



# Wilderness Medicine Institute of NOLS

## WMI Curriculum Enrichment - Medical Decision-Making

Tod Schimelpfenig, Curriculum Director  
January 2007

We leave our Wilderness First Responder (WFR) or Emergency Medical Technician (EMT) course with honed skills, but I suspect in the back of many of our minds is the question "Will I make the right decisions in an emergency."

As an outdoor leader you'll make decisions. Some are simple and routine. Some are made in the midst of uncertainty, with limited information and at the edge of your experience and training.

Outdoor leaders are familiar with the concept of judgment - a process of forming an assessment, analyzing and comparing information and options, and developing an opinion. Indeed, we have the highest regard for "good judgment". Medicine has a similar culture where "clinical judgment" is highly valued; to be a respected physician you must have it.

Judgment is reasoning under uncertainty. It's not a straightforward decision clearly based on solid scientific evidence, nor is it a random choice. Clinical judgment combines science, treatment protocols and personal experience with your assessment and insights. Clinical judgment ranges from the critical (whether to evacuate someone with a belly ache), to the commonplace (whether to bandage a blister). Clinical judgment and wilderness judgment can have common elements of missing data, conflicting information, urgency and the possibility the decision will harm more than it helps.

As an ambulance EMT I make an assessment, provide necessary treatment and in most cases transport. I don't often make the decision whether the patient needs to see the doctor or not.

In the wilderness I may have to make this decision, and it can affect the patient's health, the safety of my expedition members, and the quality and success of our planned journey. This is an understated difference between urban and wilderness medicine.

This article will highlight a few common decision-making methods and show how you can take the information, skills, treatment and evacuation protocols you're learned in your wilderness medicine course and use them to make decisions with good clinical judgment.

### **Making Medical Decisions**

We make choices all the time. We may have expertise in a situation and decide subconsciously and quickly. We may use a rule of thumb or follow a protocol or algorithm. We may gather information and make a reasoned decision, or without being conscious of it, we might guess.

Guessing isn't always bad. If consequences are low it saves time and provides the solace of action. In medicine however, the consequences can be high. We don't want to guess when the patient's health is at stake.

### **The Role of Protocols, Treatment and Evacuation Guidelines**

Just as NASA has protocols for weather conditions to launch or land the space shuttle, and wilderness programs may have protocols about traveling in poor weather conditions, medical professionals use protocol, standing orders and algorithms to guide treatment and evacuation decisions. These are pre-determined decision points. They may be the evacuation guidelines you learned in your WMI course. They may be program specific protocols supported by a physician medical director.

It can be very helpful to have decisions decided before you encounter the situation. Thank goodness we don't need to choose the ratio of compression to breaths every time we do CPR. Protocols however, are not a substitute for judgment. Cookbooks are best used by thinking cooks. Every patient is unique. Algorithms useful for classic signs and symptoms can discourage independent and creative



## Wilderness Medicine Institute of NOLS

thinking when the picture is vague. There may be a patient who does not trigger a protocol, for example does not meet any of WMI's abdominal pain triggers, but still warrants evacuation.

### The Expert's Intuition

Research suggests that experts recognize specific patterns, finds clues within those patterns, and then quickly sort the clues. Experts intuitively recognize a situation, evaluate and accept or reject choices without lengthy side-by-side comparisons. This is called the expert decision model, expert intuition, natural decision-making or a pattern recognition model. It's attractive and seductive.

An experienced WFR can look at a patient's appearance, see subtle clues, recognize a pattern and come up with a hunch as to what is wrong - "This guy is having a heart attack." An experienced rescuer can look at a map and the terrain and quickly know whether a litter-carry will be over shortly or take all night. The operative word here is experience. Most of us are outdoor professionals first, and medical providers second. We need to be honest about our medical experience, or lack of it.

Intuition is refined by remembering when you were wrong. As we'll comment on later in this article, this can be a challenge.

Intuition is most helpful in urgency. We rarely need to be urgent in the wilderness. It takes time to do anything in the wilderness, time we can use to make reasoned, intentional decisions.

### Rules of Thumb

Heuristics, simple "rules of thumb," are common problem-solving aids, mental short cuts that we adopt from your experience. We use heuristics in everyday decisions, often without thinking.

In carpentry: "Measure twice, cut once."

In baseball: "Freeze on a line drive until you see it through the infield."

In science: "Choose the simplest hypothesis to explain a set of observations."

Medicine is full of heuristics. Sometimes they are represented in models such as the many medical "triads" e.g.: "Shortness of breath, pain and bloody sputum suggest a pulmonary embolus" or "Pain, amenorrhea and bleeding suggest an ectopic pregnancy."

Sometimes they are heard in saws such as "Red and yellow, kill a fellow. Red and black, venom lack." This is used to identify the Coral Snake found in the U.S. We trust heuristics because we assume they are proven over time and supported by statistics or science. In fact, they may not be based on facts. Unfortunately, as soon as you cross the border into Mexico and head south, this heuristic doesn't work.

Using the mental short cuts of intuition or rules of thumb can be expeditious. They are valuable tools when we must think, then act. Intuition and heuristics may allow you to decide quickly in a crisis, but leaves us vulnerable to error.

### Hazards in Decision-Making

There isn't a perfect way to make a decision. Every method has traps. If you're self-aware as a leader you're honest about your human frailties, tendencies and biases. These are just a few of the dangers that lie in the fog of decision-making, and some thoughts on how to avoid falling into the pit.

*Cognitive biases*, tendencies developed from experience, are a lens through which we view a problem; e.g., a habit of jumping quickly to a diagnosis, without asking a complete spectrum of background medical history questions. *Diagnosis momentum* happens when a diagnosis becomes a label despite incomplete evidence or discrepancies. We know the trap of making the terrain fit the map by distorting the shape of the hill with wishful thinking. The same thing happens in medicine. Cherry-picking only a few features of an illness can cause a *pattern recognition* error. We close our minds to new information and alternative explanations and solutions.



## Wilderness Medicine Institute of NOLS

The *common diagnosis* is an easy pit in which to fall. “When you hear hoof beats, think of horses, not zebras” (unless, of course, you are in Africa). When we hear headache in the wilderness we think dehydration. Common things are common, yet we must be cognizant of the most potentially serious alternative diagnosis. Treat the patient for the most statistically probable problems on your list and, in case you are wrong, consider the most serious possibility.

It may help your decision to ask three questions: What is common? What is the worst case? What can I rule out? Coughing, fatigue and malaise at altitude could be a flu-like illness, a common occurrence, or High Altitude Pulmonary Edema (HAPE), much less common, and much more dangerous. Can you rule out HAPE with a thorough assessment, clear lung sounds and an absence of any shortness of breath? A surprising number of medical diagnoses are made on the basis of what something is not, rather than what it is. Can you use your thermometer to measure if a fever accompanies these signs and symptoms, suggesting the flu-like illness? Can you descend, a treatment for HAPE, and see if the patient improves? If they don't get better, you have valuable information suggesting this may not be altitude illness.

Decision-making is not an objective and rational process free from the intrusion of emotion. We can typecast the person - the whining student, the disheveled stinky drunk, - and fit the patient into the easy, yet incorrect assessment slot. If we have an emotional hook from a recent or vivid scenario we may over estimate the probability of event, e.g. confuse hyperventilation for asthma. Cognition and emotion are woven together into the fabric of our limbic system. Be wary about ‘going with your gut’ when the gut is a strong emotion, positive or negative, about a patient.

It's tough to recognize when we make errors in judgment. Peers may be reluctant to comment on patient care, especially if the situation was stressful and they are concerned with your emotional state. The patient may have been whisked away by helicopter. In this time of HIPPA it's harder to learn what really happened to the patient. We're not given the gift of accurate and timely feedback.

Give your SOAP report to someone not involved in the patient care to read and analyze. The detached reader may see something that the first responder, too worked up by the patient presentation, missed.

A distinct source of mistakes is the mysterious actions of random chance. Consider the WFR or WEMT who evaluates a patient for a cough, decides it is HAPE and brings the patient down in altitude. The cough resolves, the WFR or WEMT think they saved a life and righted a wrong, but we'll never really know if it was early HAPE, an irritated throat, or an upper respiratory infection that resolved by coincidence. This experience may lead to an overestimation of the WFR or WEMT's talent, and a bias in their next decision.

### **How do I avoid these hazards?**

Be realistic. Human stumble into these traps. Self-awareness and watchfulness give you a better chance to catch yourself before you fall.

Seek feedback. Call the life flight crew. Flight medics often like to complete the loop and educate the first responders. Compare what you learn with your original impressions. Know what these common biases and pitfalls are, and mull them over as you make your decision. Are you influenced by a recent, dramatic patient? Are you biased by preconceptions? Is the information you're using accurate? Are you ignoring information contradicting your assumptions? Can you use a written resource, or another person to bounce your impressions off?

Be thorough and careful with your assessment. If you are not sure about your history or physical exam, go back and do it again. Maybe you missed something, or maybe the patient has changed. Good decisions are based on good information. You obtain this information in your PAS.



## Wilderness Medicine Institute of NOLS

### Organized Decision-Making – The Patient Assessment System

In contrast to Malcolm Gladwell's "Blink", which made the seductive power of intuition popular, Jerome Groopman's "How Doctor's Think" presents a contrasting view with old fashioned virtues of careful, deliberate and systematic thinking – the process we use in our Patient Assessment System.

As a WFR or EMT you are expected to manage a broad spectrum of disease presentations, from the obvious to the obscure, the common to the catastrophic. You may be an experienced provider with an especially difficult problem, or a well-trained WFR or WEMT making a decision for the first time in the field. In either case a systematic approach of gathering information, weighing alternatives and deciding what is best can be a valuable tool. It can help you organize and survey factors that will go into a thorough and well-reasoned decision. Here is a simple analytical decision model.

- Describe what needs to be decided. Define the problem. *e.g.: We're out of stove fuel?*
- Gather information *e.g.: Do a careful fuel inventory*
- Identify options, choices, alternatives. *e.g.: Can we cook on fires? Do we have food that does not require cooking? Are we willing to be hungry?*
- Identify parameters for the decision. *e.g.: "Bottom line....We need to feed the clients."*
- Compare the options. What are the consequences? *e.g.: Without fuel we have limited food to eat and we cannot melt snow for water.*
- Decide, implement and evaluate. *e.g.: We need to send a team to obtain fuel.*

We use a similar model to make many of our medical decisions. A medical model of an analytical decision process begins with the PAS and the SOAP report. These are tools we know how to use.

- *Describe what needs to be decided. Define the problem.*  
The PAS gives us a sense of the urgency of the problem. The initial assessment identifies threats to life and the chief complaint, which will likely be the focal point of the decision.

There are many important decision points in wilderness medicine (i.e. deciding if abdominal pain warrants an evacuation) and less acute questions (i.e. determining if an ankle injury is unusable) but the ultimate goal is identifying who is sick and who is not-- hence the importance of good data gathering in both the initial assessment and the remainder of the PAS.

- *Gather Information.*  
The PAS gathers information in the patient exam, the measurement of vital signs and the SAMPLE history.
- *Identify options, choices and alternatives.*  
In the "A" or assessment part of SOAP we use the findings from our assessment to create a list of the problems.

In the "P" or plan we list solutions. We're bridging the gap between the information we've gathered and the development of options, choices and alternatives.

- *Identify parameters for the decision.*  
Are there clear boundaries on this decision such as limits to your resources or route options? For example, helicopters are not available, or you cannot cross the river on the evacuation route? Do you have treatment or evacuation protocols or orders from your medical director or organization to guide or dictate your decision?
- *Compare the options.*  
In the anticipated problems part of SOAP we consider consequences of this injury or illness changing or deteriorating, and sketch a response to these scenarios.



## Wilderness Medicine Institute of NOLS

- *Decide, implement and evaluate.*

An ongoing PAS gives us results of our choices, more information and potentially different options. Don't be afraid to repeat your assessment to check unclear findings or look for changes.

### **So, how do I deal with an emergency?**

Thankfully, most decisions in the wilderness are not urgent, and you have the time for an analytical approach. If it is an emergency, here are some tips to help us do the right thing.

#### *Stay Cool*

One of the physiological effects of stress is the "fight or flight" response. We can't think clearly and rationally. Our heart races. We sweat, tremble and breath fast. How we keep our cool while we surf this adrenaline rush is unique to each of us. I don't worry about the perfect choice. I seek choices that work. I try to slow things down. I mentally open a jar of calm and spread it over the scene.

#### *Have Confidence in Your Training*

Our graduates tell us time and again that responding to their first emergency after their course was "just like a scenario." They use the PAS system. Their training takes over and guides them through the crisis.

Jeff Holmes, MD wrote "Think like a doctor, act like an WEMT. While I may have more education and experience that allows me to have a higher order of thinking, I need to go back to the important basic skills, the skills a WMI trained WFR or WEMT is good at. I took my WEMT over 12 years ago, but the skills I learned are so solid and systematic that I use them as an emergency physician today."

#### *Remember the Basics*

If you get lost, return to the initial assessment, the ABC's, the "circle of life." These are the threats to life. Once these are stabilized take a breath, look around and proceed with the remainder of the assessment.

#### *Look Around*

Situational awareness is paying attention to what is happening around you. This is the leadership skill of vision. Pause after the initial assessment. Look around. Check again for hazards. Look at your people, the patient, the scene. See the big picture. Take another deep breath and finish your assessment.

#### *Tolerate the Uncertainty*

It's not necessary to be certain of the problem. There is a lot of gray in medicine. A definitive diagnosis can be elusive.

#### *Train*

If you haven't done an assessment in awhile, take a refresher course. Even professionals who use their skills regularly need refresher courses.

#### *Use Time well*

When the situation cools, check your choices. After the scene is under control (often in the back of the ambulance on the way to the hospital) I systematically review my assessment and double-check my decision.

Time is on our side in the wild (although not necessarily on the patient's side). This is not an urban 911 response with the expectation of prompt delivery of the patient to the hospital. Your decision can affect not only the patient, but also the rest of your group. Use the time you have to make careful decisions.

We've chosen to provide medical care for people, and with this comes the challenge to do good work. Stick to basics and your practiced systems and you'll do just fine.



## Wilderness Medicine Institute of NOLS

Acknowledgements: Thanks to Jeff Holmes MD, Gates Richards, Shana Tarter and Lance Taysom for their helpful comments on this article.

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