Extreme Screw-ups in Extreme Sports

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Welcome

Who Am I?

Eric Stanley

- Emergency Physician with Carilion Clinic
- OMD for several agencies in my region
- A squirrel who can’s stay away….

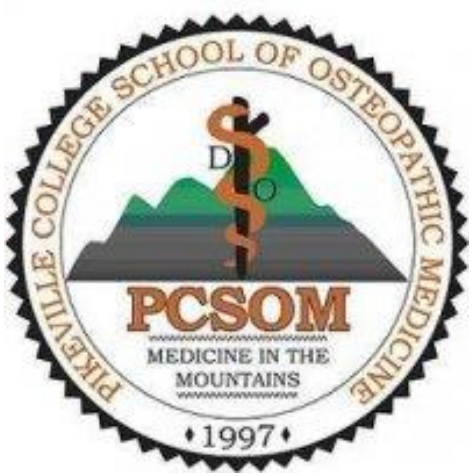
Me…

I started running rescue in 1996 with AVRS

Joined BVRS in 1998

Worked for Amherst County as paid staff in 2003

About Me


PIKEVILLE COLLEGE SCHOOL OF OSTEOPATHIC MEDICINE
PCSOM
MEDICINE IN THE MOUNTAINS
1997


VIRGINIA COMMONWEALTH UNIVERSITY
MCV
RPI
1838


CARILION
CLINIC

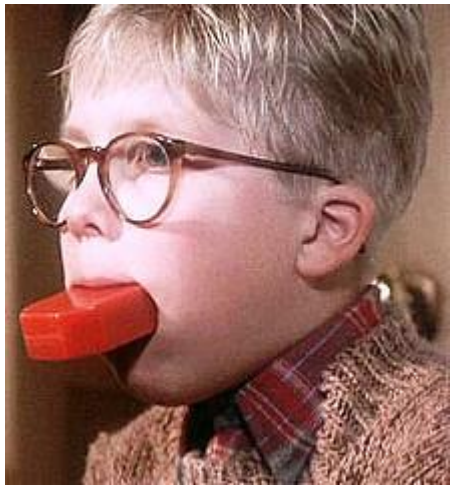
I was this guy…

Disclaimer

I have a potty mouth.

My jokes are not funny.

This lecture is not for the squeamish.



Objectives

This is a trauma lecture.

- So you should learn some trauma care today.

This is also about extreme sports.

- You should become more familiar with them.
- You should learn about some common injury patterns in them.

This is “edutainment”.

- You should not get bored.
- If you do, send hate mail to Gary Brown and Tim Perkins at Gary.Brown@vdh.virginia.gov and Tim.Perkins@vdh.virginia.gov

What are Extreme Sports?

Well, it is not this

What are Extreme Sports?

But this is about right…..

So, what happens when it goes to shit?

Parachutes

History:

- First reference is from China in the 1100s.
- Around 1495, Leonardo DaVinci designed a pyramid-shaped, wooden framed parachute.
- Sport parachuting really began in 1950's after WWII, when gear was abundant.

Parachutes

Modern day sport parachuting has evolved into two categories:

1. Skydiving
   - Jumps made from aircraft using a main and reserve canopy.
   - Opening altitude is at or above 2500 feet.

2. BASE jumping
   - Jumps are made on a single canopy system.
   - Opening altitude is best performed before impact.

Skydiving in your area?

Historically there have been drop zones in both Roanoke and the New River Valley.

There are no current drop zones in my part of the state. ☹

There are drop zones in Orange, Petersburg, Suffolk, New Market, Warrington, and Kenbridge.

Demo jumps are not uncommon for football games, races and festivals.

Skydiving Injuries

Most all injuries are related to landing.

- Failure to get a canopy out at all is extremely rare, though this is often quoted in the news.
  - AAD's and RLS have really changed the safety of the sport.

Swooping

- It is fun to go fast!
  - But going fast near the ground is hazardous to your health…..

Swooping done right.

Let’s take a look at what it looks like when it all goes well…

Swooping gone bad.

When it is good, it is amazing to watch.

When it is bad, you get called…

Femur Fractures

Always start with the ABC's and a head to toe exam.

Assess the injury:

- Identify obvious deformity
- Palpate for crepitus
- Evaluate PMS

Time to splint that puppy……

Traction Splints

Femur Fractures

The presence of a femur fracture raises the index of suspicion for internal injuries.

- It takes 250 newtons (56 lbs) to fracture the femur.
- You can lose upwards of 3 units of blood (450 ml per unit) in the thigh.

Femur fractures are described as distal, mid-shaft and proximal fractures.

- Distal and proximal femur fractures may be difficult to distinguish from knee and hip injuries
- They are often best treated without traction

Femur Fractures

Mid-shaft femur fractures, whether open or closed, are treated by the application of traction splints.

- Studies show poor compliance with the traction splint in multi-system trauma, but good compliance with isolated injury.

Always evaluate the overall condition as to load and go vs stay and play.

Don’t break your neck….

Your neck is very important.

Don’t break your neck….

Chris Colwell

- C5, C6 quadriplegic.

As always, ABC’s and head to toe exam…

- Always have a high index of suspicion for respiratory depression for a high c-spine injury and be ready with airway maneuvers.

- Do a good neuro exam. The findings you have in the field are critical for evaluation of progression or resolution of the injury. Document WELL. Your oral report will be forgotten in time, but your documentation is forever a part of the medical record.

Don’t break your neck…

Good C-spine control!

- There is great debate over backboards in the literature. In my opinion if there is ever a time to use one, it is in the field, in the setting of a known or suspected injury.

BASE Jumping

BASE is an acronym that stands for **building, antenna, span, and Earth.**

Modern BASE jumping started in the late 1970's with Carl Boenish leading the charge with his videos of jumping from El Capitan in Yosemite.

Typically, BASE jumping is illegal.

- You have to trespass to get on most of these objects.
- BASE jumping is portable. It does not require aircraft to make it happen.

Is there BASE jumping happening in your area?

Yes.

BASE jumping done well.

An amazing thing to watch.


zeedog

BASE jumping gone bad.

You need to land softly.

Tib/fib and ankle fractures.

Again, ABC's and a full head to toe exam.

As we saw in the video, he applied a tourniquet.

- Good idea?

Tourniquets are not bad medicine. If it is between uncontrolled blood loss and death, the tourniquet is always a better option.

What if there is no pulse (without a tourniquet)?

- Reduce the fracture and re-asses for a pulse.

Tib/fib and ankle splints.

Once you have addressed the issue of blood supply, do a good PMS exam. Again your documentation is important.

Pain control

- If my leg looks like his don't be stingy.
- Fentanyl is a good choice in trauma.

- A good splint is one that works.

The big hit.

Some times, you take a BIG hit….

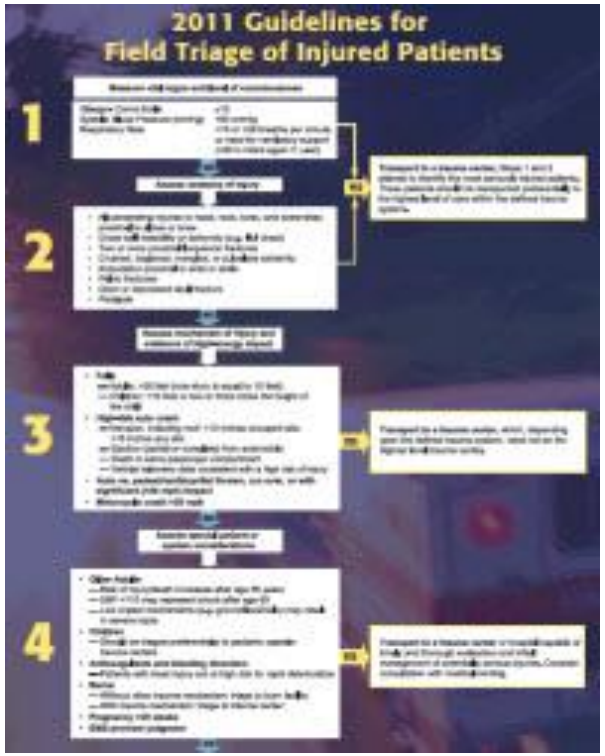
Multisystem Trauma.

This requires a disciplined approach.

- ABC's, primary survey and interventions.
- Secondary survey and interventions.
- Be prepared to manage a difficult airway and treat shock!

Appropriate field triage is critical!

- Where is he going?
  - A trauma center!
- Which one?
  - Depends on proximity and weather.
- Don't delay!



Removing parachute gear.

Often with a parachute injury there is an investigation into the cause of the accident.

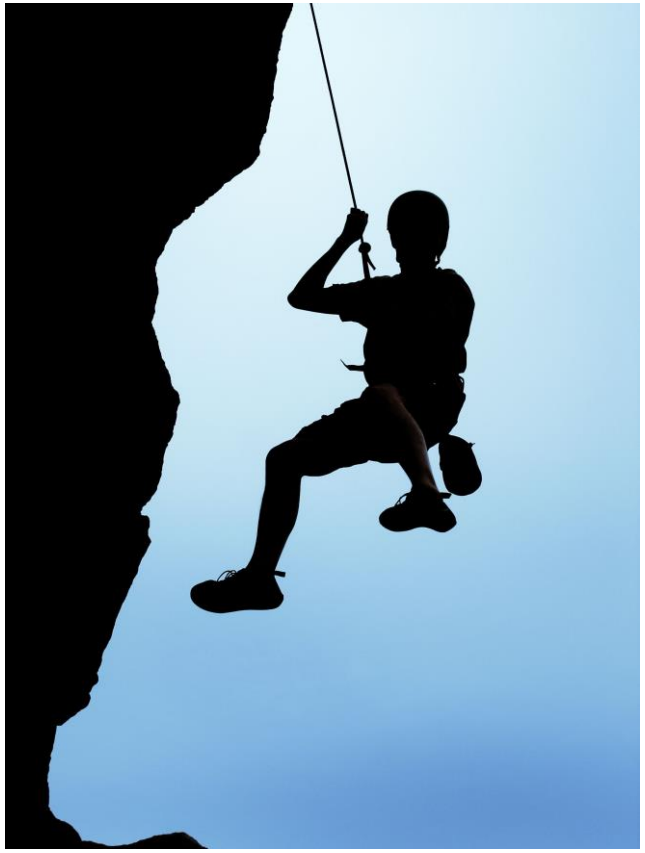
The condition of the gear is very important to that investigation, though clearly the patient is the first concern.

Try to minimize cutting to the rig.

- Avoid cutting through areas with damage
- Try to make cuts to the leg straps, chest straps and shoulder straps as shown.
- Try to cut each area only once and in a clear manner.
- If the gear can be safely removed without cutting, that is preferable.
- Try not to move the gear very much.

Removing parachute gear.

Fun with ropes.



Rock Climbing

Climbing is common in the area in both the indoor and outdoor setting.

There are several types of climbing, top roping, sport and trad climbing being the most common.

It is hard to get hurt badly top roping baring a major rigging failure.

Lead falls.

Lead falls are possible when trad or sport climbing. They occur when a climber is above their anchor and has a fall.

Lead falls.

With a lead fall you fall twice the distance you have climbed above the anchor.

Danger comes when you have an anchor failure on a lead fall.

Lead falls.

Do you trust your gear?

Lead falls.

Falls of this type often result in the climber striking the ground in an almost seated position.

Have a high index of suspicion for pelvic fractures.

Pelvic Fractures

Pelvic fractures can be associated with significant blood loss and shock.

- Pelvic volume is 1.5L, but once fractured 5L is not uncommon.

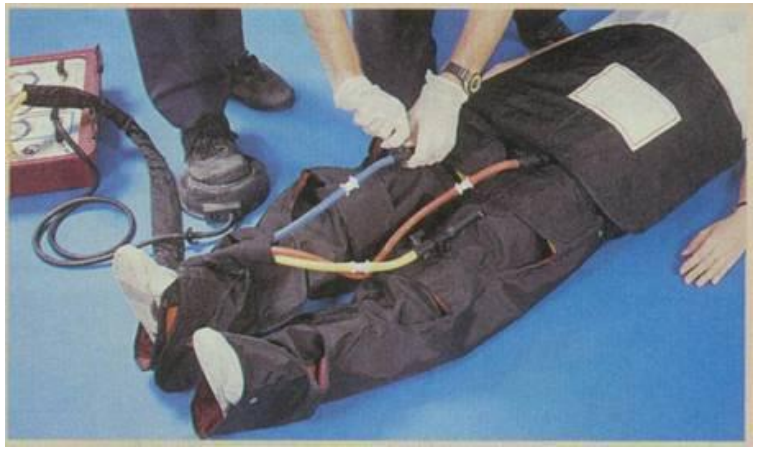
Treatment of pelvic fractures requires pelvic binding.

- Prevent reinjury from pelvic motion
- Decrease pelvic volume
- Tamponade bleeding pelvic bones and vessels
- Decrease pain

Pelvic Binders

Many options:

- Pelvic binder (e.g. sheet, SAM sling, T-POD, etc)
- Anterior external fixation
- C clamp
- Pneumatic Anti-Shock Garment (PASG) aka Military Anti-Shock Trousers (MAST) — essentially obsolete



Rope jumping

How to fall..

Rope jumping

Very gear intensive, and an “off label” use at best.

There are 2 basic types of systems, vertical falls and pendulums.

- Vertical falls like we just saw.
  - Harder to rig, more dangerous.
- Pendulum, more like a big rope swing.
  - Falls are safer, but this is a relative term.

Rope jumping Fails.

Rope jumping goes bad in several ways:

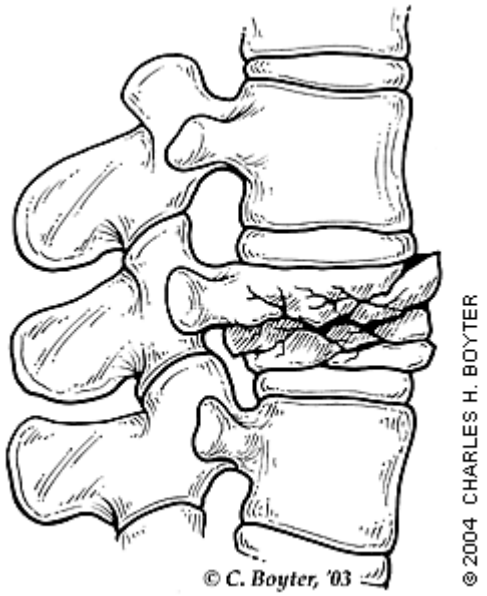
- System failure
- Failure to reach line stretch
  - Both generally result in death and nothing to do from an EMS perspective.

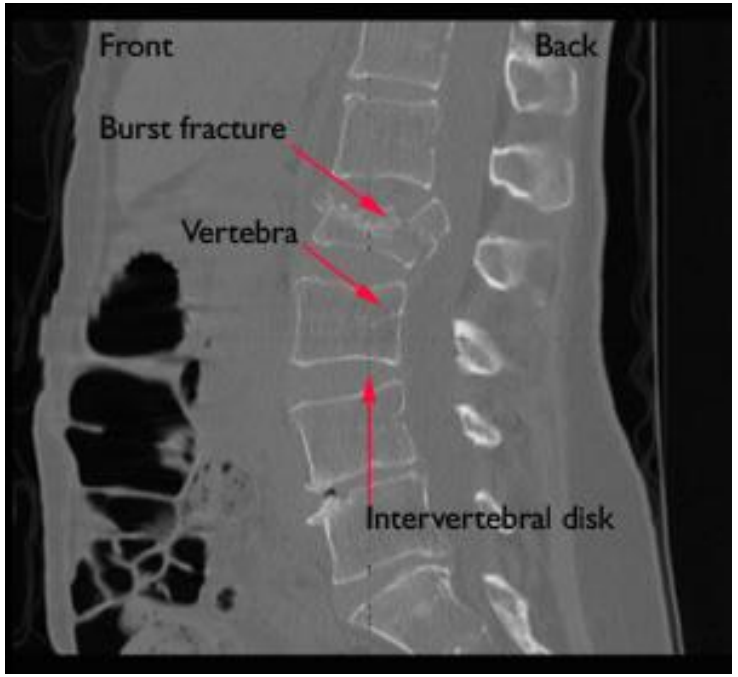
- Incomplete line stretch
  - Results in a jumper hitting the ground with a partially decelerated fall
  - Jumper is usually in a standing position in the harness when this occurs.

Injury pattern.

A fall from height with a standing impact results in a typical injury pattern.

- Calcaneal fractures from initial impact.
- Lumbar and even thoracic compression fractures from axial loading.





Treatment

Calcaneal fractures:

Good splinting, I like pillow splints for this.

Lumbar and even thoracic compression fractures from axial loading.

Good spinal control.

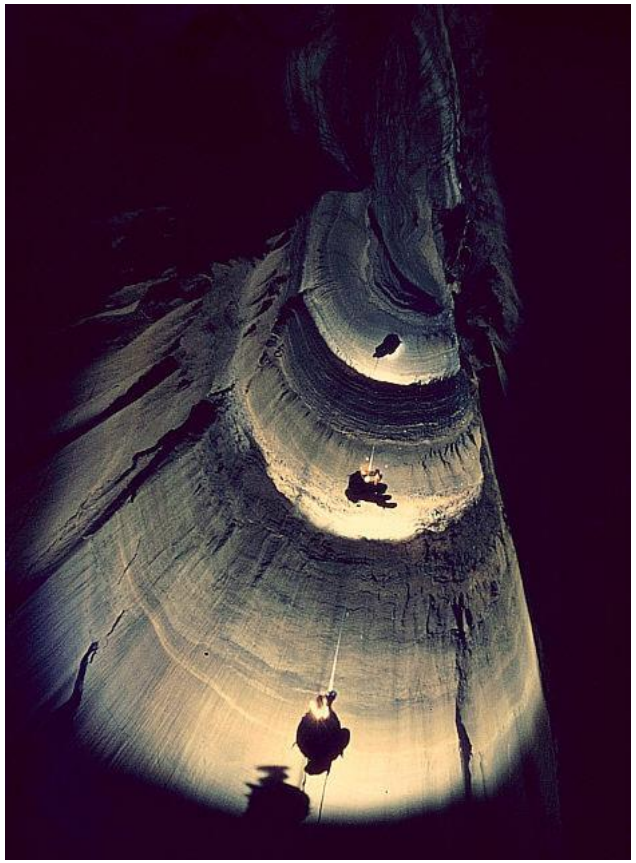
Pain medication.

Have a high index of suspicion for shock from internal bleeding!

Suspension Trauma

Suspension Trauma

In my area we have a lot of this…..



Suspension Trauma

No good definition exists.

Because no one really understands the pathology.

Believed to involve “relative hypovolemia”.

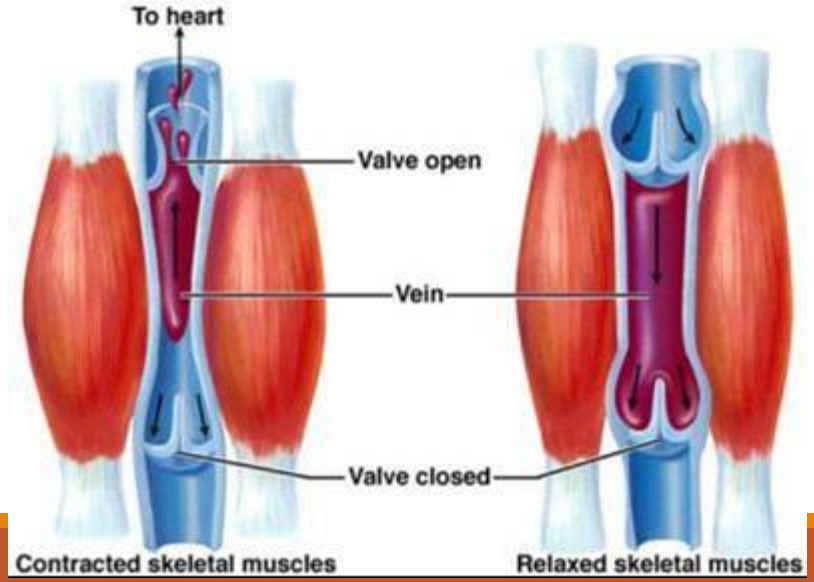
- Low blood pressure.

Suspension Trauma

The legs can hold 20% of your blood volume.

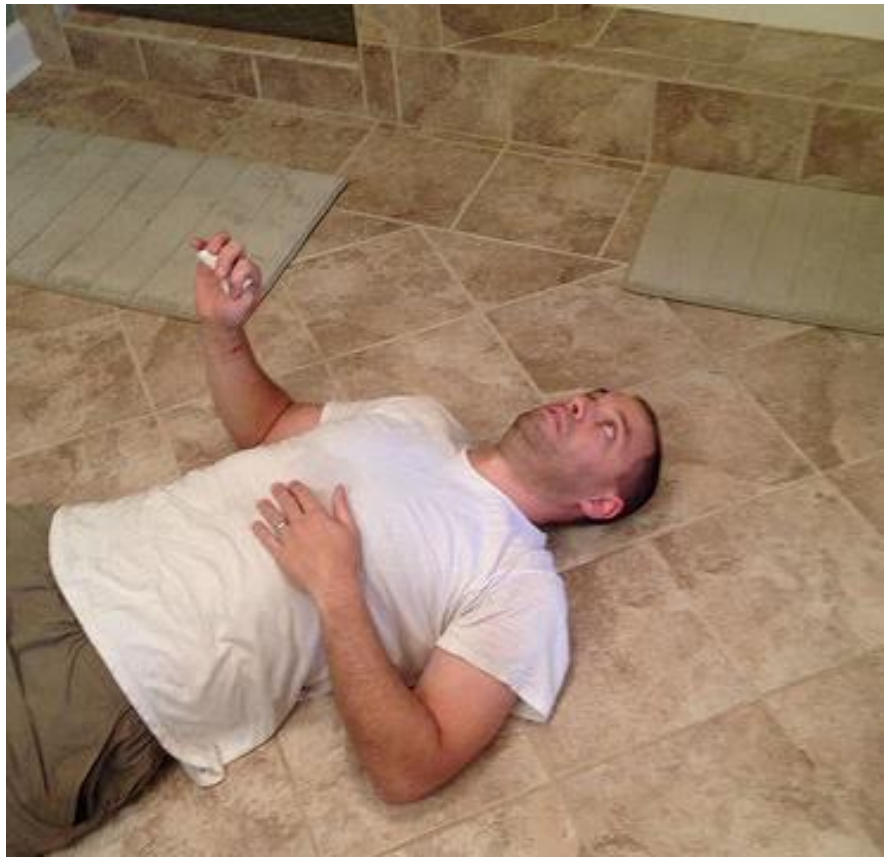
If you are not re-circulating that blood you will pass out.

- Thought to be due to “pooling” in the legs during suspension.



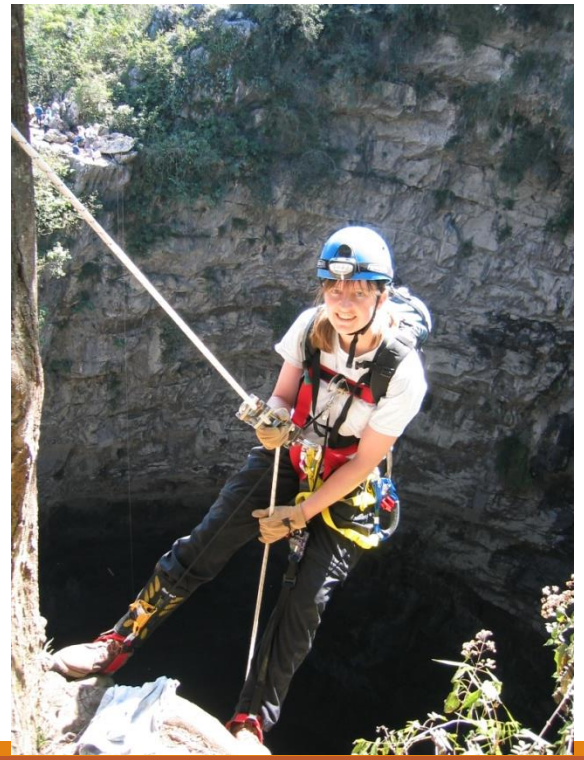
Suspension Trauma

Normal fix for this is to just pass out and lay flat!



Suspension Trauma

If venous pooling in the legs is the pathology, it does not occur to the alert rope user as long as the legs are active…. Maybe.



Suspension Trauma

With 20% of your blood volume “locked” in the legs when unconscious your brain ***could*** die of hypoxia.

- Hypovolemic shock, hypoxia, malignant arrhythmia, etc..

Also at play is muscle breakdown, which the byproducts of ***might*** be a factor in sudden death.

- Potassium, myoglobin, etc…

Bad.

Suspension Trauma

We know that death can occur in 3-9 min when you are unconscious in a harness, regardless of what we think the mechanism is.

The best treatment we know of is to get the patient off rope and flat ASAP.

Let’s Review

Extreme sports are happening in our area. This is really just the tip of the iceberg of a growing activity.

- We did not discuss high-lining, free solo climbing, terrain flying, or bungee jumping.
  - Or the bad ideas: train surfing, car surfing, or whatever mustang-wanted does…..

Femur Fractures

- Blood loss and traction splinting.

C-spine fractures

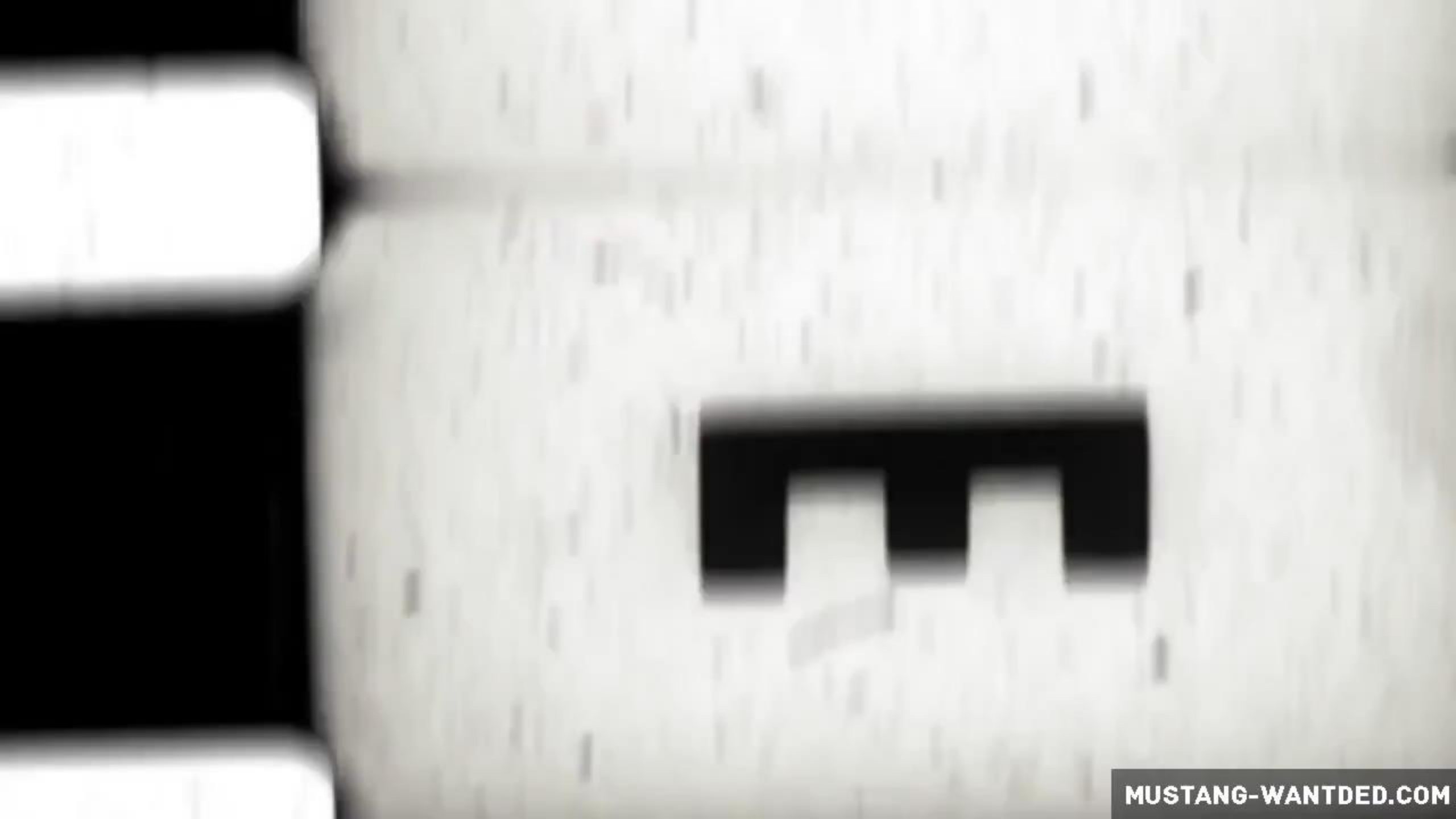
- Good spinal control and possible respiratory depression

Tib/fib fractures

- Splinting, tourniquets and pain control

Multisystem trauma

- Good field triage, anticipate airway and shock management.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Let's review

Pelvic fractures

- Binding, blood loss and shock.

Calcaneal and lumbar fractures

- Good splinting, spinal control, pain control.

Suspension trauma

- Don’t delay, getting off rope ASAP saves lives

Be safe, play hard.

Questions?


STOP
WRONG WAY
DO NOT ENTER
CONFUSION
Sometimes to stop the idiots, you have to confuse the smart ones.

Contact

Email me:

- AskDoctorStanley@gmail.com

No questions off limits.

Please give me feed back!

Bonus material?

What time is it??

Parachute fails

We all love watching others fail…

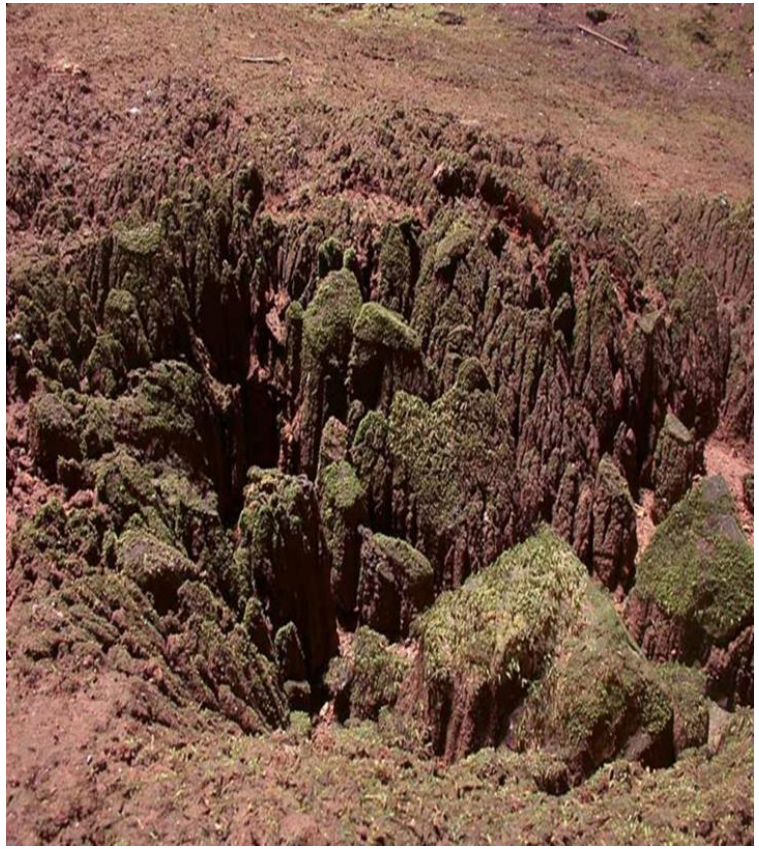
Here you go!

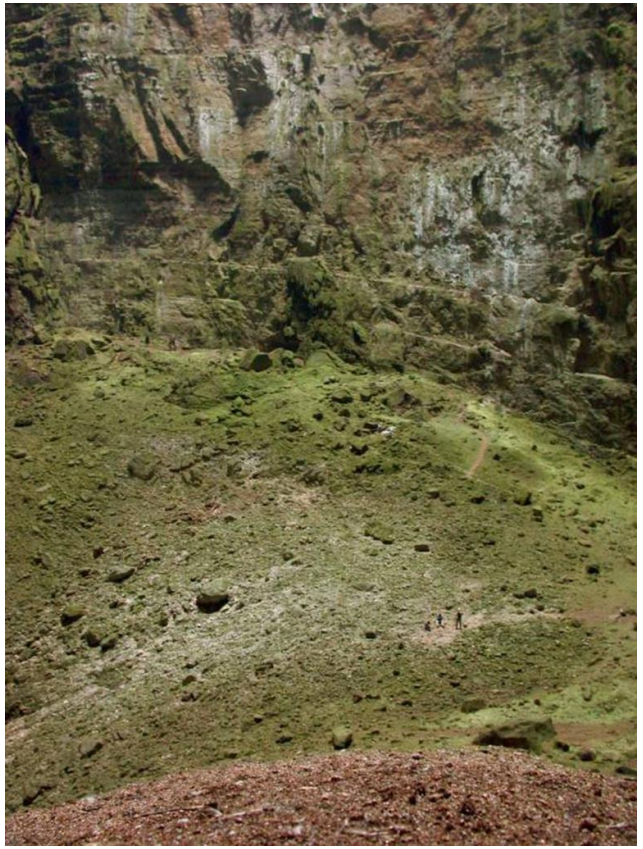
A compilation of a few close calls and some REALLY lucky escapes by skydivers and BASE jumpers who decided to die some other day...

Caving

Caving

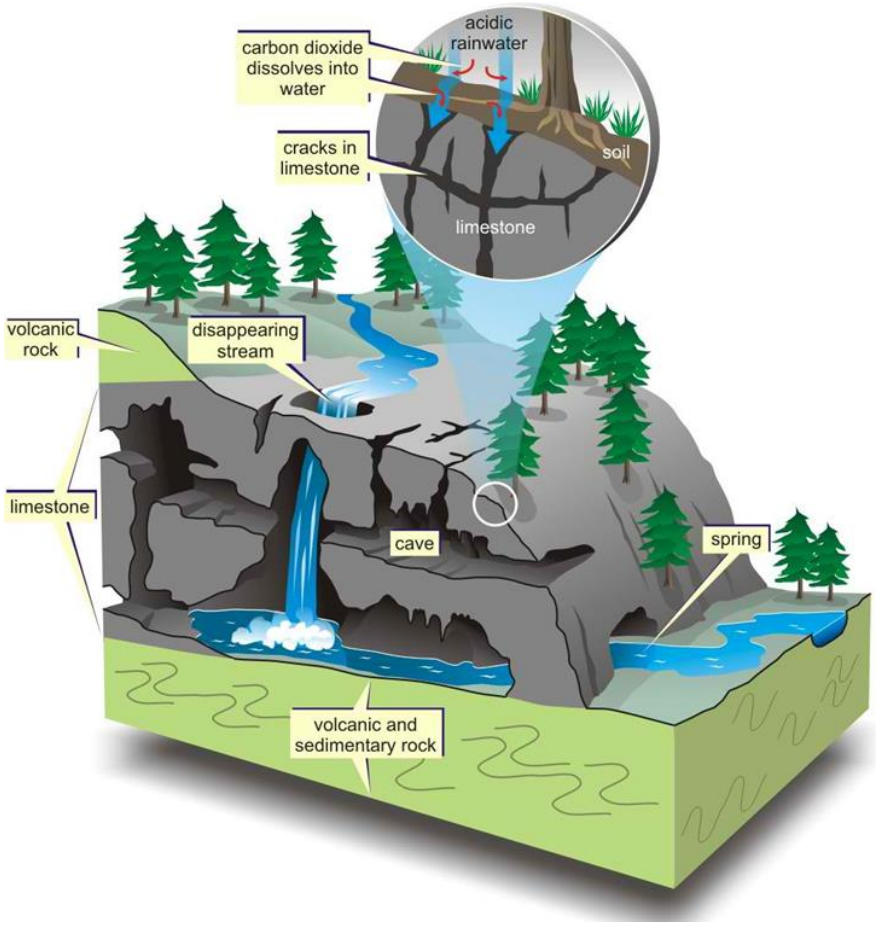
Alien landscapes





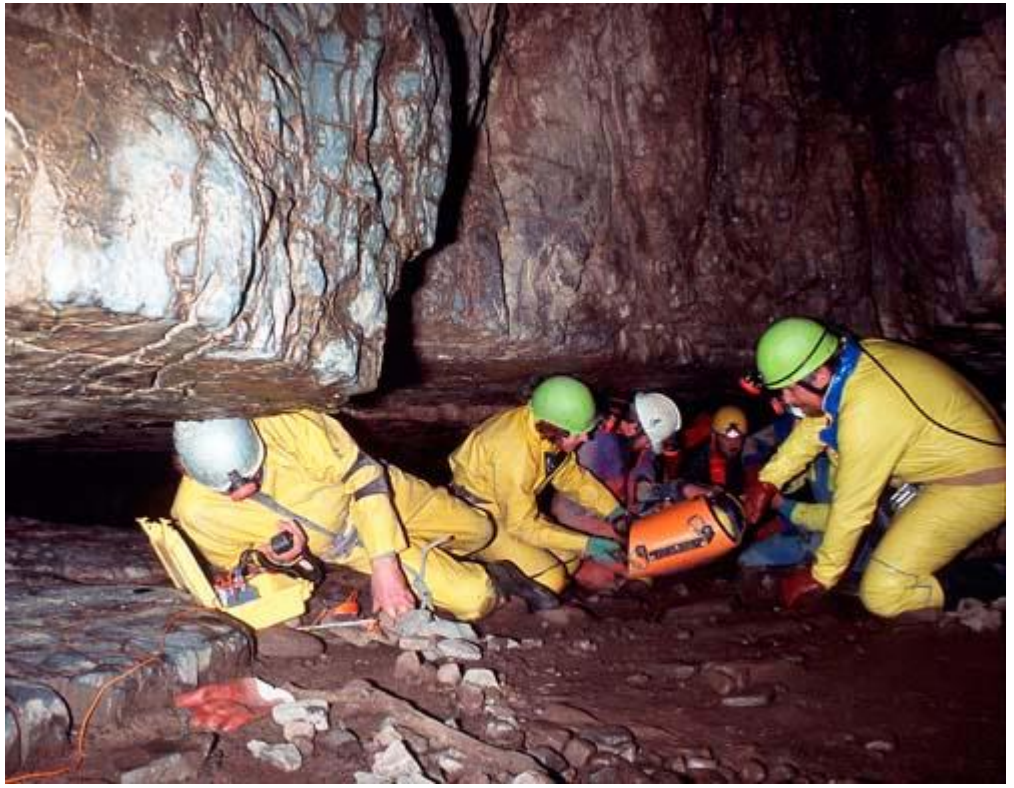
Caving

- Cold
  - Constant 54°
  - Varies by lat
- Wet
  - Water is life
- Dirty
  - Really muddy!
- Old
  - Karst geology
  - Takes a long time
- Alive
  - Rocks
  - Wildlife, Bats



Caving

Getting hurt in a cave is a bad idea….

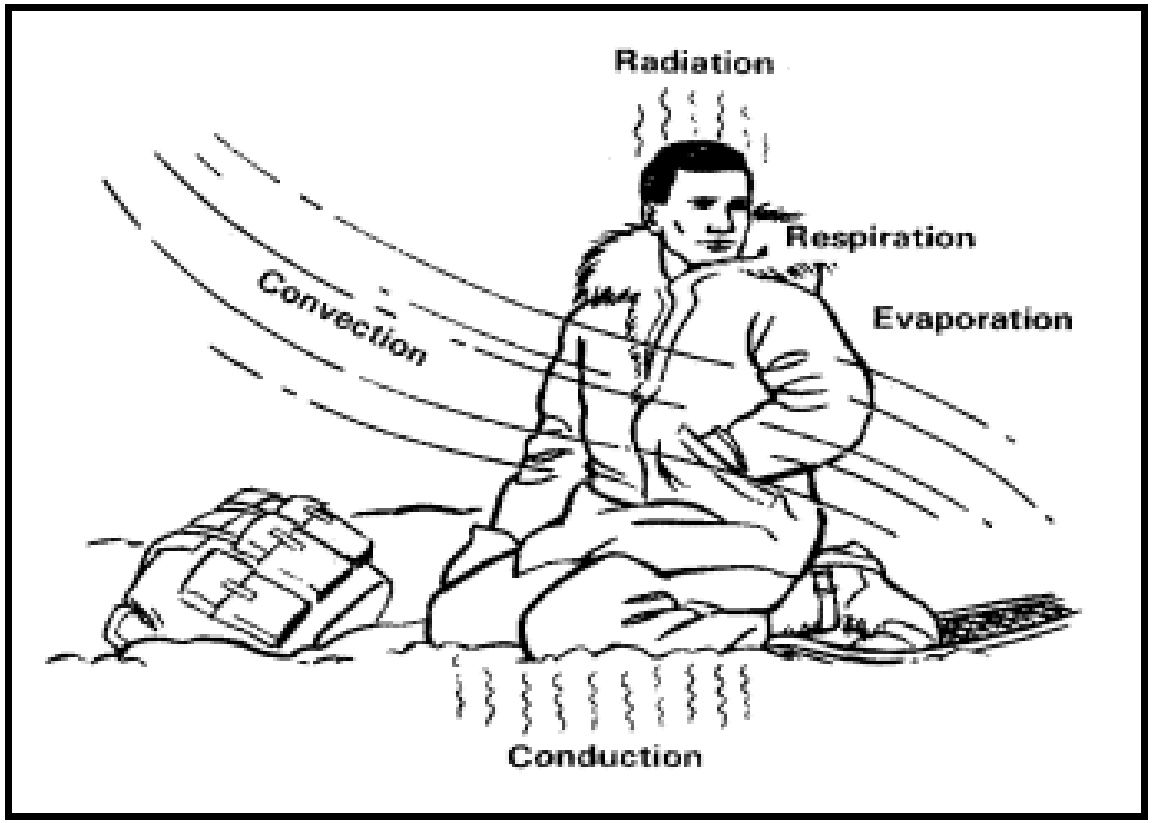


Caving

Most cave related injuries are falls. Hence fractures of the extremities are most common.

Caving

Cold kills in caves.



Caving

What does a real cave rescue look like? Here is the last one we did.

Cave Rescue

Oct 2nd

Some County, West Virginia

Approximately 2:30 pm an 18 yo male fell 10 feet breaking his right tib/fib.

He was ~3000 feet inside a horizontal cave system

Rescue was called at 5 pm

Initial Response team arrived at 7 pm to the patient

Cave Rescue

BCRG was requested by local IC at ~ 5:30

It was raining and water levels were a concern

In total there were about 75 responders (including two or three local fire departments), 57 of whom entered the cave (35 of whom were BVRS or VPI Cave Club).

Fin

This is the END