


ADVENTURE MEDICAL KITS

WILDERNESS & TRAVEL MEDICINE

A Comprehensive Guide

4th Edition

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- A photograph of a mountain peak with a snowfield and a hiker. The hiker is on the left, climbing a steep, snow-covered slope. The right side of the slope is rocky and partially covered in snow. The background shows a vast, blue sky with white clouds.
- Prepare for adventurous travel
 - Learn over 50 improvised techniques
 - Be safe—and confident!



THE MOUNTAINEERS BOOKS

Eric A. Weiss, MD

WILDERNESS & TRAVEL
MEDICINE

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CHEST INJURIES

Because wounds to the chest interfere with the ability to breathe, the victim requires immediate medical attention.

Broken Ribs

A forceful blow to the chest may break one or more ribs. Broken ribs are very painful and usually require pain medication and rest.

Signs and Symptoms

- Pain in the chest becomes worse with a deep breath.
- A crackling or rattling sensation or sound can occasionally be detected when touching the broken rib.
- Rib fractures usually occur along the side of the chest. Pushing on the breastbone (sternum) while the victim lies face up will produce pain at the fracture site rather than where you are pushing.

Treatment

Oral pain medication ibuprofen (Motrin) or acetaminophen with hydrocodone (Vicodin) will help reduce pain and make breathing easier. It takes about 2 weeks for pain to subside and 4 to 6 weeks for the rib to heal. Taping the chest over the fractured rib may provide added relief from pain.



When to Worry

Chest Injuries

One end of a broken rib can sometimes be displaced inward and puncture the lung, thus producing a pneumothorax (see “Collapsed Lung [Pneumothorax],” page 54). Rib fractures can also bruise the lung or predispose the victim to pneumonia. If a lower rib is fractured, it may injure the spleen or liver and cause severe bleeding. Multiple rib fractures can produce a flail chest (see “Flail Chest,” page 54). Immediate evacuation to a medical facility is indicated if the victim has more than one rib fracture or develops shortness of breath, difficulty breathing, persistent cough, fever, abdominal pain, or dizziness or light-headedness upon standing.

Flail Chest

When three or more consecutive ribs on the same side of the chest are each broken in at least two places, a free-floating segment called a flail chest can result.

Signs and Symptoms

The flail segment will move opposite to the rest of the chest during breathing and make it hard for the victim to get enough air. The movement of broken ribs causes great pain, which further reduces the victim's ability to breathe. The underlying lung is usually bruised with a flail chest.

Treatment

1. Immediately evacuate the victim to a medical facility. A flail chest can be tolerated only for the first 24 to 48 hours, at which time the victim will usually need to be put on a respirator for breathing assistance.
2. Place a bulky pad of dressings, rolled-up extra clothing, or a small pillow gently over the site, or splint the victim's arm against the injury to stabilize the flail segment and relieve some of the pain. Whatever is used should be soft and lightweight. Use large strips of tape to hold the padding in place. Do not tape entirely around the chest, as this will restrict breathing efforts. The main function of this object is to make it less painful to breathe, not to stop movement of the chest or restrict breathing in any manner. Transport the victim lying faceup or on the injured side.
3. If the victim is severely short of breath and cannot get enough air, it may be necessary to assist with mouth-to-mouth rescue breathing. Time your breaths with those of the victim, and breathe gently to provide added air with each inspiration.

Collapsed Lung (Pneumothorax)

A collapsed lung (pneumothorax) occurs when air enters the chest cavity and compresses or collapses the lung. This can occur when a broken rib punctures the lung, an outside object such as a knife penetrates the

chest, or even spontaneously when a weak point develops in the lung and permits air to leak into the chest cavity.

Signs and Symptoms

- Sharp chest pain, which may become worse with breathing
- Shortness of breath or difficulty breathing
- Reduced or absent breath sounds on the injured side

Treatment

Evacuate the patient immediately and monitor closely for the development of a tension pneumothorax (see "Tension Pneumothorax," below).

Tension Pneumothorax

A pneumothorax can progress to a life-threatening condition (a tension pneumothorax) if air continues to leak into the chest cavity. With each breath, air enters the space surrounding the lung, but it cannot escape with expiration. Pressure soon builds up, compressing the lung and heart, a condition that can eventually lead to death.

Signs and Symptoms

- Labored breathing
- Cyanosis (bluish skin discoloration)
- Signs of shock (weak, rapid pulse; rapid breathing; fear; pale and moist skin; confusion)
- Distended jugular (neck) veins
- Diminished or absent breath sounds on the injured side (Place your ear on the chest wall of the victim.)
- Bubbles of air felt or heard (a crackling sound) when touching the chest wall or neck

Treatment

If the situation is desperate and the victim is literally dying before your eyes, you can do only one thing to possibly save the life: you must relieve the pressure from inside the chest (pleural decompression) and allow the lung to re-expand. This procedure takes courage and

improvisation in the wilderness. ***Pleural decompression should not be undertaken lightly and should be attempted only if the victim appears to be dying.*** The possible complications include infection; profound bleeding from puncture of the heart, lung, or a major blood vessel; or even laceration of the liver or spleen.



Weiss Advice

How to Perform Pleural Decompression

Caution: This technique should only be performed in the wilderness by a trained individual on a victim who would die if the procedure were not done.

1. Swab the entire chest with povidone-iodine or another antiseptic.
2. If sterile gloves are available, put them on after washing your hands.
3. If local anesthesia is available, inject it into the skin at the site to numb the area.
4. Insert into the chest a large-bore (14-gauge) intravenous catheter, needle, or any pointy, sharp object (not wider than a pencil) just above the third rib in the mid-clavicular line (approximately midway between the top of the shoulder and the nipple, in line with the nipple). If you hit the rib, move the needle or pointy object upward slightly until it passes over the top of the rib, thus avoiding the blood vessels that course along the bottom of every rib. A gush of air will signal that you have entered the correct space—do not push the object in any farther. This will convert the tension pneumothorax into an open pneumothorax.
5. Leave the object in place. Slit the finger portion of a rubber glove and cover the opening of the object with the slit glove to create a one-way flutter valve that allows air out but not in.
6. Anchor the object to the chest wall with tape so that it cannot be pulled out or forced farther into the chest.
7. Monitor the victim closely, and if signs of tension redevelop, repeat the procedure.

Open (Sucking) Chest Wound

If an object such as a bullet or knife enters the chest, a wound that opens into the lung can develop. Each time the victim breathes, a sucking sound often can be heard as air passes in and out through the hole.

Signs and Symptoms

- Painful and difficult breathing
- A sucking sound each time the victim breathes
- Bubbles visible at the wound site when the victim exhales
- Bubbles of air that can be felt and heard (crackling sounds) when touching the chest wall near the injury
- A tension pneumothorax (see "Tension Pneumothorax," page 55)

Treatment

1. Seal the opening immediately with any airtight substance and cover it with a 10 x 10-cm (4 x 4-inch) gauze pad, then tape it on three sides. (Taping three edges produces a flutter valve effect. When the victim inhales, the free edge will seal against the skin. As the victim exhales, the free edge will allow air in the chest cavity to escape.)
2. If an object is stuck in the chest, do not remove it. Place airtight material next to the skin around it, and stabilize it with bulky dressings or pads. Several layers of dressings, clothing, or handkerchiefs placed on the sides of the object will help stabilize it.

A victim with an open chest wound below the nipple line may also have an injury to an abdominal organ such as the spleen or liver (see "Abdominal (Belly) Injuries," page 58).



Weiss Advice

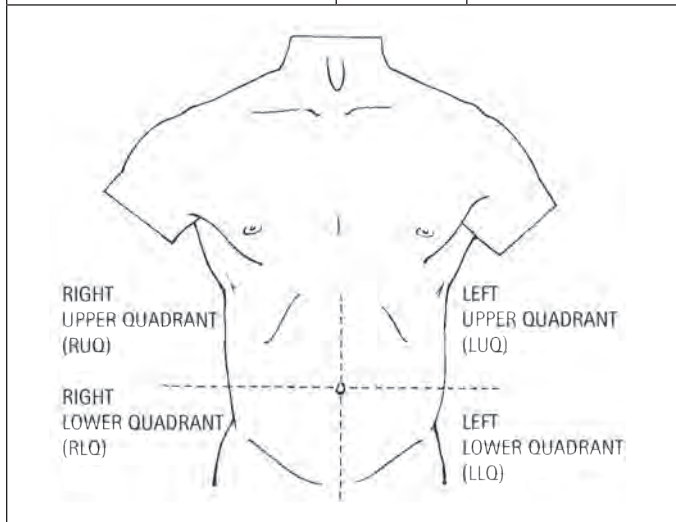
Dressing an Open Chest Wound

An airtight dressing can be improvised from a 10 x 10-cm (4 x 4-inch) gauze pad impregnated with petroleum jelly, honey, or antibiotic ointment. Plastic wrap or clean plastic will also work. Tape the dressing in place on three sides only.

ABDOMINAL (BELLY) INJURIES

Abdominal organs are either solid or hollow. When solid organs such as the spleen or liver are injured, they bleed internally. Hollow organs can rupture and drain their contents into the abdominal and pelvic cavities, producing a painful and serious inflammatory reaction and infection.

Organ	Type	Location
Liver	Solid	RUQ
Stomach	Hollow	RUQ
Spleen	Solid	LUQ
Pancreas	Solid	LUQ
Small and large intestines	Hollow	All quadrants
Kidneys	Solid	Flanks



Penetrating Injuries

(See "Gunshot Wounds and Arrow Injuries," page 60.)

Blunt Abdominal Injuries

A blow to the belly can result in internal organ injuries and bleeding, even though nothing penetrates the skin. Examine the abdomen by pressing on all four quadrants sequentially and gently with the tips of your fingers. Push slowly and observe for pain, muscle spasms, or rigidity. Normal abdomens are soft and not painful when touched.

Signs and Symptoms

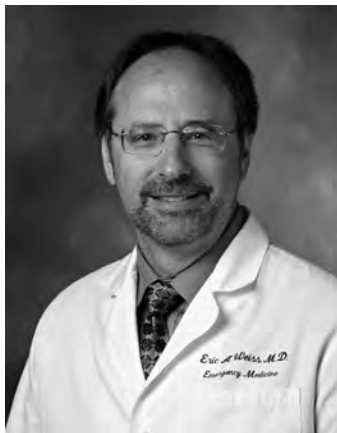
- Signs of shock (see "Shock," page 32)
- Pain that is at first mild and then becomes severe
- Distention (bloating) of the abdomen
- Pain or rigidity (tightness or hardness) of the belly muscles when pressing in on the abdomen
- Pain referred to the left or right shoulder tip, which may indicate a ruptured spleen
- Nausea or repetitive vomiting
- Bloody urination
- Pain in the abdomen on movement
- Fever

Treatment

1. Immediately evacuate the victim to a medical facility.
2. Anticipate and treat for shock.
3. Do not allow the victim to eat. If the victim is not vomiting, offer small sips of water.

ABOUT THE AUTHOR

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Dr. Weiss is a medical advisor and has been an expedition physician for the National Geographic Society and a medical officer for the Himalayan Rescue Association of Nepal. He has lectured on wilderness and travel medicine to thousands of health care professionals throughout the world and is widely considered the nation's foremost authority on wilderness medicine.



Based in Oakland, California, Adventure Medical Kits (AMK) is one of the largest suppliers of first-aid and survival kits in the world, and is dedicated to delivering the most innovative products which will keep you safe in the outdoors. The AMK team's love of the outdoors is matched only by their drive to create products that allow you to stay healthy on land, water, and air. They rely on the expertise of world authorities in wilderness medicine and survival techniques to develop and refine their products year after year. From comprehensive medical kits for wilderness, marine, and travel adventures, to survival, insect protection, hygiene, foot care, and QuikClot products—AMK keeps you safe and ready for any outdoor adventure.

Visit www.adventuremedicalkits.com for more information and products.

THE MOUNTAINEERS, founded in 1906, is a nonprofit outdoor activity and conservation organization whose mission is "to explore, study, preserve, and enjoy the natural beauty of the outdoors . . ." Based in Seattle, Washington, it is now one of the largest such organizations in the United States, with seven branches throughout Washington State.

The Mountaineers sponsors both classes and year-round outdoor activities in the Pacific Northwest, which include hiking, mountain climbing, ski-touring, snowshoeing, bicycling, camping, canoeing and kayaking, nature study, sailing, and adventure travel. The Mountaineers' conservation division supports environmental causes through educational activities, sponsoring legislation, and presenting informational programs.

All activities are led by skilled, experienced volunteers, who are dedicated to promoting safe and responsible enjoyment and preservation of the outdoors.

If you would like to participate in these organized outdoor activities or programs, consider a membership in The Mountaineers. For information and an application, write or call The Mountaineers Program Center, 7700 Sand Point Way NE, Seattle, WA 98115-3996; phone 206-521-6001; visit www.mountaineers.org; or email info@mountaineers.org

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