A group of people in outdoor gear are sitting on a rocky bank next to a river with rapids. One person is using a laptop, and another is using a tablet. There are red and orange gear bags on the ground.

Core Concepts in Wilderness and Austere Medicine

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Blue Ridge Adventure Medicine

Appalachian Center for Wilderness Medicine

Carilion Clinic Wilderness Medicine Fellowship

Financial Disclosure



Objectives

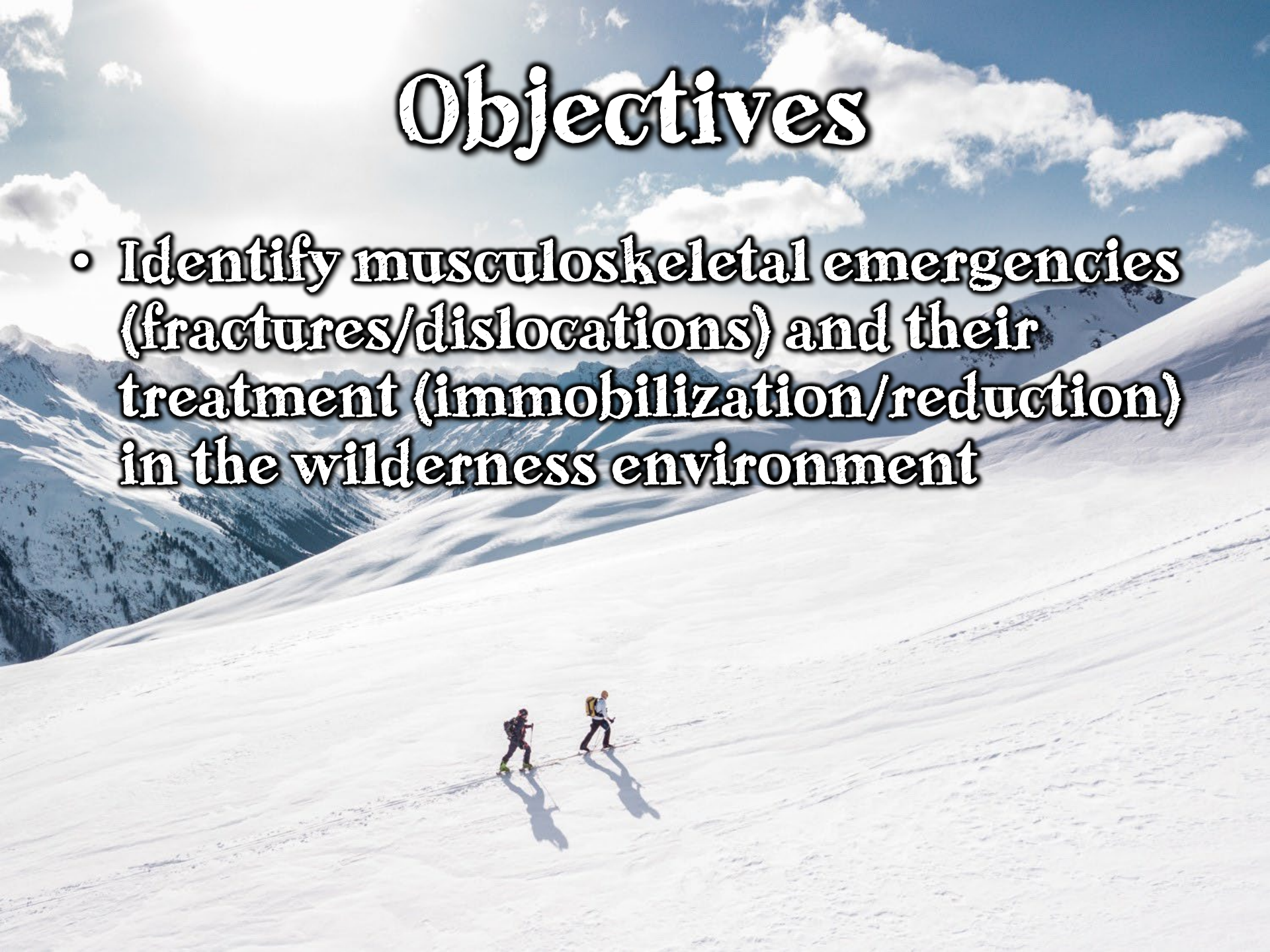
- Define Core principles of patient assessment, stabilization and evacuation in the wilderness environment
- Identify the signs and symptoms of hypo/hyperthermia and their management in the wilderness environment

Objectives

- Identify the signs and symptoms of anaphylaxis and envenomation and their management in the wilderness environment
- Demonstrate understanding of wound care and advanced hemorrhage control techniques (pressure dressing/tourniquet use) in the wilderness environment

Objectives


- Identify musculoskeletal emergencies (fractures/dislocations) and their treatment (immobilization/reduction) in the wilderness environment



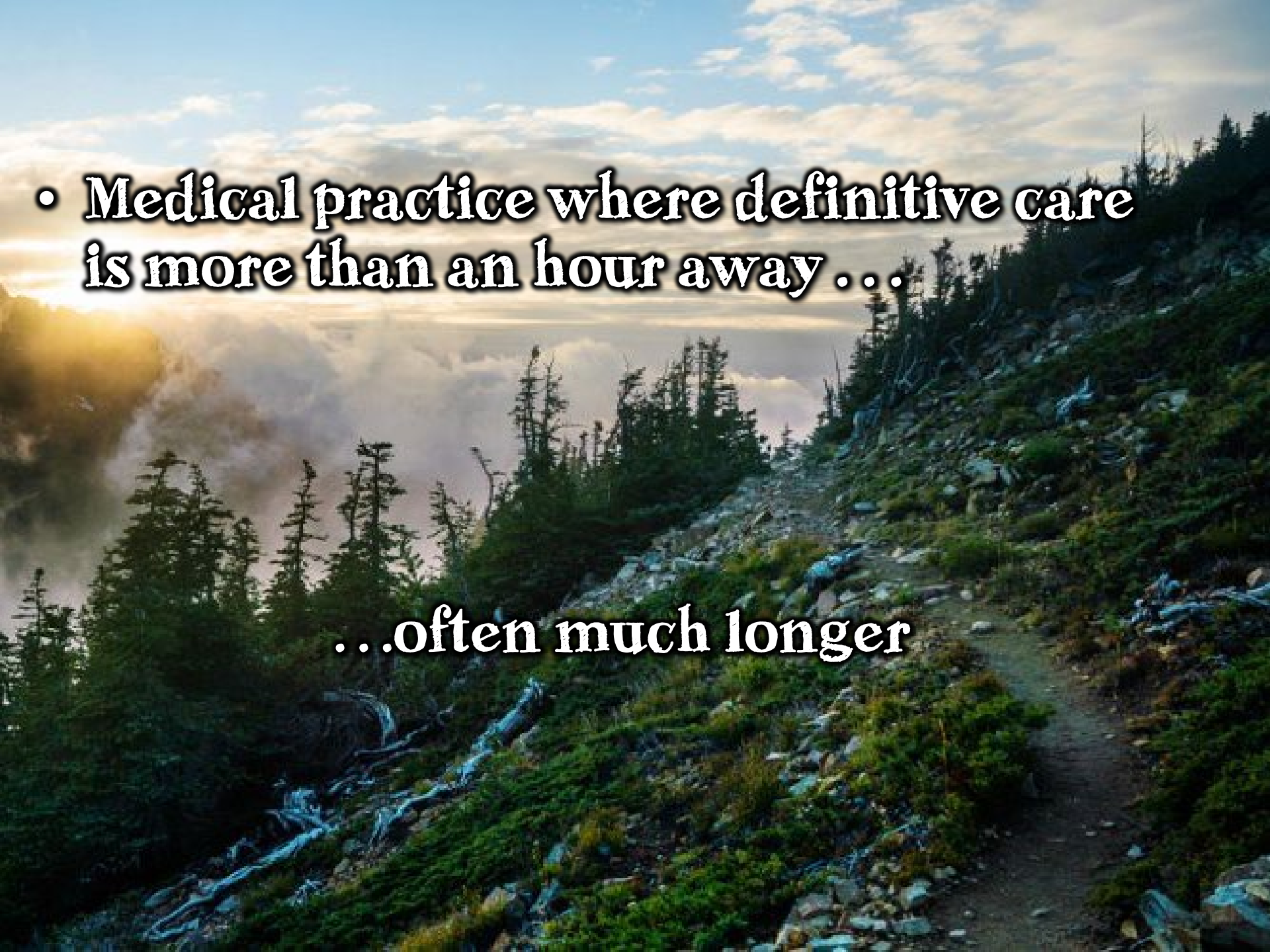


fe.com



An aerial photograph of a dense forest with a thick layer of mist or fog rising from the ground, partially obscuring the trees. The trees are mostly green, with some showing signs of autumn. The mist is most prominent in the middle ground, creating a soft, ethereal atmosphere. The sky is overcast and grey.

What is Wilderness Medicine?

- 
- A scenic mountain landscape featuring a dirt trail winding through a rocky, vegetated slope. The foreground is filled with green shrubs and scattered rocks. In the middle ground, a dense forest of evergreen trees covers the hillside. The background shows a valley with more trees and a bright sun low on the horizon, creating a hazy, golden glow across the sky and clouds. The overall atmosphere is serene and remote.
- **Medical practice where definitive care is more than an hour away ...**

...often much longer



–unfavorable environmental factors

–difficult patient access

–limited resources

–unique injury & illness patterns



Level of Care
should NOT define
Quality of Care



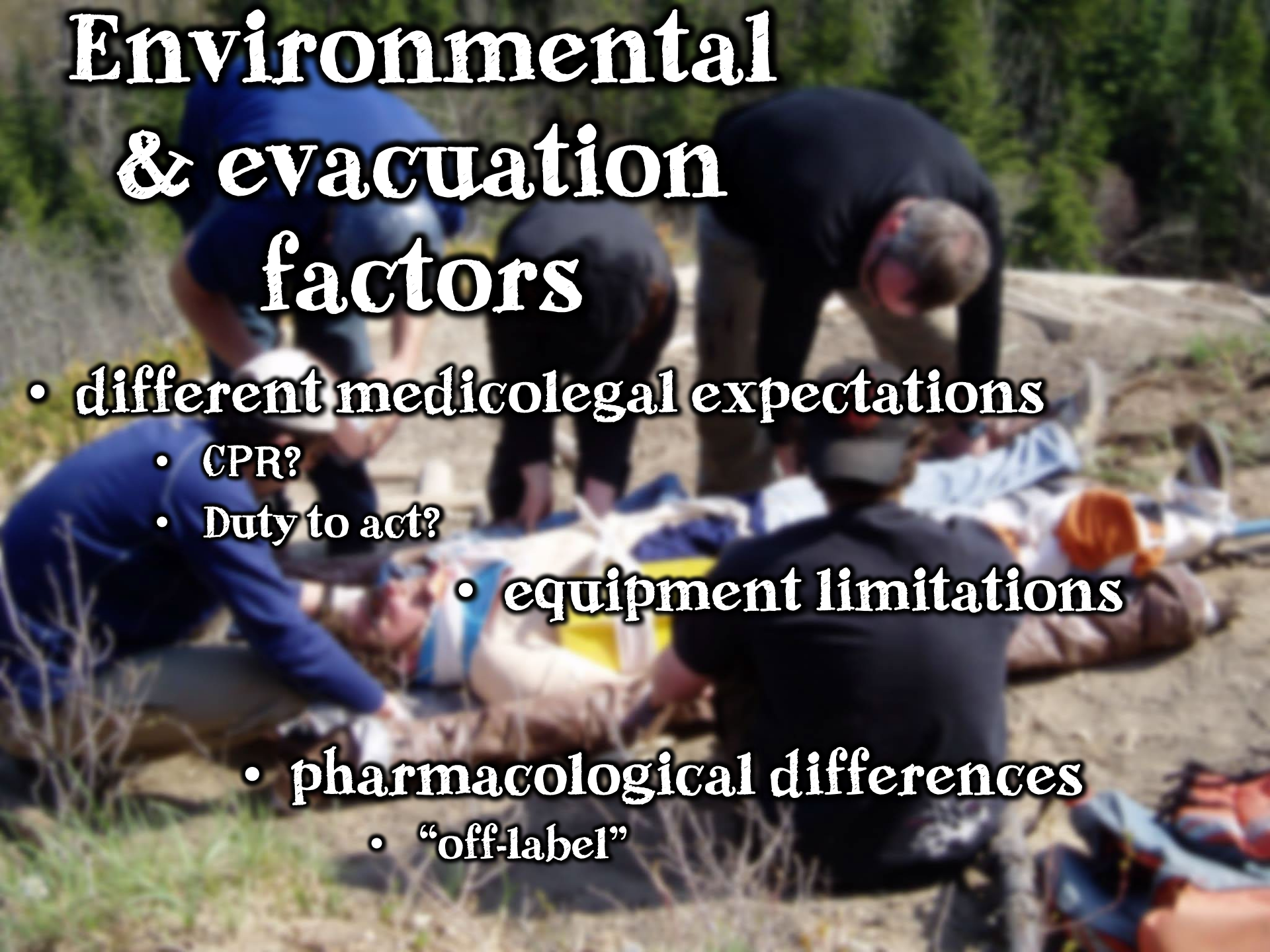
Wilderness Medicine
vs
Clinic/Hospital Medicine

Improvisation!

A group of people are on a dirt trail in a wooded area. One person is lying on a stretcher, being carried by others. The scene suggests a rescue or medical emergency in a wilderness setting.

- diagnostics
- medications
- procedures
- extrication
- evacuation

Environmental & evacuation factors

A group of people in blue uniforms are providing medical aid to a patient lying on a stretcher outdoors. The scene is set in a natural, outdoor environment with trees and a dirt path. The text is overlaid on the image.

- different medicolegal expectations
 - CPR?
 - Duty to act?
- equipment limitations
- pharmacological differences
 - “off-label”



Types of Wilderness Medicine

Recreational Medicine



Expedition Medicine



Disaster Medicine



Disaster Medicine



Rural Medicine



Global Medicine



SERVICES
ORGANISES

MEDICINE INTERNE.
PEDIATRIE.
CHIRURGIE.
GYNECOLOGIQUE
MATERNITE.

RECEPTION



CENTRE MEDICO CHIR



OFFICE CHRETIEN POUR LE

PA's in Wilderness Medicine



Patient Assessment

- Scene safety
- CPR
- ATLS
- ABC
- CBA
- MARCH

M-A-R-C-H

Massive Bleeding

Airway

Respirations

Circulation

Head / Hypothermia

TraumaMonkeys.com

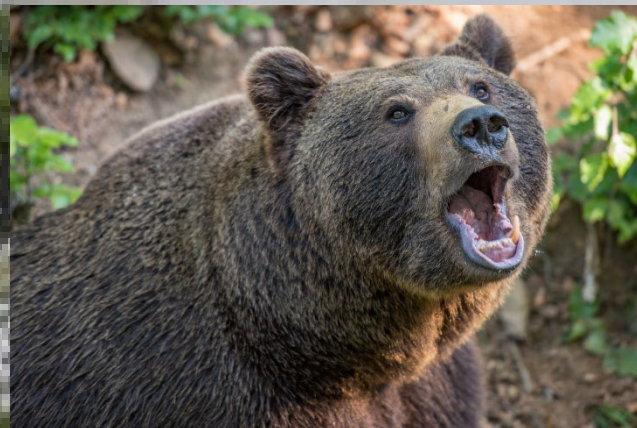
Airway

Breathing

Circulation

Disability

Exposure



Scene Safety



- Rescuer/Team safety is paramount
- Scenes can evolve...
- How rapid? How safe?
- Equipment/resources?

ATLS



- Resources?
- Effective outside hospital?
- Treatment Priorities?

Airway

Breathing

Circulation

Disability

Exposure

MARCH

- Shift in priorities
- “Condensed” evaluation
- Environmental factors

M-A-R-C-H

Massive Bleeding

Airway

Respirations

Circulation

Head / Hypothermia

HEENT

- Ophtho
- Dental
- Medications
- Evac



Optho

- Treatment/Evac....
- Topical anesthetic excellent diagnostic and therapeutic modality

Optho

– Exposure?

- Chemical
- Photokeratitis?

– Structural?

- AACG
- Retinal detachment

– Trauma?

- Globe rupture
- Hyphema
- Corneal abrasions

Dental

- **Treatment/Evac**
- **Infection?**
 - Abscess
 - ANUG
- **Traumatic?**
 - Ellis classification
 - Pulpitis
 - Avulsed/extruded

Bites and Stings

- **Envenomation**
- **Anaphylaxis**
- **Treatment**
- **Prevention**



Envenomation

- **Crotalid vs Elapid**
 - Majority of envenomation in NA crotalid
 - Field management:
 - Stabilize, evacuate.
 - Don't cut, extract or apply tourniquet.....

Envenomation

- **Latrodectus**
- **Loxocceles**
 - **Field treatment:**
 - **Stabilize, evacuate**
 - **Benzos with Latrodectus??**

Envenomation

- **Hymenoptera**
 - **Anaphylaxis**
 - Identify
 - Treat aggressively
 - Epi, steroids, diphenhydramine, H2 blockers, albuterol....
 - Evacuate

Hemorrhage control

- Detection
- Direct pressure
- Devices: quick clot/tourniquets



SAVE A LIFE

BLEEDINGCONTROL.ORG

Massive Hemorrhage

- Terminal process
- Treatment priority
- Identify
- Direct pressure
- Topical hemostats
- Tourniquet
- Pelvic binders
- Evacuate

MSK/Ortho

- Diagnosis
- Reductions
- Splinting
- Evacuation



MSK

- Impeccable NV exam
- Open or closed?
- Reduce? Depending on NV status, injury and resources
- Stabilize/immobilize
- Evacuate

Drowning

- Definitions
- Rescue
- Treatment
- Assessment
- Monitoring

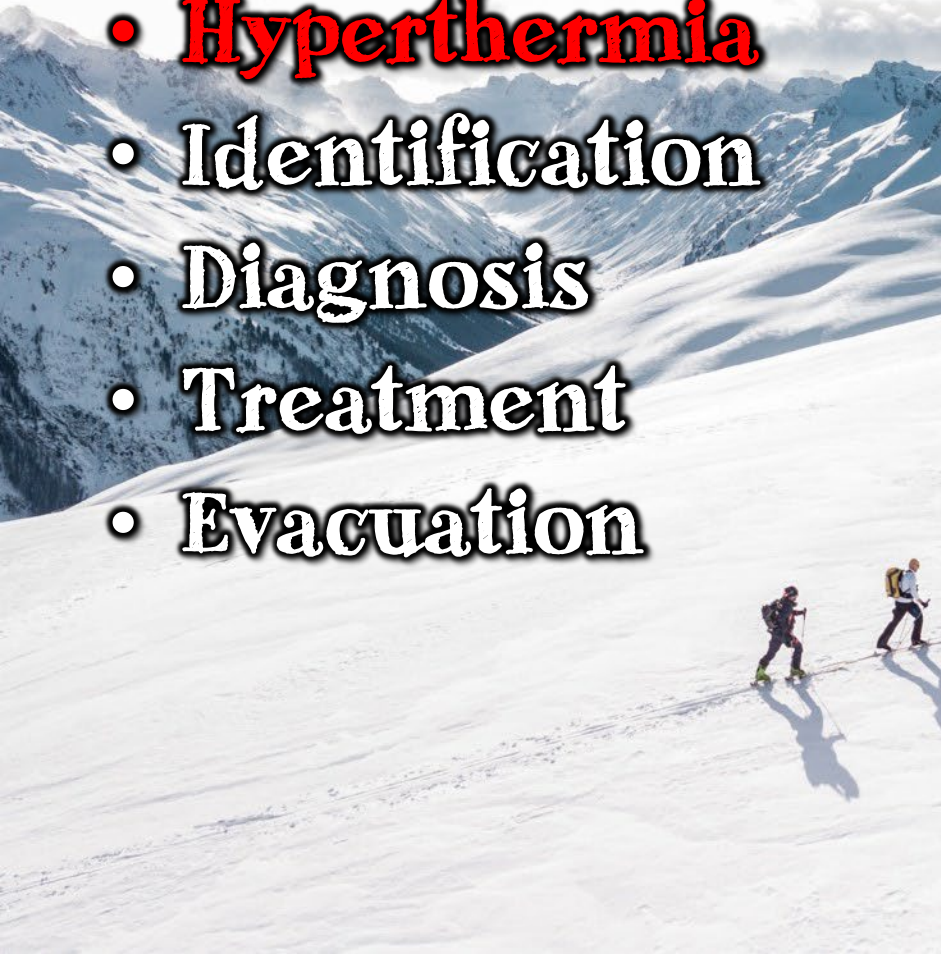


Drowning

- Rapid, cautious rescue
- Evacuate
- CPR saves lives
- Hypothermia
- 3 outcomes:
 - Death
 - Survival with neuro sequela
 - Survival without neuro sequela

Environmental Emergencies

- Hypothermia
- Hyperthermia
- Identification
- Diagnosis
- Treatment
- Evacuation



Hypothermia

- Early identification and treatment
- Protect from environment
- Active or passive rewarming
- Mental status changes
- Aggressive, intentional intervention
- Evacuation

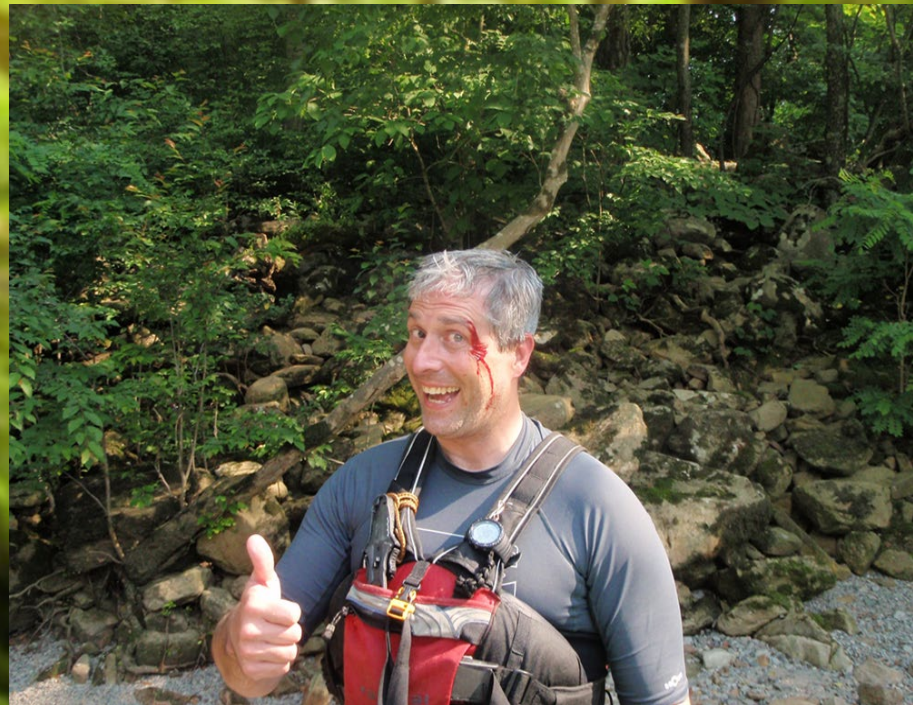


Hyperthermia

- **Early identification and treatment**
- **Protect from environment**
- **Active cooling**
- **Mental status changes**
- **Aggressive, intentional intervention**
- **Evacuation**

Wound Management

- Assessment
- Irrigation
- Close or not?
- Closure techniques
- ABX?
- Evacuation



Wound Management

- **Evaluation**
 - Exploration?
- **Irrigation, irrigation, irrigation**
- **Closure? Risk vs benefit**
- **ABX?**
- **Closure techniques, suture, staple, skin adhesives, steri-strips**
- **Wound protection**
- **Evacuate complex wounds**

Medical Kits

- **Size**
- **Medications**
- **Suited to expedition**
- **Communication**
- **Supplies**
- **Transportation**



Medical kits

- No “standard” kit
- Modularized kits effective
- Remember communication
- Transportation
- Access
- Make sure other folks know where it is
- Only bring things you can use



TAKE HOME?





TAKE HOME?

PROTECT yourself
***and* your team**

A white takeout container filled with food, with chopsticks sticking out of the top. The background is a blurred wooden surface.

TAKE HOME?

**Identify and control
hemorrhage EARLY**



TAKE HOME?

BLS saves lives!



TAKE HOME?

**Mobilize help
EARLY!**



TAKE HOME?

**PROTECTION from
the environment**



TAKE HOME?

IMPROVISATION!!



TAKE HOME?

**Set realistic
expectations**



TAKE HOME?

**Level of care
doesn't define
QUALITY of care**



Special
Thanks...



Jessie Gehner MD
Carilion WM Fellowship, 2017



Joel Bashore, PA-C
Carilion Emergency Medicine

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Tracy Cushing, MD, MPH, FAWM

Wilderness EMS
Seth C Hawkins MD FACEP FAEMS MFAW

Questions?



Snake River, Idaho; Jul 2017