

Crush Syndrome

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The information presented here will hopefully be a reminder of how dangerous digging can be, and also help you plan in case the dig goes bad. As in all cave-related activities, digging presents a set of hazards, such as entrapment, that may be life threatening, even long after the entrapment has occurred.

Let's say you and your friend are working on a dig in your favorite big-air blowhole. The passage is slightly unstable, but you can "smell" cave ahead, so you keep going without shoring up. Then a loose rock falls on your friend's leg, trapping her so she can't move. If you can safely remove the rock soon after it has fallen, then do so. If you can't get the rock off her leg, what do you do? In this situation, if there are three or more people in the area, one person should stay with the injured digger, while the others go for help. You will need to have trained rescue and emergency personnel on the scene as soon possible in order to get your friend out. However, if you are alone, first make sure your friend's airway is clear, she is breathing, and she has a pulse. Next take action to make the area safer by stabilizing loose rock or using padding to keep your friend out of water or mud. Now go for help and get that help back to your friend as quickly as possible.

To aid in your decisions in getting your friend extricated from beneath the rock as well as providing appropriate information to rescuers, it is important to understand what happens to a body that is crushed by a heavy object. Crush Syndrome, is the body's reaction to the removal of the heavy object. Sudden death, or death later can result from the removal of the heavy object, thus your recognition of this potentially fatal outcome could save your friend's life.

When a person is being crushed, the tissues at the crush site are being damaged, and toxins are building up at the site. Generally, damaged tissue releases potassium, while damaged skeletal muscle releases myoglobin. When the heavy object is lifted from the injured site, these substances are released to the rest of the body. The large amounts of potassium can cause heart problems including the possibility of sudden death from cardiac arrest. Myoglobin is toxic to the kidneys and therefore can cause renal failure, resulting in death a few days later. In addition to toxins being released, fluid flows into the damaged site from the rest of the body. This sudden flow of fluid into the damaged area can affect the fluid balance in the rest of the body and lead to shock.

While your friend is trapped, avoid giving her anything to drink or eat since she may not be able to swallow, and because there is a risk she may vomit, which could cause her to choke. Medical professionals will administer fluids when they arrive.

Now that you have the information to understand what may be happening to your friend's trapped leg, alert medical personnel when they arrive about the possibility of Crush Syndrome. You will also want to tell them (1) the sequence of events that lead to your friend becoming entrapped, (2) how long your friend was trapped, and (3) anything your friend might have told you about how she was feeling. Ideally, medical personnel will arrive who are knowledgeable about Crush Syndrome, and about how to prevent it from occurring. Usually they will treat it with administration of intravenous or oral fluids with potential addition of certain medications to diminish the effect of the toxins and/or shock.

Given this information on Crush Syndrome and the dangers of removing a rock from a digger who has been trapped for a long time, are there circumstances when removing the rock is the best course of action? The answer is yes. When the rock is prohibiting your friend from breathing, then the rock must be moved immediately.

Finally, the best way to help your friend is to take precautions before the rock falls. Shore up the dig. Work from above. Be vocal about your concerns. If you don't like the way it looks, call the dig off until a safer route can be found. For more information on cave safety and rescue techniques, see On Call, A Complete Reference for Cave Rescue, 2001 Edition.