

9 Safety Tips on Electrocutation

1. Worksites use a lot of electricity. Electricity is dangerous.
2. Just in case you didn't pay attention – Electricity is really dangerous. Now we can move on.
3. You **should be scared** of being electrocuted. That will keep you safe.
4. When electrocution happens, the muscles in your limbs contract. This causes arms and hands to *wrap around* or clench objects.
5. Someone who is being electrocuted **can't let go because of this**.
6. If you touch a person being electrocuted, you will get an electric shock too, and may also be injured.
7. The BEST thing to do is to **turn the power off**.
8. Know where the power kill switch is wherever you are working. Or at least the breaker/switch for the area that you are in.
9. Learn resuscitation. People who have been electrocuted are likely to have breathing problems and heart failure.

People shouldn't die at work. Think seriously about going home every day and what you can do to make that happen.

Basics of Electric Shock

It takes very little current to cause damage to the human body. Many people don't understand why sometimes electrical injuries vary from person to person.

Studies show that the electrical resistance of the human body varies with the amount of moisture on the skin, the type of body that the person has and the applied voltage. The typical hand-to-hand resistance of the human varies 500 Ω and 600 k Ω , depending on the conditions although other sources say 1K Ω to 100K Ω – in other words, there is not precise answer. Higher voltages have the capability to break down the outer layers of the skin, as burns, which can reduce the overall resistance value. UL uses the lower value, 500 Ω , as the standard resistance between major extremities, such as from the hand to the foot. This value is generally considered the minimum that would be encountered and, in fact, may not be unusual because wet conditions or a cut or other break in the skin significantly reduces human body resistance.

To summarise, you can't really predict what voltage/current will really hurt, damage or kill a person. It's too variable.

The Effects of Current on the Human Body

Current	Effect
1 mA or less	No sensation, not felt
More than 3 mA	Painful shock
More than 10 mA	Local muscle contractions, sufficient to cause “freezing” to the circuit for 2.5 percent of the population
More than 15 mA	Local muscle contractions, sufficient to cause “freezing” to the circuit for 50 percent of the population
More than 30 mA	Breathing is difficult, can cause unconsciousness
50 mA to 100 mA	Possible ventricular fibrillation
100 mA to 200 mA	Certain ventricular fibrillation
More than 200 mA	Severe burns and muscular contractions; heart more apt to stop than to go into fibrillation
More than a few amperes	Irreparable damage to body tissue

The typical current rating of a typical AC power socket does vary from country to country but it's at least 5 AMPS. That is more than enough to kill.

The type of injury caused by electrocution will also vary where the current passes through the body. In the worst case, an electrical current of about 10-20 milliamps applied to the back of a person's head is enough to kill. A current passing from hand to hand (reasonably common) has a much higher risk of impacting the heart. A current that passes within a limb is less likely to cause severe injury to the heart or nervous system. Of course, time is also a factor. The longer the current flows through the human body, the more damage is caused and severe injury is more likely. Also, longer exposure increases the chance of electrical burns and irreparable flesh damage.

Loss of Function

If you survive an electrocution, then you have a high probability of permanent damage to limb or body. The current flowing through the body can cause permanent nerve damage,

DC Power is more dangerous.

DC power is much more dangerous than AC power because it tends to use low voltage and high current. It's the current that is more likely to damage the body thus causing injury and death.

High Voltage is Dangerous by Proximity

High voltage is still dangerous because it can create a lot of current, but also because high voltage can jump/spark large gaps. When you are close to high voltage sources, say 1 kilovolts or more then think about whether you are the path to ground.

Resuscitation

People who have been seriously electrocuted are likely to have breathing difficulties and possibly heart failure. You should learn resuscitation because you really need the hands on training to know how to do it right.

Basics Tips

1. *Check that you are safe and able to help the victim.* You can't help the person if you are also incapacitated.
2. Disable the power to the building or area. Insulate the area with mats or other material if you can't do this.
3. Check patient is conscious.
4. Call for help.
5. Check the casualty's Airway, Breathing and Circulation (ABC).
6. Check the airway / assess breathing. If no breathing consider moving to recovery position and clear obstruction. Victim may have swallowed tongue.
7. Administer CPR if no breathing.