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# Wilderness First Aid



WILLIAM W. FORGEY, MD

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Second Edition

William W. Forgey, MD

**FALCON** GUIDES

GUILFORD, CONNECTICUT  
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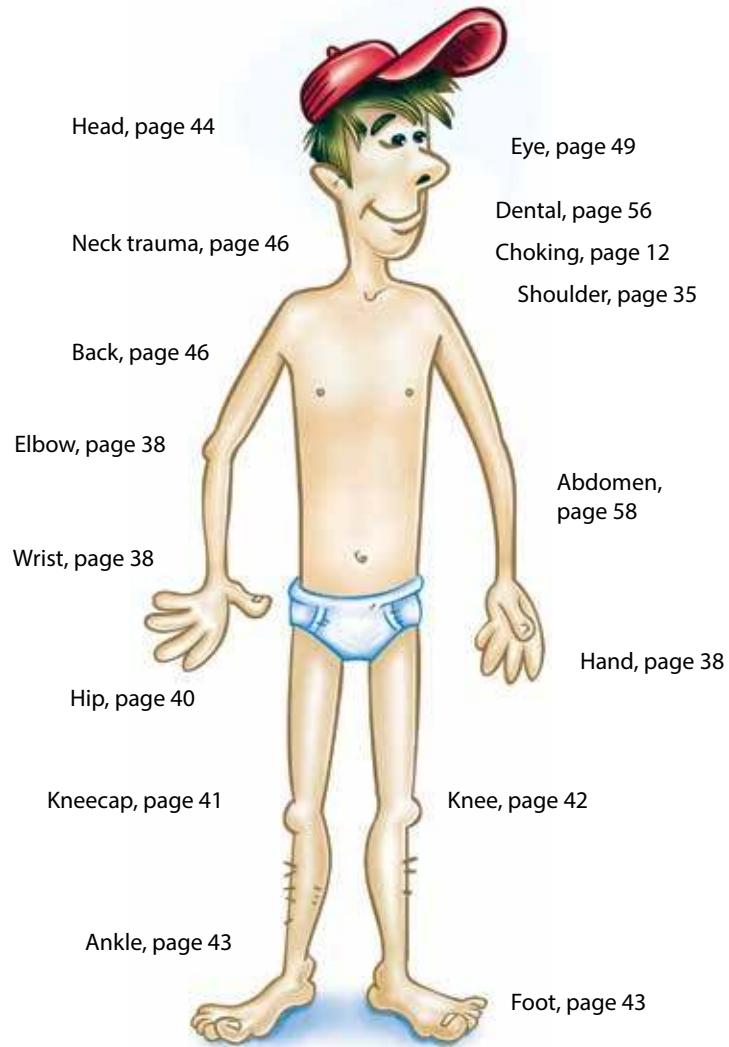
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# Contents

Injury Reference Chart	vi
Illness Reference Chart	vii
Introduction	viii
<b>Chapter 1:</b> Initial Survey	1
<b>Chapter 2:</b> Focused Survey	4
<b>Chapter 3:</b> Shock	9
<b>Chapter 4:</b> Difficulty Breathing	12
<b>Chapter 5:</b> Heart Attack	14
<b>Chapter 6:</b> Fever/Pain/Itch	17
<b>Chapter 7:</b> Wilderness Wound Care	19
<b>Chapter 8:</b> Bone and Joint Injuries	31
<b>Chapter 9:</b> Head Injuries	44
<b>Chapter 10:</b> Neck and Back Injury Management	46
<b>Chapter 11:</b> Eye	49
<b>Chapter 12:</b> Ear	52
<b>Chapter 13:</b> Nose	54
<b>Chapter 14:</b> Teeth/Mouth	56
<b>Chapter 15:</b> Abdominal Problems	58
<b>Chapter 16:</b> High-Altitude Illness	62
<b>Chapter 17:</b> Cold and Heat Injuries	65
<b>Chapter 18:</b> Lightning	71
<b>Chapter 19:</b> Insects	73
<b>Chapter 20:</b> Snakebites	82
<b>Chapter 21:</b> Wilderness First-Aid Kits	84
Appendix A: BSA WFA Lesson Outline	86
Appendix B: Evacuation Guidelines	96
Index	99

## Injury Reference Chart



### Injury Reference

- Bleeding, page 19
- Blisters, page 25
- Bone injuries, page 31
- Burns, page 26
- Fishhooks, page 28
- Insects, page 73
- Snakes, page 82
- Wounds, page 19

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## Illness Reference Chart



Ear, page 52  
Eye, page 49  
Nose, page 54  
Dental, page 56

Heart, page 14  
Heartburn, page 59  
Nausea, page 58  
Diarrhea, page 59

### Illness Reference

Altitude, page 62  
Cold, page 65  
Heat, page 68  
Water, page 60



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# Introduction

Virtually every method of handling injury and illness in the wilderness is different from what you would expect in an urban environment. The remoteness from “civilization,” the lack of readily available medical assistance, and the difficulty of having to handle serious injuries on your own—often for many hours—can be daunting if you are not prepared. Thus, a book on first aid in the wilderness is much more than a standard first-aid text. It can help ready you to meet the challenges of stabilizing injuries in remote wilderness areas.

While standard first-aid classes can provide a good basic introduction to helping injured individuals, the special techniques described in this book are taught in wilderness first-aid classes. This book follows the latest (2016) Wilderness First Aid Curriculum and Doctrine. If you haven’t already taken a CPR course, it is also a good idea to do so. Classes can be obtained through your local American Red Cross chapter. Check to see if the Wilderness First Aid course you plan to take follows the Boy Scouts of America (BSA) curriculum. The curriculum can be found at [bsa-wfa.com](http://bsa-wfa.com). It is also outlined in Appendix A of this book. All of the content of this book follows the BSA doctrine.

## Terms Used in This Book

Throughout this book I have used the terms “evacuate—go slow” or “evacuate rapidly—go fast” to describe the urgency of evacuation if it is indicated. Appendix B lists specific evacuation guidelines.

## For More Information

A further discussion of the techniques of handling wilderness related injuries and illness—particularly prolonged care when evacuation or rescue may not be an option—can be found in my book *Wilderness Medicine*, sixth edition. Another excellent book on the assessment and transport of the patient for evacuation is *Wilderness First Responder* by Buck Tilton.

# Initial Survey

Many years ago it was recognized that responding to an accident should involve a series of well-planned steps. These steps have traditionally been divided into two phases. At various times the first phase has been called “primary survey” or “initial survey”; most recently the BSA WFA Task Force has decided the term should be “initial assessment.” The second phase has been called the “secondary survey” and is now referred to as the “focused assessment.”

These changes in terms serve a specific purpose: to emphasize the importance of activities that go beyond the patient to evaluating and managing risk to others, providing leadership to a group that might be involved in the emergency, and assisting in evacuating the patient as well as providing immediate life-saving care and appropriately managing the patient afterward until safely returned to civilization and, if necessary, professional medical care.

## Secure the Scene

On reaching an accident victim, the first duty in an urban environment is to activate the emergency medical services by calling 911. Afterward the initial care consists of an urgent, simultaneous attempt to examine the patient and correct life-threatening injuries relating to breathing, heartbeat, and blood loss, while at the same time protecting the victim from a possible spine injury.

In the wilderness, however, before assessing the patient, you must assess the scene! Make sure that it is safe and that falling rock, floods, or other dangers will not hurt you or others. If the area is dangerous, you will have to immediately remove the patient to a safer location and keep other persons away from the scene to prevent them from getting hurt. Accidents tend to multiply! Some dangers are difficult to see or might be delayed in onset. For example, while treating a sprained knee, don't fail to notice if other members of your party are becoming cold from inactivity and thus at risk for hypothermia.

BSI—Establish body substance isolation. This is a rule to protect ourselves from possible infection from a patient by putting on non-latex gloves and eye protection.



**FIGURE 1**

*An improvised stretcher for moving an accident victim to a safer location.*

DR. SHANI SIAN-WEI TAN, SINGAPORE

Determine the MOI—the “mechanism of injury.” It is important for me as a doctor to know when you sprained your ankle if it happened when you stepped into a hole or if you stepped onto a rock. Reporting the MOI enables the rescuers or medical professionals to guess the extent of the injury. Falling from 1 foot or 10 feet is a big difference.

The first step in an emergency is to control the scene; the next is to control the patient. By this I mean to prevent her from hurting herself further. We comfort the patient and gather information (such as the patient’s name), all while we are performing the life-saving initial assessment—the initial assessment ABCDE method (see Appendix A, Lesson I).

## Airway

After evaluating the scene, the next step is to find out whether the victim is having difficulty breathing.

**Check the airway:** If the victim can talk, his airway is functioning. In an unconscious patient, place your ear next to his nose/mouth and your hand on his chest and look, listen, and feel for air movement.

**No air movement:** Check to see if the tongue is blocking the airway by pushing down on the forehead while lifting the chin. In case of possible neck injury, the airway can be opened without movement of the neck by lifting the jaw.

**Still no air movement:** Pinch his nose and seal your mouth over his; try to force air into his lungs. Very lightweight, disposable cardiopulmonary resuscitation (CPR) masks are available that provide sanitary protection.

**Still no air movement:** Perform the Heimlich maneuver (see page 12). Once you are able to establish air movement, continue CPR until the victim can breathe on his own.

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## Circulation

Check circulation by placing several of your fingertips lightly into the hollow below the angle of the patient's jaw to feel for a pulse.

**No pulse:** Start CPR (see page 15).

## Severe Bleeding

Check quickly for severe blood loss. Check visually and with your hands. Slide your hand under the victim to ensure that blood is not leaking into the ground and check inside bulky garments for hidden blood loss.

**Severe bleeding:** Use direct pressure or tourniquet (see page 20).

## Neck

During the initial survey keep the patient's head and neck as still as possible if you suspect a neck injury. Your suspicions should be high if the patient is unconscious or had an accident, such as a fall or significant blow to the head. See treatment of cervical spine injuries, pages 46–48.



*If the patient is unconscious or had an accident such as a fall or significant blow to the head, be careful to keep the head and neck as still as possible.*

# Focused Survey

While the purpose of the initial survey is to hastily find and correct life-threatening conditions, the focused survey is an attempt to identify all of the medical problems that the patient might have. This requires a thorough examination, because sometimes an obvious injury can be distracting. A broken bone may prevent both you and the victim from noticing a less painful but potentially more serious injury elsewhere.

The only way to perform a focused survey is to do it thoroughly, using both your vision and sense of touch, asking simple questions, and being methodical in the approach. Sense of touch is important. While sliding your hand under the victim, you might find areas of tenderness or considerable blood loss that would otherwise go unnoticed. It is surprising how much blood can be absorbed into snow or sand under a wounded victim and not be noticed until your hand encounters it.

The mission of the focused survey is not only to discover medical problems but also to record and keep track of them during periodic reassessments. The most significant difference between wilderness first aid and standard urban first aid is that the focused survey must also lead to treatment protocols.

This methodical examination should generally start at the head and work its way to the feet. With children, however, you might want to start with the legs. (Children are sometimes frightened by movement toward their heads.) Generally, starting at the head is best.

## Vital Signs

While even accurate measurements of the body's functions will not indicate what is wrong with a patient, the second and subsequent measurements indicate how the patient is progressing. The severity of the accident will determine how often you should take the vital signs, but certainly close monitoring of the patient should be continued until she is "out of the woods."

Vital signs consist of several elements:

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## Level of Responsiveness

Is the patient alert, does the patient respond only to verbal or painful stimulus, or is she unresponsive? Formerly called “level of consciousness” (LOC), the current first-aid term is “level of responsiveness.” The measurement has changed to:

1. Is the patient awake and oriented? Does she know who she is, where she is, or approximately when and what happened? or
2. Is the patient awake and disoriented? or
3. Is the patient unconscious?

## Pulse

Check and record rate, rhythm, and quality (thready, normal, or bounding) of pulse. The heart rate (HR) is the number of beats per minute. To shorten the time it takes to measure HR, count for 15 seconds and multiply the result by 4. Normal heart rates are strong and between 50 and 100 beats per minute.

## Respirations

Note the rate, rhythm, and quality (labored, with pain, flaring of nostrils, or noise such as snores, squeaks, gurgles, or gasps). Measure respiratory rate (RR) by counting the number of breaths per minute without indicating to the patient what you are doing, as some people will change their rate rather unconsciously when they notice you are checking it. A normal RR is 12 to 20 times per minute. Normal breathing is easy and unlabored without any unusual noises. Record any unusual breathing sounds or efforts.

## Skin

Check its color and note whether it is hot or cold and moist or dry. And, of course, there is a mnemonic for this: SCTM. It stands for noting the skin color, temperature, and moisture. Normal skin is pink in areas such as the inner lips and eyelids, and warm and dry to the touch.

## Blood Pressure

This can be taken with a stethoscope and blood pressure cuff or by estimating. If you can feel a pulse in the radial artery at the wrist, the top (systolic) pressure is probably at least 80 mm Hg. If you can only feel the femoral pulse in the groin, the pressure is no lower than 70 mm Hg. When only the carotid pulse in the neck is palpable, the systolic is probably at least 60 mm Hg. Normal systolic blood pressures range from 100 to 125. Low systolic blood

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pressures with normal pulses (say, the 70 to 85 beats per minute range) are safe. But an increased pulse rate with a low pressure is an indication of shock.

## Medical History

Ask about the patient's allergies, the medications that she is taking, her medical history, her last food or drink, and about the events that led up to the accident. If she is in pain ask: What provokes it? Does it radiate? How severe is it? What type is it (burning, sharp, dull)? What time did it start? What was the mechanism of injury (MOI)?

Physicians are taught that 80 percent of the diagnosis is obtained through the history—from subjective questioning rather than objective checking. What we were doing above was objective checking; we were noting physical findings. The medical history is the subjective questioning. While it might seem that checking the person is the most important first-aid event, it really is not. The excellent first aider will know how to take a great medical history.

There are two components to a great medical history: the questions and the notes. The next two acronyms describe these techniques: the SAMPLE questions and the SOAP note.

### ***The SAMPLE questions:***

- (S) Symptoms: How do you feel?
- (A) Allergies: Do you have any allergies?
- (M) Medications: Are you taking any medications?
- (P) Past Medical History: Are you seeing a doctor for any reason or have you been treated in the past for a serious condition?
- (L) Last Intake and Output: When did you last eat, drink, urinate, defecate?
- (E) What Happened: What events led to the illness or injury?

As long as note-taking does not interfere with patient care, properly recording important medical history and your plan of action is an important part of medical care. Keeping this record is important for both medical care and legal reasons. The proper note is known as a SOAP note, again an acronym that acts as a mnemonic:

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(S) Find out about the subjective information. Who (age and gender) is the patient? What are her complaints? What happened?

(O) Obtain the objective information, including the results of the patient exam, vital signs, and SAMPLE history.

(A) Assess the patient. What do you think is wrong?

(P) Plan your treatment. What do you need to do now for the patient? Answer the evacuation question—stay or go, fast or slow? The plan needs to include how often the patient should be monitored and identifying her future needs.

## Physical Examination

### Head

Look for damage, discoloration, and blood or fluid draining from ears, nose, and mouth. Ask about loss of consciousness, pain, or any abnormal sensations. Feel for lumps or other deformities.

Loss of responsiveness, see page 5.

Ear trauma, see page 52.

Eye trauma, see page 49.

Nose trauma, see page 54.

Mouth trauma, see page 56.

### Neck

Look for obvious damage or deviation of the windpipe (trachea). Ask about pain and discomfort. Feel along the cervical spine for a pain response.

Cervical spine trauma, see page 46.

Breathing difficulty, see page 12.

### Chest

Compress the ribs from both sides, as if squeezing a birdcage, keeping your hands wide to prevent the possibility of too much direct pressure on fractures. Look for damage or deformities. Ask about pain. Feel for instability. (Instability can be detected by an unusual movement of the rib cage when it is pressed upon.)

Chest injuries can present potentially serious problems and almost always painful conditions.



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## **Abdomen**

With hands spread wide, press gently on the abdomen. Look for damage. Ask about pain and discomfort. Feel for rigidity, distention, or muscle spasms.

Abdominal pain, see page 58.

## **Back**

Slide your hands under the patient, palpating as much of the spine as possible.

Spine trauma, see page 46.

## **Pelvis/Hip**

Place your hands on the top front of the pelvis on both sides (the iliac crests), pulling toward the midline of the body. Ask about pain. Do not put stress on the pelvis, as a broken pelvis might shift, causing internal bleeding.

Hip or pelvis pain, see page 40.

## **Legs**

Surround each leg with both hands and run your hands from the groin down to the toes, squeezing as you go. Note especially if there is a lack of circulation, sensation, or motion in the toes.

Bone injury, see fractures on pages 33–34, 40–43.

## **Shoulders and Arms**

With hands wide, squeeze each shoulder and run your hands down the arms to the fingers. Check for circulation, sensation, and motion in the fingers.

Shoulder trauma, see pages 35–37.

# Shock

Shock is a deficiency in oxygen reaching the brain and other tissues as a result of decreased circulation. If possible, identify and treat the underlying cause of the shock. The initial and focused surveys and history may well elicit the cause of shock, and appropriate treatment can be devised from the methods listed in this book.

Shock can be caused by burns, electrocution, hypothermia, bites, stings, bleeding, fractures, pain, hypothermia, high-altitude cerebral edema, illness, rough handling, allergic reaction (anaphylaxis), head injury, loss of adequate heart strength, or dehydration from sweating, vomiting, or diarrhea. Each of these underlying causes is discussed separately in this text.

Shock can progress through several stages before resulting in death. The first phase is called the “compensatory stage,” during which the body attempts



**FIGURE 2**

*Position of fingers to check for the carotid artery pulse. MELISSA SABO*



### FIGURE 3

*Shock treatment position.* MELISSA SABO

to counter the damage by increasing its activity level. Arteries constrict and the pulse rate increases, thus maintaining the blood pressure. The next phase is called the “progressive stage,” when suddenly the blood pressure drops and the patient becomes worse, often swiftly. When the patient has reached the “irreversible stage,” vital organs have suffered so profoundly from loss of oxygen that death occurs even with aggressive treatment.

As symptoms occur, look and assess for this progression:

1. Level of responsiveness (LOR) that is anxious, restless, and/or disoriented.
2. Heart rate (HR) that is rapid and weak.
3. Respiratory rate (RR) that is rapid and shallow.
4. Skin color, temperature, and moisture (SCTM) that is pale, cool, and clammy (but may be pink and warm in some cases, such as if the shock is the result of an allergic reaction).
5. Nausea (and sometimes vomiting), dizziness, and thirst.

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In the later stages, look for:

6. LOR that continually decreases with eventual unresponsiveness.
7. HR in which the radial pulse (at the wrist) grows increasingly rapid, weakens, and eventually disappears.

Consider the possibility of shock in any victim of an accident or when significant illness develops. Ensure that an adequate airway is established (see further discussion under rescue breathing, page 12). Make sure the heart is beating. Place your hand over the carotid artery (figure 2) to obtain the pulse. In compensatory shock the patient will have a weak, rapid pulse. In adults the pulse rate will be over 140, in children 180 beats per minute. If there is doubt about a pulse being present, listen to the bare chest. If there isn't a heartbeat present, begin CPR (see page 15). Elevate the legs to 45 degrees to obtain a better return of blood to the heart and head (figure 3). However, if there has been a severe head injury, keep the person flat. If he has trouble breathing, elevate the chest and head to a comfortable position.

Protect the patient from the environment with insulation underneath and shelter up above. Strive to make him comfortable. Watch your spoken and body language. Reassure without patronizing, and let nothing that you say or do cause the injured person increased distress.

Shock due to severe allergic reactions is called "anaphylactic shock" and is discussed on page 74.

# Difficulty Breathing

It has been stated that you can live 3 minutes without air, 3 days without water, 3 weeks without food, and 3 months without love. Some feel that their limit might be stretched to four, while others feel shorter periods might be lethal. Without question, adequate respiration is the most significant demand of a living creature. When respiratory difficulties start, it's urgent to find the reason and alleviate it. When they stop, reestablishing the airflow is critical.

## Foreign Body Airway Obstruction

If a conscious adult seems to be having distressed breathing, ask "Are you choking?" If she apparently is, perform an abdominal thrust or the Heimlich maneuver to relieve foreign-body airway obstruction or choking. If the victim is standing or sitting, stand behind and wrap your arms around the patient (figure 4), proceeding as follows: Make a fist with one hand.

Place the thumb side of the fist against the victim's abdomen, in the midline slightly above the navel and well below the breastbone. Grasp your fist with the other hand. Press the fist into the victim's abdomen with a quick, upward thrust. Each new thrust should be a separate and distinct movement. It may be necessary to repeat the thrust multiple times to clear the airway. If the person is obese or pregnant, use chest thrusts in the same manner as just described, but with the hands around the lower chest.

If the victim becomes unconscious and is on the ground, the victim should be placed on her back, face up. In civilization activate the EMS system. Perform a tongue-jaw lift, followed by a finger sweep to remove the object. Open the airway and try to ventilate. If still obstructed, reposition the head and try to ventilate again. Give up to five abdominal thrusts, then repeat the tongue-jaw lift, finger sweep, and attempt ventilation. Repeat these steps until effective.



**FIGURE 4**

*The Heimlich maneuver.* MELISSA SABO

To perform an abdominal thrust with the patient on the ground, the rescuer kneels astride the victim's thighs. The rescuer places the heel of one hand against the victim's abdomen, in the midline slightly above the navel and well below the breastbone, and the second hand directly on top of the first. The rescuer then presses into the abdomen with quick upward thrusts.

# Heart Attack

Chest heaviness or pain with exertion; pain or ache radiating into the neck or arms; sweating, clammy, pale appearance; shortness of breath—all are classic symptoms of a person having an inadequate oxygen supply to the heart. The pain is called angina, and the event is known as an acute coronary syndrome or heart attack.

Place the patient in a semi-sitting position (figure 5). If shock develops, position the patient's head down and feet up to prevent a further drop in blood pressure and further decrease in blood supply to the heart. If the group has any aspirin, give one to the patient. A chewable aspirin is the best and the 81 mg tablet is adequate. Call as soon as possible for evacuation to medical care.

Tell the person to cough deeply and repetitively if the patient feels he is about to faint. If the person becomes unresponsive, give a thump on the chest. If still unresponsive, start CPR.



**FIGURE 5**

*A heart attack victim can usually breathe better sitting up. MELISSA SABO*

## Adult One-Person Rescuer CPR/ Rescue Breathing

If the person is not breathing normally, begin by opening the airway. The head-tilt, chin-lift method is the proper technique for opening the airway in an unconscious person (figure 6). Pinch the victim's nose and cover his mouth with yours. Blow until you see his chest rise. Give two breaths with each lasting one second.

If the victim does not start breathing, coughing, or moving after the two breaths, start chest compressions. Push down on the chest 1½ to 2 inches thirty times at the rate of one hundred compressions per minute. Push down right between the nipples. Figure 7 shows the position of the hands and rescuer when performing chest compressions during CPR.



**FIGURE 6**  
*Opening the airway.*



**FIGURE 7**  
*Learning to place the hands correctly for CPR is an important skill.*



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