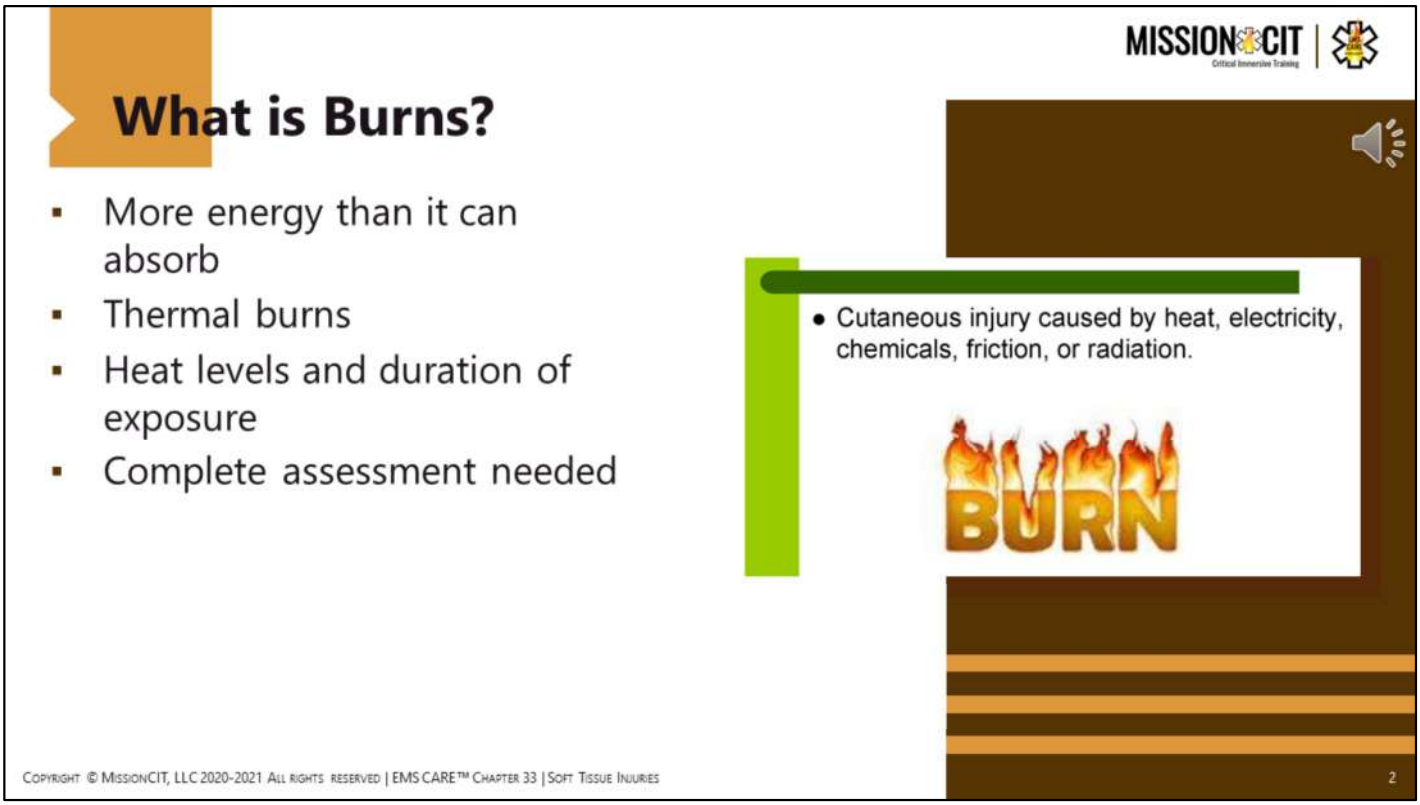


Thank you, Missah!

Welcome to this lesson where we talk about burns. This is a common injury and accounts for approximately 3,400 deaths per year in the United States. It is also one of the most serious and painful of all injuries.

As an EMT, you're likely to encounter burn injuries a lot, so let's see all about burns in this lesson.



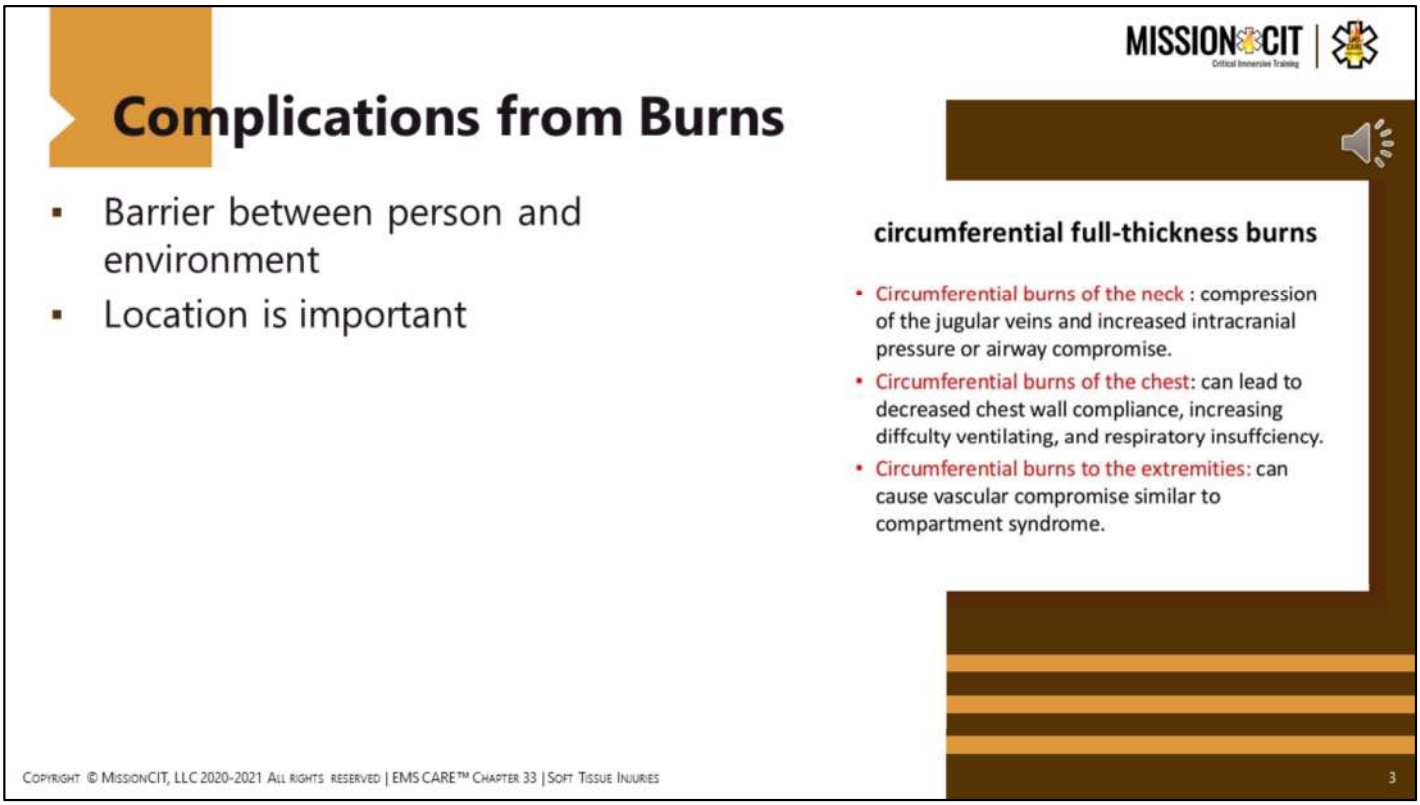
Burns occur when the body receives more radiant energy than it can absorb. This transfer of radiation can occur from thermal or electrical sources and results in soft tissue injuries.

Thermal burns occur when the skin is exposed to temperatures higher than 111 degrees Fahrenheit. The severity of a thermal burn depends on many factors such as temperature, concentration, amount of heat energy possessed by the source object, and the duration of exposure.

In general, the greater the heat energy, the deeper the wound. Also, exposure is another key factor. Though people have a natural reflex to limit heat energy and exposure time, still even small amounts of exposure can cause burns.

You must do a complete assessment to check the severity of the burn and whether there are any other potential injuries.

Children, older patients, and those with chronic illnesses are more likely to experience shock as a result of burns.

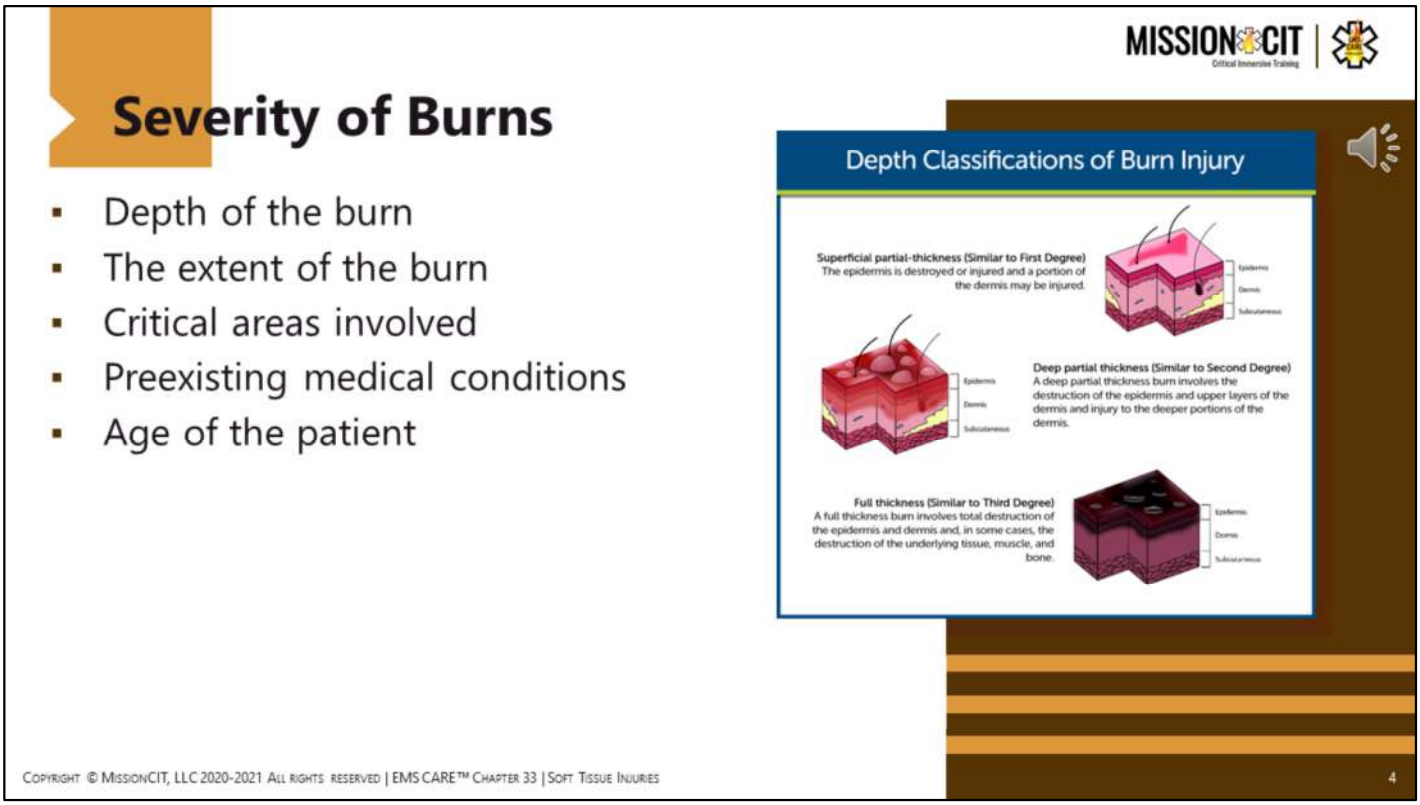


The skin acts as a barrier between a person and the environment. During a burn injury, this barrier is destroyed and hence a victim is at high risk for infections, hypothermia, hypovolemia, and shock.

Many complications can come from burns.

The location of the burn injury is significant. For example, burns to the airway are an emergency that requires immediate transportation. Likewise, circumferential burning of the chest can compromise breathing while circumferential burning of the extremities can lead to neurovascular damage and even irreversible damage.

Knowing the significance of burns in different locations is important.



The severity of burns depends on five conditions, and they are:

- Depth of the burn
- The extent of the burn
- Critical areas involved
- Preexisting medical conditions
- Age of the patient

The depth of burns can be categorized into the following:

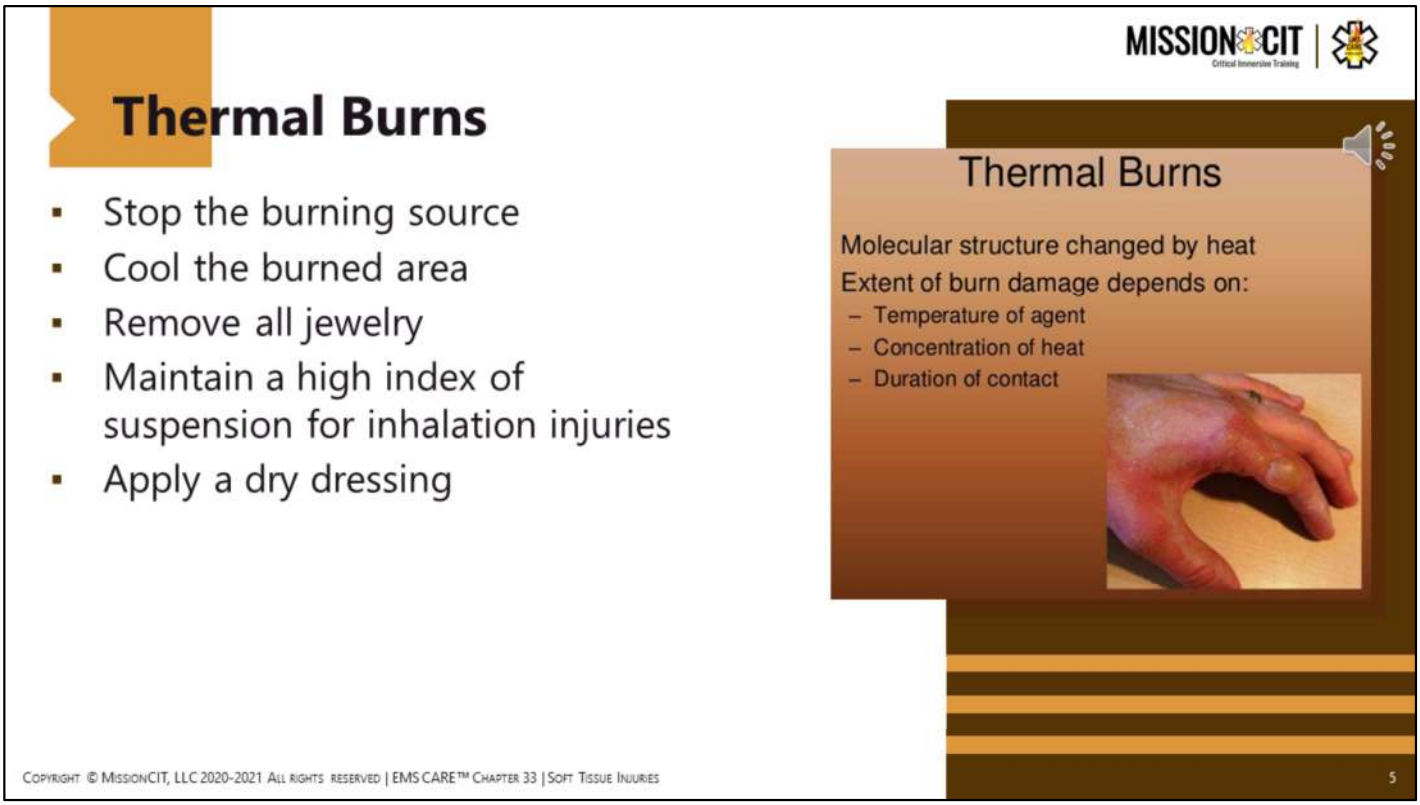
- Superficial burns or first-degree burns
- Burns that have gone through partial skin layers are second-degree burns
- Burns that have gone through the skin layer completely are third-degree burns

When it comes to the extent, use the rule of nines to estimate the severity. This rule applies only for second and third-degree burns. In this method, assign a percentage to each part of the body that is damaged. For adults, assign nine percent each to every arm including the hand, eighteen percent to the front part of the body, one percent to the genitalia, nine percent to the head and neck, eighteen percent each for the legs including feet and the back

of the body.

Give this number to the receiving hospital, so they are well-prepared to provide immediate care for the patient.

The critical areas are the ones used in the rule of nines and these can cause life-threatening situations. Burns can have a rapid deterioration in patients with preexisting conditions and in children who are less than five years or adults over 55 years of age.



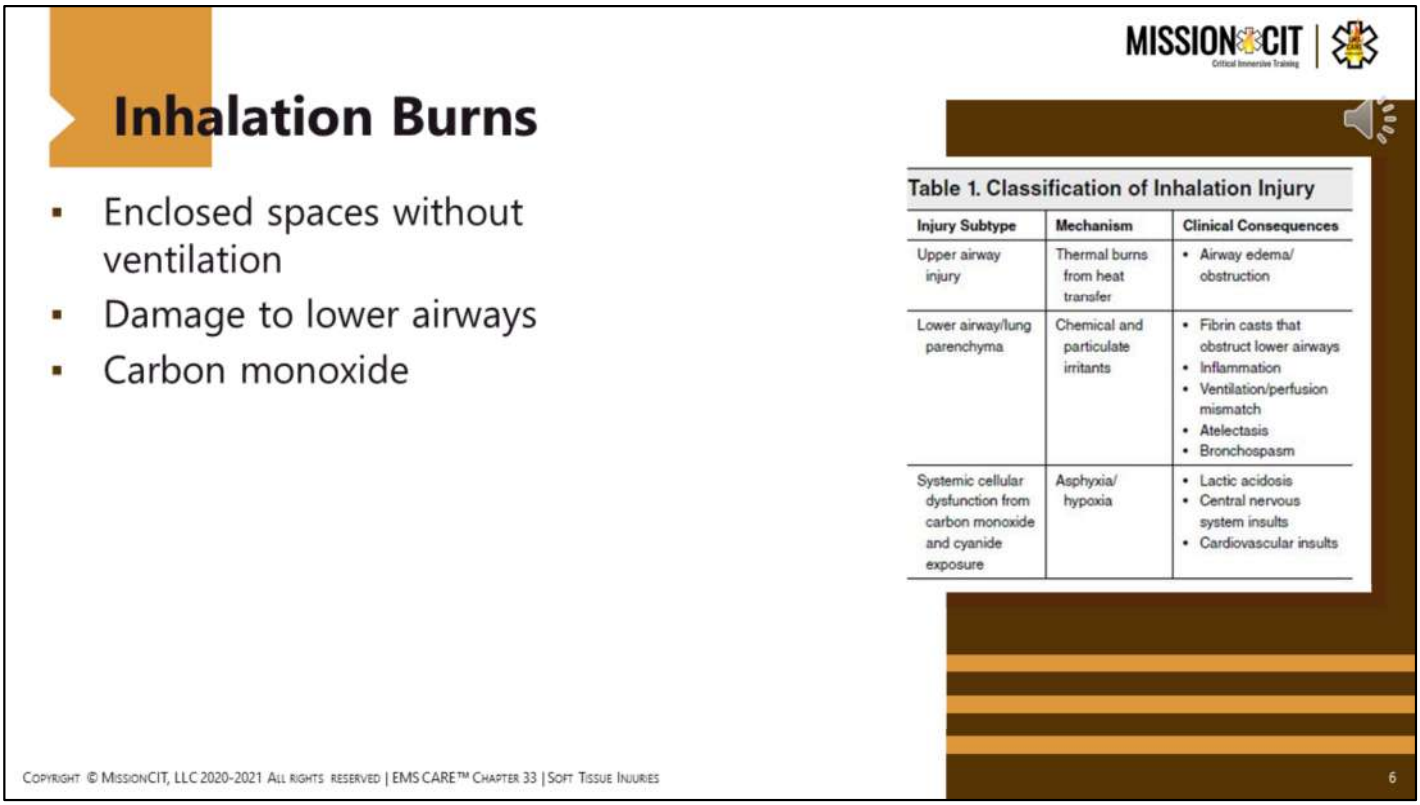
Moving on, let's look at some of the different types of burns.

Thermal burns are caused by heat sources such as scalds or an open flame. Also, when patients come in contact with hot objects, it can produce a contact burn.

A scalding burn occurs from hot steam while flash burns occur from the explosion.

To treat thermal burns,

- Stop the burning source
- Cool the burned area
- Remove all jewelry
- Maintain a high index of suspension for inhalation injuries that occur when the patient has inhaled hot air, smoke, or steam
- Apply a dry dressing

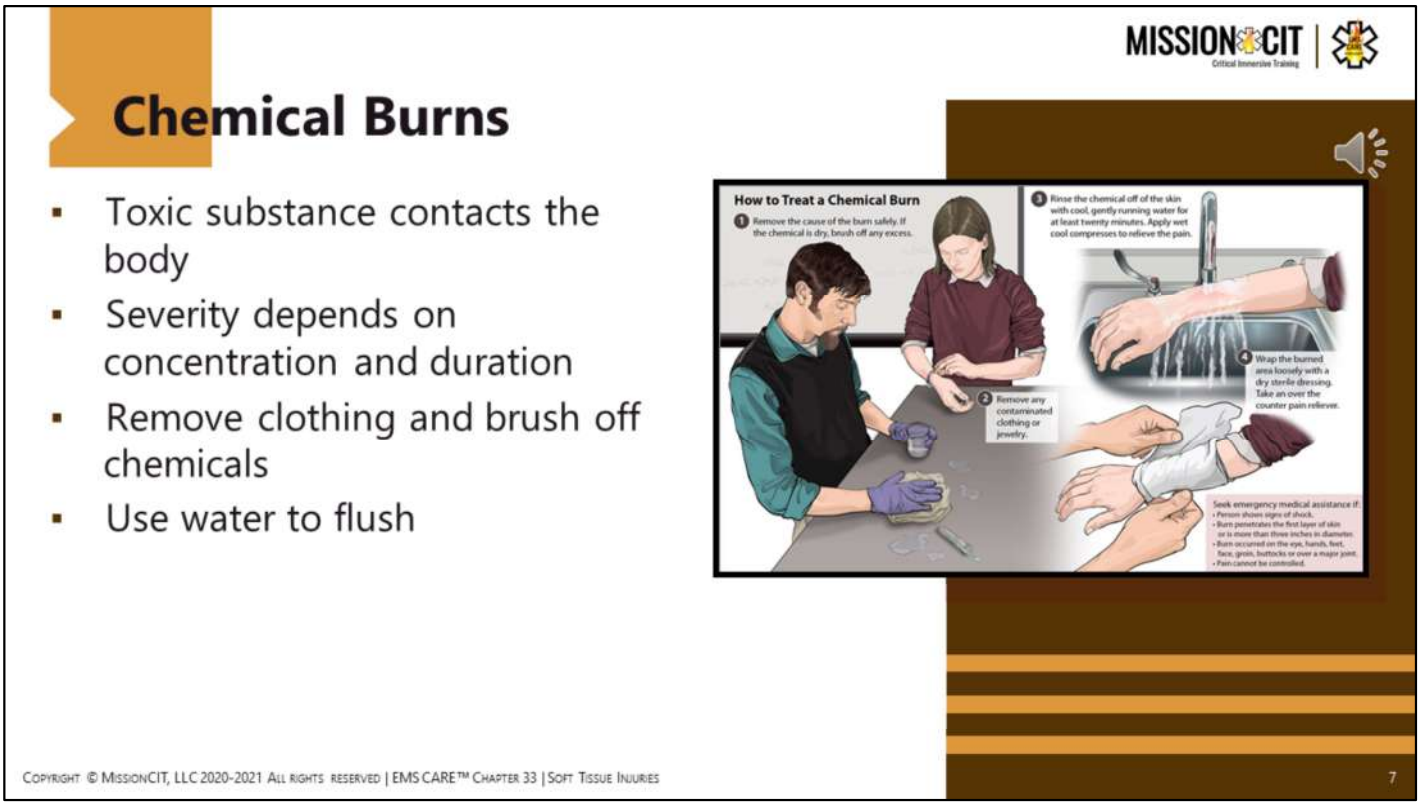


Inhalation burns occur when burning takes place in enclosed spaces without ventilation. When patients inhale the hot air or smoke, it damages their upper airways. In such cases, immediate intervention is required for the upper airway burns as these can impede the airflow.

There can also be damages to the lower airways, provided the patient inhales chemicals and other particulate matter. This is more likely when the patient inhales toxic gases like hydrogen cyanide in industrial combustion.

Carbon monoxide intoxication is also a possibility, and it should be considered when a group of people in the same area complain of headache or nausea.

The prehospital care for such patients includes decontamination and supportive care. In the event of toxic gas inhalation, recognize the burn and its impact on the respiratory system, identify the toxic gas, and provide supportive treatment until the patient is transported.



Chemical burns can occur whenever a toxic substance contacts the body. It is often caused by strong acids and alkalis that touch the body by accident or intent. The eyes are the most vulnerable part of the body in such incidents.

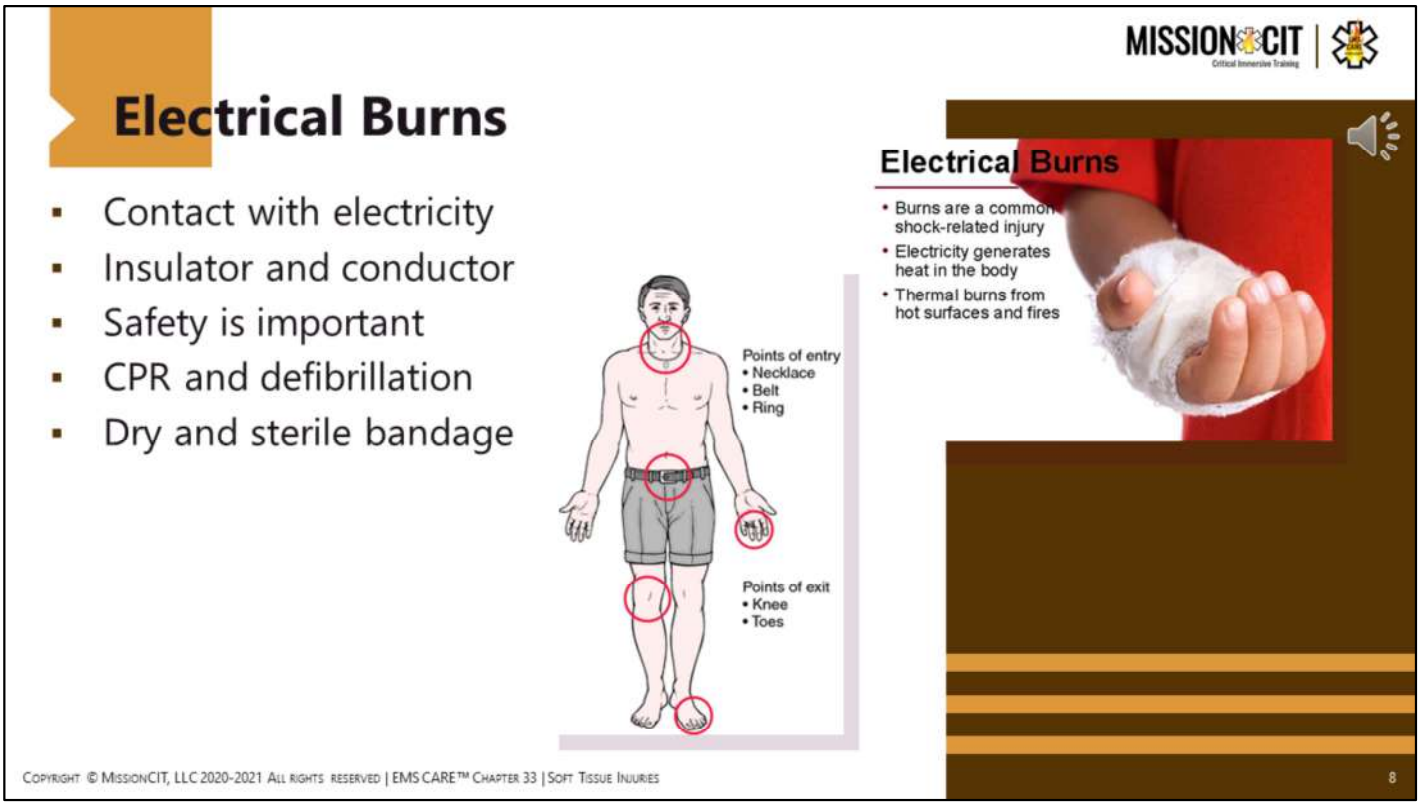
The severity of chemical burns depends on the type of chemical, its concentration, and duration of the exposure.

While handling chemical burns, make sure you wear chemical-resistant gloves and eye protection. The treatment includes removing the chemical from the patient's skin if possible. To do this, remove the clothing and brush off the visible chemicals present on the clothing and the person's skin.

If the chemicals are in liquid form, flush the burned area with lots of water and continue flooding for the next 15 to 20 minutes even if the burning has stopped for the patient. This is necessary to remove the chemical from the patient's skin cells.

When the patient complains of a burning sensation in the eyes, hold the eyelid open, and flood it with water to flush out the chemicals.

Finally, do proper decontamination as per your local protocols before loading the patient into the ambulance.



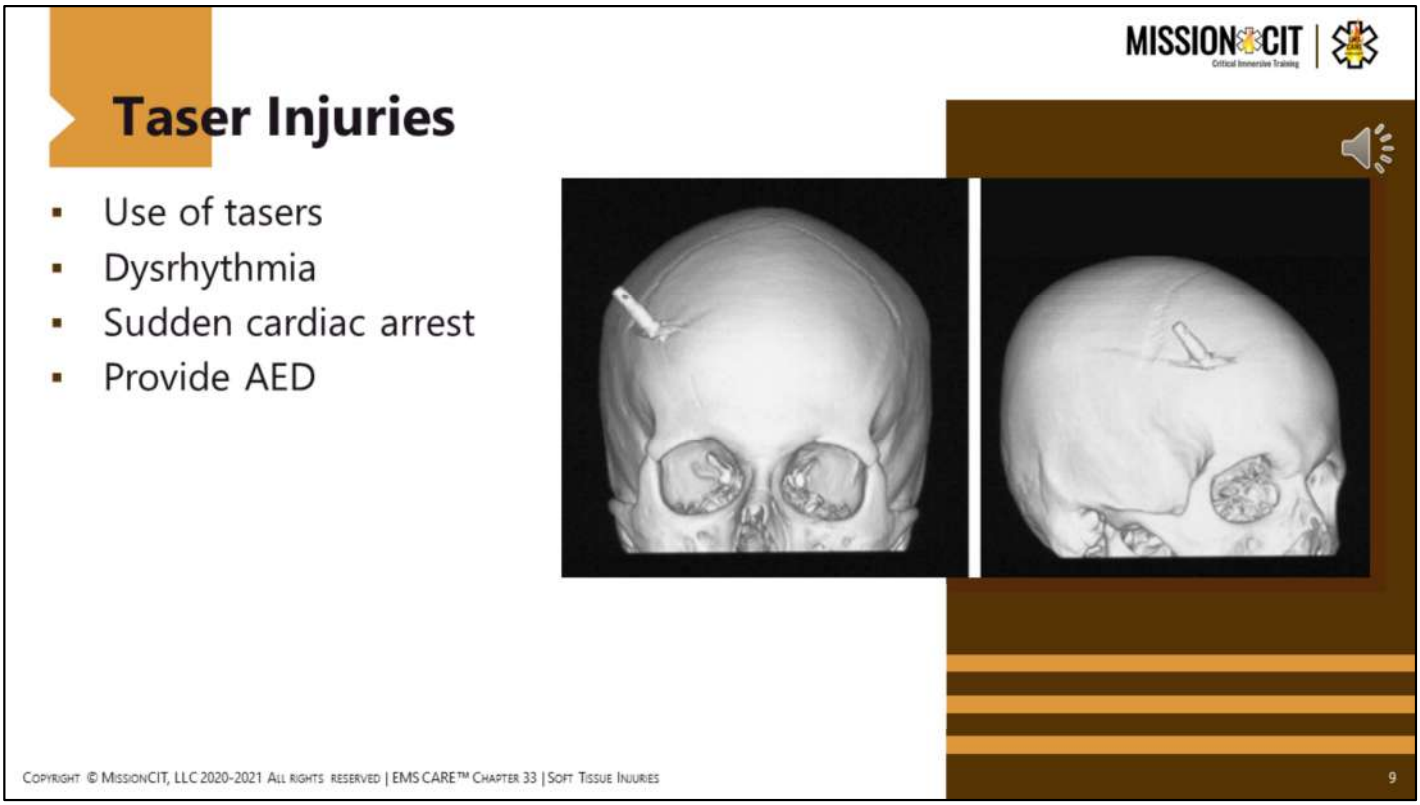
Electrical burns can occur from contact with high or low-voltage electricity. Remember, a complete circuit is required for electricity to flow from the source to the destination. In this context, there are two terms you must know, and they are a conductor and an insulator. A conductor is any substance that allows a current to flow while an insulator prevents the circuit from getting completed.

The human body is a conductor of electricity, and this is why we can be subjected to electrical burns. Hence, the type of electricity, the magnitude of the current, and voltage influence the seriousness of the burns.

The burn injury occurs at the point where the electricity enters and exits the body. This can cause extensive deep tissue injury and cardiac or respiratory arrest from the electric shock.

While providing treatment, your safety is particularly important. Depending on the severity of the injury, start CPR right away. Be on the lookout to defibrillate and give supplemental oxygen as well. Monitor the vital signs constantly.

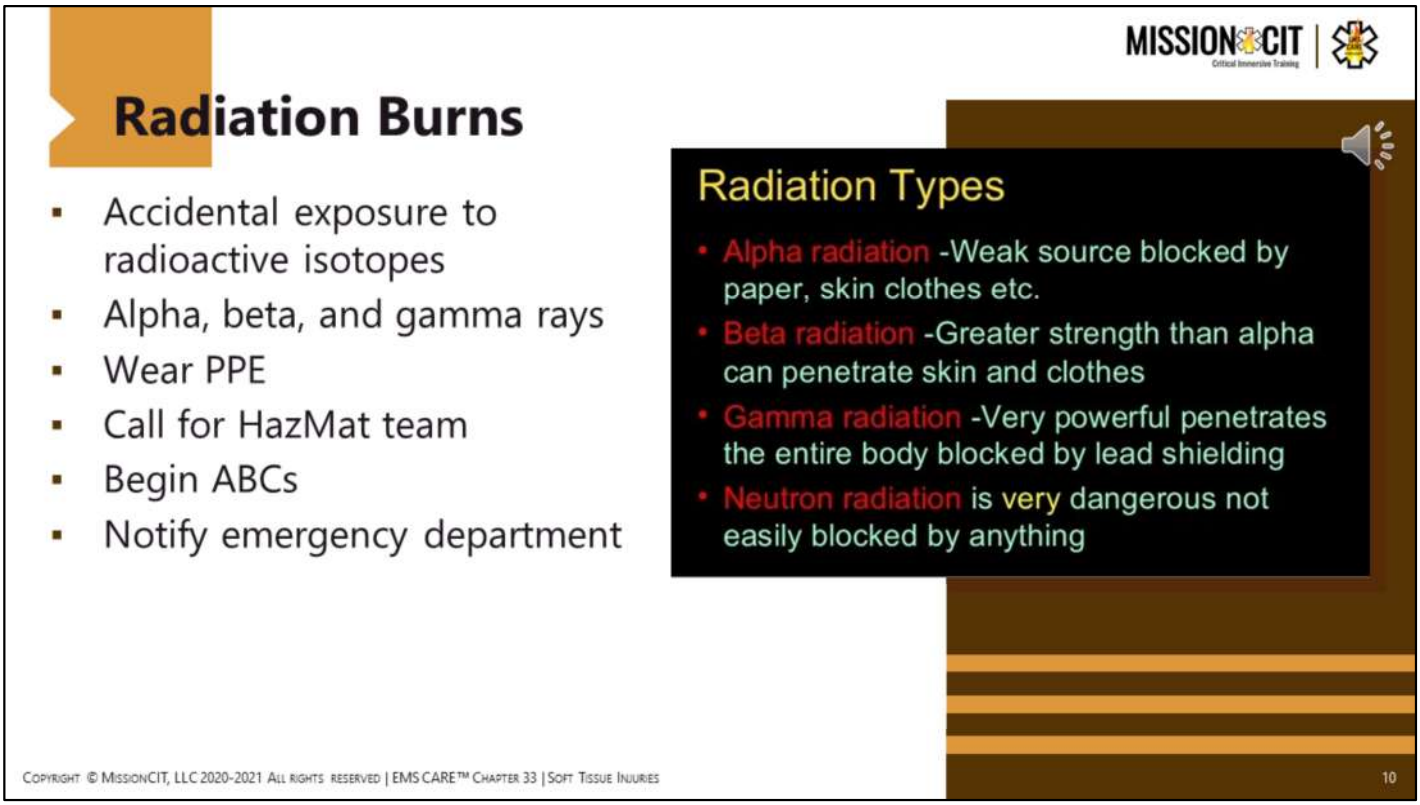
Treat the soft-tissue injuries with a dry and sterile bandage and transport the patient right away.



In recent years, law enforcement has increased the use of tasers, and in turn, this has led to an increase in taser injuries.

The use of a taser is often associated with dysrhythmia and sudden cardiac arrest and can cause complications in persons with underlying disorders.

While treating patients with taser burns, make sure you have access to an AED to provide CPR when needed.



Radiation burns can occur due to accidental exposure to radioactive isotopes during the use and transportation of radioactive material. It can also be caused when radioactive material is intentionally released during terrorist attacks.

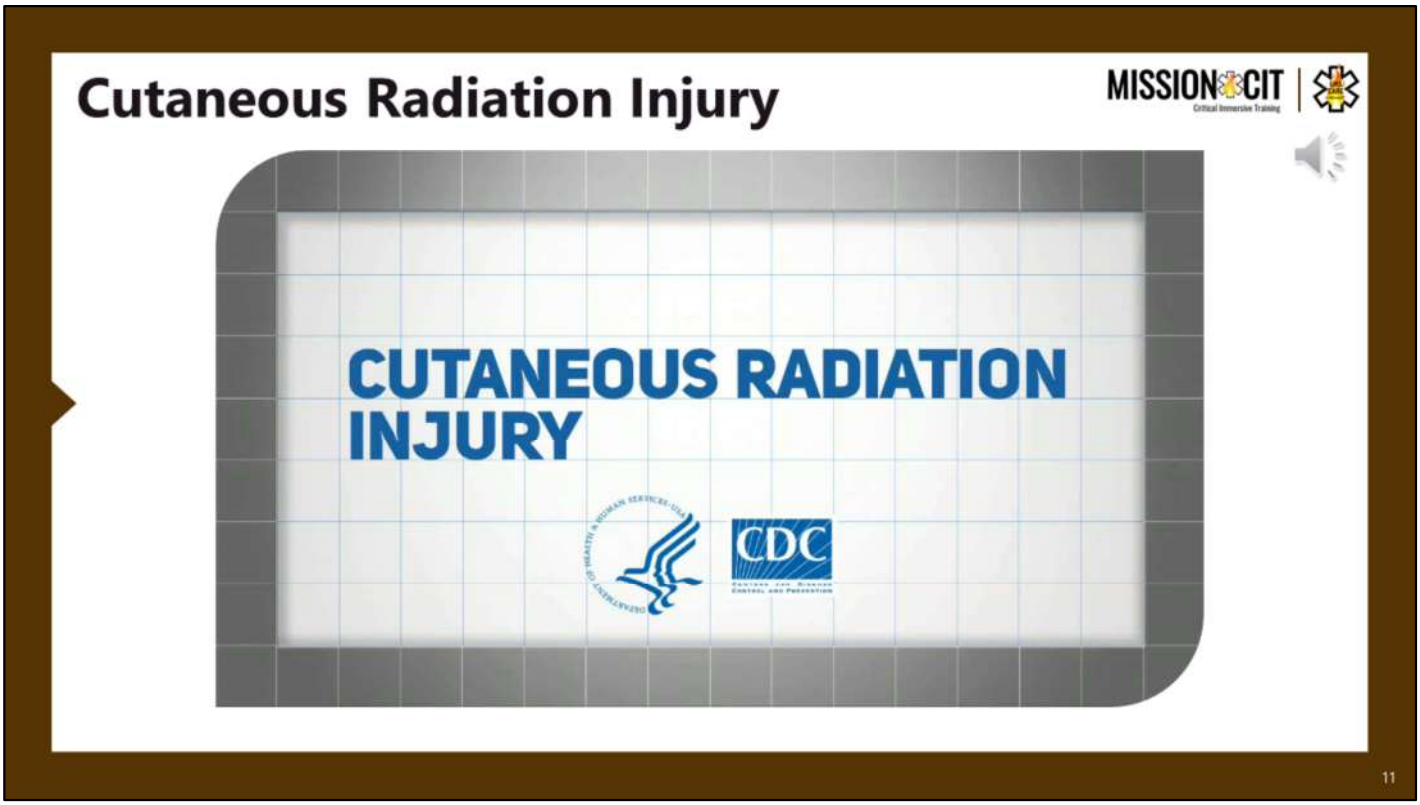
Radiation burns can occur due to exposure to the following types of ionizing radiation, namely, alpha, beta, and gamma. Out of the three, radiation burns due to gamma rays are the most common.

Before treating these patients, determine if there has been a radiation exposure and also whether it continues to exist. If so, call in the hazmat experts to handle the situation and wait at a safe distance until the HazMat team decontaminates the place.

Wear PPE before entering the scene. Your first aspect of management is to remove the patient's clothing and dispose of it appropriately, according to your decontamination procedures and processes.

Begin ABCs, irrigate the open wounds, and treat burns or trauma using bandages and other dressing materials. Notify the emergency department and prepare for transportation.

Document the source of contamination and the duration of exposure to help healthcare professionals provide appropriate treatment. While doing so, limit your duration of exposure and stay as far away as possible from the source. If possible, place a shield between the gamma rays and yourself.



We will end this lesson with a video from CDC.
Radiation can affect the body in a number of ways. How the body will be affected depends on the amount of radiation absorbed by the body, known as the dose, the type of radiation, how long the person is exposed, and which part of the body is exposed. In a radiation emergency, one of the possible health effects of radiation exposure is cutaneous radiation injury or CRI. Learn more about what CRI is, how it can happen, what it may look like, and what to do if you experience symptoms of a CRI after a radiation emergency.
In the next lesson, Missah will talk in detail about the assessment and treatment of burn injuries.