

Wilderness Medicine Reference Guide

A field guide and evidence companion for austere, remote and delayed-care environments. It's aligned to **WMS Clinical Practice Guidelines**, **AWLS v3.11**, ICAR, ERC/AHA 2025 and TCCC 2026, informed by **Auerbach's Wilderness Medicine**, and mapped to the IBSC **WP-C** domains.

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How to use: Part I is for the field (print and laminate pages 2–5). Part II is for teaching, protocol development and exam prep. **Doses and the “EMERGILITY working standard” are pending Medical Director approval.** Scope is set by your state license, agency protocols and the Medical Director.

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Wilderness Medicine: Principles, Assessment & Decisions

PART I • FIELD GUIDE

A field guide for austere, remote and delayed-care environments
Mapped to the IBSC Certified Wilderness Paramedic (WP-C) domains

WHAT MAKES IT “WILDERNESS”

WP-C IV • VIII

Wilderness medicine is care given where **definitive care is delayed**, usually ≥ 1 hour away, and where weather, terrain, limited resources and difficult communications shape every decision. The same patient gets different care at the trailhead than 12 hours up a canyon.

- **Time** changes everything. Plan for **hours to days**, not minutes.
- **Environment** is a second patient. It worsens injuries and threatens rescuers.
- **Resources** are what you carried, what you can improvise and who is with you.
- **Decisions** center on the evacuation: **stay, walk, carry or fly**.
- **Transport is treatment**. Weigh evacuation time and means in the **initial** assessment, not after the exam.

PROVIDER LEVELS & SCOPE

WP-C VIII

Level	Typical course	What it adds
WFA	16 h	Layperson first aid, short trips, recognize and evacuate
WFR	70–80 h	Outdoor leaders. Assessment, SOAP, improvised splints, dislocation and spine decisions per protocol
WEMT	EMT + module	State EMS scope plus wilderness protocols (wound care, medication assist, extended care)
W-Paramedic	Paramedic + module	ALS in the field: airway, IV/IO, analgesia, prolonged field care
WP-C	IBSC board exam	Certification for paramedics, RNs and PAS working in remote and austere settings

Wilderness credentials add knowledge, **not legal scope**. Scope comes from your state EMS license, agency protocols and medical direction.

MISSION PLANNING & RISK

WP-C I

- **Kit for the environment:** batteries fail in cold (keep them close to your body), liquid meds freeze, monitors and glucometers have temperature limits. Think about weight and volume, impact and water resistance, and backups for critical items.
- **Logistics:** maps/GPS, comms plan (radio, satellite, PLB), resupply, shelter, nearest appropriate facility and air resources.
- **Human factors:** team medical history, chronic conditions and meds, fitness, PPE, fatigue and situational awareness.
- **Risk:** stratify (likelihood $\times$ severity), use a risk tool (e.g., GAR / SPE), time operations around weather, daylight and avalanche or flood windows.
- File an **ICS 206 Medical Plan** before operations start.

WILDERNESS PATIENT ASSESSMENT

WP-C II • IV

Scene Safety, MOI/NOI, # patients, resources, environment	Primary MARCH: fix life threats	Secondary Head-to-toe, vitals, SAMPLE	Plan SOAP, problem list, evacuation decision
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SCENE SIZE-UP: THE WILDERNESS VERSION

- Rockfall, avalanche slope, moving water, lightning, wildlife, other trail users, and **darkness and weather that are coming**.
- Is the patient (and are you) about to get **cold, wet or exposed**? Shelter is a treatment.
- Call for resources early, and size them to the evacuation: a **4–6 person** carry team works for a small-to-medium patient over a short distance. Plan **15–18 people** for any significant distance so bearers can rotate. Mark the GPS location and note the time.

PRIMARY SURVEY: MARCH

- M Massive hemorrhage:** direct pressure, packing, **tourniquet without hesitation**. Mark the time.
- A Airway** with manual spine stabilization if the mechanism suggests it or the patient is unresponsive.
- R Respirations:** rate, effort, chest wall. Seal open chest wounds.
- C Circulation:** pulse, skin, shock signs. Start CPR if pulseless (see limits $\rightarrow$).
- H Hypothermia/Hyperthermia** (insulate from the ground) and **Hike vs. Helicopter**. In **extreme cold, insulate and wrap right after M:** hypothermia impairs clotting.

SECONDARY SURVEY

Full head-to-toe (in the shelter if possible), vitals with trends, **SAMPLE** (Symptoms, Allergies, Meds, Past history, Last intake, Events), and environmental history (exposure time, altitude gained, water intake).

ONGOING SURVEY

Repeat vitals and the focused exam: **every 5–15 min if unstable**, every 30–60 min if stable. Write down every set; **trends beat single readings**.

SOAP NOTE & PROBLEM LIST

WP-C VII

Subjective: age/sex, chief complaint, MOI, SAMPLE, OPQRST.

Objective: exam findings, vitals and trends. **Assessment:** problem list, plus **anticipated problems** (e.g., “closed femur fracture $\rightarrow$ anticipated shock, hypothermia”). **Plan:** treatment, monitoring, evacuation mode and urgency for each problem.

VITAL SIGNS & TRENDS

WP-C V

LOR (AVPU/GCS) • **HR** • **RR** • **SCTM** (skin color, temp, moisture) • **BP** • pupils • **SpO₂** • temp • urine output.

Red-flag trends: rising HR + RR, falling LOR, cool and clammy skin, narrowing pulse pressure, dropping urine output. **SpO₂** normally falls at altitude (often high 80s–low 90s above 3,000 m), so **trend it** and compare with teammates.

EVACUATION DECISION

WP-C IV • VI

Urgency	Examples	Typical mode
Rapid / urgent	Shock, airway or breathing compromise, $\downarrow$ level of consciousness, HACE/HAPE, heat stroke, severe hypothermia, any anaphylaxis (rebound risk), chest pain, unstable spine with deficits	Fastest safe option: helicopter, vehicle, or the fastest carry
Non-urgent	Stable fracture, reduced dislocation, wound that needs closure, infection, worsening minor illness	Walk out assisted, or a planned carry
Stay / treat & release	Minor wounds, sprain that bears weight, mild AMS that improves, reduced patella or digit	Continue with a plan, anticipatory guidance and follow-up

Rule: evacuate by the safest mode that meets the medical need. Every carry and flight has risk; **don't create more patients**.

SPINE ASSESSMENT IN THE FIELD

WP-C II • IV

If the mechanism is concerning, keep spinal motion restriction (SMR) until the patient passes **all** of these:

- **Reliable:** alert, sober, cooperative, **no distracting injury**, no language barrier
- **No spine pain** and no midline tenderness on palpation
- **Normal neuro exam:** motor and sensation in all four limbs

If they pass, clear the spine and let them move or walk out. If they fail, use SMR: padded, improvised, and focused on **keeping the head in line during movement**. A rigid collar alone isn't the goal; follow protocol.

CPR & TERMINATION LIMITS

WP-C IV • VIII

- Generally don't start CPR with obviously fatal injury, decapitation, rigor or dependent lividity, or when it endangers rescuers.
- Consider stopping after **~30 min without ROSC**, or when rescuers are exhausted, the scene is unsafe, or care is handed off. Follow medical direction.
- **Exceptions (prolong efforts):** **hypothermia, cold-water drowning, lightning** (often respiratory arrest only, so keep ventilating) and **avalanche** burial with a patent airway (see p. 3).
- Document time of death, efforts made and custody of remains. Notify the agency with jurisdiction.



HYPOTHERMIA WP-C III

Stage	Core temp	Signs
HT I • Mild	32–35 °C (90–95 °F)	Conscious, shivering , “umbles” (stumbles, mumbles, fumbles)
HT II • Moderate	28–32 °C (82–90 °F)	Impaired consciousness, shivering stops, arrhythmia risk
HT III • Severe	24–28 °C (75–82 °F)	Unconscious, vital signs present
HT IV	<24 °C (<75 °F)	No vital signs, apparent death

- All stages:** shelter, remove wet clothes (or cover them with a vapor barrier), **hypothermia wrap** (insulation → vapor barrier → insulation), insulate from the ground. **No immersion baths in the field.**
- Mild:** calories and warm sweet drinks, exercise once dry. Field rewarming is reasonable.
- Moderate/severe:** handle gently and keep horizontal (rough movement can trigger VF; this is the cause of “rescue collapse”). Heat packs to the chest, axillae and back. Warm IV fluids. Evacuate to a facility with active rewarming, **ECLS-capable if HT III/IV.**
- Arrest:** check pulse and breathing for **up to 60 s**. If arrested, CPR. Defibrillate up to 3 times while <30 °C, then per protocol as the patient warms. Intermittent CPR is acceptable if the evacuation requires it. **“Not dead until warm and dead.”**

COLD INJURY WP-C III

- Frostbite:** thaw in the field only if definitive care is >2 h away and refreezing can be prevented. Rapid rewarming in **37–39 °C (99–102 °F)** water until the tissue is soft and red/purple (~30 min). Don't rub. Ibuprofen (up to 600 mg PO q6h). Aloe vera, loose dry dressings, elevate. Leave clear blisters intact in the field. Severe cases need a hospital within 24 h for **tPA/iloprost**.
- Non-freezing cold injury** (trench/immersion foot): dry, warm gradually, elevate. Pain can last weeks.
- Snow blindness** (UV keratitis): eye shielding, cold compresses, oral analgesia. Resolves in 24–72 h. Prevent with wraparound UV glasses.

SUN & SKIN WP-C III

Snow, water and altitude raise UV exposure. Use broad-spectrum **SPF 30+**, reapply every 2 h, and cover up. Treat sunburn with cooling, NSAIDs and aloe.

WATER DISINFECTION WP-C I • III

Boil at a rolling boil for 1 min (3 min above ~6,500 ft / 2,000 m). **Filter** (0.1–0.4 µm) for bacteria and protozoa; not reliable for viruses. **Chlorine dioxide** covers *Cryptosporidium* (~4 h). **UV** needs clear water. Combine filtration with chemicals for full coverage.

HEAT ILLNESS & HYPONATREMIA WP-C III

- Exertional heat stroke** = hyperthermia (usually >40 °C/104 °F) + **CNS dysfunction** (confusion, ataxia, seizure, collapse). **Cool first, transport second.** Cold-water immersion is best. Next best: tarp-assisted cooling (TACO), ice-water towels to the whole body, or wet + fan. Stop at ~39 °C (102 °F) to avoid overshoot. Antipyretics don't work, so don't give them.
- Heat exhaustion:** fatigue, headache, nausea, normal mental status. Rest in shade, cool, oral fluids with electrolytes.
- Exercise-associated hyponatremia (EAH):** overdrinking. Na <135, nausea, headache, swelling, **confusion or seizure**. Mild: restrict fluids, salty food or concentrated broth. Severe: **3% NaCl 100 mL IV bolus**, repeat up to 2 more times at 10-min intervals. Evacuate.
- Drink to thirst**, eat salty snacks. Don't push fluids on a confused athlete without knowing their sodium.

ALTITUDE ILLNESS WP-C III

Condition	Key signs	Field treatment
AMS	Headache + GI upset, fatigue, dizziness after recent ascent (Lake Louise score ≥3)	Stop ascending, rest. Analgesics, antiemetic. Acetazolamide 250 mg PO q12h . Descend if worsening
HACE	Ataxia, altered mental status, after AMS	DESCEND . O ₂ . Dexamethasone 8 mg IV/IM/PO , then 4 mg q6h. Hyperbaric bag if descent is impossible
HAPE	Breathlessness at rest, cough, ↓ exercise tolerance, crackles, low SpO ₂	DESCEND . O ₂ to SpO ₂ >90%. Minimize exertion. Nifedipine ER 30 mg q12h if descent or O ₂ isn't available

Prevention: above 3,000 m (~10,000 ft), raise sleeping elevation **≤500 m/day**, with a rest day every 3–4 days. Prophylaxis for moderate/high risk: **acetazolamide 125 mg q12h** (peds 1.25 mg/kg q12h), or dexamethasone 2 mg q6h / 4 mg q12h. HAPE-prone: nifedipine SR 20 mg q8h or 30 mg ER q12h. Descending 300–1,000 m usually resolves symptoms. A portable hyperbaric bag buys time; it isn't a cure.

DEHYDRATION WP-C III

Signs: thirst, dark urine, headache, dizziness, tachycardia. Gauge hydration by urine color. Treat with **oral rehydration solution**; use IV only if they can't tolerate fluids by mouth. **Drink to thirst** and match electrolytes to sweat losses. Overdrinking causes EAH.

LIGHTNING • DROWNING • AVALANCHE WP-C III • VI

- Lightning:** use **reverse triage** and treat the apparently dead first. Arrest is usually primary respiratory, so **keep ventilating**. How long the patient goes without breathing, not the cardiac arrest, decides the outcome. Expect keraunoparalysis (temporary), TM rupture and burns. Evacuate every strike victim. **“When thunder roars, go indoors.”** Wait 30 min after the last thunder.
- Drowning:** start with **5 rescue breaths** (ERC/EMERGILITY; AHA uses 2), then CPR with ventilations. **No water-removal maneuvers.** Hypoxia is the problem, so prioritize airway and breathing. Expect vomiting. Treat for hypothermia. Spinal precautions only if the mechanism suggests it (diving, surf). Anyone symptomatic needs evaluation (risk of delayed respiratory distress).
- Avalanche:** survival is **>91% if dug out within 18 min** but falls to ~34% at 19–35 min (asphyxia). Use beacon → probe → strategic shoveling. Clear the airway first and note whether the airway is patent and whether there's an air pocket. Burial **≤60 min** → asphyxia: rescue breaths ASAP, then CPR. Burial **>60 min** with the airway patent or unknown → treat as hypothermic arrest (ECLS center). An air pocket doesn't change management (ICAR 2023).

BITES, STINGS & ENVENOMATION WP-C III

- Pit viper** (rattlesnake, copperhead): keep the patient calm, immobilize the limb at heart level, remove rings and watches, **mark the edge of swelling with times every 15–30 min**. **No** tourniquet, ice, cutting, suction or electricity. Evacuate for antivenom.
- Coral snake / elapids:** neurotoxic, symptoms may be delayed. **No pressure immobilization in the US.** Evacuate for antivenom even without symptoms.
- Anaphylaxis:** epinephrine IM 0.01 mg/kg (max 0.5 mg), repeat q5–15 min. Then antihistamine and steroid. Monitor for biphasic reaction.
- Marine:** spines from stingrays or venomous fish → **hot water 43–45 °C (110–113 °F) for 30–90 min**. Jellyfish → rinse with seawater (not fresh), vinegar for box jellyfish.
- Ticks:** grasp close to the skin and pull steadily. Lyme prophylaxis: **doxycycline 200 mg once** within 72 h if criteria are met (Ixodes tick, endemic area, attached ≥36 h).
- Mammal bites:** irrigate well, leave open (except the face), antibiotics, tetanus. Consider **rabies PEP**.

DIVE • SUSPENSION • PLANTS WP-C III

DCS/AGE: 100% O₂, lie flat, oral fluids if alert, recompression chamber. No flying. DAN Emergency +1-919-684-9111. **Suspension syndrome:** get them out of the harness quickly and lay them flat; normal trauma care. **Poison ivy/oak:** wash urushiol off with soap and water ASAP, topical or oral steroids for severe cases.



Wilderness Medicine: Trauma, Medical & Prolonged Casualty Care

WOUND CARE

WP-C II • IV

- **Control bleeding**, then **irrigate**. Irrigation is the single most important step. Drinkable water works as well as saline. Use a large volume (≥500 mL–1 L) under pressure (syringe or a pierced bag).
- Remove debris and devitalized tissue. Avoid full-strength alcohol and hydrogen peroxide in the wound.
- **Close** (tape strips, staples, sutures, glue) only clean, low-risk wounds after thorough irrigation.
- **Leave open** (pack and dress, delayed closure): animal bites (except the face), punctures, crush injuries, heavily contaminated wounds, old extremity wounds.
- Moist dressing, change daily. **Watch for infection** (redness, heat, pus, red streaks, fever) → antibiotics and evacuation. Per protocol: cefadroxil 1 g PO daily, or ceftriaxone 2 g IV/IM (**never with calcium or LR**).
- **Blisters**: pad hot spots early. Drain large or tense ones at the edge and leave the roof on.
- Check tetanus status.

FRACTURES, DISLOCATIONS & SPLINTS

WP-C IV

- Check **circulation, sensation and movement (CSM) before and after** every intervention. **Remove rings, watches, bracelets and tight clothing** on the injured limb before swelling makes it impossible.
- **Angulated fracture** with poor CSM: gentle in-line traction toward anatomic position, then splint.
- **Midshaft femur**: traction splint (commercial or improvised). Expect shock.
- **Reductions in the field** (per protocol, ideally early before spasm sets in): **anterior shoulder** (external rotation, Cunningham, scapular manipulation), **patella** (extend the knee, push the patella medially), **digits** (traction). Reduce once, reassess CSM.
- **Improvise**: SAM splint, sleeping pad, trekking poles, pack frame. Pad well and immobilize the joints above and below.
- **Pelvis**: bind at the trochanters with a sheet or jacket. Don't rock the pelvis to test it.

HEAD INJURY

WP-C II • V

Evacuate urgently for: ↓ GCS or AVPU, worsening headache, repeated vomiting, seizure, unequal pupils, focal deficit, or behavior change. Prevent secondary injury: **SpO₂ ≥92–94%**, **normal BP**, **normal ventilation**, head elevated 30°. Avoid hypothermia. Do neuro checks with every vital-sign set.

MEDICAL PROBLEMS IN THE BACKCOUNTRY

WP-C II • IV

Problem	Field priorities
Chest pain / ACS	Stop exertion. Aspirin 324 mg chewed (no allergy). NTG per protocol. 12-lead if available. Urgent evacuation; don't let them walk
Asthma	Inhaler (spacer), position of comfort. Severe: epinephrine IM, steroid. Cold and dry air are triggers
Diabetes	Hypoglycemia is common with exertion and cold. Oral glucose if they can swallow, IM glucagon / IV D10 if not. Insulin can freeze or overheat ; adjust doses for exertion
Seizure	Protect, recovery position. Look for causes: hypoxia, hypoglycemia, hyponatremia , heat stroke, HACE, TBI. Benzodiazepine per protocol
Abdominal pain	Evacuate for: pain >12–24 h, localized/rebound tenderness, fever, GI bleed, pregnancy, peritoneal signs
Gastroenteritis	Oral rehydration (WHO ORS or ½ tsp salt + 6 tsp sugar per 1 L). Prevent with water treatment and hand hygiene
Dental	Avulsed tooth: rinse, replant ideally within 15–30 min or store in milk or saliva (not plain water). Cover a fracture. Analgesics
Eye	Irrigate. Foreign body: flush, then evert the lid. Penetrating: rigid shield, no pressure, evacuate

CHRONIC CONDITIONS & MEDICATIONS

WP-C IV

- Screen the team before departure: meds, allergies, conditions, implanted devices. Bring **extra supplies** of critical meds and split them between packs.
- **The environment affects meds**: heat, cold and UV degrade insulin, epinephrine and inhalers. β-blockers blunt the tachycardia of shock and the response to heat. Diuretics, anticholinergics and antipsychotics raise heat-illness risk. Anticoagulants increase bleeding with trauma.
- Check for drug–drug interactions, OTC drugs and supplements (e.g., NSAIDs + anticoagulants, St. John's wort).

BURNS

WP-C II

Stop the burning and **cool with water for 10–20 min** (watch for hypothermia). Size it with the Rule of Nines (patient's palm ≈ 1% TBSA). Cover with clean dry or non-adherent dressings. **Evacuate**: inhalation signs, circumferential, partial thickness >10%, any full thickness, electrical or chemical, and burns to the face, hands, feet, genitals or joints **that threaten function**. Use judgment: a small superficial hand burn with full function can stay.

PROLONGED CASUALTY CARE (FORMERLY PFC)

WP-C V

When evacuation is delayed, **you become the ICU**. The core capabilities:

1 • Monitor	Trend vitals, SpO ₂ , EtCO ₂ , temp, urine output, mental status. Use a flowsheet
2 • Resuscitate	Blood/plasma, then calcium 1 g after unit 1. Target perfusion, not normal BP
3 • Ventilate & oxygenate	O ₂ planning (cylinder math, concentrators), BVM, PEEP
4 • Airway	Positioning, NPA + BVM, cric; SGA/ETI per protocol. Secure before moving
5 • Sedation/analgesia	Acetaminophen, NSAID, ketamine. Splinting and warmth help too
6 • Exam & diagnostics	Serial exams, POCUS (eFAST), glucose, i-STAT
7 • Nursing care	Turn q2h, pad pressure points, oral/eye care, hygiene, nutrition, temp control, UO ≥0.5 mL/kg/h
8 • Surgical interventions	Wound care and closure, finger thoracostomy, cric, escharotomy (per scope)
9 • Teleconsult	Call medical direction early. Prepare a concise SBAR/MIST with vitals and trends
10 • Prepare for evacuation	Package, secure lines and tubes, hypothermia wrap, meds and O ₂ for the trip plus a buffer

IMPROVISED CARE & COMFORT

WP-C IV

- Sleeping pad + bag + tarp = hypothermia wrap. Trekking poles + pad = splint. A shirt and stick make a tourniquet only if nothing better exists.
- Comfort is care: shelter, warmth, food, toileting, privacy, and **tell the patient the plan**.
- **Treat & release**: document the exam, instructions and red-flag symptoms, plus a follow-up plan (who checks in and when).

ANTICIPATORY GUIDANCE

Tell the patient and team **what to expect, what to watch for and when to turn around**: "If the headache worsens or you become unsteady, we descend tonight." Set specific **trigger points** (time, symptom, vital sign) that turn a stay into an evacuation.



HELICOPTER SAFETY & LANDING ZONES

WP-C VI

- LZ:** about **100 × 100 ft (30 × 30 m)**, as level and firm as possible, clear of wires, trees, poles and loose debris. Wet down dust. Tell the pilot about any hazard; **the pilot has the final say**.
- Marking:** one person in eye protection, back to the wind, arms up. Mark the corners. At night, use low-intensity lights. **No flares** (AC 135-14B says pyrotechnic flares aren't recommended for marking an LZ). Don't shine white lights at the aircraft.
- Report:** location (lat/long), wind, terrain, wires and hazards, and patient status.
- Approach:** only when the crew signals, **from the front, in the pilot's view**, crouched, from the downhill side. **Never near the tail rotor**. Carry no long objects, wear no loose hats.
- Hoist / short-haul:** let the hook touch ground first (static discharge). Follow crew direction and hand signals.
- Helicopters have weight, altitude and weather limits. Have a **ground evacuation backup plan**.

PACKAGING & LITTER EVACUATION

WP-C VI

- Package:** insulation under and around, vapor barrier, padding at pressure points, eye and face protection, **access to the airway and IV**, label the package (meds, TQ time).
- Platforms:** basket (Stokes), SKED/flexible, vacuum mattress, wheeled litter, improvised (pack, poles, rope).
- Carry teams:** **4–6 bearers** for a small-to-medium patient over a short distance. For any significant distance, plan **15–18 people** so bearers can rotate out. A long carry over rough ground takes many hours.
- Terrain angle:** flat 0–15° · low 16–40° · steep 41–60° (belay) · **high >60°** (rope system, two-rope main/belay).
- Other options: ATV/UTV, boat, snowmobile, pack animal, or a **rescue dog** for search and find.

EVACUATION TIME MATH

WP-C I • VI

Naismith's rule: ~1 h per 5 km (3 mi) + 1 h per 600 m (2,000 ft) of ascent for a fit hiker. An assisted walk-out is much slower, and a litter carry over rough ground can drop to under 1 km/h. **Count daylight backward** from sunset, and plan whether to bivouac or move at night.

SAR & INCIDENT COMMAND

WP-C VI • VII

- ICS:** Incident Commander (first priority: **life safety of responders**) + Operations, Planning, Logistics, Finance/Admin. Use the **ICS 206 Medical Plan**.
- Terms:** IPP (initial planning point), PLS (point last seen), LKP (last known position).
- Hasty search** early: fast, trained teams check trails, drainages, decision points and hazards.
- Lost-person behavior:** median distance for hikers in temperate mountains ≈ **1.9 mi (3.1 km)** from the IPP. Children 6–12 tend to go downhill; ~75% are found within 2 mi.
- Medically directed rescue:** avalanche, swift water, crevasse, canyon, cave, high angle, dive and geothermal hazards. **Rescuer safety first; medicine fits the rescue**.

SIGNALING

WP-C VI

Distress = 3 of anything: 3 whistle blasts, 3 fires, 3 flashes. Also signal mirror, strobe, smoke by day, bright clothing in a clearing. **PLB / satellite messenger** to reach SAR.

Ground-to-air symbols (ICAO), ≥3 m tall, high contrast

V	X	Y	N	↑
Need assistance	Need medical help	Yes	No	Going this way

RADIO & INTERAGENCY COMMS

WP-C VII

- Use plain language, think before you key, and be brief: who you are, who you're calling, the message, then confirm.
- PACE plan:** Primary (team radio), Alternate (cell), Contingency (satellite messenger or phone), Emergency (PLB, or Zello where there's data). Brief it before you go.
- Agree on frequencies and check-in times. Plan for **dead spots**: relay, high ground, satellite backup.
- Media: refer to the PIO. Protect the patient's privacy (HIPAA).

ROPE RESCUE ESSENTIALS

WP-C VI

- Anchors** must be bombproof or redundant and equalized (e.g., SRENE: Solid, Redundant, Equalized, No Extension).
- Two-rope system** on steep and high-angle terrain: main line + independent belay.
- Mechanical advantage** for raises (e.g., 3:1 Z-rig). Lower whenever you can; it's simpler and safer.
- Patient secured in the litter (harness or tie-in), helmet and eye protection. A **litter attendant** manages the airway and comfort.

HANDOFF & DOCUMENTATION

WP-C VII

M	Mechanism / nature of illness and time
I	Injuries / problem list
S	Signs: vitals and trends from the flowsheet
T	Treatment and response, meds with times, TQ time

Hand over the written **SOAP note** and **PCC flowsheet** with the patient, labeled on the package. Debrief the team afterward and do a hot wash.

PROFESSIONAL PRACTICE

WP-C VIII

- Scope & oversight:** know your personal, team and regional scope. Use protocols and online medical control. Know whose jurisdiction (land agency, sheriff, NPS) you're working in.
- Ethics:** DNR and end-of-life decisions, refusals, care and custody of the deceased, cultural considerations.
- Just Culture,** evidence-based medicine, literature review, lifelong learning.
- Fitness & wellness:** physical readiness, sleep, nutrition, mental health after bad calls.
- Leave No Trace:** pack out medical waste and sharps. Follow land-agency rules.

KIT BY TRIP TYPE

WP-C I

Day trip	Multi-day	Expedition / remote
TQ, gauze, tape, blister care, SAM splint, emergency blanket, analgesics, antihistamine, epinephrine (if prescribed), headlamp, whistle	+ irrigation syringe, wound closure, ORS, broader meds (antibiotics, antiemetic, antidiarrheal), water treatment, PLB	+ altitude meds, O ₂ /monitor, IV/IO, advanced airway, PCC flowsheets, satellite teleconsult, spare batteries kept warm

WP-C EXAM DOMAINS

I	Medical Mission Planning	V	Prolonged Care
II	General Medical	VI	Rescue Interface
III	Environmental Factors	VII	Communication
IV	Patient Management	VIII	Professional Considerations

IBSC WP-C: 135 questions (110 scored), 2.5 h. Eligible: unrestricted paramedic, RN or PA license. IBSC recommends texts including *Wilderness EMS* (Hawkins), *Mountain Emergency Medicine*, the NPS Technical Rescue Handbook, WMS CPGs and JTS CPGs.



WMS vs. AWLS: Two Pillars of Wilderness Medicine

PART II · STANDARDS & EVIDENCE

Who they are, how they differ, and how EMERGILITY uses both
Wilderness Medical Society CPGs · Advanced Wilderness Life Support v3.11 (2025)

WILDERNESS MEDICAL SOCIETY (WMS)

- **What it is:** a professional society for wilderness and environmental medicine. It publishes the journal *Wilderness & Environmental Medicine* (WEM).
- **Main product:** **Clinical Practice Guidelines (CPGs)** written by expert panels and updated every few years (e.g., Frostbite 2024, Spinal Cord Protection 2024, Drowning 2024, Altitude 2019 with later updates).
- **Method:** every recommendation is **graded for evidence quality and benefit vs. risk** (ACCP system, e.g., “1B” or “2C”). It shows how strong the evidence is.
- **Style:** topic by topic, physician-level, detailed doses, with prehospital, field and hospital sections. It doesn't teach an assessment system.
- **Credentials:** **FAWM** (Fellow of the Academy of Wilderness Medicine) and Master Fellow. CME conferences. WMS doesn't issue a field-provider card.
- **Best use:** **the standard you write protocols from**, and the answer when sources conflict.

DECODING A WMS GRADE

Grade	Meaning	In practice
1A	Strong rec, high-quality evidence	Do it
1B	Strong rec, moderate evidence	Do it
1C	Strong rec, low-quality evidence	Do it; the evidence may change
2A–2B	Weak rec, high or moderate evidence	Reasonable; depends on context
2C	Weak rec, low-quality evidence	Option; judgment required

A “1” means the benefit clearly outweighs the risk. A “2” means it's a closer call.

STRENGTHS & LIMITS

- + Graded evidence, regular updates, widely cited by courts, agencies and the IBSC WP-C reading list.
 - Not a curriculum. Some topics have no CPG (e.g., avalanche, which defers to ICAR), and CPGs are long and dense for field use.
- Where to find them:** wms.org (free CPG summaries) and the full text in *Wilderness & Environmental Medicine*.

ADVANCED WILDERNESS LIFE SUPPORT (AWLS)

- **What it is:** a **certification course and textbook** started in 1998 at the University of Utah School of Medicine (Ingebretsen; co-editor Della-Giustina). It's now run through Wild Med U. **BWLS** is the lay-level version.
- **Main product:** the **AWLS textbook (v3.11, 2025)**, 24 chapters from patient assessment to diving, evacuation and children, plus a course and a certification exam.
- **Method:** expert-written consensus chapters. It's practical and readable but **doesn't grade the evidence**, and some values lag the newest CPGs.
- **Style:** teaches a system (scene → MARCH → SAMPLE → ongoing), evacuation decision rules for each condition, and how to build a kit.
- **Audience:** physicians, PAs, NPs, nurses, paramedics and medical students. Certification is international.
- **Best use:** **teaching and certifying clinicians**, and quick evacuation and kit decisions.

AWLS V3.11: COURSE MAP

Trauma	Patient assessment · Wound management
Environment	Altitude · Avalanche · Heat · Cold · Lightning · Drowning
Medical	Medical problems · Dentistry · Dermatology · Eye
Bites & infection	Bites and stings · Infectious diarrhea
Tools	Medical kits · Water treatment · Diving
Additional*	Legal · Nutrition · Sports injuries · Menstruation · Sunscreen · Children · Nature deficit

*Not covered on the AWLS certification exam.

STRENGTHS & LIMITS

- + Teachable structure, strong evacuation guidance, wide topic coverage (dental, derm, nutrition, menstruation, children).
- Thinner on advanced or ALS interventions, and some recommendations (frostbite rewarming temperature, altitude ascent rate, avalanche burial time) differ from current WMS or ICAR.

AT A GLANCE

	WMS	AWLS
Type	Society + guidelines	Course + textbook
Evidence grading	Yes (ACCP)	No
Updates	By topic, every few years	Whole book (v3.11, 2025)
Assessment system	Not specified	MARCH + SAMPLE
Evacuation rules	Within each CPG	Explicit for each condition
Credential	FAWM / MFAWM	AWLS certification
On WP-C reading list	Yes (CPGs)	Not listed

COMPARISON SCORECARD (PP. 7–8)

- AGREE** Hypothermia, heat stroke, lightning, pit viper care, wound irrigation, AMS drugs, water treatment.
- DIFFER** **Frostbite rewarming** (37–39 vs. 40–42 °C), **ascent rate** (500 vs. 600 m/day), **avalanche** burial threshold (60 vs. 45 min), **spine** (spinal cord protection vs. immobilization criteria), HAPE treatment detail.
- ONE SILENT** AWLS has no dose for 3% saline (EAH), dexamethasone (HACE) or tPA/iloprost. WMS has no avalanche, diarrhea or diving CPG.

HOW EMERGILITY USES BOTH

- **Protocols:** built on WMS CPGs (plus TCCC/JTS for trauma), approved by the Medical Director.
- **Teaching:** the AWLS structure and evacuation logic, with WMS values substituted where they differ.
- **Conflicts:** listed in the “EMERGILITY standard” column. **Newest graded evidence wins.**

SOURCE HIERARCHY

1	Medical Director orders & EMERGILITY protocols
2	State EMS rules and scope (VA OEMS; EMS Compact for travel)
3	WMS CPGs · TCCC/JTS CPGs · ICAR · AHA/ERC
4	AWLS, Auerbach and other texts (teaching and context)



Clinical Comparison I: Assessment, Trauma & Environment

PART II · STANDARDS & EVIDENCE

Where WMS and AWLS agree, differ, or are silent, and the EMERGILITY working standard
Spine · Wounds · Altitude · Heat · Cold · Avalanche

Topic	WMS Clinical Practice Guideline	AWLS v3.11	Verdict	EMERGILITY working standard
Assessment	No single assessment CPG. Hemorrhage control and spinal cord protection are covered by topic	Scene → primary (MARCH : H = hypo/hyperthermia, hike vs. helicopter) → SAMPLE → ongoing survey	AWLS only	Teach AWLS MARCH, with TCCC-aligned hemorrhage control (TQ 2–3 in above the wound, mark the time, don't loosen to "perfuse")
Spine	Spinal cord protection is the goal, not immobilization. Selective assessment (NEXUS/Canadian C-spine logic). No routine role for rigid collars or backboards ; use them for movement, then remove	Hold C-spine on any unresponsive patient. Immobilize for spine pain, vertebral tenderness or ↓ range of motion. Don't immobilize penetrating spine injury	Differ	Focused spine assessment (reliable patient, no midline pain or tenderness, normal neuro exam) → clear or use padded SMR. Collars and boards only for movement
Wounds	Irrigate with potable water (as good as sterile saline). Topical antibiotic ointment. No routine prophylactic oral antibiotics. Close low-risk wounds after irrigation	High-pressure irrigation with the cleanest water. Primary and delayed closure have equal outcomes. Topical antibiotics on all wounds. Oral antibiotics for complex or contaminated wounds and bites. Don't irrigate punctures under pressure	Agree	Large-volume high-pressure irrigation. Close only clean, low-risk wounds. Leave bites (except the face), punctures and crush injuries open. Oral antibiotics for high-risk wounds
Altitude: prevention	Above 3,000 m: sleeping elevation ≤500 m/day , rest day every 3–4 days. Acetazolamide 125 mg q12h. Dexamethasone 2 mg q6h / 4 mg q12h (high risk). Ibuprofen 600 mg q8h is an alternative. HAPE: nifedipine ER 30 mg q12h or 20 mg q8h, or tadalafil 10 mg q12h	2–3 nights at 2,500–3,000 m first. Sleeping-altitude gains ≤600 m , plus an extra night every 300–900 m. Acetazolamide 125 mg BID starting 1–2 days before. HAPE: nifedipine SR 20 mg q8h, PDE-5 inhibitors or salmeterol. HAPE-prone: ≤350 m/day	Differ (rate)	500 m/day above 3,000 m, rest day every 3–4 days. Acetazolamide 125 mg q12h. Nifedipine per WMS for prior HAPE
Altitude: treatment	AMS: stop ascent, acetazolamide 250 mg q12h, dexamethasone 4 mg q6h. HACE: dexamethasone 8 mg, then 4 mg q6h + descent. HAPE: descend ≥1,000 m, O₂ to SpO₂ >90% , nifedipine if descent or O ₂ isn't possible. Hyperbaric chamber must not delay descent	AMS: rest, acetazolamide 250 mg BID. HACE: immediate descent + dexamethasone (no dose given) + acetazolamide if they can take it by mouth. HAPE: immediate descent, often improves after 500–1,000 m. Symptom-free 24 h off steroids before re-ascending	AWLS thinner	WMS doses and O ₂ targets. Keep the AWLS rules on descent vs. evacuation and the 24 h symptom-free rule before re-ascending
Heat stroke	Cold-water immersion first. Cool first, transport second. Stop at ~39 °C. Antipyretics have no role	Get core <40 °C as fast as possible, then stop at 39 °C. Immersion, pour water, fan. No acetaminophen or NSAIDs. Heat exhaustion: 1–2 L over 2–4 h	Agree	Immersion or TACO, stop at 39 °C
EAH	Sodium <135 from overdrinking. Mild: restrict fluids, oral hypertonic. Severe: 3% NaCl 100 mL IV, repeat up to ×2 at 10 min	Warns that water without electrolytes causes dangerous hyponatremia. Replace 500 mL per lb of sweat lost. No IV treatment given	AWLS silent (Rx)	WMS 3% NaCl protocol (ALS). Drink to thirst
Hypothermia	Swiss stages. Gentle handling, horizontal. Insulation and vapor barrier. Pulse check up to 60 s. CPR if no signs of life. Defibrillation guidance. ECLS for stages III–IV	Modified Swiss stages. Check vitals over 60 s. No CPR if any vital sign is present . No baths or immersion. Field rewarming for moderate; evacuate severe for core rewarming	Agree	Combined. Add WMS defibrillation and ECLS-destination guidance
Frostbite	Thaw in the field only if definitive care is >2 h away and refreezing can be prevented. Water 37–39 °C until soft and red/purple (~30 min). Ibuprofen. Aloe. tPA ≤24 h after thawing; iloprost ≤72 h	Rapid rewarming in water at 40–42 °C for 15–30 min. Never refreeze, no dry heat. Ibuprofen preferred over aspirin. Evacuate all frostbite	Differ	37–39 °C (WMS 2024, newer and graded). Evacuate all frostbite to a center that can give tPA or iloprost
Avalanche	No WMS CPG; defers to ICAR MedCom (2022/2023) : burial ≤60 min → presume asphyxia, give rescue breaths ASAP . >60 min + airway patent or unknown → treat as hypothermic arrest and go to an ECLS center . Air pocket and depth shouldn't change management	>91% survive if dug out ≤18 min; 34% at 19–35 min. Continue resuscitation of an asystolic patient buried >45 min if an air space is found. Evacuate every buried victim	Differ (threshold)	ICAR 60-min rule, ventilate early, ECLS destination. Teach the AWLS survival curve



Clinical Comparison II: Lightning, Water, Bites & Medical

PART II · STANDARDS & EVIDENCE

Where WMS and AWLS agree, differ, or are silent, and the EMERGILITY working standard
Lightning · Drowning · Envenomation · Medical · Water · Diving

Topic	WMS Clinical Practice Guideline	AWLS v3.11	Verdict	EMERGILITY working standard
Lightning	Reverse triage. Prolonged ventilation (respiratory arrest outlasts cardiac arrest). Crouching gives little protection. Wait 30 min after the last thunder	Reverse triage. How long the patient goes without breathing decides the outcome. "When thunder roars, go indoors." Crouched positions offer little protection. Wait ≥30 min. Evacuate every strike victim	Agree	Reverse triage. Ventilate early and for a long time. Evacuate every strike victim
Drowning	Airway and oxygenation first. Ventilations with compressions (compression-only is of little benefit). No compressions in water. Spinal precautions only with a mechanism. Release if asymptomatic with normal lungs (6 h observation). Consider stopping: submersion >30 min (water >6 °C), >90 min (<6 °C), or 25 min of CPR	Start rescue breaths immediately (notes ERC's 5 initial breaths). No drainage or Heimlich. Evacuate after any resuscitation or any respiratory finding (cough, dyspnea, abnormal lungs, low SpO ₂)	Agree	5 initial breaths, then CPR with ventilations. WMS release, observation and termination criteria
Pit viper	No tourniquet, pressure immobilization, ice, incision, suction or electricity. Mark the swelling. Splint. Evacuate for antivenom	Same: in North America, no pressure immobilization, ice or tight tourniquet. Remove rings. Evacuate for antivenom	Agree	As written. Mark the swelling edge with times
Coral snake	Rare. Rapid evacuation for antivenom	Pressure immobilization is not indicated for US coral snakes (it's an Australian elapid technique). Plan antivenom; symptoms can be delayed	AWLS more specific	No pressure immobilization in the US. Evacuate even without symptoms
Anaphylaxis	WMS epinephrine recommendations for outdoor education and wilderness settings support trained lay providers carrying and giving IM epinephrine. Dose: 0.01 mg/kg (max 0.5 mg adult), repeat q5–15 min	Auto-injector 0.3 mg adult / 0.15 mg child . Repeat in 5–20 min if needed. Steroids. Evacuate every anaphylaxis (rebound risk)	Agree	IM epinephrine, weight-based for ALS. Evacuate all
Cardiac / ACS	No standalone CPG (ACC/AHA apply)	Aspirin 325 mg chewed, NTG 0.4 mg SL, clopidogrel 300–600 mg PO if available. Evacuate	AWLS only	Aspirin + NTG per protocol, 12-lead if available. Urgent evacuation, no walking out
Marine	No standalone WMS CPG (toxicology references apply): hot-water immersion for venomous spines	Vinegar (5% acetic acid) for jellyfish. Hot water ≤45 °C for man-of-war (after removing nematocysts) and stingray or stonefish	Agree	Hot water 43–45 °C, 30–90 min. Vinegar for box jellyfish
Ticks / Lyme	No standalone CPG (CDC applies)	Pull straight out with steady pressure. A tetracycline (doxycycline) may be started if Lyme, RMSF, tularemia or ehrlichiosis is suspected	AWLS only	CDC: doxycycline 200 mg once within 72 h if prophylaxis criteria are met
Diarrhea	No WMS CPG (ISTM travelers' diarrhea guidance applies)	ORS recipe. Loperamide if not bloody. Bismuth. Azithromycin 500 mg × 3 d, or a fluoroquinolone (1 dose to 1 day)	AWLS only	AWLS regimen. Hold loperamide with fever or bloody stool . Azithromycin preferred for dysentery and in SE Asia
Water	WMS water disinfection CPG: heat (reaching a boil is sufficient), filtration, halogens, chlorine dioxide, UV; combine methods	CDC: boil ≥3 min above 2,000 m; 3 min is safest everywhere. Chlorine dioxide needs ~4 h for Cryptosporidium. UV requires clear water and protection from light (reactivation)	Agree	Boil 1 min (3 min >2,000 m), or filter + chemical
Diving	No WMS CPG (UHMS / DAN)	AGE: urgent recompression (even up to 24 h later). High-flow O ₂ , but it must not delay recompression. Supine. Call DAN	AWLS only	100% O ₂ , supine, call DAN (+1-919-684-9111), recompression

Reading the verdicts: **Agree** same clinical action. **Differ** a number or action conflicts, so the EMERGILITY standard picks one (usually the newer, graded WMS value). **One silent** only one source addresses it, and that source or an outside guideline fills the gap. **The standard column is a proposal until the Medical Director signs it.**



Provider Ladder: WFR → Practitioner

PART II • STANDARDS & EVIDENCE

Training pathway, how WMS and AWLS fit, and typical scope by level

Scope is set by state license, agency and Medical Director, not by a wilderness card

	WFR Wilderness First Responder	WEMT Wilderness EMT	Paramedic / W-Paramedic	Advanced Practice Paramedic WP-C · FP-C · CCP-C	Practitioner PA · NP · MD/DO
Training	70–80 h WFR course (NOLS, WMA, SOLO, WMI, etc.). Recert every 2–3 yrs	EMT (state/NREMT) + wilderness module	Paramedic license + wilderness module or AWLS	Paramedic + experience + IBSC board exam (WP-C: 135 items, 2.5 h)	Professional degree + license. AWLS, FAWM, DiMM
WMS fit	CPG summaries for instructors	CPGs inform protocols; FAWM eligible	CPGs = protocol basis; FAWM eligible	CPGs are on the WP-C reading list ; FAWM	FAWM / Master FAWM , conferences, CPG authorship
AWLS fit	BWLS (lay text)	AWLS (stretch)	AWLS certification	AWLS + WMS CPGs + JTS PCC	AWLS certification (core audience)
Legal scope	First aid only. Not a license . Org/expedition protocols	State EMT scope + agency wilderness protocols	State paramedic scope + agency protocols	Expanded protocols under the Medical Director (e.g., EMERGILITY APP)	Independent or collaborative practice per state

Intervention	WFR	WEMT	Paramedic	APP	Practitioner
TRAUMA & ASSESSMENT					
Tourniquet, hemostatic packing, pelvic binder	●	●	●	●	●
Focused spine assessment → clear spine in the field	ⓘ	ⓘ	●	●	●
Reduce dislocations (anterior shoulder, patella, digit)	ⓘ	ⓘ	ⓘ	●	●
Wound closure: tape or glue / sutures or staples	ⓘ / ○	ⓘ / ○	● / ⓘ	● / ⓘ	● / ●
Needle decompression / finger thoracostomy	○	○	● / ○	● / ⓘ	● / ●
AIRWAY, IV & MONITORING					
NPA, BVM, O ₂ / SGA / ETI / surgical cric	ⓘ/○/○/○	●/ⓘ/○/○	●/●/●/ⓘ	●/●/●/●	●/●/●/●
IV/IO, fluids, blood products	○	○	● (blood ⓘ)	●	●
Point-of-care ultrasound, labs (i-STAT), 12-lead	○	○	12-lead ●	ⓘ	●
MEDICATIONS					
Epinephrine IM: auto-injector / drawn-up weight-based	ⓘ / ○	● / ⓘ	● / ●	● / ●	● / ●
OTC (analgesics, antihistamines, antidiarrheals)	ⓘ	ⓘ	●	●	●
Altitude drugs (acetazolamide, dexamethasone, nifedipine)	○	○	ⓘ	ⓘ	●
Antibiotics, 3% NaCl, ketamine, analgesic infusions	○	○	ⓘ	ⓘ	●
DECISIONS					
Treat & release with follow-up · field termination of resuscitation	ⓘ	ⓘ	ⓘ	●	●
Prescribing / ordering for others · serving as medical control	○	○	○	○	●

● typically within scope ⓘ only with a specific protocol, medical direction or extra training ○ outside typical scope. **Scope is legal, not educational:** it varies by state (e.g., VA OEMS), agency and Medical Director. A WFR, WP-C or AWLS card never expands what your license allows.



The Evidence Base: Leading References

PART II • STANDARDS & EVIDENCE

Textbooks, guidelines, journals and open-access sources behind EMERGILITY wilderness protocols
Auerbach • WMS • ICAR • ERC/AHA • JTS • CDC

CORE TEXTBOOKS

Reference	Best for
Auerbach's Wilderness Medicine 7th ed. (Auerbach, Cushing, Harris); 8th ed. (N.S. Harris, ed.) forthcoming	The definitive comprehensive text, 2 volumes. Chapter 54 covers Wilderness EMS & response systems
Auerbach's Field Guide to Wilderness Medicine	Pocket field reference by condition
Medicine for the Outdoors (Auerbach)	Lay and WFR-level self-care and first aid
Wilderness EMS (Hawkins, ed.)	EMS systems, protocols, medical direction. WP-C list
Mountain Emergency Medicine (Brugger, Zafren, Festi, Paal, Strapazzon)	Alpine and ICAR-aligned rescue medicine. WP-C list
Remote & Austere Medicine Field Guide (CoROM)	Remote and offshore practice. WP-C list
NPS Technical Rescue Handbook	Rope and rescue systems. WP-C list
AWLS v3.11 / BWLS (Wild Med U)	Course texts: clinician and lay
NOLS Wilderness Medicine (Schimelpfenig)	WFR curriculum standard
2025 Ranger Medic Handbook (75th Ranger Regt / JSOM)	SOF field protocols; check against TCCC 2026

START HERE: HIGH-YIELD READS

1. WMS Frostbite CPG, 2024 update (doi:10.1177/10806032231222359)
2. WMS Spinal Cord Protection CPG, 2024 update
3. WMS Drowning CPG, 2024 update
4. ICAR MedCom, Avalanche Victim Management, 2023 (doi:10.1016/j.resuscitation.2023.109708)
5. ERC Guidelines 2025: Special Circumstances
6. WMS Acute Altitude Illness CPG (current)
7. JTS Prolonged Casualty Care CPGs + TCCC Guidelines (May 2026) + TCCC Change 25-1 (antibiotics, JSOM 2025)

GUIDELINES (MOSTLY OPEN ACCESS)

- **WMS Clinical Practice Guidelines** in *Wilderness & Environmental Medicine*, on a 5-year review cycle (2014 • 2019 • 2024 • 2029), with free summaries on wms.org. **In development:** fluid resuscitation, cardiovascular emergencies, ultrasound, behavioral emergencies, pediatrics, blisters, concussion/TBI, gastroenteritis, burns.
- **ICAR MedCom** (alpine-rescue.org, open): avalanche victim management (2022, amended 2023), termination of resuscitation (2023), hypothermia, helicopter and rescue medicine.
- **UIAA MedCom** (open): advice on mountain and altitude medicine for climbers and expeditions.
- **ERC Guidelines 2025** (Special Circumstances): drowning, hypothermia, avalanche. **AHA 2025** CPR & ECC.
- **Joint Trauma System CPGs** (open): TCCC Guidelines (May 2026) and the **Prolonged Casualty Care** series (e.g., Nursing Interventions in PCC, July 2025).
- **CDC Yellow Book** (open): altitude, water, vector-borne disease, travel.
- **NAEMSP** position statements (*Prehospital Emergency Care*): wilderness EMS, spinal motion restriction, medical direction.
- **DAN / UHMS**: diving injury and hyperbaric referral.

CITING SOURCES IN EMERGILITY MATERIALS

Cite the **guideline, organization, year and the specific recommendation**, not just the textbook, e.g.:

"Rewarm in water at 37–39 °C until pliable (WMS Frostbite CPG 2024)."

When a protocol departs from a CPG, write down why (scope, logistics, Medical Director decision) and the date.

JOURNALS

Wilderness & Environmental Medicine	WMS journal; home of the CPGs
High Altitude Medicine & Biology	Altitude research
Resuscitation	ERC and ICAR papers, avalanche and hypothermia
Prehospital Emergency Care	NAEMSP, EMS evidence
J Special Operations Medicine	TCCC, PCC, SOF medicine; TCCC change papers
Air Medical Journal	HEMS and flight
Scand J Trauma Resusc Emerg Med	Fully open access ; mountain EMS
Journal of Travel Medicine	Travel and expedition medicine

OPEN-ACCESS SEARCH HUBS

PubMed (use the "Free full text" filter) • **PubMed Central** • Google Scholar • Cochrane Library • wms.org CPG summaries • alpine-rescue.org library • deployedmedicine.com (JTS/TCCC).

APPRAISING WHAT YOU READ

- **Hierarchy:** systematic review/meta-analysis → RCT → cohort → case series → expert opinion. Most wilderness evidence sits at the bottom, so **graded guidelines matter**.
- **Population:** fit young soldiers ≠ older clients, children or people with chronic illness.
- **Setting:** hospital or urban EMS data may not transfer to a 12-hour evacuation.
- **Currency:** check the date, the edition and whether a newer CPG supersedes it.



Leading Practices: How the Evidence Has Shifted

Topic	Outdated teaching	Current leading practice	Source that changed it
Spine	Backboard + rigid collar for any concerning mechanism	Protect the spinal cord with a selective field assessment. Padded SMR. Collars and boards are only for moving the patient	WMS Spinal Cord Protection 2024; NAEMSP/ACS-COT/ACEP SMR consensus
Hemorrhage	Tourniquet as a last resort; loosen it periodically	Early TQ, hemostatic packing with ≥3 min pressure, junctional devices. Never loosen to “perfuse.” Convert only within rules	TCCC 2026; AWLS v3.11; Stop the Bleed
Wound cleaning	Sterile saline only; peroxide or alcohol in the wound	Drinkable tap water is equivalent. High-volume pressure irrigation is the key step	Cochrane (water for wound cleansing); WMS wound CPG
Hypothermia	Rub limbs, aggressive field rewarming, “dead at any temp”	Gentle horizontal handling, hypothermia wrap, 60 s pulse check, ECLS-center destination , HOPE score for ECLS decisions	WMS Hypothermia 2019; ERC 2025; ICAR
Frostbite	Thaw at 40–42 °C; nothing beyond rewarming	37–39 °C until pliable, ibuprofen, tPA within 24 h / iloprost within 72 h at a specialty center	WMS Frostbite 2024
Heat stroke	Ice packs to the groin and axillae, then transport	Cool first, transport second. Cold-water immersion or TACO, stop at ~39 °C	WMS Heat Illness CPG; AWLS v3.11
Hydration / EAH	“Drink ahead of thirst,” push fluids	Drink to thirst. Suspect EAH in the confused athlete. 3% NaCl 100 mL boluses	WMS EAH CPG
Altitude	Ginkgo; HAPE nifedipine for everyone; bag instead of descent	Graded ascent, acetazolamide 125 mg q12h. Ginkgo not recommended. Descent is definitive ; a hyperbaric chamber must not delay it	WMS Altitude CPG; AWLS v3.11
Drowning	Heimlich or drain water; compression-only CPR	Ventilation first (5 rescue breaths), no compressions in the water, release criteria and termination thresholds	WMS Drowning 2024; ERC 2025
Avalanche	35-minute / 32 °C decision rule	60-minute rule , rescue breaths ASAP, air pocket doesn't change management, ECLS destination	ICAR MedCom 2022/2023 (Resuscitation 2023)
Snakebite	Cut and suck, extractor, ice, tourniquet	None of these. Remove rings, splint, mark the swelling, evacuate for antivenom	WMS; AWLS v3.11; Unified Treatment Algorithm
Epinephrine	Only licensed clinicians give epinephrine	Trained outdoor leaders carry and give IM epinephrine for anaphylaxis	WMS Epinephrine Recommendations
Analgesia	Opioids first-line in the field	Multimodal (acetaminophen + NSAID), ketamine . Fentanyl/OTFC removed from TCCC	TCCC 2026; JTS
Field antibiotics	Moxifloxacin PO / ertapenem IV	Cefadroxil 1 g PO daily (cephalexin alt.) or ceftriaxone 2 g IV/IO/IM : narrower spectrum, longer acting, better supply. Never run ceftriaxone with calcium	TCCC Change 25-1 (JSOM 2025); TCCC 2026
Field airway	SGA as a standard TFC airway	Positioning first, NPA + BVM for hypoxia, surgical cric as the only invasive TFC airway. SGA/ETI per local protocol	TCCC 2026
Delayed evac	Load and go, nothing more to do	The 10 Prolonged Casualty Care capabilities , nursing care, teleconsult, flowsheets	JTS PCC CPGs (formerly PFC)
Diagnostics	Clinical exam only	Field POCUS for pneumothorax, HAPE (B-lines) and FAST. WMS ultrasound CPG in development	Emerging literature; WMS pipeline
Termination	Continue CPR indefinitely	Defined criteria (e.g., ICAR 2023 termination; WMS drowning thresholds), with hypothermia exceptions	ICAR 2023; WMS Drowning 2024



Reading Plan & Staying Current

	WFR	WEMT	Paramedic	Advanced Practice Paramedic	Practitioner
Core text	NOLS Wilderness Medicine or WFR course manual; <i>Medicine for the Outdoors</i>	Course text + <i>Auerbach's Field Guide</i>	AWLS v3.11 ; <i>Auerbach's Field Guide</i>	<i>Wilderness EMS</i> (Hawkins); <i>Mountain Emergency Medicine</i> ; CoROM field guide	<i>Auerbach's Wilderness Medicine</i> (full text)
Guidelines	WMS CPG summaries ; WMS epinephrine recommendations	WMS summaries; agency protocols	Full WMS CPGs; TCCC; ERC/AHA 2025	Full WMS CPGs; ICAR; JTS PCC series; TCCC 2026; 2025 Ranger Medic Handbook	All, including the primary studies behind the CPGs
Journals	—	WEM CPG summaries	WEM; <i>Prehospital Emergency Care</i>	WEM; JSOM; <i>Resuscitation</i> ; Air Medical Journal	WEM; HAM&B; <i>Resuscitation</i> ; J Travel Med
Credential goal	WFR (recert 2–3 yrs)	WEMT; FAWM	AWLS; FAWM	WP-C (± FP-C / CCP-C); FAWM	AWLS; FAWM ; DiMM
CE habit	Annual scenario refresh	Quarterly skills	Monthly journal review	Journal club + CPG tracking	Conference CME; teach and author

STAYING CURRENT: CYCLE CALENDAR		
Source	Last	Next expected
WMS CPGs	2024 cycle	2029 (5-year review)
ERC / AHA resuscitation	2025	2030
TCCC Guidelines	1 May 2026	As needed
ICAR MedCom	Rolling	As published
AWLS textbook	v3.11 (2025)	Next version
Auerbach's Wilderness Medicine	7th ed.	8th ed. forthcoming

PROTOCOL MAINTENANCE LOOP
1. Watch: PubMed alerts for “wilderness” + WEM, and for ICAR, ERC and TCCC releases. 2. Appraise: population, setting, grade. 3. Compare: update the WMS vs. AWLS tables in this guide. 4. Decide: the Medical Director approves any change. 5. Train: brief the team, update the field guide pages, and log the version.

CHECK YOURSELF (ANSWERS BELOW)
1. A climber at 4,200 m is ataxic and confused. First action? 2. A runner collapses confused at a hot race finish; temp 41.2 °C. Cool or transport first? 3. An avalanche victim is dug out pulseless after 25 min. Priority? 4. Field rewarming water temperature for frostbite (WMS)? 5. Can a WFR certification authorize IV access? Answers: 1) HACE: descend + dexamethasone 8 mg. 2) Cool first (immersion), stop at ~39 °C. 3) ≤60 min burial → asphyxia: clear the airway, rescue breaths ASAP, CPR. 4) 37–39 °C. 5) No. Scope comes from license, agency and Medical Director. Version control: print the version and review date on every copy and retire old copies from kits.

