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# The Dangers of Electrical Shock

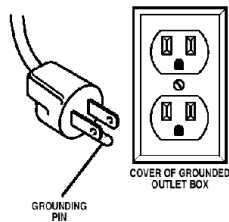
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Electric power, when installed and used correctly, does a tremendous amount of work. But because electricity cannot be seen and it's such a powerful force, we need to be very careful when using it. People are injured or killed every year by electricity. The reasons for injury or death are almost always carelessness, a faulty appliance or tool, or a lack of knowledge about how electricity works. You can reduce electrical injuries and death by doing three things:

1. Understanding how electricity works,
2. Recognizing potential electrical hazards, and
3. Learning about safety devices and mitigation methods that prevent shock.

Electricity naturally flows to the earth, or to ground, through anything that will conduct electrical current. Electricity will pass through the human body, sometimes with fatal results, trying to get to ground. If an appliance or tool is faulty or has a shorted wire, the electric current may try to find another path to ground. That's why electrical systems should always be installed correctly and be grounded.



**Three-Prong Plugs.** The installation of electrical outlets in residential establishments have changed considerably. We now have ground fault circuit interrupters, arc fault breakers for bedrooms and, you may have noticed that the electrical outlets in most homes now have three-wire receptacles that accommodate electrical cords with three-prong plugs. The third prong provides a continued path to ground along which the electric current travels. Most major appliances, such as stoves, refrigerators, and computers, have three-prong plugs, meaning they are grounded. Most older homes do not have three-wire receptacles. If yours does not, you should consider having an electrician rewire

the home to upgrade your electrical system to meet with the new standards. Although three-prong adapters can be purchased, they are not recommended for permanent use. Also remember never to remove the third prong of a plug to make it fit a two-hole outlet.



**GFCI.** Another device that's commonly used to prevent shocks in the home is a ground fault circuit interrupter. These are usually installed in wall-mounted receptacles in areas where electricity and water are most likely to come in contact, such as bathrooms, laundry rooms, kitchens, and outdoors. They have buttons that are marked TEST and RESET. GFCIs monitor electric current and can switch a circuit off before injury occurs. It is advisable to consult a qualified licensed electrician about installing these safety devices, although many newer homes have them already.

It's advisable to use tools and appliances with three-prong grounding plugs, even if you have a GFCI. Portable, or temporary, GFCIs are available, but they should not be used as a permanent alternative to wall-mounted, receptacle-type GFCIs.



Overloaded receptacles. Avoid overloading a receptacle or an electrical circuit. The electrical system has been designed and installed to accommodate an electrical current at a rated value. Most residential installations for electrical outlets are protected at 15 amps. Plugging in too many devices to one outlet by using power bars or outlet multipliers can or may cause fires to occur due to overloaded wires becoming hot. Most receptacles are designed for two plugs only.



Double-insulated tools. Double-insulated tools help protect against electrical shock. An electrical short in a tool can occur, because of worn wiring that lets a bare wire touch the frame of an appliance or tool. These tools should only be used when plugged into a GFCI. Double-insulated tools have an outer casing of plastic or some other nonconductive material and tools with two-wire plugs. Some tools, that have been modified and refitted with two prong plugs may not be double insulated and should be considered dangerous.



In the workshop. Ungrounded faulty tools are always hazardous. Make sure power tools are grounded, or are double-insulated. Wear rubber-soled shoes, stand on a rubber mat, and keep work floors dry. Receptacles in basements and garages must have a ground fault circuit interrupter.



In the bathroom. Never touch electrical equipment while in the bathtub. Keep all electrical appliances far enough away from water in tubs, showers, and sinks so you can't touch them, and so that they can't fall into the water. If this happens, the electricity could and possibly will flow through the water—and through you. Receptacles in bathrooms must be a ground fault circuit interrupter.

Throughout the house. It's a good idea to cover electrical outlets so that objects like, pins, nails, and other foreign objects can't be inserted into the outlets. New rules require the use of tamper proof outlets be installed in all common areas of the home.



In the laundry room. An ungrounded faulty appliance anywhere can be a hazard because you could become part of the electrical circuit. For example, handling an ungrounded clothes iron while touching an operating washing machine could be dangerous because you could become a path for current to flow. In this example, the washing machine is grounded, but the iron is not. Because electricity is constantly seeking a path to ground, when you touch the washing machine while using the ungrounded iron, the electricity from the iron will travel through you as it tries to get to ground, which in this case would be through the washing machine.



In the kitchen. An ungrounded faulty appliance, such as an electric toaster, used near a grounded kitchen sink can be dangerous. Do not handle or operate appliances when your hands are wet or when the appliances are on wet surfaces, such as a countertop that has water on it. Receptacles within six feet of a kitchen sink must have a ground

fault circuit interrupter. In addition, new rules identify the installation and use of 20 amp t-slot receptacles be installed in the kitchen. You are not required to upgrade your electrical system to meet the new codes, but if you plan any renovations to the kitchen, you may be required to upgrade the electrical system. Check with the local authorities prior to your renovation project.

Check equipment. It's advisable to check the condition of cords, plugs, and insulation on all tools for signs of fraying or other damage. Do not use a tool that has been damaged. Repair or replace the tool prior to use. Never use electrical tape to make a temporary repair to the cord of an electrical tool. If the cord is damaged, have it replaced.



In swimming pools. Pool lights and pumps may become faulty and create hazards. Make sure your pool has only properly installed lighting and equipment. Receptacles near pools must have ground fault circuit interrupters.

If you have questions about your electrical system or appliances and tools, you may wish to consult an electrician about the best way to ensure your safety.

Summary; Electricity is a very powerful force, which we cannot see, hear or taste. Electricity is a utility that we take for granted. We always expect it to be there. When we turn on a switch or plug in an appliance, we expect the electricity to flow and the lights to come on or the appliance to do our cooking. If electrical circuits are installed correctly and according to local codes and jurisdictions and maintained in good order the use of electricity is safe. It is when we do not follow these simple rules that electricity can get out of control and cause damage to our homes, injury or even death. It only takes a very small amount of electrical current to pass through your heart and chest area to cause severe injury or even death. Be safe with your electrical equipment, use it for its intended purpose and if in doubt, check with a qualified electrical person.

Safety is a personal responsibility.  
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