



View from summit of Rysy, highest peak in Poland

ICAR MEDCOM REPORT, Zakopane, Poland
October 2019
Alison Sheets MD Delegate
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The International Commission on Alpine Rescue (ICAR) Mountain Emergency Medicine Commission (MEDCOM) met in Zakopane Poland as one of the four main commissions to ICAR. ICAR has grown significantly in the last few years, 68 people from 22 countries are represented in the MEDCOM alone. Much of the MEDCOM business revolves around the research and publication of recommendations to the international mountain medicine community. This year, we spent a great deal of time discussing the revision of previous recommendation in order to keep them up to date and relevant to mountain SAR.

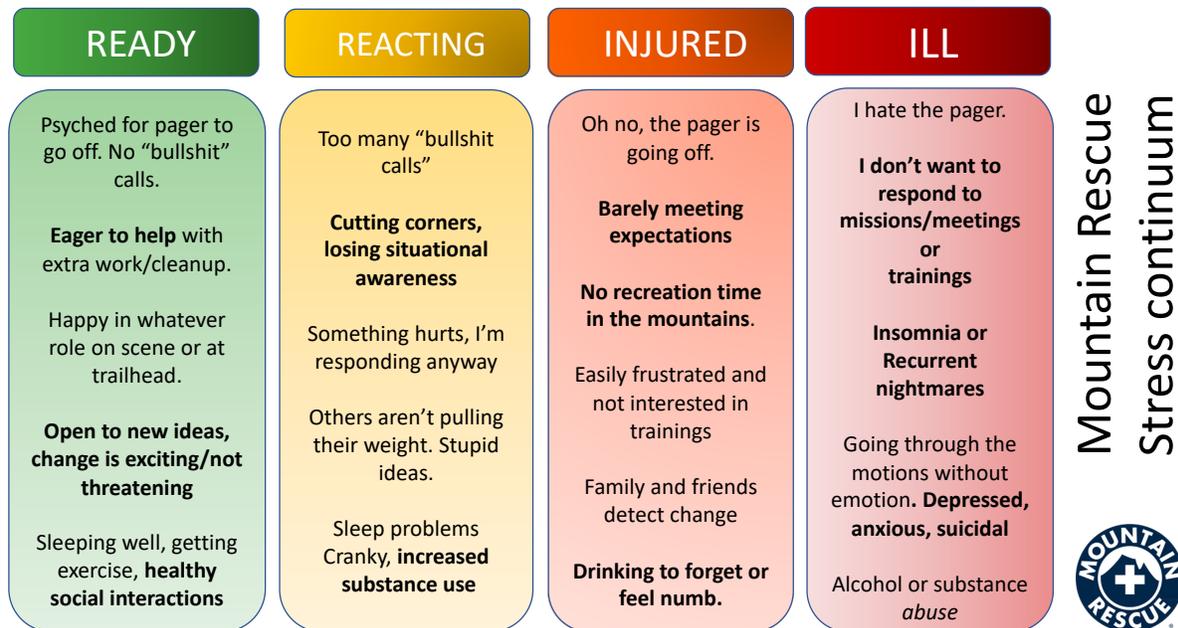
The development of both an internal web-based forum and a new open access website is one important development in the MEDCOM. This will allow us to better get our message out to the ICAR community. The forum is for working within the MEDCOM and access is limited, but the new website- www.info@icar-med.com, is up and running and makes it easy to view existing recommendations, educational programs, and upcoming events. We encourage all who are interested to take a look.



Two vice presidents were elected to the MEDCOM this year, Dr. Natalie Holzl, anesthesiologist representing the German Association of Mountain and Expedition Medicine (BExMed), and Dr. Alison Sheets, emergency physician representing Mountain Rescue Association, USA. They will assist president Dr. John Ellerton from the UK.

The newest recommendations to be made by ICAR MEDCOM will include “Determination of Death” Dr. Corinna Schoen and “Suspension Syndrome” Dr. Simon Roach. Determination of death is aimed at allowing non-physicians to more confidently decide when a mountain casualty is deceased, allowing decreased urgency and risk in evacuation decisions. New recommendations for “suspension syndrome”, which is illness, syncope or death after hanging motionless in a harness, bring forward recent research to provide a more evidence-based approach to suspension injury treatment and rescue. It also includes the recommendation that rope work should not be performed alone. (see draft of entire recommendation below) Both of these ICAR MEDCOM recommendations and research will be submitted to peer-reviewed and will be on the MEDCOM website once finalized.

Dr. Alison Sheets presented research findings and recommendations on the psychological stress injuries associated with mountain search and rescue. The MRA has been on the forefront of this topic with much activity in the USA. The ICAR MEDCOM team is working to expand the awareness and education of this important topic to a wider audience. Official MEDCOM recommendations will be forthcoming in 2020.



The stress continuum remains an important model for improving awareness of stress injury and provides a convenient way of facilitating identification and treatment of stress injured rescuers. Although the incidence of PTSD, suicide, and other stress related injuries is not well described in the mountain rescue population, first responders (law, fire, EMS) have twice the rate of suicide as the general population and suicide is now recognized as the leading occupational killer of emergency responders (Responder Strong 2018). Utilization of emotional rescue techniques including establishing calm, safety, connection, providing hope and self-efficacy should be taught to rescuers and incorporated in to team culture as part of normal first aid training. Normalization and de-stigmatization of mental health discussions will go a long way in reducing the detrimental effects of stress injuries.

Jason Williams from University of New Mexico presented the current status of the Diploma in Mountain Medicine (DiMM) program. The DiMM is the only internationally endorsed program for training in mountain medicine and rescue techniques recognized by International Society of Mountain Medicine, ICAR, and Union Internationale des Associations d'Alpinisme. The course involves a minimum of 120 hours, usually in a separate winter and summer program, and provides training and practice in all areas of mountain medicine. Additionally, extra modules exist in helicopter operations, terrestrial rescue specialty and wilderness and expedition medicine. The diploma is awarded to students with medical training and certification of paramedic or higher. BLS providers are not eligible. See ICAR website for a list of the 22 approved course sites and additional information.

All four commissions, MEDCOM, Terrestrial, Avalanche and Air, joined for two discussions related to avalanche safety and rescue. The first was a presentation posing the question as to whether avalanche safety training should include CPR to "forge a better chain of survival" by Heiko Stopsack, paramedic from Washington state. His opinion is that recreationalists taking

introductory courses in avalanche safety should be required to have CPR as part of that training.

Dr. Christopher Van Tilburg, MRA Alternate Delegate to MEDCOM, presented the question, “should airbags be mandatory avalanche safety equipment?” He presented the work of Haegli et al regarding the survival benefit of avalanche airbags showing a reduction in mortality of 22% to 11% in avalanche victims. In that study there was a 20% non-inflation rate. The audience agreed that airbags are a potentially valuable addition to rescuer safety equipment but ICAR has generally not made “mandatory” recommendations.

“Multiple Trauma Management in Mountain Environments” lead author Dr. Peter Paal, is a paper in the works and nearing completion. It will be submitted to peer review process as well as provide recommendations to ICAR audience. This work will review evidence and best practice for the multiple trauma patients seen in Alpine environments the world over. Completion expected by end of 2019.



Many manufacturers and sponsors discussed their products in joint sessions. One interesting product from a Swedish company, twICEme, uses Bluetooth technology to allow rescuers to access personal medical information from patients who have loaded the information into a small device placed in a helmet (see photo). Privacy control managed by a two-minute time out after access of information is done. Obviously, questions about nefarious access came up but the idea is that the information available is limited to emergency care needs and would not be a repository of personal demographic info or insurance details.

“Heat Illness and Injury” presented by Dr. Drew Harrell and Dr. Risa Garcia from University of New Mexico, reviewed the Grand Canyon National Park’s extensive experience with heat related illness. Despite a well-established Preventative SAR program, the canyon’s “upside-down-mountain”, where retreat requires uphill travel, and the 145 F ground temperatures in the bottom, result in many cases of severe dehydration, heat stroke, and hyponatremia (life-threatening low sodium from overhydration and salt losses). They are very aggressive with cooling for heat stroke utilizing the river and ice brought in by helicopter to rapidly reduce core temperatures. As the “Rim to Rim” and the “Rim to Rim to Rim” hiking and running have become popular, they are seeing increasing numbers of exercise induced hyponatremia. As a

result the park service paramedics began performing blood tests in the field and infusion of intravenous fluids with 3% saline to rapidly correct sodium levels pre-hospital. This rapid correction has proven to be well tolerated and goes against historic teaching in emergency medicine. In 2019 so far 10 patients have had this rapid correction performed with no detrimental effects reported.

Outdoor Emergency Care, 6th Revision was reviewed by Dr. David Johe. The National Ski Patrol (NSP) was voted as a 2b member of ICAR in 2018. Dr. Johe reviewed the role of the NSP and the structure of the educational program and various ski resorts. There are 30,000 ski patrollers in the USA and over 90% of the resorts use the NSP volunteers. Many resorts have both NSP volunteers and paid professional patrollers. Outdoor Emergency Care is the first aid program developed by the NSP and is required for most patrollers. The course includes 60-80 hours of classroom and online training along with 40 hours of skills and practical evaluation. Revisions will update and modernize material but likely no major changes.

“Tactical Alpine Medicine” presented by Markus Isser, Österreichischer Bergrettungsdienst (ÖBRD), Austria, provided an approach to mountain rescue that was both practical and entertaining in its presentation. He referred to the immediate location of a casualty such as in dangerous terrain or beneath a hovering helicopter as the “red zone”. In this area treatment interventions are limited to a single airway maneuver and hemorrhage control (tourniquet). Once a patient has been moved to a safer location, additional treatment may be considered. Markus then demonstrated the many uses of a “space blanket”. Additionally, they pull tested the folded space blanket and found that it could hold 250 kg. Several novel uses were demonstrated including as sunglasses, tourniquet, transporting a patient on your back, and heat retention. The best way to wrap someone was demonstrated by placing the blanket under the jacket, over the head, and under the groin like a diaper. This wrap was practical and fast.



The ICAR MEDCOM spent a day in Krakow before the regular conference to visit the Krakow Hypothermia Centre at the University Hospital. Southern Poland has advanced treatment

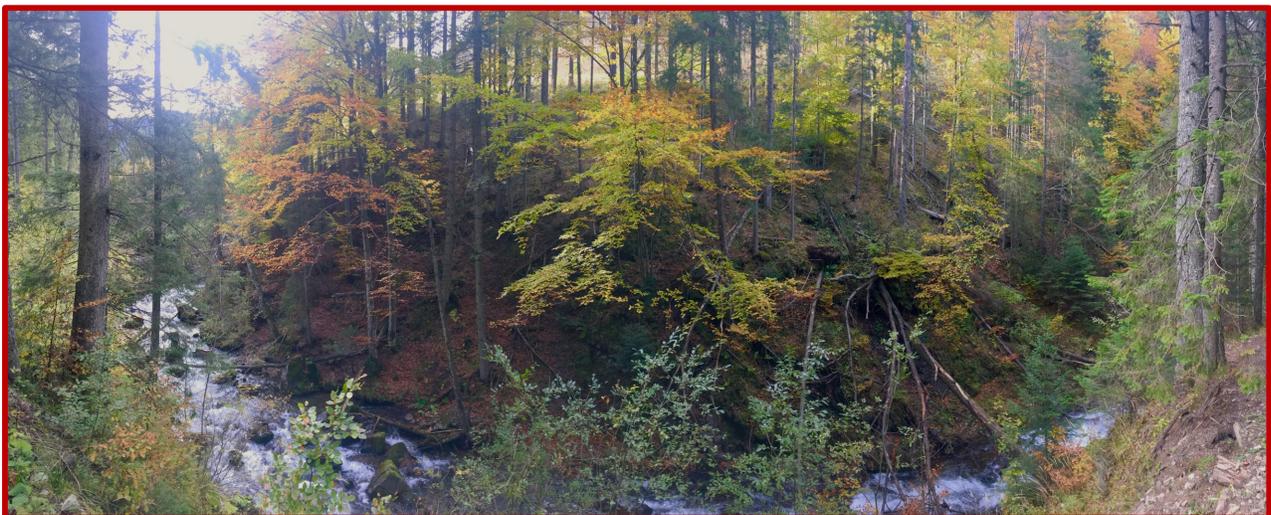
protocols for hypothermia and has had very good success with extra-corporeal life support (ECLS) in severe hypothermia cases. Additionally, the MEDCOM members were placed in a dark, cold chamber (-30C) with wind and snow to practice hypothermia field treatment techniques. The difficulties and limitations of performing medical assessments, treatment, and utilization of equipment in extreme cold were painfully reinforced.

Dr. Pasquier gave a hypothermia update. A review of literature regarding the “Swiss Staging” of hypothermia shows that field findings- vital signs, mental status, etc., do not correlate well with actual core temperature expected with clinical stage. Additionally, vital sign changes do not behave predictably as hypothermia progresses. As one might imagine, research on hypothermia is limited to animal models and case reports with fewer cases of mild to moderate hypothermia in the medical literature. This is a good reminder to consider factors other than cold (such as trauma or medical conditions) when patient’s presentation is inconsistent with expected hypothermia findings.

The Hospital Outcome Prediction after ECLS (HOPE) score provides a prediction of the survival probability in hypothermic cardiac arrest patients undergoing ECLS rewarming. The score ranges from 0% to 100% chance of survival to hospital discharge. It has been validated and is a better predictor of survival than potassium level alone, which has been used historically. Although this is a tool for use in hospital, SAR teams should be familiar with it in order to obtain the necessary information from the field for the decision tool to be utilized. The following data points are used: Age, gender, type of hypothermia (with or without asphyxia or submersion), CPR duration, serum potassium (mmol/L), and temperature. In general, best outcomes are from patients with no history of asphyxia. See links to original articles for more information on HOPE score.

<https://doi.org/10.1016/j.resuscitation.2018.02.026>

<https://doi.org/10.1016/j.resuscitation.2019.03.017>



Fall colors near Zakopane

“Standardizing our approach to preventing and treating hypothermia”- was presented by Dr. Live Kummen. Dr. Kummen developed a nation-wide program to train Norwegian People’s Aid Volunteers in dealing with hypothermia. Norway has an average annual daytime temperature of 9.5 C so hypothermia is a common problem for SAR and EMS. She approached development of the program in a practical “train like you fight” style. This included standardized, light, compact, weather-resistant equipment such as waterproof instructors manual, waterproof notebook with flow charts and report forms. She addressed all methods of heat loss in a “warmies” kit which includes wool base-layers, balaklava, pad (folded, not rolled), chemical heat blanket, sleeping bag, vapor barrier, trauma shears for clothing removal and emergency shelter. The cost for her kit is approximately 1000 euros. She did not use patient core temperatures or “staging” as this program is aimed at volunteer first aid providers. Standardized training was mostly done outside. Benefits of the program, besides better patient care and potential outcomes, included increased awareness on the problem of hypothermia and improved PSAR.

Finally, several short presentations utilizing case reports were proposed to ICAR MEDCOM including utilization of advanced airway interventions and use of blood products, following military approaches, in mountain rescue. It is important to understand that in many areas of Europe, mountain SAR is a professional activity and physicians and advanced providers are often on scene via helicopter. Some agencies in the USA are able to provide this level of care but most MRA teams do not have advanced providers in the field. Other medico-legal issues also limit prehospital options for many USA based volunteer teams. Nevertheless, all options to help our patient have better outcomes are worth considering and should be discussed with local medical control. Visit the ICAR MEDCOM website for international recommendations.

Future ICAR MEDCOM spring conferences will be held in Christchurch New Zealand April 16-19, 2020 and Glenmore Lodge, Scotland April 8-10 April 2021. I will be attending both representing the MRA. ICAR General Assembly scheduled for Thessaloniki, Greece, October 13-17, 2020, and Reichenau an der Rax, Austria October 27-31, 2021. All MRA ICAR delegates will be there.



Nr.	Suspension syndrome recommendation-DRAFT	Grade
1	<p>We suggest the following classification of suspension syndrome:</p> <ol style="list-style-type: none"> 1. 1 Acute suspension syndrome <ol style="list-style-type: none"> 1. a) Near suspension syncope (characterized by light-headedness, pale skin, warmth, blurred vision or nausea)^{12,14} 2. b) Suspension syncope^{12,14} 3. c) Suspension cardiac arrest (after exclusion of other causes of cardiac arrest, e.g. myocardial ischaemia, trauma, hypothermia)^{4,15} 4. d) Post-suspension cardiac arrest within 60 min after rescue⁴ 2. 2 Subacute <ol style="list-style-type: none"> 1. a) Sensory or motoric deficit in the legs persisting for >24 hours after rescue⁴ 2. b) End organ dysfunction, in particular rhabdomyolysis-associated acute kidney injury^{4,9} 3. c) Cardiac arrest >60 min after rescue⁴ 	2C
2	Rope work should never be conducted alone.	1A
3	Persons suspended in a harness should be rescued as soon as possible, even if the casualty is asymptomatic, as time to (near) syncope and cardiac arrest is variable and unpredictable. ¹²	1A
4	While awaiting rescue, persons suspended freely on a rope should move their legs in order to reduce venous pooling. ¹²	2B

5	If no adjoining structures are in reach, foot loops should be used to step in and activate the muscle pump. ^{1,4,12,15}	2B
6	If the casualty is no longer able to act, the first rescuer reaching the casualty should raise the victim's legs to create a more horizontal position while measures are taken to lower the patient to the ground. ^{12,15}	2C
7	Once the casualty is on the ground, the casualty should be positioned supine. Assessment and treatment should follow standard advanced life support algorithms. ^{4,12,16-18}	1A

8	After prolonged hanging (>2 hours), monitoring for serum potassium and creatinkinase should be established and renal replacement therapy considered in patients with acute kidney injury. ^{3,4}	2C
9	In case of cardiac arrest, hyperkalaemia and pulmonary embolism should be considered as potentially reversible causes and respectively treated. ¹⁸	