Background

This is a proposal for a standard ASRC Patient Record Form. This would be a “best practice” available to Groups to use if they wish. Groups could also develop and use their own forms, provided they gather appropriate information and submit a copy to the ASRC Medical Committee.

Keeping patient records is a generally good thing. It helps those caring for the patient later on in the patient’s course. It can help us plan better for future medical and first aid needs if we review them for patterns. It can help us improve care by using actual patient interactions as teaching tools (“Quality Improvement”).

Creating a good patient record during a search and rescue operation is hard. As a result, patient records from search and rescue medical incidents generally suck. Even ones from incidents where I provided the care and also made my own record of the medical care suck. Mea culpa.

Within AMRG (the ASRC’s Allegheny Mountain Rescue Group) we decided to do something about this. Given the context for charting, we decided not to have high expectations. We simply wanted a field patient record system that didn’t suck. Meaning that it fulfilled all the needs for a patient record, even if not all that well. (Sort of like Google’s “Don’t be Evil.”)

We considered doing a cellphone app, sending information back to a central server. Given the number of technophiles and computer-science people in AMRG, it seemed like a fun project. But then we realized the downsides:

- No connectivity in caves.
- No connectivity in deep valleys.
- Cellphones are sort of fragile and don’t like getting wet; waterproof cellphone cases make them very klunky to use.
- Cellphones don’t work well in deep winter.
- Cellphone screens are hard to see in bright summer sunlight.
- Speech recognition on phones makes narratives easier, but doesn’t work when there’s poor connectivity, or lots of noise.
- We really need to give a copy of the medical record when we turn the patient over to “street” EMS, and nobody wanted to meet this need by giving away their cellphones.

We reluctantly abandoned the idea of a cellphone app, with the option to revisit it at some point. We decided to go with pen and paper.
**Patient Record Form Functions and Characteristics**

This is what AMRG came up with:

- Small: Fits in a cargo pocket, big shirt pocket, or parka pocket.
- Big: big enough to reasonably write on.
- Light.
- Durable.
- Works in rain and snow. (Need water-resistant paper).
- Should be 2-part “NCR set” forms so that you can make two copies at the same time, one to keep and one to give to “street” EMS, and the binder should have a solid backing so the yellow copy is legible.
- Should have mnemonics with it, either on the forms themselves or on a separate page, to help remind us how to do good medical charting.
- Should follow principles of good forms and good information design, as expressed in *Forms for People* and the work of Yale’s Edward Tufte.
- Can add additional reference pages for not only medical reference material, but also generic SAR references.

**Considerations**

**Paper**

We looked into water-resistant and waterproof paper. You can get plastic “paper” that is entirely waterproof, sort of like Tyvek. Both Rite-in-the-Rain and Relyco (Revlar) make it. However, nobody makes it in 2-part NCR-set forms, which we really, really need. So for now, we’re stuck with using the Rite-in-the-Rain wax-impregnated water-resistant paper if we want NCR-set 2-part forms.

**Binder**

We considered using the Rite-in-the-Rain binder that many have used for cave surveying and have found very, very sturdy. It’s model #210, is 5-5/8”x7-1/2” and takes Franklin-Covey style pages or paper punched by a Franklin-Covey style hole punch (widely available). It takes 4”x6.5” loose-leaf paper. People liked the sturdiness but thought it too big and bulky to be practical.

We also considered a quick-and-dirty but much smaller notebook made out of two pieces of plastic, cut to slightly larger than 4”x6” and bound at the bottom with some duct tape. The pages would be connected to the binder with a single binder ring in the top right. (See the diagrams in the accompanying ASRC-Patient-Record-Simple-Cover-01.pdf.) When, at an AMRG meeting, we passed around the yellow 3-ring binder and the kludge with two bits of plastic and duct tape, the membership unanimously preferred the version with duct tape. When we later passed around Ben’s prototypes, they got an even better reception:

AMRG’s Ben McCandless has developed a prototype more elegant flat “checkbook.” Prototypes were distributed to Group representatives at the Retreat, and pictures are in this PDF portfolio. It:

1. Is tougher.
2. Provides a secondary storage area in the rear for completed forms.
3. Has been laser-engraved with a logo.
4. Is just really slick.

Development is continuing.
Mnemonics and Reminders

We finally decided on a mixed strategy as far as mnemonics and reminders. Reminders for the most essential information will be on the forms themselves, but more detailed mnemonic will be on separate pages. This would allow people to select pages with those mnemonics they felt most useful, or make up their own. (We encourage those who make up their own to share.)

Information Design

We carefully reviewed the principles of forms design; see, for example:


and


and selected the following to apply to our work:

- Emphasize the information we’re entering, not the explanatory text or lines.

- In writing areas, deemphasize the lines so that the text is more visible.

- Leave lots of room for free writing, using prompts outside the writing area to indicate what needs to be written, unconstrained by boxes. Given there isn’t much room on a small page, need to be flexible to accommodate different charting needs.

- Make checkboxes big enough to enclose an X or checkmark.

Data Items

We made up a list of data we want to capture:

- Reminders for important stuff, including “Page # of #”. This requires a bit of training; you fill in the "page" number as you start a new page, and the "of" number once it’s all done.

- Patient ID information. We decided (after quite a bit of discussion) that, given that space is at a premium, subsequent pages could have just a name and a page number.

- On the first page, date and time. On subsequent pages, patient name and time, but no date. We figured (after much discussion) it will not be a problem to get pages in order after the fact, as long as we have name and time. Having page number will make it that much easier.

- The more detailed elements of a history that may be appropriate in the backcountry.

- A time-saving checklist with the elements of clearing the cervical spine in the field by protocol. Note: you might be able clear the cervical spine even if a patient doesn't meet all these criteria, with medical direction from a physician.

- Additional pages for generic timed entries (especially important for many-hour cave rescues).

- No rigid blocks for vital signs and physical exam reassessment. Instead, there should room for time and whatever you want to write. For example, if you wrote: 1230 hrs 140-22-110/70-93%RA anyone could probably figure out which vital signs are which.
**Holes**

One of the advantages of using a system with a single hole in the top left is that there only needs to be a single hole in the pages.

**Homunculi**

We discussed the possibility of using a homunculus (diagram of a body) initially as aid for a cellphone app, but later as part of a paper charting system. This email excerpt addresses this:

I have a lot of experience with medical charting software, indeed have a website devoted to the usability of medical software which features charting software:


I’ve used and analyzed a lot of medical charting software, some using the homunculus approach you suggest. While it’s visually attractive, the vast majority of users find it doesn’t help. Narrative text with an occasional drawing seems to work much better, and ends up being the user’s choice.

For example, I am at MedExpress right now, and in front of me I have a computer with DocuTAP on it, the charting system that is used here.

One of the screens offers a homunculus to click to select a template (sore throat, ankle injury, etc.), and then a simple multicolumn list of templates to click as an alternative method to choose.

I have yet to find a single person who uses the homunculus, and that’s about 40 people I’ve surveyed.

In DocuTAP, mall anatomic diagrams on which you can draw with the mouse are available, and about 5-10% of the people use this. But most just use text, using standard anatomic terminology ("5x3 inch partial thickness burn R anterior shin") as it’s faster and easier. Maybe on a phone, using your finger, we could get more efficient drawing, and it might be more attractive, as I would think that people can draw better with a finger than a mouse. On the other hand, phone screens are small, and your finger covers up what you’re drawing.

So in practice, homunculi seem to take up space on the screen but not offer much if any advantage to text. But it looks great on your webpage when you’re trying to sell a charting product.

**References**


AMRG is custom-building some more complex folders which will be documented in separate document. If those are not available, you may use the shapes below to mark and cut pieces of plastic that will serve, though not as well.

Bottom, with hole for binder ring

Top, with cutout for binder ring and ASRC sticker. Top and bottom attached at lower edge with duct-tape hinge.
Figure 1: Assembled binder showing cover.
A single binder ring attaches the sheets to the binder. The AMRG logo is laser-etched. I have played with it a bit: I rubbed an orange grease pencil back and forth across it and then wiped off the excess. Note the hole in the front cover has a slit in it so the cover can be detached from the binder ring.
Figure 2: Cover opened.

You can unsnap the cover from the binder ring, then insert your thumb to hold the cover open, exposing the Patient Record Forms.
Figure 3: Patient Record Form flipped over onto cover, ready for writing.
Figure 4: showing the 2-part NCR set Rite-in-the-Rain forms.
Figure 5: Storage in Back.

The back cover may be hinged away, providing storage for completed Patient Record Forms.
Medical Reporting Format

Team Identifier ("Team Alpha")

Medic Name and level of training

Chief Complaint

History
- History of Present Illness
- Past Medical History
- Medications
- Allergies

Physical Exam

Field Diagnoses (or problem list)

Scene
- Weather
- Terrain
- Resources
- Prior Treatment
- Evacuation Time Estimate

Evacuation Priority
- Hasty (Very Urgent) or
- Urgent or
- Routine or
- Delayed (Bivouac)

Treatment Now

Plans for Possible Problems During Evacuation

"Clearing the C-Spine" (NEXUS Criteria, direct quote)
- absence of tenderness at the posterior midline of the cervical spine
- absence of a focal neurologic deficit
- normal level of alertness
- no evidence of intoxication
- absence of clinically apparent pain that might distract the patient from the pain of a cervical-spine injury

Shoulder Dislocations
- Check and document distal CMS/NVI incl. "patch area" and forearm.
- Can pt. bring affected hand to opposite shoulder? If so, unlikely is shoulder dislocation.
- Palpate for deformity: AC sprain? Humerus fx?
- Pain medications, muscle relaxants, suggestion, or hypnosis; ask patient to relax muscles
- Stimson method: face down on ledge/table, padding under shoulder at edge; attach weight to elbow or wrist and monitor for neurovascular impairment from weight; use other method if no results in 30 minutes.
- Milch technique: traction upwards.

Emergency Water Disinfection
- if dirty, flocculate (alum or white campfire ash)
- 8 drops Betadine(r)/L for 30 minutes; use more or leave longer if dirty or very cold water
- 4 cc of Clorox 5% bleach for 40 L (10 gallons) overnight; double if have to use in an hour

Inspired by the teachings of the Wilderness EMS Institute (WEMSI)
Neurological Exam

- Mental Status
- Cranial Nerves:
  - “How many fingers?” [CN II, optic: vision]
  - “Look up, look down, look right, look left.” EOMI (ExtraOcular Motions Intact) [CNs III, IV, VI, oculomotor, trochlear, abducens: move eyes in all directions]
  - “Close your eyes and say ‘now’ when you feel a touch.” {forehead, cheek, chin}) [CN V, trigeminal: bilateral face sensation]
  - “Smile; raise your eyebrows.” [CN VII, facial: bilateral face strength]
  - “Which side do you hear the sound on?” {rub fingers next to ear, then other} [CN VIII, auditory: hearing]
  - “Hold your shoulders up.” {press down on shoulders} {alternate: have patient turn head against resistance} [CN XI, accessory: elevates shoulders, turns head side to side]
  - “Stick out your tongue” {tongue in midline?} [CNXII, hypoglossal: protrudes tongue]
  - Not tested: CN I, olfactory: smell; CN IX, glossohyparyngeal: sensation back of throat; CN X, vagus: parasympathetic to internal organs
- Sensory: light touch, pinprick
- Motor: strength
- Deep Tendon Reflexes: forearm [brachioradialis], elbow [biceps], knee jerk [patellar], ankle jerk; also response to stroking lateral sole (“Babinski”: normal is down > 1 yr. old.)
- Cerebellar: “finger -> nose,” “heel -> shin,” gait (“Walk a straight line, heel to toe.”)
The following pages represent optional reference material that may be added at the back of a stack of forms in the ASRC Patient Record notebook. These pages could be printed on more durable waterproof plastic paper, rather than Rite-in-the-Rain paper. Unfortunately, plastic paper 2-part sets are not available.

Inspired by the teachings of Wilderness Medical Associates (WMA)
Identification
- Calling another station: give that station’s call, followed by yours. “Base, this is Team Delta…”
- When ending a conversation, give your call and then the proword clear. “…Team Delta clear.”
- Base announces time & license call sign on each half hour.
- In convoys, the Leader also announces the call sign at least every 30 minutes. When no COMCTR (Base) is operating, or no mobile station has been designated Leader, and always on CB, you must give the license call sign at the beginning and end of each conversation.

ASRC Callsigns
- Public Safety: WPEZ758
- Business: WQEU871
- The COMCTR is Base.
- The lead vehicle in a convoy is Leader.
- The DO is Dispatch preceded by a Group name (e.g. Blueridge Dispatch).
- Your field team uses its letter designator, e.g., Team Alfa, Team Bravo.
- If your team is tasked as a relay, you identify as Relay rather than Team, e.g., Relay Alfa, Relay Bravo.
- Within a team, you use functional titles followed by your team’s letter, e.g., Leader Alfa, Rescue Alfa, Medic Alfa, Radio Alfa. Or, Left Wing Alfa, Brake Alfa, Haul Alfa.
- If you are on a sub-team, or acting as a secondary radio operator, use your team letter plus a number, e.g., Charlie Two.
- If you are on staff in Base, use your ICS title or common abbreviation, e.g., Ops, this is Plans. Comms, this is Logistics.
- If you can’t figure out a functional callsign, use your last name, e.g., Jones, this is Smith.

International Telecommunication Union (ITU) Phonetic Alphabet

<table>
<thead>
<tr>
<th>Alphabet</th>
<th>Phonetic</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alfa* (AL fah)</td>
<td>Alfa</td>
</tr>
<tr>
<td>B</td>
<td>Bravo (BRAH voh)</td>
<td>Bravo</td>
</tr>
<tr>
<td>C</td>
<td>Charlie (CHAR lee)</td>
<td>Charlie</td>
</tr>
<tr>
<td>D</td>
<td>Delta (DELL tah)</td>
<td>Delta</td>
</tr>
<tr>
<td>E</td>
<td>Echo (ECK oh)</td>
<td>Echo</td>
</tr>
<tr>
<td>F</td>
<td>Foxtrot (FOKS trot)</td>
<td>Foxtrot</td>
</tr>
<tr>
<td>G</td>
<td>Golf (GOLF)</td>
<td>Golf</td>
</tr>
<tr>
<td>H</td>
<td>Hotel (hoh TELL)</td>
<td>Hotel</td>
</tr>
<tr>
<td>I</td>
<td>India (IN dee ah)</td>
<td>India</td>
</tr>
<tr>
<td>J</td>
<td>Juliett* (JEW lee ETT)</td>
<td>Juliett</td>
</tr>
<tr>
<td>K</td>
<td>Kilo (KEY loh)</td>
<td>Kilo</td>
</tr>
<tr>
<td>L</td>
<td>Lima (LEE mah)</td>
<td>Lima</td>
</tr>
<tr>
<td>M</td>
<td>Mike (MIKE)</td>
<td>Mike</td>
</tr>
<tr>
<td>N</td>
<td>November (no VEM ber)</td>
<td>November</td>
</tr>
<tr>
<td>O</td>
<td>Oscar (OSS cah)</td>
<td>Oscar</td>
</tr>
<tr>
<td>P</td>
<td>Papa (pa PAH)</td>
<td>Papa</td>
</tr>
<tr>
<td>Q</td>
<td>Quebec (keh BECK)</td>
<td>Quebec</td>
</tr>
<tr>
<td>R</td>
<td>Romeo (ROW me oh)</td>
<td>Romeo</td>
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<tr>
<td>S</td>
<td>Sierra (see AIR rah)</td>
<td>Sierra</td>
</tr>
<tr>
<td>T</td>
<td>Tango (TANG go)</td>
<td>Tango</td>
</tr>
<tr>
<td>U</td>
<td>Uniform (YOU nee form)</td>
<td>Uniform</td>
</tr>
<tr>
<td>V</td>
<td>Victor (VIK tah)</td>
<td>Victor</td>
</tr>
<tr>
<td>W</td>
<td>Whiskey (WISS key)</td>
<td>Whiskey</td>
</tr>
<tr>
<td>X</td>
<td>X-Ray* (ECKS ray)</td>
<td>X-Ray</td>
</tr>
<tr>
<td>Y</td>
<td>Yankee (YANG kee)</td>
<td>Yankee</td>
</tr>
<tr>
<td>Z</td>
<td>Zulu (ZOO loo)</td>
<td>Zulu</td>
</tr>
</tbody>
</table>

Numbers are spoken digit by digit except for multiples of 100 or 1000.

0 (ZE RO) 1 (WUN) 2 (TOO) 3 (TREE) 4 (FOW er) 5 (FIFE) 6 (SIX) 7 (SEV en) 8 (AIT) 9 (NIN er) 100 (HUN dred) 1000 (TOU SAND) 16 One, Six 20 Two, Zero 35000 Three, Five, Thousand 1800 One, Eight, Hundred 3664 Three, Six, Six, Four

Light signals: use hand over source as shutter. Wigwag flags: flag to sender’s right is dot, flag to sender’s left is dash. Send slowly.

* NATO Military Phonetic Alphabet spells thusly: Alpha, Juliet, Xray
### Message

<table>
<thead>
<tr>
<th>Message</th>
<th>Whistle Light Voice</th>
<th>Hands Flags Lights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble/ Help</td>
<td>Help Help Help</td>
<td>Waving to get attention</td>
</tr>
<tr>
<td>Status One</td>
<td>Hey One</td>
<td>Don’t Cross Touchdown</td>
</tr>
<tr>
<td>Status Two</td>
<td>Hey Two Two</td>
<td>Similar to Trouble</td>
</tr>
<tr>
<td>Status Three</td>
<td>Hey 3 3 3</td>
<td>Cross and Uncross Dead Ball</td>
</tr>
<tr>
<td>Come to Me/ Send Evac Team</td>
<td>Come Heeere</td>
<td>Roll</td>
</tr>
<tr>
<td>Don’t Come to Me/ Don’t Send Evac Team</td>
<td>Don’t Come Heeere</td>
<td>Wave Away</td>
</tr>
<tr>
<td>Affirmative</td>
<td>Morse Code C</td>
<td>Nodding</td>
</tr>
<tr>
<td>Negative</td>
<td>Morse Code N</td>
<td>Shaking</td>
</tr>
<tr>
<td>Read Back</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Read Back</td>
<td></td>
<td></td>
</tr>
<tr>
<td>That is Correct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Spell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure the Net</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear the Net</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status One</td>
<td>Subject found; alive and well.</td>
<td></td>
</tr>
<tr>
<td>Status Two</td>
<td>Subject found; alive, needs evacuation.</td>
<td></td>
</tr>
<tr>
<td>Status Three</td>
<td>Subject found; dead.</td>
<td></td>
</tr>
</tbody>
</table>

### This is
- Precedes identification.

### Over
- It is your turn to transmit, I am listening.

### Go Ahead
- I am ready to receive your message.

### Roger
- I have satisfactorily received your message. **Does not** mean yes.

### Affirmative
- Yes.

### Negative
- No.

### Stand By
- Wait a moment (other stations keep out).

### Clear*
- I have no more traffic, but I will be listening.

### Out*
- I am turning off my radio.

### Say Again
- Repeat your last transmission. **Do not** say “repeat”: means another artillery barrage.

### I Say Again
- I will repeat what I have just said (or last transmission).

### Say Again __
- Asking last station to repeat the indicated specific information.

### Correction
- I have made an error; what follows is correct.

### Prepare to Copy
- Write this down. (Wait for **Go Ahead** before sending message.)

### Read Back
- For verification, read back the message I just sent you.

### I Read Back
- I am reading back your message for verification.

### That is Correct
- I verify that you have received or relayed my message correctly.

### Spell
- Spell out your message with phonetics.

### Spell __
- Spell phonetically the indicated specific information.

### I Spell
- A phonetic spelling follows.

### Figures
- Numerals and letters follow which do not spell words.

### Secure the Net
- Protect following radio traffic. Sensitive information to follow.

### Clear the Net
- All stations cease transmission. Priority traffic to follow.

### Status One
- Subject found; alive and well.

### Status Two
- Subject found; alive, needs evacuation.

### Status Three
- Subject found; dead.

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* NATO Military and some dispatchers use **Out** to mean the same as the ASRC’s **Clear**.
Use two fingers in a V to form a sight. Line up eye, mirror, fingers and aircraft. Move mirror back and forth so you see the light flashing across the bottom of your finger-sight. On real operations, ASRC members have successfully signaled a aircraft using just the blade of a Swiss Army knife as a signal mirror.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>II</td>
<td>X</td>
</tr>
<tr>
<td>Serious Injury</td>
<td>Require Meds</td>
<td>Unable to Proceed</td>
</tr>
<tr>
<td>F</td>
<td>K</td>
<td>→</td>
</tr>
<tr>
<td>Require Food and Water</td>
<td>Indicate Direction to Proceed</td>
<td>Am Proceeding This Direction</td>
</tr>
<tr>
<td>△</td>
<td>LL</td>
<td>N</td>
</tr>
<tr>
<td>Safe to Land Here</td>
<td>All is Well</td>
<td>Negative</td>
</tr>
<tr>
<td>Y</td>
<td>JL</td>
<td>T</td>
</tr>
<tr>
<td>Affirmative</td>
<td>Not Understood</td>
<td>Wind Direction</td>
</tr>
<tr>
<td>O</td>
<td>!</td>
<td>🔰</td>
</tr>
<tr>
<td>Require Map and Compass</td>
<td>Require Comms Equipment</td>
<td>Affirmative</td>
</tr>
<tr>
<td>△</td>
<td>🔰</td>
<td>🔰</td>
</tr>
<tr>
<td>Negative</td>
<td>Understood</td>
<td>Not Understood</td>
</tr>
</tbody>
</table>
The following pages represent optional reference material that may be added at the back of a stack of forms in the ASRC Patient Record notebook. These pages could be printed on more durable waterproof plastic paper, rather than Rite-in-the-Rain paper. Unfortunately, plastic paper 2-part sets are not available.

**SAMPLE history**
- Symptoms
- Allergies
- Meds
- Pertinent history
- Last ate/drank
- Events prior

**BCLS**
- Circulation
- Airway
- Breathing

**3 Hs**
- Hypothermic
- Hungry
- Dehydrated

**AVPU Mental Status**
- Alert
- Verbal response
- Pain response
- Unresponsive

**Military MARCH 1° Survey**
- Massive hemorrhage
- Airway
- Respiration
- Circulation
- Head trauma/Hypothermia

**Signs of Trauma**
- Deformities
- Contusions
- Abrasions
- Punctures/Penetrations
- Burns
- Tenderness
- Lacerations
- Swelling

**Pediatric ABC Triangle**
- Airway & Appearance
  (Open/Clear – Muscle Tone /Body Position)
- Work of Breathing
  (Visible movement/Respiratory Effort)
- Circulation to Skin
  (Color/Obvious Bleeding)

**Pelvic Binder IF** suggestive mechanism of injury AND ONE OF
- Hemodynamically unstable,
- Pulse >100 and systolic blood pressure <90,
- GCS <13 (decreased level of consciousness),
- Distracting injuries present, OR
- Patient complaining of pelvic pain.

**Swiss Hypothermia Grading, and Treatment Guidelines**

**HT I:** Conscious, shivering
- Typical core temp: 35-32°C (95-90°F)
- Warm environment and clothing, warm sweet drinks, active movement.
- May be treated in field and released per medical command or per Group protocols.

**HT II:** Impaired consciousness, not shivering
- Typical core temp: 32-28°C (90-82°F)
- Avoid movement or head-up position, insulate, aggressive rewarming (hot packs, charcoal vest), warm IV fluids, warm humidified air or O₂, and cardiac monitoring.
- If SBP <90 mm Hg, or ventricular arrhythmias, or core temp <28°C (82°F), try for air transport to tertiary care hospital with cardiac bypass/ECMO (extracorporeal membrane oxygenation) capabilities.

**HT III:** Unconscious, not shivering, vital signs present
- Typical core temperature 28-24°C (82-75°F)
- Manage as per HT II, above, plus: if needed, invasive airway.
- If possible, air transport to tertiary care hospital with cardiac bypass/ECMO (extracorporeal membrane oxygenation) capabilities.

**HT IV:** No vital signs (check for 60 seconds for pulse)
- Typical core temp: <24°C (<75°F)
- Do not attempt/cease resuscitation (consult medical command if possible) if:
  - obvious signs of irreversible death
  - CPR not possible during evacuation, or unsafe for team
  - valid DNR order
  - avalanche burial ≥ 35 minutes, airway packed with snow, and asystole on monitor
  - Manage as per HT II and III, initiate standard CPR
  - May interrupt and resume CPR if needed during evacuation, as may survive despite pauses in CPR; might survive hours of basic CPR.
  - IV or IO access, up to 3 doses of 1 mg of epinephrine IV or IO, and defibrillate up to 3 times.

(common first aid/EMS/medical mnemonics 0.4

Nontechnical and Semi-Tech Evac Calls

CLEAR! A call by The Belayer during semi-tech evacuations, uphill or downhill: the rope is clear of the tree or belay device and ready to switch over to the next tree or belay device.

DOWN FAST! Lower the litter down somewhat faster. Usually a call from The Litter Captain to The Belayer. The Belayer echoes.

DOWN SLOW! Lower the litter down slowly. Usually a call from The Litter Captain to The Belayer. The Belayer echoes. Whistle equivalent: 2 Short Whistles (NCRC standard: “Down,” ASTM rope rescue standard: “Down”)

FALLING! I am falling, or the litter is falling.

FORWARDS! From The Litter Captain to the litter team: start carrying the litter forwards.

HAUL! Pull on the haul line. Call from the member who has just reset the haul Prusik to the haul team. Whistle equivalent: 2 Short Whistles (NCRC standard, ASTM rope rescue standard: “Up”)

LADDER! In the context of toenailing a litter up a short steep bit, or across an obstacle, from the new Litter Captain to the litter team: keep your feet planted, and lift the litter a short distance up the hill or across or around the obstacle to where the two new litter bearers can grasp the litter rail.

OFF BELAY! From The Litter Captain, or a climber, or a rappeller, to The Belayer. I no longer need to be belayed. Paired with a call from The Belayer: BELAY OFF! (The Belayer always says the word BELAY first.)

OFF ROPE! I am no longer attached to the rope. May be qualified, such as OFF ROPE RED! or OFF ROPE LINE 3! May be used after a rappel, an ascent, or after being belayed.

ON BELAY! From The Litter Captain, or a climber, or a rappeller, to The Belayer. I am attached to the belay rope and ready to be belayed. Not a question. Paired with a call from The Belayer: BELAY ON! (The Belayer always says the word BELAY first.)

ON ROPE! I am attached to the rope. May be qualified, such as ON ROPE RED! or ON ROPE LINE 3! Used mostly for rappelling and ascending.

ONE-OH! In the context of a downhill semi-tech evac, from The Belayer to The Litter Captain and The Downhill Ropehandler: you’ve got about 10’ (3 m) of rope left.

PRELOAD! In the context of a downhill semi-tech evac, from The Litter Captain to The Belayer: do not let any rope slip as we load the rope. The Belayer echoes.

READY! [pause] DOWN! Prepare to lower; sound off if not ready; pull out and squat to gently set the litter down.

READY! [pause] LIFT! Prepare to lift; sound off if not ready; pull out to lift up the litter.

READY TO LADDER! In the context of toenailing a litter up a short steep bit, or across an obstacle, from The Litter Captain to the litter team: front four bearers, plant your feet, shift your hands back a bit, and the back two bearers peel off and move up the hill or across or around the obstacle to the head of the litter.

READY TO ROTATE! During a nontechnical evacuation, from The Litter Captain to the next set of relief bearers: step off the trail and be ready to grab the back of the litter when we come through.

RESET! Drop the haul line and move the Z-haul Prusik back toward the load. Call from the member who checked that the ratchet Prusik has gripped the rope to the rest of the haul team.

ROCK! Something is falling; something other than me (see FALLING!). All echo.

ROPE! I am casting a rope over a cliff or into a pit. Watch out, and also if you can, check to see if the rope made it all the way to the bottom.

ROTATE! During a nontechnical evacuation, from the new back-left litter bearer to the litter bearers ahead: I and my partner have hold of the litter and it’s time to start shifting forwards on the litter.

SET! Gradually release tension on the Z-haul line until the ratchet Prusik is engaged. Call from the member best able to see that the team can make no more progress.

SLACK! Let out some rope. May be quantified as, for example, SLACK ONE FOOT! The Belayer echoes. (Sometimes used instead of RESET! in cave rescue)

STOP! Meaning 1: In the context of a technical rescue or semi-tech evac, from anyone to everyone: major safety issue, everyone stop! Everyone echoes. Whistle equivalent: 1 Short Whistle (NCRC standard, ASTM rope rescue standard)

Meaning 2: In the context of a nontechnical litter carry, from The Litter Captain to the litter team: stop walking.

STOP, STOP, WHAT STOP?! Why has movement stopped? or, Why is progress delayed? Usually a question from The Litter Captain to The Belayer. Concern is that the lowering has stopped; the lowering rope has snagged, and a dangerous amount of slack may be developing in the upper portion of the lowering rope if The Belayer lets out more rope. Everyone echoes. Developed by the National Cave Rescue Commission but appropriate to above-ground rescues as well.

The series of four words, even if the actual words cannot be made out, is an easily-recognizable call for a potentially fatal safety problem. Whistle equivalent: 4 Whistles (not NCRC standard but should be)

TENSION! Take any slack out of the line but don’t lift or move the litter or climber. Usually a call from The Litter Captain or a climber to The Belayer. In technical rescue, may be TENSION MAIN! or TENSION BELAY! The Belayer echoes.

TWO-OH! In the context of a downhill semi-tech evac, from The Belayer to The Litter Captain and The Downhill Ropehandler; you’ve got about 20’ (6 m) of rope left.

UP FAST! Haul the rope/load up faster. Usually a call from The Litter Captain to the haul team. The response NO PANTS WAY! is not an accepted call. The leader of the haul team echoes.

UP ROPE! From The Litter Captain or a climber: take in the belay rope; or, take in the belay rope faster if you can.

UP SLOW! Haul the rope/load up slowly. Usually a call from The Litter Captain to the haul team. The leader of the haul team echoes.
Shoulder Dislocation Reduction: Cunningham Technique

- Patient’s arm adducted (held close to chest), elbow at 90 degrees. Injured arm rests on rescuer’s upper arm.
- Apply minimal downward pressure.
- Massage Trapezius, Deltoid, Biceps -> Repeat.
Shoulder Dislocation Reduction: FARES (modified Milch)
Apply gentle traction.
Start anterior-posterior oscillations
Slowly ABduct (move away from chest) to 90 degrees then externally rotate (rotate arm into the waving position).
Continue oscillations and abduction to 120 degrees.

Shoulder Dislocation Reduction: Scapular Manipulation
Push inferior tip of scapula medially with slight lateral displacement of superior tip.
Ottawa criteria for ankle injury with ankle pain

1. If able to bear weight 4 steps at any point after injury, may not need ankle X-rays; if unable, needs X-rays. Next:
2. Palpate for tenderness of the inferior posterior 6 cm (2½”) of either lateral or medial malleolus; if no tenderness, does not need ankle x-rays; if tender, needs X-rays.