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 People¹ and the work of Yale’s Edward Tufte.²⁴⁻⁶
- 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:

http://ed-informatics.org

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.
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.
Patient Record Form 0.7 8/27/14

Name, age, sex, date of birth, weight:

Date/time

Hx: Chief Compl., Hx of Present Illness, Past Medical Hx (allergies, meds), Family/Social Hx; SAMPLE: Signs and Symptoms, Allergies, Meds, Last meal, Events leading to problem.

VS: pulse, respirations, BP, temp, O2 sat.

Physical:

Deformities, Open inj., Tenderness, Swelling

Field Diagnoses: C-spine Clearing:

Alert, no intoxication

No distracting injury

No neck pain

No neck tenderness

No numbness, tingling, weakness

Normal motor and sensory exam

Painless motion of neck

Reason for clearing?

BP, temp, O2 sat.

Cut 1: 7.5"
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 Triage**
- Massive hemorrhage
- Airway
- Respiration
- Circulation
- Head trauma/hypothermia

**DCAP-BTLS**
- Deformities
- Contusions
- Abrasions
- Punctures/
  - Penetrations
- Burns
- Tenderness
- Lacerations
- Swelling

**DOTS**
- Deformities
- Open injuries
- Tenderness
- Swelling

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

**SOAP note**
- Subjective
- Objective
- Assessment
- Plan

Common first aid/EMS/Medical mnemonics
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

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

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

I Spell A phonetic spelling follows.

Spell ___ Spell phonetically the indicated specific information.

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.

* NATO Military and some dispatchers use Out to mean the same as the ASRC’s Clear.

<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>— •</td>
<td>Don’t Cross Touchdown</td>
</tr>
<tr>
<td>Status Two</td>
<td>— • •</td>
<td>Similar to Trouble</td>
</tr>
<tr>
<td>Status Three</td>
<td>— • • •</td>
<td>Cross and Uncross Dead Ball</td>
</tr>
<tr>
<td>Come to Me/ Send Evac Team</td>
<td>—</td>
<td>Roll</td>
</tr>
<tr>
<td>Don’t Come to Me/ Don’t Send Evac Team</td>
<td>— • •</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>Rope: Stop</td>
<td>—</td>
<td>Stop! Stop all movement until further instructions. (ASTM 1768)</td>
</tr>
<tr>
<td>Rope: Up</td>
<td>— • •</td>
<td>Up! Up! Moving towards anchor, or needs to move towards anchor. (ASTM 1768)</td>
</tr>
<tr>
<td>Rope: Down</td>
<td>— • • •</td>
<td>Down! Down! Down! Moving away from anchor, or needs to move away from anchor. (ASTM 1768)</td>
</tr>
<tr>
<td>Rope: Free</td>
<td>— • • • • Free! Free! Free! Free! At the end of a climb, rappel, raise, or lower. (ASTM 1768)</td>
<td></td>
</tr>
</tbody>
</table>
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 an aircraft using just the blade of a Swiss Army knife as a signal mirror.