INNOVATIONS IN WILDERNESS MEDICINE

Seth C. Hawkins, MD
Wilderness Risk Management Conference
October 31, 2019
STRUCTURE

32 Chapters

• Section One: Principles of WEMS Systems
• Section Two: Management of Wilderness Medical Conditions
• Section Three: Medical Interface with Technical Rescue Operations

52 Authors

• Alaska to Florida, Maine to New Mexico

Audience
WHAT IS WILDERNESS MEDICINE?

Duration of Time to Definitive Care?

Environmental Medicine?

Remote Care?
INNOVATIONS: DEFINITIONS

Anthropology-driven definition of wilderness medicine:

*Medical care and problem-solving when the surrounding environment has, or has been allowed to have, more power over us than does the infrastructure (and underlying social structure) of our civilization.*

_WEMS Intro:3_
INNOVATIONS: DEFINITIONS

• Wilderness medicine:
  medical care delivered in those areas where fixed or transient geographic
  challenges reduce availability of, or alter requirements for, medical or
  patient movement resources.

• Wilderness EMS:
  the systematic and preplanned delivery of wilderness medicine by
  formal health care providers

WEMS 1:22-23
Also Auerbach’s Wilderness Medicine 7e and NAEMSP 2e
SO…

- Do experiential education training programs, camps, etc provide wilderness EMS services?
INNOVATIONS: DEFINITIONS

Independonym
initials that no longer reference, or never referenced, an underlying meaning or definition.

@hawkvox
Seth Collings Hawkins

EmergencyMedicineNews @EM... · 4h
@hawkvox introduces a new word to the English language: #independonym.

WEMS Intro:11
INNOVATIONS: HISTORY

- 6 page timeline
- Premodern Era: Prehistory-19th Century
- Early Modern Era: First Half of 20th Century
- Golden Era of Growth: Late 1960s-Early 1980s
- Consolidation, Expansion, & Academic Era: Late 1980s-2006/2013
- Consensus & EBM Era: 2006/2013-Present Day

WEMS 1:29-35
INNOVATIONS:
EVIDENCE-BASED MEDICINE

“Because we’ve always done it that way.”
INNOVATIONS: EDUCATION

• WFR vs WEMR

• Box 2.1: US-based WM & WEMS Training Organizations
• Box 2.8: Current Medical Student Electives with WM Focus
• Box 2.9: Current WM Fellowships
INNOVATIONS: EDUCATION

Organizational Nomenclature

- **Wilderness medicine school**: has its own proprietary curriculum and its own instructors
- **Outdoor school**: uses an external WM school’s curriculum, often has its own instructors (but not required), multiple WM offerings
- **Program host**: uses an external WM school’s curriculum, uses external instructors, few WM offerings, and WM is not its primary institutional mission
INNOVATIONS: TRANSITIONS IN CARE
DAWSON ET AL, 2001-2012 LIT REVIEW OF CONCERNS IN PATIENT HANDOFF

• Professional relationships, respect, barriers to communication
• Need for structure or handover tool
• Multiple/repeated handovers
• Education and training in handovers
• Vital signs
• Documentation and other data formats
INNOVATIONS: TRANSITIONS IN CARE

Box 6.1

Minimum Key Information per National Association of EMS Physicians (NAEMSP) Position Paper on Transfer of Patient Care

- Vital signs
- Treatment interventions
- Time of symptom onset (for time-sensitive illnesses)
- Copies of results of medical testing performed by emergency medical services (EMS)

## Verbal Communication Tools

<table>
<thead>
<tr>
<th>Mnemonic</th>
<th>Description</th>
<th>Background/Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital-Based Tools</strong></td>
<td></td>
<td></td>
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<tr>
<td>SBAR</td>
<td>Situation, Background, Assessment and Recommendations</td>
<td>Developed from the US Navy into medical tool by Kaiser.</td>
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<tr>
<td></td>
<td></td>
<td>Recommended by the Joint Commission's Institute for Healthcare Improvement.</td>
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<tr>
<td></td>
<td></td>
<td>and the National Australian Clinical Handover Initiative.</td>
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<tr>
<td></td>
<td></td>
<td>Institute for Healthcare Improvement, and National Australian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clinical Handover Initiative</td>
</tr>
<tr>
<td>I-PASS</td>
<td>Illness Severity, Patient Summary, Action Items,</td>
<td>Studied as a resident transition of care tool.</td>
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<tr>
<td></td>
<td>Situation Awareness and Contingency Plans, Synthesis by Receiver</td>
<td>Demonstrated statistically significant decrease in medical errors</td>
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<tr>
<td></td>
<td></td>
<td>and preventable adverse events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extensive training process required for use of the tool.</td>
</tr>
<tr>
<td><strong>Out-of-hospital Based Tools (both In-Person and Pre-Arrival)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAP ± SAMPLE</td>
<td>Subjective, Objective, Assessment, Plan ± Signs/Symptoms, Allergies,</td>
<td>Well known to most EMS providers</td>
</tr>
<tr>
<td></td>
<td>Medications, Past Medical History, Last Int/Outs, Events Leading to Illness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commonly used in England and Wales.</td>
</tr>
<tr>
<td>SBAR</td>
<td>Identification, Situation, Background, Assessment and Recommendations</td>
<td>Variation of SBAR, emphasizes need to introduce patient and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>identify providers involved in transition of care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential benefit in transitioning care of an acutely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>decompensating patient</td>
</tr>
<tr>
<td>DaMIST</td>
<td>Demographics, Mechanism of injury/illness, Injury or illness found, Signs,*</td>
<td>Adopted from Military Medicine originally used in civilian trauma</td>
</tr>
<tr>
<td></td>
<td>Treatment given</td>
<td>Limited Data to support use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Familiar to providers (especially UK, Australia).</td>
</tr>
<tr>
<td>MIST-AMBU</td>
<td>Identification, Mechanism/Medical complaint, Signs,* Treatment—Allergies,</td>
<td>May reduce need for clarifying questions, reduce duration of</td>
</tr>
<tr>
<td></td>
<td>Medications, Background (PMHs), Other (Social)</td>
<td>handoff, and lead to fewer repetitions of handoff.</td>
</tr>
</tbody>
</table>

* Denotes objective

WEMS 6
INNOVATIONS:
PSYCHOLOGICAL FIRST AID
& STRESS INJURIES

Laura McGladrey
Overwhelmed, Alone, Helpless
1. Safety
2. Calm
3. Connection
4. Self-Efficacy
5. Hope

Laura McGladrey, aka “Glad,” is a family and psychiatric nurse practitioner who specializes in emergency medicine, mental health and traumatic stress, especially in the wilderness and remote parts of the world. She has been an instructor with NOLS Wilderness Medicine since 1999.

WEMS 10:192-195
<table>
<thead>
<tr>
<th>Recommended Terminology</th>
<th>Commonly Used Terminology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distress</td>
<td>Trauma</td>
</tr>
<tr>
<td>Anguish</td>
<td></td>
</tr>
<tr>
<td>Tormented</td>
<td></td>
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<tr>
<td>Overwhelmed</td>
<td></td>
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<tr>
<td>Psychological and social problems</td>
<td></td>
</tr>
<tr>
<td>Terrifying/life-threatening/horrific events/devastation</td>
<td>Traumatic events</td>
</tr>
<tr>
<td>Reactions to difficult situations</td>
<td>Symptoms</td>
</tr>
<tr>
<td>Signs of distress</td>
<td></td>
</tr>
<tr>
<td>Problems</td>
<td></td>
</tr>
<tr>
<td>Reactions to difficult situations</td>
<td>Traumatized children or traumatized adults</td>
</tr>
<tr>
<td>Signs of distress</td>
<td></td>
</tr>
<tr>
<td>Problems</td>
<td></td>
</tr>
<tr>
<td>Structured activities, community social support</td>
<td>Therapy, Counseling, Treatment</td>
</tr>
<tr>
<td>Survivors</td>
<td>Victims</td>
</tr>
</tbody>
</table>

INNOVATIONS: WORDS MATTER

• “Victims”

• Horizontal hierarchy

• Gendered language

WEMS 10:193, Intro:4-10
INNOVATIONS: MARCH MNEMONIC

Massive hemorrhage
Airway
Respirations
Circulation
Hypothermia

Military version
INNOVATIONS: MARCH MNEMONIC

Massive hemorrhage
Airway
Respirations
Circulation
Hypothermia, Hyperthermia, Hike/Helo

AWLS version
INNOVATIONS: MARCH MNEMONIC

Massive hemorrhage
Airway
Respirations
Circulation
Hypothermia, Hyperthermia, Hike/Helo/Hunker down, Hanging

Vertical Aid version
INNOVATIONS: INDIAN MNEMONIC

- Intoxication
- Neurological deficit
- Distracting Injury
- Altered mental status
- Neck pain/tenderness
INNOVATIONS:
CHANGING SPINAL TRAUMA CARE
INNOVATIONS:
CHANGING SPINAL TRAUMA CARE
INNOVATIONS: CHANGING SPINAL TRAUMA CARE

PRELIMINARY REPORTS

Out-of-hospital Spinal Immobilization: Its Effect on Neurologic Injury

Mark Hauswald, MD, Gracie Ong, MBBS, Dan Tandberg, MD, Zaliha Omar, MBBS

ABSTRACT

Objective: To examine the effect of emergency immobilization on neurologic outcome of patients who have blunt traumatic spinal injuries.
A re-conceptualisation of acute spinal care

Mark Hauswald

ABSTRACT
The emergency care of patients who may have spinal injuries has become highly ritualised. There is little scientific support for many of the recommended interventions and there is evidence that at least some methods now used in the field and emergency department are harmful. Since prospective clinical trials are not likely to resolve these issues I propose a re-conceptualisation of spinal trauma to allow a more rational approach to treatment. To do this I analyse the basic physics, biomechanics and physiology involved. I then develop a list of recommended treatment variations that are more in keeping with the actual causes of post impact neurological deterioration than are current methods. Discarding the fundamentally flawed emphasis on decreasing post injury motion and that acceptance of an innovation does not occur until individuals believe that the innovation is reasonable. This requires a theoretical model that is compatible with the proposed change. The generally accepted theoretical model of preventable post injury neurological deterioration is that visible movement of the spine as a unit is an adequate surrogate for movement at the injured site and that movement at the injured site causes unstable segments or sharp bony fragments to ‘cut’ the cord. This leads to an emphasis on ‘immobilisation’ that is, restricting gross motion. I will show that this model violates accepted principles of injury mechanics and elementary physics and propose a re-conceptualisation of spinal trauma to allow a more rational approach to treatment.
INNOVATIONS: CHANGING SPINAL TRAUMA CARE
INNOVATIONS: SPINAL CORD PROTECTION

Rigid cervical collars are not a required component of patient care in a WEMS operation even in the case of suspected spinal injuries. Not only are rigid cervical collars not useful for general WEMS operations, the lack of utility for cervical collars has also been shown for teams in specific WEMS environments, such as ski patrols. For a more
Recommendation. A patient requiring extrication should be encouraged to reduce movement of
the neck, especially painful movement, and allowed to exit the situation under their own volition
if alert and reliable. If injuries or other circumstances such as unconsciousness prevent controlled
self-extrication, patients’ cervical spines should be packaged to reduce passive motion and
adequately manage the airway without a goal of absolute immobilization. There is no requisite
role for a commercially made or improvised rigid cervical collars in an out-of-hospital
environment (1C).
Recommendation. Spinal cord protection should be considered an appropriate goal in patients with actual or suspected spinal injury; current evidence suggests spinal motion restriction and not immobilization is the safest and most effective means of spinal cord protection (2C).
Recommendation. Vacuum mattress (Figure 1) provides superior motion restriction and improved patient comfort (with corresponding decreased risk of pressure sores) and is preferred over a backboard for motion restriction of either the entire spine or specific segments of concern. Backboards and other rigid carrying devices may be used for temporary patient movement if needed but should not be applied as a medical tool with an immobilization goal (1C).
INNOVATIONS: CHANGING SPINAL TRAUMA CARE
INNOVATIONS: CHANGING SPINAL TRAUMA GOALS

Spinal Immobilization (SI)

Spinal Motion Restriction (SMR)

Spinal Cord Protection (SCP)
INNOVATIONS: DROWNING

• DROWNING IS THE **PROCESS** OF EXPERIENCING RESPIRATORY IMPAIRMENT FROM SUBMERSION/IMMERSION IN A LIQUID

• THERE IS NO LONGER NEAR-DROWNING, DRY DROWNING, ETC
INNOVATIONS: BLEEDING CONTROL
INNOVATIONS: NALOXONE
INNOVATIONS: SNAKE ANTIVENOM

Venom Has Met Its Match

ANAVIP
Crotalidae Immune F(ab')2 (Equine)
INNOVATIONS: EPINEPHRINE

SYMJEPI™ (epinephrine) Injection
THE DEVICE FOR ALLERGIC EMERGENCIES THAT FITS YOUR LIFE

SYMJEPI keeps the confidence to handle allergic emergencies close at hand, wherever you are.

SYMJEPI contains the same medicine as in the most widely used epinephrine auto-injectors (EAs), and it is packaged in a compact, easy-to-carry, and ready-to-use device.*

*SYMJEPI is not an EAI.
INNOVATIONS: SAFETY THIRD

EXCLUSIVES, OPERATIONS

Safety is Third, Not First, and We All Know It Should Be

By Christopher Davis, MD, NRP, FAWM, Benjamin Abo, DO, EMT-P, FAWM, Sarah Frances McClure, DO, NRP and Seth C. Hawkins, MD, FAEMS, FACEP, MFAWM | 11.13.18

hawkaerie.org/s3
CONCLUSION & QUESTIONS

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