# WILDCARE™

## Working In Less than Desirable Conditions And Remote Environments

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Published by
**Stonehearth Open Learning Opportunities, Inc.**
621 Tasker Hill Rd., Conway, NH 03818
www.soloschools.com



ISBN: 9780-615-98516-9

Printed in Canada by Friesens Corporation, Altona, Manitoba

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061614

Talking into a glove? Huh? It's called improvizing. During a night whitewater rescue training exercise, the rescuers needed to waterproof their radios. Brilliant!

## The first 5 minutes...

# CRITICAL CARE

## dealing with immediate life threats

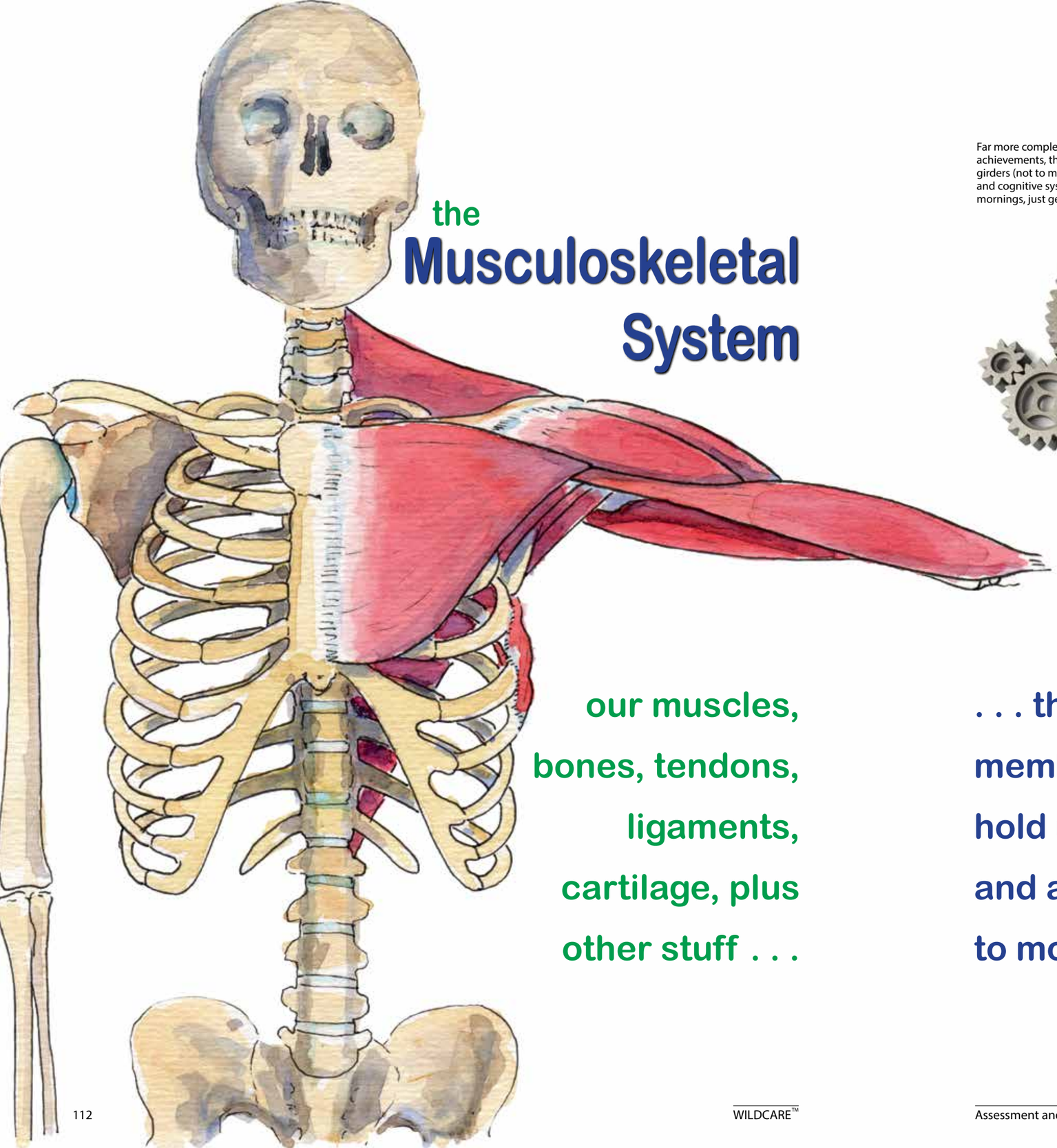
There are certain medical emergencies that scream **NOW!**

These are the things you find during your primary and secondary surveys that can **KILL** your patient, maybe in the next few minutes, maybe in the next hour or two. This isn't the time to boil Ramen Noodles or build an igloo—it's time to move, and move fast! Diagnose > treat > and then

**GET YOUR PATIENT OUT OF THERE!**

**Chief Complaints (C/C) that can indicate life threats:**

- **Changes in Level of Consciousness (LOC)**
- COMPROMISED AIRWAY
- shortness of breath
- Severe Bleeding
- chest pain
- ANAPHYLAXIS
- SHOCK



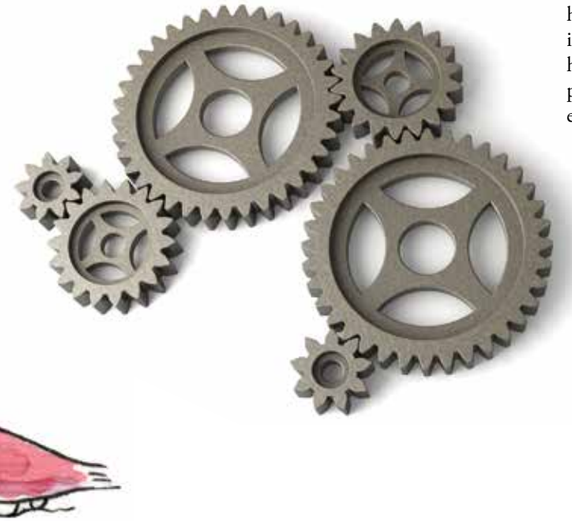
# the Musculoskeletal System

**our muscles, bones, tendons, ligaments, cartilage, plus other stuff . . .**





Far more complex than man's greatest technological achievements, the human body, with its pulleys, cables, and girders (not to mention its electrical, plumbing, sensory, and cognitive systems) is a marvel of engineering. Some mornings, just getting out of bed can seem amazing.



**. . . the structural members that hold us together and allow us to move**

Without our musculoskeletal system we would have all the structural integrity of a jellyfish—and it would give new meaning to the phrase, "Let's hang out." Unfortunately, we wouldn't be able pass the chips, or operate the TV remote, or even speak to each other, so the party might end up pretty dull. But we're not jellyfish, we're human beings, designed with a harmonious combination of structural parts that give us form and function—and allow us to do important things, like flip burgers on the grill and text each other with our thumbs. The fundamental roles of our musculoskeletal system include:

- **MOVEMENT**
  - The contraction of muscles provides us with purposeful movement.
- **HEAT PRODUCTION**
  - The contraction of muscles produces heat.
- **PROTECTION**
  - The strength and flexibility of muscles protect many internal structures, including the bundles of nerves, arteries, and veins under the muscles.
  - Bones protect the underlying structures.
- **CALCIUM STORAGE**
  - The bones act as a large calcium store.
  - Calcium is an electrolyte that allows for the contraction of muscle and the conduction of nerve impulses.
- **HEMATOPOIESIS**
  - This is the process by which the various blood cells—red blood cells (RBC), white blood cells (WBC), and platelets—are produced in the bone marrow.
- **COSMESIS**
  - The muscular and skeletal structures contribute greatly to how we look.

**Head trauma**: with change in Level of Consciousness (LOC) and increasing intracranial pressure (ICP).

**Facial trauma**: all kinds of nasty fractures, some that intefere with the patient's airway.

**Chest trauma**: many complex injury scenarios, some that can interfere with breathing or circulation.

**Pelvic trauma**: dangerous fractures that can cause severe internal bleeding and hypovolemic shock.

**Abdominal trauma**: lots of stuff that can go wrong, from nausea and vomiting to blunt and penetrating trauma

***Plus:*** Crush injuries and Compartment syndrome: with their associated soft tissue damage and circulatory complications.

# ORTHOPEDIC EMERGENCIES

**UP UNTIL NOW, WE HAVE BEEN CONCERNED WITH FRACTURING BONES THAT STICK OUT TO THE SIDES: ARMS, LEGS, FINGERS AND TOES**

**IT'S TIME TO GET TO THE CORE**

**These core structural injuries can be serious, life-threatening emergencies, and recognizing and managing them quickly in the wilderness is essential.**

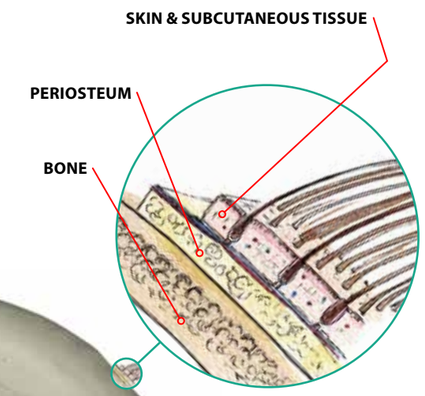


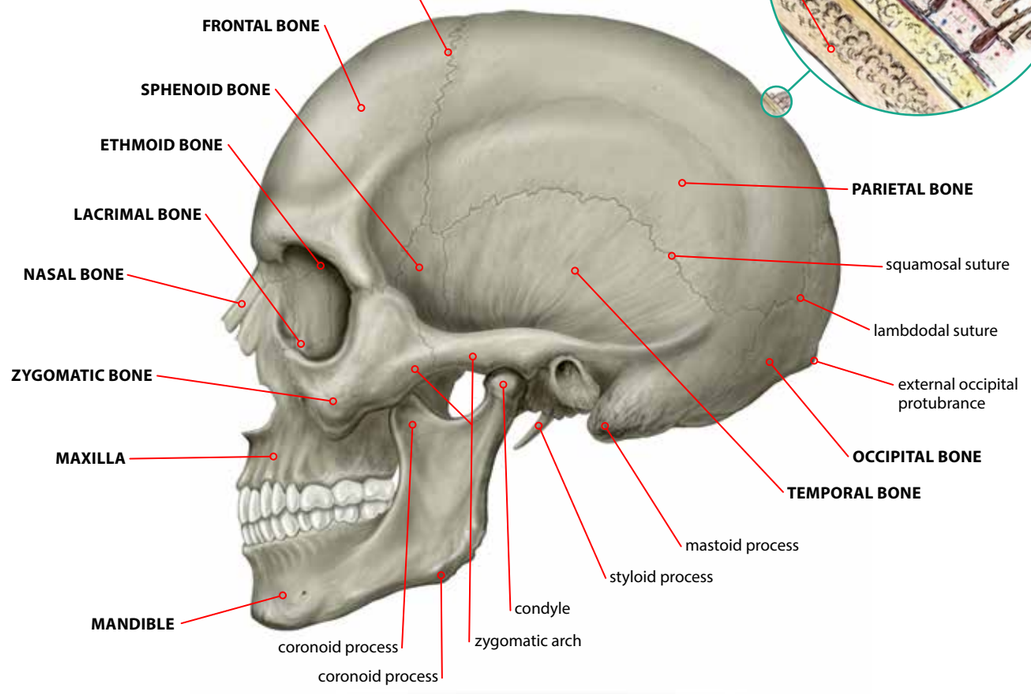
# HEAD TRAUMA

**OF ALL THE PLACES ON YOUR BODY TO DAMAGE**, your head is just about the worst one to pick—there's just so much important stuff that goes on above your neck and between your ears. It's simple: if what's inside your skull doesn't work, nothing works.

Some head injuries are dramatic but minor (a big scalp laceration, a superficial hematoma), some are obviously major and scary (a fractured skull), and some are hard to see, insidious, and really dangerous (increasing intracranial pressure)—the minor stuff you can treat in the field, but the big stuff demands immediate and swift evacuation.

## THE HARDWARE



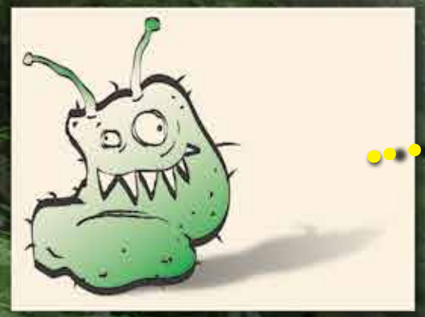
# SECTION 5

When the wilderness comes to town

The problems with "You are here" and the art of the bivuoac

"Yes, you can drink the water"

The deviousness of nasty tropical things (mostly) unseen



When the blessed event doesn't quite make the hospital

## Disaster/Wilderness

## Survival/Navigation

## Water purification

## Tropical disease

## Childbirth

and other things that you'd expect to find in the appendices of a medical textbook

# Bivouac: noun \ˈbi-və-ˌwak\ :
## a usually temporary encampment under little or no shelter

## BIVY: verb \ˈbi-vē\ to be forced by circumstance to bivouac (or preplanned, e.g., during a light/fast alpine climb)

*A few tarps, some cord tied to handy trees, and a floor made of foam pads:*

"Hey folks, we're home!"

## When faced with the need to bivouac, you must consider things beyond the care of the injured—some of which may be out of your control.

### weather

- A primary concern.
- You have no control over it.
- It can have a dramatic influence on all your decision-making.
- Know the long-range forecast before you head out.
- Understand the basics of backcountry weather forecasting.

### terrain

- Although you generally control the nature of the terrain across which you choose to travel, accidents or sudden illness strike unpredictably, and you may be forced by circumstances to treat a patient and consider a bivouac on terrain that may not be well-suited to that purpose.

### time and distance to definitive care

- What time of day is it?
- How soon will it be dark?
- How soon will it be light?
- How far from the road are you?
- How long will it take to get out?

***Components of a happy bivy:***

Good weather (a warm spring night in Nevada), a natural shelter, (big ledge with walls), good pads and sleeping bags, food and water (the latter really heavy when lugged up 3,000 feet of desert sandstone), a good friend, and (at 5:00 A.M.) a sense of humor. The airplane pillows are optional (oh, so nice).

***Cool, a snow cave:***

Cramped, damp, dark, and hard to ventilate. But they get nice and warm and are completely windproof. The flannel shirt and baseball cap are not ideal.

### resources and people

- What is the size, age, experience, and skill level of your group?
- What kinds and amount of food, extra clothing, and equipment are they carrying?

### the patient's needs

- It may seem as if the patient's needs should be of paramount concern; however, after their injuries/illness have been treated appropriately, the focus must turn back to the group's welfare and needs, and these must be balanced with those of the patient.
- How stable is the patient?
- Can they await evacuation?
- Considering these concerns, can the group "self-rescue" safely?
- If not, how will those same concerns affect the group if they have to bivouac?

## The elements of effective bivouacs

All these elements increase the group's safety, wellbeing, and productivity.

### basic considerations

- Protection from water
- Protection from wind
- The availability of fire/heat/warmth
- The availability of food and water

### terrain considerations

#### Rocky

- Avoid high, exposed places.
- Seek natural shelter: caves, big boulders, cliff overhangs, depressions, talus fields (often provide small caves or protective overhangs—ensure stability).
- Enhance your site by building a windbreak.
- Remember, some of these places may become unsafe during a thunderstorm.

#### Woodlands

- Avoid marshy ground and drainage areas.
- Seek low trees—they often offer greater protection.
- Build lean-tos with tarps, trees, and tree limbs.
- Use pine trees as natural rain/snow shelters.
- Use dry leaves and duff or pine boughs for ground insulation.

#### Snow

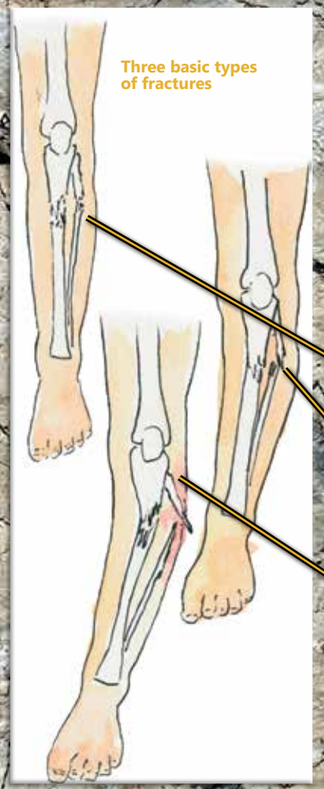
- Avoid potential avalanche terrain and high snow deposition areas.
- Dig a deep trench and cover with a tarp.
- Dig a snow cave (into a slope is easier): keep the entrance low and the roof thin, and cut an air hole.
- In proper snow conditions, cut blocks for an igloo/windbreak.
- Alternately, make a quincy: make a big pile of snow (bigger than you think), compact it (the more, the better), dig into it to form a snow cave.

# OH SNAP

## STICKS AND STONES MAY BREAK YOUR BONES...

The symbol **$F_X$** is medical shorthand for "fracture."

Some activities just lend themselves to fractures. Here we might get a clavicle, a wrist, a forearm, or a tib/fib; shoot, we may even see a femur—it probably all depends on velocity (which sure looks pretty fast).




## Fractures

A fracture occurs when enough force is applied to effect a break in the dense cortex[1] of a bone, causing pain and disruption of normal function. The pain results from the tear that occurs in the periosteum[2] surrounding the bone (the bone itself has no pain receptors).

## Types of fractures

Although physicians differentiate between many kinds of fractures, because our treatment options in the backcountry are limited, the nuances are not that important. We're basically interested in answering two questions: **1)** Are the broken bones still in anatomical position? **2)** Is there an associated wound? And we keep the descriptions basic.

### CLOSED (SIMPLE), IN-LINE FRACTURE

- There is a break in the bone's cortex, but the skin over the injury site is intact; the bones are in proper anatomical alignment; and there is no open wound.

### CLOSED ANGULATED FRACTURE

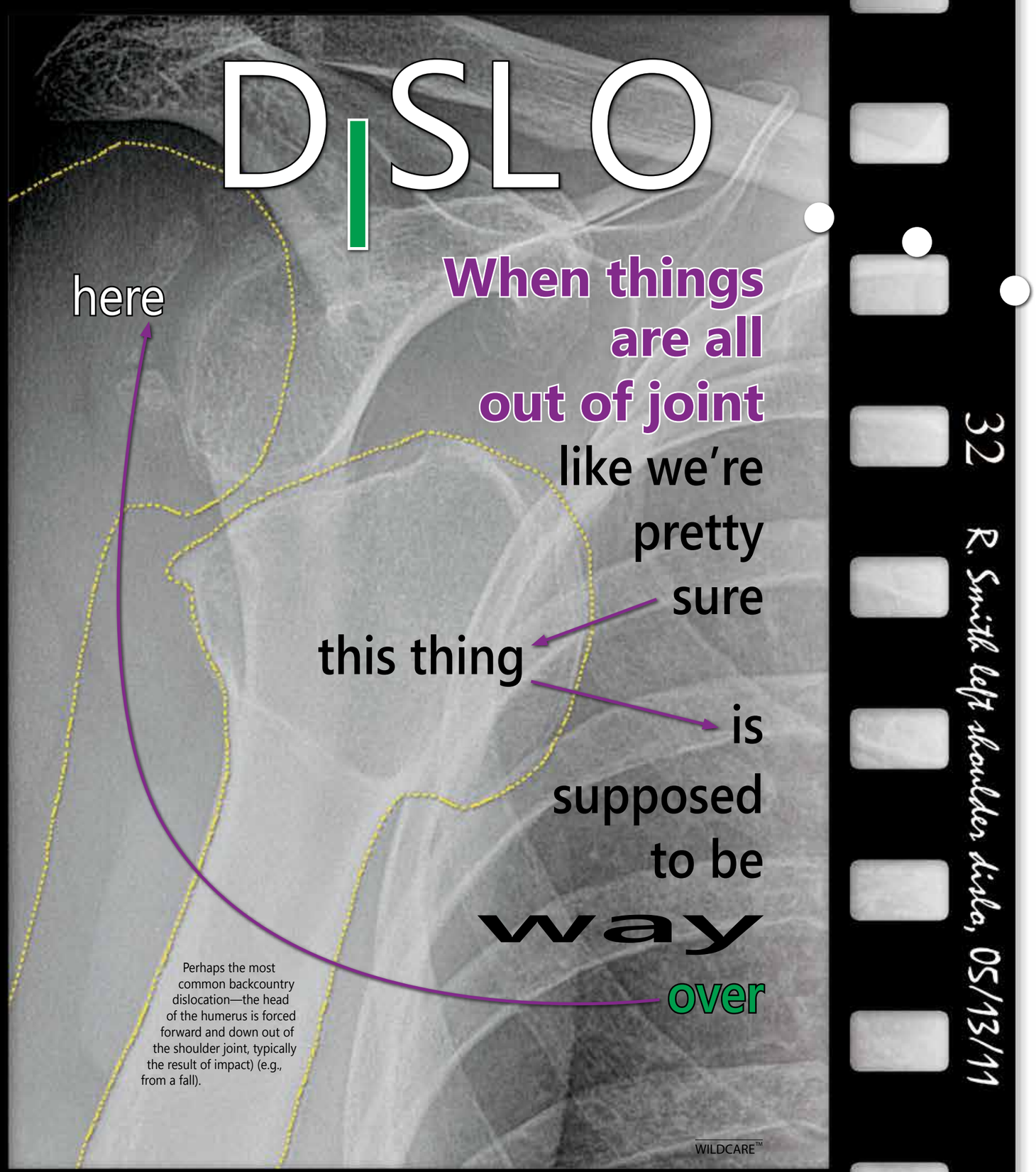
- There is a break in the cortex, and the bone ends are angulated and not in anatomical alignment.
- Angulated fractures can be closed or open.

### OPEN (COMPOUND) FRACTURE

- A fracture with an associated open wound—a break in the skin at the fracture site—with or without bone ends showing through the skin.

1 The dense outer shell of all bones: stiff and hard, it provides primary skeletal support for the body.
2 A membrane that lines the outer surface of all bones, except at the joints of long bones (bones that are longer than they are wide).

# DISLOCATION




**When things are all out of joint** like we're pretty sure

Perhaps the most common backcountry dislocation—the head of the humerus is forced forward and down out of the shoulder joint, typically the result of impact) (e.g., from a fall).

R. Smith left shoulder disla, 05/13/11





## dislocations

Dislocations occur when the bones in a joint become displaced, misaligned, or otherwise traumatized to the point where the joint pulls apart—the disruption is such that the correct anatomy is no longer maintained, and the joint's normal range of motion is reduced.

- All dislocations damage the surrounding soft tissues: muscles, tendons, ligaments, and/or cartilage.
- Dislocations can be associated with a fracture, and it can be very difficult to distinquish between a fracture and a dislocation—when in doubt, position the joint to maintain circulation distal to the injury, and splint.
- Dislocations are debilitating.They put the future function of the limb at risk because of compromised circulation.
- People who have had previous dislocations may experience less pain upon recurrence and may be more able to help you treat them.
- Dislocations sometimes reduce quickly and spontaneously. When they do not spontaneously reduce, they are often extremely painful.
- Reducing dislocations involves risk. If you attempt a reduction in the field, don't exceed the pain barrier—if what you are doing causes more pain, you are also causing more harm.


*Signs of dislocation? Just give us a second...*

## signs symptoms

- **Pain:** generally very painful and diffused, rather than point-specific.
- **Reduced range of motion (ROM)**: patient voluntarily says that they cannot move the joint.
- **Reduced CSMs:** due to compromised circulation—this can be a long-term-care concern.
- **Deformity:** the injury is typically, obviously, anatomically incorrect.