

**International Commission for Alpine Rescue (ICAR) Medical Commission  
2008 Meeting - 8-12 October 2008  
Chamonix, France**

Report to the Mountain Rescue Association by Ken Zafren, MD  
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**Introduction**

The Medical Commission of ICAR (ICAR MedCom) meets twice yearly. The main meeting is the Fall meeting, which takes place in conjunction with the Annual Meeting of the ICAR. The Spring meeting is a working meeting, usually in a mountain setting. With one historical exception, all of the meetings take place in Europe or the UK. It is my privilege to represent the MRA on the ICAR MedCom. I serve as one of the two vice-presidents of the commission. Tim Kovacs is the alternate delegate from the MRA to the ICAR MedCom.

The Mountain Rescue Association benefits from participation in ICAR in many ways. First and foremost is the opportunity to learn techniques from the leaders of mountain rescue from around the world, but especially in Europe. In the alpine countries of Europe, mountain rescue is far more active than in North America and it is more important to more people on a regular basis. Because mountain rescue in most non-European countries more closely resembles that in North America, we also have a lot to contribute.

Like the other 3 commissions of ICAR, the ICAR MedCom is not only an important forum for discussion and exchange of ideas, it also generates guidelines related to medical issues in mountain rescue. For the last several years, all new guidelines of the ICAR MedCom must be published in peer-reviewed medical journals. The guidelines are intended to help mountain rescue groups worldwide. The members of the commission are primarily physicians who are leaders in mountain medicine from around the world.

**Overview**

Over 50 members and guests from 24 countries attended the 2008 Fall Meeting of the ICAR MedCom in Chamonix, France. The Annual ICAR meeting was organized by the French Mountain Rescue. Chamonix is located in a spectacular valley with steep mountains on both sides. On the southeast side of the valley, Mt. Blanc rises about 3700 m above the valley floor. Tim Kovacs and I were both able to attend the meeting this year.

## **President's Report**

As usual, the meeting started with a report from the President, Hermann Brugger from South Tyrol, Italy.

One of the items Hermann discussed was our relationship to the International Society of Mountain Medicine (ISMM). Along with the Medical Commission of the International Mountaineering and Climbing Federation (UIAA MedCom) our sister commission which concerns itself with medical issues of mountaineers and climbers not related to rescue, we work closely with the ISMM in order to advance the field of mountain medicine. We have regular joint meetings with the UIAA MedCom. The next one will be in 2010 during the ISMM World Congress.

Hermann also discussed the International Diploma in Mountain Medicine. This course was designed by the UIAA MedCom and the ICAR MedCom to be an international standard for mountain medicine physicians. In addition to the basic course and the module on wilderness and travel medicine, there is an International Specialty Diploma in Mountain Rescue. There are 5 organizations that are officially approved to conduct this course, of which the ICAR MedCom is one. We previously conducted a course in Argentina. We have a course planned for Nepal in May 2009 and have also been asked to run a course in Arequipa, Peru in conjunction with the ISMM World Congress in August 2010.

### **“Time is Life” DVD**

We are now in our 4<sup>th</sup> pressing of our multilingual DVD, which covers medical aspects of avalanche rescue. For information about the DVD and for orders, we have a new website [www.time-is-life.org](http://www.time-is-life.org).

### **New papers**

#### **Published**

Winterberger E, Jacomet H, Zafren K, et al. The use of extrication devices in crevasse accidents. *Wilderness Environ Med* 19:108-110, 2008.

This paper deals with spinal protection and physiological aspects of extricating victims from crevasses. It was written in cooperation with the Terrestrial Rescue Commission.

#### **Accepted**

Sumann G, Paal P, Mair P, Ellerton J, Dahlberg T, Zen-Ruffinen G, Zafren K, Brugger H. Fluid management in traumatic shock –a practical approach for

mountain rescue. Resuscitation. In press.

This paper discusses when to use intravenous fluids for resuscitation of severely injured patients. In particular, it discusses the concept of permissive hypotension to decrease ongoing internal bleeding which cannot be treated in the prehospital setting. It contrasts this with the need to aggressively fluid resuscitate patients with traumatic brain injury in order to avoid further brain damage caused by poor perfusion. In cases of severe traumatic brain injury (GCS<9) the goal is to keep systolic blood pressure at or above 110 mm Hg, by liberal use of fluids and possibly with the use of vasopressors and hypertonic/hyperoncotic fluids. If there has been no severe traumatic brain injury, it is preferable to give fluids only to a target systolic blood pressure of 90 mm Hg and transport the patient as rapidly as possible, preferably to a Level I Trauma Center (if possible).

Ellerton JA, Zuljan I, Agazzi G, Svajda D, Boyd J. Prevention and on site treatment of eye problems in mountain and remote areas. Wilderness Environ Med, In press. This paper is an overview of eye problems for mountain rescuers.

Elsensohn F, Niederklapfer T, Ellerton J, Swangard M, Brugger H, Paal P. Current status of medical training in mountain rescue in America and Europe. High Alt Med Biol, In press. This paper presents the results of a survey which looked at required medical training for mountain rescuers. The analysis examined both initial and refresher training.

### **In preparation**

Elsensohn F, Zenruffinen G, Ellerton J, Sumann G, Zafren K, Nerin MA, Brugger H. Initial assessment of casualties in the mountains. This paper is aimed at first responders and is intended to provide an organized system for initial assessment of ill and injured patients.

Tomazin I, Soteras I, Reisten O, Kovacs T, Teale S, Ellerton J. Recommended Standards in Helicopter Emergency Medical Services (HEMS) in Mountain Rescue. While HEMS is highly organized in most Western European countries, the situation is much less efficient in other areas, including Eastern Europe. The aim of this paper is to help helicopter services become more effective, in part by providing model regulations as guidance.

Ellerton J, Elsensohn F, Demetz F, Brugger H, Tomazin I, Paal P. Immobilization and Splintage. This paper is intended to provide guidance to rescuers regarding patient packaging. It is intended to compliment previous papers recommending the use of the vacuum mattress in spinal immobilization.

Reisten O, Soteras I, Wiget U. A Modular First Aid Kit for Alpinists, Mountain Guides and Alpinist Physicians. This paper is intended to be a revision of an

earlier paper on the same subject. The idea is to provide a recommended list of contents of first aid kits that can be carried in the mountains. The emphasis is that the kits should be lightweight and compact, so they are practical to carry, while including the most important items for use in treating ill and injured persons in the mountains.

Soteras I, Paal P, Reisten O, Brugger H, Elsensohn F. Contents of mountain rescue doctor's rucksack. This paper is a survey of what mountain rescue doctors (the norm in Europe, but not North America) carry with them, in both helicopter and ground operations. Mountain rescue doctors and paramedics should be able to use the results to simplify their own medical kits by learning from what has worked for others.

### **Short communications**

Beat Walpoth from Geneva, one of the world's most prominent hypothermia researchers, presented his plans for a hypothermia registry. Interested hypothermia centers will enter data on all hypothermia patients with core temperature  $<32^{\circ}\text{C}$  with cardiac arrest. An international group will be formed to analyse the data. The goals are increased awareness of hypothermia treatment and development of international guidelines to improve outcome of hypothermic cardiac arrest.

Manuel Genswein, a well-known Swiss avalanche expert and member of the Avalanche Commission of the ICAR posed the question: how long should we do CPR on an avalanche victim before moving on to an unextricated victim. The MedCom will be discussing avalanche triage further in future.

### **Forthcoming events**

February 20-25, 2009 Wilderness and Mountain Medicine Conference (Wilderness Medical Society) – Park City, UT. Further information about this and related meetings at [www.wms.org](http://www.wms.org).

March 10-14, 2009 16<sup>th</sup> International Hypoxia Symposium, Chateau Lake Louise, Alberta, Canada. Further information at [www.hypoxia.net](http://www.hypoxia.net).

March 25-29, 2009 ICAR MedCom Spring Meeting - Bansko, Bulgaria.

May 25-30, 2009 ICAR MedCom Specialty Course in Mountain Rescue for Nepali doctors and trekking guides - Kathmandu and Langtang.

July 24-29, 2009 Wilderness Medical Society Summer Wilderness Medicine Conference and Annual Meeting – Snowmass, CO. Further information about this and related meetings at [www.wms.org](http://www.wms.org).

September 23-27, 2009 ICAR MedCom Fall meeting in Zermatt, Switzerland. In addition there will be a hypothermia working day organized by Beat Walpoth.

March 2010 ICAR MedCom Spring meeting – Spitsbergen, Norway.

August 2010 World Congress of Mountain Medicine (International Society of Mountain Medicine and ICAR MedCom Specialty Course in Mountain Rescue – Arequipa, Peru

October 2010 ICAR MedCom Fall meeting - Slovakia

### **Presentations**

During the last day, all four commissions (Air Rescue, Avalanche Rescue, Terrestrial Rescue and Medical) met for a morning of presentations. There were four presentations given by members of the ICAR MedCom

#### **Presentation 1: Case report – Rescue on Pic de la Font-Sainte NE Face (3387 m). Presented by Dr. Xavier Ledoux (France)**

Three climbers fell in a couloir with rock and hard snow due to a large loose rock encountered by the leader. A helicopter with 2 rescue guides and 1 emergency doctor responded to the scene 1.5 hours after the fall. Flight time was 25 minutes. One climber was found dead. A second climber was severely injured with head, chest and leg injuries. He was immediately stabilized and flown to the hospital. The third climber, who was less severely injured was placed in a horizontal position and given oxygen. He stayed at the scene with the 2 rescue guides.

A second helicopter was called and again had a 25-minute flight time. This helicopter also had 2 rescue guides and an emergency doctor. It arrived 2.5 hours after the fall. The second doctor assessed the situation. Two rescuers were at the scene with the dead body of climber #1 and the injured climber. He was conscious but sleepy with an obvious femur fracture and a suspected pelvic fracture. He had good color, normal blood pressure (105/82), but a rapid heart rate (125), and no obvious chest or abdominal injury.

The initial plan was to land the patient and doctor in a safe location at lower altitude for further medical care, remove the rescuers and the dead body from the couloir to the “staging area” and then fly the patient and doctor to the hospital. Later a helicopter would retrieve the rescuers and the dead body.

But, the secondary survey showed that climber #3 had an epi tympanic temperature of 30.5°C. The doctor determined that the rescuers were not in a dangerous situation and could escape easily by walking down the slope. Climber #3 was hypothermic and would soon be critically hypothermic if there were a delay. The priority was to evacuate the injured climber to the hospital with continuous cardiac monitoring and treat cardiac arrest if it occurred.

The third climber reached the hospital after an uneventful flight, 3 hours 40 minutes after the fall. He has made a full recovery. Some learning points are that hypothermia is common in mountain casualties even in summer and especially at altitude. The onset of hypothermia is very rapid in severely injured patients. If the degree of hypothermia seems unexpectedly deep, look for a severe injury.

**Presentation 2: Current status of medical training in mountain rescue. Presented by Dr. Fidel Elsensohn (Austria).** Dr. Elsensohn presented the results of his survey. Please see the section on new papers, above.

**Presentation 3: Fluid management in traumatic shock. Presented by Dr. Günther Sumann (Austria).** Dr. Sumann presented the Resuscitation paper, including the rationale for aggressive fluid resuscitation in patients with severe traumatic brain injury and for “permissive hypotension” in non-head injured patients. Please see the section on new papers, above.

**Presentation 4: Case report - Less can be more: fluid treatment in polytrauma. Presented by Dr. Oliver Reisten (Switzerland).**

A 32-year old woman was walking with a friend on an easy path in a canyon when she was struck unconscious by a small rock that fell from above. She rolled down a 6-7 meter embankment that wasn't very steep. She regained consciousness in a few minutes and initially complained only of a headache. A helicopter arrived to find her oriented, with a scalp laceration and retrograde amnesia. She was pale, with a systolic blood pressure of 80, complaining of headache, chest and abdominal pain. She had decreased breath sounds in the right chest.

She was placed on a vacuum mattress for transport, two large-bore IVs were started, but very little fluid was given. A hypertonic saline solution was kept ready, but not infused. Pain was treated with small doses of fentanyl. No further

treatment was given at the scene. She was evacuated by a long-line operation and flown to the trauma center 20 minutes away. She remained conscious and oriented without signs of intracerebral injury, but continued to be hypotensive with blood pressures 70-80 mm Hg and tachycardic with a heart rate of about 130/min. Oxygen saturation was 88% with 10 L oxygen by non-rebreather. Less than 100 ml of saline solution was administered.

After arrival at the hospital, saline was infused at a higher rate and the blood pressure promptly fell dramatically. The patient became unconscious. She was intubated and a right-sided chest tube was placed, which drained 1 Liter of blood. FAST (Focused Abdominal Ultrasound in Trauma) exam was done, which showed free fluid (blood) in the abdomen.

She was taken to surgery immediately. Findings included a liver laceration, splenic rupture and rupture of the right kidney with a retroperitoneal hematoma. She had a splenectomy, partial renal and liver resection and liver cauterization. She required a massive transfusion of 25 units of packed red cells and multiple factor concentrates. She had no further complications, was extubated the following day and has made a full recovery.

Potential blood loss at different sites, include chest – 1 Liter each side, liver and spleen 2 Liters each, pelvis up to 5 Liters, femur 2 Liters and lower leg 1 Liter. An injured patient can easily lose enough blood for a fatal outcome from 1 or more of these sites.

Infusion therapy can cause increased blood loss from injured blood vessels with reduced clotting or dislodged clot at the site of a the injury to the vessel. Infusion of saline also can cause anemia and loss of clotting factors. If the fluid is not heated, the risk of hypothermia is increased.

Dr. Reisten reviewed the principles presented in the paper: “Fluid management in traumatic shock – a practical approach for mountain rescue.” Please see the section on new papers, above. The learning points of this paper were the very minimal use of fluids during the rescue phase, monitoring the level of consciousness of the patient. Although small volume hypertonic fluid was kept on standby it wasn’t used, avoiding the problems of increased blood loss after fluid infusion. The critical situation was deferred to the hospital setting where emergency surgical treatment and blood products were available.

## **Acknowledgment**

I would like to thank the MRA for financial support to attend the ICAR meeting in Chamonix.