



Lower Leg Injuries: Assessment and Treatment

AMONG THE MOST COMMON sites for traumatic climber injuries are the lower leg and ankle. These injuries are also likely to cause the need for evacuation and a visit to the hospital. Injuries to the lower leg range in severity from a sprained ankle to an open fracture. The following assessment and treatment techniques can be performed to assist an injured climber if a fall resulting in injury occurs.

ASSESSMENT

Always check for life-threatening injuries and address these first—think ABCs (airway, breathing, circulation) as well as head trauma and massive bleeding.

Common signs and symptoms of lower leg/ankle injury include pain, deformity, tenderness, crepitus (crackling or popping sound when touched or moved), rapid swelling or bruising, inability to bear weight on the injured leg, and loss of normal movement. Of these, the most common are pain, tenderness, and swelling. It is important to remember that not all serious injuries result in ankle deformity, including fractures of the talus (a spongy bone located directly below the tibia/fibula).

In order to assess the injury, remove climbing shoes, approach shoes, or mountaineering boots. (You may want to integrate approach shoes/boots into a splint later, but tight climbing shoes can cause further injury.) Once shoes and socks are removed, the most important items to check on any injured extremity are circulation, sensation, and movement (CSM).

Circulation. Finding a pulse in the feet is difficult. The dorsalis pedis artery is found on the top and outside of the prominent ridge of the foot while the posterior tibial artery is located behind the bone (medial malleolus) that sticks out on the inside of the ankle. If you are unable to find pulses at either site, try pinching the climber's toe. The nail bed will turn white, but a normal pink color will return within three seconds if there is normal blood flow.

Sensation. An injured extremity should be tested for both sharp and dull sensation. A pine needle works well for testing sharp sensation, while using the flat edge of your thumb is useful for the dull sensation. Try not to allow the climber to see which you are testing.

Movement. Ask the climber to wiggle the toes on the injured foot.

If the climber fails any of these tests, the injury is serious and immediate evacuation should occur. A loss of CSM could result in permanent injury.

Test whether the person can bear weight by having him or her try to take five steps. If they can, it is likely a sprain. If they cannot, it is indicative of a fracture. If your climbing partner cannot bear weight, it is better to be cautious and evacuate.

TREATMENT

If the injury is minor, the climber may only need to “RICE”: **R**est, **I**ce, **C**ompression, and **E**levation. If you have ibuprofen, it can be helpful to reduce inflammation. If the climber cannot place body weight

on the injured limb, there is deformity, or a lack of any component of CSM, the injury should be splinted and the climber evacuated.

A SAM splint—a foam-padded, malleable aluminum splint—is lightweight and highly effective, and some climbers carry one in their packs. If a SAM splint is unavailable, use whatever material is available. The tape splint and the U splint are easy to build (see below). Always check for CSM before and after placing a splint, and every 30 minutes thereafter. Get input from the injured climber regarding comfort and effectiveness of the splint.

The Tape Splint. An ACE bandage (found in many first-aid kits) is ideal, but if one is not available, two-inch climber's tape works well. It should be placed on the bare leg. Attempt to align the foot and leg in a 90° angle, but do NOT do so if this causes an increase in pain. Begin taping on top of the foot, just above the big toe, and wrap to the inside and under the ball of the foot and then around and above the foot to the inside of ankle, anchoring the tape strip below the calf. Repeat three times with strips of tape side by side. Next, using additional tape, attach one end to the interior of the mid-calf and run directly under the heel and anchor tape to exterior of the leg at mid-calf. Repeat three times. This splint limits the movement of the ankle in all directions.

Improvised U-Splint. Using whatever clothing is available, roll it tightly into a tube. If using a shirt, roll from neck to the bottom of the shirt. Position the foot to as near as 90° as possible (without increasing pain) and position the roll at the center of the sole of the foot. Take the two ends and use tape to secure them just above the ankle and on the lower leg.

EVACUATION

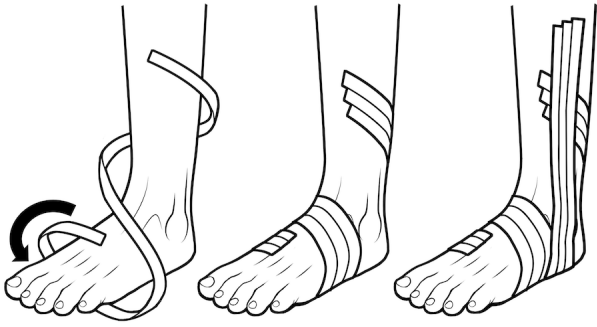
If you suspect a fracture, get your partner to the nearest medical center. If there is loss of any component of CSM, evacuation should be hastened, as permanent damage may occur.

REFERENCE

Vertical Aid: Essential Wilderness Medicine for Climbers, Trekkers, and Mountaineers, by Seth Hawkins, R. Bryan Simon, Pearce Beissinger, and Deb Simon (2017).

R. Bryan Simon, R.N., is senior editor of this publication.

Images



When placing any type of splint, be sure to check for comfort and support of the injury. Replacing the boot or shoe after completing the splint, if possible, adds protection and stability.

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