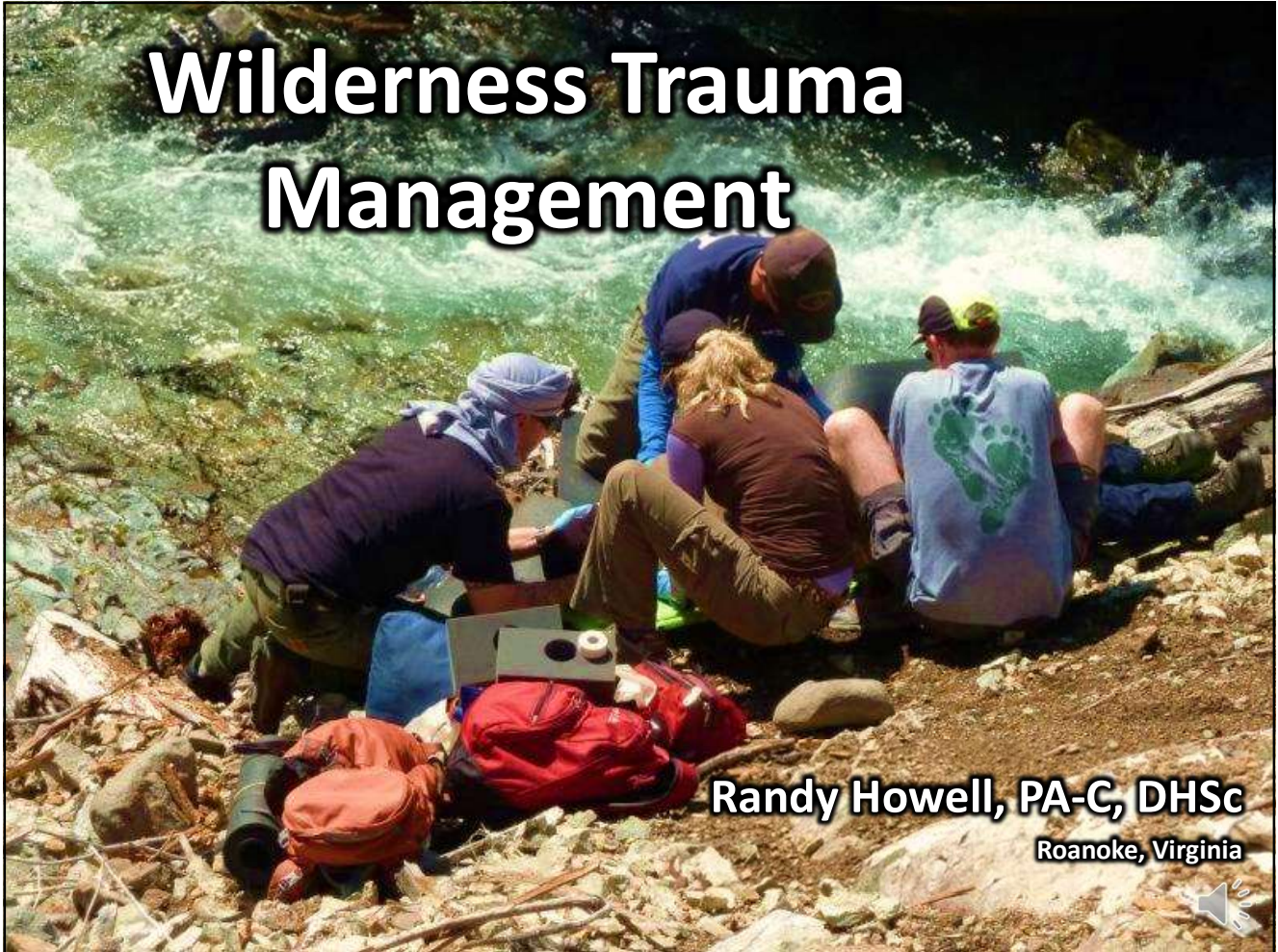


Wilderness Trauma Management



Randy Howell, PA-C, DHSc
Roanoke, Virginia

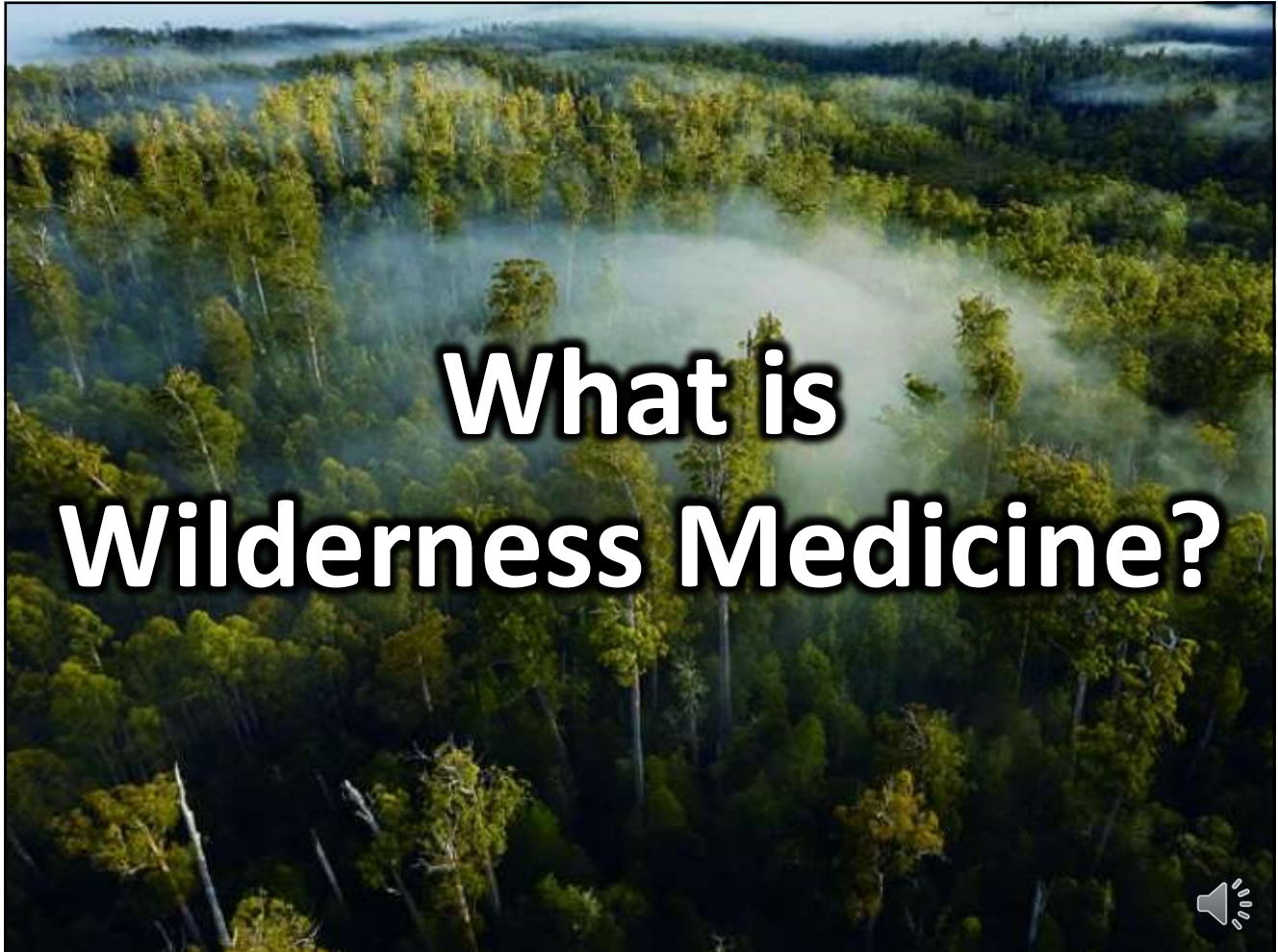


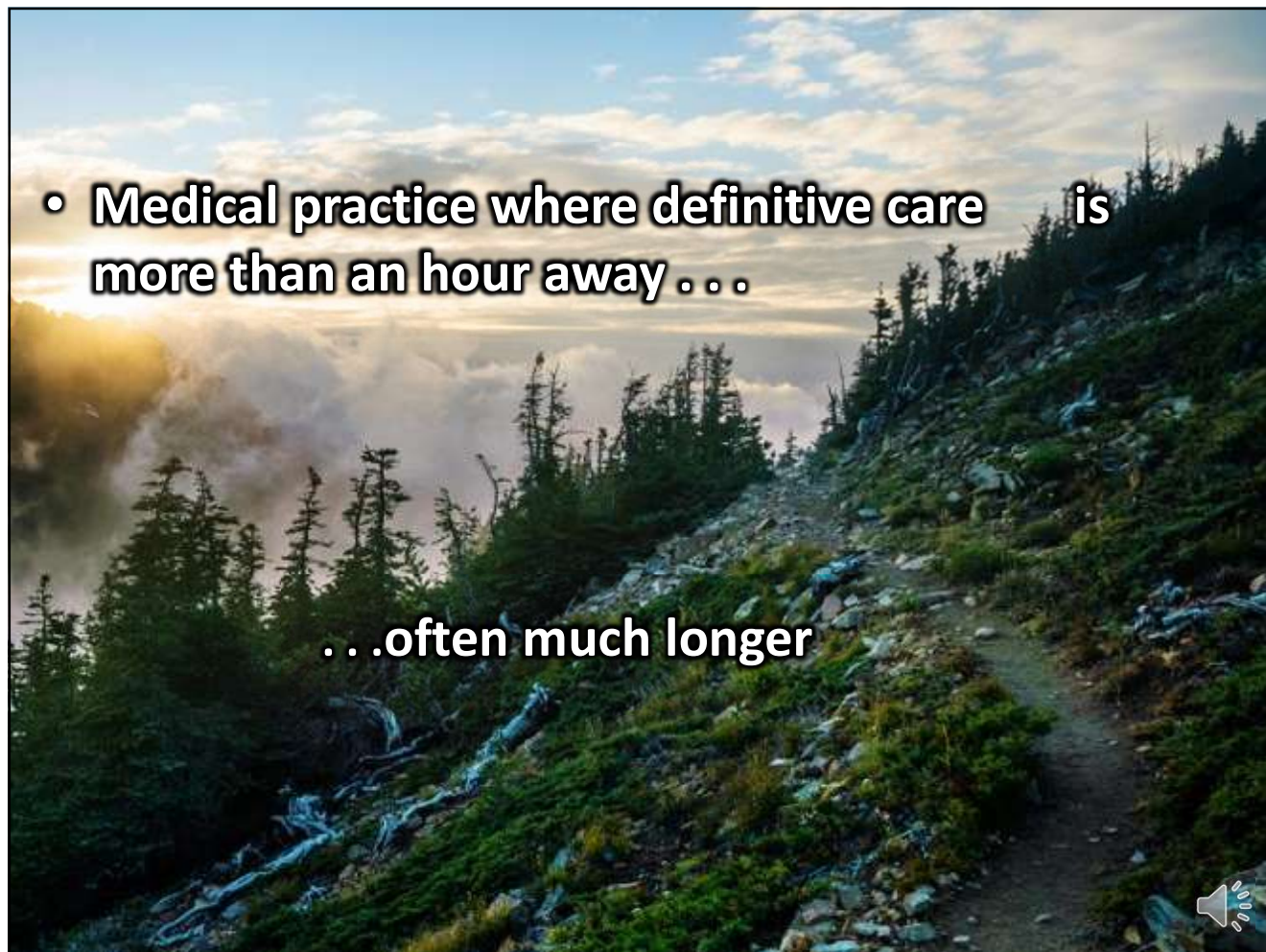
Financial Disclosure











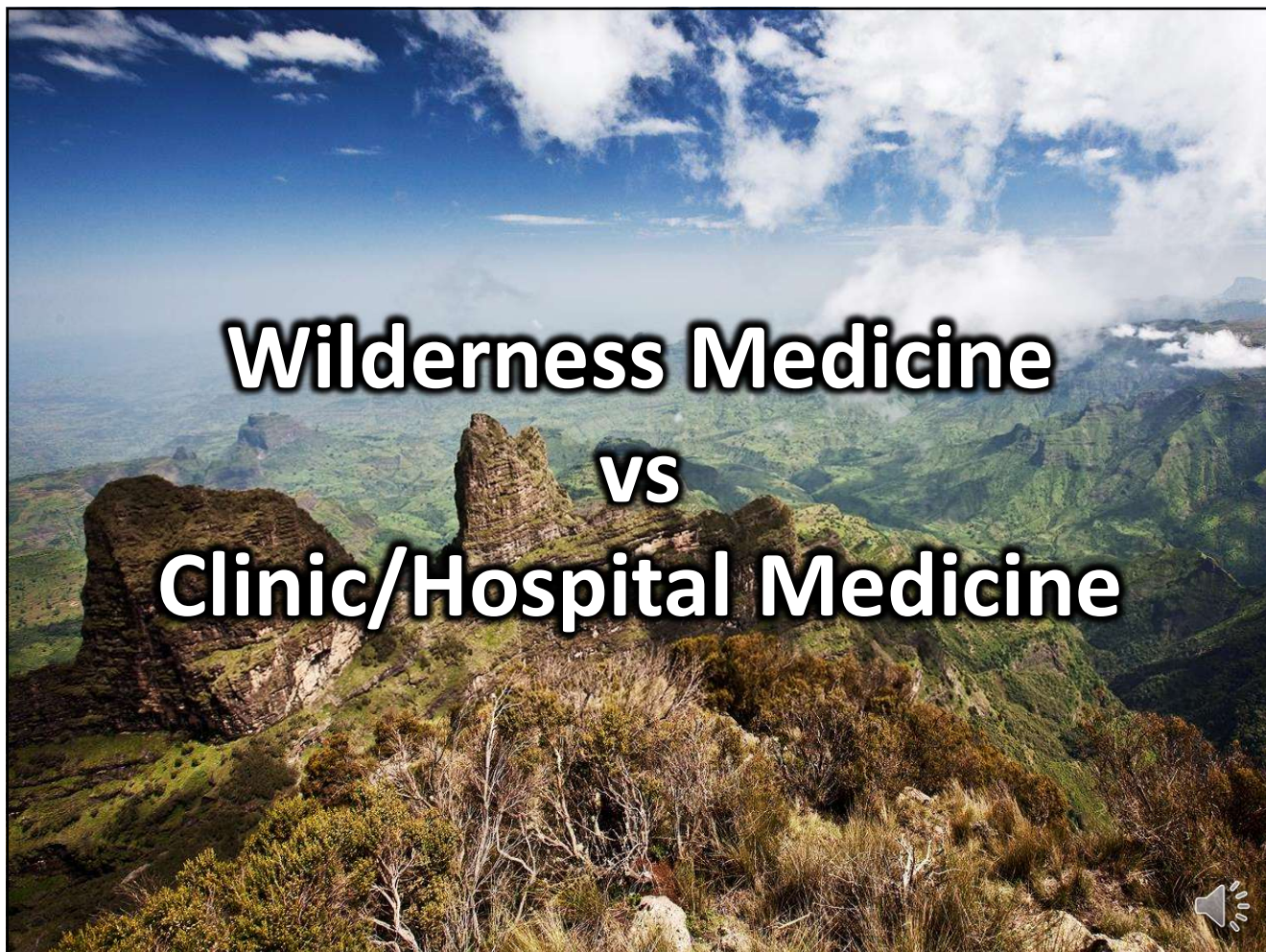
• **Medical practice where definitive care is more than an hour away . . .**

. . .often much longer











Environmental & evacuation factors

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



Recreational Medicine





Disaster Medicine





Global Medicine

















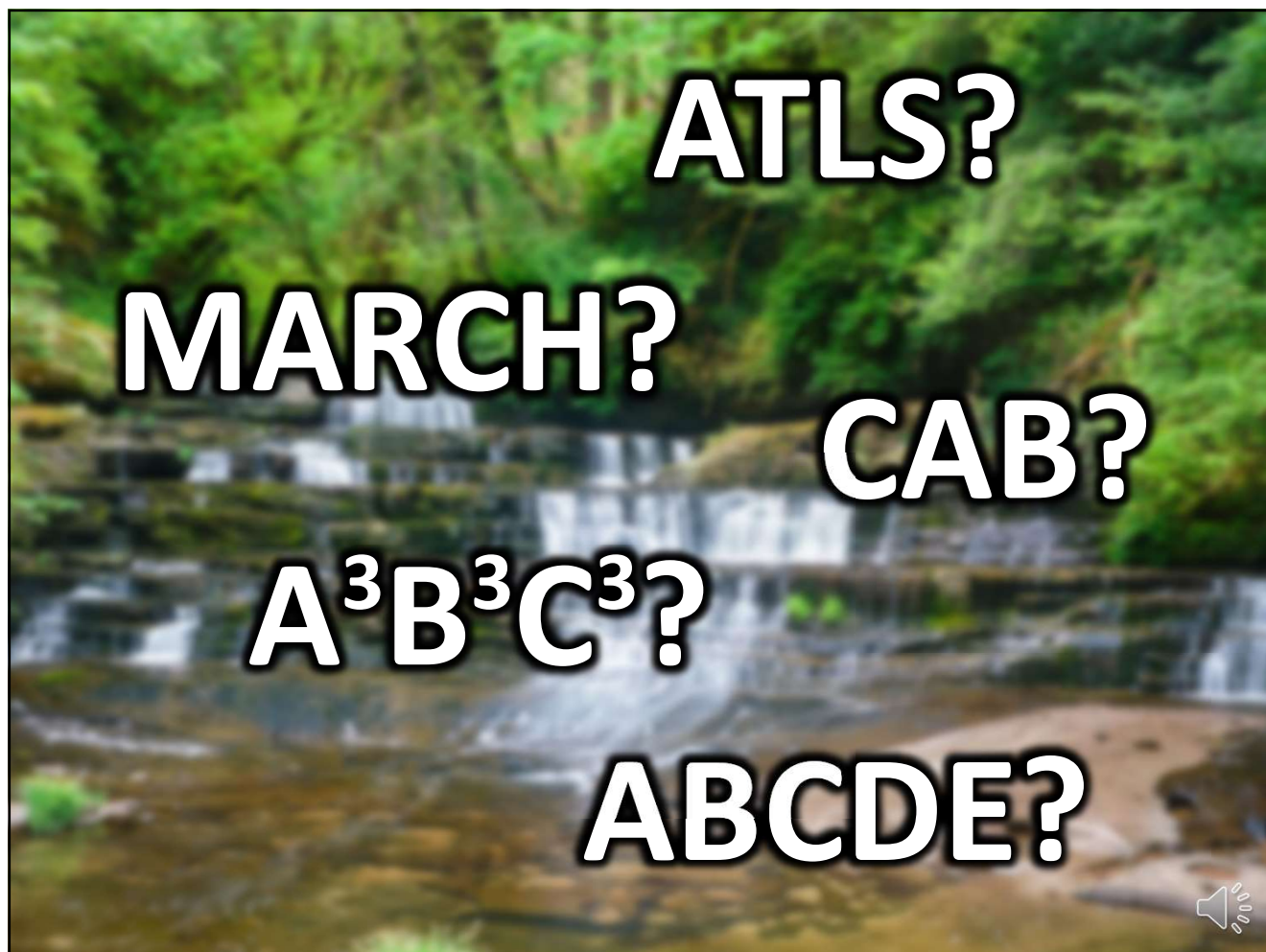
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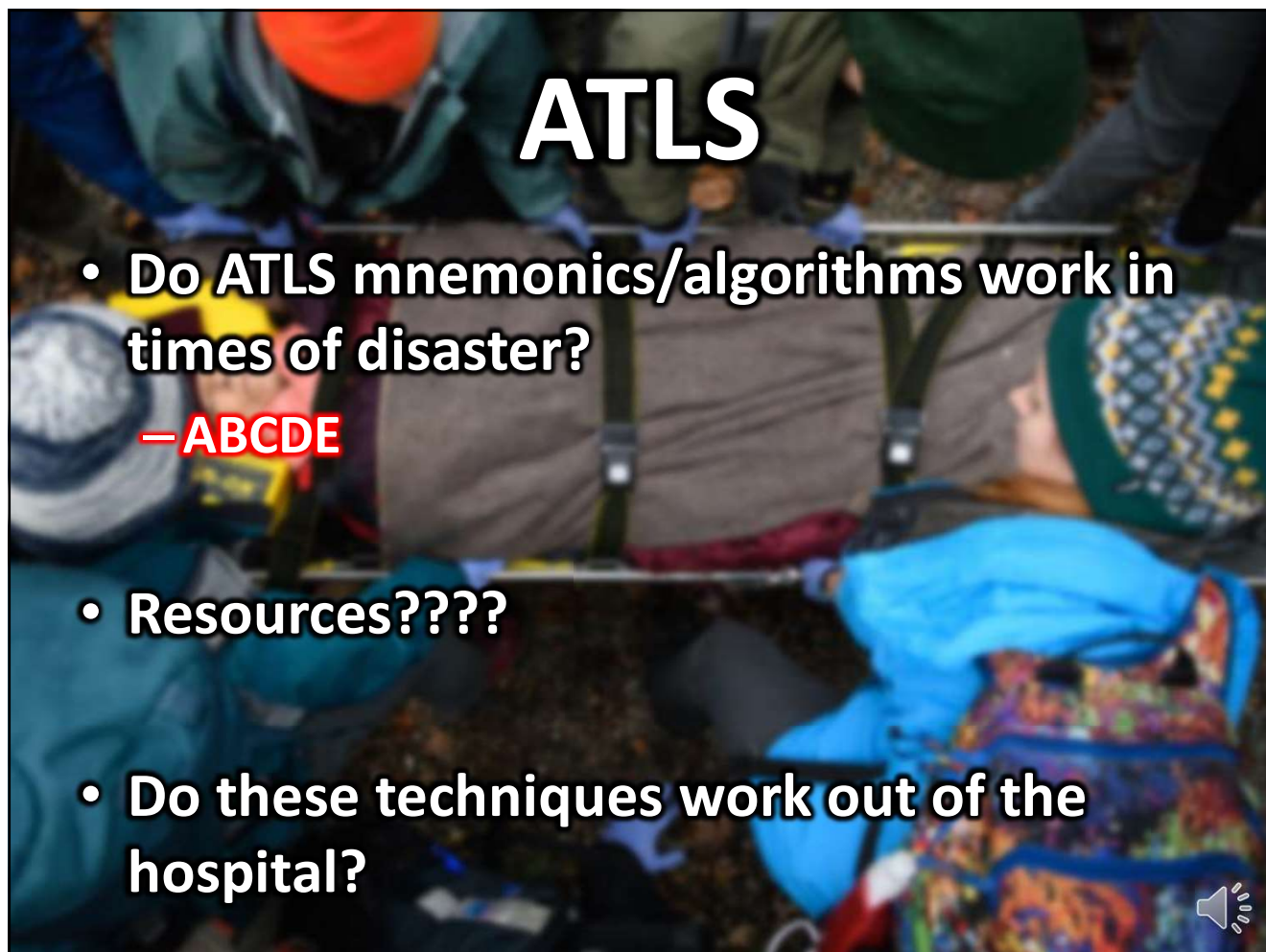




Considerations

- Resources/equipment/diagnostics
- Extrication/evacuation times
- Minimal standardized protocols
 - inherent variability





ATLS

- Do ATLS mnemonics/algorithms work in times of disaster?
– ABCDE
- Resources????
- Do these techniques work out of the hospital?

BRIEF REPORT

Effect of Advanced Trauma Life Support (ATLS) on the Time Needed for Treatment in Simulated Mountain Medicine Emergencies

Franck G Billmann, MD, PhD, FACS; Claude Burnett, MD; Stefanie Welke; Therezia Bokor-Billmann, MD

From the Department of General and Visceral Surgery (Dr Billmann); and the Department of Thoracic Surgery (Dr Bokor-Billmann), University Hospital Freiburg, Freiburg, Germany; the Department of Surgery, USA Health Center, Vicenza, Italy (Dr Burnett); and the Department of General Surgery, St. Vincentius Kliniken, Karlsruhe, Germany (Ms Welke).



Table 1. Demographics of participating physicians

Variable	ATLS (n = 15)	Non-ATLS (n = 15)	P
Sex ratio (M:F)	6:9	5:10	0.42 ^a
Age (years), mean ± SD	40.0 ± 4.8	40.3 ± 4.0	0.83 ^b
Experience			
Working on trauma center, n(%)	5 (33.3)	6 (40.0)	0.63 ^a
Working as mountain rescuer, n(%)	8 (53.3)	7 (46.7)	0.77 ^a
Working in emergency department, n(%)	4 (26.7)	5 (33.3)	0.89 ^a
Years since mountain medicine diploma, mean ± SD	4.9 ± 2.1	5.5 ± 1.7	0.35 ^b
Years of clinical experience, mean ± SD	12.3 ± 3.2	13.1 ± 3.3	0.29 ^b

^a χ^2 test.^b Student's *t* test.

Table 2. Median time spent to manage the simulated trauma cases at an altitude of 3600 m in both groups of physicians (ATLS and non-ATLS)

<i>Simulated trauma case</i>	<i>ATLS group (min)^a</i>	<i>Non-ATLS group (min)^a</i>	<i>P^b</i>
Airway and cervical spine	10.40 (3.44)	14.76 (4.30)	.044
Breathing	12.25 (3.32)	16.68 (3.58)	.045
Circulation	10.33 (2.63)	15.68 (3.11)	.023
Environment	6.22 (2.63)	5.36 (1.91)	.730
Combination	14.32 (3.51)	18.33 (3.91)	.001

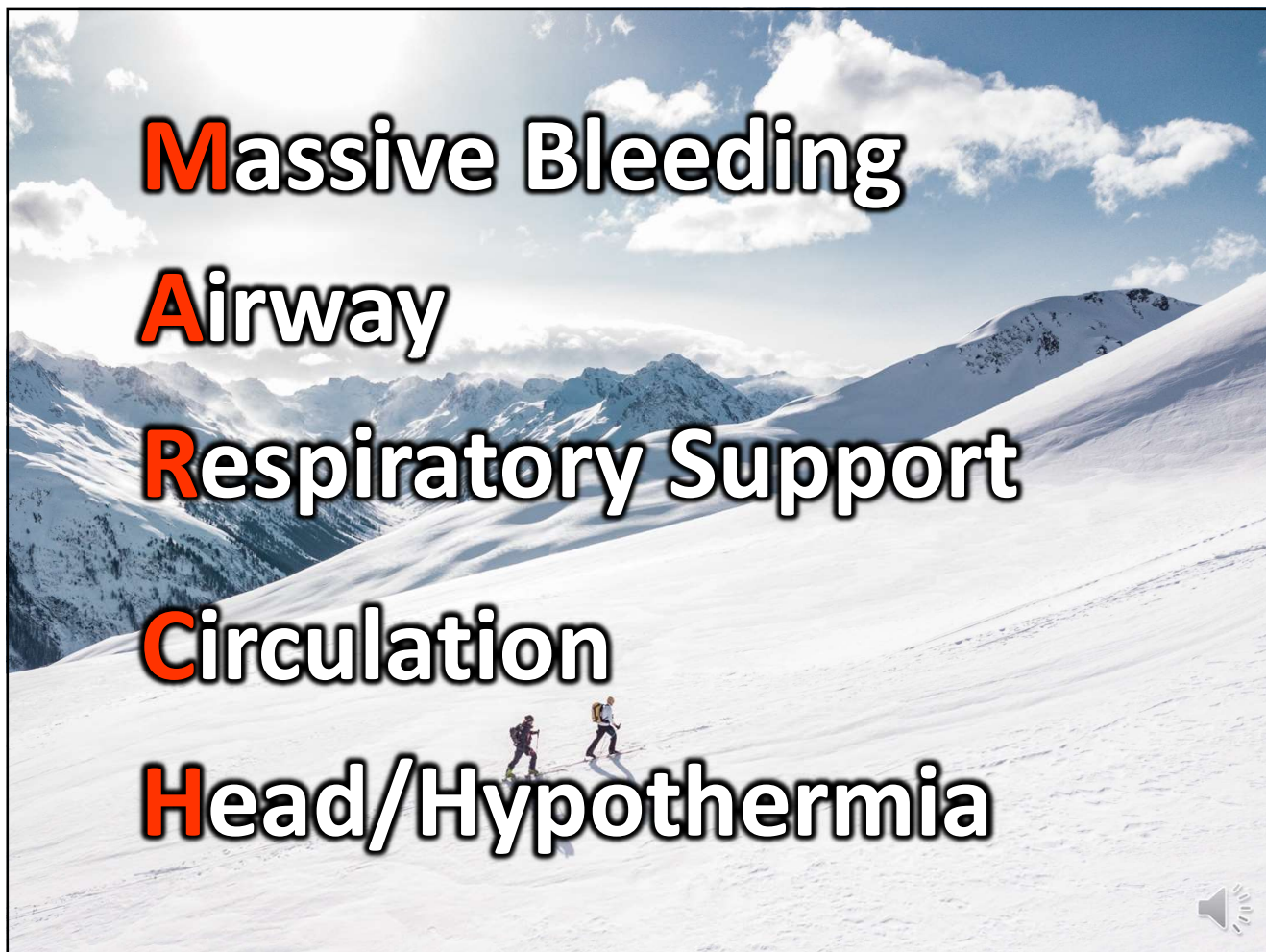
^a Values are median (SD).

^b Student's *t* test; statistically significant when *P* < .05.



MARCH







Massive Bleeding

- Detect
- **Direct pressure**
- Devices
- Don't Dilute
 - depending on resources
- Pelvic binders



Airway

- **100% mortality rate for patients without an airway**
 - BLS saves lives!
- **Jaw thrust**
- **OPA/NPA**



Airway

- Endotracheal intubation/RSI
 - depending on resources
- Cricothyroidotomy
 - depending on resources



Respiratory Support

- **Rescue Breathing**
- **Thoracic Trauma**
- **Sucking chest wound**
- **PTX**
- **Supplemental O₂**
–depending on resources



Circulation

- Evaluate overall circulatory status
- Pulse, mental status
 - BP?
- Volume stabilization/resuscitation
 - depending on resources



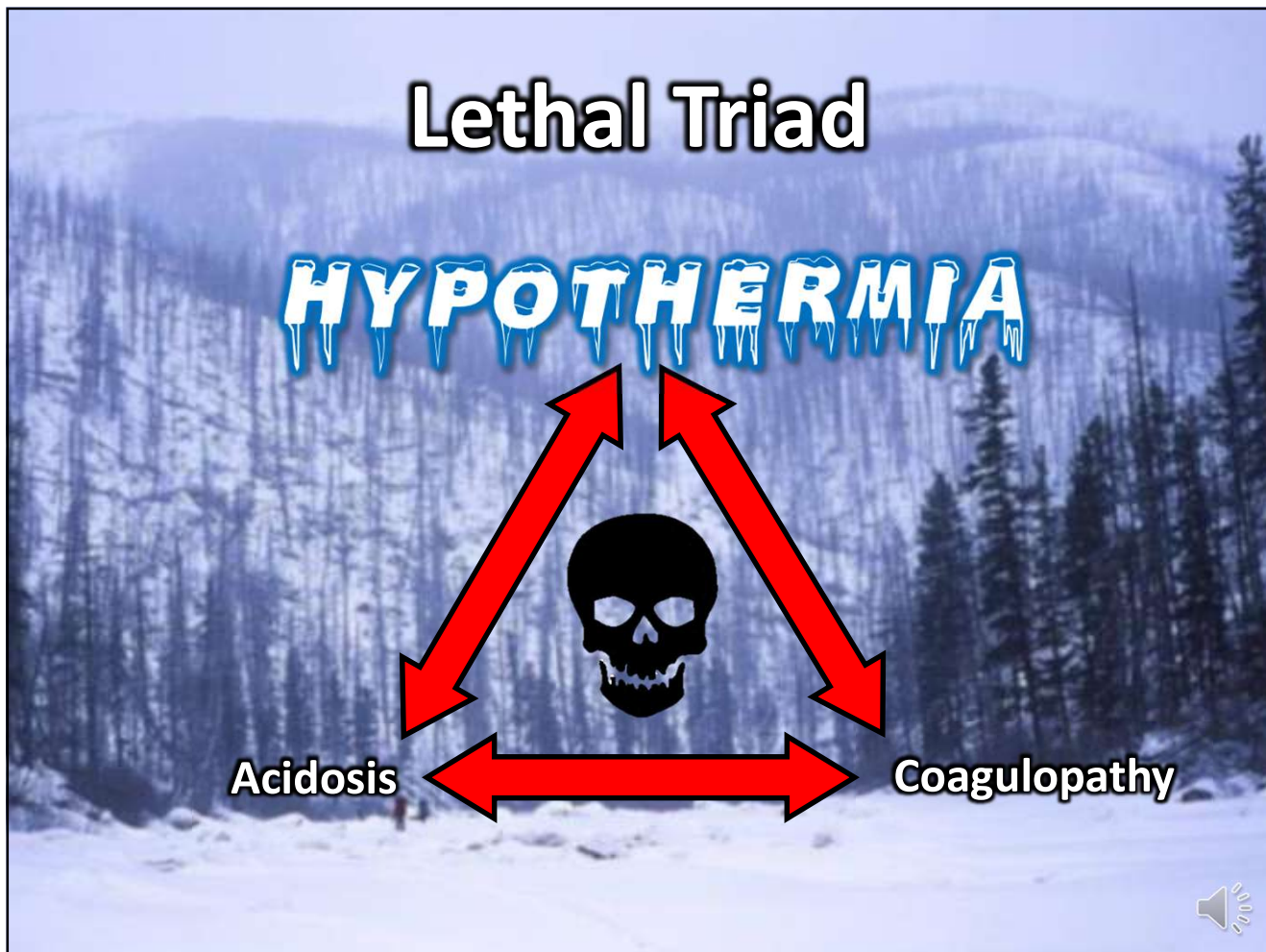


Head

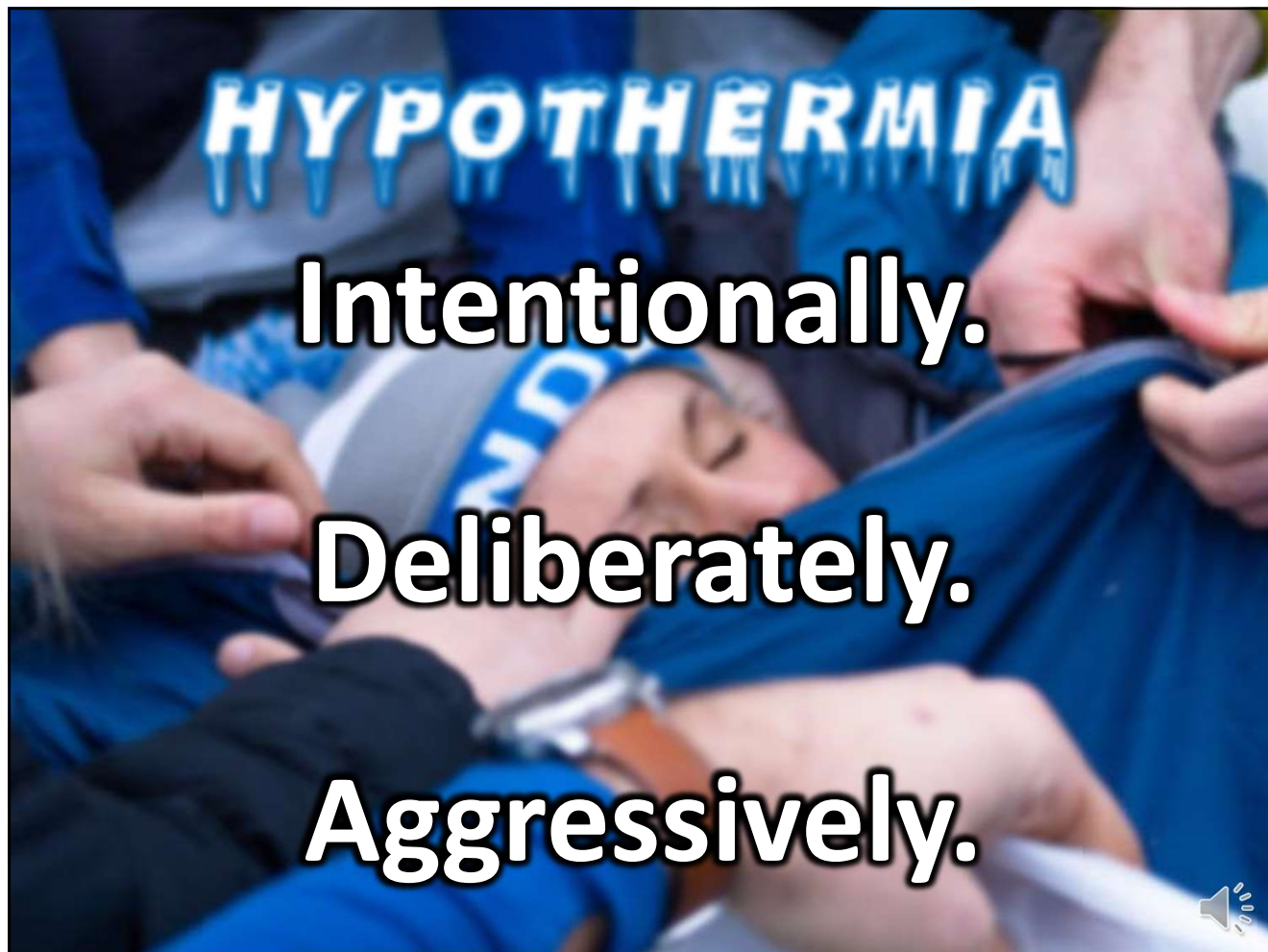
- Evaluate mental status & changes
- FOCUSED neuro exam
- Keep in mind:
 - hypoxia
 - hyperventilation
 - hypotension

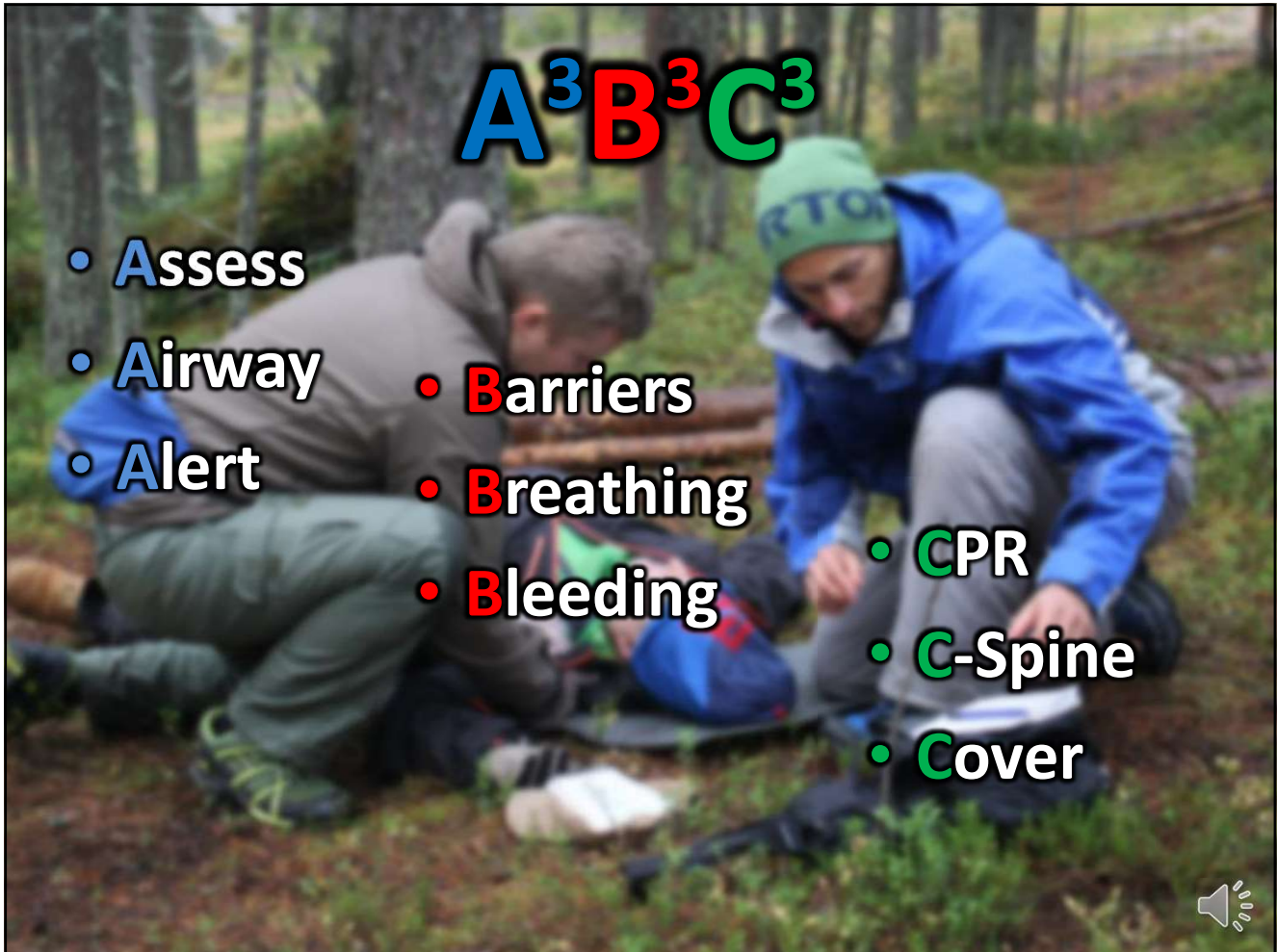








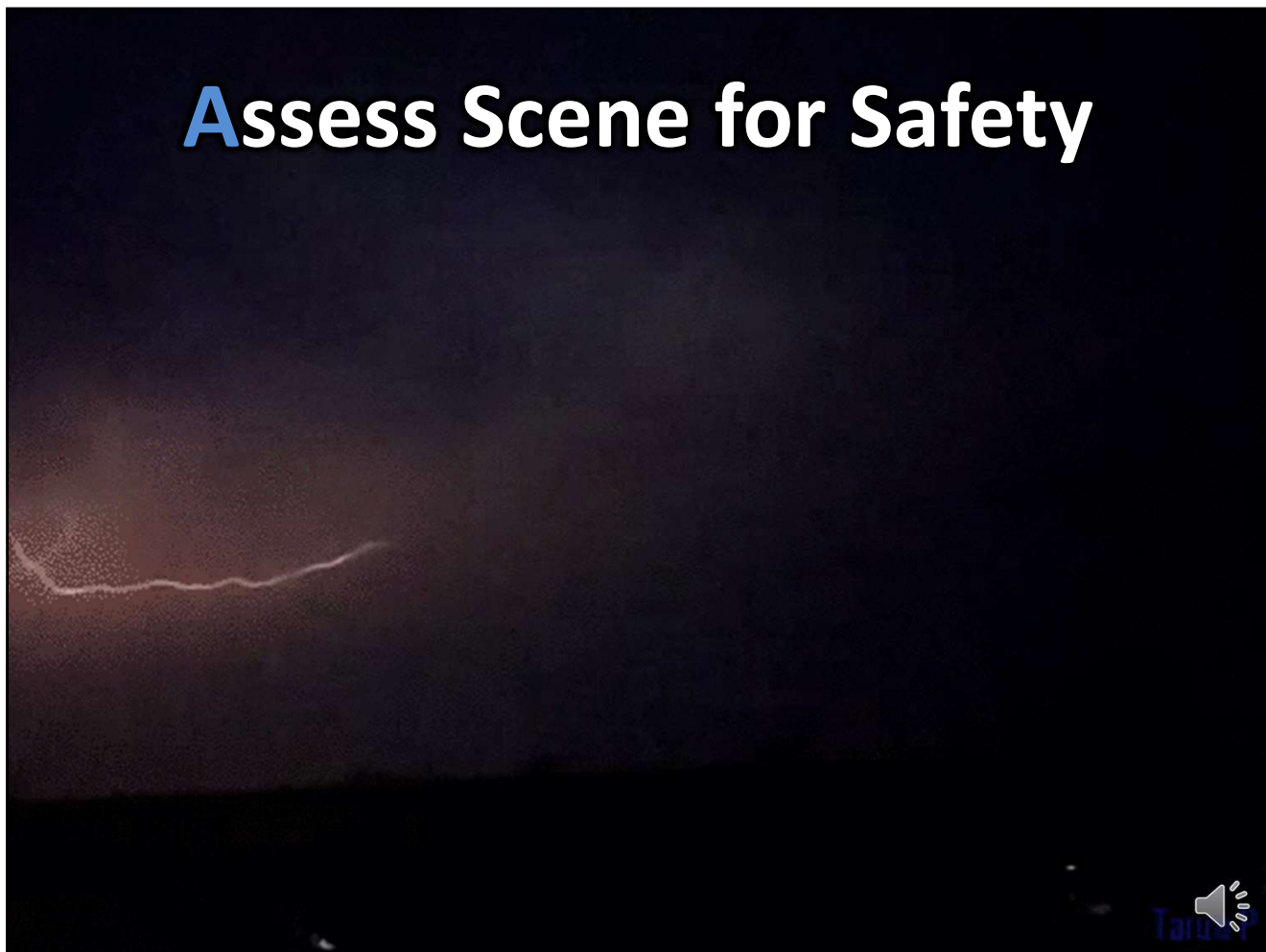








Assess Scene for Safety



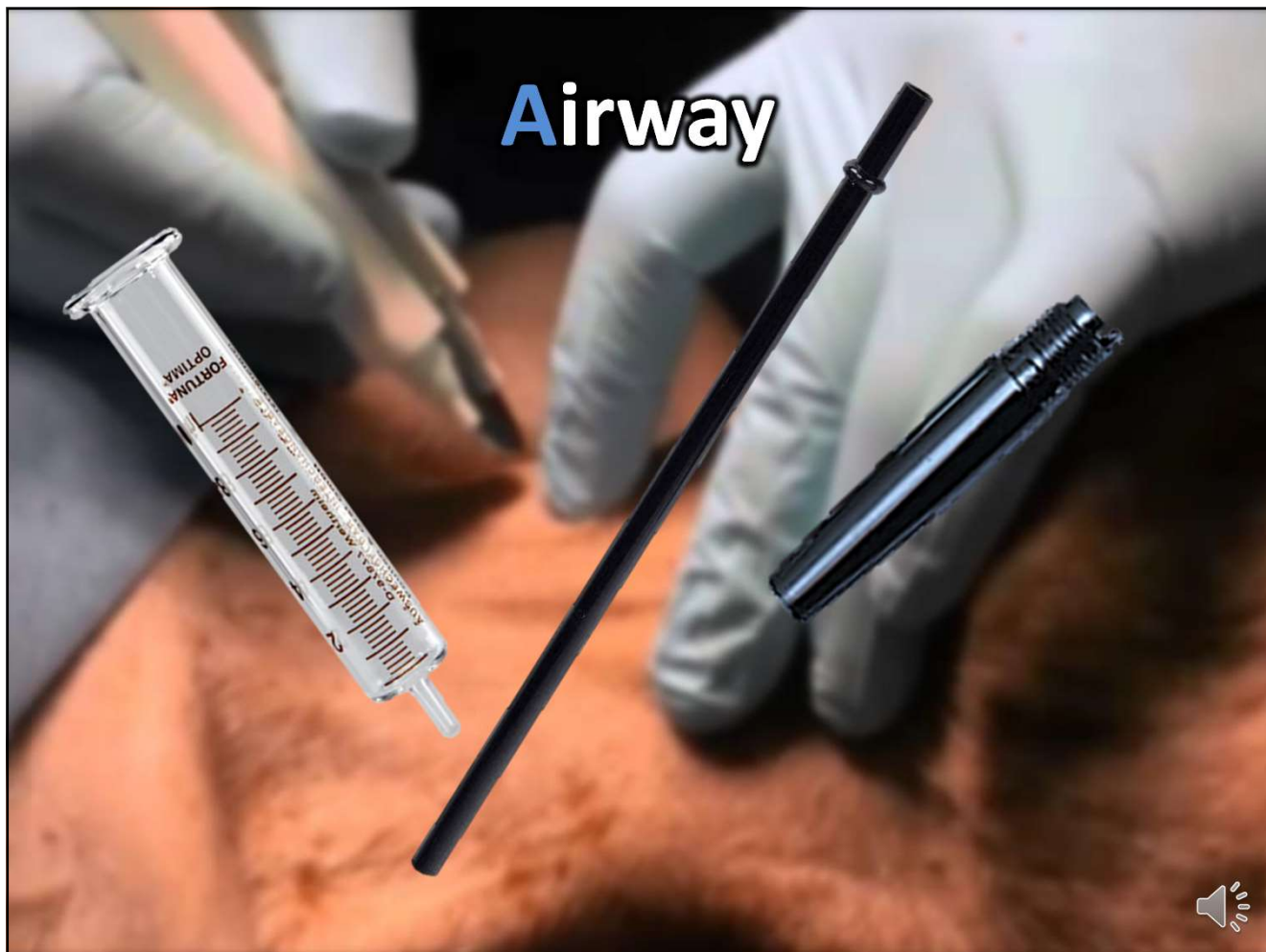




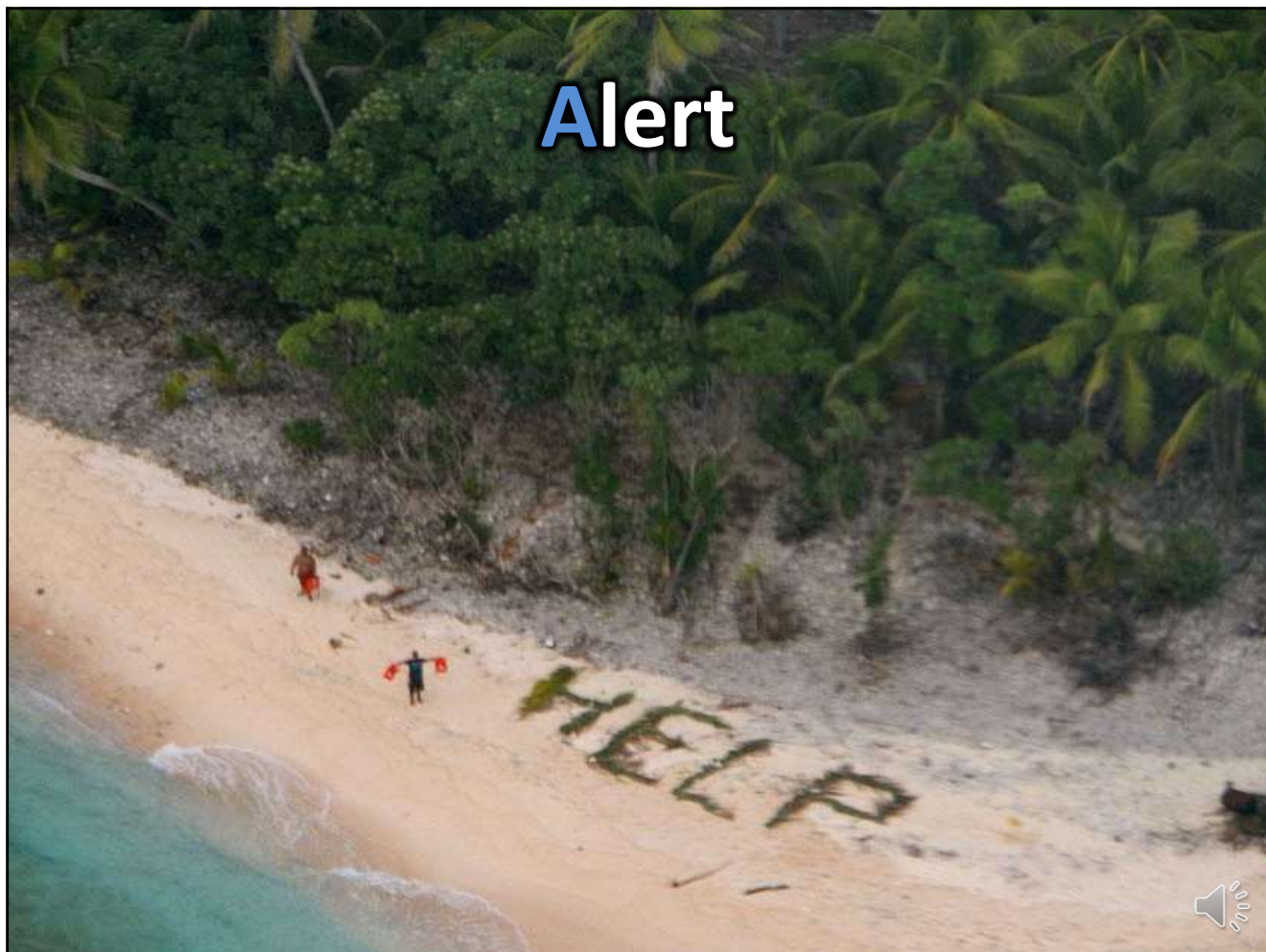








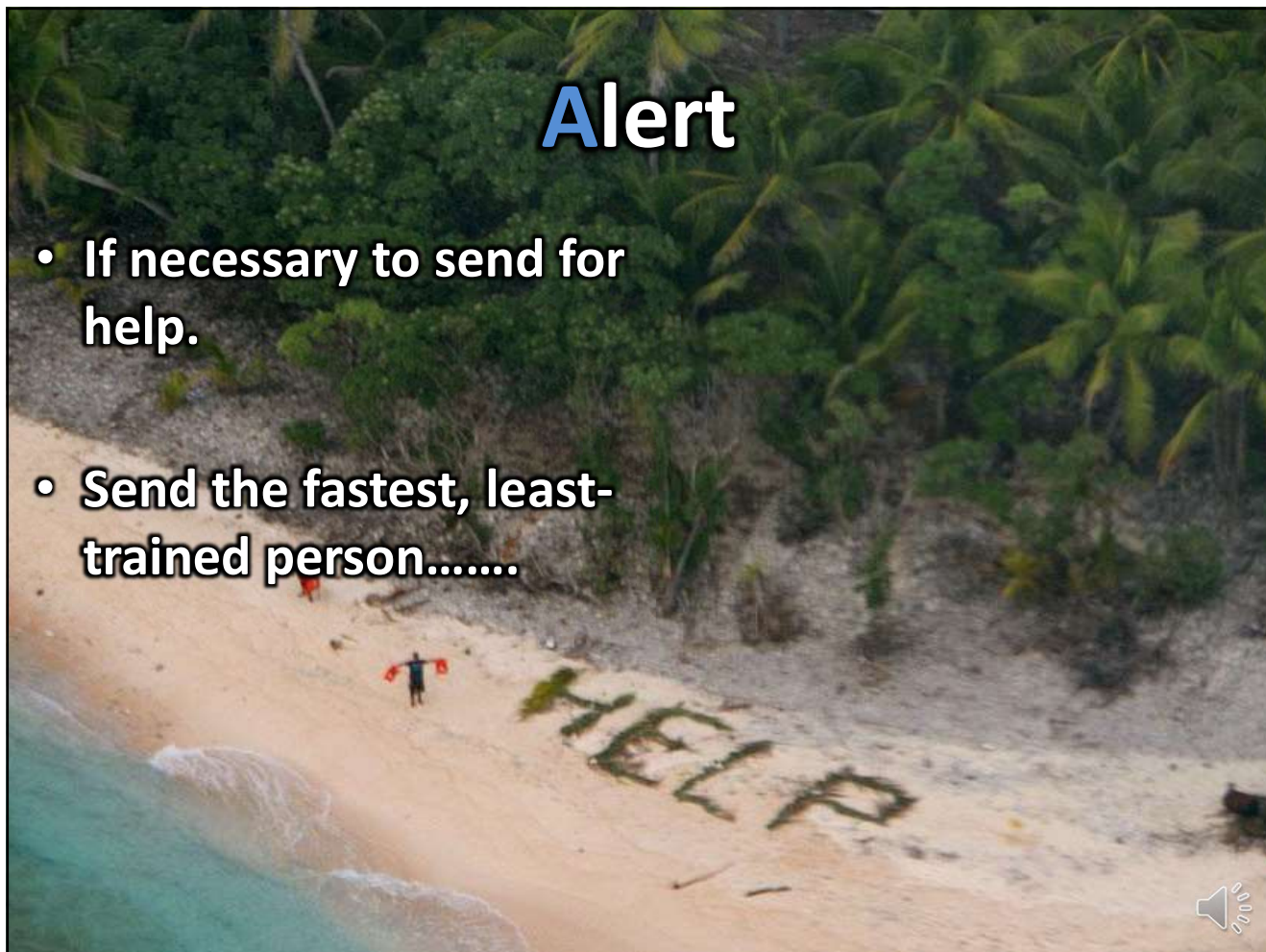
Alert



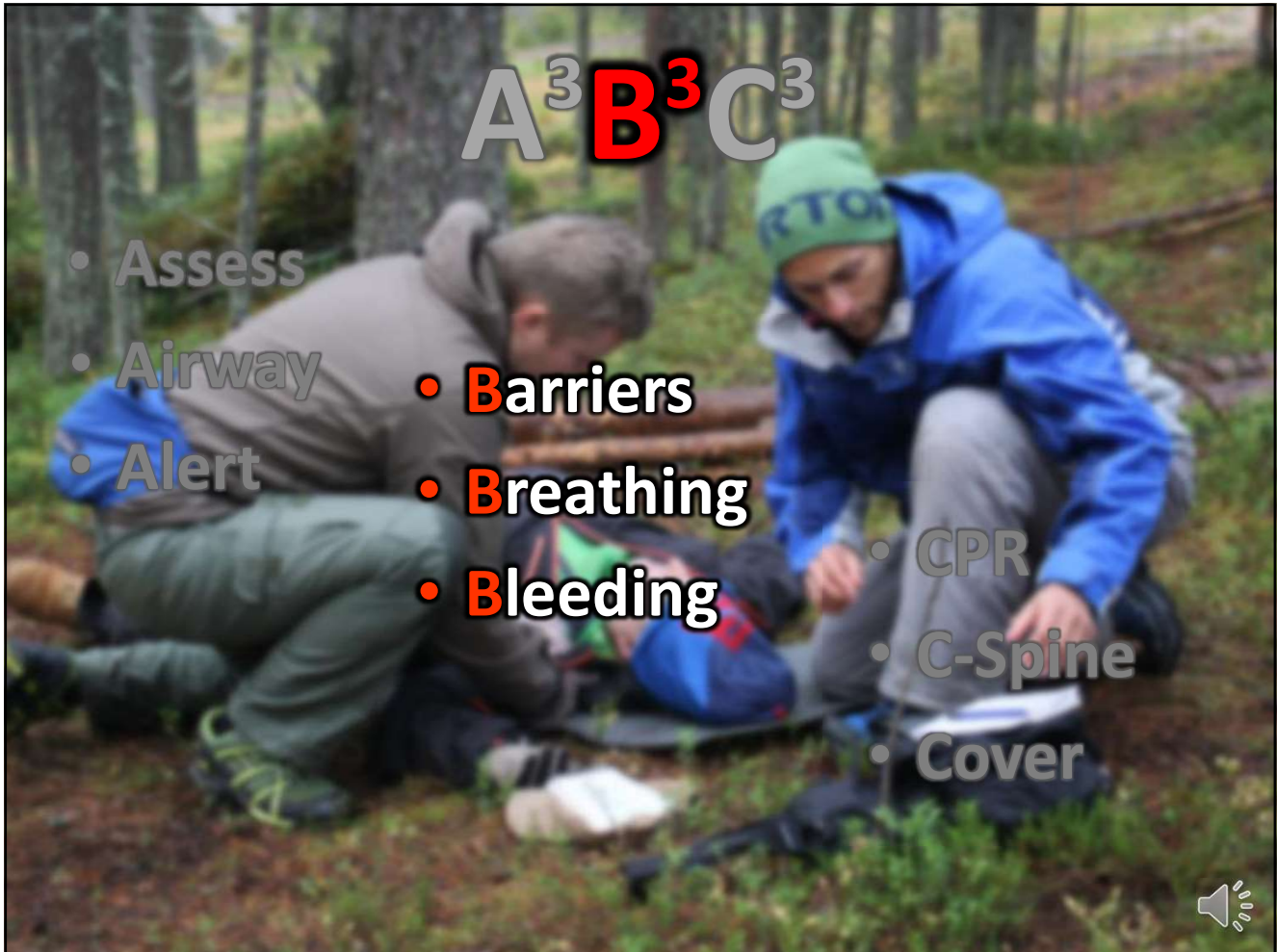


Alert

- If necessary to send for help.
- Send the fastest, least-trained person.....















Thoracic injuries



3-sided dressing, petrolatum/abx ointment, AND . . .

Bleeding



Pressure dressings, tourniquets, pelvic binders



Pressure dressing



Tourniquets



Common Tourniquet.



Tourniquets







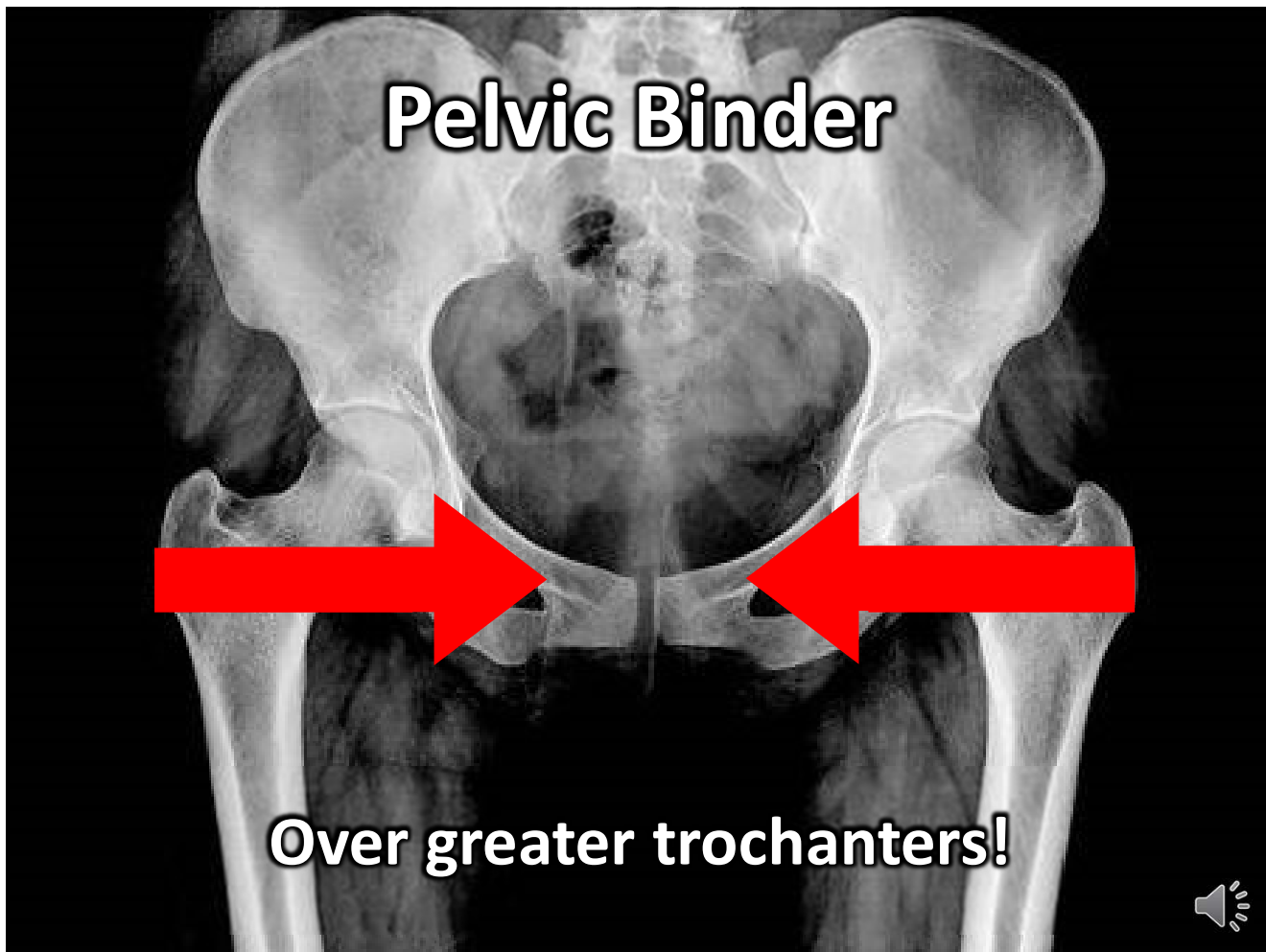


Pelvic Fracture

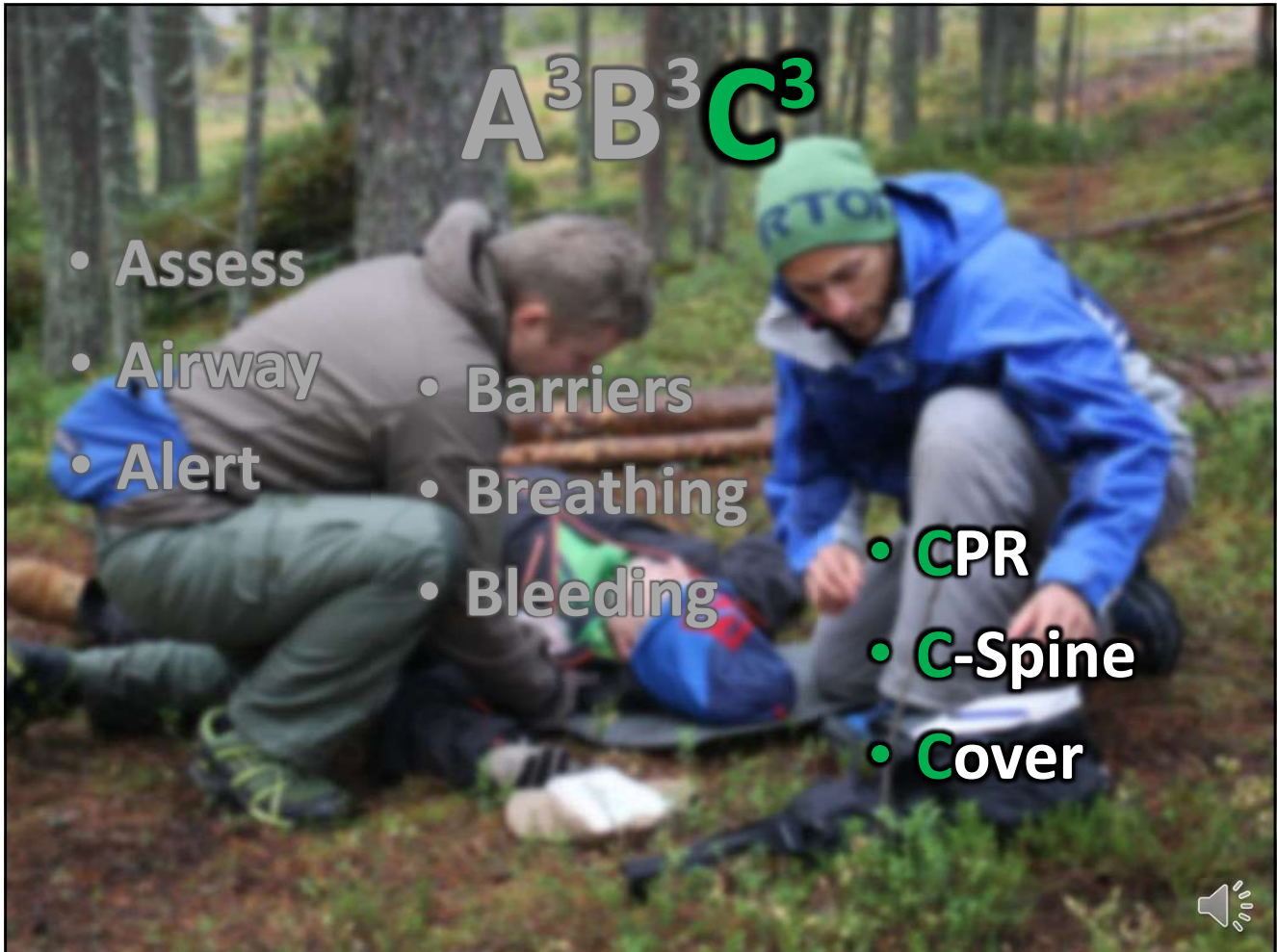


3 liters!















Following Initial Stabilization

- Secondary Survey
- Stabilizing other injuries
- Extrication/transport



Secondary Survey

- Expose patient
- Distracting injuries
- Obtain history (SAMPLE)
 - Be nosy!
 - Look through gear



Musculoskeletal

- Fracture/Dislocation?
- Neurovascular intact?
- Reduce?



Long bone fractures

- Crooked ⇒ straighten ⇒ immobilize



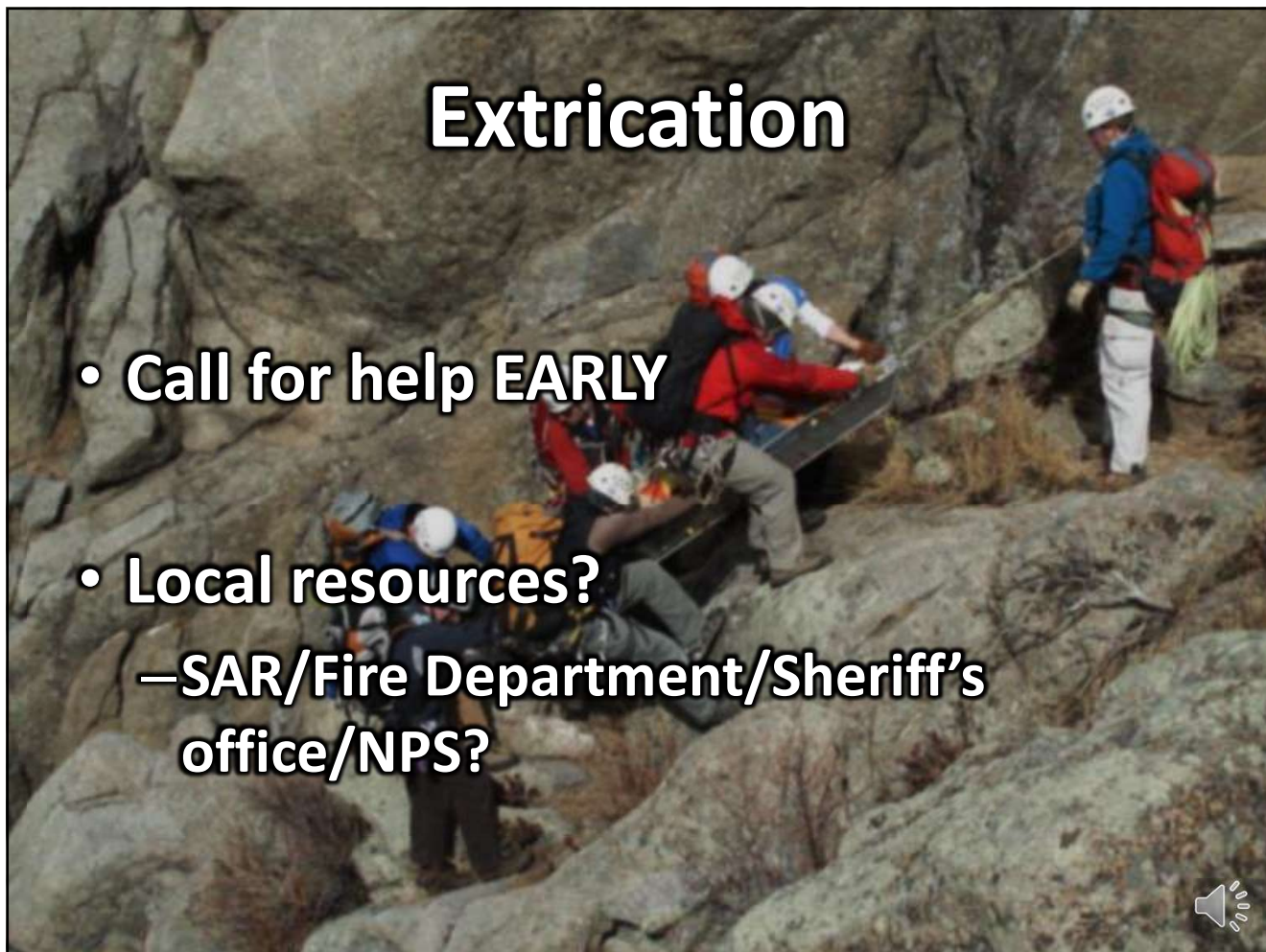
Long bone fractures

- Poles/sticks/water bottles/sleeping pads
- SAM Splint
- **Well padded!**
- Cravats/Webbing/Rope
- Open fracture? (peek and shriek)
 - Cover wound
 - Stabilize/splint
 - ABX



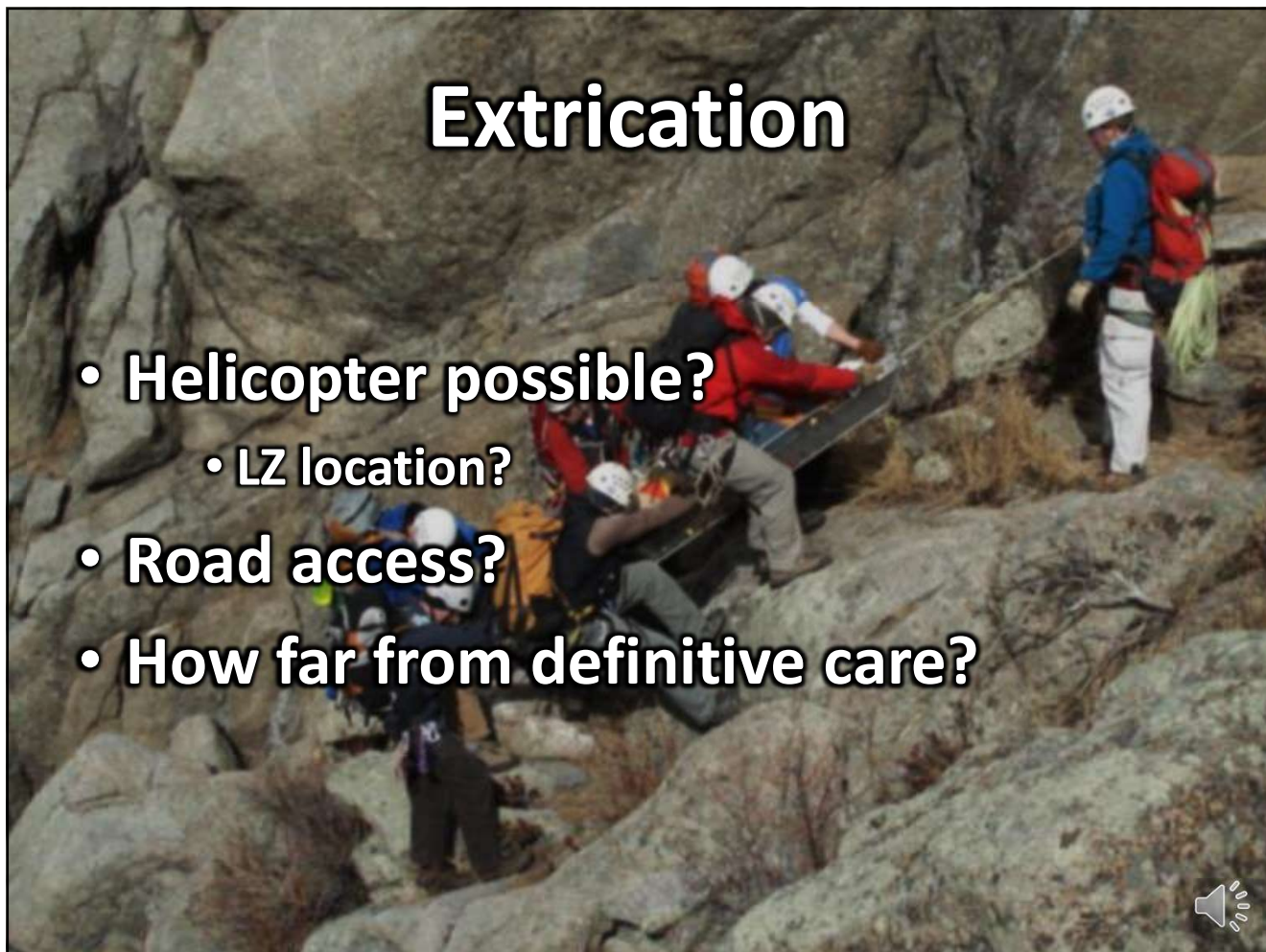
Extrication

- Call for help EARLY
- Local resources?
 - SAR/Fire Department/Sheriff's office/NPS?



Extrication

- **Helicopter possible?**
 - LZ location?
- **Road access?**
- **How far from definitive care?**









Trauma Kit

- Barriers: gloves/mask
- Occlusive dressing
- Large angiocath
- OPA/NPA
- Tape/gauze
- Space blanket



Trauma Kit

- Duct tape!
- Kerlix/trauma bandage
- QuikClot
- Tourniquet
- Ace wraps
- Cravats
- SAM splint













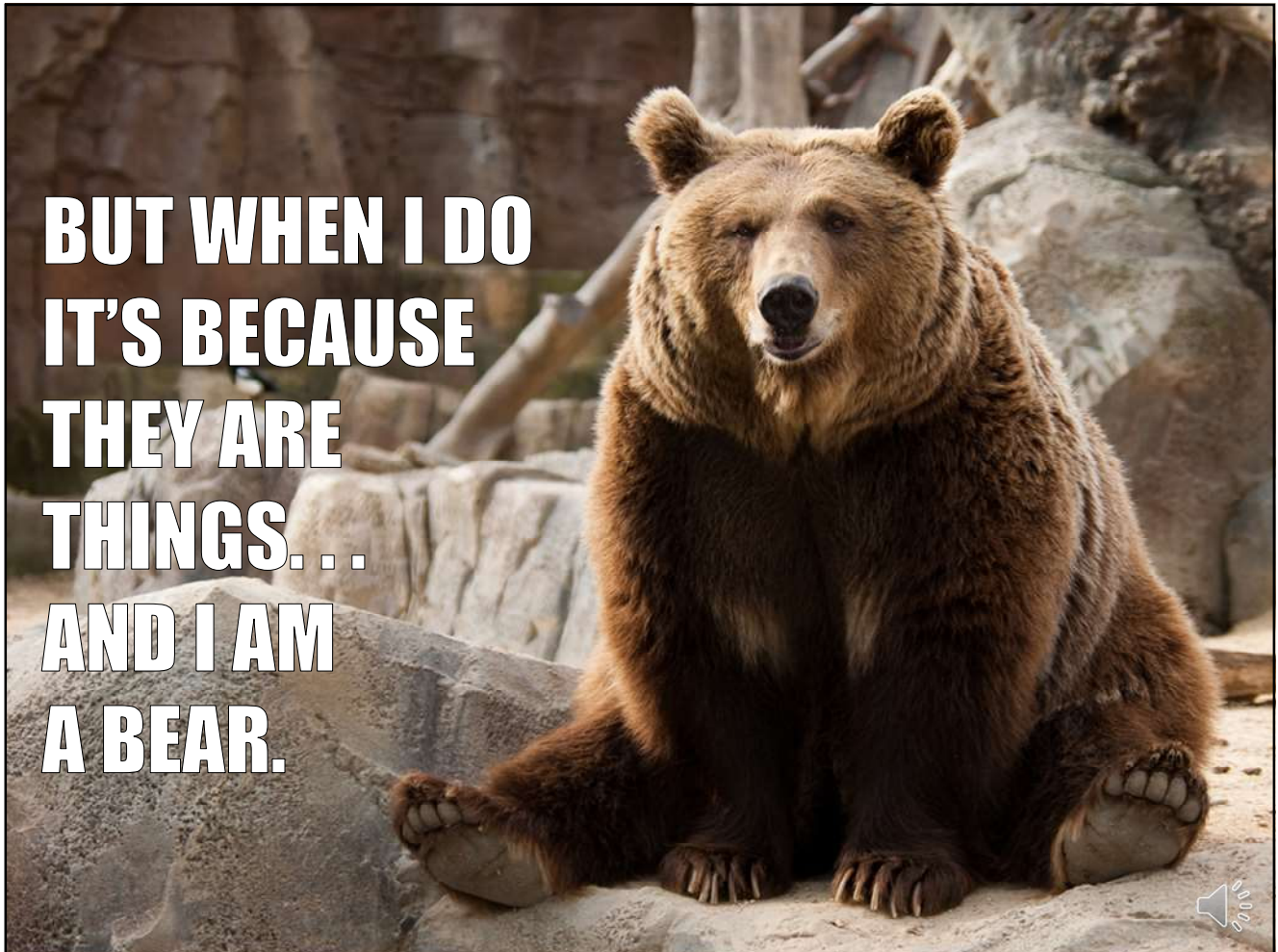




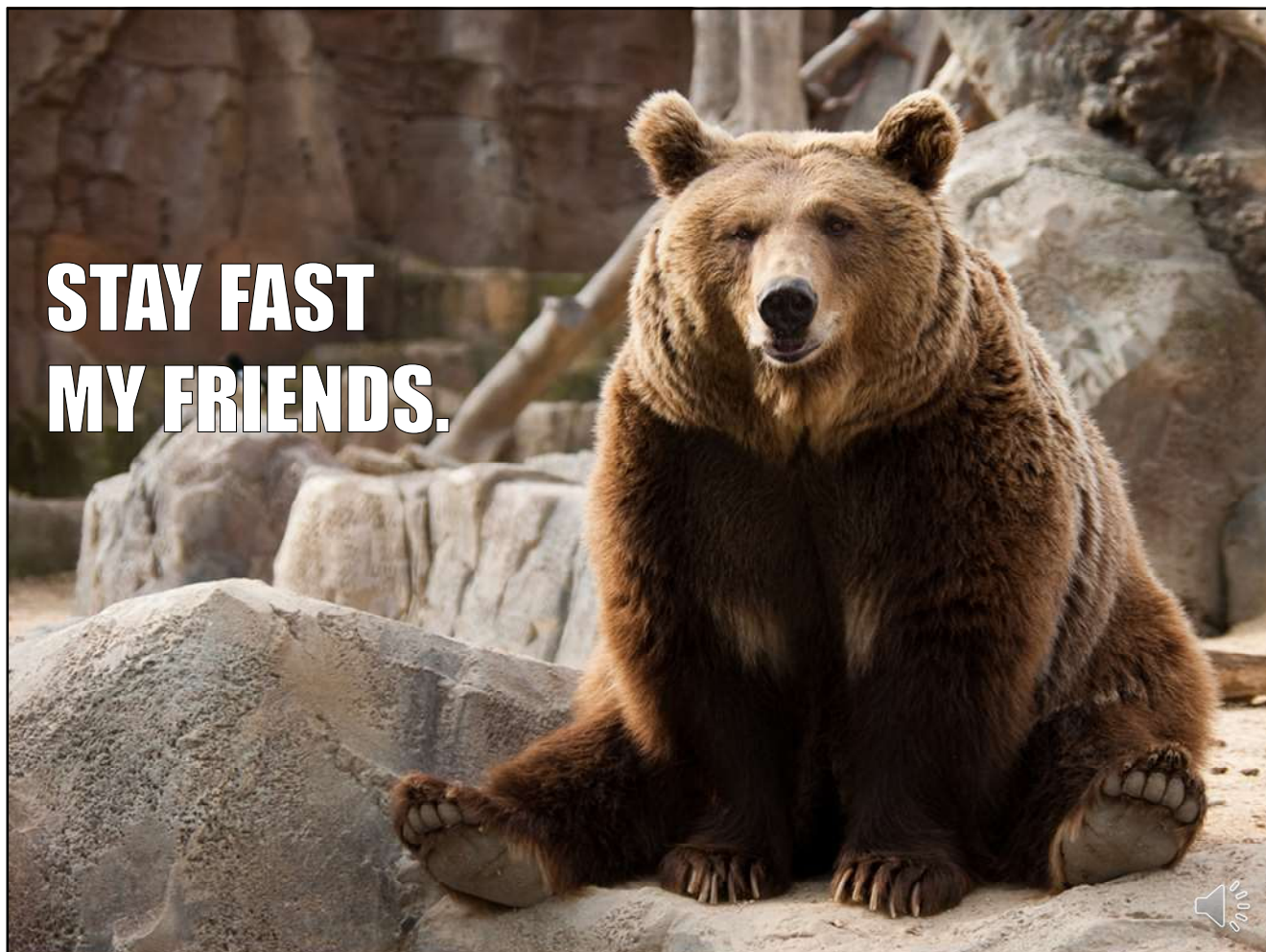








**BUT WHEN I DO
IT'S BECAUSE
THEY ARE
THINGS...
AND I AM
A BEAR.**









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