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An important use
of this technique
for roped teams is
on glacier travel,
where self-arrest is
used to stop the
rest of the team
from sliding into a
crevasse.
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SNOW CLIMBING

Techniques

Self arrest



Snow Climbing: Techniques: Self Arrest

In the event of a slip on snow, you must know how to regain control as quickly as possible. Self-belay is the primary skill to prevent a slip in snow from becoming an uncontrolled slide; **self-arrest** is the primary recovery measure from a slide. If self-belay fails and you begin an uncontrolled high-speed slide down the snow slope, you've got to quickly go into self-arrest. **Safety considerations to keep in mind.**

- Don't fall. Stay in balance using proper snow-travel techniques, including the rest step and stepkicking with coordinated ax placements.
- Be aware of the run-out. Are there cliffs at the bottom of the slope or short run-outs that end in rocks? If you cannot tell, assume the worst.
- If there is dangerous run-out, do not rely on self-arrest. If you are not completely comfortable with your safety as you ascend using the self-belay, arrange for an anchored belay or turn back and find another route.
- Be aware of the snow conditions and steepness of the slope. If snow is turning hard or icy, use crampons and chop steps if necessary.
- Be alert to the party's overall condition and climbing ability. If it's late in the day, the effects of exhaustion may greatly diminish a climber's reaction time in the event of a fall.
- If you have to stop to adjust equipment such as crampons on an exposed slope, create a secure anchor first by planting your ice ax firmly in the snow and tying in.
- Wear gloves when crossing a steep slope. In a fall, they prevent abrasion and improve your chances of holding onto your ice ax to successfully execute self-arrest.
- Use extra caution when carrying an overnight pack. Heavy packs can contribute to loss of balance and to falls that are very difficult to stop.
- If self-arrest is required, be very aggressive and act fast before you have accelerated to an unstoppable speed.

The Completed Self-Arrest.

The goal of self-arrest is to stop safely, ending up in a secure and stable position on the snow. As you complete a successful self-arrest, you should be lying face down in the snow with the ice ax beneath you.

- The hands hold the ax in a solid grip, one hand in the self-arrest grasp with the thumb under the adze and fingers over the pick and the other hand on the shaft just above the spike.
- The pick is pressed into the snow just above your shoulder so that the adze is near the angle formed by the neck and shoulder. This is crucial. Sufficient force cannot be exerted on the pick if the adze is not in the proper position.
- The shaft crosses your chest diagonally and is held close to the opposite hip. Gripping the shaft near the end prevents that hand from acting as a pivot around which the spike can swing to jab the thigh. (A short ax is held the same way, although the spike will not reach the opposite hip.)
- The chest and shoulder are pressed strongly down on the ice-ax shaft. It is your body weight falling and pressing on the ax, rather than just arm strength driving the ax into the snow, that results in successful self-arrest.
- The head is face down, not looking up the slope, so that the brim of the helmet or hat is in contact with the slope. This head positioning prevents the shoulders and chest from lifting up and keeps the weight over the adze.
- The spine is arched slightly away from the snow. This arch is critical because it places the bulk of your weight on the ax head and on your toes or knees, which are the points that dig

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Strength obviously helps in self-arrest, but knowing the correct methods is more important than simple muscle power.
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into the snow to force a stop. Also pull up on the end of the shaft, which starts the arch and rolls weight toward the shoulder by the ax head. (Note: the arch can be carried to excess by those unwilling to get their chest and face down into the snow.)

- The knees are against the surface, helping slow the fall in soft snow. On harder surfaces, where they have little stopping power, they help stabilize your body position.
- The legs are stiff and spread apart, toes digging in. But if you have crampons on, keep them above the snow until you've nearly come to a halt. A crampon point could catch on hard snow or ice and flip you over backward.

Self-Arrest from Different Positions.

The position you find yourself thrown into when you fall determines how you self-arrest. You'll likely be sliding in one of four positions: head uphill or head downhill and, in either case, face down or on your back.

The immediate goal is to get your body into the only effective self-arrest position: with your head uphill and your face down. And the first move toward that goal is to grasp the ax in both hands, one hand on the ax head in the self-arrest grasp and the other at the base of the shaft. From that point, here is how to handle each of the four situations.

- *Head uphill, face down:* You're already in the desired self-arrest position. All you have to do is get your body over the ax shaft, ending in the secure final position described in the previous section, on the completed self-arrest.
- *Head uphill, on your back:* This isn't much more difficult than the first version. Roll toward the head of the ax and aggressively plant the pick into the snow at your side as you roll over onto your stomach. If the ax head is on the right, roll to the right. If it's on the left, roll to the left. Beware of rolling the other way, toward the spike, which could jam the spike in the snow before the pick and wrench the ax from your hands.
- *Head downhill, face down:* Self-arrest from headfirst falls is more difficult because the feet have to first be swung downhill. Reach downhill and off to the ax-head side and get the pick into the snow to serve as a pivot to swing the body around. Work to help swing the legs around so they are pointing downhill. Never jab the spike into the snow and pivot on that end of the ax. That would bring the pick and adze of the ax across your slide path and on a collision course with your chest and face.
- *Head downhill, on your back:* Hold the ax across your torso and aggressively jab the pick into the snow; then twist and roll toward it. Once again, the pick placed to the side serves as a pivot point. But merely planting the pick won't bring you around to the final self-arrest position. You must work at rolling your chest toward the ax head at the same time as you work your legs to swing around and point downhill. A sitting-up motion helps the roll.
- *Variations:* In the loose snow of winter and early spring, the pick may not be able to reach compact snow, making the usual self-arrest useless. The best brakes in this case are feet and knees and elbows, widely spaced and deeply pressed into the snow. The greatest drag potential of the ax then lies not in the pick but in the shaft, thrust vertically into the slope or dragged in the self-arrest position. Pivoting is usually unnecessary on a headfirst fall because you stop before you can get turned around.
- *A final reminder: Act fast!* How fast you get into the arrest position is the key to success. On hard snow, a quick stab at the slope with the pick or spike, or even boot heels, may stop a fall before it gets started. Arrest on extremely hard snow is very difficult if not impossible, but always give it an intense try, even if you're belayed on a rope. Occasionally, in the first instant of a fall, the pick lodges in a crevice or behind a hump and stops the action even on a very steep slope.

The Limits of Self-Arrest.

Although self-arrest is an important snow climbing skill, it is often a misunderstood technique that has led to serious accidents. It is critical to understand the limits of self-arrest and to not regard it as a reliable lifesaving technique but, rather, as a last-resort maneuver. A 50 percent success rate in executing the self-arrest is probably realistic.

Many climbers have a false sense of security in their self-arrest skills. Self-arrest is meant to stop a fall by friction of ax and body against snow. But when the slope is too steep or slippery, even the most skillful technique won't stop the slide. Acceleration, even on a relatively modest snow slope, can be so

rapid on hard snow that the first instant of fall is the whole story. The climber rockets into the air and crashes back to the unyielding surface with stunning impact, completely losing uphill/downhill orientation. If you do not stop your fall in the first few seconds, the chances of stopping by self-arrest at all are poor.

Even successful arrests require at least a little time, during which the climber slides some distance. Therefore, the effectiveness of the self-arrest is limited by the climber's speed of reaction and the steepness and length of the slope. If all initial efforts at self-arrest are unsuccessful, don't give up. Keep fighting. Self-arrest might work in softer snow or at a lower angle farther down the slope. Even if you don't stop, the attempt may slow you down and help prevent rolling, tumbling, and bouncing. It may also help keep you sliding feet first, the best position if you end up hitting rocks or trees. And if you are roped to other climbers, anything you can do to slow your fall increases the chance that their self-arrests or belays will hold.

If you lose your ax in a fall, use your hands, elbows, knees, and boots to dig into the snow slope, using positioning similar to what you would use if you still had the ax. It may help to clasp your hands together against the slope so that you accumulate snow in them and create more friction. On harder snow, you can try to push out from the slope with your arms, placing your weight on your toes to create friction.