



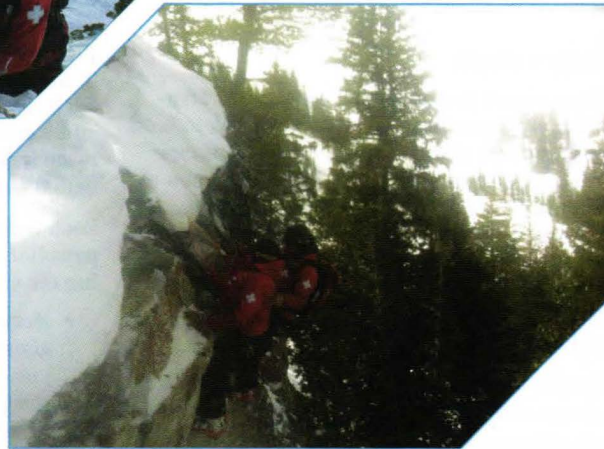
# CLIFFED - Out

## CLIFF RESCUE FOR SKI PATROL

BY STEVE ACHELIS AND ANDY RICH



Setting up a rescue. Photo by Steve Achelis.



High angle rescue. Photo by Steve Achelis.

Despite the best efforts of the ski patrol to warn guests about cliff areas, guests do occasionally become perched on a rocky precipice, unable to move up or down. These dangerous situations might be the result of limited visibility in unfamiliar terrain, trying to ski aggressive lines with limited skills, falling in exposed terrain, or ducking a rope line. Regardless of the cause or frequency, patrollers must have the training and the critical skills to handle these situations, just as they must have the training and skills to evacuate lifts and handle a wide variety of medical situations.

In partnership with Snowbird Ski and Summer Resort, Remote Rescue Training (RRT), a division of the Center for Emergency Programs at the University of Utah, developed protocols for patrollers to rescue cliffed-out guests. RRT established a corresponding four-day training and certification course, and seven veteran Snowbird patrollers earned Cliff Rescue for Ski Patrol certifications in March 2014. Snowbird adopted these cliff rescue protocols, and full implementation into its internal training is scheduled for preseason training in 2014.

Under what circumstances might patrol be called to help cliffed-out guests, and how might they implement a rescue? Below are the

cliff rescue protocols adopted at Snowbird.

### Search and rescue versus ski patrol

Although search and rescue teams and ski patrollers both perform rope rescues in mountainous terrain, there are notable differences:

- Patrollers tend to be notified of cliffed-out patrons quickly, often within minutes. This is usually the result of other guests reporting the situation, but cliffed-out guests may also self-report their situation via cell phone.
- Stationed near the cliffy terrain and geared up for mountain travel, patrollers can rapidly respond to guests in perilous situations. This rapid response by trained patrollers can prevent injury or death.
- Patrollers often carry lightweight rope rescue gear for personal lift evacuation that can be used for stabilization and low angle rope rescue. Heavier rope rescue gear caches can be stored at top shacks. Either way, rope rescue equipment can be readily accessible.
- The terrain where guests require assistance is typically well-known by patrollers. This makes it easier for the rescuers to preplan anchors and rescue

systems.

- The “victims” are paying guests who expect skilled rescuers to come to their aid. The ski resort has a duty to act in response to these incidents.

Unlike the search and rescue cliché that backcountry victims are either “stable or dead,” the combination of early notification, rapid deployment, ready access to rescue equipment, and familiar terrain can result in patrollers arriving at the scene when the guest is still in an unstable position, e.g. clinging to a tree.

### Keep it simple

Rope rescue protocols that are simple, standard, and team-based decrease the risk to both rescuers and guests. Cliffed-out rope rescue is a high-consequence task. Patrollers have limited time to train in the required skills. The rescue systems need to be simple, versatile, and, most importantly, safe. Having a few well-rehearsed protocols that use standardized skills and standard gear kits ensures safe and efficient rescues.

Simple is, of course, relative, but a simple system utilizes clean, minimal rigging without extraneous components. Simple protocols utilize similar skills, knots, devices, and communication to overcome varied challenges.

Standard systems are pre-planned and practiced. Standardization ensures seamless integration with other rescuers and reliable systems checks.

Team-based systems take advantage of having another rescuer present to double-check decisions, rigging, and operations. Three rescuers are recommended for all of the described cliff rescue techniques.

Trained rescuers are undeniably more predictable and reliable. The training needs to be hands-on and provide patrollers with a solid foundation, as well as the breadth of skills necessary to address the situations they are likely to encounter. Comprehensive initial training allows ongoing training to be targeted, effective, and efficient.

Lower Risk	Higher Risk
Simple	Complex
Standard	Improvised
Team-based	Individual-based
Trained	Untrained

Table 1: Risk Management.

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Simple, standard, and team-based systems are easier to learn, remember, check, and perform. The more a rescuer dips into the higher-risk column (Table 1), the greater the exposure to safety and liability hazards. Simple, standard, and team-based systems require less expertise, are faster, and provide fewer opportunities to make mistakes. Patrols that are responsible for rope rescue should have training and protocols in place that allow patrollers to respond in the lower-risk column.

#### Situations and solutions

The optimal method of extracting a cliffed-out guest depends on the terrain, the guest's mental status, and the available resources. The following four versatile rescue techniques provide standardized methods to respond to the vast majority of cliffed-out situations. Each rescue begins with locating the guest and a scene size-up. In most in-bounds cliff rescues, locating the guest and making initial verbal contact can be done quickly.

Each technique has its own specifics for patroller access and stabilizing and transporting the guest.

- **Access:** Identify a staging area above the guest to build anchors and base the rescue. A patroller is belayed or lowered to the guest. Not compromising the guest's safety while achieving access is vitally important. Although patrollers may be able to ski to the guest unroped, it is important to ensure rescuer safety.
- **Stabilize:** It is critical to stabilize the guest as soon as possible to prevent their precarious situation from turning into a fall. The patroller may initially secure the guest with a bight of rope around the chest and then with a quick harness; in some cases, a chest harness may also be used.
- **Egress:** The guest and patroller are belayed, lowered, or raised. Systems must have appropriate friction and backups. Consideration must be given to managing skis, loose rock, sluffing snow, postholing, etc.

During the scene size-up and initial contact with the guest, rescuers must decide which technique is appropriate for the situation. The following four techniques include two techniques for bringing the guest up and two techniques to lower the guest down.

#### Assisted belay: guest scrambles up while being belayed

The most common cliff rescue situation at a ski area is when a guest is stuck at the top of a cliff and unable to climb the relatively low angle snow above. Often,

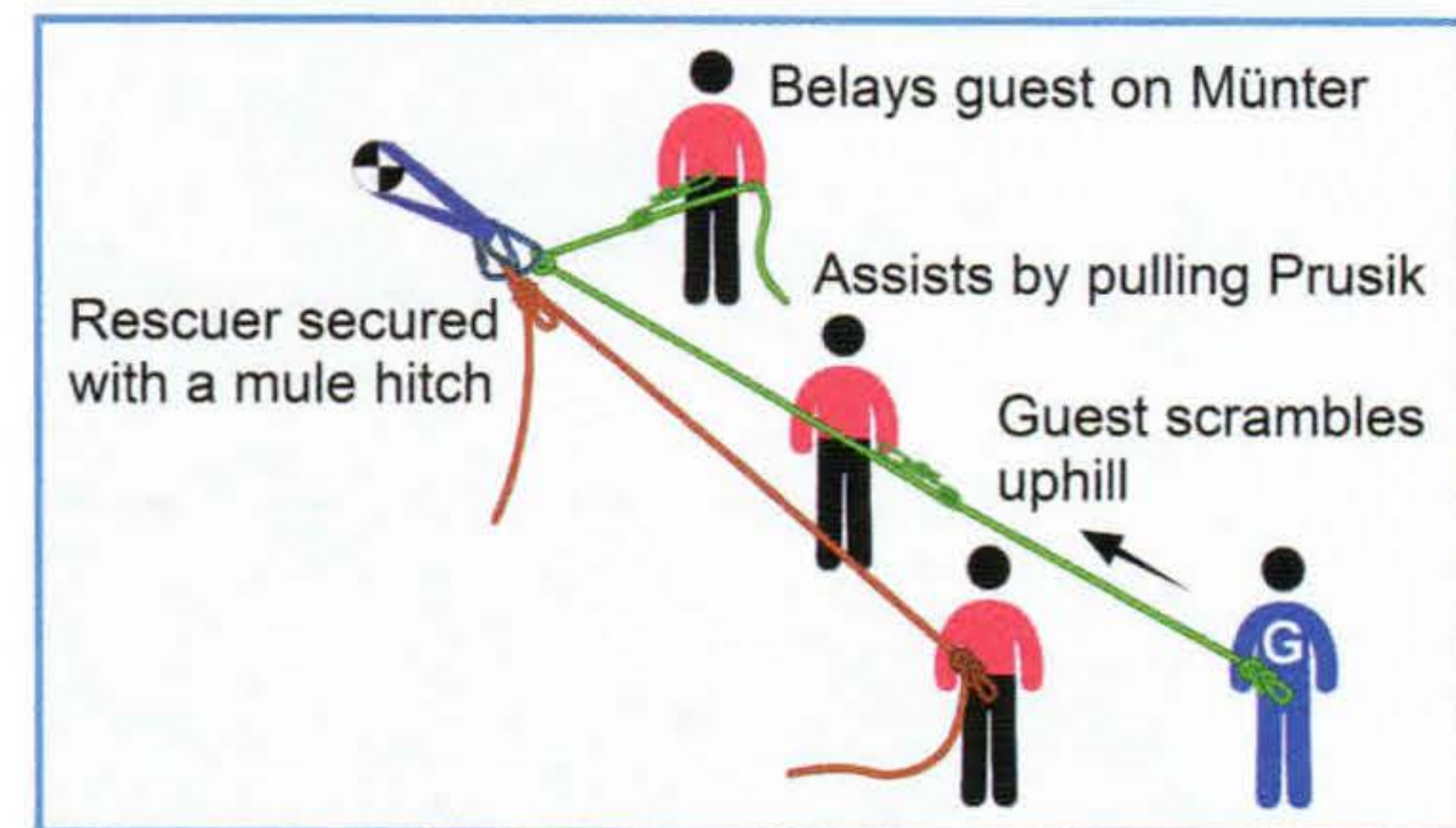


Figure 1: Assisted Belay.

the guest's inability to climb uphill is due to the consequences of a slip. Sometimes, it is due to soft snow, and other times it is simply trepidation. Regardless of the cause, providing the guest with an assisted belay in low angle terrain should enable the guest to scramble uphill safely (Figure 1). This is the "bread and butter" of ski patrol cliff rescue, but the consequences of inadequate preparation or improper implementation are dire.

#### Raise: guest is raised using a pulley system

If the terrain is too steep for the guest to scramble uphill with an assisted belay, lowering the guest is almost always preferable to the complexity of raising. However, there are situations where the terrain makes lowering impractical. For example, the ropes might not reach the bottom of the cliff, or there may not be

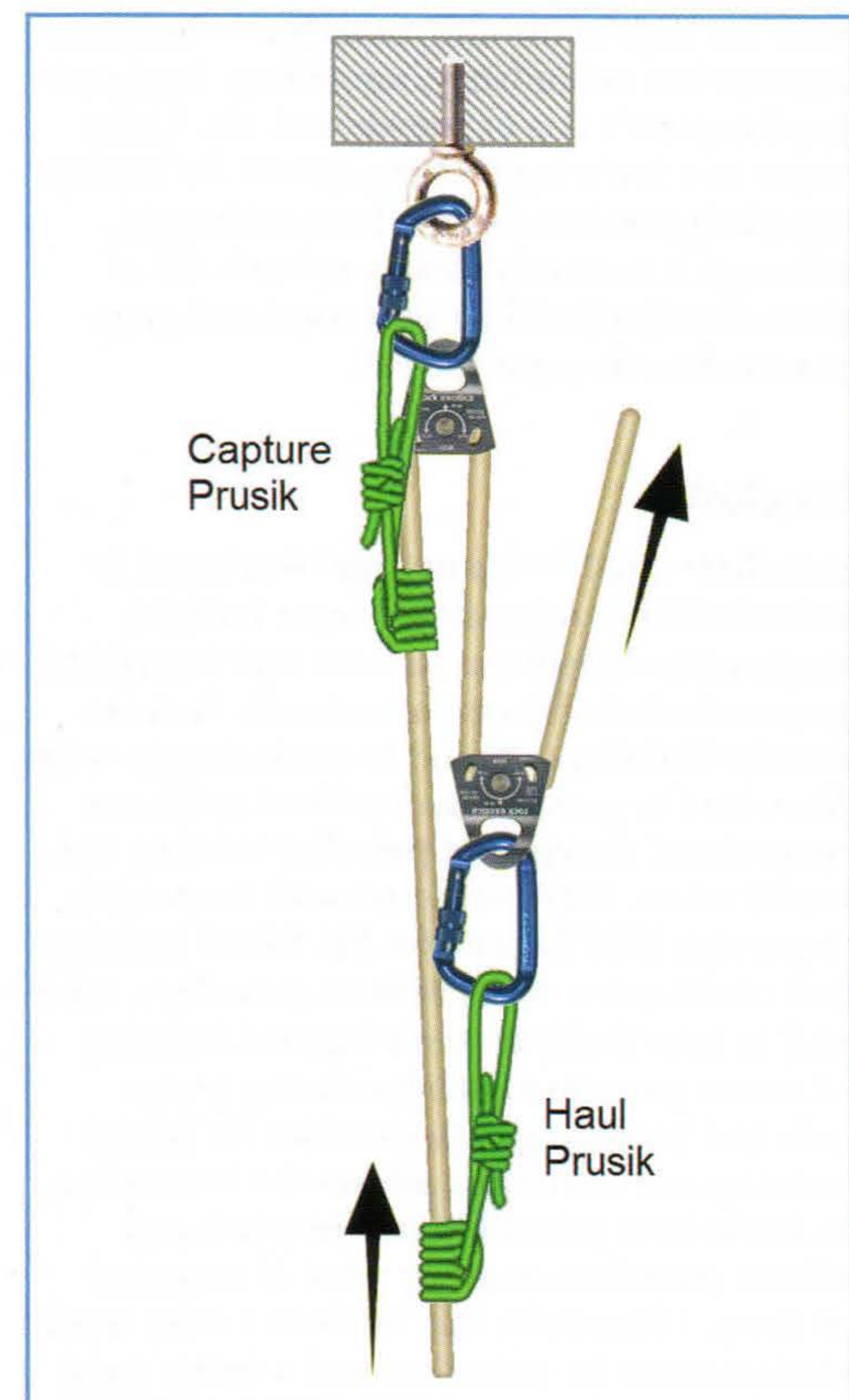


Figure 2: Raise.



safe egress from the bottom of the cliff. In these cases, the guest must be raised using a mechanical advantage system (Figure 2).

### **Solo lower: guest is lowered without an attendant**

When the guest is reliable (i.e., an adult, following directions, uninjured, etc.), the lower is in clear view and very simple, yet scrambling uphill is not possible, rescuers may lower an uninjured guest without an attendant (Figure 3).

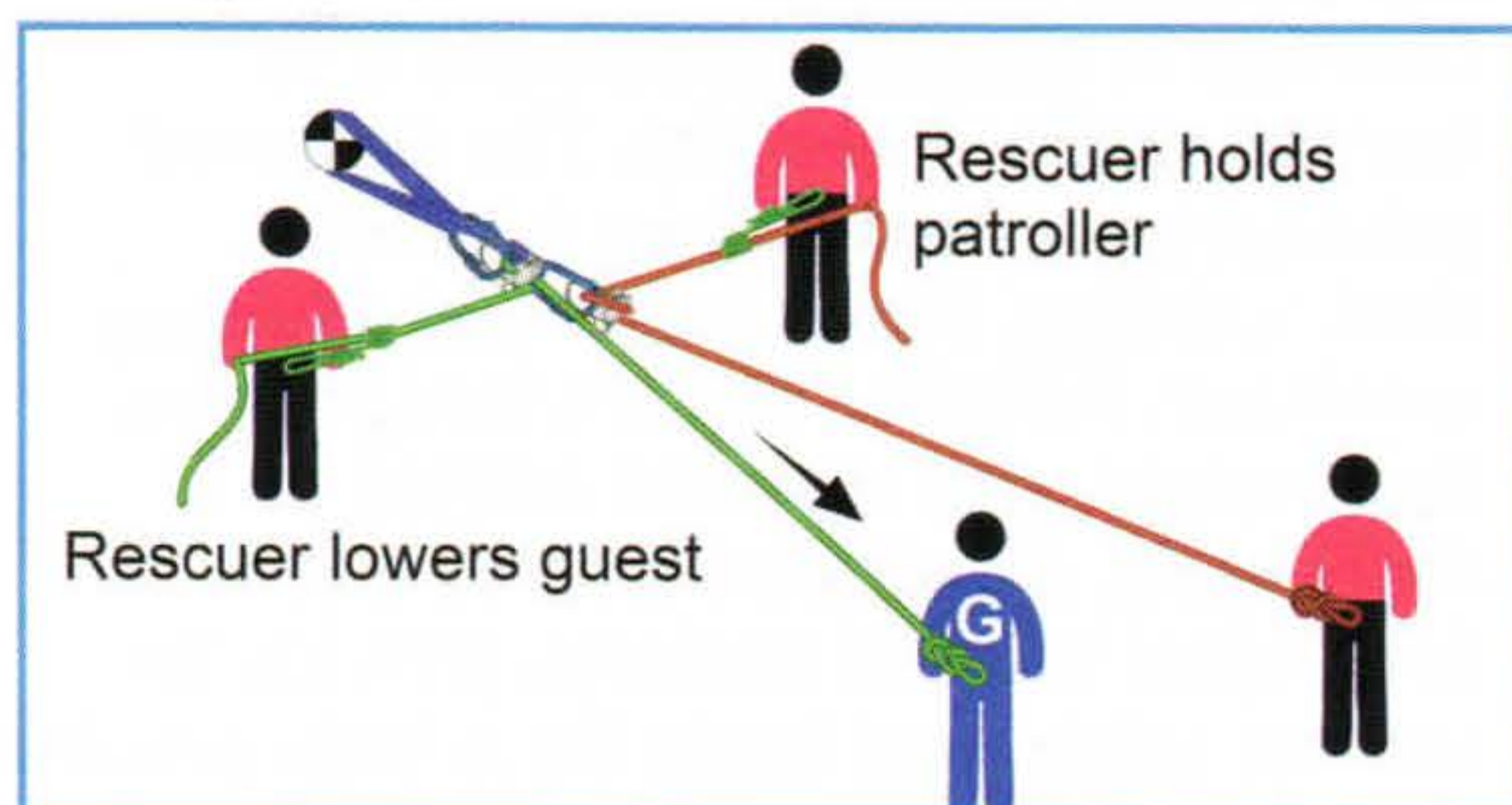


Figure 3: Solo Lower.

### **Tandem lower: guest lowered with an attendant**

If the terrain is too steep for the guest



Technical rescue on snow. Photo by Steve Achelis.

to scramble uphill and a solo lower is not appropriate, the patroller may do a tandem lower with the guest (Figure 4).

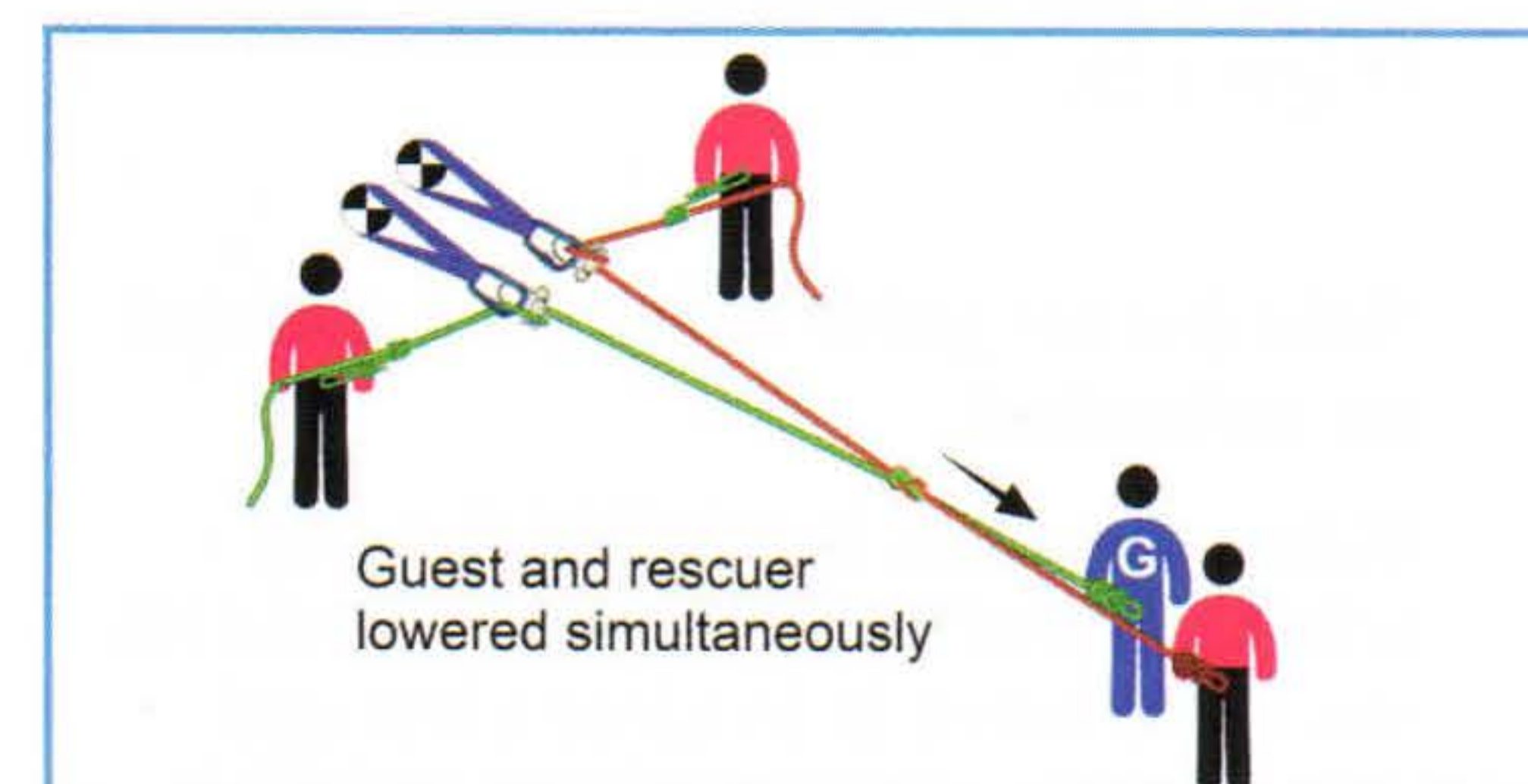


Figure 4: Tandem Lower.

### **Equipment selection**

One way to simplify rope rescue is to use standardized gear kits. The suggested patroller's gear kit includes a self-evac cord, webbing, Prusik loops, and a locking carabiner. Patroller kits are inexpensive, lightweight, and are often carried on a daily basis. A patroller kit will allow an individual to build anchors, provide for rescuer safety, and begin the rescue process. Two patroller kits are enough to perform an assisted belay rescue.

For any of the other techniques, two team kits are recommended. Our suggested team gear kit includes rope, webbing, Prusik loops, pulleys, carabiners, belay devices, rope protection, and a helmet. The suggested team gear kit has adequate equipment to perform the vast majority of rescues required of ski patrols while keeping the investment minimal and the kits easy to carry. Keeping two team kits at each top shack or pre-planned cache location will allow for a quick response. Choosing the proper equipment and knowing how to maintain it, check it, and when to retire it is a fundamental institutional responsibility.

### **Required skills**

All patrollers who are involved in rope rescue should be trained and evaluated to be competent in the following minimum basic skills:

- Creating anchors using trees, towers, rocks, and buried skis ("deadman" anchors).
- Tying bowlines, figure 8s (bight, follow-through, and skeleton), mule hitch, overhand, Prusik, square, and water knots.
- Tying quick seat and chest harnesses.
- Operating ATCs or other belay devices, munter hitch belays, and Prusik loops.

More importantly, patrollers need to understand the proper application and integration

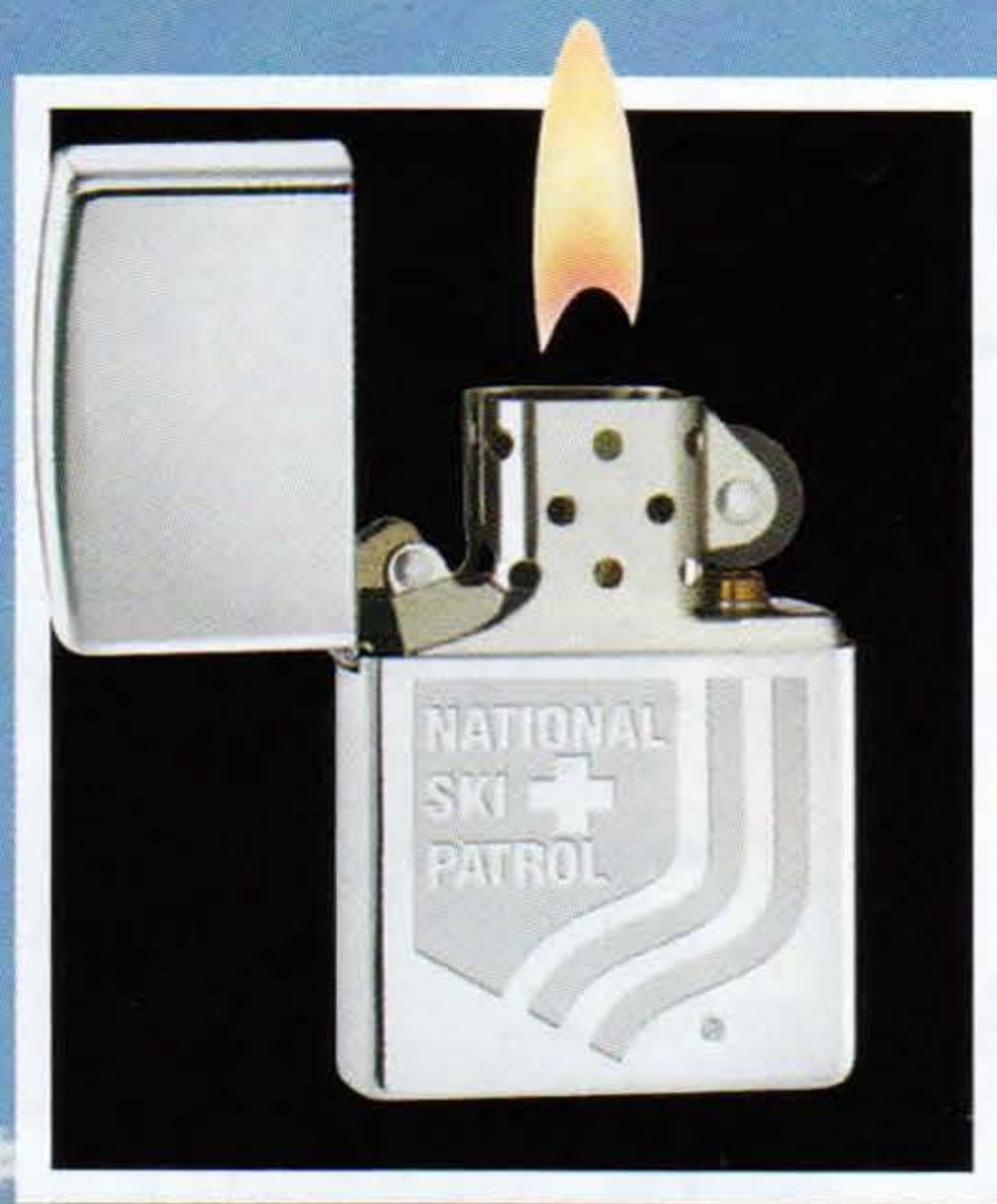
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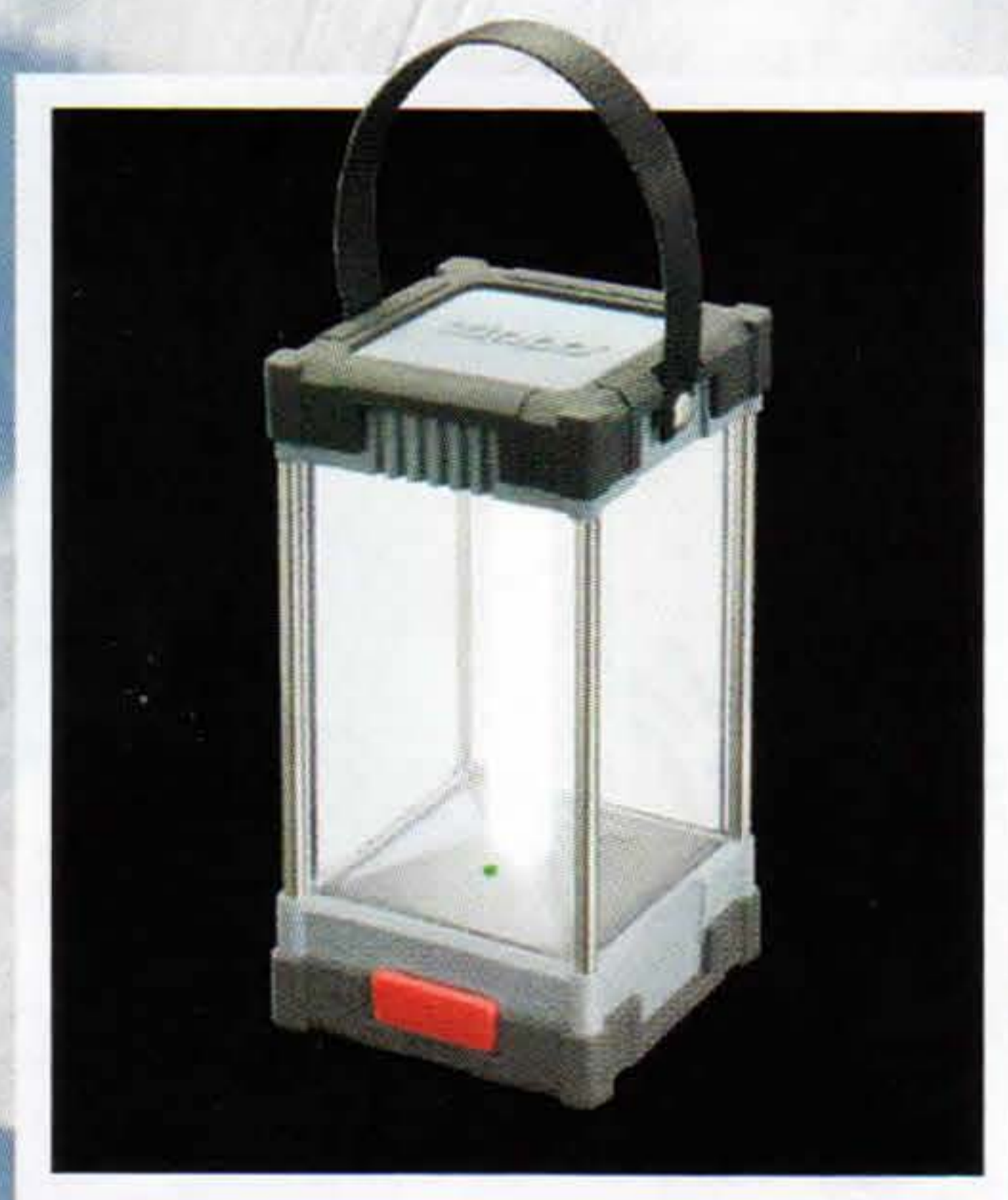
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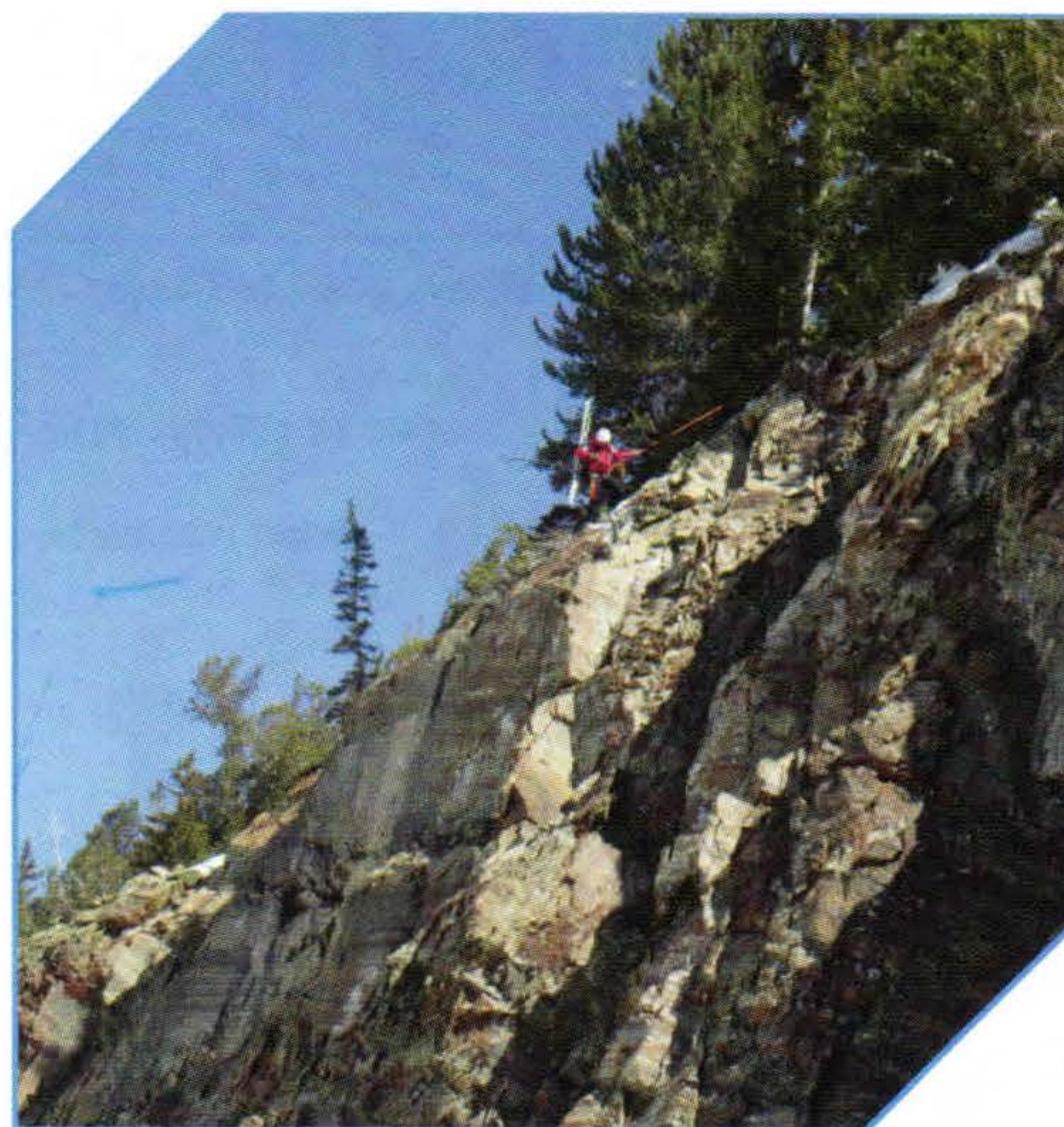
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Lowering from a cliff. Photo by Steve Achelis.

within a system for each individual skill. Standard communication and systems checks should be routine. More experienced rescuers should also know how to create mechanical advantage systems using pulleys. Less experienced patrollers should be supervised and mentored by patrollers with more rope rescue training, skill, and experience. Proper allocation of resources includes investing in human resources in addition to equipment.

## Other considerations

There are obviously many important details that need to be incorporated into your patrol's rope rescue protocols that are not addressed in this article. These include anchoring, tethering systems that protect patrollers who work near the edge of the cliff, belaying techniques, appropriate redundancy, rappelling, transporting the guest's skis or snowboard, etc. Using ropes as a lowering/braking system for managing toboggans has also not been addressed, although it is clearly closely related. All of these details should be addressed and practiced before they are needed.

## Conclusion

Patrollers must be trained and equipped to extract cliffed-out guests. Proper training starts with a needs assessment and thoughtful protocols that address those needs. Remote Rescue Training is proud to work closely with Snowbird to provide institutional guidance on protocol design and patroller training and certification. RRT partnered with Snowbird to provide Cliff Rescue for Ski Patrol training and certification to its veteran patrollers, who will in turn facilitate their internal training of newer patrollers. Standardizing protocols and providing opportunities for initial training and refreshing allows the institution to know how patrollers will respond and allows patrollers to know what is expected of them. Ultimately, this leads to a safer work environment for patrollers and a better guest experience. +



Steve Achelis is a Senior patroller at Brighton Ski Resort, is on the board of the Utah Avalanche Center, and is the author of the avalanche rescue website, BeaconReviews.com. He

teaches wilderness first responder courses for the Wilderness Medical Institute and rock and alpine rescue for Remote Rescue Training. His book, *Mountain Responder – When Recreation and Misfortune Collide*, tells of his experiences as commander of Salt Lake County Search and Rescue. He has written articles for *Wilderness Medicine*, *Advanced Technical Rescue*, and presented at the Mountain Rescue Association and the International Technical Rescue Symposium. His projects include rope rescue software (vRigger.com), an EMT training website (SmartMedic.com), and EMS apps (eMedic.com).



Andy Rich has been a full-time technical rescue educator for the past five years, working as the program coordinator of Remote Rescue Training at the University of Utah. He also is

on the Technical and Rescue Advisory Board for the Diploma in Mountain Medicine offered by the Wilderness Medical Society, is an AMGA-certified rock guide and alpine aspirant guide, teaches avalanche courses for the American Avalanche Institute, and works as an industrial safety alpine specialist and rescue technician. He has been a professional instructor and guide for 20 years in the climbing, skiing, whitewater and rescue industries and has lead dozens of wilderness expeditions worldwide. Andy live in Salt Lake City, but he spends most of his time in the mountains.

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