

Basic life support: guidelines for expedition caving

The purpose of this document is to give clear guidelines for emergency life support on expedition. It will answer these two questions:

1. When should I give CPR?
2. When should I stop CPR?

The guidelines

1. When should I give CPR?

If you cannot detect **obvious** signs of a circulation, start CPR immediately. **Do not feel for a pulse: this is unreliable and time consuming.** There are some situations, however, in which you should **not** begin CPR:

- If doing so would place you in danger
- If there is an obvious fatal injury (for example, decapitation)
- If you suspect the casualty is **profoundly** hypothermic.



In this case, you should ventilate the casualty (help him to breathe), but you **must not give chest compressions unless you can guarantee to maintain them for the duration of a rescue.**

The case of profound hypothermia is the only one that makes your decision difficult. Follow the process on the next page to decide whether to give CPR. **If you are unsure, it is better to give CPR.**

There are no direct physical signs of profound hypothermia that you can detect. The way to diagnose it is to **consider the circumstances of the casualty.** Here are some situations in which you should suspect profound hypothermia:

- Cold water immersion
- Exposure on the surface during cold weather
- If the casualty lost consciousness following mild hypothermia



When the core body temperature drops below 32°C, shivering will stop and the pulse and breathing will slow. This is profound hypothermia.

Further cooling will result in unconsciousness.

If an incident occurs **at surface camp**, remember that contacting the emergency services takes priority over commencing CPR (since the probable cause is a heart attack).

2. When should I stop CPR?

You should stop CPR:

- If you are in danger
- If the casualty shows signs of a returning circulation



Stop chest compressions, but continue ventilating the casualty until he starts to breathe again.

In practice, breathing is very likely to return at the same time as circulation.

- If the emergency services arrive
- **After 20 minutes if you are underground**

The last one is important. Unless you are very near the cave entrance and can send someone for help, you must not continue to give CPR after 20 minutes. **Measure this time with a watch and stick to it.**

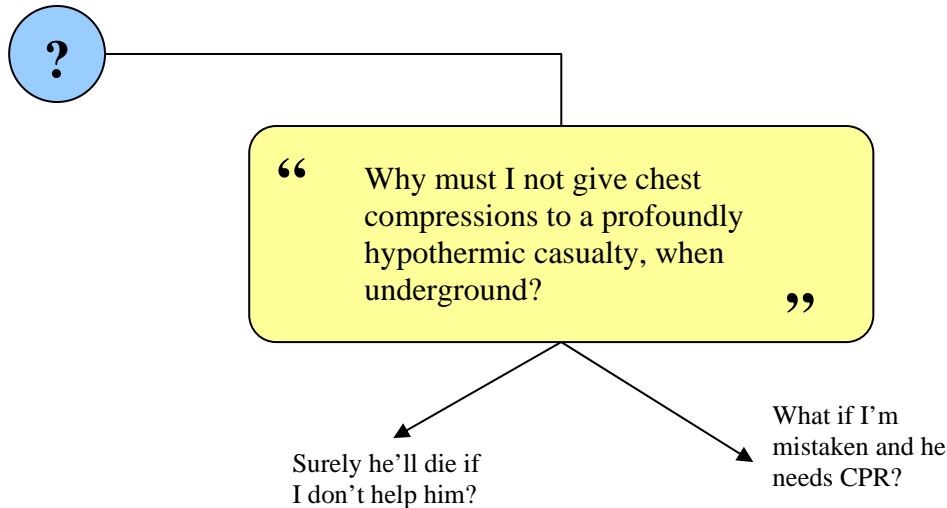
If there are no signs of improvement after 20 minutes of CPR, you should consider the casualty dead. You must then leave the cave as safely as possible and return to surface camp. Do not split up the group – **everyone leaves together**. The body will be retrieved from the cave at a later date.

Remember that profound hypothermia is a special case. If you suspect profound hypothermia, **continue ventilation for as long as possible**, whilst slowly re-warming the casualty. **He is not dead until he is WARM and dead.**

The explanation for the guidelines

Basic first-aid training is based on the premise that expert help is on its way. Therefore you are taught to give CPR without interruption unless it becomes dangerous to continue. Unfortunately that is not a realistic premise if you are 500m underground in the mountains.

Expedition members will disagree about emergency first-aid in these situations. In the traumatic situation created by a serious injury, this disagreement could easily lead to conflict between other cavers in the group. It is essential for them to **remain calm, avoid arguing, and follow the guidelines**. Heated arguments about CPR carry a serious risk of endangering the rescuers; over-extended CPR is a danger to the rescuers since it may lead to exhaustion. The physical and emotional demands of CPR could compromise a rescuer's ability to cave out safely.

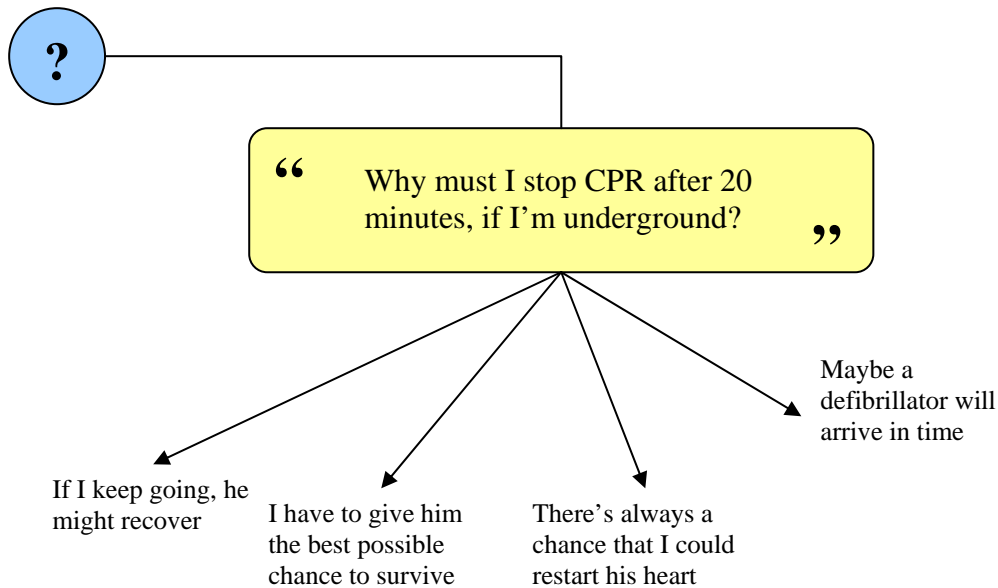


When a casualty is profoundly hypothermic, he may have no detectable signs of a circulation. Profoundly hypothermic casualties can survive for long periods with a very weak, slow pulse (it might beat only a few times a minute). Giving chest compressions is extremely dangerous, since they can cause the casualty to enter ventricular fibrillation. That means that **once you stop giving CPR, his heart will not be able to beat effectively and he will die**. It is better to leave him with a poor circulation than to destroy his circulation completely.

Unfortunately it is not easy to make a diagnosis of profound hypothermia. The most common cause – cold water immersion – is also often associated with near-drowning or cold shock. And here’s the tough part: following near-drowning or cold shock, immediate CPR is essential. That’s why the flow-chart on page 2 asked you how long the casualty had been in the water: after 30 minutes, victims of cold shock or drowning will certainly be dead, but a hypothermic casualty may still be alive.

Unlike profound hypothermia, **mild** hypothermia is not a **cause** of unconsciousness, but an unconscious casualty may **develop** mild hypothermia. **Mild** hypothermia is **never** a reason to withhold CPR

It is difficult to take the decision to withhold CPR – you will feel responsible for the consequences if you are mistaken – but remember that you will kill a profoundly hypothermic casualty if you give him chest compressions. ***First, do no harm.***



Unless you are very near the cave entrance and can send someone immediately to alert surface camp, it will not be possible for the emergency services to arrive in time to help. Even at the most optimistic estimates it will be **at least four hours** before they arrive. By this time your casualty will certainly be dead (unless the problem is profound hypothermia; see above).

- **CPR cannot restart a stopped heart.** CPR can only keep a casualty alive, and only for a few hours at most.

After the initial 20 minutes of CPR, professional medics might be able to restart the casualty's heart using a defibrillator. Without this, there is no way to revive the casualty.

- No defibrillator is coming. Therefore you should maintain CPR for **20 minutes** before stopping. **Measure this time with a watch and stick to it.**
- Your safety is at risk if you give over-extended, pointless CPR.

Although you will not be able to restart someone's heart, there are other potentially reversible causes of a circulation failure. These conditions may respond well to a short period of CPR. That's why it's worth spending 20 minutes.

Conflicting guidelines

These guidelines contradict some advice given in Gavin's rescue guide, which is available at http://users.comlab.ox.ac.uk/gavin.lowe/Caving/rescue_intro.html .

Wherever there is a conflict of advice, **the guidelines in this document take precedence**. Some of the first-aid recommendations in the rescue guide are inappropriate for expedition caving.

The rescue guide is still the main source for cave rescue guidelines. This document amends those guidelines, but has much narrower scope.

Sources

I have consulted a number of medically-qualified friends, including doctors. In particular, Dr. Tariq Qureshi has helped to shape these guidelines. I have also discussed the guidelines with Gavin, who agrees with them.

Other sources:

- The European Resuscitation Council guidelines:
 - [Basic life support](#)
 - [Advanced life support](#)
- [The Resuscitation Council \(UK\)](#)
- [Wilderness Medical Training](#)