





Management del paziente critico in ambiente ostile

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Direttore CNSAS SNaMed
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Questions

- How much remote or hostile is a remote/hostile area?
- How big the problem is?
- Which sort of accident is more frequent?
- Which standards of treatment: what does it mean “normal” treatment in the Country (region, province) where you are? & which protocols are applicable?
- By who?
- Which devices?

definition

- **ur·ban** (ûr'bən) ^ləɪbən ^lɜːbən *adj.*

1. Of, relating to, or located in a city.

2. Characteristic of the city or city life

- **re·mote** [rɪˈməʊt] [rəˈməʊt]

adj. re·mot·er, re·mot·est

a. far away in time or place; far from any (other) village, town etc

- **hos·tile** (ˈhos-tīl) *adj.*

1. Unfavorable to health or well-being; inhospitable or adverse

An introduction to wilderness medicine

J. Matthew Sholl, MD^{a,*}, Edward P. Curcio III, MD^b

Defining wilderness and wilderness medicine

Perhaps the natural place to begin when defining wilderness medicine is to first examine the definition of wilderness. The term “wilderness” might have different meanings for different people. A traditional definition of wilderness includes “(a) a tract or region uncultivated and uninhabited by human beings, and (b) an area essentially undisturbed by human activity

backcountry skiing). In an attempt to draw together these varying descriptions, this article borrows from the wilderness EMS arena and begins by defining wilderness in terms of time from definitive care, typically 1 to 2 hours from hospital-based care. While not focusing on the

descriptions, this article borrows from the wilderness EMS arena and begins by defining wilderness in terms of time from definitive care, typically 1 to 2 hours from hospital-based care. While not focusing on the



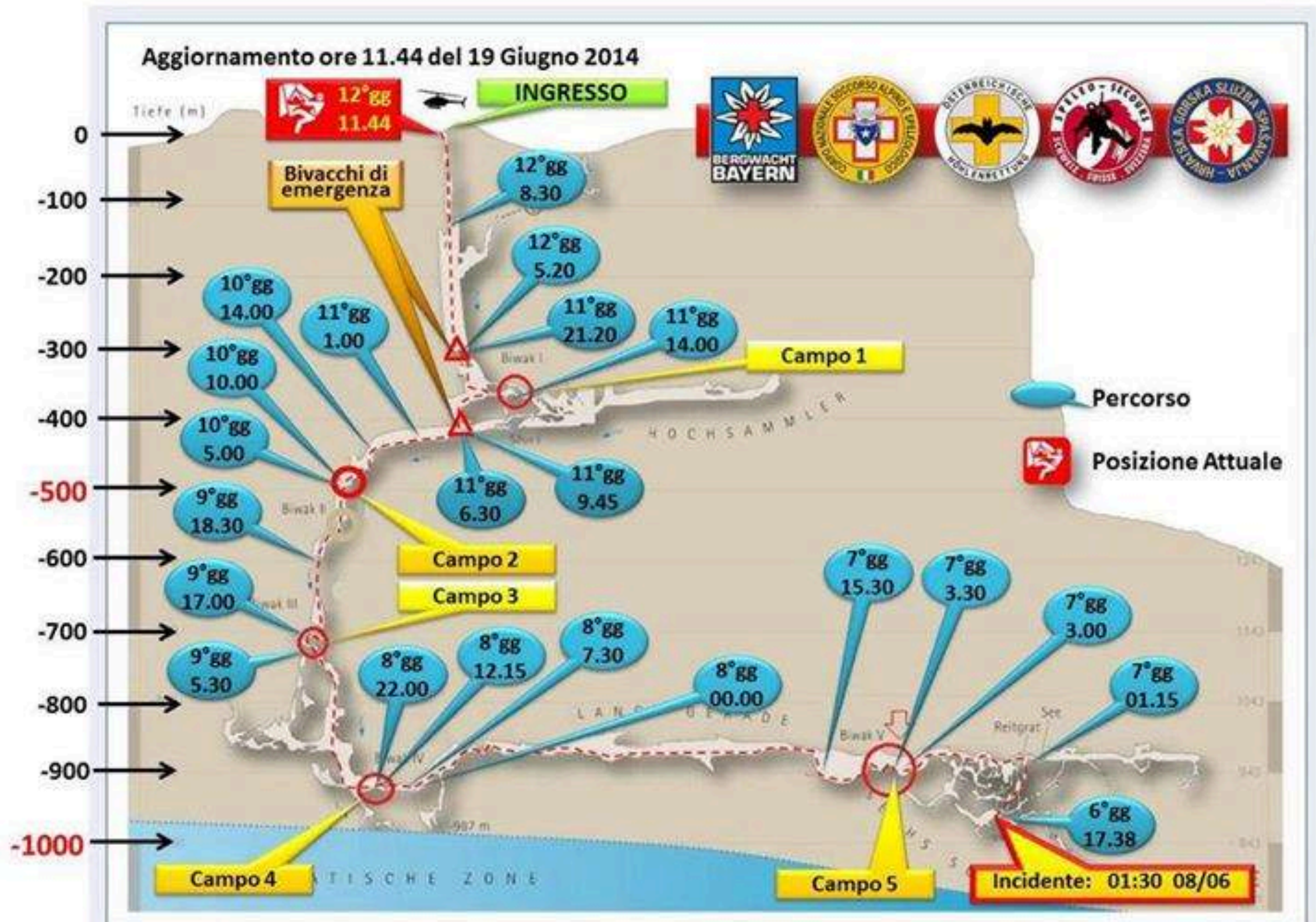


Abb. 1: Aufriss SO-NW der Riesending-Schachthöhle.

Planbearbeitung und Zeichnung: Thomas Matthalm und Ulrich Meyer 2002-2008



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Answer 1

A remote area is

A place far away in **TIME**

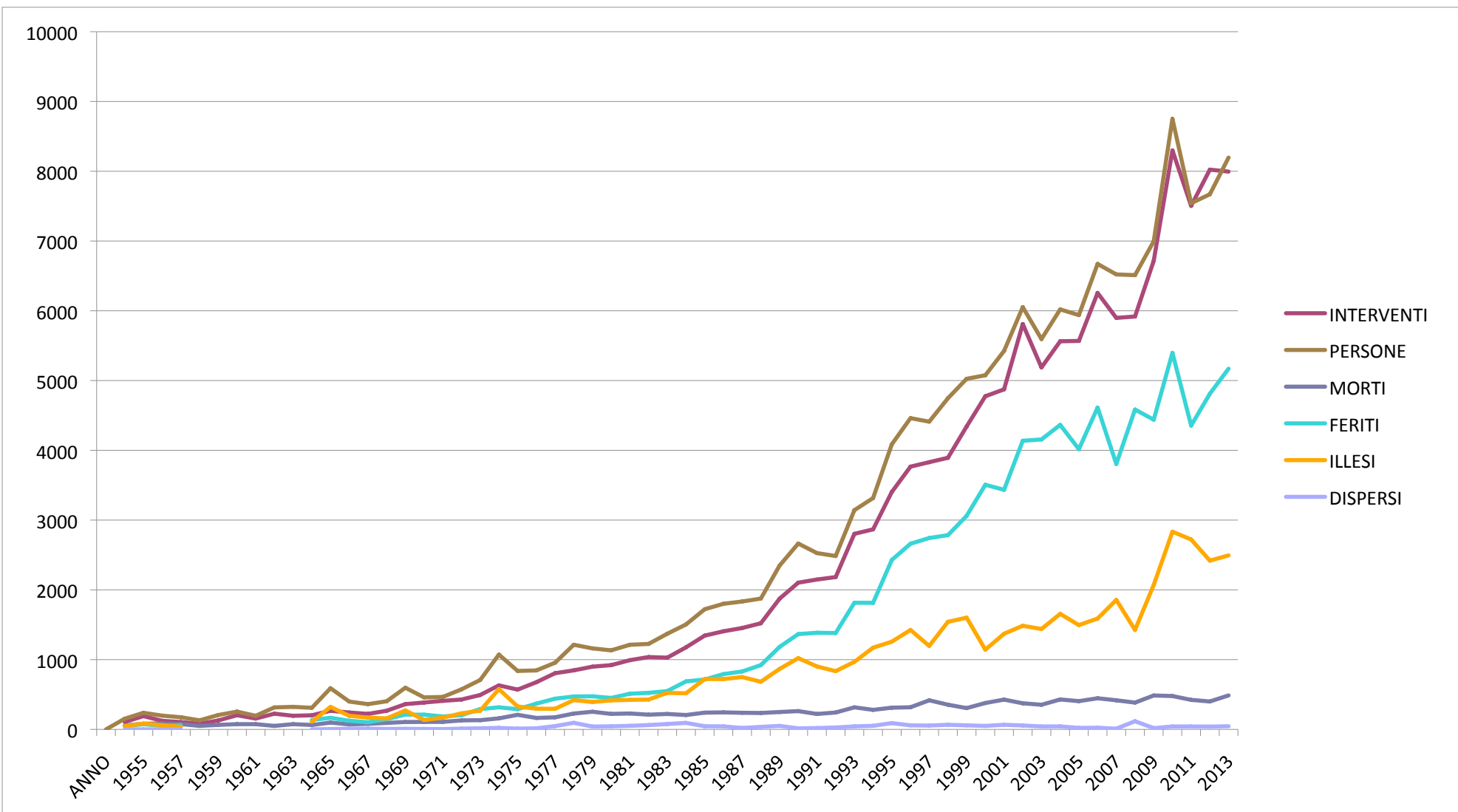
From definitive care

An hostile area is

A place **adverse to survival**

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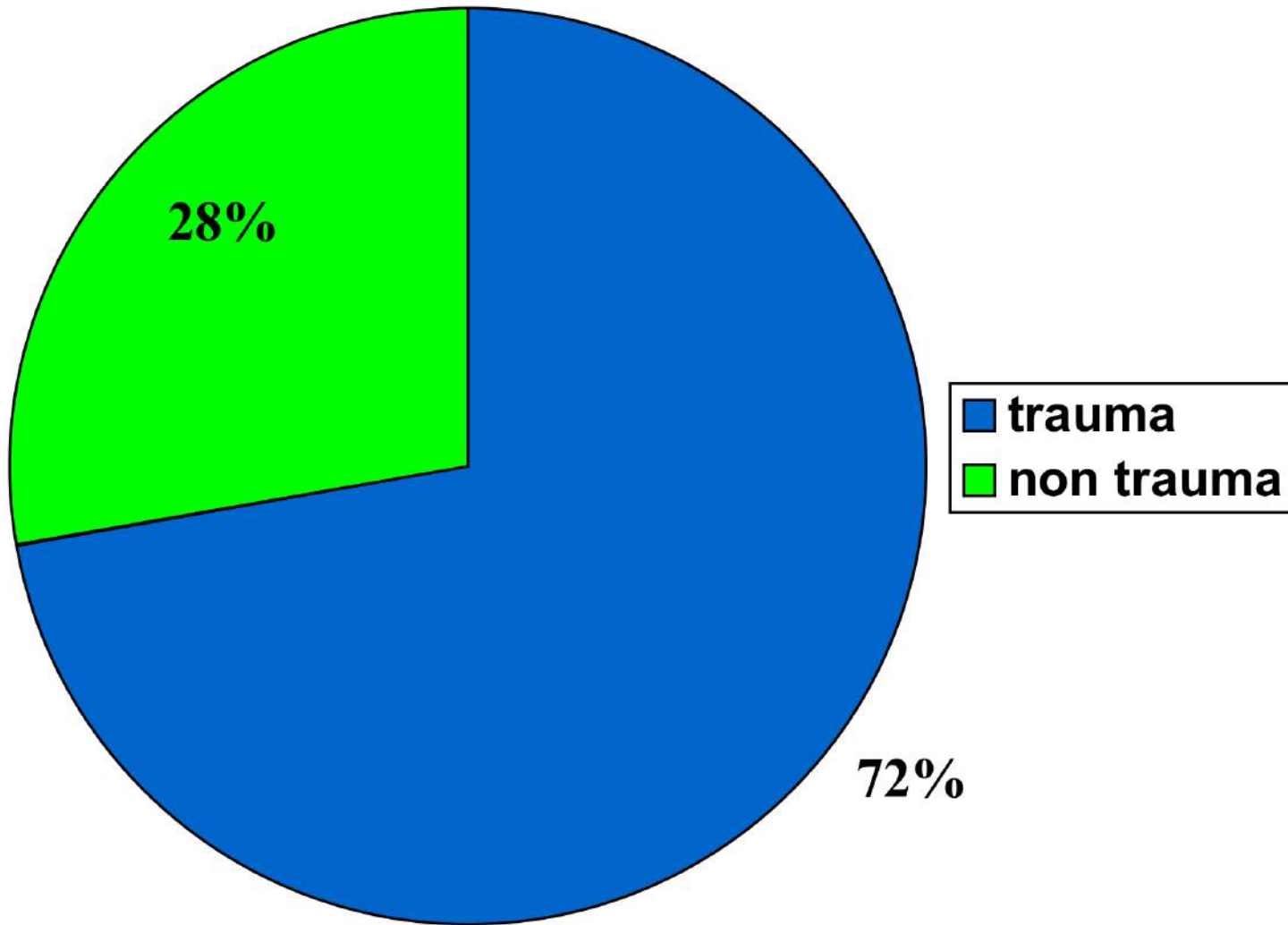
Mountain mortality: a review of deaths that occur during recreational activities in the mountains

J S Windsor, P G Firth, M P Grocott, et al.

Postgrad Med J 2009 85: 316-321

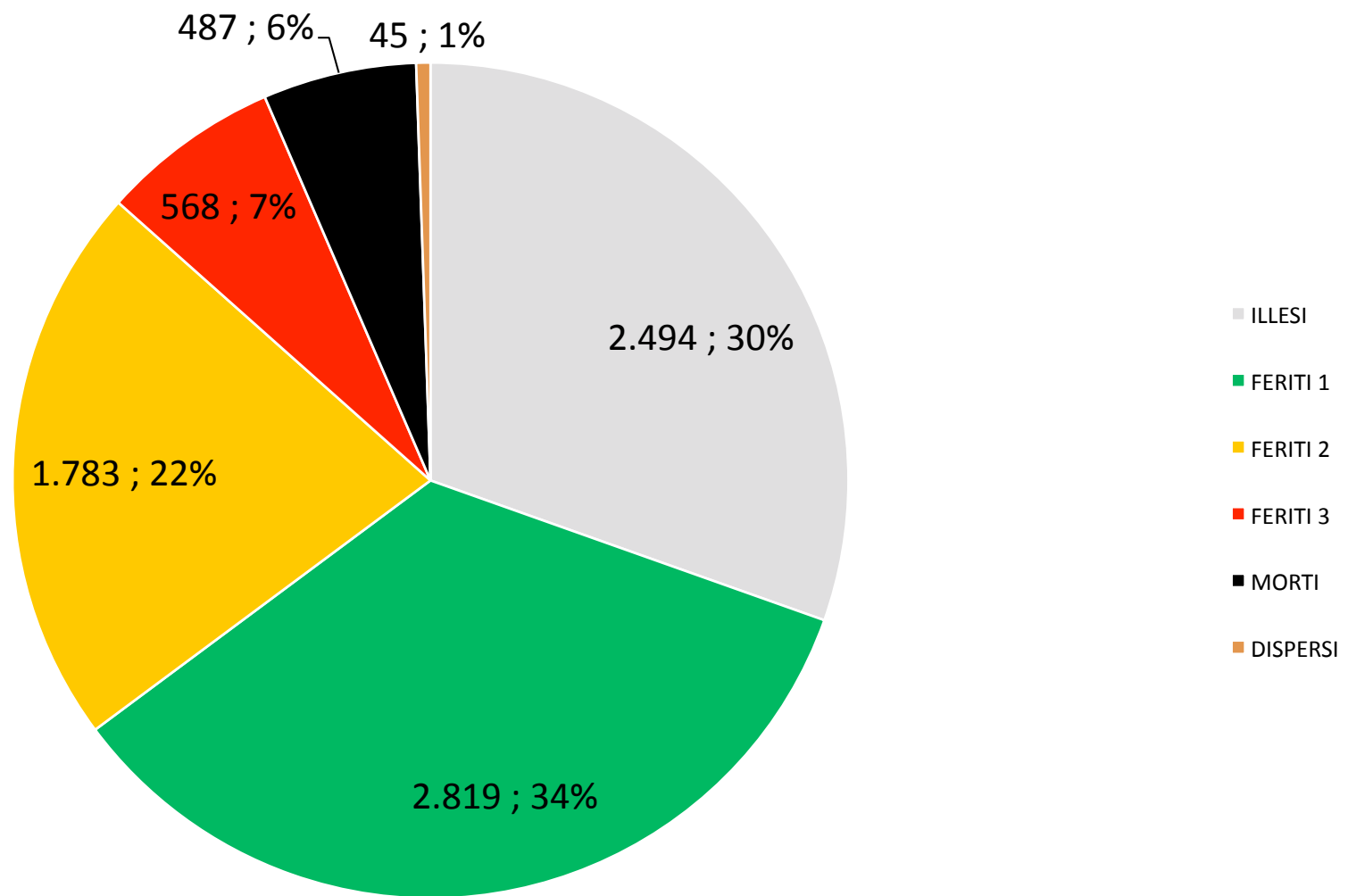
doi: 10.1136/pgmj.2009.078824

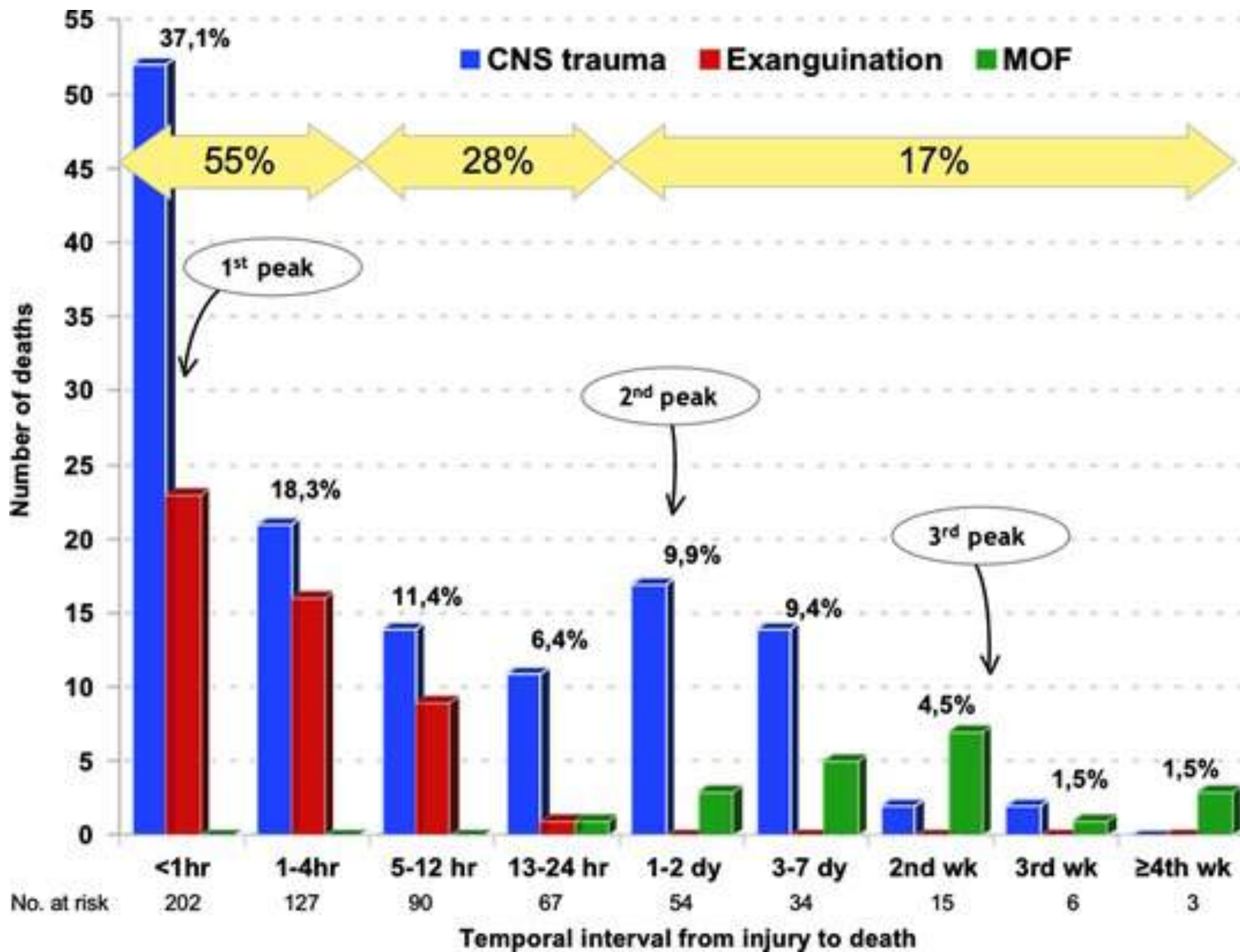
- ▶ The reported mortality rate among skiers and snowboarders is 0.11 and 2.46 deaths for every million days of exposure, while the mortality rate among mountaineers is 2.3 to 1870 deaths for every million days of exposure.
- ▶ Deaths in the mountains are most commonly due to trauma, high altitude illness, cold injury, avalanche burial, and sudden cardiac death.



74268 patients

2003-2013





Hemorrhage is More Prevalent than Brain Injury in Early Trauma Deaths: The Golden Six Hours

Vishal Bansal, Dale Fortlage, Jeanne G. Lee, Todd Costantini, Bruce Potenza, Raul Coimbra¹

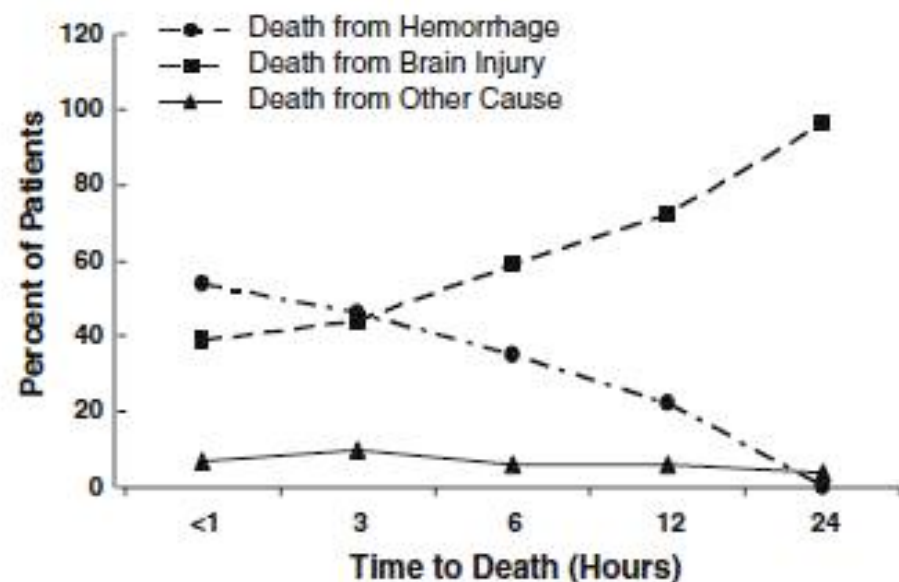


Figure 2. The temporal distribution of autopsy-determined cause of early trauma death, after categorization into brain injury, hemorrhage or other (n = 167).

Patients that die from trauma within 24 h have a very different cause of death depending on the hour they expire. Those expiring within the first 3 h die mostly from brain injury; however, hemorrhage, and its physiologic consequences, continue to be an important cause of death up to 6 h. Brain injury is the sole cause of death following 12 h. This knowledge may help in

Answer 3 (mountain)

- Trauma accounts for 70-90% of all rescues
- The mortality is higher in mountaineers than in skiers, with CNS trauma & haemorrhage as leading cause of death
- Helicopter turns a major trauma in remote area in a 'urban' accident with better outcome
- The number of incidents and injured patients are rising, fortunately the number of deaths do not increase in the same way

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Spine and Spinal Cord Trauma

Evidence-Based Management

Alexander R. Vaccaro
Michael G. Fehlings
Marcel F. Dvorak



- About OTA
- Committees
- Educational Resources
- International
- Job Opportunities
- Meetings & Exhibits

Orthopaedic Trauma Evidence Based-Medicine Resource List

Compiled and reviewed by the OTA Project Team for Evidence-Based Medicine
Committee Chair: William Obrebsky, MD
September 2007

home | info on east | annual meeting | links | contact us
fellowships and jobs | practice guidelines | members only



trauma practice guidelines

For more information on Trauma Practice Guidelines, please contact:

William J. Bromberg, M.D., F.A.C.S.
Memorial Health University Medical Center
Savannah Surgical Group
4700 Waters Ave
Savannah, GA 31404
Phone: (912) 350-7412
Email: guidelines@east.org

To see a list of current topics undergoing guideline development, [click here](#).

For more information on evidence based medicine and practice guidelines, please visit the following links:

- www.guideline.gov
- www.medecine.quebec.gc.ca
- www.swsahs.nsw.gov.au/livtrauma

Members of the American College of Surgeons can access an Evidence Based Reviews in Surgery (EBRS) module for free. It teaches critical appraisal skills to practicing general surgeons and residents so they can critically evaluate the literature and practice evidence based surgery. Visit the EBRS area at the following link:

www.facs.org/education/ebrs.html

Please read this [legal disclaimer](#).

Guideline	Pub Year	Citation	Down-load	Comments
Penetrating Intra-peritoneal Injuries	1998	J Trauma. 44(6):941-956, June 1998.	html pdf	
Prophylactic Antibiotics in Tube Thoracostomy for Trauma	1998	J Trauma. 48(4): 758-759, April 2000.	html pdf	Currently being



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Fluid Management in Traumatic Shock: A Practical Approach for Mountain Rescue

Official Recommendations of the International Commission
for Mountain Emergency Medicine (ICAR MEDCOM)

Günther Sumann,^{1,2} Peter Paal,² Peter Mair,² John Ellerton,³ Tore Dahlberg,⁴
Gregoire Zen-Ruffinen,⁵ Ken Zafren,⁶ and Hermann Brugger⁷

Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association
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Part 8: Adult Advanced Cardiovascular Life Support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

Robert W. Neumar, Charles W. Otto, Mark S. Link, Steven L. Kronick, Michael Shuster, Clifton W. Callaway, Peter J. Kudenchuk, Joseph P. Ornato, Bryan McNally, Scott M. Silvers, Rod S. Passman, Roger D. White, Erik P. Hess, Wanchun Tang, Daniel Davis, Elizabeth Sinz and Laurie J. Morrison

Circulation 2010;122:S729-S767

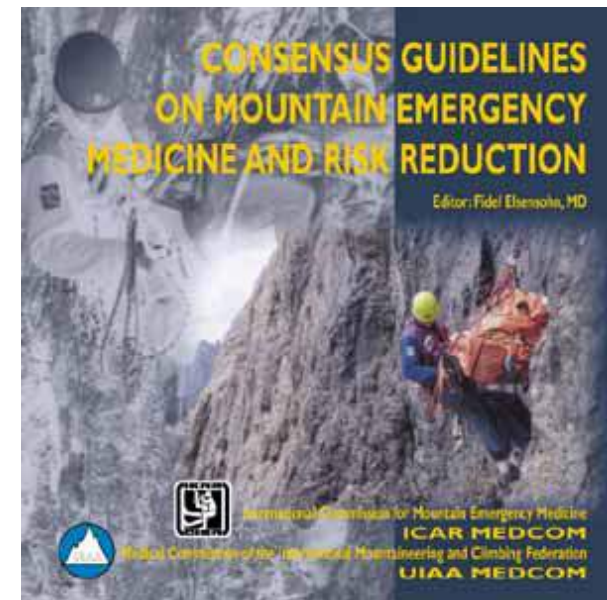
DOI: 10.1161/CIRCULATIONAHA.110.970988

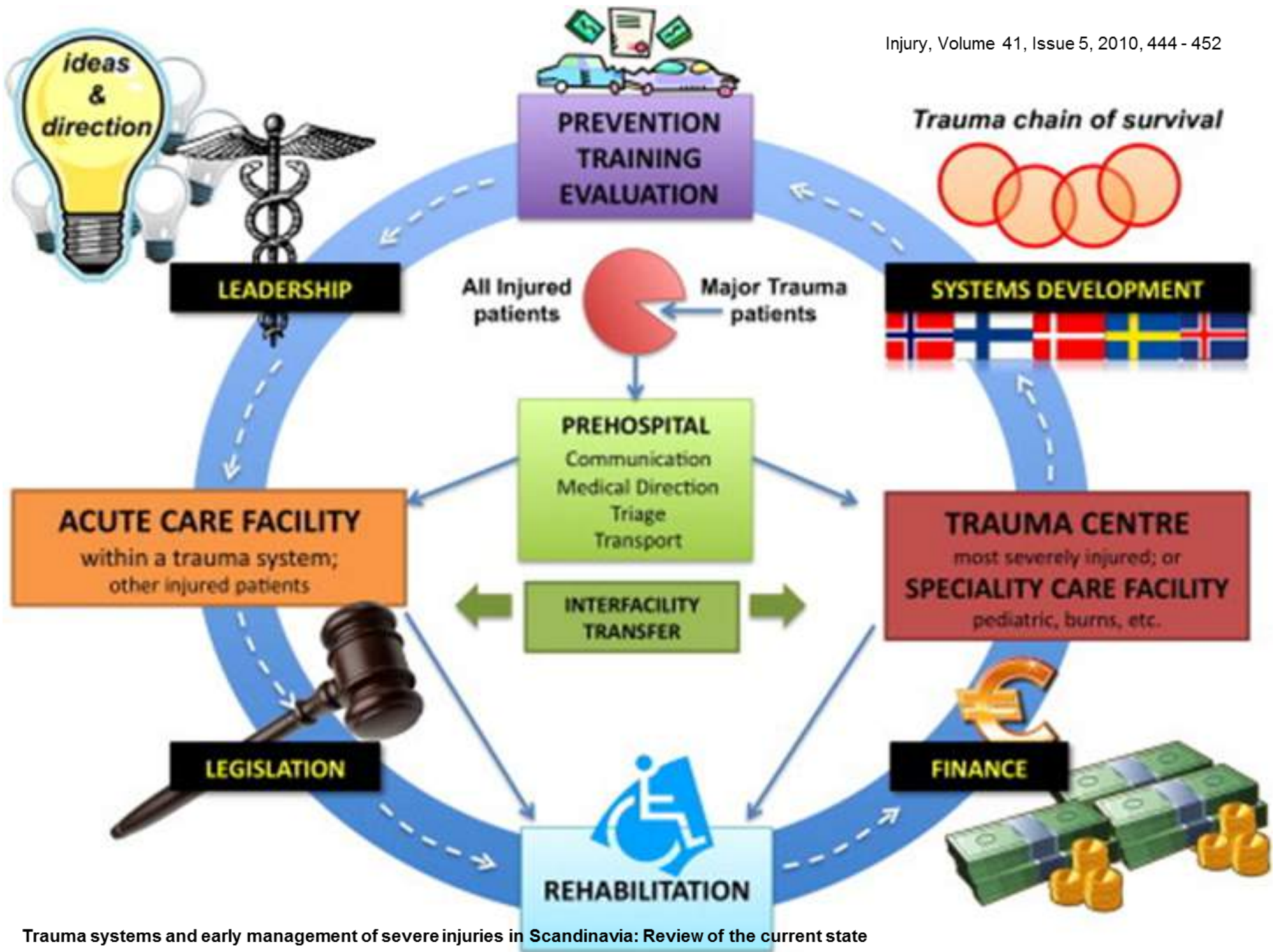
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75214

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The online version of this article, along with updated information and services, is located on the World Wide Web at:

http://circ.ahajournals.org/cgi/content/full/122/18_suppl_3/S729





Trauma systems and early management of severe injuries in Scandinavia: Review of the current state

Epidemiology of Trauma Deaths: Location, Location, Location!

Kjetil Søreide

WORLD JOURNAL OF SURGERY
Volume 34, Number 7, 1720-1721; 2010

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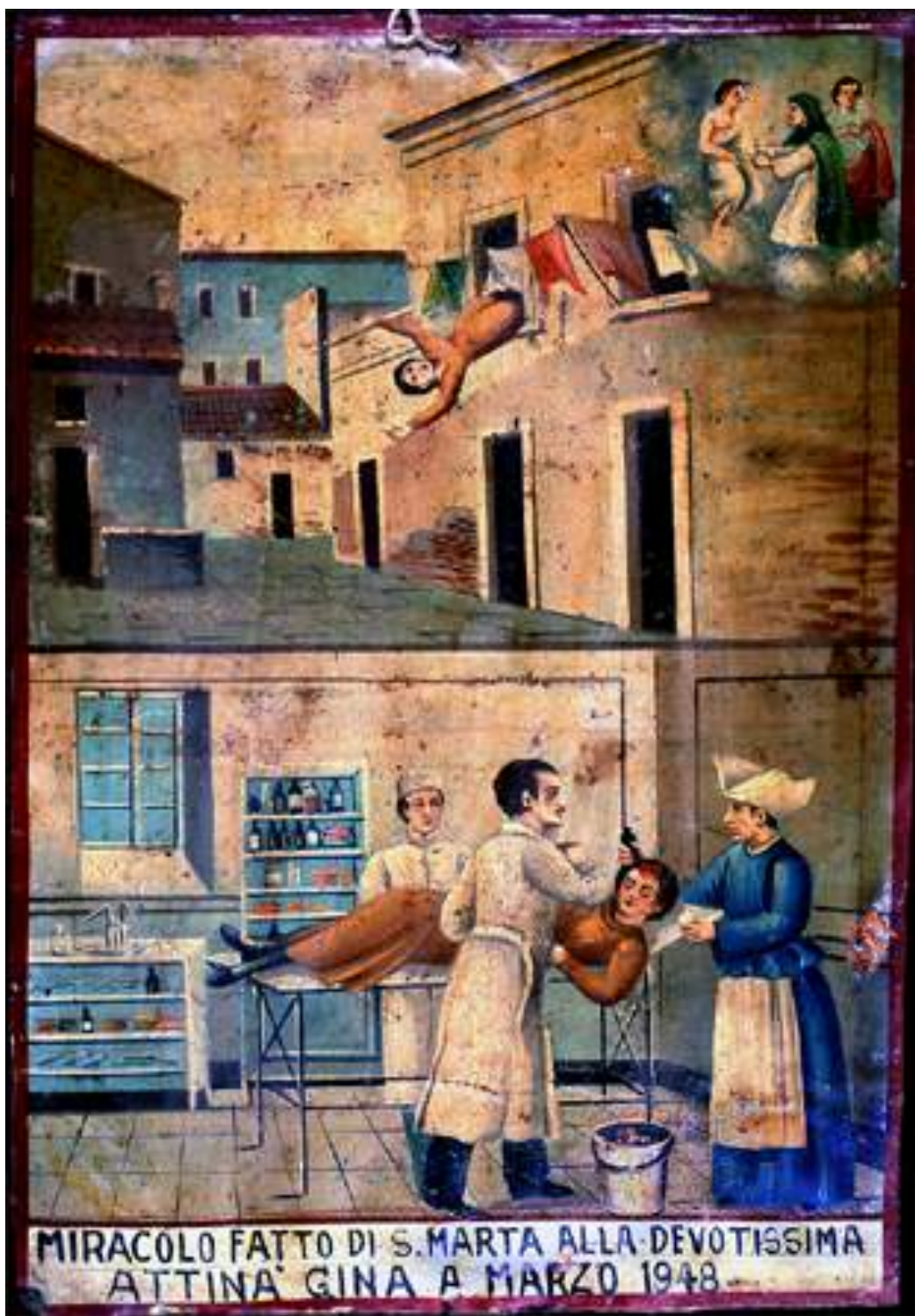
Online article and related content
current as of July 6, 2009.

Surviving Cardiac Arrest: Location, Location, Location

Arthur B. Sanders; Karl B. Kern

JAMA. 2008;300(12):1462-1463 (doi:10.1001/jama.300.12.1462)

<http://jama.ama-assn.org/cgi/content/full/300/12/1462>



MIRACOLO FATTO DI S. MARTA ALLA DEVOTISSIMA
ATTINA GINA A MARZO 1948

Management - ABCDE

- 3 S: safety scene e situation
- ABCDE – primary & secondary survey
- Airways management
- Fluid management
- Analgesia
- Hypothermia
- Other situations

Tactical Combat Casualty Care in the Canadian Forces: lessons learned from the Afghan war



Box 1. The MARCHE protocol

Massive hemorrhage control (tourniquets and hemostatic dressings)

Airway management (including surgical cricothyroidotomy for TACMED medics)

Respiratory management (occlusive dressings for open pneumothoraces and needle decompression for tension pneumothoraces)

Circulation (BIFT)

Bleeding control

Intravenous/intraosseous access

Fluid resuscitation (HSD as a volume expander)

Tourniquet assessment and removal

Hypothermia

Head injury

Eye injury

Everything else (M-PHAAT-D)

Monitoring

Pain

Head to toe

Address all wounds

Antibiotics

Tactical evacuation preparation

Documentation of care

HSD = hypertonic saline/dextran; TACMED = tactical medicine.

Tactical Combat
Casualty Care

Tactics, Techniques, and Procedures

Fluid Management in Traumatic Shock: A Practical Approach for Mountain Rescue

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for Mountain Emergency Medicine (ICAR MEDCOM)

Günther Sumann,^{1,2} Peter Paal,² Peter Mair,² John Ellerton,³ Tore Dahlberg,⁴
Gregoire Zen-Ruffinen,⁵ Ken Zafren,⁶ and Hermann Brugger⁷

Managing Moderate and Severe Pain in Mountain Rescue

John Ellerton, MRCSP,^{1,2} Mario Milani, MD,^{2,3} Marc Blancher, MD,^{2,4} Grégoire Zen-Ruffinen, MD,^{2,5}
Sven Christjar Skaiaa,^{2,6} Bruce Brink,^{2,7} Ashish Lohani, MD,^{2,8} and Peter Paal, MD^{2,9}

REVIEW ARTICLE

CURRENT CONCEPTS

Accidental Hypothermia

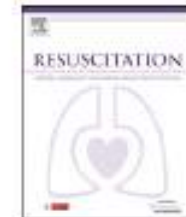
Douglas J.A. Brown, M.D., Hermann Brugger, M.D., Jeff Boyd, M.B., B.S.,
and Peter Paal, M.D.



Contents lists available at SciVerse ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Resuscitation great

Resuscitation of avalanche victims: Evidence-based guidelines of the international commission for mountain emergency medicine (ICAR MEDCOM)
Intended for physicians and other advanced life support personnel[☆]

Hermann Brugger^{a,*}, Bruno Durrer^b, Fidel Elsensohn^c, Peter Paal^d, Giacomo Strapazzon^a,
Eveline Winterberger^e, Ken Zafren^f, Jeff Boyd^g



Patient ID

Time of avalanche ____ : ____

Face exposure ____ : ____

Burial Time _____ min+
(If unknown use core temp**)

≤ 35 min ($\geq 32^{\circ}\text{C}$)

> 35 min ($< 32^{\circ}\text{C}$)

BLS Provider

Air Pocket .../...

YES NO

Vital Signs

FIRST AID

CPR

YES NO

Vital Signs

FIRST AID

Airway Patent

YES (or unknown) NO

CPR

YES NO

Obvious lethal trauma or body totally frozen

STOP

ALS Provider

$< 32^{\circ}\text{C}$ (or unknown) $\geq 32^{\circ}\text{C}$

Core Temp _____ $^{\circ}\text{C}$

NO (or unknown) YES

ECG Asystole

ALS

APPROPRIATE MEDICAL FACILITY

YES (or unknown) NO

Airway Patent

ALS

STOP

Circulation Stable and Core Temp

YES $\geq 28^{\circ}\text{C}$ NO

ALS

NO YES

Long transport or multiple casualties

ALS

ALS

≤ 12 mmol/L Serum K⁺ > 12 mmol/L

ALS

STOP

ECLS

APPROPRIATE MEDICAL FACILITY

ALS Provider Name:

AVALANCHE VICTIM RESUSCITATION CHECKLIST

©ICAR MEDCOM, 28.10.2013, Kottmann, Blarasin, Lavagner, ... / Prof. L. Brugger

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Termination of Cardiopulmonary Resuscitation in Mountain Rescue

Peter Paal,^{1,2} Mario Milani,^{2,3} Douglas Brown,^{2,4} Jeff Boyd,^{2,5,7} and John Ellerton^{2,6}

Il trasporto del ferito problemi sanitari

- Ipotensione ortostatica e ipoperfusione cerebrale
- aggravamento dello shock
- **Sindrome da sospensione**
- Rischio di vomito in trauma cranico
- rischi di movimentazione della colonna, soprattutto cervicale





Il trasporto del ferito problemi sanitari

- Sorveglianza medica difficile o per diversi tratti impossibile
- difficoltà d'accesso e di valutazione alle varie aree del corpo
- difficoltà di valutazione/monitoraggio dei diversi parametri vitali con o senza strumenti
- Ossigenoterapia difficilmente attuabile





Il trasporto del ferito

problemi sanitari

- Difficoltà a mantenere vie di infusioni
- Difficoltà a gestire le vie aeree
- difficoltà a intervenire immediatamente sul ferito durante il trasporto in caso di calate su terreno molto accidentato
- Postura obbligata : problemi di decubito e lesioni cutanee in Persone incoscienti o in soccorso in grotta se tempi molto lunghi



Corpo Nazionale di Soccorso Alpino e Speleologico CNSAS

Il trasporto del ferito problemi sanitari

Situazione disagiata per i soccorritori

trasporto su terreno difficile

spazi di lavoro e manovra ridotti

condizioni di sicurezza precari

condizioni meteo avverse

chi trasporta la barella a rischio di incidenti

Sono fattori che limitano la performance della
squadra e del medico

Strategies

“Art of the possible” & sometime of the impossible in major trauma & time-dependent diseases

- Scoop & run vs Stay & play
- More often Stay & pray or Pray & Run
- Transport!! Itself a problem with medical complications

Depending of situation you are facing, organization, location, weather and so on

Answer 4

- We know many things about trauma, Hypothermia, cardiac arrest treatment (+/- EBM supported)
- There is no reason that the treatment in urban & in remote areas should be different, it is the possibility to treat the patient in the same way to be different

Answer 5 protocols

- Clinical decisions may be very difficult to take on field
- You are alone
- Perhaps the most important thing is a well organized system (EMS) from the scene of the accident to rehabilitation unit

Answer 5 - by who?





Corpo Nazionale di Soccorso Alpino e Speleologico CNSAS



- La 'richiesta' medica
 - Technical & non-technical skills
 - Gestione del problema (semplice/complesso)
 - Conoscenza dei protocolli (PHTLS, ALS...)
 - Gestione clinica (scarsa strumentazione) e ascolto del paziente
 - Gestione del dolore
 - Comportamento da leader
 - Sicurezza per la squadra
 - Aspetti medico-legali (constatazione, A.G.)
 - Conforto ai familiari

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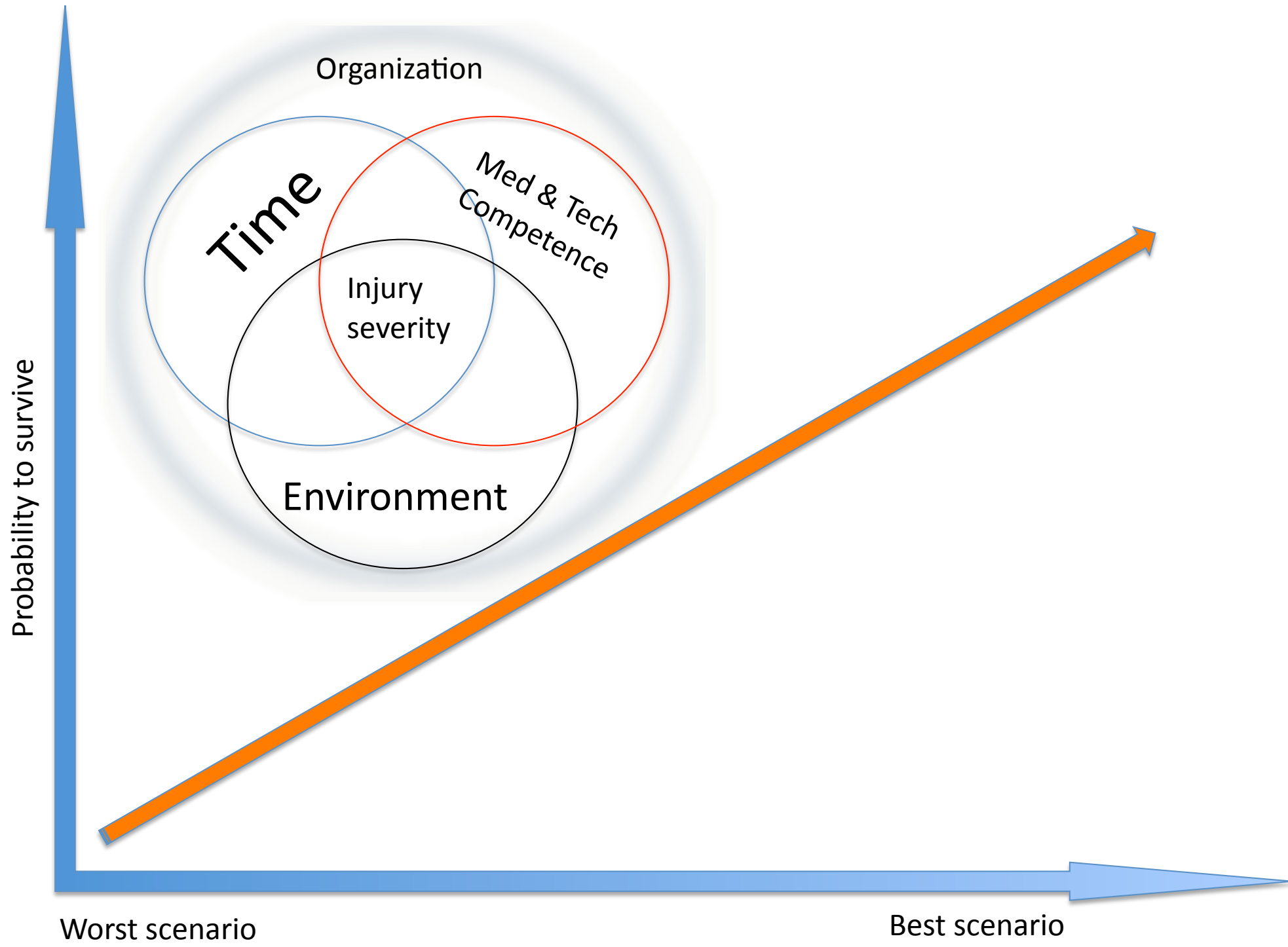


Answer 6

Wath is used usually can be used above-ground
& underground as well

Desiderata (something considered necessary or highly desirable):

- Not heavy
- Not expensive
- Easy-to-use
- Portable
- Robust
- Useful
- Effective / appropriate





Oh well,
this is
the
END

Thank you
for
your attention

