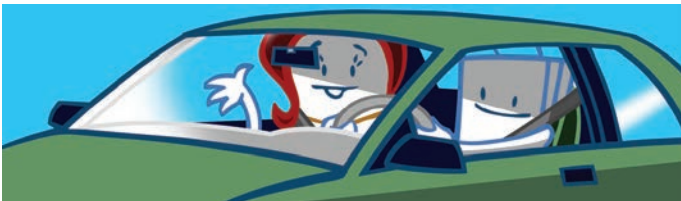
Motor vehicle crashes are Alberta's number one killer of young people.

- Buckle up
- Drive sober
- Slow down and drive safely
- Keep your brain and hands focused on the task of driving
- Keep young drivers safe

#### For more information on how to prevent vehicle collisions contact:

Alberta Office of Traffic Safety: [www.saferoads.com](http://www.saferoads.com)

Traffic Injury Research Foundation: [www.tirf.ca](http://www.tirf.ca)



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# TAKE ACTION TO PREVENT PEDESTRIAN INJURIES

## TAKE ACTION TO PREVENT PEDESTRIAN INJURIES:

### DID YOU KNOW:

Over 45 pedestrians die every year in Alberta.

More than half of the pedestrians killed are 25 and older.

Over 1,270 pedestrians are injured each year in Alberta.

### For pedestrians:

- Only cross the street at corners or in crosswalks. Is there a button you can press to turn on a pedestrian crossing signal? Use it! After the "Walk" signal turns on, check to make sure traffic stops and then start walking.
- Do you see a flashing red hand or "Don't Walk" signal? Don't cross the street. Wait for the next "Walk" signal.
- Watch for traffic in all lanes. Drivers making right turns on a red light might not see you. Drivers turning left across traffic might not see you. Walk when crossing a street; don't run.
- Pay attention. Talking on a cell phone or to a friend is distracting. You may not notice traffic coming toward you.
- Walk on sidewalks. If there is no sidewalk, walk on the left side, off the road, so you're facing traffic.
- Make sure drivers can see you. Wear clothes with bright colors. Carry a flashlight or put reflective tape or a badge on your clothes. Keep reflectors or a flashlight in your glove box in case your vehicle breaks down at night.
- Make eye contact with drivers before you cross the street. Treat driveways and alleys like streets. Always look left and right for traffic before crossing.
- Show and teach your child how to cross driveways, alleys, and streets safely. Most children can cross streets safely without an adult when they are 9 to 11 years old.

### For drivers:

Did you know that if you fail to stop for a pedestrian in a crosswalk you could be fined \$575 and get 4 demerit points?

- Watch out for pedestrians at intersections and crosswalks. Has a vehicle beside you stopped or slowed down? Maybe there is a pedestrian. Slow down and look.
- Obey speed limits and traffic signs and signals.
- Watch closely for pedestrians in neighborhood streets and school zones.
- Make sure there is nothing behind your vehicle when you back up.

Do you see hazards in your area? Report them to your city or municipal planning department or to your community league. Hazards might be:

- No sidewalks.
- Traffic signals that don't give you enough time to cross. Poorly lit sidewalks or intersections.
- Wide roads with no median in the centre where you can stop.
- No curb ramps. This is especially important for people in wheelchairs. Speeding drivers.
- No crosswalk signals on busy streets.

# TAKE ACTION TO PREVENT DISTRACTED DRIVING

- Ask about ways to fix hazards like:
  - Timing traffic lights so that pedestrians begin crossing the street several seconds before the traffic starts moving.
  - Putting up signs or signals that warn pedestrians to watch for turning vehicles.
  - Making rules that prevent vehicles from turning right on a red light.
  - Moving stop lines farther back from crosswalks. Building more sidewalks or walking paths.
  - Lowering posted speed limits.
  - Slowing down traffic with tree-lined streets, narrow streets, or curb extensions.
  - Putting up street lights.

## For more information on how to prevent pedestrian injuries, visit:

Alberta Office of Traffic Safety: [www.saferoads.com](http://www.saferoads.com)

Parachute: [www.parachutecanada.org](http://www.parachutecanada.org)

## TAKE ACTION TO STOP DISTRACTED DRIVING:

- Be aware of electronic distractions: cell phones, MP3's, GPS, and others
- Use electronics before you start your trip or after you arrive
- Minimize inside your car distractions
- Be aware of outside distractions: signs, billboards, hazards
- Be aware of distractions in your head - keep your mind focused on driving. Avoid intense conversations with passengers including children and pull over safely until everyone is ready for the road
- Keep young drivers safe -remember they are watching your driving. Crashes happen more often when young drivers have other teen passengers -for the first 6 to 12 months, young drivers should drive alone or with family members only.

## For more information on distracted driving contact:

Alberta Office of Traffic Safety: [www.saferoads.com](http://www.saferoads.com)

Parachute: [www.parachutecanada.org](http://www.parachutecanada.org)

## TAKE ACTION TO PREVENT SPORTS AND RECREATION INJURIES:

- Wear the gear (body equipment) intended for your activity
- Warm up and cool down
- Check your environment (activity area) for hazards/ risks
- Get trained and get qualified coaching staff
- Play fair
- Pace yourself
- Be smart
- Take care of your injuries
- Stay healthy

### **DISTRACTED DRIVING LAWS IN ALBERTA**

*Alberta legislation restricts drivers from:*

- Using a hand-held cell phone
- Texting or emailing
- Using electronic devices like laptop computers, video games, cameras, video entertainment displays and programming portable audio players
- Entering information of GPS units
- Reading printed materials in the vehicle
- Writing, printing or sketching
- Personal grooming.

*The legislation applies to all vehicles, including bicycles and covers all roads in both urban and rural Alberta.*

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# TAKE ACTION TO PREVENT SUICIDE

## For more information on preventing sport and recreation injuries, contact:

Parachute: [www.parachutecanada.org](http://www.parachutecanada.org)

Health Canada: [www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)

Sport Medicine Council of Alberta:  
[www.sportmedab.ca](http://www.sportmedab.ca)

ThinkFirst Canada: [www.parachutecanada.org/thinkfirstcanada](http://www.parachutecanada.org/thinkfirstcanada)

Canadian Avalanche Centre: [www.avalanche.ca](http://www.avalanche.ca)

## TAKE ACTION TO PREVENT SUICIDE:

### DID YOU KNOW:

Every day in Alberta, at least one person dies by suicide. Many more attempt suicide, but live.

People who die by suicide are all ages and from all backgrounds

YOU can help prevent suicide

### Look for signs that someone wants to talk.

- Here are a few signs that someone might want you to help them talk about suicide:
  - They talk about wanting to die.
  - They lose interest in doing things they used to enjoy.
  - They avoid being with people they used to like.
  - They have more trouble at home, work, or school than usual.
  - They are misusing or abusing drugs or alcohol.
- Use a direct question.
- Listen.
- Get them connected to help.

### It is important to learn more about preventing suicide.

Suicide affects us all. Here are some ideas to help you prevent suicide in your family and community:

- Get suicide intervention training to learn how to Take Action.
- Get your workplace or community to do a presentation on the taboo and stigma of suicide.
- Learn what you and your family can do to protect against the risk of suicide.

### You can learn more about preventing suicide at:

The Centre for Suicide Prevention: 403-245-3900 [www.suicideinfo.ca](http://www.suicideinfo.ca)

The Canadian Mental Health Association - Alberta Division:  
[www.cmha.ab.ca](http://www.cmha.ab.ca)

*\*These are not crisis lines\**

## MENTAL HEALTH EMERGENCIES

### DID YOU KNOW:

You are more likely to encounter someone who is experiencing a behavioural health condition or mental health crisis, than someone who is facing a physical emergency.

Mental health emergencies can vary greatly from individual to individual. Some people may be more vocal about their experience, while others may lack insight or understanding of the mental health emergency they are facing.

### TAKE ACTION:

- To assist someone who is experiencing a mental health crisis, the first step is to determine the level of that emergency. Evaluate if the level of risk to the individual in crisis involves harm to themselves or others.
- Gathering information is very important when engaging with the individual, to try to achieve a better understanding of what they may be experiencing.
- Advise that help and support is available to them with appropriate resources.
- Ask if they have access to professional services, and if they have the support of friends and family or people they trust that they can talk to. Encourage them to reach out.

## OCCUPATIONAL STRESS INJURY AND SELF CARE

Occupational stress injury or work place stress has many causes, including long work hours without effective breaks or time off. Other work related stress can stem from the type of work performed, shift work, or a lack of training. The economic impact of individuals living with a mental health problem in the workplace can impact all places of work, due to loss of productivity and increased absenteeism.

Ensuring adequate support is key for individuals who may experience a mental health emergency at work. Some workplace environments offer counselling as a part of Occupational Health and Safety programs.

### Self-Care Management Tips:

Self-care is very important for individuals living with a mental health disorder, as well as for people assisting someone living with a mental health related disorder. Finding ways to decrease immediate stress is critical. Self-care can take the form of:

- healthy nutrition
- daily exercise
- adequate sleep
- relaxation techniques
- others may benefit from journaling, self-help books and communication with a support group.

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## 2-RESCUER CPR

If two first aiders are on the scene and trained in 2-Rescuer CPR, the tasks are divided up and the casualty receives more efficient circulation of blood and oxygen. One first aider is the ventilator, the other is the compressor. Each first aider should have their own mouth-to-mouth barrier device.

### Procedure:

- 1** STOP! Go through the Sign of Life™. **Activate EMS** and get an AED. Once the AED arrives, begin AED protocol (see page 50).
- 2** The ventilator remains at the casualty's head and gives 2 breaths after each set of compressions, while maintaining an open airway.
- 3** Rescuers should switch positions every 2 minutes, while maintaining rhythmic cycles. It is important to minimize interruptions in compressions during each switch – take less than 10 seconds to switch positions.

**For an adult, use a ratio of 30 compressions to 2 breaths switching every 5 cycles.**

**For a child or infant, use a ratio of 15 compressions to 2 breaths switching every 10 cycles.**

