

deuter.com

#deuterforever



deuter

FIRST AID ON SNOW

In cooperation with Philipp Dahlmann and Fabiola Shaw

Emergency first aid for winter activities in the mountains

This Booklet offers first responders guidelines for what to do when faced with an accident on snow, to enable them to provide competent support in a medical emergency - from administering first aid to communicating effectively and working together with mountain rescue services when they arrive.

Would you know what to do in an accident in the mountains?

It's a beautiful day in the mountains. Everything's going to plan. The sun is shining. The scenery is varied and interesting. The powder is untouched and you're on the final ascent. There's nothing to indicate what's about to happen. A tiny lapse in concentration, one wrong step, or just plain bad luck - even a small mishap can soon turn into a serious incident in the mountains. Would you know what to do?

No? Well, it's high time you changed that. Having a solid understanding of what to do in an emergency and keeping a cool head are crucial skills for anyone who's into mountain sports. Following a clear set of rules and adopting a structured approach in a high-stress situation prevents mistakes from happening and saves lives.

Structured approach for accidents on snow

Even a small mishap can soon turn into a serious incident in the mountains. That's why having a solid understanding of what to do in an emergency and keeping a cool head are crucial skills for anyone who's into mountain sports. Following a clear set of rules and adopting a structured approach in a high-stress situation creates calm and prevents mistakes from happening. That is why targeted strategies have been established in the fields of emergency medicine and mountain rescue, intended to help achieve a structured, systematic approach.

The basics in four effective, easy-to-follow steps

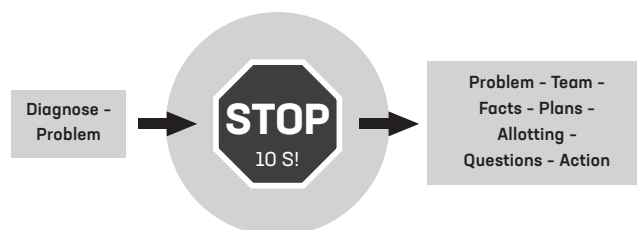
Acting blindly or panicking is no good in an emergency. But staying calm is easier said than done, because our first reaction in an emergency tends to be instinctive. That's why it's important to know the four steps of the **STOP** system so well that they become second nature.

STOP = STOP

When the pressure is on in an emergency, we often feel like we have to react immediately and know intuitively what to do. But it's when we act rashly that we most risk making critical errors, doing things in the wrong order, and not taking the collective knowledge of a team into account. So before you step in to help, whether you're alone or working as part of a team, you should stop and take a step back (both physically and mentally). We can only make good decisions when we're in a calm, collected state. After a brief timeout, you'll be able to tackle the task before you far more effectively and safely.

Before you make your first move, take "10 seconds for 10 minutes".

In other words, pause for 10 seconds to consider what you need to do in the next 10 minutes. If you're



working as a team, the emphasis here should be on a structured decision-making process that needs time if is going to make use of the collective knowledge of the group. Good communication and feedback within the team and with the injured person and mountain rescue is essential.

IMPORTANT: Any life-saving actions like CPR should NOT be paused during these 10 seconds.

STOP = THINK

As the first responder you need to assess the overall situation. Bear in mind that your own safety is your top priority. You can only help others if you yourself are safe. And it's only by assessing the dangers and potential risks that you'll be able to make the right decisions and prevent any secondary accidents from happening. It's good to have a solid understanding of the potential objective hazards (mostly natural) and subjective hazards (mostly human) in the mountains, as well as other potential risks, such as airborne toxins, panic reactions, an expansion of the emergency to additional persons or areas, atomic radiation, chemical or explosive hazards, cave-in/landslide/avalanche, electrical hazards, illness.

STOP = OPTIONS

You can then decide whether you can safely cope with the dangers and risks involved in providing assistance, and whether the injured person will benefit from your help in this situation. In other words, if the accident site is exposed to objective dangers, the injured person should be moved out of the danger zone to a safe place. If, after assessing your own abilities and the situation, you feel that you would be putting your own safety and that of the injured person at risk by acting, then you should refrain from providing assistance, leave the danger zone, make an emergency call, keep observing the injured person, and wait for professional rescuers to arrive on the scene. You can then help guide them to the victim and brief them on the key details of the incident.

Making an emergency call is essential to initiate a professional rescue. In the mountains, however, it can be hampered by lack of cell phone signal.

So here are a few tips on how to act in an emergency and what precautions you can take:

1. When heading into the mountains, it's important to tell friends or family where you intend to go and what time you expect to be back.
2. You can also leave a note on the dashboard of your car, with details of your route and planned return time.
3. For tours in very remote and inhospitable areas, an alternative communications device such as a satellite phone might be a good idea.
4. To make an emergency call, dial 112 for most of Europe, 999 in the UK, or 911 in the US and Canada (look up the emergency number if you will be traveling outside these areas). Emergency numbers will usually work even if there is no normal coverage. That's because it uses the best network coverage, regardless of your cell phone contract, or your cell phone uses better signal strength for this specific purpose. There are several ways to do this:

- Type the numbers in manually
- Use your cell phone's emergency call function
- Instead of unlocking a phone with your PIN select the emergency call / emergency SOS function
- Some cell phones (e.g. iPhones) have a specific combination

5. Once you're through to the emergency service, you'll have to answer some essential questions such as: What happened? How many people are injured? What types of injuries? Where did it happen? When did it happen? Who's calling? What's the weather at the accident site?
6. If you can't get a signal, change locations and try again. If that still doesn't work, and you can't get a signal within a reasonable radius of the accident site and within a reasonable timeframe, you should try to use visual or acoustic signals, including the signals for an aerial rescue.

STOP = PERFORM

If you decide to carry out first aid, it's important to prioritize the measures you're going to take. Besides carrying with you a first aid kit, bivouac sack, cell phone, helmet, and an emergency card, it's essential that you have a solid understanding of first aid and

know how to perform some important techniques. The **A / B / C / D / E** approach gives a clear understanding of what to do, and serves as a useful guide for all first aiders in assessing and providing care to persons who have been injured or in an accident

A /

AIRWAY: Check if the victim is breathing and their airways are free from obstruction. Tilt the head to check inside the mouth and remove any foreign objects such as vomit, snow, etc.

B /

BREATHING: If the airways are clear and the victim is breathing fine, then maneuver them into the recovery position and monitor them. If their airways are clear but they are not breathing, then begin cardiopulmonary resuscitation (CPR). This should be carried out at a ratio of **30:2** (30 x heart compressions, 2 x resuscitation breaths) and do not stop until the victim is breathing independently again, or until professional rescue services arrive on the scene and take over.

C /

CIRCULATION: Measure the victim's pulse at the extremities and/or the carotid artery. Check for bleeding, any irregularities, and skin condition (color changes, sweating, etc). Treat any wounds with pressure bandages and follow the **RICE** guidance of Rest, Ice, Compression and Elevation. Following this sequence of self-help measures alleviates acute pain and prevents more serious outcomes.

D /

DISABILITIES: Evaluate the victim's level of consciousness and check for visible injuries such as head trauma etc.

E /

ELSE - ENVIRONMENT: Assess any other remaining symptoms and take action. Prevent hypothermia by using a survival blanket, warm clothing, a shelter or bivouac.

CASE STUDIES

Exhaustion and falls are some of the most common emergencies in the mountains in winter. We'll therefore look at both scenarios in detail below, using the structured approach outlined above.

1

STRUCTURED APPROACH IN THE CASE OF EXHAUSTION

Overestimating one's own abilities and inadequate physical conditioning are very common, particularly when it comes to ski touring. We'll walk through how to apply the **A / B / C / D / E** - approach in such cases here.

Exhaustion situation on a ski tour



You're skiing in the backcountry when your partner suddenly complains of feeling extremely tired and unable to continue.

Assessing potential terrain hazards to ensure personal safety



You take 10 for 10 to assess the alpine environment, and you determine that the situation is generally safe for everyone involved.

Securing the accident site and placing an emergency call



Protect the site by setting up a pair of crossed skis some distance above the exhausted person. Also immediately place an emergency call (112 for most of Europe, 999 in the UK, or 911 in the US and Canada) and inform the mountain rescue services. By sounding the alarm early, you reduce the wait time, and the exhausted person will be in the hands of professional rescue teams faster.

Checking in with the victim

A / Following the **A / B / C / D / E** - approach your first step, A, is to speak to your exhausted touring companion. They are responsive and able to speak nor-



mally, so you know their airways (A) are clear and unobstructed. Since you also know that your companion did not suffer a fall, you don't need to stabilize the neck/spine.

Checking for breathing

B / The next step is to check for breathing (B). Can the exhausted person get enough breath? Does it hurt to breathe? Does the chest rise and fall evenly? Here, it's a good idea to count the number of breaths per



minute. Place your hand on the side of the chest and count breaths for one minute. An adult typically takes about 12-18 breaths per minute. Children take 16-25 breaths per minute. If your companion has no chest injuries and is able to breathe without pain and get sufficient air, you can move on to the next step.

Checking pulse

C / For C (Circulation) you'll assess whether the victim's blood circulation is impaired. There are two ways to do this: First, you can feel for a peripheral pulse on an extremity, such as the wrist. Hold the hand and trace a path with your index and middle fingers along the inside of the thumb towards the lower arm. Just after passing over the wrist, you'll feel a hollow. You can feel the radial pulse here (from the radial artery). If you feel a strong pulse, you can assume that the person's circulation is sufficient. You can also assess the person's capillary refill time. With your fingers, apply pressure to a point on the body and time how long it takes for the skin to return to the color of the surrounding skin after releasing the pressure.



PLEASE NOTE: It only makes sense to check capillary refill time on a part of the body that is warm and has sufficient blood flow. Chilled fingers or toes will not give you a reliable indication of overall circulation.

Check neurological and BE-FAST status

D / The next step is to assess the person's neurological status. Ask the person to tell you what day it is, where you are, whether they can tell you their name, and what happened. You'll then perform the **BE-FAST**-test.

B
BALANCE

Balance
Check for loss of balance. Do they favor the right or left when walking for example?

E
EYES

Eyes
Are they visually impaired or have loss of vision?

F
FACE

Face
Ask the patient to smile or frown.

A
ARMS

Arms
Ask patient to outstretch both arms and rotate palms.

S
SPEECH

Speech
Ask the patient to repeat a simple sentence.

T
TIME

Time
Ask the patient or relative how long they have had these symptoms.

B = Balance Check for loss of balance and any weakness in the feet or legs. Have the exhausted person flex their feet. Have them walk a couple of steps and look for any unsteadiness or difficulty balancing.

E = Eyes Check for sudden impairment of vision. Assess their peripheral vision, whether they are seeing double, have blurred or impaired vision, and check whether their pupils look normal.

F = Face Ask the person to puff up their cheeks, to smile, and to furrow their brow. Does the face look uneven.

A = Arm Have the person close their eyes and hold both arms out in front of them, with palms facing upward, for 10 seconds. Is one arm weak or numb.

S = Speech Check for slurred speech or confusion. Have the person repeat a simple sentence. If they can't do it perfectly, something's amiss.

T = Time Find out when the person last felt or seemed to be in a normal neurological state.

NOTE:

If you see any of the BE FAST signs, the person may have suffered a stroke. Time is of the essence for stroke victims. If you suspect the person is having a stroke, let the emergency services know immediately, placing a second emergency call if necessary. The emergency responders may be able to expedite the rescue by using a helicopter.

Keep the person warm

E / In steps A, B, C, and D above, we were able to rule out life-threatening, time-critical factors. Your companion is merely exhausted from the long tour and doesn't have the energy to ski further. For E (Else/Environment), your goal is to keep the person warm until help arrives. Use the survival blanket from your first aid kit. To



protect exposed body parts, wrap the blanket around the torso and legs, like a burrito. If you have a second emergency blanket with you, you can lay it over the person as well. You can also use a jacket instead. Hot, sweet tea or a snack or energy bar can also help prevent hypothermia and low blood sugar.

Rescue services arrival



When the rescue squad arrives, help them locate you, briefly describe what happened and offer to help if needed.

Air rescue signal

If the rescue service arrives by helicopter, you can help guide them in as follows: Look around for a



suitable landing spot and use these signals (Yes/No), ensuring that no loose items are lying around since they might interfere with or damage the helicopter's rotors and control system.



Falls in the backcountry



A freerider falls while skiing off-piste terrain. You saw it happen and are concerned. It's up to you to check things out and provide first aid.

Assessing potential terrain hazards to ensure personal safety

Before approaching the victim, make sure your own safety is assured. Because you're alone, it helps to run through all possible hazards step-by-step. Consider the danger of avalanche, a fall, or falling rocks or ice, as well as the risk of encountering a crevasse. Gather



yourself and take your time. If you were in a group, you would have the group "take 10 for 10" to get organized, make a plan, assign tasks, and, if necessary, place an emergency call.

Securing the accident site

Secure the area of the accident by setting up a pair of crossed skis well above the victim, so other skiers can see them.



2

STRUCTURED APPROACH IN THE CASE OF A FALL

Fall-related injuries to the knees and upper extremities like the arms or hands are very common in winter, when skiing or ski touring. We'll walk through how to apply the **A/B/C/D/E** - approach in such cases here.

Checking in with the victim



When you reach the victim, you're relieved to note that they are responsive. Now, follow the **A / B / C / D / E** - approach, one step at a time.

A / Because the victim is responsive and therefore not unconscious, they can keep their airways clear themselves. If the victim were unconscious, you would need to check for breathing and make sure the airways are clear by tilting the head to check inside their mouth and removing any foreign objects such as vomit, snow, etc.

Special caution required when moving the neck/spine

NOTE: Be very careful. A fall could have resulted in spinal injury. If the fall was bad enough or if the victim indicates that they are in pain or have lost feeling



anywhere, it's best to hold their head in your hands in order to stabilize the neck/spine and avoid causing further injury.

Checking for breathing



deuter.com

B / Fortunately, the fall wasn't that bad. The victim is able to move their head freely and doesn't feel any pain or malaise. The airways are clear, the victim is responsive, the spine is stabilized. You can now move on to checking their breathing (B). This can be done by simply asking how it feels to breathe and feeling the chest to see how frequently and evenly it rises and falls. In this situation, all is well. The victim is breathing steadily and there is no pain.

Checking pulse and possible bleeding - external and internal

C / Next comes C (Circulation). Take the victim's pulse, either at the radial artery (wrist) or at the carotid artery (neck) and check the capillary refill time. Then



check for "blood on the floor, plus four more", meaning look for external blood loss as well as potential hemorrhaging in the four main areas where life-threatening amounts of blood can be lost: the abdomen, the pelvis, and both thighs. Keep an eye out for the following signs: red contusion marks, bruising, tight skin, muscle guarding, or swelling. The pelvis deserves particular attention. It is not advised to palpate here (apply hand pressure). It's far more important to consider the intensity of the fall and any pain, and to communicate that to the dispatcher or to the professionals when they arrive.

Checking for disability and stabilizing the victim

D / Now it's time to check the victim's neurological status (Disability). Ask the victim to tell you what day it is, where you are, whether they can tell you their name, and what happened, so you can assess whether they seem disoriented, whether and for how long they may have been unconscious, and whether they are experiencing pain. In your case, the victim is in a stable condition, and everything appears to be okay except for some arm pain. Do not administer painkillers. Unless you are a certified emergency medical technician (EMT), leave that to the professionals, who have been trained to know whether and how much

is appropriate. Keep the victim in a stable position, protect them from hypothermia, and contact rescue services (dial 112 for most of Europe, 999 in the UK, or 911 in the US and Canada). While you are waiting for the rescue squad to arrive, it is important to stay with the victim and communicate calmly with them about what is happening.



You can also use this time to take 10 for 10, asking yourself: Did I provide enough details to the dispatcher, or should I call again? Is the site still secure? Is there a spot that offers better shelter from the weather nearby (within walking distance)? If you haven't yet placed an emergency call, now's the time to do that too.

Stabilizing the injured arm

E / In steps A, B, C, and D you checked for life-threatening conditions. In E (Else/Environment), your goal is to take care of any non-life-threatening injuries. This victim has pain accompanied by swelling and redness in the lower arm / wrist area. On closer inspection, you determine that the skin is intact and there is no exter-



nal bleeding. However, you do need to keep the arm stable to prevent further injury, enable blood flow to the extremities, and reduce pain. Communicate with the victim as you stabilize the arm, making sure not to cause further harm. It helps that the victim is likely holding their arm in such a way that it is relatively comfortable and in the least amount of pain.

A triangular bandage can be used as a sling to improve or stabilize the position. If the injury could lead to a significant reduction in blood flow to the area or if a dislocated joint or broken bone needs to be reset, professional help is needed. If the victim is in considerable pain, it does not make sense to have them ski down (especially on ungroomed, backcountry terrain).

Professional rescue services arrival

Describe your observation of the accident and the **A / B / C / D / E** - measures you have taken to the arriving rescuers. They will then take over, provide professional care, and transport the victim.



NOTE:

This booklet is meant to serve as a guide for first aiders in the event of an accident on snow, to enable them to provide competent support in a medical emergency. It does not in any way substitute first aid training and does not claim to cover every eventuality.

Fabiola & Philipp both work as paramedics and are active in mountain rescue. Fabiola works as an operations manager and Philipp as a practical instructor.

Photos: Aestivation / Moritz Garhammer (Titel), Julian Bückers (Pages)