



INSTANT HERO

A Simple Guide for Learning
How to Save Lives...

And Confidently Handle Any Medical Emergency
Using Our AID STAR Framework

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We cannot guarantee that the procedures in the book are being properly administered & anyone using techniques that require specific training, certification or licensure should always be sure to have the proper credentials prior to administration of those techniques.

Ren, this one is dedicated to you. Without your positive influence, this book may have never been written.

SPECIAL THANKS

Enormous thanks go to a dear friend and colleague Mr. Alain Lipowicz RN, as an editor for Instant Hero.

Alain's deep understanding of anatomy, physiology, academia, and his super-human ability to see things from all perspectives added considerable value to this project. It is a blessing to have had his fingerprints on this project.

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WHAT IS FIRST AID?

First aid is medical treatment you give someone when you are outside the hospital. First aid treatments are usually simple, because people don't often carry medical equipment with them. Hospitals have highly trained medical workers and equipment, therefore hospitals can give the most advanced medical care.

When you think of 'first aid' think of 'the first medical help a person gets'. It happens at work, at home, in stores, on the street.

Some examples of first aid:

- Stopping bleeding from an injury
- Giving rescue breaths to someone who can't breathe
- Giving medication to reverse a drug overdose

WHAT IS THE PURPOSE OF FIRST AID?

Purpose One: To keep someone alive long enough to get to the hospital for more advanced medical treatment. When a medical situation is severe or life-threatening and they need treatments that can only be done in a hospital, the purpose of first aid is to keep an injured or sick person alive long enough to get them to the hospital so they can get full treatment.

Purpose Two: To completely treat simple injuries or illnesses, which may not require the advanced treatments available at hospitals. In these cases you still may want to visit a hospital or doctor to make sure everything is ok.



WHO ARE WE?

Howdy! We're Polaris.

We're an American non-profit organization.

Our mission is simple: Help communities overcome disasters by turning ordinary people into extraordinary rescuers, and by doing so, prevent death and injury.

The word 'Polaris' means the North star, it is the light that guides one home and gives one hope and certainty in the darkness. Natural disasters and medical emergencies are some of the darkest moments a person will face in their life. We want knowledge and skills to be your point of stability and hope in those times.

To achieve that mission, the digital (ebook) version of this guide is available to you, the reader, for free and always will be.

That is our promise.

While most first aid guides will cost you around \$20, this one is available to you for free, in spite of countless hours of labor, because we don't want ANY barrier between you and this life-saving knowledge.

All we ask is that you read the entire guide and get your friends, family and co-workers to download it as well.

We must spread the word and get this knowledge out to as many people as possible, so we can prevent injury and deaths.



WHAT TO EXPECT FROM THIS GUIDE

What transformation should you expect after reading this guide?

Will you be able to save lives? Will you be as confident as a veteran combat medic?

I would love it if you were!

But in all honesty, you probably won't be. But you will have the **KNOWLEDGE** on what to do, you just won't have the skills yet.

The only way one can acquire skills are by practice, learning, more practice, on and on. This guide is knowledge. After acquiring knowledge, you must train to get skill.

This guide is designed to make you:

1. Aware of the problem
2. Aware of the solutions (first aid knowledge)
3. Decide to take action
4. Take action (get trained on first aid)

This guide is meant to be your introduction to first aid, your first step on your path, giving you the knowledge you need and the interest to get trained on first aid and get your skills.

So, what should you expect after reading this guide?

1. You should expect to have much more knowledge and understanding of first aid than the average person

2. You should know what to do for all the major injuries/illnesses in the guide
3. You should know the AID STAR Framework and what to do in any medical emergency
4. Have the interest necessary to take the next step and get trained

WHAT WILL I LEARN EXACTLY?

You'll be able to answer these questions:

- What do I do in a medical emergency?
- How do I know if it IS an emergency?
- When do I call 911?
- How do I save a life?
- How do I stop bleeding?
- What do I do if someone is choking?
- What do I do if someone's having a heart attack?
- What about:
 - a. Stroke?
 - b. Drug over-dose?
 - c. Poisoning?
 - d. Burns?
 - e. Drowning?
 - f. Lightning strikes?
- And so on...

OUR FOCUS

We focus on treating life-threatening injuries or illnesses.

These are the type of situations where a person only has minutes to live, and whether or not they live or die depends on what you do at that moment.

Examples are:

1. Serious bleeding
2. Inability to breathe
3. Chest pain (heart attacks)
4. Strokes
5. Spinal cord injury
6. Organ failure from traumatic injury (car crashes, gun shots, stabbings)
7. Lightning strikes
8. Drownings
9. Drug overdoses
10. Poisoning

There are many injuries and situations that are not life-threatening but still need first aid:

1. Stepping on glass
2. Getting a fish hook caught in the skin
3. Twisting an ankle
4. Pulling a muscle
5. Getting blisters on feet

These minor injuries and illness are still important, however they are **not** discussed in this guide.

But, why does one really need to bother learning these skills in our modern society?

Why bother when we have ambulances and emergency services?



WHY FIRST AID IS A BIG DEAL...

Let me tell you why in one example: In 2019, over 150,000 Americans died from having a stroke.

Most strokes are caused by a blood clot (a clump of blood) in the blood vessels of the brain, causing the brain to not get oxygen, and the patient to lose mental functions, and potentially die. There is a short window of time where the patient qualifies for a special clot-busting treatment (it breaks up the blood clot). Any longer than that, they cannot get the clot-buster, and so may die or suffer brain damage, which could have been easily prevented. With that said, it is absolutely VITAL that a person who is showing signs of a stroke, gets identified as a potential stroke patient, and gets to the hospital immediately, so they can get treated and live.

World wide:

- 6.6 million people die each year from stroke
- 8.9 million people die each year from heart disease
- 5 million people die each year from traumatic injuries

And in America:

- 93,000 people died from drug overdoses in 2020
- 659,000 people die of heart disease, each year
- 130,000 people die of stroke, each year

Of the 20+ million deaths mentioned above, how many do you think could be prevented if bystanders knew CPR and first aid?

Even if only 1% of that 20 million could be prevented that would be 200,000 people getting a second chance at life. While some might not appreciate that fact, the families of those who did die certainly would appreciate it.

3 REASONS WHY YOU NEED TO LEARN FIRST AID

1. You won't always be able to call 911

Some may say: "In most American cities, an ambulance is just 10 minutes away. Just whip out your phone, call 911 and you'll be taken care of. "

But what if your battery is dead, or there is no signal, or you don't have a phone, or maybe you're in a rural area and the closest ambulance is 45 minutes away (which is not uncommon as 1 in 5 Americans live in a rural area). And just because you're in a city doesn't mean you can always get an ambulance in 10 minutes, as there could be heavy traffic, which will cause delay. It is irresponsible to drop the responsibility at the door of the ambulance services. YOU need to know what to do.

2. You won't always have your phone to ask the internet what to do

Some may say: "Why bother memorizing all the different signs and symptoms of illnesses when you can just search it on your phone since everyone always has their phone on them!?"

That is a terrible argument for many reasons:

1. During an emergency is not the time to learn what to do, as one will be frantic, and unfocused mentally
2. There is ALWAYS a chance the phone may have no signal, no battery, be broken or be lost

3. First aid needs to be FAST. Every second counts when someone is in a life-threatening situation

3. You might be alone and have no one else to help you.

Some may say: “There’s always people around, right? Even in a city?”

Not necessarily, and even if they are, what if they are as un-trained as you? What good will that do you? What if you’re in a rural area, or camping in the woods? Not only will you be alone but you’ll probably also not have a signal for your phone, in which case it is essential you yourself know what to do in case of an emergency.

5 REASONS WHY YOU MIGHT NOT WANT TO GIVE OR STUDY FIRST AID

1. “I studied first aid before, and I can never remember anything”

That is not surprising. A common reason people cannot remember what they have read or studied is because there is terminology that they didn’t fully understand, and therefore the whole concept is just empty in their minds. In our guide we address that by having a glossary, avoiding medical terminology as much as possible, and when we do use it, we define what it means.

2. “First aid is complex”

Some first aid guides can get pretty complicated. With ours, it is designed so that an elementary school child can read it and use it. What good is a guide that can’t be used by everyone? We go out of our way to explain things simply, and we don’t try to impress anyone with fancy words or medical terminology.

3. “I don’t have any experience or training”

Many people have little experience with first aid. Perhaps they’ve watched some videos, maybe they did a class when they were a kid, or they might have done a class not too long ago but have forgotten everything. Regardless of the situation, this guide is designed so that someone with absolutely NO experience in first aid can read it, understand it, and then use it.

4. “I’m afraid I’ll hurt someone”

The code of a first responder is “do no harm”. We are learning first aid to help others, the last thing we want to do is hurt them. You’ll find that once you learn about specific injuries and illnesses and what you need to do to treat them, it is highly unlikely for you to actually cause any harm, because the correct treatments are so obvious.

5. “I’m afraid I’ll get sued”

The last thing you want is to be sued for trying to do the right thing by helping someone who was hurt or dying. Yes, people have been sued, but in America, anyone can get sued for anything, it doesn’t mean that the lawsuit will be successful in the courts. Such lawsuits are usually thrown out of the court as they are ridiculous. Additionally, in the USA most states have laws that protect citizens who are helping an injured person, thus giving them the right to help others without fear of punishment as long as they do things that are:

- a. Within their training level
- b. Helpful and not harmful things
- c. Not high-risk procedures that doctors would normally do

CONCLUSION

While some of the five reasons above seem valid, they really are not. Every man, woman and child needs to be trained on first aid, and should be able to give it.

The preservation of life is not only our duty as human beings, but it is one of the most important things anyone could ever do.

A society that doesn't value first aid training does not value life.

A WHOLE NEW WORLD...

In this guide, we teach you how to spot the signs and symptoms of many illnesses and injuries.

The more people who have this knowledge, the more needless deaths will be prevented.

Imagine if all people decided to take on the role of a 'first responder' and learn how to save a life.

Imagine if everyone knew what to do in medical emergencies, just how many deaths would be prevented?

Well, we don't have to imagine it. By you reading this, we are one step closer.

However, the big question is this: is this book for you?



WHO IS THIS GUIDE FOR?

By picking up a book titled 'Instant Hero', I can make some assumptions about you:

1. You want to learn how to save people
2. You want it NOW
3. You want to be a better 'you'

You want it all and you want it now. As you should! There is no time to waste, people need your help.

You have picked up the right book. We can help you with 1 & 2, but you can only acquire 3 by getting the skills and putting them to use, helping people.

If you're reading this guide, it means you're a very special person:

- A person who wants to help their fellow man
- A person who wants to be competent, skilled
- A brave person who wants to know how to help when people are in danger
- A person who doesn't turn their back and retreat in fear
- A person who takes matters into their own hands
- A person who takes action and doesn't wait
- A Leader rather than a Follower, the kind of person who steps forward and takes action in an emergency without having to be told to do so by someone else

This guide is your first step to being able to do something in these situations.

- If you have zero first aid training, this guide will benefit you
- If you have already been trained on first aid, you will also benefit from this guide, thanks to our AID STAR framework: a tool which shows you how to effectively deal with any medical emergency

We're giving you the tools. It will be up to you to put them to use. Your friends, family and community are counting on you. Your adventure starts now.

LET'S START LEARNING FIRST AID!

The topic of first aid can seem like a ball of confusion.

There are so many different illnesses, and injuries, do's and don'ts, where does one even start?

The answer is the: ABCS!

But, first, we need you to take a stand.

TAKE A STAND

This might sound overwhelming, but we really need your help right now, in taking a stand.

We want more people to be informed on first aid, so we can prevent injuries and save lives. And, we think you want the same thing, because you are reading this book, right?

The only problem is, we can think about things all we want and have hopes and intentions but never take action.

So, we want you to take a small action, to show us that you're serious about this.

We want you to commit. We want you to send us an email, (yes we mean literally send an email from you to us), and put in the subject line: "I'm taking a stand". And in the body of the email tell us your story, and why you want to learn first aid, and we want you to promise me that sometime in this year YOU will take a first aid class so you can get those skills!

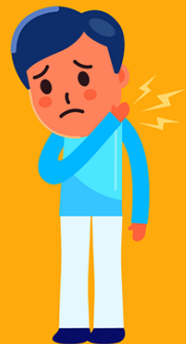
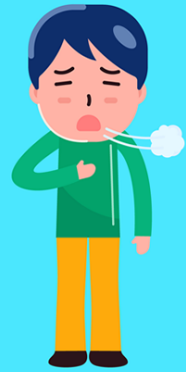
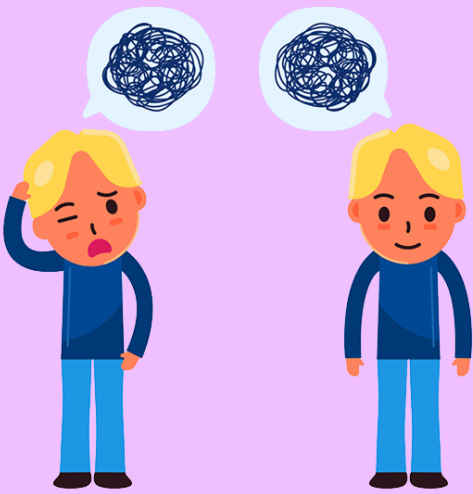
Email us at: hello@polarisdrt.org

I'm being 100% serious! We WANT you to email us. It may take a while, but we do check these and we will respond eventually.

Do this right now, we mean it! We're being 100% serious, send us this email and let's make it official. Take a stand with us.

We're waiting!

Let's do it!



HOW DO I KNOW IF SOMETHING IS AN EMERGENCY?

When someone is sick or hurt, you need to know if it is serious enough to call 911.

Some illnesses and injuries are minor and do not need an ambulance, and you can handle everything without needing to go to the hospital.

But some illnesses and injuries are serious, and if you don't get an ambulance the person may die.

There are hundreds of possible illnesses or injuries... how can we memorize which are serious or not?

We need a fast and simple way to determine if a hurt person is having a life-threatening emergency, and needs an ambulance!

To help us do that, we created the ABCS:

They do not cover all major illnesses, but they do cover the most common.

- Altered consciousness / Unconsciousness
- Breathing / Bleeding
- Chest Pain
- Stroke / Spine Injury

Let's discuss more about each one.



ALTERED CONSCIOUSNESS

Unconsciousness or altered consciousness is an emergency. It can be a sign for a serious health problem such as:

- Stroke, low oxygen, low blood sugar, drugs & poisons, heat-stroke, fever or sickness, and others

What does it look like?

- a person who is wide awake, eyes open, but staring blankly.
- a person who has their eyes closed, and is shaking and moaning, but cannot speak.
- a person who is awake and seems normal but is just saying strange, unusual things.
- a person with an altered consciousness may have their eyes open, or eyes closed. They will be making some sort of movement, or sound.

How do you determine if a person has an altered level of consciousness?

You walk up to someone and ask a few questions, they can be anything, but these are the most common:

1. what is your name?
2. what is going on?
3. do you know where you are?
4. what year is it?
5. who is the president?



INADEQUATE BREATHING

Having inadequate breathing or being unable to breathe is a serious emergency. Without breathing you can go unconscious within a minute, and brain damage can occur within 4-6 minutes of not being able to breathe.

What does it look like?

A person having difficulty breathing may show one or more of these signs:

- Rapid shallow breaths
- Slow shallow breaths
- Gasping for air
- Breathing more than 30 breaths per minute
- Breathing less than 10 times per minute
- Blue colored skin on lips



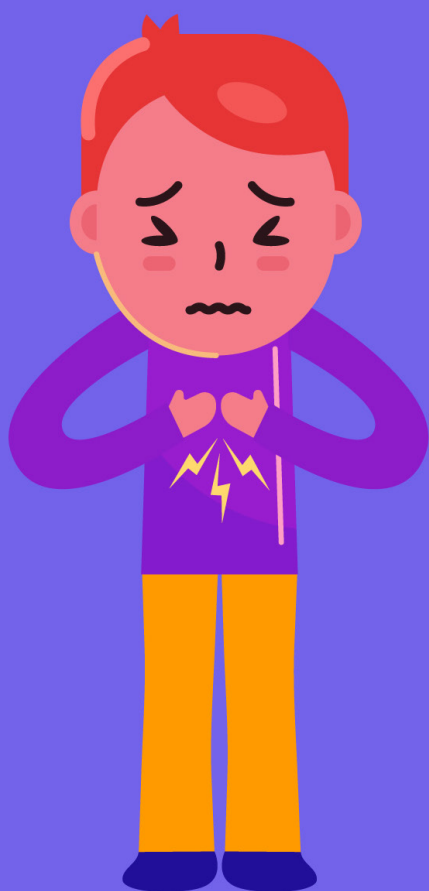
SERIOUS BLEEDING

Bleeding can be a simple cut that is handled with a band-aid. Or a life-threatening spurting of blood, which will end in death if not handled in seconds. In this book, we're concerned with serious life-threatening bleeding.

What does it look like?

A serious bleed will look like:

- A steady or fast flow of blood
- It doesn't stop even when you put pressure on it



CHEST PAIN

Chest pain can be a symptom that someone is having a heart attack, which can result in death if not treated at a hospital immediately. However, just because someone has pain in their chest does not always, 100% of the time mean they are having a heart attack, there could be other less serious situations that are causing the chest pain (like having eaten too much spicy food).

In order to be safe, we consider ANY chest pain to be an emergency. We assume it is a heart attack, even though we are unsure. It is best to be safe, not sorry.

What does it look like?

Chest pain is only one symptom of many. A person having a heart attack may have several of these:

- Dull pressure on chest
- Feeling like someone is sitting on chest
- Pain in center of chest
- Pain in jaw
- Pain in left arm
- Shortness of breath (difficulty breathing)
- Sweating



STROKE

A person having a stroke has a limited time window to receive a life-saving treatment at a hospital. This window may be between 1-2hrs. Otherwise, if they miss this time window they may get brain damage or die. Therefore, being able to detect a stroke is a crucial life-saving skill.

What does it look like?

Strokes vary in their severity, from light to intense. Some symptoms will only effect one side of the body (the right or left side).

- Altered consciousness, confusion
- Weakness (one side)
- Slurred speech
- Facial drooping (one side)
- Numbness (one side)



SPINE INJURY

Most spinal fractures occur in the neck, as that is the weakest area. A trauma strong enough to break the spine bones in the neck, could be strong enough to damage the spinal cord which is inside the spine bones. If the spinal cord is damaged, the brain won't be able to send signals to the body to breathe, or regulate the heart, and other vital organs, which will result in death.

What does it look like?

The trouble with a spinal cord injury is that the person may or may NOT feel any pain, but still have a tear in his spine. Therefore, you have to assume that you are NOT able to see or feel it. You assume that every person who has experienced any trauma to the head or significant trauma to the body has a spinal cord injury.

This concern over spinal cord injuries is why emergency responders always immobilize the head, neck, and spine of a trauma patient, even if they feel okay in those areas.



WHAT DO I DO IN AN EMERGENCY?

In the last section we learned the main life-threatening medical emergencies: The ABCS:

- Altered consciousness / Unconsciousness
- Breathing / Bleeding
- Chest Pain
- Stroke / Spine Injury

This is great to be able to identify an emergency.

But just identifying is not enough. We also need to know what to do!

Have you ever seen an emergency situation in a movie or TV show and asked yourself: “what would I do in that situation?”

Have you ever been in an emergency yourself and had no idea what to do?

These are vitally important questions. People need to know what to do in emergencies, so they can prevent injury and death.

So, how do we know what to do?

The answer is simple: we need an exact system that takes the confusion of an emergency and organizes it so it can be handled.

Good News! We have made such a system! It is called the AID STAR framework! We’ll discuss more about that later. But first, in order to conquer emergencies, we need to understand them better. Let’s take them apart and see what they’re made of.

THE NATURE OF AN EMERGENCY

Emergencies are confusing. There are multiple factors that need your attention urgently, and if they are not handled, it can lead to injury or death. Additionally, if you are untrained, you will have no knowledge to refer to and you won't have any judgement on what is right or wrong.

Someone might tell you, "oh, I saw this in a movie, you need to do X, Y and Z". If you are not trained on first aid, you won't know if it will help the injured person or harm them.

In other words:

1. Emergencies are time sensitive, you need to act now
2. You might not know what to do
3. If you're wrong, people can die

Needless to say, this is a high stress, complex situation.

Fortunately, there is something we can do about it.

HOW TO DEFEAT THE CONFUSION OF EMERGENCIES

Here is how we defeat the confusion of an emergency: We focus our attention on the most important things we need to know: The things that are life or death, and we ignore everything else.

Remember:

The purpose we are learning first aid is simple: keep the person alive long enough to get them to the hospital so they can get the full treatment.

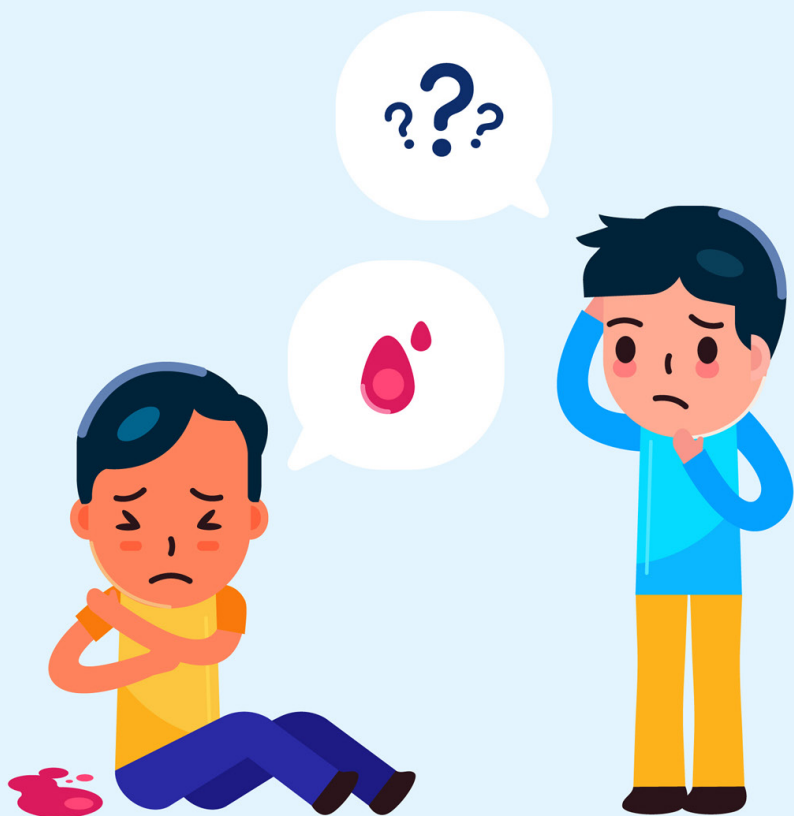
To achieve this purpose, we can safely ignore a lot of first aid information like how to deal with bruises, headaches, small cuts, splinters, and other minor injuries, and instead focus only on the life-threatening injuries and illnesses.

The AID STAR Framework helps us do that.

Each letter in ‘AID STAR’ stands for a word. And each of these words is a step in a sequence of actions you take every time there is an emergency. AID STAR stands for:

- Ask
- Identify (We use the ABCS from the previous section)
- Decide
- Safety
- Treatment
- Ambulance
- Re-evaluate

Let’s take a look at each one in detail.



ASK

Find out what the injury or illness is. Look at the person, ask the person, ask people nearby, find out what happened.

What are some things you can ask to help you identify the injury or illness?

- What's wrong?
- Do you need help?
- What happened here?
- Are you hurt?
- Are you sick?

It is at this first step of 'ask' where we find out if a person is conscious or not, since if they are conscious they will respond to our questions.

A. altered consciousness

B. breathing or bleeding

C. chest pain

S. stroke or spine injury

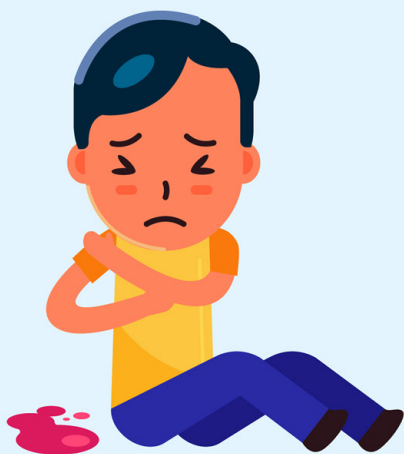


IDENTIFY

Identify if the injury or illness is a life-threatening emergency. Use the ABCS as mentioned in the earlier section to help remember what types of injuries/illnesses are immediate life-threats:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

If you already know the subject of first aid well, you will also (during the step of 'Identify') instantly know what the treatment would be.



DECIDE

Decide to call 911 or not.

- If it is a life-threatening emergency, you should always call 911
- If you are unsure if it is a life-threatening emergency, you should also call 911
- If it is a minor injury which does not require going to a hospital, you should not call 911. But if the situation changes and it does become serious, at that point you should call 911.



SAFETY

Before you dive in and help, you need ensure you are safe. You will do no good for anyone if you also become injured and need to be saved, which means the person who needed your help is not getting it because you got hurt.

Using the information you gathered on the Ask and Identify step, ask yourself: is the area unsafe? Is it safe enough to approach?

An example of an unsafe area would be hearing gun shots, or downed electrical power lines. Another thing to consider is personal protective equipment, such as gloves, to protect yourself against diseases in the person's blood if they are bleeding.



TREATMENT

When an emergency occurs, many people remember medical treatments they've seen in movies and TV, and may try to attempt these treatments. These are not reliable and should not be done. The motto of the first responder is to 'do no harm', so make sure that whatever you do helps and does not cause further injury. When treating someone with first aid, just let these three rules be your guide:

1. Keep them alive
2. Do no harm
3. Don't do anything beyond your training level

What do I treat first?

The following three treatments must be given **FIRST** before any other treatment. These are the most serious life threatening situations:

Spine: If you suspect the person has a spine injury, you must immobilize their spine, so they don't accidentally turn their neck and potentially cause a spinal cord injury.

Breathing: If the person is having difficulty breathing, or can't breathe, you must give rescue breaths. This information applies when giving a person epinephrine, if someone can't breathe due to a life-threatening allergic reaction. It includes abdominal thrusts for someone who is choking. And also includes helping someone take their inhaler, if they're having an asthma attack. No breathing results in unconsciousness and death shortly after.

Circulation: Circulation is all about blood flow from the heart to the body. If the person has uncontrolled bleeding, you must stop the bleeding. If the person has no pulse, then you must start CPR immediately. No pulse means no blood flow to the rest of the body and will result in death shortly after.



AMBULANCE

If it was a real emergency, your survivor needs to be transported to the hospital to get full and complete treatment, because you can only do so much by yourself on the street.

In most cities an ambulance is usually only a few minutes away, which is a great luxury. Unfortunately, those living in rural areas are not so fortunate, with some areas having response times as long as 30 minutes.

If you called 911 on the Decide step, then an ambulance should be coming. If not, then you need to transport the person yourself.

If the person was in a car accident (or had fallen, or received a traumatic injury), consider immobilizing their head, in order to prevent a spinal cord injury.

- a. Immobilize head (if applicable)
- b. Move carefully into your vehicle
- c. Transport to nearest hospital



RE-EVALUATE

Although in our AID STAR framework, the word ‘Treatment’ appears once, that does not mean treatment is just done one time only.

Treatment is an on-going action. It does not end until you have fully saved the person and taken steps to prevent further injury or until you have transferred them to a medical professional who will then continue treatment.

For example, if someone had a life-threatening bleed, your treatment will be first to stop the bleeding. Let’s say you were successful, and you stopped the bleeding. Your treatment does not end there. You now need to take some actions to ensure the person does not go into shock from blood loss (keep them warm, raise their legs, etc.). Not only do you need to do treatments to prevent their condition from worsening into shock, but you also need to continuously monitor them to see if they DO in fact go into shock, and then treat the shock.

Therefore, we have the ‘Re-evaluate’ step in our AID STAR framework, so that we are reminded that we must continuously monitor the person and change our treatments as their condition changes.

Another example of the importance of continuous monitoring and re-evaluation is giving aid to someone who is having a heart attack. They are conscious, sitting up, and have chest pain. You get them some baby aspirin to help. It does not end there. You need to stay with them and watch what happens next, second by second, because at any moment their heart attack could worsen, and then they could go unconscious and then you need to provide a new treatment: CPR.

When dealing with a person who’s in a serious medical emergency you want to monitor them continuously, and if anything changes or

worsens, you need to note it, and use your intelligence and training to see if the change is:

- Safe to ignore or requires attention
- Something you need to treat right then
- Indicating that things may get worse soon

When the person's condition changes, you should predict what might happen next and take the right actions to prevent it.

This will be hard if you don't have any experience with first aid, but with training and time you will become more confident and able to predict different outcomes

USING THE AID STAR FRAMEWORK

You will always know what to do in an emergency if you follow our AID STAR framework.

When you use the framework, think of it in two parts: AID and STAR.

AID

- Ask (the person or someone there)
- Identify injury or illness, and severity (use ABCS to determine if it is an emergency)
- Decide to call 911 or not

The AID step is all about getting permission from the person to treat them, and then getting information to identify what their injury/illness is so we can make a decision about how to help them. Before you can effectively help someone you must go through these steps.

After doing the AID steps, there are two possible paths you can take:

1. If it is not an emergency, you find out what you can do and help them, help them contact a friend or family member who can come to take care of them. Or take them to the hospital.
2. If it is in fact a life-threatening emergency, you need to take fast action to save their life, and you need the 911 operator to send an ambulance.

STAR

The STAR step is when you actually go into action and help the person.

- Safety (Take precautions to keep you and the person you're helping safe)
- Treatment (Treat their illness/injury using the information you'll learn later on in this booklet)
- Ambulance (After you're finished treating the person, do they need to be brought to the hospital?)
- Re-evaluate (Stay with the person until you have either fully handled their illness/injury, or help has come to take over)

Moving forward

You now have your framework to guide you through the overwhelming confusions of medical emergencies.

The AID STAR framework never changes, but the treatments are unique for each type of injury & illness.

What are the treatments?

Read on and find out!



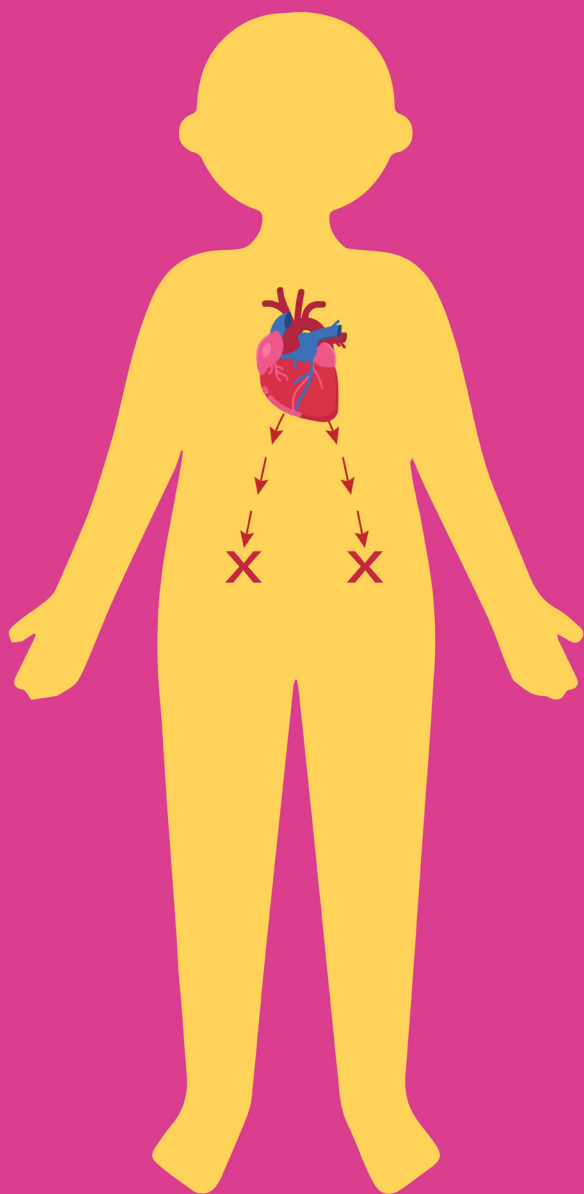
FIRST AID GOLDEN RULES

Before we help ANYONE with first aid, we should learn some of the Golden Rules.

1. If you're unsure if you need an ambulance, just call 911
2. If your treatment might harm the person, don't do it
3. Never do something beyond your training level
4. It is better to call an ambulance and not need it, than to NOT call an ambulance and end up needing it
5. If you find yourself trying to explain away that something isn't an emergency or not serious, but your attention is stuck on it, then it is probably an emergency
6. When it comes to inability to breathe, or massive life-threatening bleeding, you have SECONDS to act
7. If CPR is needed start it within one second. Do NOT delay
8. When in doubt if someone is unconscious and has no pulse, start CPR
9. Unconsciousness ALWAYS indicates there is a problem, which could be a minor or a major problem

10. The first things to handle are always the most life-threatening injuries
11. If there are multiple life threatening injuries, you have to try and treat both at the same time
12. Just because you have given first aid does not mean the person is stable. Their condition can worsen within seconds after you treat them. Always monitor
13. Do not risk your life. If you get injured then the others will have to wait longer for help, and more responders will be needed since you are now a victim
14. If the scene is unsafe get yourself and the injured person out as quickly as possible and then start treatment
15. After first aid is given, deliver second aid by giving the person emotional and spiritual support





CARDIAC EMERGENCIES

WHAT IS A CARDIAC EMERGENCY?

Cardiac means ‘relating to the heart’. The heart is part of the circulatory system, which is a network (a group of interconnected parts) of all of your blood vessels, from microscopic to large, and your heart. Every time your heart pumps, it sends out blood to your lungs to get oxygen, and then sends out the oxygenated blood to the rest of your body, through your blood vessels. When the heart relaxes, it fills up with de-oxygenated blood carried to it by the veins. When the heart pumps once more, it begins the cycle again of sending de-oxygenated blood to the lungs to get fresh oxygen, and then pumps out this newly oxygenated blood to the rest of the body.

It is called the circulatory system because it is like a circuit (a continuous ‘loop’ of flow). Think of a race car track. The blood vessels are the roads, and the cars racing are the blood flow (individual blood cells in motion).

TERMINOLOGY

Cells

The building blocks of the body. Skin, brain, heart, bone, all contain different types of cells, which all need blood (which gives them oxygen and nutrients) to stay alive.

White blood cells

A cell that protects the body, by attacking germs such as, viruses and bacteria. It is present in the blood, so whenever there is an injury, the body can instantly have white blood cells fighting to protect it against any germs that may have entered the body as a result of the injury.

Red blood cells

A red, disk-shaped cell that carries oxygen to the body's cells and carries away carbon dioxide (a potentially harmful waste product produced by all cells).

Blood vessels

Tubes, ranging from centimeters to microscopic, that deliver blood from the heart to the cells, and then back to the heart. Veins and arteries are different types of blood vessels.

Blood

A mixture of red blood cells, white blood cells, salt, glucose and other nutrients in a water-like substance called 'plasma'.

Heart rate

The speed which the heart is beating, measured in beats per minute (BPM).

Cardio

Relating to the heart. Example: Cardio exercises make the heart stronger.

Heart attack

Injury to the heart, leading to the death of heart cells and formation of a scar in place of previously existing cells. It is usually caused by a blood vessel in the heart being blocked, and therefore the heart not receiving oxygen. Some heart attacks occur without any symptoms and without the person even noticing. Many heart attacks feel like heavy pressure on the chest, pain in the chest, and tightness. Difficulty breathing and sweating may also be present. If a blood vessel in the heart gets a blood clot, it can cause a heart attack, because the clot will slow the blood flow and the heart will then not get enough oxygen. Aspirin will help slow the clotting process and decrease the size of the clot.

Glucose

A simple form of sugar which your body's cells use as fuel. When you eat food, your body breaks down the food into various things. After your body breaks food down into glucose it puts it in your blood so it can be pumped by the heart, and sent to all the cells in your body to be used by them as fuel. Without this process your cells would not have energy to function.

Diabetes

A disease in which the person suffers from high blood sugar levels that are usually caused by improper diet and obesity; both of which put serious strain on the heart.

CPR (Cardio-Pulmonary Resuscitation)

On a person who is unconscious, and does not have a heartbeat, and is not breathing, we push down on their chest and breathe into their mouth. We're operating their heart and lungs for them.

Artery

A blood vessel that has bright red blood. It carries blood away from the heart and towards organs and tissues in the body. It carries oxygenated blood to deliver to the body's cells. It is bright red because of the high oxygen content.

Compressions

Pushing down on the center of the chest. This is done on people who are in cardiac arrest.

Cardiac Arrest

The heart has stopped beating effectively. Meaning it could be not moving at all or it could be beating way too fast or in a way that does not lead to effective pumping action. It could be completely still, beating extremely fast, or it could be quivering—, in all cases the heart is no longer beating or pumping in a proper way, which means there is no pulse, which also means it is not pumping out blood to the rest of the body, which then makes them go unconscious.

Heart Disease

A general term describing many different illnesses that one may have with their heart.

Blood clot

A mass of blood cells stuck together. Normally the blood clotting process works without any issues and allows the body to heal and stop further bleeding but sometimes it goes wrong for various reasons and can cause a blood clot so large it totally blocks flow in a blood vessel which causes the area ahead of the clot to not get blood and fresh oxygen, causing the body cells in that area to die.

Rescue breaths

Opening a person's mouth and blowing air down, to fill their lungs.

Pulse

A pulsation or 'throb' you feel from an artery when you place your finger on a person's skin (usually the wrist or neck). It is created by the heart's beat pumping blood through a blood vessel and, indicates the person's heart is beating and therefore pumping blood through the arteries towards vital organs and tissues. The pulse you feel is literally a wave of blood passing by. Veins do not have pulses. Instead, they have a steady flow of blood that you cannot feel. This is because the blood in veins is not coming from the heart and its pumping activity, but rather blood in veins is coming from organs and tissues and is moving towards the heart. Only arteries have a pulse.

Resuscitation

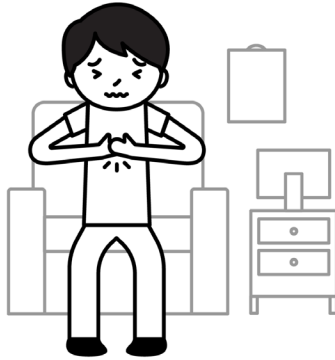
To bring back to life. Example: we need to learn how to resuscitate the body.

Pulmonary

Relating to the lungs. Example: pulmonary veins (the veins in your lungs).

Vein

A blood vessel that has dark red blood. It carries blood towards the heart to be recirculated. Blood found in the veins has already given up its oxygen to the body's cells, and therefore is not as bright in color.



HEART ATTACK

What is a heart attack?

Injury to the heart, usually caused by a blood vessel in the heart being blocked, and therefore that part of the heart not receiving oxygen.

Over 600,000 Americans die every year from heart disease related issues. Many of these deaths can be prevented if bystanders (someone witnessing a heart attack) know first aid and CPR. CPR is effective, and the earlier it is given, the higher the likelihood of survival. Early CPR can increase the odds of survival dramatically.

What happens if it is not treated?

An untreated heart attack can lead to cardiac arrest (heart not beating), followed by death. When someone's heart stops beating altogether, or is not beating and instead quivering, they will no longer have a pulse, and their heart won't be pumping out blood to the rest of the body. This means the brain no longer gets blood, which means the brain doesn't receive oxygen, which means the person will go unconscious. It only takes around 10 seconds of no blood flow to the brain to cause unconsciousness. After about 4 to 5 minutes the brain is injured,

and after about 9 to 10 minutes the entire brain dies. In the case of a person who is unconscious, has no pulse and not breathing, we need to do CPR.

The 'c' stands for cardio, 'p' pulmonary, 'r' resuscitation. The idea is you are acting as the person's heart and lungs for them, since they are no longer breathing, nor is their heart pumping. By serving as the body's heart and lungs, you can restore or 'resuscitate' the heart and therefore save the person's life.

What causes it?

There are many possible causes for a heart attack, but the most common is the narrowing of blood vessels in the heart itself, from build-up of fat. If a clot gets stuck in this narrowed vessel it can completely block blood flow to an area of the heart. This narrowing or blockage makes it harder for blood to circulate through the heart, and causes the heart to become oxygen starved, (which causes pain in the chest), and then results in death of the cells in the heart. Heart attacks can be caused by heart disease, and heart disease can be caused by:

- Diabetes
- Obesity
- Unhealthy diet
- Physical inactivity
- Excessive alcohol use
- Drug use (especially cocaine and amphetamines)

Spotting the symptoms: How do I know if someone is having a heart attack?

There is a difference between a heart attack and cardiac arrest. A heart attack can lead to a cardiac arrest but it does not always lead to this. In fact, most heart attacks do not result in cardiac arrest.

Someone having a heart attack can still be conscious, and they may feel tightness in the chest, difficulty breathing, pressure, pain in their chest, and possibly pain in their jaw or arm. Their heart can still beat (and often does), they can talk to you, they can have a pulse. They do not necessarily need CPR simply because they have had a heart attack.

It is only when a heart attack results in cardiac arrest (when the heart has stopped beating altogether or is just quivering and not pumping blood), that the person goes unconscious, has no pulse, and then needs CPR.

How do I treat it?

1. Ask the person how they're doing and what symptoms they are experiencing
2. Heart attack symptoms include:
 - Feel tightness in chest
 - Difficulty breathing
 - Dizziness or light-headedness
 - Pressure on chest
 - Pain in their chest
 - Pain in their jaw or arm
 - Nausea or vomiting
 - Sweating
3. Call 911
4. If not already, have the person sit up. Lying down will make it harder to breathe. Do not let them get up or move, because that may cause too much stress on the heart
5. Have someone get an AED in case they go into cardiac arrest

6. If they have any prescribed medication for their heart, go get it for them, and have them take the medication if appropriate. For instance, some people have a medication called nitroglycerin prescribed in case of chest pain, as it opens up blood vessels and can improve blood flow to the heart
7. If available, give them 4 baby aspirin (81mg each). Aspirin helps to slow blood clot growth and formation, and helps to lessen the size of existing ones
8. Stay with them until emergency services arrives

CARDIAC ARREST

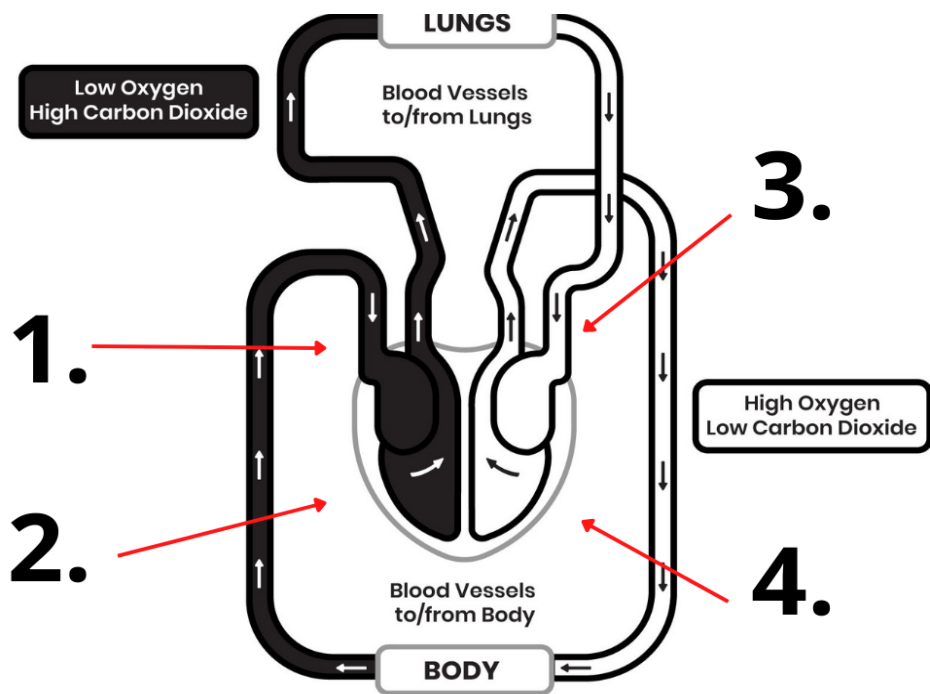
People in cardiac arrest are unconscious and have no pulse. They need CPR. Remember, people who have had a heart attack are often conscious (meaning their heart has been injured but is still pumping blood). If a person has had a heart attack and then becomes unconscious (unresponsive), this means the heart damage has progressed to cardiac arrest

They need us to pump their heart and breathe for them.

How does the heart work?

The heart has four 'chambers'. Two of the chambers receive blood, and the other two chambers pump blood:

1. Chamber 1: receiving deoxygenated blood from the body
2. Chamber 2: pumping deoxygenated blood to the lungs, so it can get oxygen
3. Chamber 3: receiving newly oxygenated blood from the lungs
4. Chamber 4: pumping newly oxygenated blood to the rest of the body



Why do we push down on the chest?

By pushing down on the chest, we are squishing the heart for the person, and therefore ejecting blood, which gets sent through the blood vessels to the rest of the body and helps keep the cells alive. When we push down on the chest, ALL four steps in the above 'how does the heart work' section will occur.

Why do we breathe air into the mouth?

The air outside contains about 21% oxygen, and the rest is nitrogen and other gases. When you inhale, you inhale that 21% oxygen along with the other gases. When you exhale, your lungs have absorbed 5% of that oxygen and put it into the bloodstream. Therefore, the air you exhale is 16% oxygen. When you inhale air, and then breathe it into a person's mouth, they are getting 16% oxygen, since you first absorbed 5% of it. This 16% of oxygen is enough to keep the unconscious person alive. They don't need the full 21%.

By breathing into their mouth, we will fill their lungs with oxygen. The lungs have many tiny blood vessels which connect to the heart. When you push down on the chest two things happen at the exact same time:

1. The deoxygenated blood from the heart is pumped to the lungs, where it then absorbs the oxygen you exhaled into the person's mouth. The blood is then oxygenated.
2. The oxygenated blood (that was oxygenated by the prior heart pump) flows into the to the rest of the body.

Two scenarios

There are two scenarios you may encounter. 1) a person you were monitoring who had a heart attack went into cardiac arrest and became

unconscious, or 2) you came upon an unconscious person, checked their pulse, and found they have no pulse, and therefore need CPR.

It is essential that CPR is started immediately, and that it is not interrupted. Maximum interruption time should be under 10 seconds. CPR must be continuously done. If you become so tired to the point where the quality of your compressions is lacking, take a break and have a bystander do compressions.

See section on CPR for instructions on how to perform this life-saving procedure.

How to Check for a Pulse

A person's pulse refers to their heart rate, which is the number of times their heart beats in one minute. Knowing how to check a person's pulse is a crucial skill for emergency response, as a person's heart rate is an important indicator of the type of first aid they may need. The best places on the human body to check a pulse are at the neck and wrist.

How to check the pulse at someone's neck

1. Place your index finger and middle finger on the side of their neck, in the soft area just beside their windpipe. This area is approximately 2" to either side of the center of the neck.
2. If there is any difficulty locating a pulse, try moving your fingers around slightly or pressing harder, push in 1 inch.
3. Using a clock or watch, count how many beats you feel in 10 seconds, and multiply that number by six.
4. A normal resting heart rate is about 60 to 100 beats per minute. A person who has a pulse much lower than that or much higher may require medical attention, and a person who has no pulse and who is not breathing will require CPR.

How to check the pulse at someone's wrist

1. Hold the person's arm out straight, with the palm of their hand facing upwards.
2. Place your index finger and middle finger on the person's wrist, where the base of the thumb meets the base of the wrist.
3. If there is any difficulty locating a pulse, try moving your fingers around slightly or pressing harder.
4. Using a clock or watch, count how many beats you feel in 10 seconds, and multiply that figure by six.
5. A normal resting heart rate is about 60 to 100 beats per minute. A person who has a pulse much lower than that or much higher may require medical attention, and a person who has no pulse and who is not breathing will require CPR.

Warnings for performing CPR

- Never go slower than 100-120 compressions per minute
- Always push down 2 inches or more in depth on adults. For children 2 inches, infants, push down 1.5 inches
- Always allow for full return of the chest to its normal, resting position. This allows the heart to fill back up with deoxygenated blood from the veins.
- Under no circumstance do you stop CPR once begun except:
 - For when giving breaths
 - Switching rescuers
 - A medical professional takes over
 - You run out of energy
 - They regain consciousness

How do I prevent heart disease?

- Minimize sugar intake
- Minimize alcohol intake
- Avoid excessive sodium intake (typically less than 2000mg per day)
- Exercise regularly
- Lose weight (ideally, unless you are very muscular, your BMI should be < 25)
- Eat more vegetables
- Avoid drug use
- Consult with a doctor on what lifestyle changes you need to make to lower your risk

Common misconceptions

- A person having a heart attack needs CPR. False! If someone is talking to you and is having a heart attack, they do not need CPR
- CPR brings people back to life most of the time. False! CPR only works approximately 10% of the time
- All heart attacks are very intense. False! You can have a heart attack and not realize it
- A person having a heart attack should be shocked. False! You only shock people with an AED if they are unconscious and have no pulse--and even then the AED will automatically determine if the type of cardiac arrest they are having would benefit from a shock
- Only over-weight people get heart attacks. False! Heart attacks can happen to people who are not over-weight

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for a heart attack emergency.

You're at a friend's house and their parent is sitting on the couch watching T.V. They put their hand on their chest, and say "my chest hurts".

What should you do?

Ask: Ask the person what else they are feeling, any other symptoms or anything else that is not normal?

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You identify the 'C' in 'ABCS' as the parent is having chest pain. You identify it as a possible heart attack.

Decide: Having identified a possible heart attack, which is on the list of life-threatening emergencies, you decide to call 911.

Safety: Because you are at a friend's house there is no concern for your safety.

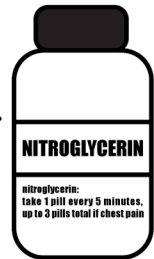
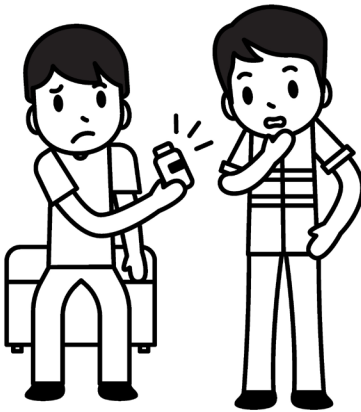
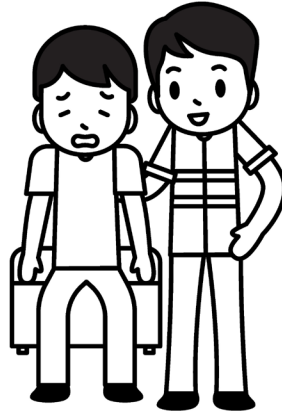
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (ABCS). In this scenario the person has chest pain so that needs to be treated first. You refer to your training for heart attacks and recall that you need to give four baby aspirins, and keep the person sitting up-right, and not make them get up. Ask them if they have medication their doctor has prescribed to them for their heart and have them take that if appropriate*.

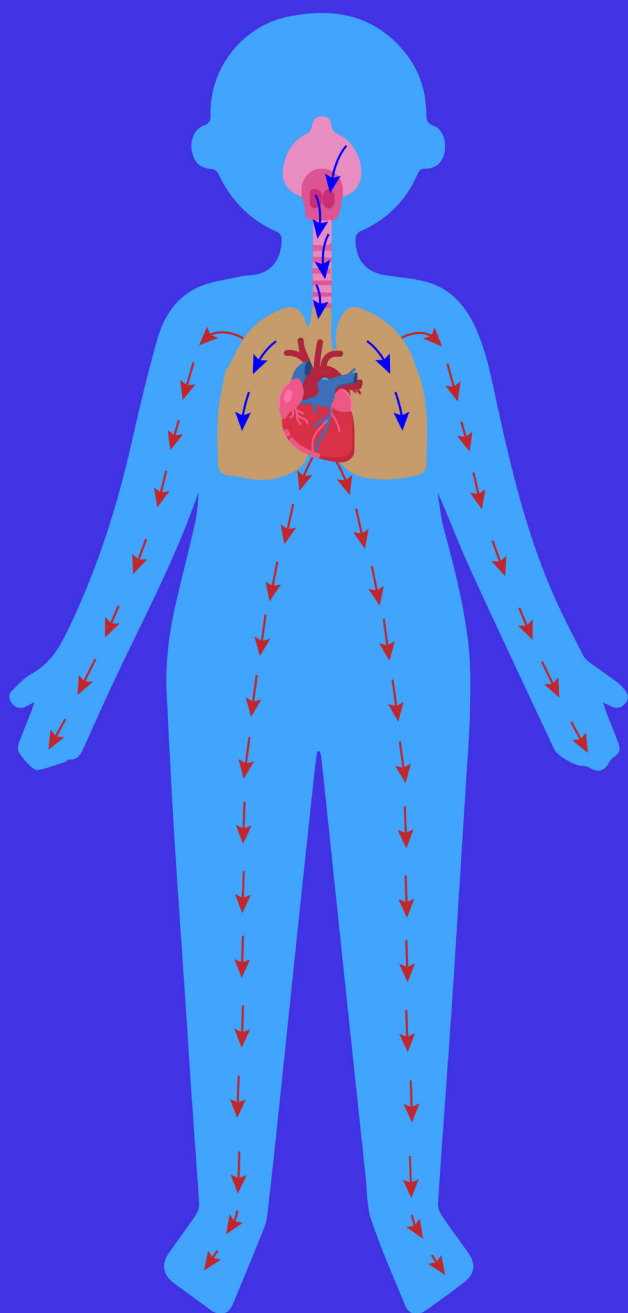
Ambulance: If an ambulance cannot reach you then you must transport them to the hospital. When doing this, try to carry the person into your vehicle. You can make their heart attack worse by making them get up and walk as any exertion puts added stress and strain on an already troubled heart.

Re-evaluate: Continuously watch them to see if their condition worsens. If they become unconscious, you will need to provide CPR.

*People have many 'heart medications' prescribed to them for many reasons. Typically these are given at certain doses only so many times per day. It would not be appropriate to take an extra dose of a heart medicine that has instructions of 'take 1 tablet each day' if the person has already taken this medicine today. You don't want to have him take extra medications as this is dangerous. What we typically are looking for when asking for 'heart medications prescribed to them' is a medication called nitroglycerin. Nitroglycerin increases the size of existing blood vessels in the heart, increasing the amount of blood that reaches the heart. It can save someone's life and relieve chest pain in the event of a heart attack. However, nitroglycerin is only taken 'as needed'. It isn't prescribed as 'take 1 pill' or 'take 2 pills each day'. In an emergency it is typically taken once every 5 minutes, up to 3

times total if chest pain is unrelieved, in order to treat chest pain and improve blood flow to the heart. The point is that you shouldn't think that you are asking the person to take just any heart medicine at this time: you are specifically trying to see if the doctor has prescribed an "take as-needed" heart medicine such as nitroglycerin as this may be quite beneficial for the person to take at the time of his possible heart attack.





RESPIRATORY SYSTEM EMERGENCIES

WHAT IS THE RESPIRATORY SYSTEM?

Your nose, mouth, windpipe, and lungs. They all work together so when you breathe in, oxygen is going into your lungs and when you breathe out, carbon dioxide is going out.

TERMINOLOGY

Windpipe

The airway that connects your lungs to the back of your mouth. It is also known as the ‘trachea’.

Abdominal Thrust

A life-saving procedure where you stand behind a person who is choking, form a fist with your hands and thrust inward, into the person’s abdomen (belly area), which causes the person to cough up the object.

Coughing

A forceful reaction, driven by important respiratory muscles, that forces air from your lungs, into your windpipe and out of your mouth. This reaction is triggered by substances entering your windpipe and/or lungs that shouldn’t be there. For example, you may have water or food—or even your own saliva—accidentally enter into your windpipe and cause you to cough. It is also possible to have food get stuck in your windpipe and lead to coughing. The purpose of coughing, (which generates forceful bursts of air from within your lungs and out through your mouth), is to dislodge an object that is stuck in your airway: whether a fluid, particle, or piece of food.

Lungs

Two large organs in the chest that absorb oxygen when you inhale and release carbon dioxide when you exhale.

Wheeze

A high-pitched sound made when someone breathes out or in, caused by the air passages in the lungs being narrowed. The person will be trying forcefully to move the air out. They may have tightness in their chest.

Asthma

A condition where the passageways in the lungs narrow due to an allergen, like dust or cat hair, or environmental factors like cold air. There are many asthma triggers and some can be certain medicines (like aspirin or ibuprofen) or other chemicals. Whatever the cause of the asthma attack (an episode of asthma), it is often treated by inhaling a medication like Albuterol, which opens the passageways up again. Depending on the severity of the asthma attack, other medications like steroids or epinephrine may need to be given by emergency personnel or doctors in hospitals.

Hyperventilation

Breathing too fast. Hyper = above. Ventilate = move air.

Choking

The inability to breathe due to something getting stuck in or blocking the windpipe. People who are choking cannot breathe and will go unconscious due to lack of oxygen. If you can hear someone coughing, that means air IS moving in and out of the lungs and they are therefore able to breathe (even if it is blocked somewhat). It is when you hear nothing that you should be seriously concerned, as this indicates a total blockage of the airway and is considered choking rather than merely coughing. Choking, not simply coughing, is what can lead to unconsciousness and death if left untreated.



CHOKING BY FOREIGN OBJECT

What is it?

A foreign object (like food, or any small object) gets stuck in the body's windpipe. The windpipe connects the lungs to the back of the mouth, which allows air inhaled through the nose and mouth to enter and exit the lungs by passing through the windpipe.

What happens if it doesn't get treated?

The body needs to be able to breathe, to supply the cells with oxygen, otherwise they die. Additionally, without oxygen the human body has 4-6 minutes before brain damage occurs. Therefore, it is vital that one is able to breathe so the oxygen gets into the blood and transported to the cells to keep them alive.

What causes it?

- Eating too fast
- Laughing and eating
- Talking and eating
- Doing physical activity and eating
- Children accidentally swallowing toys or small objects

How do I know when I see it?

It is vital to see the difference between coughing and choking. In coughing the individual is still able to attempt to force the foreign object out of their windpipe by 'coughing' it out. This is the body's most effective mechanism for removing an object that went down the windpipe. Therefore, if someone is actively coughing, you must not touch them, and instead encourage them to keep coughing, as that is what will get the object out.

If they are choking, they won't be able to cough any more, and won't be able to talk or barely able to make sounds. They may be turning blue or purple, or be gasping for air, and panicking. They will typically wrap their hands around their neck, this is the universal sign of choking. At this point, you would give the person abdominal thrusts.

How do I treat Choking?

Choking Adult (Ages 12+): Conscious – abdominal thrusts

1. Tell the person you're going to help them by giving them an abdominal thrust
2. Stand behind the person. Wrap your arms around their belly
3. Locate their belly button
4. Using one of your hands, make a fist an inch above the belly button
5. Turn your fist inwards so that your pinky is against their belly, and your thumb is pointing away from their body
6. Reach around with your other hand and cover the fist. Your arms and fist should be like a belt around them
7. With force and with one motion, push your fist, in and up into their abdomen

8. You would continue abdominal thrusts until the person coughs up the foreign object. However, if they go unconscious and fall to the floor, stop abdominal thrusts and switch to chest compressions and rescue breaths. To learn more about chest compressions see our section on CPR

Choking Child (Ages 2-12): Conscious

– Back slaps & abdominal thrusts

1. Tell the child you're going to help them. If parents or guardians are present, request their permission to help the child. You may simply state, for example, "I am trained and certified in First Aid and CPR. I am going to help your child" and if they don't refuse you, it is implied that they've offered their consent. Of course, if parents or guardians aren't around then don't let that stop you from offering your assistance. You may proceed by telling the child you are going to help them. The 'Good Samaritan' and other such laws should protect you from any possible legal consequences assuming you were properly trained, did nothing dangerous and tried your best to help.
2. Deliver 5 back slaps:
 - a. Stand behind the child and, using, the heel of your hand, slap their upper back (between their shoulder blades), forcefully, 5 times
 - b. If the child is still choking after delivering 5 back slaps, proceed to step 3 below
3. Deliver 5 abdominal thrusts:
 - a. Stand behind the child. Wrap your arms around their belly
 - b. Locate their belly button

- c. Using one of your hands, make a fist an inch above their belly button
 - d. Turn your fist inwards so that your pinky is against their belly, and your thumb is sticking away from their body
 - e. Reach around with your other hand and cover your fist with it
 - f. With force and intention, push both hands, in a single in & up motion. Do this 5 times.
 - g. If the child is still choking after delivering 5 abdominal thrusts, proceed to step 2 above
4. You will continue alternating between back slaps (step 2) and abdominal thrusts (step 3) until: the object comes out, or the child becomes unconscious. If they become unconscious and fall to the floor, begin CPR. (See later section on how to do CPR)

Choking Infant (Ages 0-1): Conscious – back slaps and infant chest thrusts

1. Hold out your arm, extended, palm up, and rest it against your knee. Have the infant placed lying in your arm, with its face resting on the palm of your hand, and your fingers grasping the back of its head. The front of the infant's body will be facing the ground and its back will be facing you
2. Locate the baby's back, and specifically the area between the shoulder blades
3. Slap this area hard five times with the heel of your hand, directly between the shoulder blades
4. Flip the infant over on to your other hand, on to your other knee, so that his body is now facing up, and facing you, and with your other hand's fingers grasping its head securely

5. Locate the infant's chest, and chest bone (flat bone, located between the nipples)
6. With two fingers, press into the middle of the chest bone hard, five times. Try to get a depth of $\frac{1}{3}$ of the bodies depth (typically about 1.5 inches or 4cm approximately)
7. Flip the infant back to the other hand and knee, his head will now be facing down toward the floor. Give five back slaps
8. Proceed in this manner, delivering back slaps and chest thrusts until it coughs out the object
9. If the infant goes unconscious, stop back slaps and begin CPR. (See later section on how to do CPR)

Choking: Pregnant/Obese Conscious

In pregnant or obese people, their bellies will be too large, preventing you from performing effective abdominal thrusts. In this case, do an adult chest thrust.

Chest Thrust

1. Tell the person you're going to help them by giving them a chest thrust
2. Stand behind the person. Locate the center chest bone (sternum). It is flat and hard
3. Make a fist with one hand in the center of the chest bone
4. Turn your fist inwards so that your pinky is against their chest bone, and your thumb is pointing away from their body
5. Reach around with your other hand and cover the fist
6. With force and intention, push both hands inward

7. Repeat, each time forcefully pushing in until the person coughs up the foreign object
8. If the person goes unconscious, begin CPR. (See later section on how to do CPR)

Warning

- If a person is coughing, do NOT touch them. Encourage them to keep coughing. Coughing is the body's most effective mechanism to force a foreign object out of the windpipe.
- If any of the above go unconscious and fall to the floor, perform CPR:
 1. Have someone call 911
 2. Start chest compressions immediately: 30 compressions at a rate of at least 100 compressions per minute (roughly the rhythm of the 'Staying Alive' Beegees song), at a depth of 2 inches for adults and children, and for infants a depth of 1/3 of the body's depth (or 4cm). (see more about chest compressions in the CPR chapter)
 3. After the 30 compressions, give two rescue breaths as follows:. tilt the head back, lift the chin, pinch their nose, and blow into their mouth, over one second. (see more about rescue breaths in the CPR chapter)
 4. Continue the cycle of above giving 30 compressions followed by 2 rescue breaths until help arrives

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SCAN ME



How do I prevent choking?

- Chew food slowly
- Don't talk and eat at the same time
- Don't talk/laugh and eat/drink at the same time
- Keep swallowable objects out of reach from children
- Don't try to eat and swallow large pieces of food
- Only swallow once your food has been chewed enough

Common misconceptions

- You can't get a disease when giving rescue breaths. False! When giving rescue breaths you can get germs, viruses and bacteria from the person
- You should give a glass of water to a person who is coughing due to a foreign object stuck in their windpipe. False! Water goes down the esophagus (the tube where your mouth connects to your stomach), not the windpipe, and so water will not help at all.

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for a choking emergency.

You're at a local coffee shop and you see a man eating a cookie, suddenly he starts coughing, and then he stops coughing, grabs his neck and you see his face turn red.

What should you do?

Ask: Because the man cannot breathe, he won't be able to talk, therefore you have to figure out what is happening to him. In this case it is very clear to see that he is choking.

Identify: With the information you gathered by looking at the man and his actions, see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You identify it as a breathing emergency (choking).

Decide: Having identified choking, which is on the list of life-threatening emergencies, you tell someone to call 911.

Safety: The coffee shop looks safe and there are no immediate threats to your safety.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is

choking, which is a life-threat, and there is no other injury/illness, so you refer to your training for choking and recall that you need to get behind the person and give them abdominal thrusts, over and over until they cough out the object. You may only have one minute before the person goes unconscious (since they cannot breathe). If they go unconscious, they won't be able to stand and will hit the floor and you will have to switch to CPR.

Ambulance: An ambulance should arrive soon. If an ambulance cannot reach you and you have begun performing CPR, then you must continue to deliver CPR and do your best to get the Police, Fire Department or anyone to come and transport them to the hospital.

Re-evaluate: Give abdominal thrusts as long as they are conscious, all the while watching to see if they cough up the object. You are constantly giving abdominal thrusts and Re-evaluating to see if they have coughed up the object and cleared their airway. If in Re-evaluating you notice they have gone unconscious you would then give CPR.





ASTHMA ATTACKS

What is it?

Asthma: a breathing disorder where a chemical, drug, virus, bacteria or environmental factor (cold & dry air), or personal factor (exercise or emotions) will trigger the passages in the airways in the lungs to suddenly narrow, causing the person to have a very hard time breathing in and out.

What happens if it is not treated?

Situations can occur where an inhaler is forgotten, or empty, or an allergic reaction causes a fierce and sudden asthma attack that the person cannot handle. In this case it is vital to assist the person, and call 911, otherwise they could die.

What causes it?

Different people have different triggers for an asthma attack. For some it may be cold air, for others it can be emotional stress, pollen, dust. Even certain drugs, especially aspirin or ibuprofen, can trigger an asthma attack in some people. Certain viruses and bacteria may

do so as well.

Spotting the symptoms: How do I know if someone is having an asthma attack?

- Wheezing
- Inability to breathe or struggling to breathe
- Visible efforts to breathe (like using neck, and other ‘accessory muscles’ to breathe)
- Upright posture
- Inability to speak in full sentences (having to stop and take a breath in between words)
- Pursed lips
- Hyperventilating
- Panic
- Lips turning blue (in severe cases)
- No sound of breathing or wheezing (in severe cases due to how severely constricted their airways are)
- Uncontrolled coughing
- Heavy pressure on chest
- Feels like breathing through a straw

How do I treat it?

Calm the person by having them match your breathing, calmly, slowly, in deep breaths. Assist them to take their inhaler. If there are no signs of improvement call 911.

Warnings

Do not move the person, keep them exactly where you found them.

Moving them may aggravate the asthma.

How do I prevent it?

- If you have asthma, keep your inhaler on you at all times and have a backup
- Know what your asthma triggers are and be make sure to avoid them

Common misconceptions

- Asthma is a mental issue, and a person can decide not to have it. False! It is a medical disease of the lungs. However, although in some people's emotions can trigger the attack it is still a medical disease of the lungs and once triggered needs to be handled medically
- An asthma inhaler can cure asthma. False! An inhaler can help you manage asthma, but cannot cure it. Asthma is a chronic disease with periods of remission (where your breathing is normal) and exacerbation (where you suffer an asthma attack due to some trigger)

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for an asthma attack emergency.

You're at a concert and a girl next to you starts breathing in and out very loudly, it looks unusual.

What should you do?

Ask: Ask the person if this is normal and are they ok? They say they're fine, and say "it happens all the time". Because it seems under control, you don't ask any more questions. But a minute later they

are breathing fast in and out, and unable to speak and can't catch their breath. You ask them what is happening and they can't speak.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You identify it as a breathing emergency.

Decide: Having identified a breathing emergency, which is on the list of life-threatening emergencies, you ask someone to call 911.

Safety: You're at a concert and there do not seem to be any dangers.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is having difficulty breathing, which is a life-threat, and there is no other injury/illness. You determine she is having an asthma attack and not choking because you see she is breathing air in and out, and you ask her if she's choking on something and she shakes her head with a 'no'. The first thing you do is get her to sit down and stop standing, so she can conserve her energy, next you ask the girl for her inhaler and she shakes her head, indicating she doesn't have one. The inhaler is the only thing that will save her, therefore it is vital an ambulance comes, or you get to the nearest hospital.

Ambulance: If an ambulance cannot reach you then you must transport them to the hospital. When doing this, try to carry the person into your vehicle. You can make their asthma attack worse by making them get up and walk.

Re-evaluate: Continuously watch them, to see if their condition worsens, as they may need rescue breaths.

OTHER BREATHING-RELATED EMERGENCIES

Hyperventilation

Occasionally, you will find people who, due to psychological trauma are breathing too rapidly. Rapid deep breaths can cause an imbalance in the body's chemistry, causing them to faint. They will be breathing at a fast rate, which will seem faster than normal.

Coach the person to slow down their breathing by following you, and matching your breathing, with slow deep breaths.

Inadequate breathing

The average is 12-20 breaths per minute. If it is less, or if it is less and shallow the person may not be breathing adequately. One example can be drug-overdose. If someone's breaths are too shallow and slow, you will need to breathe for them, by giving rescue breaths. This is also known as 'mouth to mouth' or 'mouth to mouth resuscitation'.

A person who is conscious or unconscious and whose heart is beating, but whose breathing is too shallow or slow will need rescue breaths. This is not CPR. CPR involves both compressions on the chest and rescue breaths together.

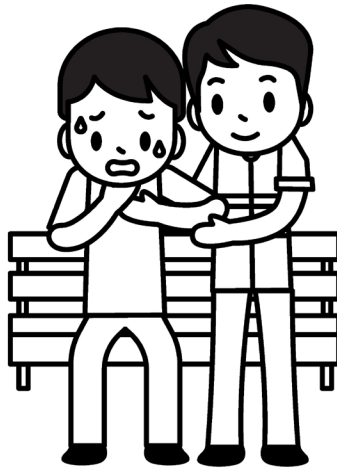
There are a great many things that could cause a person to be breathing inadequately. One example can be a drug-overdose, either with an illegal drug or a prescribed medication that has been misused. Not all drug overdoses lead to shallow or slow breathing requiring rescue breaths. It is classes of drugs, commonly called 'downers', sedatives, that slow your breathing to a dangerous slow or shallow level when you take too high of a dose. Examples include: morphine, heroin, xanax, oxycodone and fentanyl. Whatever the cause, if someone's

breaths are too shallow and slow, you will need to breathe for them, by giving rescue breaths.

How to give rescue breaths:

1. Call 911
2. Tilt the head back
3. Lift the chin up
4. Place your mouth over the person's mouth
5. Pinch their nose
6. Blow into their mouth, over one second (you should see slight chest-rise). Give one breath every 5 or 6 seconds in adults. In infants you would give one breath every 2-3 seconds. Every 2 minutes reassess them by checking their pulse for 10 seconds, if no pulse, begin CPR.

Continue to give breaths until the ambulance arrives, or until the person can breathe adequately on their own.







CARDIOPULMONARY RESUSCITATION (CPR)

WHAT IS CPR?

The action of doing compressions on the chest, and rescue breaths into the mouth. Adult, Child and Infant CPR all have slight variations.

TERMINOLOGY

Cardio

Relating to the heart. Example: Cardio exercises make the heart stronger.

Pulmonary

Relating to the lungs. Example: pulmonary veins (the veins in your lungs).

Resuscitation

To bring back to life. Example: we need to learn how to resuscitate the body.

Compression

Pushing down on the center of the chest the appropriate depth for the person's age, and coming back up with your arms to allow the chest to bounce back or resume its resting position fully before giving the next compression.

Rescue breaths

Opening a person's mouth and blowing air down, to fill their lungs.

CPR (Cardio-Pulmonary Resuscitation)

On a person who is unconscious, and does not have a heartbeat, and is not breathing, we push down on their chest and breathe into their mouth. We're operating their heart and lungs for them.

EKG

Electro (electric), Cardio (relating to the heart), Graph (written representation of the heart's rhythm). You see these in the movies when someone's heart is being monitored by a machine.

Automated External Defibrillator

It interprets the heart's rhythms for you. You don't have to read an EKG print. Paramedics use EKG's to read heart rhythms and shock the person manually, at their decision. It is outside the body (some diffibrilators are implanted internally in the chest). 'Fibrillate' means to quiver and 'de-' means 'not'. A Defibrillator is a device that stops the quivering of the heart by shocking it, causing it to stop quivering, and hopefully restart and beat normally.

What is it?

The action of doing compressions on the chest, and rescue breaths into the mouth. Adult, Child and Infant CPR all have slight variations.

Why is it important?

The heart pumps blood through the blood vessels, which then reach all the cells in the body. Blood carries oxygen to cells, and glucose (energy), and carries away waste products (carbon dioxide), this process must occur for the cells to stay alive. If the heart stops, in just a matter of minutes the cells begin to die and soon the body will too.

How to perform a chest compression:

1. Position the person flat on the floor (not on a bed, not in a chair)
2. Get on your knees, at the person's side, with your knees facing their side
3. Bend over the person's chest
4. You should be right above the person's sternum (long flat bone in center of chest) so that your arms go straight down into their chest bone
5. Place the heel of your hand along the lower half of the chest bone (sternum)
6. Place your other hand on top, wrapping your fingers together
7. Lock your arms
8. Push down, using your shoulders and back. Do not push with your hands or arms they are not strong enough. Instead use your upper body to push down. Do not bend your arms when you push down. Keep your arms locked the entire time
9. Push down two inches deep
10. Allow chest to bounce back to it's normal resting position

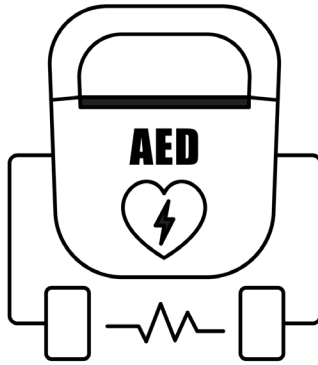
12. If you hear or feel cracking, don't worry, just keep going
13. Continue compressions at a rate of 100-120 per minute
14. Give 30 compressions and then 2 rescue breaths and then repeat this cycle five times (which should take 2 minutes), at which point stop CPR and check their pulse for no more than 10 seconds to see if they have come back to life. If there is still no pulse, continue another five cycles of CPR.

Warnings

- Allow full return of the chest to its normal, resting position each time you push down. If you don't allow the chest to resume its normal position, the heart will not fill up with fresh blood.
- Make sure the person is on a hard surface. Chest compressions will be ineffective if the person is lying on a bed
- Lock both arms, and push with your upper body, don't try to do compressions with just your arms, it will be ineffective
- Compressions must never be paused for longer than 10 seconds

How to give rescue breaths:

1. Tilt the head
2. Lift the chin
3. Place your mouth over the person's mouth
4. Pinch their nose
5. Blow into their mouth. The breath should take 1 second to deliver. You should see slight chest rise
6. Deliver one breath every 5-6 seconds (10-12 per minute)
7. If possible, use a barrier device to protect yourself from the person's body fluids



USING AN AED WHEN DOING CPR

What is an AED?

An AED is a critical tool that will help make CPR more effective by shocking the heart. They are simple to use and require no previous training. They come with simple written instructions, and many also come with audio instructions which begin once you turn them on. These instructions will guide you through all the steps needed. In addition to shocking the heart to restart it, many AED's will also make a 'beep' sound at a rate of 100 beats per minute, to help you keep the right speed for your chest compressions.

Where can I find an AED?

In the United States, you will find AED's at most public buildings:

- Airports
- Shopping Malls
- Libraries
- Schools
- Offices
- Grocery stores
- Gyms

How to use an AED

1. Turn on the AED
2. Listen carefully to its instructions
3. Apply the pads to the person's body, per the AED's instructions
 - Adults get a pad on the right chest, and left side abdomen
 - Children & Infants get one pad on their chest and one their back, unless otherwise specified by the AED
4. The AED will analyze the body's heart to see if its rhythm is the type of rhythm that can be shocked. Do not be in contact with the person while the AED is analyzing
5. The AED will either tell you that a shock is advised, or to continue doing chest compressions
6. If the AED says a shock is advised, step back from the person, and ensure no one is in physical contact with the person. If anyone is touching the person, they will also get shocked
7. Press the shock button
8. Resume chest compressions, until the AED tells you to stop, at which point it will re-analyze the heart to see if it has a shockable rhythm
9. Continue in this manner, following the AED's orders, until help arrives or until the person comes back to life

Notes:

- Pads have pictures on them to show where to be placed
- Use pediatric pads for infants and children younger than 8
- Never shock a person who is in a pool of water
- Never be in contact with the person when you analyze or when shocking them, as you will also receive the shock and can die from it

- If the person's chest is sweaty, dry it
- If the person's chest is too hairy to allow the pads to attach, use a razor to shave off their chest hair, or use an extra set of pads to apply to the chest and rip off rapidly, to remove the hair

Additional Considerations when using an AED

Medication Patches

When taking off someone's shirt to perform CPR, you may notice medication patch(es). If these are in the way of where you need to place your AED pad, then you must remove these patches BUT take EXTREME care to not let the medication patch touch your skin. If it touches your skin the medication can go into your blood stream and it can harm you, since it is not a medication that is prescribed to you.

Physical Contact

There are two instances where you MUST ensure you are in absolutely NO physical contact with the CPR patient:

1. When the AED is analyzing the patient, make sure you are not touching them, as your physical contact will confuse the AED and it won't be able to analyze correctly
2. When you press the shock button to deliver the shock, make sure you are not touching the patient, as touching them allows the shock to travel from them to you, and it can result in stopping your heart

Pacemaker

This is not common, but when taking off someone's shirt to perform CPR, you may notice a bump over their skin. This is an implanted device, it could be a pacemaker or an internal defibrillator. Ignore them and place the pads according to the illustrations, even if that

means the pads are going over the implanted device.

How to perform CPR

1. Approach the individual (who may be lying on the ground, or sitting on a bench) and ensure the area is safe
2. Vigorously tap or nudge the person to see if they are conscious. If they moan or speak, that means they are alive, and they are not candidates for CPR. If they moan or speak, try to determine if there is any emergency, and if so, call 911, and stay with them until an ambulance arrives
3. If no response to your nudging, check for a pulse: Locate the person's neck, look at the center of the neck. Place two of your fingers one inch to the left or right of the center of their neck, and push in, about one inch. Wait no more than 10 seconds to see if there is a pulse. If there is no pulse within 10 seconds, consider the person has no pulse.
4. While checking for a pulse, also check for breathing: Look at the chest to see if it rises slightly, put your ear over the person's mouth to feel and listen for breaths. Wait for no more than 10 seconds when checking to see if they are breathing.
5. When checking for pulse and breathing, do both at the same time. This way you spend 10 seconds total instead of 20 seconds if you did each separately. Make sure you wait no more than 10 seconds when checking
6. Determine which situation:
 - If there is a pulse and no breathing, this is respiratory arrest, and they need rescue breaths, 10-12 per minute (one every 5-6 seconds).
 - If there is a pulse and breathing, they are not a candidate for CPR, but there still may be a serious situation causing

their unconsciousness. Call 911 and stay with them until an ambulance arrives.

- If there is no pulse after ten seconds, consider they have no pulse. If there is no pulse, they are a candidate for CPR. Begin chest compressions at a rate of 100-120 per minute, at a depth of 2” inches for adults, and 1.5 inches for infants
7. Have someone call 911
 8. Have someone get an AED
 9. After 30 compressions, give 2 rescue breaths, and then repeat 30 compressions, 2 breaths.
 10. As soon as an AED arrives, attach it to the person, turn it on, and then follow the AED’s orders
 11. Continue giving 30 compressions and 2 rescue breaths until help arrives. Every 5 cycles of CPR, check pulse for 10 seconds to see if they have come back to life, if not, do another 5 cycles of chest compressions and rescue breaths

Do not stop CPR unless

- A medical professional arrives to take over
- A bystander takes over for you
- The area becomes unsafe and you need to rapidly move the person
- You become exhausted
- The person returns to consciousness (10% should return to consciousness)

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SCAN ME



Common misconceptions

There is a lot of confusion about CPR and when you should give it, and different combinations of breathing, pulse and consciousness. Here's the facts.

True: A person who is conscious can have a heartbeat and not be breathing, but not for long. This usually happens when choking on an object. They will lose consciousness and their heart will stop beating if they continue to be unable to breathe. At that time they will need CPR.

True: A person who is unconscious can have a heartbeat and be breathing. You would NOT do CPR on this person. However, unconsciousness is still a problem and could indicate a serious illness or injury. Therefore, you should always call 911 when you find an unconscious person.

True: A person who is unconscious can have no heartbeat and no breathing. This person needs CPR

True: A person who is unconscious can have a heartbeat but not be able to breathe, but not for long. This usually happens when choking on an object, and falling to the floor due to unconsciousness after being unable to breathe for too long a period of time.

Eventually their heart will stop because their inability to breathe has starved the body of oxygen and it cannot operate any more. This person needs CPR.

False: A person who is unconscious or conscious and is breathing but has no heart beat. This is impossible, therefore you do not have to concern yourself with what to do in this situation.

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for CPR.

You're walking down the street and a man walking in front of you collapses and falls to the ground. He was walking alone.

What should you do?

Ask: Ask the person if they are ok, and what happened? The man does not respond, and no one around knows what happened, you nudge him and tap him on the shoulder, but he still does not respond.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Because he is unconscious you identify it as an emergency.

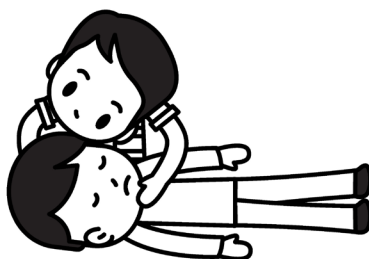
Decide: Having identified an emergency, you ask someone to call 911.

Safety: You're on a sidewalk, and the area seems to not have any dangers.

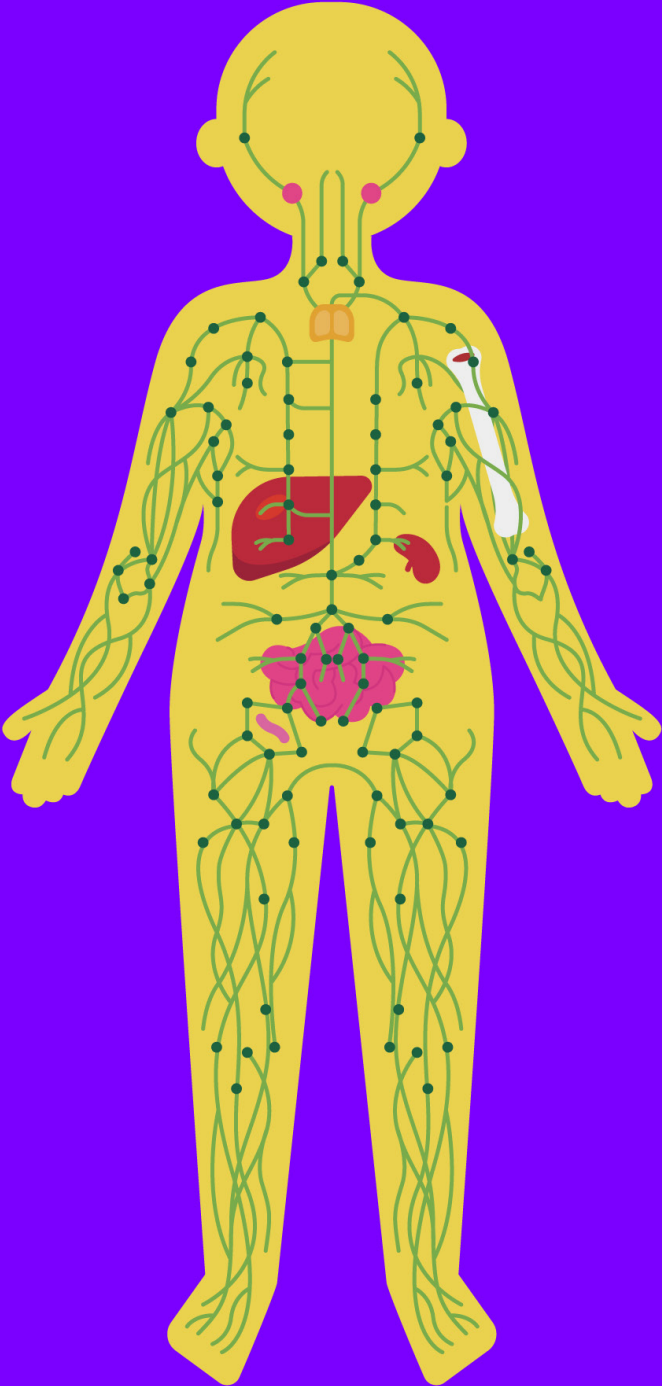
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is unconscious, and since you can't ask them what is wrong, you need to check if they are breathing and if they have a pulse. You check the man's pulse for ten seconds and don't get any pulse. The man needs CPR, you begin giving chest compressions immediately. 30 compressions 2 breaths, and then repeat over and over. While you are giving compressions you ask someone to find an AED and to call 911. A person tells you they've called 911 and an ambulance is coming. You find yourself exhausted from giving compressions, so you have that person take over, and ensure they do it at a rate of 100 compressions per minute and at least 2 inches deep, with the chest resuming its normal, resting position after each compression.. Once someone comes with an AED, take off the man's shirt to apply the pads. The pads will have an illustration on where they should be placed. Turn on the AED and let it analyze the person's heart. It will either tell you to shock them or keep giving chest compressions. At this point just follow what the AED tells you.

Ambulance: If an ambulance cannot reach you then you must continue to do CPR where you are, do not transport the person.

Re-evaluate: Once you apply an AED to the person it will be easier to Re-evaluate, as the AED will do that for you.







IMMUNE SYSTEM EMERGENCIES

WHAT IS THE IMMUNE SYSTEM?

Your body has an army of special cells used to destroy bacteria, viruses and other unwanted particles. When you get a cut, and your skin is red, that is a local immune response. When you are sick and have a fever, or have an anaphylactic reaction, that is a body-wide response.

TERMINOLOGY

Allergen

A substance that causes the body to have an allergic reaction. For example: peanuts, bee stings, dust, cat hair, shellfish, etc.

Anaphylaxis

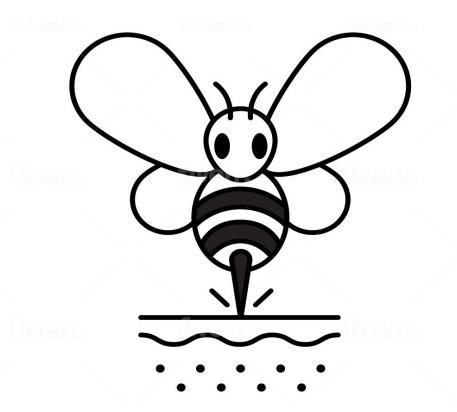
An allergic reaction that affects the entire body, with redness, swelling and difficulty breathing. The reaction is caused by a substance (allergen) to which the body is super sensitive. The word comes from Greek: “Ana” = Without, “Phylaxis” = protection. Also known as anaphylactic shock.

Epinephrine

A substance used to counteract a life-threatening allergic reaction. Also known as adrenaline. Anaphylaxis will cause the passageways in the lungs to narrow, which makes it hard to breathe. Epinephrine opens these passages up again.

Hives

Hives refer to an outbreak of pale red bumps on the skin. Hives usually appear suddenly, and they can be uncomfortable, sometimes somewhat painful or itchy. They can come about due to an allergic reaction, a chemical reaction, an insect sting, sunlight, medication side effects, and stress.



ANAPHYLAXIS – LIFE-THREATENING ALLERGIC REACTIONS

What is it?

There is a flaw in the immune system's response to allergens. It can 'overreact' to the presence of a certain type of allergen in or on your body. Some people have certain substances for which they are highly allergic: peanuts, insect stings, fish, tree nuts, milk, eggs, medications, etc. The reaction causes air passages in the lungs to narrow, making it hard to breathe.

What happens if it is not treated?

The body can have mild, non life-threatening reactions, such as bumps and redness on the skin, these are harmless. However, with a body-wide reaction, these can happen suddenly and quickly produce swelling and redness across the body. The swelling spreads to the passages in the lungs resulting in an inability to breathe. You've most likely heard of this where someone eats a peanut and they are allergic, and then within minutes they are completely red and can't breathe. This is called anaphylactic shock.

What causes it?

Ingestion or physical contact (like a bee sting), with a substance to which you are allergic.

How do I know when I see it?

Widespread redness on body, hives, bumps, fast heartbeat, difficulty breathing, fast and shallow breathing, wheezing, dizziness, sweating.

How do I treat it?

There is only one antidote to counteract a life-threatening allergic reaction (anaphylaxis): It is available as a medicine called: epinephrine (also known as adrenaline). It comes in a container shaped like a pen. One simply pushes it against their thigh, and a needle will automatically pop out, poke through the skin/clothes, pierce the skin and inject the medicine into the muscle. 'EpiPen' is a common brand name for this medication.

People who have life-threatening allergies (anaphylaxis) will carry epinephrine pens on them, so all you need to do is get it from them and help them self-administer the epinephrine.

The outside of the epinephrine pen will also have detailed instructions on how to use it, so there is no fear if you forget what to do.

It is vital that you act fast when identifying if someone is having anaphylaxis and then using their epinephrine pen, as the person's situation can degrade very fast, (remember, someone in anaphylaxis may progress to the point where they cannot breathe).

How to use an epinephrine pen

1. Establish that the person is having a life-threatening allergic reaction. If so, call 911
2. Ask the person for their pen
3. If it is expired within 1-2 years it may still work, but it may be less effective. Use ones that are not expired
4. Follow the directions on the pen
5. Locate the person's thigh
6. Find the middle of the thigh
7. On the side of the middle of the thigh, push the pen inwards until it clicks
8. When it clicks it will have injected the medication, through the person's clothes, and skin
9. Observe for 90 seconds to see if there's improvement
10. If only slight improvement or no improvement, flip the pen around and administer a second dose but this time do it on their other thigh
11. Stay with person until emergency services arrive

Learn this skill with our video!

Learn how to do this skill by watching our online video tutorial, just take out your mobile phone and scan the code with your camera.

Or visit: <https://polarisdrt.org/pages/resources>



Warnings

- Follow the instructions EXACTLY on the epinephrine pen
- Do not inject the epinephrine pen in any location not specified on the pen's instructions
- Every second counts, do not delay in identifying and providing treatment
- Do not make the person get up or walk

How do I prevent anaphylactic shock?

- If you're unsure you have an allergy, go to a doctor to find out if you have any life-threatening allergies on record
- If you do have an allergy, always: find out the ingredients before you order food and carry an epinephrine pen on you at all times

Common Misconceptions

- If you go into anaphylaxis you will die. False! The majority of people survive
- If you don't have body-wide redness and hives, it is not anaphylaxis. False! You don't have to have hives for it to be anaphylaxis
- You can use antihistamine medication (these medications reduce swelling) to treat it, and not epinephrine. False! Epinephrine is the treatment. However, antihistamines (like Benadryl) are often given after epinephrine to further assist in reducing the reaction and bringing the body back to normal

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for anaphylaxis.

You're walking your dog at a park near your home. You sit down at a bench, and you notice some children playing at the playground and

you hear screaming. You don't pay attention to it. You hear 'someone help', and then you get up and rush over.

What should you do?

Ask: Ask the screaming child "What happened?". The child says his friend is sick and then points to the sick friend. It is a young boy and he is breathing rapidly and struggling to catch a breath, looking confused and tired. You ask the child "What happened?". He shakes his head.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Because he is having trouble breathing you identify it as an emergency.

Decide: Having identified an emergency, you ask another adult at the park to call 911.

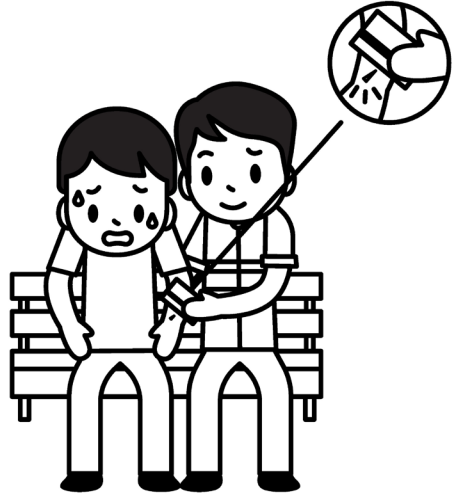
Safety: You're at a playground and there are no dangers.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario it is clear there is difficulty breathing, and that seems to be the only thing that needs

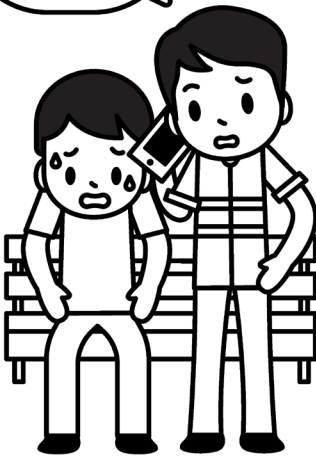
treatment. You are unsure if it is an asthma attack or an anaphylactic reaction. So, you ask the child: “Do you have asthma”, he shakes his head with a “no”. You then ask: “are you allergic to anything”, he shakes his head with a “no”. You ask where his parents are, he shakes his head again. You ask “were you bitten or stung by anything”, the boy nods his head with a “yes” and show you a stinger on his leg. You take a credit card from your wallet and scrape it off his leg, to remove any excess venom. You ask him if he has an epinephrine pen (EpiPen), he does not. You have him sit down and try to calm him down and have him match your breathing.

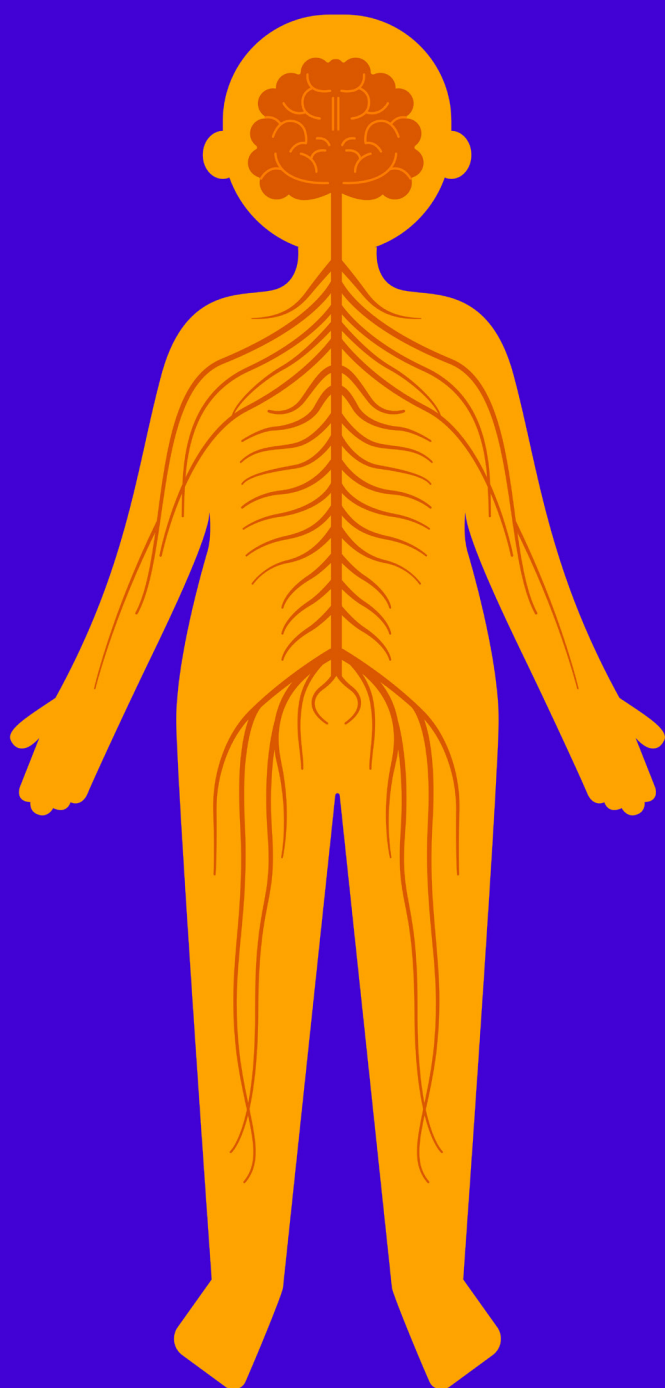
Ambulance: If you were in an area where an ambulance could not reach you, you would need to bring the child to the hospital.

Re-evaluate: Continuously watch the child to see if his breathing gets more labored in which case you will need to give rescue breaths. His skin may turn red and may have hives. Be prepared to give CPR if he goes unconscious.



911, a child was
stung by a bee
and he's allergic





NERVOUS SYSTEM EMERGENCIES

WHAT IS THE NERVOUS SYSTEM?

A nerve is a collection of nerve cells forming a channel that conducts an electrical message from point A to point B (example: from spinal cord to your arm to make it move).

The nervous system is composed of the brain, spinal cord and all the nerves that branch off the spinal cord. The nervous system controls functions of the body, it sends commands to body parts to make them go into action.

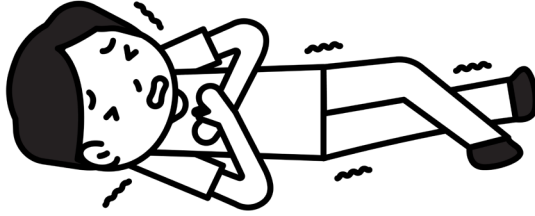
TERMINOLOGY

Nerve

A nerve is a collection of nerve cells forming a channel that conducts an electrical message from point A to B point be (e.g. from spinal cord to your arm to make it move).

Febrile Seizure

A seizure caused by a fever. 'Febrile' means 'relating to a fever'. Some people, especially young children may experience seizures when they have fevers.



SEIZURE

What is it?

A seizure could be considered 'a lightning storm' of disorganized signals in the brain, resulting in either loss of consciousness or involuntary muscle movement.

Febrile Seizures

Young children may experience seizures when having very high fevers, these are called 'febrile seizures'. Febrile fevers are very serious and require immediate treatment. As the cause is fever, the temperature would need to be addressed to stop the seizure by ice packs, cooling blankets, or medicine like Tylenol or ibuprofen. A seizure, of any cause, can damage the brain. It is known that an extremely high fever can kill, and a seizure would be a symptom of the damage this fever is causing to the brain as it is not meant to function at such a high temperature.

What happens if it is not treated?

For many who have seizures on a routine basis there will be no ill effect, and no necessity to treat the seizure, unless the seizure is worse than normal and indicates a worsening in their condition. If someone

is having a seizure for the first time it could be an indication of a more serious underlying life-threatening situation, which cannot be known for sure unless they go to the hospital.

What causes it?

There are several known causes of seizures:

- High fever
- Drug or alcohol withdrawal
- Brain concussion

In cases where the cause is not able to be determined, the person is said to have 'Epilepsy'

Spotting the symptoms: How do I know if someone is having a seizure?

- Loss of consciousness
- Involuntary muscle movement
- Shaking
- Inability to speak
- Starting blankly into space, staring and not responding to your voice
- Involuntary bowel movement or urination
- Drooling

How do I treat it?

A person who is experiencing a seizure should be lowered to the floor, and positioned on their side (the recovery position) and protected by having any objects near them removed: chairs, desks, etc. in order to give them as much space as possible to seize without hitting anything. Protect their head by putting a pillow under it. Unfortunately, there is not much else that can be done. Just let them seize and call 911.

How do I prevent it?

If you have a history of seizures, make sure you:

- Get plenty of sleep
- Keep stress low
- Take all prescribed medications
- If you have epilepsy, avoid flashing lights and visual stimuli
- If you have epilepsy, know what your triggers are and avoid them

Common Misconceptions

- If someone is having a seizure, put a spoon in their mouth for them to bite down. False! Do not put anything in the mouth of a seizing person. The idea behind doing this is people want to prevent the person from choking on their tongue, swallowing their tongue or biting it. It is dangerous to put something in someone's mouth: 1) it may damage their teeth if they bite hard, 2) their bite may break the object and they may accidentally swallow it, causing choking. There is a chance they may bite their tongue, but there is no real way to safely prevent that from happening.
- If someone is having a seizure, they may swallow their tongue, and die. False! It is impossible to swallow the tongue.
- If someone is having a seizure, you need to hold them down. False! It is not necessary at all, and does no good.

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for a seizure.

You're visiting a relative and you're having a conversation in the living room while their child is playing nearby. The child starts shaking.

You ask the parent what is happening, and they say he gets seizures sometimes, and that it should go away in a minute, but the seizure gets worse and his whole body starts shaking, and the child does not seem to be conscious.

What should you do?

Ask: Ask the parent if this has ever happened before, and they say ‘no’.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Because his level of consciousness is altered you identify it as an emergency.

Decide: Having identified an emergency, you ask another adult in the home to call 911.

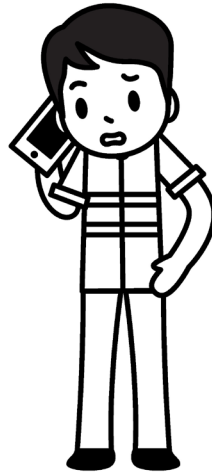
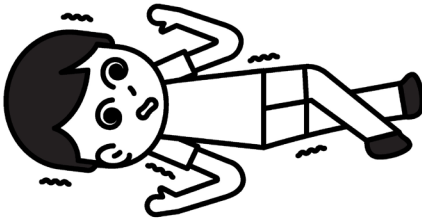
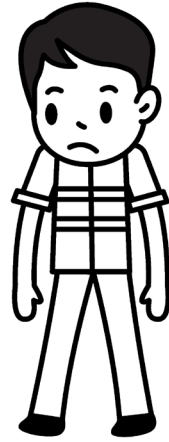
Safety: You’re at a friend’s home and there are no dangers.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with this, so you proceed to lay him on the floor on his side, remove the table, toys and chairs that are surrounding the child so that his head doesn’t hit them while he is seizing, and get a pillow for his head. There is no treatment you can provide, the only

thing you can do is ensure his safety.

Ambulance: If you were in an area where an ambulance could not reach you, you would need to bring the child to the hospital.

Re-evaluate: Continuously watch the child to see if his condition worsens. In the worst case scenario he may go unconscious and his breathing may be too shallow, requiring rescue breaths. If he goes unconscious, continuously monitor his breathing and pulse. If he is unable to breathe or has no pulse, start CPR.





STROKE

What is it?

Stroke is a leading cause for death world-wide and in the USA, with 150,000 Americans dying from stroke in 2019. There are two types of stroke:

- Stroke from blood vessels in the brain being clogged with a clot (which can be from a variety of causes)
- Stroke from uncontrolled bleeding in the brain, causing a buildup of pressure from the blood, and then that pressure harming the brain (usually happens from trauma to the head)

In both cases sections of the brain are injured, and the person then loses some amount of mental function and muscle control function. A person experiencing a stroke will not have full control of their muscles on both sides of their body. They may have weakness or numbness in their face or body.

What happens if it is not treated?

A stroke which is caused by a clogged blood vessel can be treated effectively with a 'clot buster', but it must be administered immediately,

within about 1-2 hours of the stroke. Therefore, it is vital that a stroke is detected, and the person is brought to the hospital without delay, otherwise they cannot get the treatment and may suffer permanent brain damage, and possibly death.

What causes a stroke?

- Stroke from clogged blood vessels can be caused by poor diet and lack of exercise, or from a heart condition which causes blood clots form in the heart which are then pumped into the brain
- Stroke from uncontrolled bleeding in the brain is usually caused by trauma to the head, blood thinning medication, high blood pressure emergencies, and others

Spotting the symptoms: How do I know if someone is having a stroke?

- Loss of strength or weakness on one side of body
- Loss of muscle control on one side of body
- Inability to speak on one side of the mouth
- Slurred speech
- Numbness on one side of the body

How do I treat it?

If you suspect someone is suffering from a stroke, do the following test on them and if they meet any of the criteria then call 911 immediately.

Ask the person to:

1. Smile
2. Speak
3. Raise their left arm
4. Raise their right arm

Compare how they are now, with how they are normally. Is this just normal for them or is something different?

Any numbness or weakness on one side of their body could be an indicator they are experiencing a stroke. If you do the above test and you are unsure, it is better to be safe than sorry, and call an ambulance.

Warnings

- It is vital that you identify a stroke immediately and get the person transported to the hospital without any delay
- If in doubt, just call 911 and have the operator walk you through the steps to see if the person is having a stroke

How do I prevent it?

Similar to heart attacks, you can help prevent strokes with a healthy diet and exercise:

- Minimize sugar intake
- Minimize alcohol intake
- Minimize sodium intake
- Exercise regularly
- Lose weight
- Don't smoke
- Eat more vegetables

Common Misconceptions

- A person having a stroke always acts like they are mentally disabled. False! There are many symptoms which one can display when having a stroke, mental status only being one of them
- Only old people get strokes. False! They can happen at any age, though it is most commonly something that occurs with older individuals or among those who use drugs such as amphetamines

- Strokes feel like a heart attack in your brain. False! Usually there is no pain when a person is having a stroke
- People who survive strokes become mentally disabled. False! Many survive, without any change to their mental ability

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a stroke.

You're on your way to work, walking through a park. You notice a family having a picnic on the grass. You hear some panicking and commotion.

What should you do?

Ask: You walk over and ask “is everything all right?” a middle aged woman says “my mom is acting strange”. You tell them you are trained in first aid and you can help. You ask the mother: “hello, can you tell me your name?” She responds with her name, but you see she is shaking and seems not completely ‘present’.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Because she has an altered level of consciousness, you identify the situation as an emergency.

Decide: Having identified an emergency, you ask another adult at the park to call 911.

Safety: You're at a park and there are no dangers.

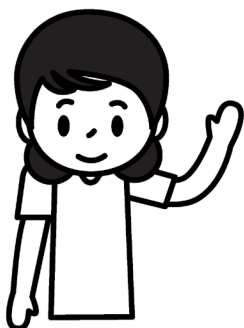
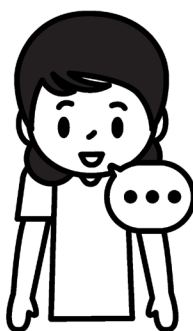
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these, so you proceed to investigate the altered consciousness further. You are unsure if the woman is either having low blood sugar, or a stroke, or something else. In order to rule out stroke, you ask the woman to:

1. Smile
2. Speak
3. Raise their left arm
4. Raise their right arm

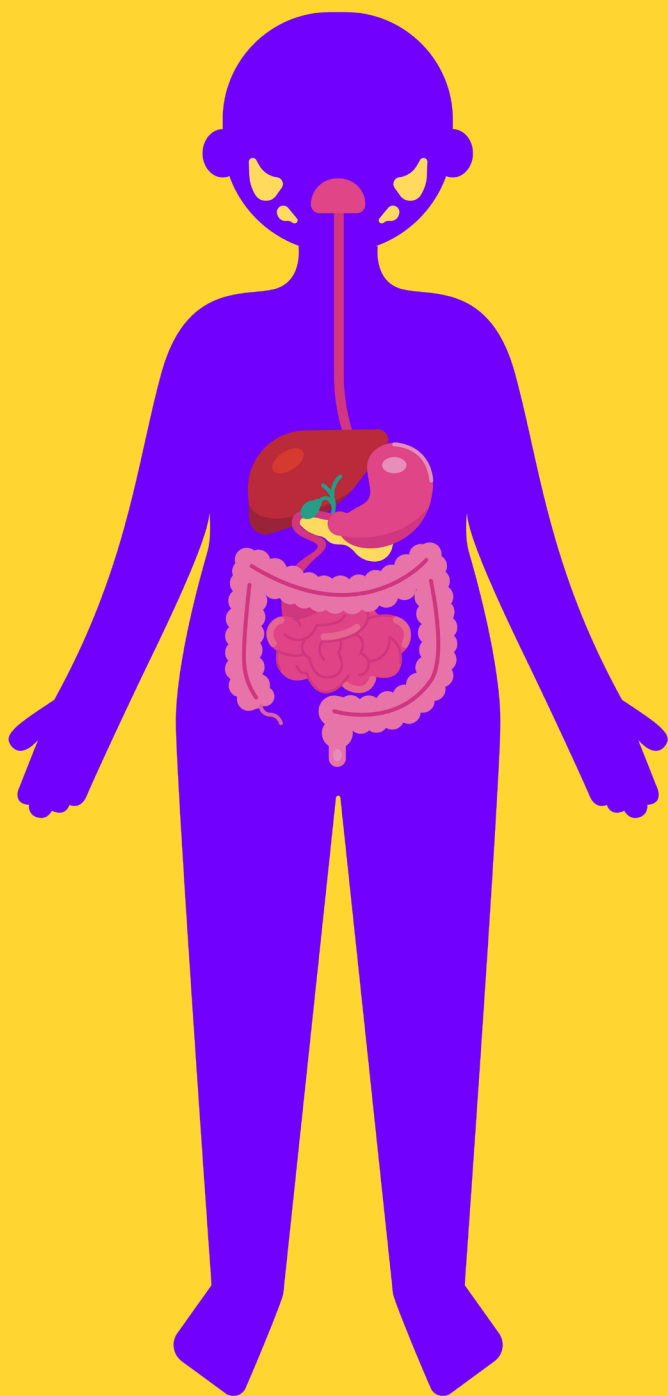
You see weakness on one side of her body, which indicates to you that it may be a stroke. You give this information to the 911 operator, on the phone.

Ambulance: If you were in an area where an ambulance could not reach, you would need to bring the woman to the hospital immediately. If they are having a stroke there is only a short time window where they can get the stroke treatment, otherwise they may die.

Re-evaluate: While waiting for the ambulance, continuously watch the woman to see if her condition changes. Be prepared to give CPR if she goes unconscious.







DIGESTIVE SYSTEM EMERGENCIES

WHAT IS THE DIGESTIVE SYSTEM?

A great many different organs all working together to take the food you swallow and break it down into a substance that the body can use for energy.

TERMINOLOGY

Supportive Care

“Supportive care” is an emergency response term, and it refers to medical treatment that is intended to provide comfort or prevent or control symptoms. Supportive care aims to improve the patient’s comfort and quality of life. In a real-life emergency setting, supportive care would be the medical care provided to a patient after first aid is applied and the patient’s condition is stabilized. An example would be keeping a person warm with a blanket.



APPENDICITIS

What is it?

Sudden and intense swelling of the appendix. The appendix is a small 'pouch' located on the large intestine, 'appendix' comes from Latin 'hang upon'. 'itis' means 'irritation or inflammation'.

Often times, an appendix will get irritated and swell (inflammation), and then go back to normal without treatment. But on some occasions, it does not resolve on its own and it can then become a life-threatening situation if not treated.

What happens if it is not treated?

If swelling is not stopped, or if the appendix is not surgically removed, it may rupture and spill out its contents (bacteria and other substances) inside the body, causing harm to all of the organs and tissues. In fact this spilling of bacteria into the body cavity can lead to a major blood infection and possibly death.

What causes it?

There are several possible causes for an occurrence of appendicitis, some of them being infections from viruses or bacteria. In many cases the exact cause is unknown (spontaneous).

Spotting the symptoms: How do I know if someone has it?

Pain in the right lower or right upper section of your abdomen. Strong, sharp pain that pierces. It can go away and come back, repeating. The pain can be during movement, and on contact. Vomiting and nausea may also be present.

How do I treat it?

The only way to treat it is by having the appendix surgically removed at a hospital.

How do you prevent it?

There is not much that can be done to prevent appendicitis. However, you may be able to lower your risk by having a diet of high-fiber.

Common Misconceptions

- Eating a big meal will cause appendicitis. False! There is no connection to over-eating and the inflammation of the appendix
- Eating vegetables that have seeds can cause appendicitis. False! There is no scientific evidence that proves this

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for appendicitis.

You're at a restaurant and the table in front of you is having a birthday party. You notice one of the children saying to the parent that their stomach hurts and they are hunched over, and in great pain. Their parents are uncertain of what to do.

What should you do?

Ask: You walk over and introduce yourself and tell the parents that you are trained in first aid and ask them what is happening. They say the boy is in pain.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

The child is not showing any of the above emergencies therefore you determine it is not an emergency.

Decide: Having identified it is not an emergency, you don't call 911.

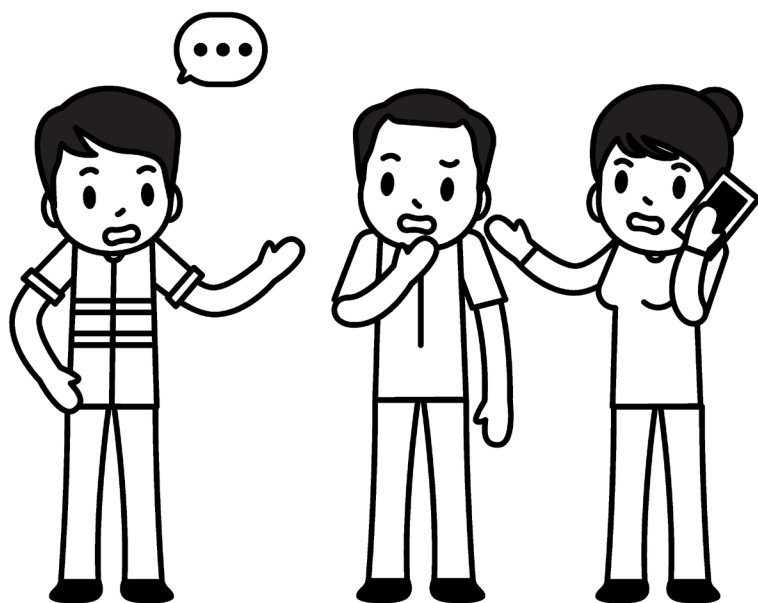
Safety: There are no dangers present.

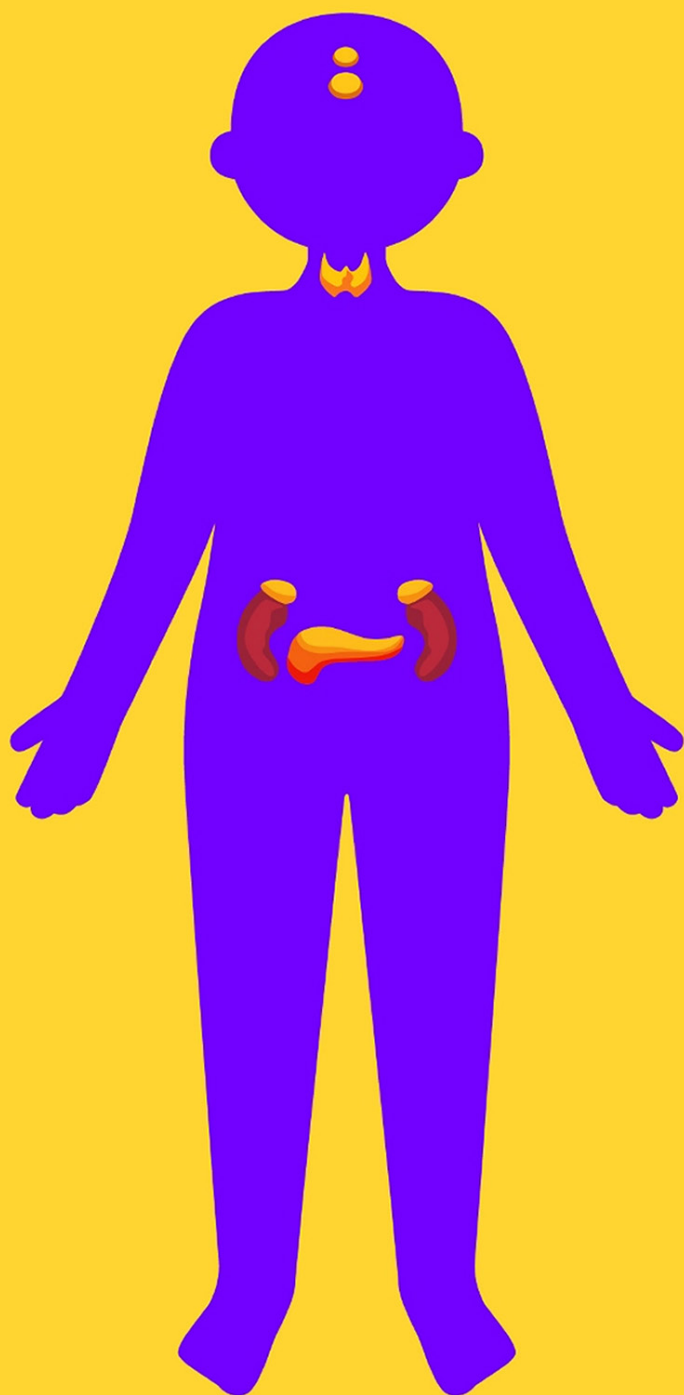
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these. Although it does not look like an

emergency, you still want to help. You ask if you can talk to the child. You ask them where the pain is located. The child points to the lower right side of his abdomen. You ask him to describe the pain, he says it is very sharp. With your knowledge you determine that this could be appendicitis which can be life-threatening. You tell this to the parents and recommend that they take him to a hospital right away.

Ambulance: In this case they could call 911 and get an ambulance, or drive the child directly to the hospital. The ambulance will not have anything to treat the appendicitis, the child will only get full treatment at the hospital.

Re-evaluate: Have the parents continuously watch the child to see if his condition worsens and provide supportive care.





ENDOCRINE SYSTEM EMERGENCIES

WHAT IS THE ENDOCRINE SYSTEM?

A network of organs that produce and send out special substances into the blood stream called 'hormones'. These hormones signal the body to do many different things, like increase heart rate, or increase body growth, etc.

'Endo' means 'in', and 'crine' means 'secrete'. The word 'secrete' basically means to drip out or release a liquid.

TERMINOLOGY

Glucose

A simple form of sugar the body uses to power all of its cells.

Blood sugar

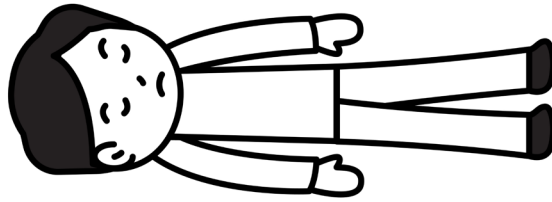
Food gets digested by the body and broken down into glucose and put in the blood. Blood sugar refers to the amount of glucose (sugar) in the blood. If one has low blood sugar, they will have low energy.

Insulin

A chemical which makes cells accept glucose. People with Diabetes need extra insulin.

Diabetes

A medical condition where the body's cells do not accept glucose, therefore the person must inject insulin into his body to force the cells to take the glucose.



LOW BLOOD SUGAR EMERGENCY

What is it?

The body digests foods and turns them into a simple substance called glucose. This is a type of sugar, and the body uses it as fuel. All of the body's cells run on this. As you digest food, part of it is turned into glucose, and put into your bloodstream so all of your body's cells can have access to this energy. At any moment there is always a certain amount of glucose in the blood. If you have not eaten for a long time, the amount of glucose (sugar) in the blood may be lower than usual. However, the body has built in mechanisms in place to handle such situations where the blood sugar dips too low due to a lack of food intake. For instance, the liver can release or create more sugar to balance the glucose levels in the blood and maintain it within a normal range.

A low blood sugar emergency most often occurs among diabetic persons who must take medications, such as insulin or others, in order to keep their glucose levels from becoming too high. Diabetes is an issue of too much glucose in the blood. What can happen is that too much insulin (or other similar drugs) is taken by the diabetic person, which lowers their blood glucose to a low and possibly dangerous level.

The degree of danger depends on how low the blood sugar has gone. Because diabetics take medications to lower their blood sugar, it is important that they eat in a predictable way (routinely, not skipping meals) so that their blood sugar doesn't drop too low. Skipping a meal or not eating can lead to their blood sugar levels falling too low (even if they took a normal dose of their medications) because the medication will lower sugar regardless of how much sugar exists in the bloodstream. Effects of low blood sugar can range from merely feeling dizzy and weak, to losing consciousness and even having seizures--all depending on how low exactly your blood sugar has gone.

More about insulin and blood sugar

Blood sugar is useless without insulin to push it into cells that can actually use it. Without insulin, cells cannot use the sugar in the bloodstream, no matter how high it is. In fact, too high a blood sugar is toxic to blood vessels and can harm organs as well. This is why insulin is so important as a drug: it allows diabetics to have sugar present in the blood to enter their cells and thus provide the essential fuel to their body. If you are diabetic and have no insulin, blood sugar builds up to dangerous levels and causes harm to the body while also starving the cells as they will receive no sugar without insulin.

What happens if it is not treated?

A person will become tired and then unconscious, and eventually they can go into a coma, or stop breathing, because the body is not getting the energy it needs to operate, so it goes into a deep sleep.

What causes it?

A low blood sugar emergency typically only happens to people who are diabetic.

Causes include:

- Diabetic person not eating meals
- Diabetic person injecting too much insulin into the body (Insulin causes blood sugar to be used up rapidly by the cells), which causes nearly all of the blood sugar to be taken by the cells, leaving not enough left in the blood to continue to power the rest of the cells

Spotting the symptoms: How do I know if someone has low blood sugar?

In early stages a person can be tired, irritable, hungry, dizzy, sweating. As it becomes more serious, they may act unusual or confused, similar to how someone would act if they drank too much alcohol and may act strange or say strange things. If it continues to go untreated, they will go unconscious.

How do I treat it?

- Call 911
- Get them to eat something, or put sugar under their tongue if they are unconscious and not able to eat

How do you prevent it?

Don't skip meals, always ensure you eat, even if you don't feel hungry. And always make sure you take the right dose of insulin

Common Misconceptions

- You have to be over-weight to get diabetes. False! You do not have to be obese to get diabetes
- There is nothing you can do to prevent diabetes. False! Lifestyle choices can have a huge impact on prevention
- Only adults get diabetes. False! Children can get diabetes

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life, for a low blood sugar emergency.

You're in an airplane, sitting in your chair with your eyes closed. You hear a commotion behind you. A mother is panicking. The flight attendants ask if there is anyone on board who has medical training. You get out of your seat to offer assistance.

What should you do?

Ask: Ask the parent what is happening. She says the child is unconscious.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Because of his reduced level of consciousness (he is unconscious) you identify it as an emergency.

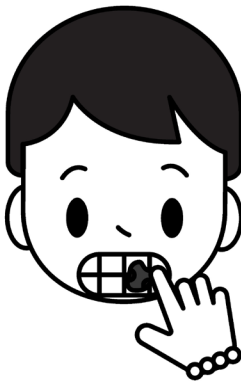
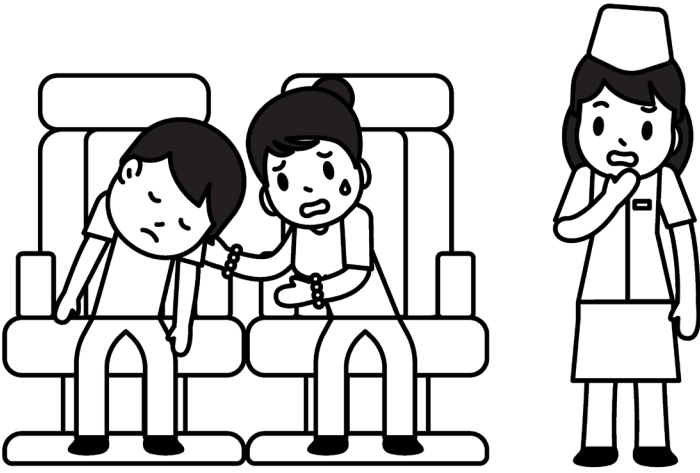
Decide: Having identified an emergency, you tell the flight attendant to inform the pilots that it is an emergency and the child needs medical attention.

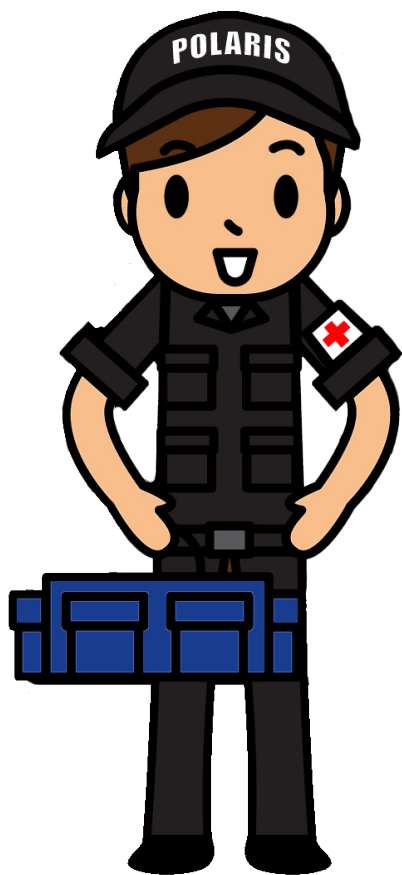
Safety: There are no dangers.

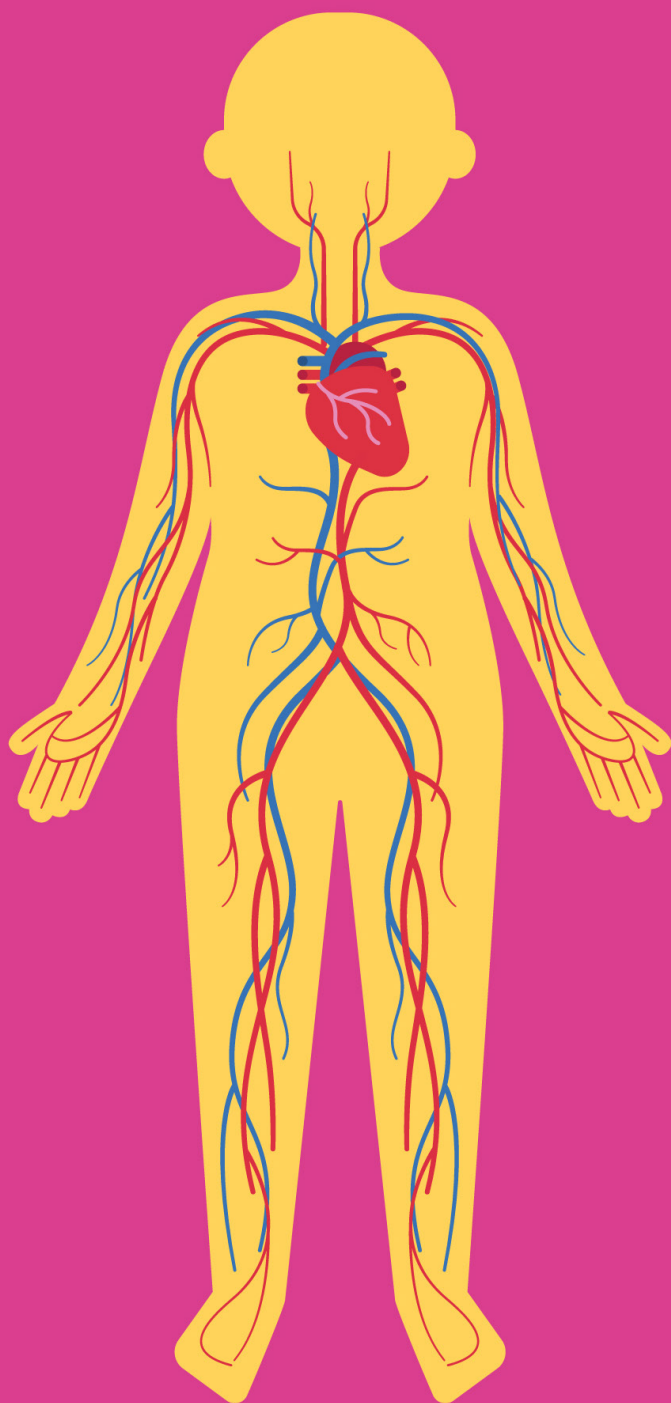
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the child is unconscious, and since you can't ask them what is wrong, you need to check if they are breathing and if they have a pulse. You see that he is breathing and does have a pulse. You ask the parent if he has any medical issues, and she says he is a diabetic and that she thinks he may have skipped a meal. The flight attendant brings you a first aid kit with a blood sugar tester, you test the child's blood and you see the blood sugar is low. You ask the flight attendant for some packets of sugar, and have the mom put some on her fingers and rub it under the child's tongue and on the child's gums.

Ambulance: The child needs to be taken to the hospital, but it might be a while, since you are in an airplane.

Re-evaluate: After providing the sugar, make sure you continuously watch the child to see if his condition worsens. In the worst case scenario he may go unconscious, or have seizures, and he may need CPR. Upon giving the child some sugar under tongue and on gums, the child's condition might improve, in which case you would want to keep providing sugar in form of sugary juices (if he is conscious, so he can swallow) like orange or apple juice and re-evaluate his condition and re-check his blood sugar periodically. The mother especially should know what his normal range ought to be, so she can assist in determining if it has come back to a normal level.







TRAUMA: BLEEDING

RELATED BODY SYSTEMS: CIRCULATORY SYSTEM

As trauma and bleeding have to do with the circulatory system, it's important to understand this system.

This is the network of all of your blood vessels, from microscopic to large, and your heart. Every time your heart pumps, it sends out blood to your lungs to get oxygen, and then sends out the oxygenated blood to the rest of your body, through your blood vessels. When the heart relaxes, it fills up with de-oxygenated blood carried to it by the veins. When the heart pumps, it begins the cycle again of sending de-oxygenated blood to the lungs to get fresh oxygen, and then pumps it out to the rest of the body.

It is called the circulatory system because it is like a circuit. Think of a race car track. The blood vessels are the roads, and the cars racing is the blood flow (individual blood cells). See the diagram on the Cardiac Emergencies chapter.

TERMINOLOGY

Blood

A mixture of red blood cells, white blood cells, salt, glucose and other nutrients.

Blood vessels

Tubes from large to microscopic that deliver blood from the heart to the cells, and then back to the heart. Veins and arteries are different types of blood vessels.

Vein

A blood vessel that has dark red blood. Blood found in the veins has already given up its oxygen to the body's cells, and therefore is not as bright in color. Blood in veins is not blue.

Hemophilia

Hemophilia is a medical condition in which the body's natural ability of the blood to clot (stick together) is severely reduced. Clotting is a part of the normal function of blood, which is why wounds stop bleeding. Someone with hemophilia may bleed severely even from a small cut or wound, creating a potential emergency.

Shock

A dangerous state where the body has lost too much blood, and the body's cells are not getting enough oxygen to stay alive. After a short period of time, a person in shock will have an increased heart rate, pale and sweaty skin, and may feel nauseous or dizzy. This situation is an emergency and will result in death if the person is not given blood. Shock from blood loss is different than psychological shock, where a person faints due to emotional stress.

Artery

A blood vessel that has bright red blood which has oxygen to deliver to the body's cells. It is bright red because of the high oxygen content.

Bandage

A light cloth, narrow and long, and rolled into a roll. It is used to wrap around a dressing. When you think of bandage, think of 'band', because it wraps around the body, like a band.

Dressing

A light cloth, usually in the shape of a square, that is used to put on a bleeding wound. A popular dressing is 'gauze' (which is a light fabric).

Limb

A limb refers to an arm or a leg. Limbs extend from the body. The head is not a limb.

Pulse

A pulsation you feel from an artery when you place your finger on a person's skin (usually the wrist or neck). It is created by the heart's beat pumping blood through a blood vessel, it indicates the person's heart is beating and therefore pumping blood through the arteries. The pulse you feel is literally a wave of blood passing by. Veins do not have pulses, they just have a steady flow of blood. Only arteries have a pulse.

Heart Rate

The speed at which the heart is beating.

Trauma

An impact, from a strong force, hitting the body. It can be sharp and concentrated like a knife. Or it can be wide like being hit by a shovel.



LIFE THREATENING BLEEDING

How does blood & bleeding work?

The heart is a pump, and the blood vessels are tubing connected to it. The blood carries oxygen & nutrients to the cells. When there is less blood, there is less oxygen, and the cells die shortly after from 'suffocating' because they cannot get oxygen, and they also die because their waste products (carbon dioxide) accumulate and don't get taken away by the blood. Also, less blood means less blood sugar being transported which the body also needs to function.

Facts about blood

- Adults can cope with losing blood faster than children since they have more blood than children
- Blood is red and dark red. It is not blue
- An adult has about 5.5 liters of blood
- A child has 2-3 liters of blood
- A newborn has 0.2 liters of blood

Why is controlling bleeding important?

It is possible the body can lose as much as 20% of its blood over a period of time without going into shock & dying. But if it loses that same 20% rapidly, the body may not be able to cope and the body may go into 'shock' and die if not given blood.

What causes bleeding?

- Cuts to the body from knives or sharp objects
- Trauma to the body from bullets or weapons
- Trauma to the body from accidents or falls
- Internal bleeding from trauma
- Medications, such as blood thinners, can cause spontaneous bleeding
- Medical conditions, such as hemophilia and others, can cause spontaneous bleeding
- Certain diseases, such as Ebola, can cause it

How do I know when I see it?

Minor bleeding: Slight trickle of blood, which either stops by itself or stops with a band-aid or moderate pressure.

Serious bleeding: The flow of blood will be steady, and it may or may not stop when you try to put hard pressure over the wound.

How do I treat it?

1. How to handle bleeding from the limbs (arms and legs)
 - a. Hard pressure with gauze or your hand directly on the site of the injury. If it is a minor cut and there are just a few drops of blood, a band-aid will stop the bleeding
 - b. If bleeding doesn't stop, get more gauze or cloth, and add on to the existing gauze, and press down with direct

- pressure. Call 911. If the bleeding does stop, continue to hold direct pressure for at least 15 minutes before letting go, and then wrap it tight with a bandage
- c. If bleeding still doesn't stop, place a tourniquet up-stream (towards the heart) from the injury. After you have stopped the serious bleed, wrap the injury tight with a bandage. Tourniquets for arms go on the upper arm, and for legs, go on the upper leg
2. How to handle bleeding from everywhere except the limbs (neck, back, chest, abdomen, feet, hands)
 - a. Hard pressure with gauze or hand directly on the site of the injury. If it is a minor cut and there are just a few drops of blood, a band-aid will stop the bleeding
 - b. If bleeding doesn't stop, get more gauze or cloth and add on to the existing gauze, and press down with direct pressure. Call 911. If the bleeding does stop, continue to hold direct pressure for 15 minutes before letting go, and then wrap it tight with a bandage
 - c. If bleeding still doesn't stop, place more material, gauze, whatever you can find, on top and continue to hold direct pressure. Continue adding more and more material until the bleeding stops. After you have stopped the serious bleed, hold direct pressure for at least 30 minutes before letting go, and then wrap it tight with a bandage

What to use when applying direct pressure:

Gauze is the best dressing because it is highly absorbent and sterile (completely bacteria/virus free), but if you don't have it, you can use:

- Paper towels
- Socks
- Scarf

- Shirt
- Bare hands

How to make a tourniquet

The purpose of a tourniquet is to stop blood flow in the limb.

1. Maintain direct pressure on the injury while making the tourniquet. Either have the person hold direct pressure or use your knee to hold direct pressure
2. Find a long narrow piece of cloth. Ideally use a triangular bandage. Triangular bandages can be rolled into a long scarf-shaped object. If you do not have a triangular bandage you can use an alternative:
 - a scarf
 - a torn t-shirt
 - a torn bed sheet
 - a wide neck tie

Do not use:

- a shoe lace
 - string
 - a towel
3. Straighten out the cloth, so it is in a long and narrow shape
 4. If an arm is bleeding, place the cloth under the upper arm (bicep). It must be placed above the injury towards the heart, never below or on top of the injury.
 5. If a leg is bleeding, place the cloth under the upper leg (thigh). It must be placed above the injury towards the heart, never below or on top of the injury
 6. Tie a half knot, snug against the limb. Note: You do not have to remove the person's shirt or pants, the person can have clothing on or not

7. Place a pen or stick on top of the half knot
8. Tie another half knot on top of the pen or stick, completing the knot
9. Begin turning the pen. The cloth will become very tight, and will slow down the blood flow
10. Keep turning the pen slowly, until the bleeding stops. Note, it will cause the person great pain, since you are squeezing their limb extremely hard as you turn the pen/stick. If they ask you to stop, you must not, and you must keep turning until the bleeding stops
11. The tourniquet must now be secured. Using the ends of the cloth (the tails), wrap one tail around the end of the pen, and then under the limb, and bring it up, and then take the other tail, wrap it around the other end of the pen, and then under the limb, and then, on the top tie both tails together
12. Have the person cease direct pressure on the injury. Do NOT remove the dressings/gauze. Leave them there, and then wrap the injury in a clean bandage tightly. Within moments the color of the limb will change to a purplish color because there is no longer any fresh blood flow.
13. Write the time on a person's forehead when the tourniquet was put on

Warnings when using tourniquets:

- Once it is applied, never loosen a tourniquet to let some blood flow through
- Once a tourniquet is on it does not come off
- Only a doctor is allowed to take off a tourniquet
- You can do a tourniquet over clothes
- The person will lose the limb if they don't get the tourniquet removed by a doctor within 24 hours
- Tourniquets are used only on limbs: legs and arms
- Place tourniquets on the biceps for arms, or on the thigh for legs. The tourniquet must not be on the injury site, but above the injury site
- Never tourniquet the neck, or fingers

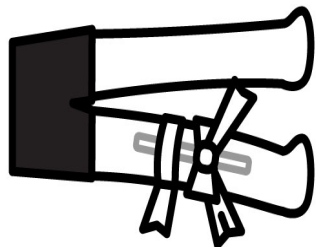
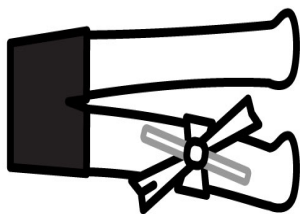
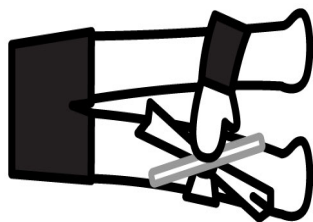
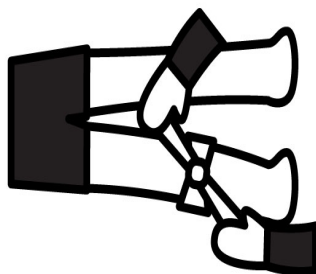
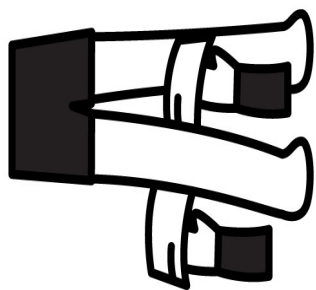
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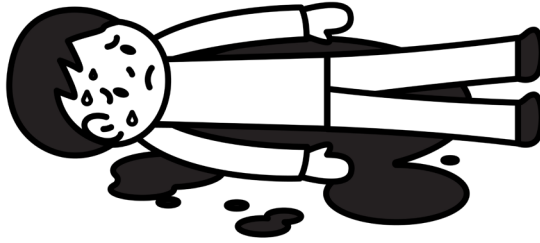
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SCAN ME







SHOCK

What do I do if someone goes into shock?

If someone has lost enough blood to go into shock, it is a true emergency and they must be transported to the hospital immediately to get blood. In early stages of shock their heart rate will be high, and then as shock progresses their skin will be cool, pale, and sweaty.

How do I treat life-threatening bleeding?

- The treatment for bleeding is direct pressure, anywhere on the body. Chest, neck, abdomen, head, feet, fingers, and continuing to add more gauze or cloth as needed. Only with limbs do you have the option to tourniquet
- Elevating limbs above the heart can help
- If a limb has been severed/amputated, you can go straight to a tourniquet

Warnings about bleeding control

- Drinking a glass of water is not recommended, as they may get nauseous and vomit
- Always add new dressings on top of the bleeding injury, don't remove old ones. Removing old bandages can disrupt the body's healing process, causing the wound to bleed again

- Don't hold direct pressure for just a few seconds and let go. Hold it hard for at least 15 minutes after it stops bleeding. And hold it for 30 minutes if it was a serious bleed. If you ended up using a tourniquet and the bleeding stops you don't have to continue holding direct pressure, but you should wrap the injury in a bandage
- If a person has a disease, it can be in their blood. Therefore, if their blood gets into your eyes or a cut on your skin, you may get their disease. Always protect yourself with gloves and protective equipment when helping someone who is bleeding seriously

How do I prevent life-threatening bleeding?

Avoid high-risk situations where an accident may happen:

- Be mindful of your surroundings
- Avoid drug or alcohol intoxication
- Keep a first aid kit in your home, office and car
- Avoid running with scissors
- Avoid playing with knives, swords or other sharp objects
- When in an environment where you may be cut, wear the proper protective gear

Common misconceptions

- Blood is blue. False! Blood is red and dark red. Diagrams often show blue blood vessels as veins and red blood vessels as arteries. However, this is just to make it easier for you to tell the difference when looking at the diagram
- Blood vessels are blue. False! Blood vessels are always red. If you look at your wrist they appear blue, but that is because of the

color of your skin absorbing and reflecting certain colors from the light of the sun. For instance, water itself has no color, but it appears blue when you look at it in the ocean

- You can die from a nosebleed if you are a hemophiliac (a person who bleeds easily). False! You cannot die from blood loss from a nosebleed, even if you are a hemophilic
- When having a nosebleed, pinch the nose, and lean back. False! That causes pressure for the blood to flow backwards. Instead, lean forward and let it bleed out

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for serious bleeding.

You are at a hardware store and one of the staff is cutting wood with a saw. You hear him yell, and you go over to investigate.

What should you do?

Ask: You ask him what is going on? He says he cut himself on the saw. He is holding his hand tightly with his other hand. You see blood dripping down at a fast rate.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You have not seen the cut with your own eyes, but because of the amount of blood and the fact that he was cut with a saw, you suspect the worst and identify 'bleeding' as the life-threatening emergency.

Decide: Having identified an emergency, you ask another person in the store to call 911.

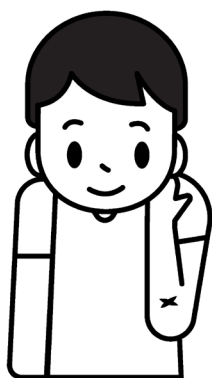
Safety: The saw is still on, and buzzing. This is a danger to you and others, therefore the first thing you must do is turn it off (unplug it from the power source if you cannot find the switch).

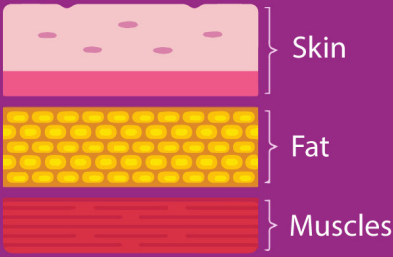
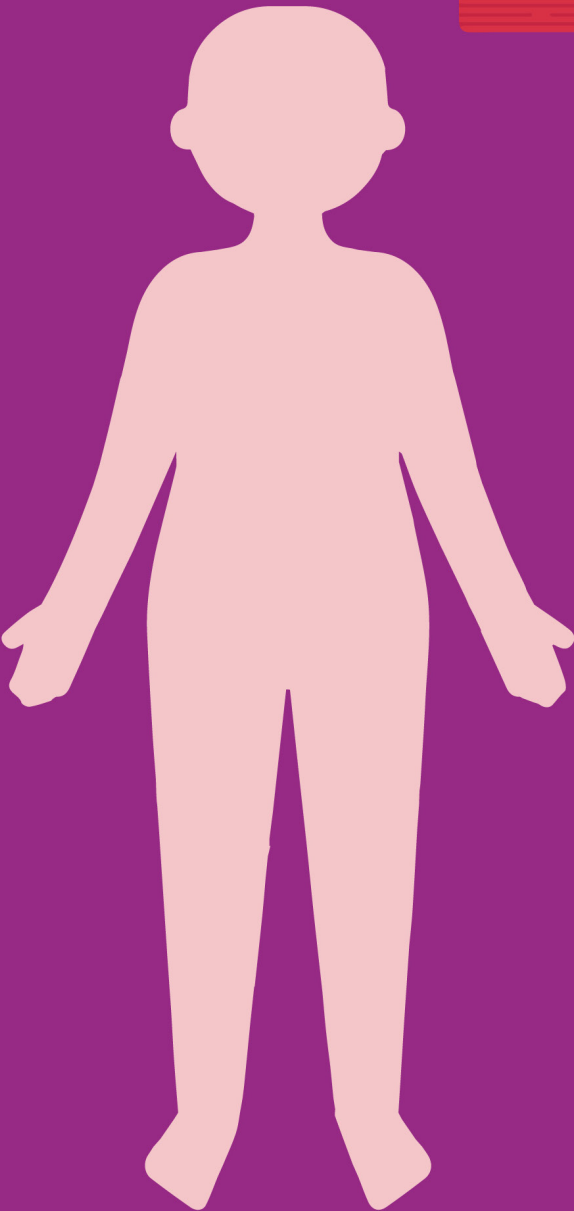
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there is life-threatening bleeding. You need some gauze, paper towels or something to put on the person's cut hand. You ask an employee to get you some paper towels right away. With the paper towels in your hand, you tell the injured person that you want him to remove his good hand from holding his cut hand, and then immediately put the paper towels on the cut hand, and put his good hand back on, with very hard pressure. You do so, and the bleeding stops. You then take steps to help prevent shock by having them lie down with their legs elevated and keep them warm with a blanket.

Ambulance: Depending on how much blood was lost, the person may or may not need to go to the hospital. It is their choice. Regardless, he will need stitches to close up the cut, so it can heal properly. Most Urgent Care centers and walk-in health clinics will stitch up wounds that are bad enough they won't close up on their own, but not so bad they require ER treatment. However, if the saw

cut off (partially or fully) a finger or a part of his hand, then the other goal of this scenario becomes preserving a lost limb (finger or hand) and so taking them to the hospital for immediate treatment becomes absolutely necessary.

Re-evaluate: Continuously monitor the person to see if the bleeding starts again, or if they go into shock from too much blood loss (extremely pale, losing consciousness, sweaty and shaky, etc.).





TRAUMA: BURNS

RELATED BODY SYSTEMS: INTEGUMENTARY SYSTEM

Although it is not shaped like our other organs, our skin is actually an organ. It has a specific structure (skin cells), and a several key functions (to keep us warm, keep germs out, protect us from injuries, and many others), it is also the body's largest organ.

The word 'integument' means 'a tough protective layer'.

The first organ injured in a burn is always the skin (integumentary system).

TERMINOLOGY

First degree burns

This burn has mild to medium pain, redness, heat, discomfort. Consider it like a sunburn. You could have a first degree burn on your entire body and it would not be an emergency.

Third degree burns

The pain will be severe on the outer areas, and there will be no pain in the deepest area, because the nerves will be burnt. The center area is black and charred, and burnt into the muscle and bone. The outer areas of a third degree burn are second degree burns and will be painful.

Hypothermia

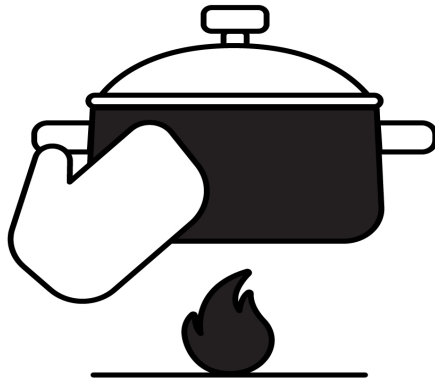
A condition where the body temperature has gone too low and the person is at risk for going unconscious, and dying.

Electrolytes

The word “electrolyte” is a biology term. Electrolytes are important because they help balance the amount of water and key nutrients in the body.

Second degree burns

This burn has a high amount of pain, redness, heat, discomfort, blistering, orange patches.



WHAT IS A BURN?

The skin is the body's largest organ. Its vital roles include giving our organs protection from the germs of the outside world and regulating body temperature. Think of the skin as a 'coat' that your body wears to keep the heat within the body and to keep germs, dirt, and debris outside of it.

A burn occurs when too much energy (think of energy as heat) or a chemical (like an acid) contacts the skin. It destroys the skin's cells, and if the source of the burn is strong enough, it can burn through the skin, and into the muscle.

Skin that is burned loses its ability to keep germs out, letting heat and fluids escape and germs enter in.

Another key function is actually keeping water INSIDE the body. When the skin is damaged, it allows moisture and water to leave the body. Therefore, burns can lead to dehydration as there is no longer a 'seal' in place to keep the body from losing its moisture and fluid content. This is not blood, but the water in muscles and tissues that can freely exit the body when skin is no longer present to 'seal it in'. This is relevant because dehydration is a vital concern in severe burns and hydration with electrolytes and fluid replacement a vital treatment.

What happens if a burn is not treated?

Significant burns to large portions of the body can end up causing serious infection and hypothermia, leading to death.

As mentioned above, the skin acts like a 'coat', keeping the body warm. The normal body temperature is 98.6 degrees. If a large amount of skin is damaged in a burn, the body's temperature will drop. If it drops 95.0 degrees this is called hypothermia. Hypo = low, thermia = heat.

Also as mentioned above, life-threatening dehydration can be caused by burns causing the body to lose its fluids.

What causes a burn?

- Steam
- Fire
- The Sun
- Electricity/Lightning
- Powdered chemicals
- Liquid chemicals
- Hot objects (irons, frying pans)
- Boiling oil
- Explosions

How do I know when I see it?

1. First degree burns: pain, redness, heat, discomfort
2. Second degree burns: pain, redness, heat, discomfort, blistering, orange patches
3. Third degree burns: looks like the above two, but center area is black and charred, and burnt into the muscle and bone

How do I treat it?

First Degree

Description: Red skin. Itchy and stinging. Not serious, even if your entire body surface area has a 1st degree burn (a minor sunburn).

Pain: Painful and annoying (can be dry and red).

Treatment: Cool (not hot, not cold) water (bath/shower), aloe is fine, as well as any creams that help make it feel cool and preserve moisture. Ice cold water is NOT necessary and is more painful than it is helpful. You do not need to go to the Emergency Room for any 1st degree burn no matter the size.

Second Degree

Description: Red skin, with orange patches and blisters. The blisters will take a bit of time to form, roughly 24 hrs, and will not occur immediately.

Pain: Intense pain.

Treatment: Delicately run cool/lukewarm (not hot, not cold) water over the burn for as long as necessary (30min) to remove the heat. Then wrap with a cool damp bandage. There are commercially made 'burn' dressings & bandages for this. They work great. Do NOT put a 2nd degree burn into a bowl of ice water! Do NOT pop the blisters, as that increases risk of infection. If the burn is on your eyes, neck, hands, feet, or genitals you should go to the hospital. Or if the burn is larger than 1% of your body's surface area, you should go to the hospital. For a frame of reference: the size of the palm of your hand is about 1% of your body's surface area whereas the entire surface area of a single arm is 9%, while the entire surface area of your chest (front and back) is 18%.

Third Degree

Description: Flesh is burned through, exposing muscle and possibly bone. The outsides of the burn will be red and orange patches, and the inner area itself may be gray, black and charred. The burned area is dry and leathery. Some third-degree burns will feel hard and firm.

Pain: Areas where nerve endings are damaged may not have feeling. Surrounding areas with burns which are less severe may be very painful.

Treatment: Do NOT pour any water on the burn. Simply wrap the burn in a DRY sterile bandage and go straight to the Emergency Room. Do not put ANYTHING on the burn other than the sterile bandage. This is because a burn to this degree exposes the muscle, blood vessels, and possibly even bone to an extremely high risk of infection. Anything contacting this burn directly must be sterile. A third degree burn of any size requires a visit to the hospital.

When do I go to the hospital?

- The burn is white, pink, red or brown; or appears dry, leathery or charred. (3rd degree burn)
- 2nd degree burn is larger than the victim's palm. (1% of the body)
- Any size 3rd degree burn
- Hands, feet, face, eyes or genitalia are burned
- Electricity or chemicals caused the burn
- Smoke or toxic fumes affected the person
- The person has a chronic health condition such as diabetes
- The person is an infant, young child or senior citizen
- The person complains of being cold or is shivering. In this case they have hypothermia, and you should cover them in a blanket to keep them warm

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How do I prevent it?

- Have functional fire detectors in your home and office
- Use oven mitts when handling hot pans
- Avoid deep-frying with oil at home
- Keep all chemicals out of reach of children
- Keep matches and lighters out of reach of children

Common misconceptions

- You should put butter, mayo, or oil on a burn. False! Just use water, as described above
- You should put water on third degree burns. False! Only cover them in a dry bandage. You do not want water and germs going into the burned muscle

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a burn emergency.

You are at a shop buying some fried chicken and a cook knocks over a pot and the boiling oil spills onto his feet. You hear screaming.

What should you do?

Ask: You look over the counter and ask the cashier what happened, and he says the cook got burnt. You hear screams. You tell the cashier you know first aid and ask if you can help. He lets you into the kitchen.

Identify: With the information you gathered, see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You have not seen the burn yet, and how much of the body has been burnt therefore you do not yet know if it is an emergency.

Decide: Having not been able to tell if it is an emergency, you do not call 911, and get more information instead.

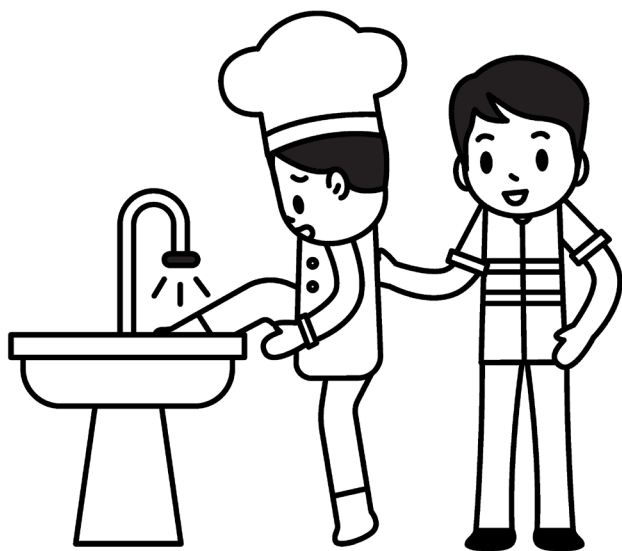
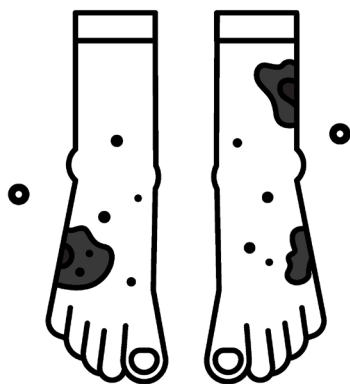
Safety: The flame on the stove is still on and if the oil comes into contact with it, it could start a fire. Turn off the stove first, before doing anything.

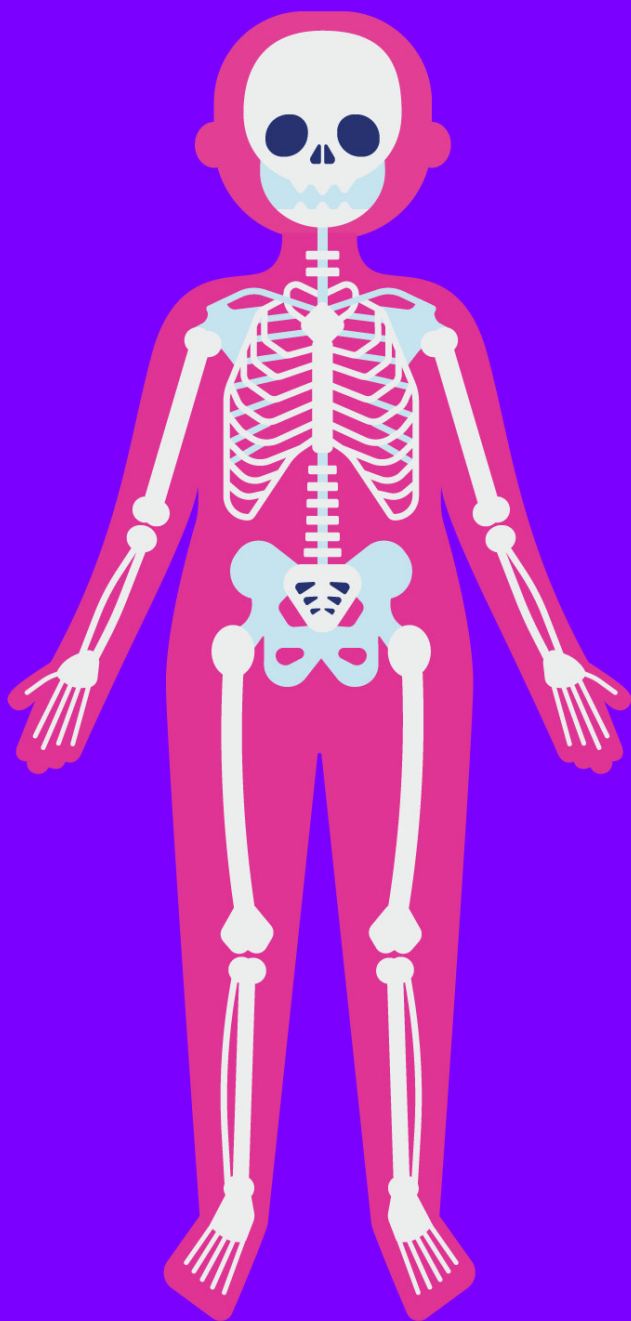
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these, so you proceed to investigate further. You approach the cook and see that the oil has spilled on his leg and foot. The skin is red and swollen. It is a second degree burn. You recall

from your training that you must run cool water on the burn for as much as 30 minutes or more to help remove all the heat and stop the burning process. You help the cook get up on the kitchen counter and put his foot in the sink, and start running water directly on the leg and foot, not hot, not cold, but cool. This is not a life-threatening emergency but he should go to the hospital as the skin may become infected and he will need bandages and antibiotics and because it is a 2nd degree burn larger than 1% of his body surface area.

Ambulance: It is the person's choice to go to the hospital immediately. They could stay and run water on their injury for a while, or they can go directly to the hospital. The choice is theirs. Regardless, you see that they burned about 2% of their body's surface (size of two palms), additionally the burned body part were his feet, and if you recall, burns to hands and feet require a visit to the hospital. Keep in mind that you cannot force someone to go to the hospital, it is their right to choose to go or not.

Re-evaluate: Continuously monitor the person, once finished cooling off the burn, wrap it in a clean cloth, and keep the person warm. Damage to a large area of the skin can cause hypothermia (a condition where the body temperature is too low).





TRAUMA: BROKEN BONES

RELATED BODY SYSTEMS: SKELETAL SYSTEM

All of the bones and joints in your body work together to allow you to move your body. Bones also protect organs from impacts and trauma (like your skull or rib cage). Additionally, deep inside their core, bones produce red blood cells

TERMINOLOGY

Splint

A hard object that is tied to a body part, such as a limb, in order to prevent movement of that bone or joint. There are splints created to fit body parts (like wrists or necks), there are splints that look like boards, and there are improvised splints: broom handles, sticks, pipes, etc.

Immobilize

To make something be unable to move. When someone has a broken bone, we want to immobilize it, so the person doesn't cause more damage.

Spine

A series of disk-shaped bones, in the center of the back which protect the spinal cord. Commonly called the 'backbone', it is made up of about 24 individual bones.

Spinal cord

A long strip of nerves that start at the brain, and travel to the bottom of the spine. The spinal cord has many branches of nerves that spread to all parts of the body, this way the brain can send instructions to all parts of the body.

Fracture

A break in a bone. It can be a complete break, a partial break, or just a very fine crack.

Joint

A point where two bones connect, which allows them to move

Sprain

An injury usually at a joint (ankle, elbow), where there is not a broken bone but instead damage to the tissue that connects bones (ligaments). They can be splinted to give the person relief from pain.



BROKEN BONES

What is a broken bone?

Bones are very strong but when enough pressure is exerted, or when impacted hard enough, they will either crack slightly or break into two or more pieces.

Some people can have a bone with a break so slight that they do not even notice, and have barely any pain, in which case, first aid is not necessary. However, in other cases the person will have a visible deformity and will be in great pain when moving that body part.

A broken bone that moves causes pain and a broken bone that is immobilized does not hurt as much. The movement causes pain. This is true for bones and joints. The injured area should be immobilized with a long rigid object (a splint).

What happens if it is not treated?

The person will be in considerable pain if the bone is not immobilized and if the bone is not aligned correctly, it may heal in the wrong position, causing a deformity which may cripple the person.

What causes a bone to break?

- Falls
- Trauma
- Car accidents
- Gunshot wounds

How do I know when I see it?

You will have no difficulty locating a fully broken bone. A bone or joint that needs to be splinted will be causing significant pain to the person, and though the person may not realize the bone is broken, they will be sure something is wrong due to the pain, especially when the bone or joint is moved. If a bone break is so minor that the person isn't aware of it, it may not need to be splinted.

How do I treat it?

A broken bone is immobilized by spanning a splint from the joint immediately above to the joint immediately below.

A broken joint is immobilized by spanning a splint from the bone immediately above to the bone immediately below.

1. For limbs: straighten the broken limb, so it is in a natural straight line, this will cause great pain. Find a long rigid object: broom handle, or something similar. Place it on the broken limb. Secure it using a bandage, tape or whatever you can find. Make sure the splint is long enough, if it is too short then it won't fully immobilize the limb.
2. Non-limbs (ribs, etc.). wrap the area with something slightly rigid like a magazine, and then wrap it against the body with a bandage.

Warnings

- If you encounter a broken arm or leg with the bone breaking through the skin (also referred to as an ‘open fracture’), do not touch the bone, and do not attempt to straighten out the arm or leg, simply wrap it, and splint it in the position that it is in.
- If you live in a city or town, it is best that you call an ambulance and have a doctor splint it for you, just to make sure you splint it in the right direction so that the bone heals at the correct angle (otherwise if it heals in the wrong direction you could be crippled). If you are in the wilderness or away from civilization then it is advised that you do the splint yourself.

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SCAN ME



How do I prevent getting broken bones?

- Maintain awareness of your surroundings
- Avoid being intoxicated by drugs or alcohol
- Avoid jumping from high heights
- Wear a seat belt when in a motor vehicle
- Ensure your diet has enough calcium and vitamin D so that your bones are not brittle. If you find your diet may lack these elements and if okay with your doctor, consider supplementing with Vitamin D and calcium. This is especially relevant in older

adults as these issues are more common and bones are more brittle with age.

Common Misconceptions

- If there is no bruising, then it is not broken. False! A broken bone may not have any visual signs that it is broken. Pain is a good indicator. The 'more broken' it is, the worse the pain will likely be.



SPINAL FRACTURES

What is a spinal fracture?

The Brain connects to the rest of the body via the spinal cord (a group of nerves), and from the spinal cord, nerves go to all parts of the body. The spinal cord is delicate, and protected by spine bones. The spine bones are strong but weakest in the neck, and can easily be damaged, for instance in a car accident.

Why are spinal fractures important?

Most spinal fractures occur in the neck, as that is the weakest area. A trauma strong enough to break the spine bones in the neck, could be strong enough to damage the spinal cord which is inside the spine bones. If the spinal cord is damaged, the brain may not be able to send signals to the body to keep it functioning and this may lead to death (which depends on extent of damage to the cord and the location of the damage).

What causes a spinal fracture?

A violent impact to the body strong enough to break the bones of the spine:

- Falling
- Motorcycle accident
- Car accident
- Getting hit in the head by an object

How do I know when I see it?

The trouble with a spinal cord injury is that the person may or may NOT feel any pain, but still have a tear in his spinal cord. Therefore, you have to assume that you are NOT able to see it.

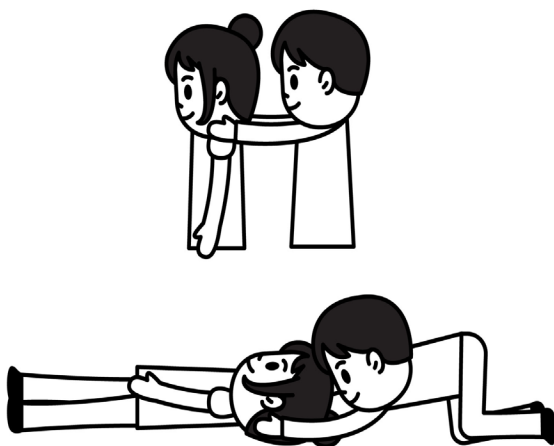
You assume that every person who has experienced any trauma to the head or significant trauma to the body, has a spinal cord injury.

This concern over spinal cord injuries is why emergency responders always immobilize the head, neck, and spine of a trauma victim, even if that victim seems okay in those areas.

How do I treat it?

You must explain to the person that it is possible they have suffered a spinal injury and cannot feel it, and that if they turn their head they could damage their spinal cord and die. Then explain that you need to hold their head for them until help arrives. Regardless of whether the person is seated, standing, or lying down, from a position behind them, you must hold their head straight and with two hands. Do not let go until an emergency responder arrives to take over.

When providing first aid, 'do no harm' is one of our guiding concepts. The issue of spinal cord injuries shows us clearly that doing absolutely nothing to the person BUT holding their head is actually the correct solution.



How do I prevent a spinal fracture?

- Always wear a seat belt when you are in a vehicle
- Always wear a motorcycle helmet when you ride

Warnings

- Do not allow the person to turn their head if you suspect a spinal cord injury.
- If you need to let go, find someone else to hold their head for you.

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for broken bones.

Your father is on your roof, installing strings of Christmas lights. He slips and falls off the roof, landing on his back on snow-covered ground. You hear a yell, and you rush outside.

What should you do?

Ask: You ask what happened and he said he fell off the roof. It was an 8-foot drop.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You suspect a possible spinal cord injury, given the height of the fall and the fact that he landed on his back, and determine it is an emergency.

Decide: Having identified it is an emergency, you tell someone to call 911.

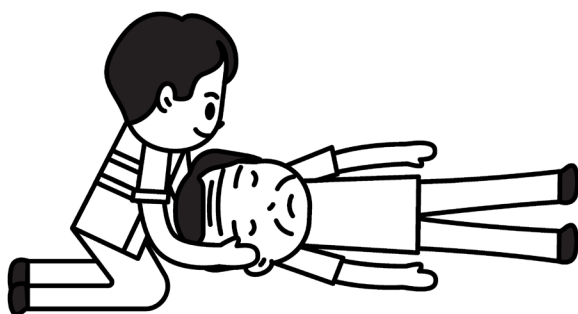
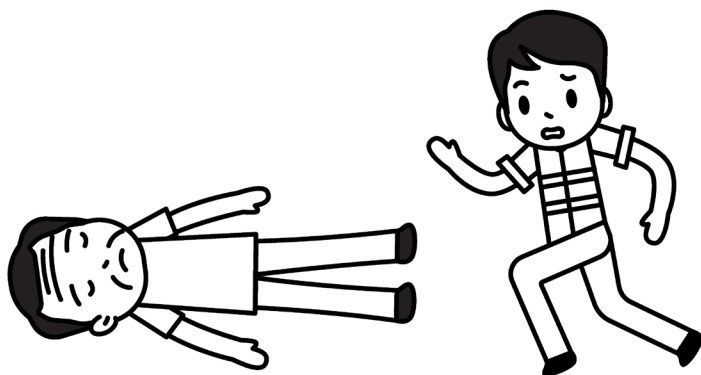
Safety: There are no dangers.

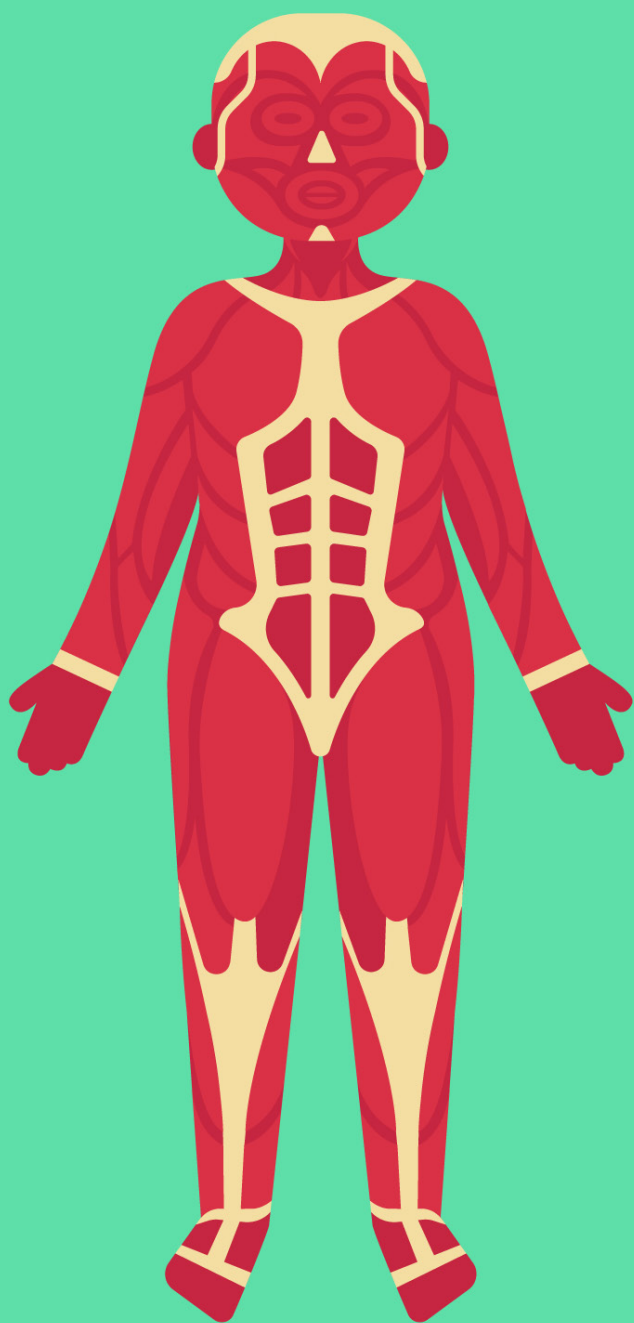
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there may be a spine injury. The very first thing you do is tell him not to move at all, as he may have a spinal cord injury and if he turns his head, he may damage his spinal cord. You know from your training that you should immobilize his head. You approach from behind his head, and hold his head steady with both your hands, while either sitting or squatting. You wait in this position until first responders arrive and can take over. With your hands still holding his head, look at

the rest of his body to see if there are any other life threats or injuries that need to be treated.

Ambulance: He needs to go to the hospital and get X-rays, and possibly more advanced scans, to determine if he have had any spinal cord injury from the fall. You will not be able to transport him yourself, because you don't have the equipment to properly immobilize the head. Therefore, you must wait for an ambulance.

Re-evaluate: Keep communicating with them and monitor their consciousness.





TRAUMA: SOFT TISSUE INJURY

RELATED BODY SYSTEMS: MUSCOSKELETAL SYSTEM

The skeletal system and muscles combine form the musculoskeletal system. It includes your bones, muscles and connective tissues: ligaments and tendons. Ligaments are tissues that connect bones to bones, and tendons are tissues that connect muscles to bones.

WHAT IS TRAUMA?

If the body is hit so hard that there is damage, the body has been traumatized. There can be light trauma, like hitting your toe on a door, in this case just some of your skin and muscle might be damaged. There can also be severe trauma like getting hit by a car. In this case you'll have damage to many systems of your body. Trauma can be sharp and focused like a stabbing from a knife, or it can be broad and spread out, like getting hit with a bat.

Trauma affects multiple body systems: skeletal, muscle, circulatory, and more, depending on what part of the body is hit.

The main concern with trauma is stopping life-threatening bleeding, and then transporting the person to the hospital to deal with damage to any of the other body systems.

TERMINOLOGY

Sterile

Something that is clean and free of germs.

Stabbing

An object punctured the body and left a hole. The object is no longer in the body.

Bandage

A light cloth, narrow and long, and rolled into a roll. It is used to wrap around a dressing. When you think of bandage, think of 'band', because it wraps around the body, like a band.

Trauma

An impact, from a strong force, hitting the body. It can be sharp and concentrated like a knife. Or it can be wide like being hit by a shovel.

Tissues

Parts of the body, like muscle, skin or parts of organs like the brain, lungs, heart, etc.

Dressing

A light cloth, usually in the shape of a square, that is used to put on a bleeding wound. A popular dressing is 'gauze', which is a light fabric.

Soft tissue injury

Injuries to the body's soft tissues: skin, muscle, and organs.

Impalement

An object punctured the body and is inside the body, with part of the object sticking outside the body.

The following objects can cause a stabbing or impalement

knife

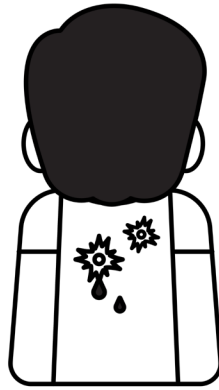
screwdriver

pencil

box cutter

pole

fence



GUNSHOTS

Gun-shot wounds (GSW) will have a small entry wound and a large exit wound. Oftentimes, the bullet will fragment when it enters the body: tumbling and breaking apart as it hits the body's organs and tissues. These bullet fragments cause additional damage to the body.

Some bullets go straight through without fragmenting, these may cause less damage. They are called 'through and through'.

Hollow-point bullets are designed to fragment once they hit the body and not exit out the other end. These do more damage internally. The purpose of the hollow point is so that the bullet does not exit out the body, and then hit an innocent bystander.

In addition to the damage caused by the bullet, there is also damage caused by the bullet's shock wave, as the bullet is traveling faster than the speed of sound. This shock wave can rupture organs and cause considerable damage to the body's internal tissues. Bullets that are pistol caliber have smaller shock waves than bullets from rifle calibers.

When getting shot in the chest or abdomen you should expect internal bleeding, however we are not able to treat that in the field. The person must be brought to the hospital for surgery.

Depending on the area of the body hit (certain parts of the chest/back), a gunshot wound may not even bleed much.

If the bullet or bullet fragment hits an artery or vein, or a blood-rich organ (liver), there will be serious bleeding, therefore, direct pressure will be needed, and if a limb, a tourniquet. You can't tourniquet the abdomen of someone shot in the liver.

Getting shot can be fatal or not, depending on what is hit:

- Head & neck, death instantly
- Limbs, arteries, and veins, may require tourniquet
- Heart, death instantly
- Digestive organs, not immediately life threatening
- Lungs, can lead to collapsed lungs, death eventually, but not instantly

Treatment

Apply direct pressure on the site with a dressing. Wait a few seconds to see if bleeding has stopped.

Determine immediately if the bleeding is serious enough (artery or vein) to call 911, and have someone call, while you hold direct pressure.

If bleeding did not stop, get more dressings and apply harder direct pressure. Wait a few seconds to see if bleeding has stopped.

If bleeding still doesn't stop, use a tourniquet for limbs, otherwise, continue adding more dressings.

Once the bleeding stops, if it was a serious bleed (artery or vein), hold direct pressure for at least 30 minutes, then wrap the whole area in a tight bandage. If it was not a serious bleed, hold direct pressure

for 15 minutes, then wrap the whole area in a tight bandage. If the bullet is still in the body, you will need surgery to get it removed at a hospital. Do not attempt to remove the bullet.

Gunshot wound to the chest & lung

When a gunshot wound has caused life-threatening bleeding, all we can do is apply direct pressure to the wound (unless it was a limb, in which case we can do a tourniquet). However, in the case of a gunshot wound to the chest, if the bullet does not hit the heart, and instead hits the chest cavity, where the lungs are housed, then a serious situation can develop.

The lungs are encased in their own container. This is an over-simplification, but if you suddenly have a hole over your chest, that hole will act as a ‘nose’, and start sucking in air, and air will not flow as effectively from your actual nose (air coming from your noes goes down your airway passages, whereas air sucked into the gunshot hole just collects in the chest). This hole over the chest begins to collect air and it does not release the air effectively when you try to breathe out. The end result is air and blood building up in the lung cavity (container), which puts a lot of pressure on that lung, and makes the lung collapse. Lungs are very fragile. The end result is an inability to breathe, and then death.

How do I treat it?

The treatment for a chest wound from a stabbing, or a bullet, or any other puncture is as such: place a piece of flexible plastic (cling wrap, plastic bag, etc.) over the site, so that air does not get sucked in. This will provide some immediate relief to the person. Tape this piece of plastic on three sides, leaving the fourth side un-taped. It is essential to also check for an exit wound, and seal that as well, but on the exit

wound, tape all four sides of the plastic piece (a complete seal). We use plastic because it does not let any air through.

The person still must be brought to the hospital and have surgery.

Do not bother to find and pull out any bullet fragments.

Every time they breathe in, despite the GSW's being sealed, some of the air they breathe in will get trapped in the lungs. This is because the bullet damaged the lung compartments, which are normally air-tight, and created a hole where air can now enter and become trapped—compressing the lungs (more air in the lung compartment means less space for lungs to expand within that compartment). Therefore, breath by breath, more air will get trapped and eventually there will be so much air trapped that the person will not be able to breathe. The solution is to get that air out! This is why we tape 3 sides on the front wound: this allows you to occasionally open the bandage (also known as 'burping' it) and allow the extra air to come out. After you do that, the cycle repeats again, with air gradually building up inside the lung compartment, until you need to burp it again. Note, that if by lifting the untaped bandage up (burping) does not give the patient relief, you should try pushing down on the chest while burping it, to force the air out.

Here are the steps, from start to finish:

1. Locate the entry wound. Remove any blood and quickly find a piece of non-porous dressing (something that does not have holes): plastic, rubber glove, plastic bag, credit card, anything, place it directly over the hole, tape 3 sides (if you can't get tape, just hold the plastic down with your hand)

2. Flip the person over, locate the exit wound, if present, wipe off blood, place a piece of plastic over the hole, tape on all 4 sides
3. Monitor the person and burp the piece of plastic (non-porous dressing) as needed (when the person begins to have a harder time breathing)

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SCAN ME



How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a gunshot wound.

You are at a gas station filling up your tank. You see a man run into the station. You hear a gunshot and you then see him run out.

What should you do?

Ask: Because the potential victim is out of your reach you cannot ask them anything, and you obviously are not going to ask the person who you saw running out since they may be the shooter.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You assume that someone has been shot and is in a life-threatening situation.

Decide: You call 911.

Safety: It is too dangerous for you to run towards the station, as the shooter may see you. Therefore, you have to wait for the shooter to run away, before you go inside the station to help. It is important that you survive, so that you can help those who are hurt.

Treatment: You run into the station and see a man on the floor, apparently unconscious, with a gunshot wound to the chest. You check his consciousness by tapping him on the shoulder. He does not respond. You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is unconscious, and since you can't ask them what is wrong, you need to check if they are breathing and if they have a pulse. You check for a pulse. He does have a pulse. You check for breathing. He is breathing but very shallow. You sit him up, as it will be easier for him to breathe, sitting upright. You note he has a bullet hole over his lung area. You look behind him and note there is no exit wound. You remove his shirt and expose the wound. You take a bag of chips, open it, remove the chips, and take the empty bag, flatten it, and place it on his chest, so that air does not get sucked in. In this case

you do not have tape to tape it down on three sides, so you'll have to use hold down the bag with your hand to keep it in place.

Ambulance: The person must be transported immediately to the hospital. Inform the 911 operator and they will help you get an ambulance as soon as possible. If you are in an area where you cannot reach ambulance services, then you will have to transport the person yourself.

Re-evaluate: Since this person is having difficulty breathing, give them rescue breaths. Remember to 'burp' the piece of plastic you put over their chest, to let the air out. Monitor their pulse. If they lose their pulse (their heart stops beating) they will need CPR. It should be noted that any damage to the chest from stabbings or gunshots will likely be worsened if you have to do chest compressions, however that is a secondary concern. The main concern is to keep their heart pumping, therefore, if their heart stops, then you must do CPR in spite of the damage it may cause to the chest when you push down.





STABBINGS

Contrary to what TV & movies have taught us, a person can be stabbed and not die, as long as no vital organs were hit, and as long as they did not lose too much blood. A less immediate but relevant concern is that survival also depends on not dying from an infection from a dirty object penetrating into their body; though this issue is addressed within the hospital by medical professionals by disinfecting the wound and giving the patient antibiotics).

Wounds can be just the size of the blade on insertion, or wounds can be large slashes, which are often shallower than a stabbing. Oftentimes in the case of stabbings, there will be multiple puncture sites, not just one. Due to the nature of the injury, stabbings are commonly deep, and so the likelihood that they will cut large veins and arteries that lie deeper within the body is high, therefore the chance of serious bleeding is high.

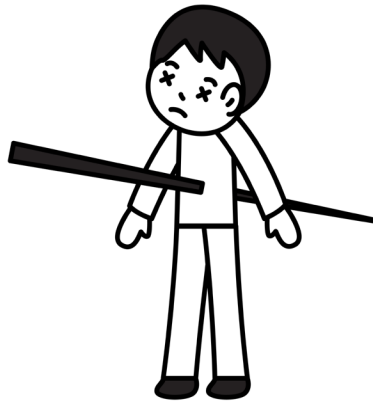
How do I treat it?

Apply direct pressure on the site with a dressing wait a few seconds to see if bleeding has stopped, if not, keep adding more dressings and direct pressure.

Determine immediately if the bleed is serious enough (artery or vein) to call 911, and have someone call, while you hold direct pressure. For instance, if after a few seconds of strong pressure to the stab wound site the bleeding has not stopped, it is likely a significant vessel such as a large vein or artery has been punctured and professional medical assistance is needed immediately.

If bleeding still doesn't stop, use a tourniquet for limbs, otherwise, continue adding more dressings.

Once you observe that the bleeding has stopped, if it was a serious bleed (artery or vein punctured), you would continue to hold direct pressure for at least 30 minutes. You would then wrap the whole area tightly in a bandage. If it was not a serious bleed, you would hold direct pressure for 15 minutes after observing that the bleeding had stopped, and then you'd wrap the whole area tightly in a bandage.



IMPALEMENTS

Impalements most often occur when a person falls and lands on a sharp narrow object. Depending on where the object penetrates, it may not be life threatening, as long as it does not pierce any vital organs or major blood vessels, causing serious bleeding.

The most important thing to know about impalements is that you must never remove them.

If you remove an impaled object you may damage blood vessels when removing it, leading to more bleeding. The object may also itself be blocking a blood vessel from a potential bleed, thereby if you remove it, you'll open the flow. Additionally, you may damage nerve endings by removing objects.

The next most important thing to know is that an impaled object is at risk of it getting either:

- Pushed through the person accidentally, causing damage, and bleeding or
- Getting removed accidentally, and causing damage, and bleeding as it exits

How do I treat it?

Secure the impaled object to the body with a bandage, by tying them together:

1. Take a bandage and wrap it around the object
2. With the two tails of the bandage, wrap them to the body, securing the object to the body

Warning

- Do not remove the object
- If it falls out, don't put it back in
- Don't push it in further to secure it

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How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a stabbing/impalement.

You are leaving a restaurant and are walking along a sidewalk in the city. You pass by a construction site where you hear yelling and screaming. You turn your head and you see a worker lying on the floor, surrounded by other workers.

What should you do?

Ask: You walk up and ask them what happened. They tell you the man was walking, slipped and fell on a screwdriver, and the screwdriver is now stuck in his abdomen.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

There is a possibility for severe internal bleeding if the screwdriver punctured the liver, therefore you determine it is an emergency.

Decide: You have a worker call 911.

Safety: To prevent anyone else from slipping, you tell the construction worker to handle the slippery surface.

Treatment: The patient is conscious, in pain and panicking. You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these, so you proceed to investigate further. There is no bleeding. He wants to take the screwdriver out. You have to convince him to leave it in. Next, you need to secure it, so it does not accidentally fall out or get pushed deeper into the body. You tell one of the workers to go get a first aid kit. When they return, you take

out a bandage roll, and wrap the bandage roll around the handle of the screwdriver and then around the body of the worker, over and over, from different angles until it is as secure as you can make it.

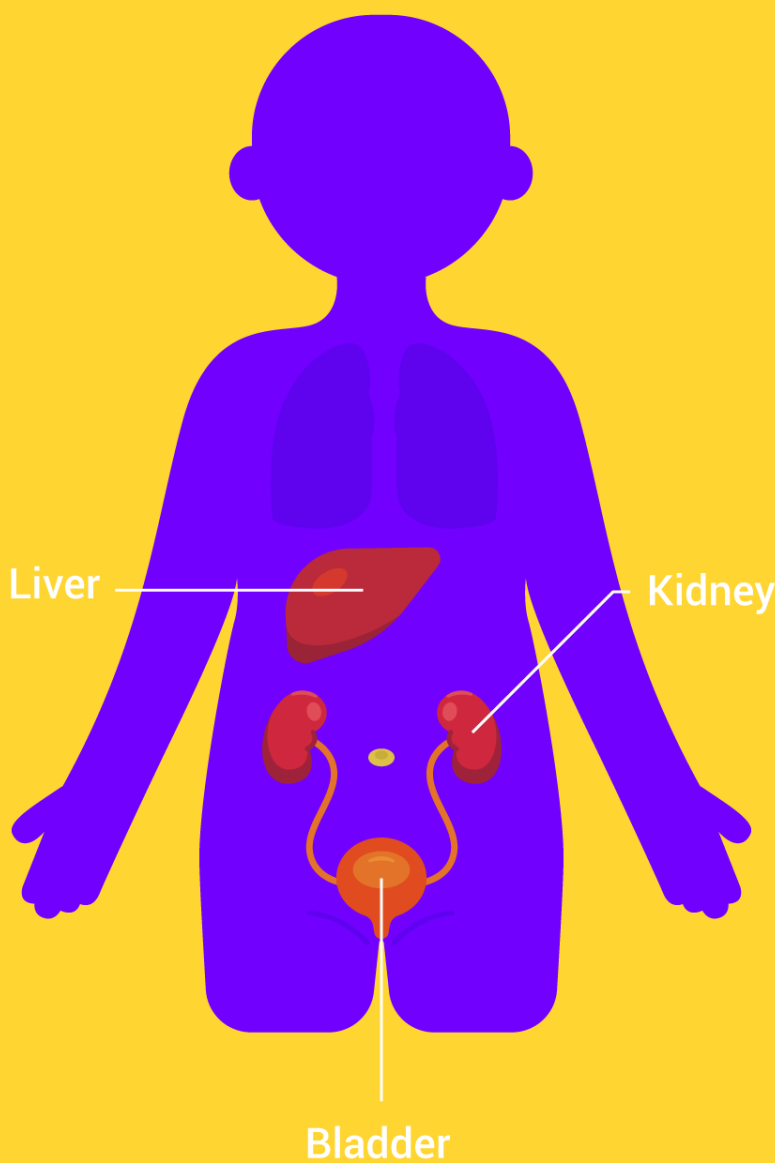
Ambulance: The person must be transported immediately to the hospital. Inform the 911 operator and they will help you get an ambulance as soon as possible. If you are in an area where you cannot reach ambulance services, then you will have to transport the person yourself.

Re-evaluate: Keep monitoring the person, and watch for signs of shock, due to internal bleeding (pale skin, sweating, fainting/loss of consciousness, etc.). If he goes unconscious and has no pulse, be ready to perform CPR as needed



Common misconceptions

- When shot, you must remove the bullet right away, otherwise the person will die. False! It is not necessary at all to remove the bullet immediately
- If you've been shot, you will die. False! The majority of gunshot victims do live. While a shot to a vital organ will likely result in death, a person can be shot several times, in non-vital areas and still fully recover
- If you've been stabbed, you will die. False! If a person has been stabbed in a vital organ then it is more likely they will die, otherwise they could be stabbed many times in non-vital areas and still fully recover. It all depends on what exactly the object has punctured, and it is possible that the object punctures all the way into your body and yet does not pierce any vital organs or major blood vessels



Liver

Kidney

Bladder

POISONING AND DRUG OVERDOSE

RELATED BODY SYSTEMS: THE EXCRETORY SYSTEM

This is a system of organs all working together with one simple goal: remove waste, chemicals, poisons, etc from the body. The liver, kidneys, and others all play a key role in removing harmful substances from the body.

The word 'excrete' means to 'separate out and get rid of'.

TERMINOLOGY

Opioid

A drug that has similar effects to the drug opium. Opioids slow you down, slow your breathing, relieve pain, and give a feeling of pleasure. They are highly addictive.

Amphetamine

A drug that speeds you up, increases heart rate, and increases breathing, and gives a body-wide feeling of pleasure. Amphetamines are highly addictive.

Antidote

A substance that can counteract a poison.



OVERDOSE

What is an overdose?

Death by drug overdose is a problem within dense urban centers and small rural towns. The most commonly encountered overdoses are from opioids: (heroin, fentanyl, oxycodone, morphine), and amphetamines (cocaine, crack, meth, ecstasy).

These substances are taken for pleasure, but they are toxic to the body. As toxins, they can easily overwhelm the body even when taken in small amounts.

While over-doses are usually from drugs one is intentionally taking, they can be unintentional if one is taking the wrong medication at the wrong dose.

What happens if an overdose is not treated?

Overdoses with opioids slow breathing to dangerously slow rates, so slow that the person may cease breathing altogether, and then go into cardiac arrest, and die.

Overdoses with amphetamines increase heart rate and overwork the heart, resulting in a heart attack and death, they can also lead to

extremely high blood pressure and stroke due to a ruptured brain blood vessel bleeding (stroke from bleeding in the brain).

What causes it?

As a toxin, very low doses of a drug may only have light effects, but as the dose increases the effects change drastically and can overwhelm the heart, circulatory system, breathing and other body systems. Additionally, everyone has different sensitivities to drugs, so it is not always easy to know how much would be too much for a person.

How do I know when I see it?

Opioid (heroin, fentanyl, oxycodone, morphine), overdose: sleepy, unconscious, groggy, shallow and slow breathing, small pupils, confused, behaving in a slower and more sedated way.

Amphetamines (cocaine, crack, meth, ecstasy) overdose: extremely high blood pressure, fast heart rate, chest pain, muscle spasms, hyperthermia (body is too hot), abnormal breathing (especially rapid breathing), heart failure, wide pupils, behaving in a very hyper, excited, or agitated way. Sweating. Behavior symptoms may include: paranoia, delusions, terror/fear, aggression,

How do I treat it?

Opioid overdose can be treated outside the hospital, by using the over-the-counter medication: naloxone, which is sprayed into the nostril.

While there is no antidote for an amphetamine overdose, you can provide supportive care by giving them a calm environment, removing layers of clothing, cooling them off, and giving them water to combat any dehydration.

How to treat an opioid drug overdose

(heroin, fentanyl, oxycodone, morphine)

1. Nudge the person vigorously to determine their level of consciousness. If semiconscious or unconscious, or groggy and there is evidence of opioid use, they are candidates for naloxone. If they are awake and speaking, they have not overdosed. Other symptoms of an opioid overdose: slowed breathing, pinpoint pupils, slow pulse
2. Call 911
3. Follow instructions on the Naloxone spray device
4. Lay the person on their back, tilt their head back, and lift their chin
5. Insert the tip of the naloxone spray device into one of their nostrils
6. Push the plunger inwards to spray the medication into the nostril
7. Remove the device
8. Move the person, so they are lying on their side and not their back, so that if they vomit, they will not choke on it. The medical name for such a position is the recovery position
9. If you see no improvement in their breathing or consciousness after 2-3 minutes, give them another dose with another naloxone spray device in their other nostril

Warnings

- Pay close attention to your safety, and the surrounding environment when dealing with drug overdoses, as there may be criminals nearby
- Be aware that it is not uncommon for people who have overdosed on opioids and who have been brought back with naloxone to

react in an agitated or aggressive manner in general or towards those around them. They may perceive it as being robbed of their 'high' and therefore may react irrationally and in a manner that seems ungrateful towards the rescuers. At any case, be aware of this possibility and create space between you and them in order to safeguard against this situation.

- For stimulant & amphetamines drugs (cocaine, ecstasy, meth), you can provide supportive measures to people on outside the hospital but it isn't the 'full treatment' you'd get in a hospital

How do I prevent it?

- Do not take or experiment with drugs regardless of what people say to convince you
- Stay away from people who do take drugs
- Seek pleasure from things that are not toxic substances
- If currently taking prescription medication, always ensure you read the bottle and know your dose before taking it
- Add naloxone to one's first aid kit, and to ensure that family members and friends have naloxone in their homes and cars

Common misconceptions

- You can't overdose on the first time you take a drug. False! An overdose occurs when you take too much of a drug, and everyone has different tolerances and sensitivities, therefore even a small amount can cause someone to overdose
- You can't overdose if you've used a drug for a long time. False! Even if you are desensitized to a drug, there is still an amount that will kill you, because drugs are toxins
- You can use Naloxone for all drug overdoses. False! It only works on opioid drugs

- You can't overdose on a medication prescribed to you. False!
You can overdose on any medication

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a drug overdose.

It is nighttime and your neighbor knocks on your door, they tell you they need help, their friend overdosed on something.

What should you do?

Ask: You go with them and find a person lying on the ground, apparently unconscious. You ask what happened, the friend says they don't know. You tap the shoulder of the person and they seem to be unconscious.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

The person is unconscious. You don't know what is causing it, but regardless it is an emergency.

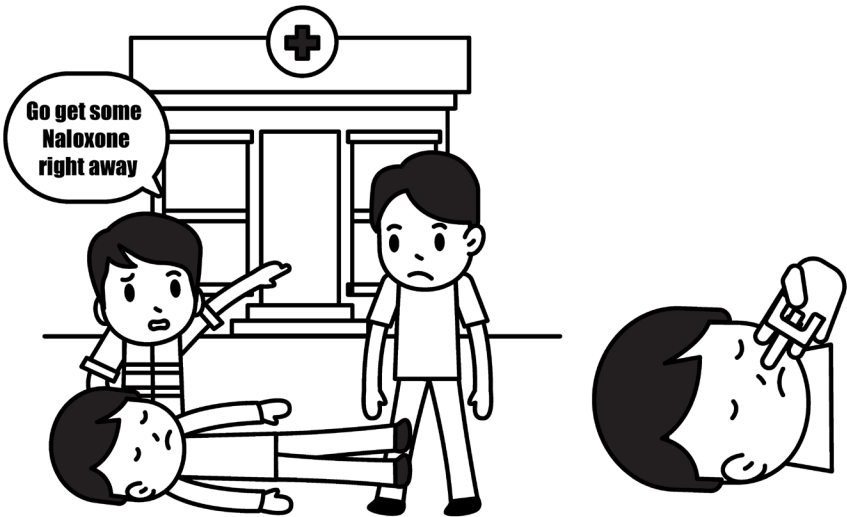
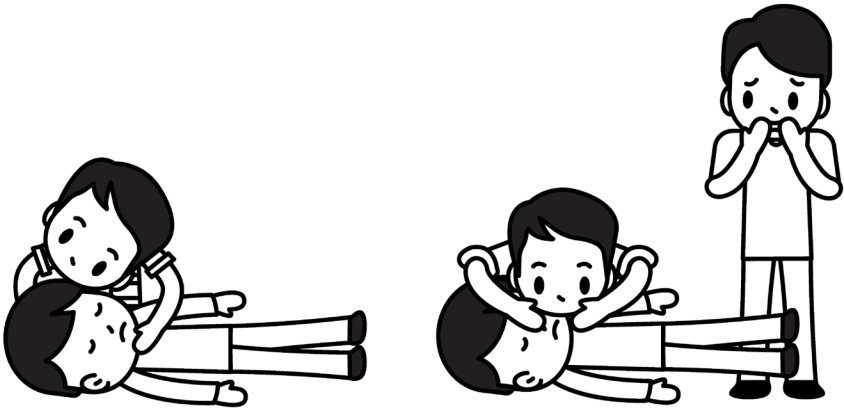
Decide: You tell the friend to call 911.

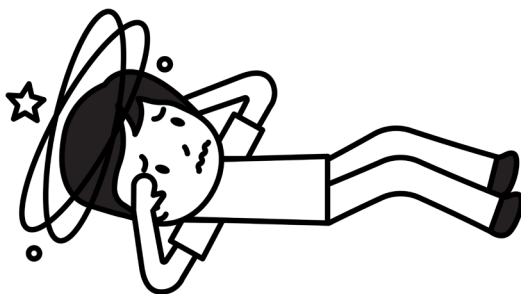
Safety: Because this is the scene of a drug overdose there may be other dangers present, such as armed criminals. Use your judgement to decide if it is safe enough for you to stay.

Treatment: You tap on their shoulder and shout at them, but they do not respond. You note that they are unconscious (unresponsive). You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is unconscious, and since you can't ask them what is wrong, you need to check if they are breathing and if they have a pulse. You check immediately for a pulse and for breathing. You feel a pulse, but you see that their breathing is shallow and not adequate. So you start giving rescue breaths, at rate of one every 5-6 seconds. Due to the circumstances you conclude that this person may be an opioid overdose. You tell the friend to call 911 but they refuse. You tell them that, they must go to a drug store and purchase Naloxone, which will counteract the overdose. Once they get the Naloxone, follow the instructions on the bottle, by spraying it into the nose. The person should then wake up.

Ambulance: In this case it would be best for you to convince them to call 911 and get the person into an ambulance, so that they don't die. If they refuse to call 911, you should do it yourself. Opioid overdoses can become fatal quickly, and if it takes the friend a long time to go get naloxone, that may be too long.

Re-evaluate: Keep monitoring the person's breathing and pulse. Opioid drug overdoses are at a high risk for losing the ability to breathe, which means they will need CPR.





POISONING

What is it?

There are many household items we keep in our kitchens, or elsewhere that may not look like poison, but certainly would be toxic and potentially fatal to our bodies. In addition to poisoning by cleaning chemicals, there is also the chance of poisoning by taking the wrong medication, or too much, or even eating poisonous plants & berries from the outdoors.

What happens if it is not treated?

Considering the vast amount of different substances that one could be poisoned by, there is no way to cover them here. But put simply, if left untreated some poisonings may simply cause you prolonged nausea, vomiting and diarrhea, whereas others may cause unconsciousness, inability to breathe or heart attack. Therefore, it is essential that you call 911 so they can transfer you to your local Poison Control office to find out exactly what your options are.

What causes it?

Many poisonings are caused by accidentally taking the wrong medication, accidentally taking too much of the right medication, and in the case of children, ingesting household chemicals or poisonous mushrooms & berries.

How do I know when I see it?

Considering the almost unlimited number of things that could poison a person, it is impossible to have a set list of signs and symptoms to look out for. This is why it is so vital that you call 911 and get transferred to Poison Control.

How do I treat it?

You should make an effort to determine what the poison was. If it was from some sort of chemical that you keep in your house, you should retrieve the bottle, and look on the back of it, to find instructions on what to do if the poison is ingested. If it was a different substance, such as a plant, try to identify exactly what it was. This will be key information for medical workers.

Whatever the form of poisoning may be the answer is always simple: call 911 if you suspect you or anyone in your care has ingested poison. They will transfer you to a poison specialist.

Unfortunately, there is little that can be done outside a hospital for someone who has been poisoned. In some cases, you could take activated charcoal (a thick black liquid substance that you drink which coats your digestive system and helps to absorb toxins and so can prevent poisons from taking effect), but this is not always the solution. For poisoning, the best solution is to always call 911 so they can connect you with a poison specialist.

How do I prevent it?

- Keep all cleaning chemicals out of reach of children
- Do not take expired medication
- Do not take medication which has labels that are unreadable
- Do not take medication not prescribed to you
- Do not eat wild berries, plants or mushrooms

Common Misconceptions

- You should force yourself to vomit if you've ingested poison. False!
Do not force yourself to vomit unless a medical professional has directed you to do so. The poison may cause damage in your esophagus (the passage where your food goes to your stomach), and may be accidentally inhaled into your lungs if you vomit
- You should drink milk to help counteract the poison. False!
Do not drink anything unless instructed to do so by poison control

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a poisoning.

You are at a friend's house eating dinner. Your friend gets up to walk into the kitchen to get dessert and you hear a scream.

What should you do?

Ask: You go to the kitchen, to ask what happened. You see their child on the floor next to a bottle of what appears to be a cleaning liquid. He looks ill.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

The child may be unconscious and also may not be able to breathe, either right now or if not at the present moment then in the near future, so therefore it is an emergency.

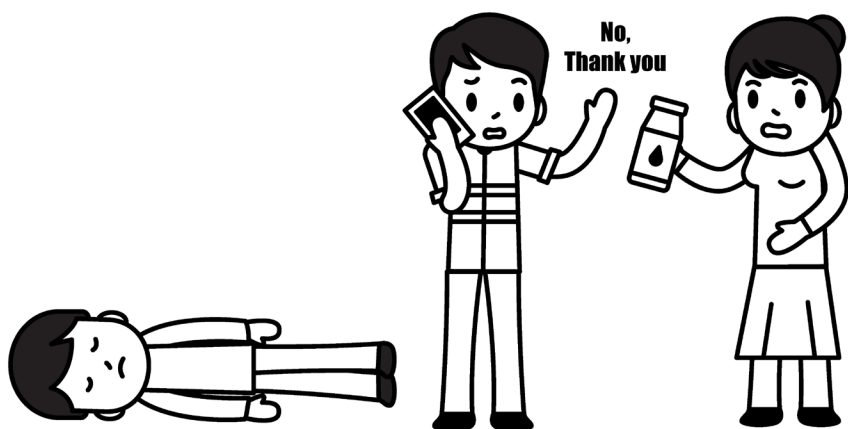
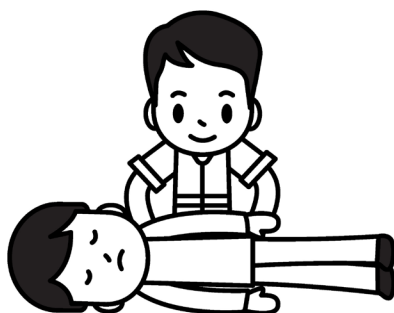
Decide: You tell the parent to call 911.

Safety: The area is safe.

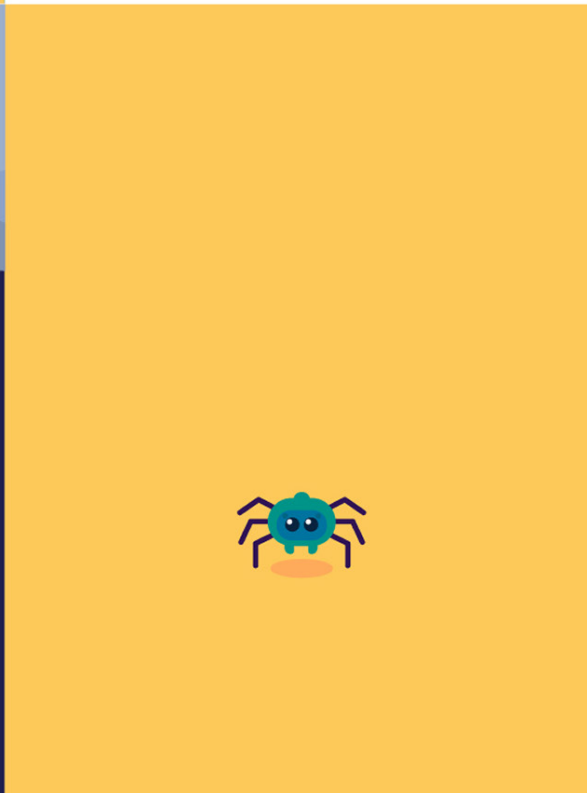
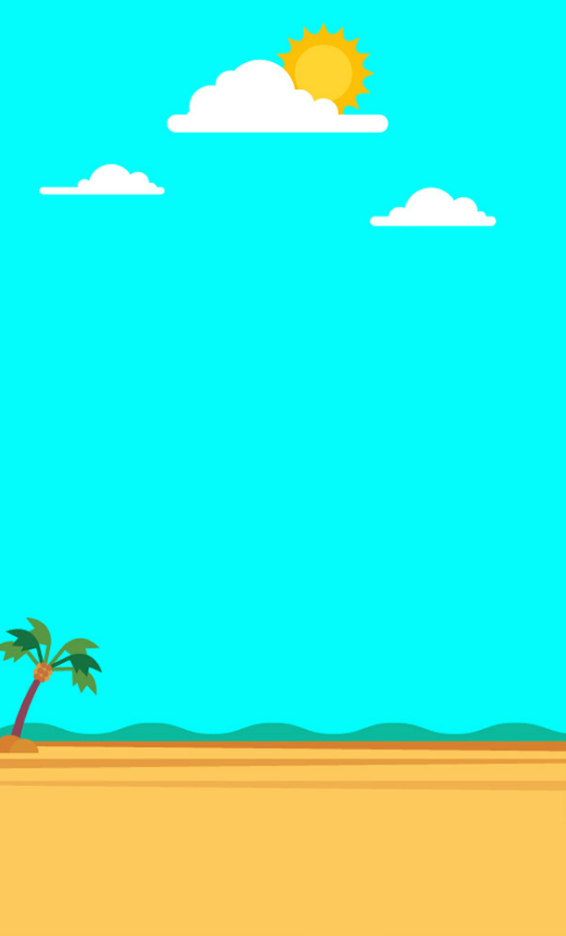
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is unconscious, and since you can't ask them what is wrong, you need to check if they are breathing and if they have a pulse. You check the child's pulse and breathing and see that they do have a pulse and are breathing. The bottle of cleaning fluid does not have a label on it, so you do not have any directions on what to do if the liquid is ingested. At this point, all you can do is wait for the 911 operator to transfer you to poison control and follow their instructions. Make sure not to give the child any water, milk etc unless poison control tells you to do so.

Ambulance: The child must be transported immediately to the hospital. Inform the 911 operator and they will help you get an ambulance as soon as possible. If you are in an area where you cannot reach ambulance services, then you will have to transport the child yourself.

Re-evaluate: Keep monitoring the child, watching carefully to see if his pulse or breathing stops, at which point you must give CPR.







ENVIRONMENTAL EMERGENCIES

WHAT ARE ENVIRONMENTAL EMERGENCIES?

Environmental emergencies is an umbrella term used to cover injuries or illnesses caused by nature.

They are but, not limited to:

- Hot weather
- Cold weather
- Lightning
- Drowning
- Animals & insects

TERMINOLOGY

Frostnip

Frostnip occurs before frostbite. The skin has become too cold and becomes red, numb, and you lose sensation. When you rewarm the skin you feel pain.

Amputation

The surgical removal of a body part.

Venom

A poison (toxin) created by an animal which it uses to harm other animals.

Frostbite

If frostnip is not treated and you continue to stay out in the cold the skin and tissues start to freeze and the damage worsens.

Heat exhaustion

If someone is too hot for too long they will begin to get heat exhaustion. They'll may feel dizzy, be sweating profusely, nauseous, rapid heart rate.

Antivenin (antivenom)

A substance that can counteract the harm of venom.

Heatstroke

After someone has had heat exhaustion for long enough, and does not get cooled down, they will then progress into heatstroke. They may be unconscious or have a headache & nauseous or an altered level of consciousness. Their body will not be able to sweat as much, their skin may be dry, they will have a rapid pulse. Their body temperature will be above 103F or 39C.



WHAT IS HEATSTROKE?

In order for the body's cells to operate properly, the body must maintain a very exact internal temperature. Going just a few degrees above or below this can cause cells to stop working properly and if the body temperature is high enough, loss of consciousness may result. This is because the brain, like the rest of the body, must operate within a certain temperature range and going beyond or below that range can harm it.

The main way the body cools itself is by sweating. The body sweats and the sweat evaporates off the skin, and when it evaporates, heat goes with it, resulting in cooler skin. If one has been in the heat too long, or has exerted themselves too hard in the heat, the body will be overheated and will stop sweating, at which point the body temperature will not go down, but will stay high and even increase. One major factor that leads to the sweating mechanism being stopped is dehydration, in that the body will conserve water and electrolytes if it is dangerously low on them, as a priority over sweating.

What happens if it is not treated?

The body has become too hot and it cannot cool itself, resulting in rising body temperatures, which can result in exhaustion, disorientation,

and unconsciousness. Most commonly affecting elderly and children, heatstroke can also occur to healthy adults who have simply overexerted themselves. While it is not fatal for most people, it can be for the elderly, especially if they are left untreated over a period of time. When heat waves come through cities and people die as a result, it is usually the elderly population as a result of neglect and the fact that they are more at risk to negative effects of heatstroke. Elderly people are also not as perceptive of temperature differences and can so be injured by overexposure to heat and or dehydration, as they cannot perceive thirst as well either.

What causes it?

Being in the heat too long, or working hard in the heat, without cooling off. Heatstroke can occur in the Summer in nearly any climate, except for the arctic. Contributing causes are many. A humid environment makes it harder for sweat to evaporate, which could contribute to overheating. Also, many medications can impair one's ability to sweat and thus contribute to heart stroke. Examples include heart and allergy medicines.

Dehydration also contributes to heatstroke. So long as the body is hydrated enough it WILL sweat, but once it is too dehydrated it won't and this causes heat exhaustion to heat stroke and makes for a worse situation.

Spotting the symptoms: How do I know if someone has heat stroke?

The signs of heatstroke are dehydration, hot, red skin, fast strong pulse, fatigue, loss of consciousness or mental impairment.

Before heat stroke, a person has heat exhaustion. It starts with weakness, exhaustion, nausea, sweating.

How do I treat heatstroke?

Treat heatstroke by getting out of the heat and cooling down and removing clothing, taking a cold bath, wrapping in wet towels and placing a fan to blow on the person. It is also crucial to hydrate oneself as dehydration is often a cause. Drink cool water and consume electrolytes, such as by taking Gatorade or some other drink with sodium and potassium.

How do I prevent it?

- Take breaks to cool yourself down if you are working in the heat
- Stay hydrated, don't wait until you are thirsty, by then you are already dehydrated
- Take electrolytes. When you sweat you lose these, and their loss may result in headaches due to dehydration of the body, which causes pain in the brain (the brain is mostly composed of water).
- When you start to see signs of heat exhaustion address it before it becomes heatstroke

Common misconceptions

- Heatstroke can only happen in the Summer. False! It can happen in any season
- Heatstroke only happens when you're outside in the heat. False! Heatstroke commonly happens indoors to elderly people who don't have air conditioning

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for heatstroke.

You are visiting your grandmother. She lives in an nursing home, which has nurses on staff. You enter her apartment and notice it is very hot and humid. You locate your grandmother and find she is disoriented, confused but conscious, lying in bed.

What should you do?

Ask: You ask her what happened, she makes some sounds and says some words but you are not able to understand her.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

She has an altered level of consciousness, which is an emergency.

Decide: You call out for a nurse and tell them to call 911.

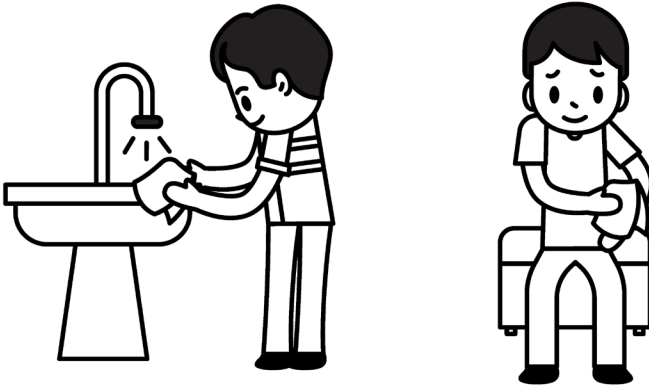
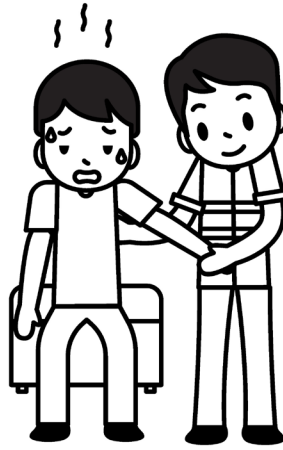
Safety: The area is safe.

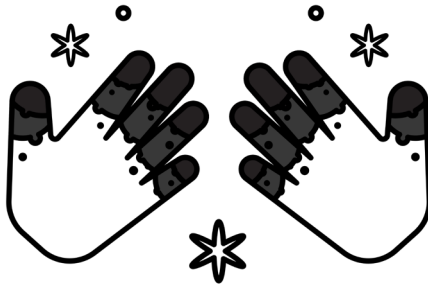
Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). You check her pulse and breathing. You see her pulse is fast, and her breathing is rapid, with this information, the heat of the room and her altered level of consciousness you determine that she has heat stroke. You check her skin and it is dry and hot, which is another indication. You go to

turn on the air conditioner, but it is broken. You must cool her body down. To do this, you go to the bathroom, get a towel, pour water on it, and then wet her body with the towel. Next, you take a dry towel and 'fan' air over her. This will help cool her down. Next, deal with the dehydration by getting them a cool glass of water or Gatorade and offer it to her to drink if she is able to (conscious enough to do so safely).

Ambulance: She must be transported immediately to the hospital. Inform the 911 operator and they will help you get an ambulance as soon as possible. If you are in an area where you cannot reach ambulance services, then you will have to transport her yourself.

Re-evaluate: Keep monitoring her, especially her breathing. Watching carefully to see if it improves after you cool her down, you may need to provide rescue breaths.





FROSTBITE

What is frostbite?

Frostbite is the freezing of the tissue, blood vessels, and cells, resulting in cell death. It has phases with light frostbite (frostnip), to intermediate frostbite, and then irreversible frostbite (requiring amputation).

What happens if it is not treated?

If left untreated and if deep enough frostbite may require amputation, as when cells are frozen solid and then thaw they die. If detected early and it is intermediate frostbite, it will be reversible and will have no lasting damage. Frostbite progresses through phases if left untreated: early (frostnip), intermediate (red blisters), and deep (black skin).

What causes it?

Being in the cold too long without sufficient protection for body parts. The colder the weather, the more cold protection you will need. Frostnip can occur in minutes on skin that is bare. Depending on temperature, and wind, if one has bare, unprotected skin, they can get frostbite in under 10 minutes.

Spotting the symptoms:

How do I know if someone has frostbite?

Early frostbite will feel like pins, needles, throbbing, numbness, and the area will look red. This is also called 'frostnip'. The skin will not feel hard like a block of ice.

Intermediate frostbite will look very pale and white and later turn red and have blisters and swelling when the skin is thawed. This does require medical attention from a professional.

Deep frostbite will feel hard and cold to the touch outside, and appear white or blue in color. When the skin thaws it will be red, have blisters and turn black.

How do I treat frostbite?

For early detected frostbite, get out of the cold, and start gradual warming of the area, by only room temperature and warm water, and nothing hot. For intermediate (red blisters) or deep frostbite, you must go to the hospital.

Warnings

- Do not put frost bitten injuries in hot water
- Do not try to amputate yourself
- Do not thaw out your frost-bitten body parts if there is a chance it will freeze a second time
- Do not drink alcohol to warm yourself.
- It is key to GRADUALLY warm up the body parts. No hot showers, no hot baths, no saunas, because the body part is likely numb and you may accidentally damage your tissues by unwittingly applying too high a temperature and not feeling it.

How do I prevent it?

- Always wear gloves when going out into the cold, even if only for a few minutes
- Don't forget to cover the ears and nose, as these are some of the most common body parts to get frost bitten

Common misconceptions

- If you get frostbite, you will lose that body part. False! The early & intermediate stages of frostbite will not require amputation
- Alcohol warms the body. False! It may feel like it, but it does not actually warm the body, but does the opposite, and lowers body temperature

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for frostbite.

It is Winter. You and some friends are on a snowboarding trip in the mountains. After an hour of snowboarding one of your friends says they can't feel their hands at all.

What should you do?

Ask: You ask your friend how long their hands have felt like that, and they said for about an hour. They show you their hands and they are white.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

At this time the situation is not a life-threatening emergency.

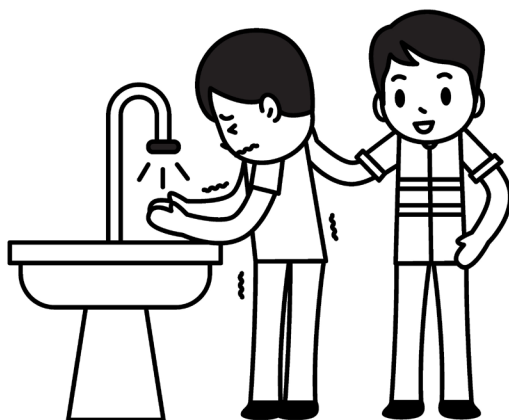
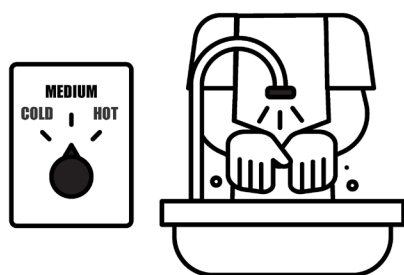
Decide: You decide not to call 911.

Safety: The area is not safe for your friend, because of the continued exposure to the cold. Therefore, you must bring them indoors, where they can warm up.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these, so you proceed to treating the frostbite. You need to thaw your friend's hands under warm or room-temperature running water. Not hot water. It is also vital that you do not thaw the hands if there is any chance that they may again freeze. For example, you wouldn't try to thaw their hands outside while you're still in the cold, because the hands may freeze again. As you warm their hands it will be extremely painful for your friend. This is normal, just continue. Many people may take the feeling of pain as a signal to stop, but you must not stop, and you must push through the pain and continue to gradually warm the body part.

Ambulance: There may be no access to any ambulance, or emergency services. Contact your hotel to find out if there is a doctor on call who can come help.

Re-evaluate: Keep monitoring to see how bad the frostbite was. If you notice swelling and blisters, then this is intermediate or deep frostbite and you must go to the hospital. If it just stays red and the pain goes away, then it was frostnip (early frostbite), and does not require hospitalization.





BITES & STINGS

What is it?

Regardless of where you live (except for the Arctic) there will be venomous insects, and other creatures, whether by air, land or sea.

As soon as a venomous creature has injected its venom through your skin, the venom is instantly in your bloodstream.

The vast majority of bites come from snakes and spiders, but not all of them have venom. Bites from venomous snakes and spiders will require you to go to a hospital to get the antivenom.

There are also dangers in the water. Certain fish and jellyfish are venomous, ranging from painful to deadly.

What happens if it is not treated?

If not treated with antivenom, body parts may require amputation, or may be swollen for months and take months to heal. In the worst-case scenario, one may die from the venom.

What causes it?

Venom injected into your bloodstream and tissue can cause damage, swelling and blisters to the local area. Venom is essentially a poison

(toxin) which interferes with your body's normal functions. From affecting your breathing to your heart functions. It can even affect your nervous system and cause paralysis or other neurological problems.

Examples of creatures that can envenomate (inject with venom) you are:

- Spiders
- Snakes
- Scorpions
- Jellyfish
- Sting rays

Spotting the symptoms: How do I know if someone has been bitten?

Venomous snakes will leave two holes, where their fangs broke the skin. If the snake is non-venomous it leaves a series of many small holes. Spiders will also leave two small holes, they will be much closer together and smaller than a snake's. There will be redness, swelling, heat, pain and possibly blistering around the site shortly after the bite/sting.

Different venoms will have different effects on the body. Some will cause paralysis, nausea, vomiting, increased heart rate, difficulty breathing, blurred vision, extreme pain in the area bitten, as well as a blackening of the skin (due to tissue death from the poison).

How do I treat it?

If you do get bitten or stung it is vitally important that you identify what bit or stung you so that when you call 911 or go to the hospital, they will know how to treat you (snake, spider, scorpion, etc.).

Snake & Spider bites:

- Lay down, or sit down

- Keep calm, and keep heart rate down (this slows the spread of the venom throughout the body)
- Remove any watches or rings, before swelling starts (this is because once a limb is swollen, it may be impossible to remove such accessories from the body and the swelling may cause the accessory to cut off blood flow to the limb or finger)
- Wash the area of the bite with soap and water to remove any remaining venom
- Cover the bite with a dry clean dressing

Jellyfish:

- Pain from jellyfish stings can be eased by applying warm salt water, whereas cold water activates the stingers and causes more pain

Warnings

- If a snake has been decapitated it can **STILL** move it's jaw and bite and envenomate someone

How do I prevent it?

- Do not harass wild animals or insects
- Know what types of venomous creatures populate your area so you can identify and avoid them
- When going into the woods, wear boots and pants

Common misconceptions

- If you have been bitten, you should suck out the venom. False! Do not cut out, or suck out venom—it has already entered the bloodstream the moment you are stung/bitten. If you see venom on the skin, then carefully wipe it off (not letting it touch your skin)

- You should tourniquet the limb if you've been bitten. False! The venom is already in the blood stream and so this measure will not be helpful
- Using a knife, you should cut out the area that has been bitten. False! This will do no good as the venom is instantly in the bloodstream

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a bite or sting.

You're on a hike in the woods and you come across two people sitting on the ground, one with his pants rolled up and a leg exposed.

What should you do?

Ask: You ask them "what happened?, Is everything ok?" The friend tells you his friend stepped on a snake and got bitten, and they don't know what to do. The friend is conscious and is also speaking, and seems normal. You ask what kind of snake and they don't know. You are unable to determine if the snake was venomous or not, therefore you must assume it was venomous.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

At this time, it does not seem like a life-threatening emergency, however, the person does need to be brought to the hospital immediately to get antivenom. Again, we must assume the snake was venomous.

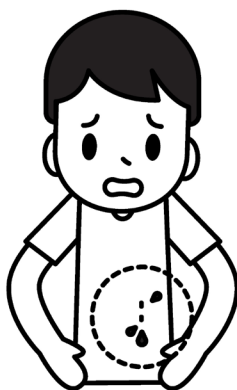
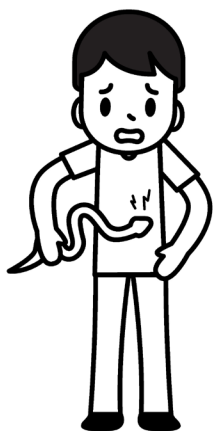
Decide: You tell the friend to call 911. They say there is no reception out in the woods.

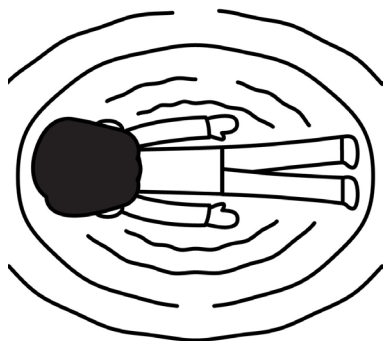
Safety: Because this person was bitten by a snake and there could be others nearby, take care and pay attention so you don't get bitten as well.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario there does not seem to be any issue with these, so you proceed to treat the bite. You inspect the bite area and you see two small punctures where the fangs broke the skin. The two holes proves it was a venomous snake. The person is breathing heavily (but adequately) and sweating, which may be from stress or from venom. The only real treatment for this situation is antivenom. You coach the person to be calm and try to relax. They insist that they should use a knife to cut out the venom. Tell them that they must not do that, and that it is not effective.

Ambulance: You and the friend must carry the injured person to their car, and then have them drive to the nearest hospital.

Re-evaluate: Keep monitoring the person's breathing and pulse. There may be a delayed reaction with some venom, which can affect their breathing.





DROWNING

What is drowning?

Drowning is commonly mis-understood because it actually has several phases. Let's take a look at them and see the differences:

- Conscious, panicking, swallowing water, unable to breathe, heart still beating. They will soon become unconscious, since they cannot breathe
- Unconscious, unable to breathe, heart still beating. They will soon no longer have a heartbeat since the heart is not getting oxygen
- Unconscious, unable to breathe, no heartbeat

What is a near drowning?

A person is still conscious or semi-conscious (altered level of consciousness), coughing, having difficulty breathing, but not to the point of being completely unable to breathe.

What causes drowning?

A person gasps to breathe in air, but instead breathes in water, which goes into their lungs. Oxygen is no longer going into the lungs, which means the heart, and brain are not getting oxygen, which means the

body will go unconscious and eventually the heart will stop beating, and the person will die.

Drowning is not something that only happens in lakes and the ocean. It only takes a few inches of water to drown someone. Therefore, people and especially children are at risk of drowning in shallow ponds or bathtubs. In children, drownings most often occur when they are near a body of water and are unsupervised. In adults, drowning most often occurs when engaging in water sports or boating while under the influence of drugs or alcohol.

What happens if you don't treat it?

If unable to breathe, the human body has 4-6 minutes before brain damage occurs. We must also consider that the heart will 'stop', or go into cardiac arrest, in a few minutes without receiving adequate blood flow or oxygenation. Therefore, it is vital that someone who is drowning be pulled out of the water immediately and be given CPR.

How can I spot someone who is drowning?

Spotting someone who has drowned can be very hard. They will be in water, unconscious, not breathing, they may or may not have a pulse. But from a distance you will not be able to notice that. In a near drowning, they may be flailing their arms, which will be easy to spot. But if they have already drowned they will be unconscious and therefore not moving. The only way to know for sure is to go up to them and check.

How do I treat it?

How to save someone who has drowned:

1. Immobilize their neck, as they may have suffered a spinal cord injury if they fell or impacted the water forcefully (for

instance, if they fell off a bridge, or fell from a boat that was travelling fast)

2. Pull them out of the water, and on to dry land
3. If someone else is present, have them take over immobilization of their neck, so you can do CPR. Otherwise, if no one else is there, stop immobilization of the neck so you can do CPR
4. Determine their consciousness by yelling and slapping them
5. Check for pulse & breathing
6. Open their mouth and give them two rescue breaths
7. Begin CPR. Have someone call 911 and bring an AED (See section on CPR)
8. Once they regain consciousness they may convulse or vomit. Turn their body on to their side (recovery position) so they don't inhale their vomit. Inhaling vomit can cause death

How to treat someone who has had a near drowning

1. Immobilize their neck, as they may have suffered a spinal cord injury if they fell or impacted the water forcefully
2. Pull them out of the water, and on to dry land
3. Determine their consciousness, check for pulse and breathing
4. Have them lie on their side (recovery position), or sit up
5. They will cough, might vomit and will likely be struggling to catch their breath
6. Monitor them closely, and call 911

Warnings

It is essential when they regain consciousness that you turn them over to their side so they can vomit out the water they swallowed. If you

don't turn them over, they may inhale the vomit, which can destroy their lungs and lead to death.

Prevention

- Do not take baths while under the effects of drugs or alcohol
- Do not engage in watersports or boating while under the effects of drugs or alcohol
- Always use life jackets, especially if you are unable to swim, when boating or engaging in watersports
- Never leave children unattended when at the pool, beach, near water, or when bathing

Common Misconceptions

- It's easy to spot someone who's drowned. False! It is very hard to spot, the only way to know for sure is to go up to them to see if they are conscious
- You can't drown if you know how to swim. False! Knowing how to swim won't protect you from water getting into your lungs
- You should do the Heimlich maneuver on someone who has drowned or had a near-drowning. False! Current CPR guidelines do not recommend the Heimlich maneuver for this

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for drowning.

You are visiting a friend's apartment and you're at the pool. There are many families present but no lifeguards. You hear a mother scream, and someone jump into the pool.

What should you do?

Ask: You ask the lady who screamed what happened, and she said her son is drowning. You then see the father retrieve the boy from the water and put him on the pool deck.

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

You approach the son and his father and introduce yourself as someone qualified and trained in First Aid, and you ask his permission to assess his child. He agrees. You examine the child and note his eyes are closed and that he is lying limp on the side of the pool. You shout at him and try to rouse him by shaking his shoulders, but he remains unconscious. Because he is unconscious it is automatically an emergency.

Decide: You tell the mother to call 911.

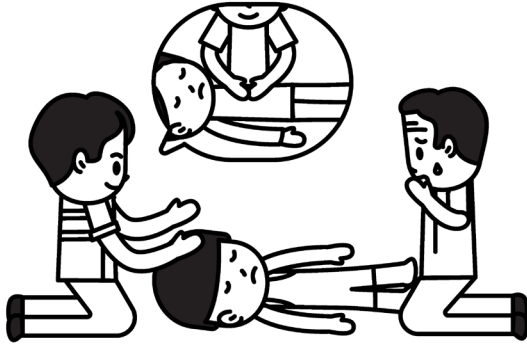
Safety: The area is safe—however, there is water all around the pool side from when the son was pulled out of the pool. You make note of that wet area and take care not to slip and fall accidentally.

Treatment: You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). In this scenario the person is

unconscious, as you already determined that in the previous steps. You check for breathing and pulse at the same time (taking no more than 10 seconds). He does not have either. You then begin CPR for the drowning victim. The father then tells you that he heard that you should give the child abdominal thrusts. You tell them that is not the recommended action, and that CPR is the recommended action. As you are doing CPR, the boy vomits up water, you turn him on his side, so he doesn't inhale the vomit. He coughs out the rest of the water and is now breathing.

Ambulance: Even though the child is now alive, he should still be taken to the hospital, by ambulance, or by the parents to ensure his lungs are ok, and to prevent pneumonia (infection of the lungs).

Re-evaluate: Keep monitoring the child to see if his condition worsens and needs CPR again.





LIGHTNING STRIKES & ELECTROCUTIONS

What is a lightning strike?

A bolt of lightning coming from a thunderstorm, hitting a person directly, hitting nearby him, or hitting something he is touching. Being hit by lightning is essentially the same as being electrocuted by a high energy source, such as an electrical power line. Miraculously, the majority of people struck by lightning or powerful electrocutions do survive without serious side effects.

What causes it?

Thunderstorms, electric fences, exposed electrical wires, electrical power lines.

What happens if I don't treat it?

Many people return to consciousness on their own, without needing rescue, and only about 10% actually die.

How do I spot a lightning strike or electrocution?

Many people hit by lightning or a high energy source will be unconscious, therefore they will be lying on the ground. They may not have

a pulse, and may also not be breathing. Their clothes and hair may be burnt, and they may or may not have a visible wound from the shock.

How do I treat it?

For someone who has been knocked unconscious by a lightning strike OR by electrocution at home, work, power plant etc, the treatment is CPR.

1. In the case of electrocution by wires or other devices, before doing anything, ensure the person is no longer connected to the power source, so that you don't get electrocuted accidentally
2. Assess the person to see if they are conscious or not
3. If unconscious and no pulse begin CPR. (see section on CPR)
4. If unconscious and has a pulse, but not breathing, give rescue breaths
5. For lightning strikes and electrocutions it is vital that you get an AED
6. If you find someone who has been hit by lightning and survived, you should still take them to the hospital to ensure all is well

Prevention

- If you are in the water of a pool, pond, or lake, get out if you hear thunder
- During a thunderstorm, avoid standing by the windows
- If you are caught in the open during a thunderstorm, get indoors and do not wait under trees. Because they are tall, they often get hit by lightning
- If you see wires sparking, avoid them, and anything they are touching
- If you see power lines down, on the ground or the road, avoid the area, and do not step near them

Common misconceptions

- You're only at risk if the lightning hits you directly. False! You can be near a lightning strike and it can still shock you through the ground
- No one can survive a direct hit by lightning. False! The human body can survive a direct hit from lightning
- You can only be electrocuted by a power line if you touch it. False! A power line that is broken and touching the ground or road, electrifies the area around it, so even if you stepped near it, wearing boots, you would get shocked
- Boots will protect me from electrocution. False! If the power is strong enough, boots will not be able to stop the electricity flow

How to respond to this emergency in real life

Let's see how we can apply the AID STAR framework in real life for a lightning strike.

You are driving down a highway, the clouds are dark and you see lightning and hear thunder. There is a car stopped on the side of the road and you see a man standing panicking and waving his hands trying to get help. You stop your car and go to see what is happening.

What should you do?

Ask: You ask "what happened?", The person said they were having a picnic under a tree when lightning struck the tree and their friend got electrocuted and is now unconscious, you see the friend in the distance lying on the ground, next to a tree that is split in half (from the lightning).

Identify: With the information you gathered see if it fits into the life-threatening emergencies list (see below).

Use ABCS to identify a life-threatening emergency:

- Altered consciousness or unconsciousness
- Breathing or Bleeding
- Chest Pain
- Stroke or Spine Injury

Although you cannot see or check the body, you assume what the friend said is accurate, therefore it is an emergency.

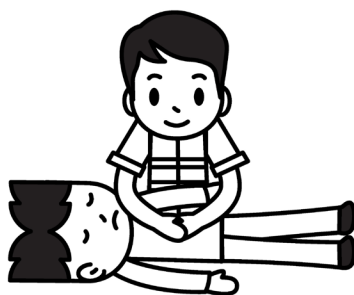
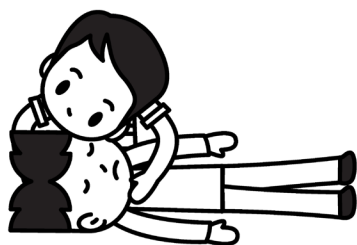
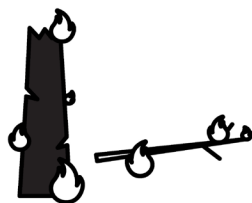
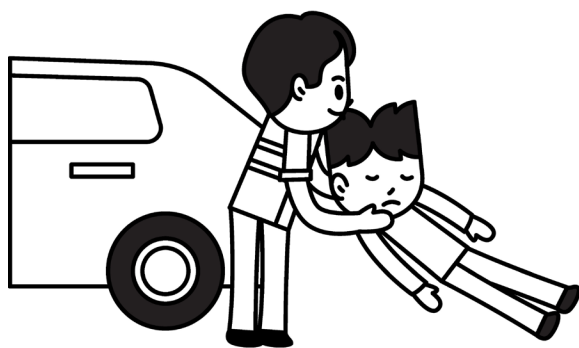
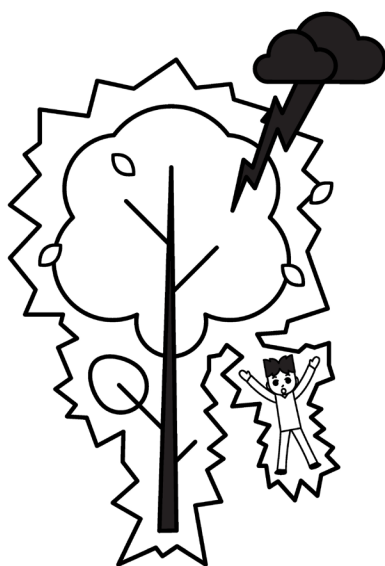
Decide: You tell them to call 911.

Safety: Trees and tall objects attract lightning. Because of the risk of a second strike of lightning, the area may or may not be safe. The body needs to be pulled from the tree, over to the car. You have to decide for yourself if you want to risk getting struck by a second strike of lightning.

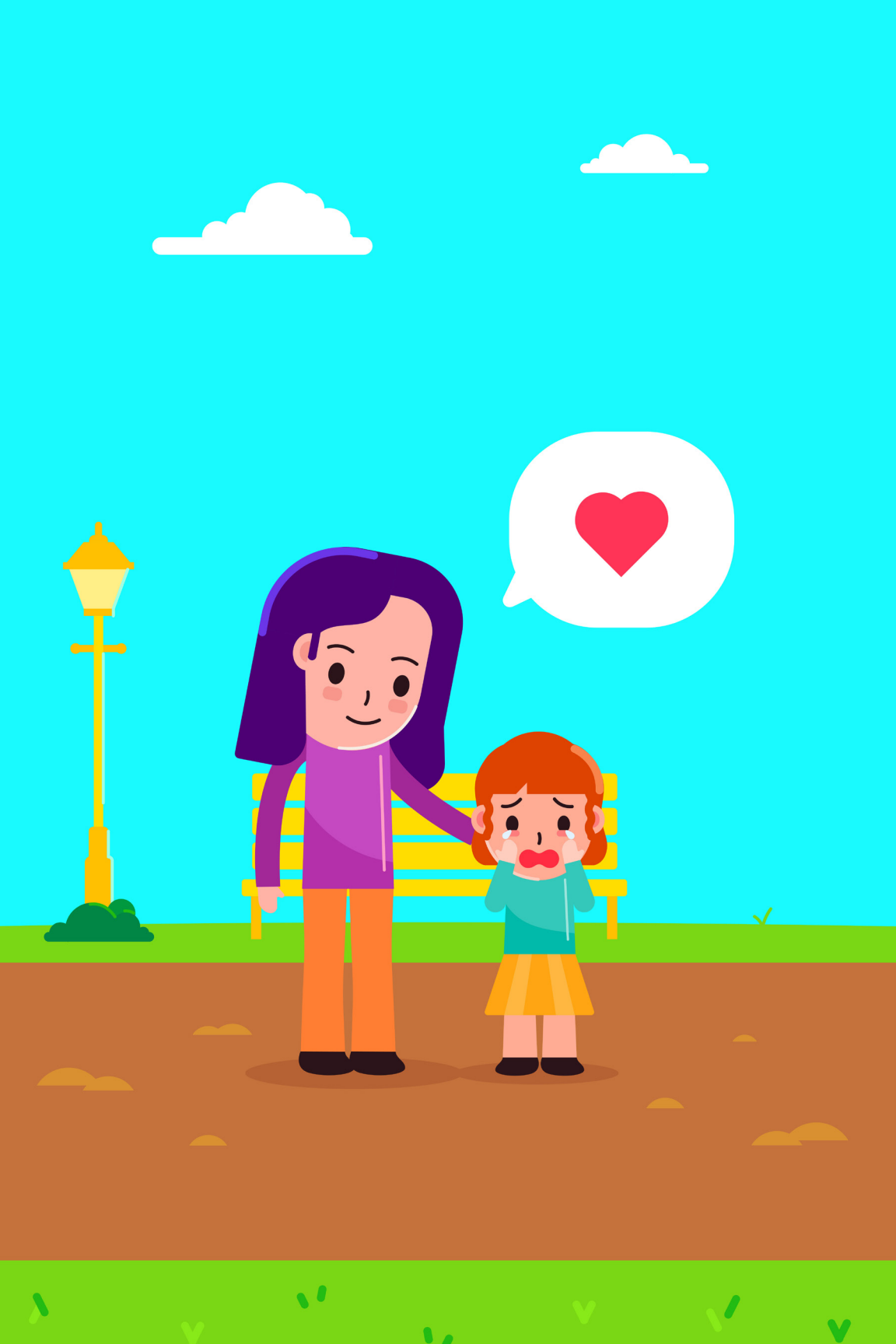
Treatment: You decide to take the risk and you run to the body and drag it back to the car, away from the tree (since the tree is a tall object, it is a hazard to stay by it). The person is unconscious. You recall that on the treatment step, we must look for the most life-threatening situations and treat them FIRST (Spine injury, breathing, bleeding, no pulse). You need to check if they are breathing and if they have a pulse. You check and they have no pulse. You begin CPR.

Ambulance: You must continue to do CPR until the ambulance arrives. You should not try to transport the person yourself, instead just stay and do CPR.

Re-evaluate: Have the friend switch over to delivering CPR, and switch back and forth every 2 minutes. This way the quality of your CPR stays high because you each get a chance to regain your strength. Of course, make sure the friend does it correctly when taking over for you.







SECOND AID

WHAT DO YOU DO AFTER FIRST AID?

In the previous sections we learned how to help treat someone's injury or illness and save their life.

You help someone physically with first aid, but what about psychological first aid?

A person who was hurt will also be emotionally injured. They may be having the worst day of their life. What can we do? We treat the body, but what about the soul?

Most of us feel that after we have provided first aid and the person is stable (not dying), the job is done. First aid is done. What about second aid?

SECOND AID

Definition: Emotional help given after first aid to make the person feel better.

Let's take a look at a real-life example.

You're outside and some kids are playing in the street. One of them gets a deep cut in his hand, blood drips everywhere, you run up with some bandages from the first aid kit in your car because you're prepared and you bandage it up. You've stabilized him, he is not going to die. You've applied first aid. All he needs are some stitches. We are done at this point. But wait, this kid is in a great amount of PAIN and is crying. Isn't there anything else we can do? Yes, give him Second Aid.

What would be an example of a second aid treatment?

It is different for adults and children.

Children

One technique is shifting attention from the injury to something nice.

Police officers have had great success with children suffering from traumatic experiences by giving the child a teddy bear (or any stuffed animal toy) to them to fix their attention on. Officers keep these in their squad cars just for these types of occasions. Although it may seem unimportant or silly, it is better than nothing and does provide the child a bit of distraction and joy in an otherwise serious situation.

Therefore, you could take a page out of their book, and keep a teddy bear in the trunk of your car, along with your first aid kit, so that you'll always have access to one, should you need it.

Building on the idea of the stuffed animal, is idea if you can give the child TWO stuffed animals. As soon as you give him two, he will make the two toys interact, role play and communicate with each other, he'll have less attention on himself, and more attention on what he's doing with the two toys.

Adults

Giving stuffed animals to adults will not be as effective as with children. With adults the approach should be more education based.

Adults hate to have their intelligence insulted, additionally, they know very little about first aid, and for many, the entire topic is avoided. The emergency situation they have found themselves in acts as brutal lesson given to them by life. Their lack of knowledge and skill in first aid is right in their face.

Therefore, this is the perfect opportunity for you to empower them with some education.

If you're reading this guide you will know more than the average person about first aid.

After treating someone, teach them what you have done, the treatment steps, the do's and don'ts, and all related information. Tell them about what to do if it gets worse, what will happen if they don't do anything. Tell them common misconceptions that people have, or yours from your personal experience. Discuss the importance of always calling 911.

It may seem awkward to shift into this conversation, so you would need to bridge into it with a statement like: "well, it looks like you're going to be just fine! Now, [first name], I've studied first aid and there are some extremely important things I just have to tell you".

CONCLUSION

While saving lives is obviously the most important, some attention should be given to helping injured and ill people cope with their pain by using communication and care.

Just as physical wounds leave scars, mental wounds also leave scars, often taking MUCH longer to heal. An accident or injury can be a life-changing experience, and the mental/emotional effects often are longer lasting than the physical ones. What you, as a first responder, do to lessen the mental/emotional/spiritual trauma can have long-term benefits by making the event itself far less traumatic.



INSTANT HERO

A Simple Guide for Learning
How to Save Lives...

And Confidently Handle Any Medical Emergency
Using Our AID STAR Framework





DISASTER PREPAREDNESS

Although this guide focuses on first aid, we must also mention disaster preparedness.

Why? Because being unprepared for a disaster can cause injury to you, your friends, family and entire community.

And as discussed at the introduction of this guide, preventing injury and deaths is the whole purpose of this book.

It is always best to have prevented an injury and NOT used your first aid skills than to have failed at prevention and have to use your skills.

What can I do about natural disasters?

One of the main things that will go through your mind when you think about a natural disaster is: what should I do?

Before you know what you should do, you need to understand that there are three phases in a disaster:

- Before
- During
- After

When you think of a disaster, think of it as an event with a timeline. It has a beginning, middle, and end.

When answering the question ‘What should I do?’, the answer will be different depending on where you are in those three phases.

We need to specify if we’re talking about:

- Preparing & planning (Before)
- You’re caught in the middle of a disaster (During)
- You’re recovering from a disaster that just happened (After)

All three have different priorities and actions.

By organizing a disaster into three phases it adds tremendous clarity to our concept of what actions we need to take. Therefore, the answer to the question of: what should I do in a disaster? Is answered with, which phase are you in?

For example:

1. There is a hurricane projected to make landfall in your area in three days. What should you do? (before phase)
2. You are sheltering in your home while a hurricane makes landfall on your city. What should you do? (during phase)
3. The hurricane has just passed over and there is much damage and confusion. What should you do? (after phase)

Each phase of the disaster will have its own appropriate actions to take. Let’s go over each one.

BEFORE A DISASTER

You may have warning (in the case of a hurricane), but typically you will not have warning when a disaster happens.

Therefore, the ‘before’ phase is all about having a bullet-proof plan of action in place, fully thought out, written, and accessible to you and your loved ones, so that in the event of a sudden disaster, you know exactly what you need to do. This means not only having a plan in place, but also having all your supplies and preparations **DONE** before a disaster happens.

Creating a plan

The plan is everything.

Using our 1 Page Disaster Plan (1PDP) framework, we have **ALL** the questions and concerns already addressed, and arranged in such a way where you simply fill in the blanks.

No thinking required; we’ve taken care of all of that for you.

Your plan will include:

- Everything you need to have and do before a disaster
- Everything you need to have and do during a disaster
- Everything you need to have and do after a disaster

Visit our website’s resource page to download your 1 Page Disaster Plan, for **FREE**: <https://polarisdrt.org/pages/resources>

Getting prepared

Having a plan is great, but it is not enough. You also need to take action, and get prepared.

Don't wait for a tornado to knock out your power, and then go to the store to get a generator, along with everyone else who was not prepared. Don't be that guy! Instead, get your generator now, while there is no emergency, and they are in stock.

The Before Phase is where you get your:

1. Plan
2. Knowledge
3. Skills
4. Supplies

Having these four things solves MANY of the problems that disasters spring upon people.

It is the lack of preparedness which causes confusion in a disaster.

If you're prepared, it isn't a disaster, it's just a situation.

It is crucial this is done before the disaster, otherwise it'll be ten times more difficult to properly respond. If you are prepared, you'll have everything you need, and if there are surprises, you will have accounted for them.

DURING A DISASTER

The next phase of a disaster is the occurrence, the event itself.

In the case of a hurricane, if there was sufficient warning for you to evacuate and get out of town then this phase of a disaster is very simple for you. But, if you elected to stay home and shelter in place, or if you were at work or driving your car and got caught in a sudden disaster, the scene is more complex.

There are three scenarios for dealing with a disaster that is happening right now:

1. You're caught in it
2. You're sheltered at home or in a city shelter
3. You've already evacuated

You will need to know what to do in each scenario. And put that information in your disaster plan.

When you're out and about, you're caught with your pants down. This is the most challenging scenario because you need to find protection, get to your base, and communicate with your loved ones to make sure they get to your base as well, or if it is too dangerous for them to go to your base, they need shelter in place, wherever they are.

Write down the most common natural disasters that may affect your area (hurricane, tornado, flooding, earthquake, etc), and for each disaster write your plan for the three above scenarios. This will be your contingency plan. One sheet of paper for each disaster type, and the above three scenarios on each sheet of paper. Use our 1 Page Disaster Plan framework to help create your plan.

AFTER A DISASTER

The third and final phase of a disaster is after the event. The earthquake has stopped, the tsunami has gone back to sea, the tornado has vanished, the hurricane has passed over.

If you have evacuated (either to a local shelter, a friend's or a few states away) you will have to return home and assess the damage of your property and decide if you want to salvage it or not. Be sure to assess if the conditions are suitable for you to return home, for example the roads may be damaged preventing you from even getting home.

It is the same if you sheltered at home or at a shelter in your town. You'll have to assess many things to see if you can continue to stay in your home or town:

1. Is it possible to access your home at this time?
2. Is your home safe to stay in?
3. Is the power out, and if so, for how long?
4. Is there access to water, and if not, can you get some?
5. Do you have enough food for you and your family?
6. Is there sufficient road access to get around?
7. Is the area too unsafe?
8. If you live in a city: are there enough businesses open to provide for everyone's basics needs?

In other words, after the disaster you need to determine if your home and your town is still livable. If not, then you'll have to stay somewhere else while you decide what to do.

CONCLUSION

While we all feel that a natural disaster will never happen to us, and that kind of thing happens to other people, and other countries, it is always best to be safe than sorry, and get prepared before the storm.

And if that terrible day ever does come, you and your family will thank you, and it will be simply an situation for you, and not a disaster.

GLOSSARY

Abdominal Thrust: A life-saving procedure where you stand behind a person who is choking, form a fist with your hands and thrusts inward, into the person's abdomen (belly area), which causes the person to cough and hopefully cough up the object.

AED: Automated External Defibrillator. A portable electronic medical device used to shock the heart and restore regular rhythm.

Allergen: A substance that causes the body to have an allergic reaction. For example: peanuts, bee stings, dust, cat hair, shellfish, etc.

Amphetamine: A drug that speeds you up, increases heart rate, and increases breathing, and gives a body-wide feeling of pleasure. Amphetamines are highly addictive.

Amputation: The surgical removal of a body part.

Antidote: A substance that can counteract a poison.

Antivenin (antivenom): A substance that can counteract the harm of venom.

Artery: A blood vessel that has bright red blood. It carries blood away from the heart.

Asthma: A condition where the passageways in the lungs narrow due to an allergen, like dust or, cat hair, or environmental factors like cold air.

Asthma attacks: A breathing disorder where some chemical (drug, allergen, etc.), microorganism (virus, bacteria, etc.), environmental

factor (cold & dry air), or personal factor (exercise or emotions) will trigger the passages in the airways in the lungs to suddenly spasm and narrow, causing the person to have a very hard time breathing in and out.

Automated External Defibrillator: A device that interprets the heart's rhythms for you and allows you to shock the person (which will help re-start the heart) by pressing a button.

Bandage: A light cloth, narrow and long, and rolled into a roll. It is used to wrap around a dressing. When you think of bandage, think of 'band', because it wraps around the body, like a band.

Blood: A mixture of red blood cells, white blood cells, salt, glucose and other nutrients.

Blood clot: A mass of blood cells stuck together. Many things can cause a blood clot, but most often, they occur on blood vessels when there is damage.

Blood sugar: Food gets digested by the body and broken down into glucose and put in the blood. Blood sugar refers to the amount of glucose (sugar) in the blood. If one has low blood sugar, they will have low energy.

Blood vessels: Tubes, ranging from centimeters to microscopic, that deliver blood from the heart to the cells, and then back to the heart. Veins and arteries are different types of blood vessels

Cardiac Arrest: The heart has stopped beating effectively. Meaning it could be not moving at all or it could be beating way too fast or in a way that does not lead to effective pumping action. A person in cardiac arrest will not have a pulse.

Cardio: Relating to the heart.

Cells: The building blocks of the body. Skin, brain, heart, bone, all contain different types of cells, which all need blood (which gives them oxygen and nutrients) to stay alive.

Choking: The inability to breathe due to something getting stuck in or blocking the windpipe. People who are choking cannot breathe and will go unconscious due to lack of oxygen.

Compressions: Pushing down on the center of the chest to squeeze blood out of the heart so it is pumped to the rest of the body. This is done on people who are in cardiac arrest.

Coughing: A forceful reaction, driven by important breathing muscles, that forces out air from your lungs, into your windpipe and out of your mouth

CPR (Cardio Pulmonary Resuscitation): On a person who is unconscious, and does not have a heartbeat (does not have a pulse), and is not breathing, we push down on their chest and breathe into their mouth.

Defibrillator: A device that stops the quivering of the heart by shocking it, causing it to stop quivering, and hopefully restart and beat normally. Fibrillate means to quiver, and 'de' means to undo.

Diabetes: A disease in which the person suffers from high blood sugar levels that are usually caused by improper diet and obesity; both of which put serious strain on the heart.

Dressing: A light cloth, usually in the shape of a square, that is used to put on a bleeding wound. A popular dressing is 'gauze' (which is a light cotton).

EKG/ECG: Electro (electric), Cardio (relating to the heart), Graph (written representation of the heart's rhythm).

Electrolytes: The word “electrolyte” is a biology term. The word refers to a substance that helps regulate the flow of nutrients into cells while simultaneously regulating the flow of waste products out of cells. Electrolytes are important because they help balance the amount of water and key nutrients in the body.

Epinephrine: A substance used to counteract a life-threatening allergic reaction. Also known as adrenaline. Anaphylaxis will cause the passageways in the lungs to narrow, which makes it hard to breathe. Epinephrine opens these passages up again.

Febrile Seizure: A seizure caused by a fever. ‘Febrile’ means ‘relating to a fever’. Some people, especially young children may experience seizures when they have fevers

First degree burns: This burn has mild to medium pain, redness, heat, discomfort. Consider it like a sunburn.

Fracture: A break in a bone. It can be a complete break, a partial break, or just a very fine crack.

Frostbite: If frostnip is not treated and you continue to stay out in the cold the skin and tissues start to freeze and the damage worsens, if not treated it may require amputation of the effected body part. Fingers, toes, noes and ears are most commonly effected.

Frostnip: Frostnip occurs before frostbite. The skin has become too cold and becomes red, numb, and you lose sensation. When you rewarm the skin you feel pain.

Glucose: A simple form of sugar which your body's cells use as fuel.

Heart attack: Injury to the heart, leading to the death of heart cells and formation of a scar in place of previously existing cells.

Heart rate: The speed which the heart is beating, measured in beats per minute (BPM).

Heat exhaustion: If heat exhaustion does not get treated a person may then get heat stroke, where they lose their ability to sweat, their body temperature goes over 103 degrees, and they may go unconscious.

Heatstroke: Heat exhaustion comes first. After being in the heat for too long the body will feel weak, sweat considerably, feel nausea and may faint.

Hemophilia: Hemophilia is a medical condition in which the body's natural ability of the blood to clot (stick together) is severely reduced. Clotting is a part of the normal function of blood, which is why wounds stop bleeding. Someone with hemophilia may bleed severely even from a small cut or wound, creating a potential emergency.

Hives: Hives refer to an outbreak of pale red bumps or welts on the skin. Hives usually appear suddenly, and they can be uncomfortable, sometimes somewhat painful or itchy. They can come about due to an allergic reaction, a chemical reaction, an insect sting, sunlight, medication side effects, and stress.

Hyperventilation:: Breathing too fast. Hyper = above. Ventilate = move air.

Hypothermia: A condition where the body temperature has gone too low and the person is at risk for going unconscious, and dying.

Immobilize: To make something be unable to move. When someone has a broken bone, we want to immobilize it, so the person doesn't cause more damage.

Impalement: An object punctured the body and is inside the body, with part of the object is sticking outside the body.

Insulin: A chemical which makes cells accept glucose. People with Diabetes need extra insulin.

Joint: A point where two bones connect, which allows them to move.

Limb: A limb refers to an arm or a leg. Limbs extend from the body. The head is not a limb.

Lungs: Two large organs in the chest that absorb oxygen when you inhale and release carbon dioxide when you exhale.

Nerve: A cell of the nervous system. They either send commands from the brain to the body, or they send information to the brain from the body, such as perceptions of touch, sound, etc.

Opioid: A drug that has similar effects to the drug opium. Opioids slow you down, slow your breathing, relieve pain, and give a feeling of pleasure. They are highly addictive.

Pulmonary: Relating to the lungs. Example: pulmonary veins (the veins in your lungs).

Pulse: A pulsation or 'throb' you feel from an artery when you place your finger on a person's skin (usually at the wrist or neck).

Red blood cells: A red, disk-shaped cell that carries oxygen to the body's cells and carries away carbon dioxide (a potentially harmful waste product produced by all cells).

Rescue breaths: Opening a person's mouth and blowing air down, to fill their lungs.

Respiratory system: Your nose, mouth, windpipe, and lungs. They all work together so when you breathe in, oxygen is going into your lungs and when you breathe out, carbon dioxide is going out.

Resuscitation: To bring back to life. Example: we need to learn how to resuscitate the body.

Second degree burns: This burn has a high amount of pain, redness, heat, discomfort, blistering, orange patches.

Shock: A dangerous state where the body has lost too much blood, and the body's cells are not getting enough oxygen to stay alive. After a short period of time, a person in shock will have an increased heart rate, pale and sweaty skin, and may feel nauseous or dizzy.

Soft tissue injury: Injuries to the body's soft tissues: skin, muscle, and organs.

Spinal cord: A long strip of nerves that start at the brain, and travel to the bottom of the spine. The spinal cord has many branches of nerves that spread to all parts of the body, this way the brain can send instructions to all parts of the body.

Spine: A series of disk-shaped bones, in the center of the back which protect the spinal cord. Commonly called the 'backbone', it is made up of about 24 individual bones.

Splint: A hard object that is tied to a body part, such as a limb, in order to prevent movement of that bone or joint. There are splints created to fit body parts (like wrists or necks), there are splints that look like boards, and there are improvised splints: broom handles, sticks, pipes, etc.

Sprain: An injury usually at a joint (ankle, elbow), where there is not a broken bone but instead damage to the tissue that connects bones (ligaments). They can be splinted to give the person relief.

Stabbing: An object punctured the body and left a hole. The object is no longer in the body.

Sterile: A substance that is clean and free of germs.

Supportive Care: “Supportive care” is an emergency response term, and it refers to medical treatment that is intended to prevent, control, or relieve complications and side effects. Supportive care aims to improve the patient’s comfort and quality of life. In a real-life emergency setting, supportive care would be the medical care provided to a patient after first aid is applied and the patient’s condition is stabilized.

Third degree burns: The pain will be severe on the outer areas, and there will be no pain in the deepest area, because the nerves will be burnt. The center area is black and charred, and burnt into the muscle and bone. The outer areas of a third degree burn are second degree burns and will be painful.

Tissues: Parts of the body, like muscle, skin or parts of organs like the brain, lungs, heart, etc.

Trauma: An impact, from a strong force, hitting the body. It can be sharp and concentrated like a knife. Or it can be wide like being hit by a shovel.

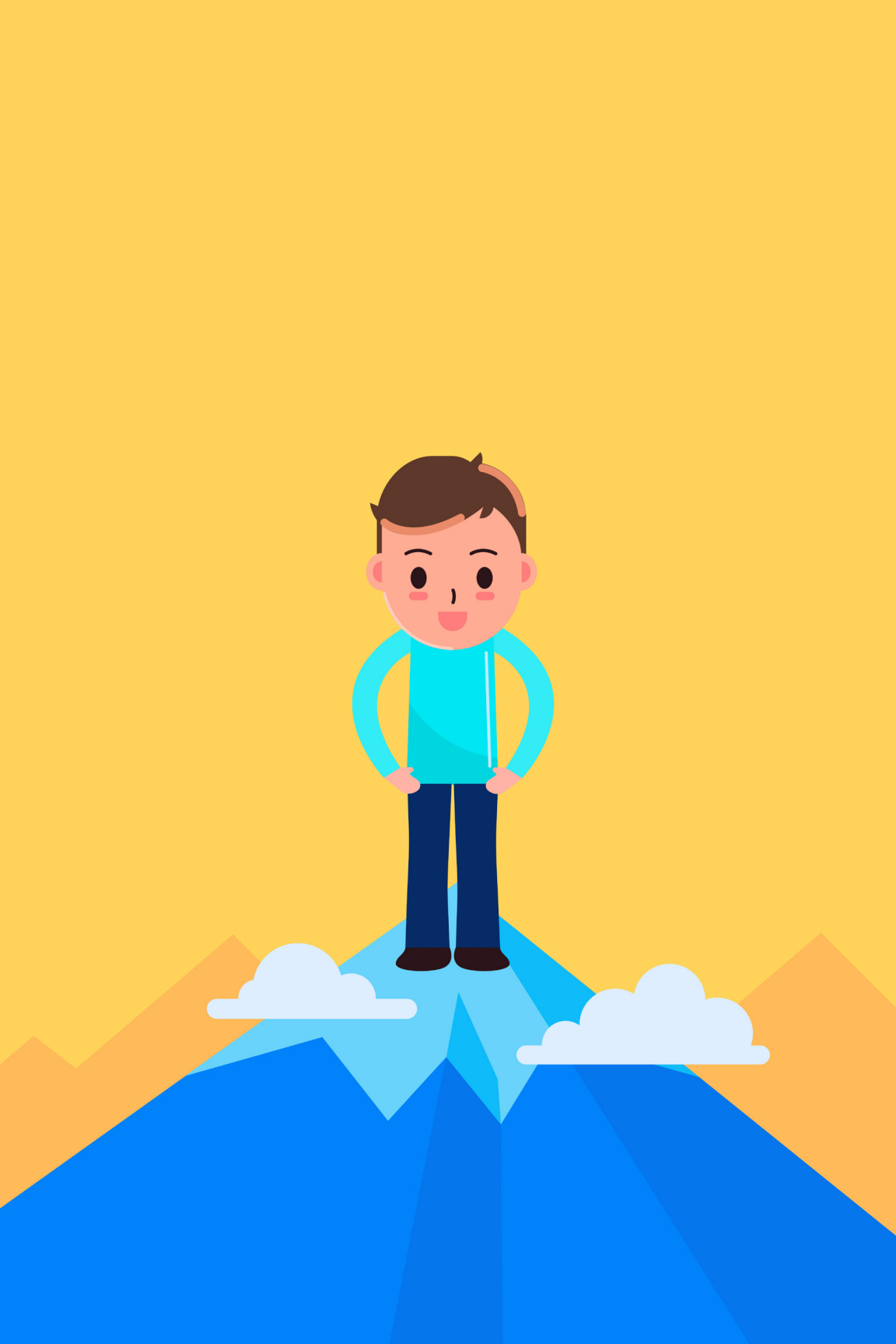
Vein: A blood vessel that has dark red blood. It carries blood towards the heart so it can be pumped to the lungs to get oxygen.

Venom: A poison (toxin) created by an animal which it uses to harm other animals.

Wheeze: A high-pitched sound made when someone breathes out or in, caused by the air passages in the lungs being narrowed. The person will be trying forcefully to move the air out. They may have tightness in their chest.

White blood cells: A cell that protects the body, by attacking germs such as, viruses and bacteria.

Windpipe: The airway that connects your lungs to the back of your mouth. It is also known as the 'trachea'.



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