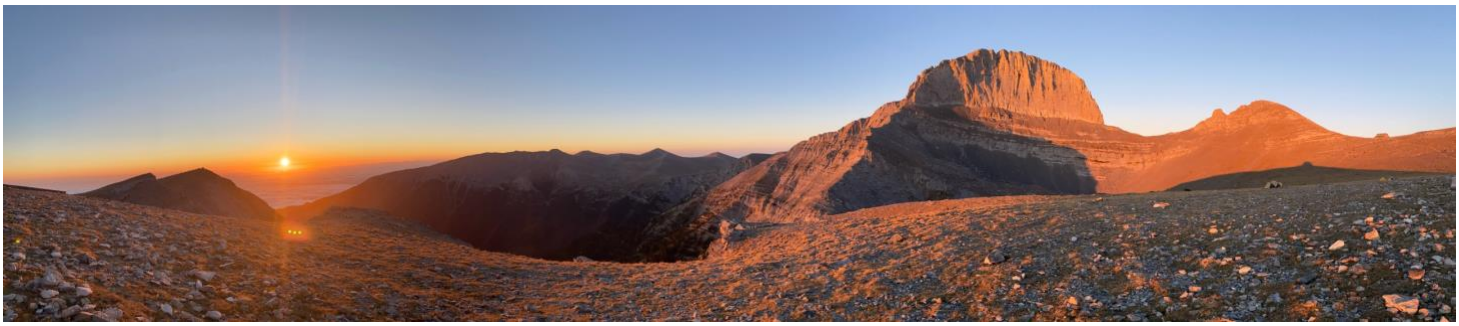


ICAR 2024 MRA MEDCOM Report
Dr. Alison Sheets and Dr. Christopher Van Tilburg

The 2024 ICAR congress was held in the Northern Greek city of Thessaloniki, not far from Mount Olympus pictured above. The Hellenic Rescue Team did an outstanding job of hosting with great accommodations, food and social events. The Medical Commission had excellent participation with nearly every A level team sending a delegate. As usual, the presentations were professional, relevant to SAR and with interesting new research and information. Below Dr. Van Tilburg and I have selected some of the highlights from the MEDCOM meeting not covered by other commission delegates.

The practical day was held in the foothills below Mount Olympus with views of the Aegean Sea. Multiple stations similar to last year's practical day allowed participants to work in small groups on medical aspects of SAR such as intermittent CPR, airway management and tree well submersion. In the afternoon the MEDCOM put on a "rescue Olympics" with serious and silly SAR activities, including a three-legged race. An appropriate medal ceremony finished off the day.

The next day the congress committee meetings began with our MEDCOM president's report and a brief business meeting. Presentations began with a lengthy discussion of the major project on rescue at very-high altitude. This is being led by Dr. Kyle McLaughlin from Parks Canada. The project will include papers on the ethics of rescue at very high altitude, helicopter rescue, history of high-altitude rescue, preparation for rescuers both terrestrial and air, as well as patient care.

In considering the ethics of rescue at very high altitude it is important to keep in mind that organized rescue at very high altitude is rare. Ad hoc rescue by other members of the climbing team, other climbers, bystanders and guides is generally what occurs. Although Sir Edmund Hillary said "You have a duty, really, to give all you can to get the man down and getting to the summit becomes very secondary", recent trends in high-altitude mountaineering have seen many climbers and porters left for dead even when still very much alive. Of course, rescue in high altitude and technical terrain is difficult and dangerous even with a well-equipped and practiced team. Who has the responsibility to help any given climber is open to much debate. Bystanders may not have the knowledge, skills or ability to effect a rescue safely. The hope is that the discussion in ICAR will encourage guide services, tour leaders and the jurisdictional authorities acting in high altitude terrain to consider pre-plans, training and organization to serve the mountaineering community accessing their high peaks.

Other high altitude rescue specific recommendations in the works include prophylaxis for rescuers ascending rapidly, air or ground, with acetazolamide, dexamethasone and nifedipine depending on individual indications. Supplemental oxygen can replace medications for short forays to high altitude. Other specific recommendations will depend on starting altitude, time to prepare, base line health issues, and time at altitude as these can vary significantly. There will be air crew specific

recommendations for both medications and necessary survival gear in case of mechanical issues or stranding by the weather. ICAR should be publishing the final version of these recommendation in 2025.

Some other research that has spun off of the very high-altitude topic is Dr. Steve Roy's investigation into equipment performance in the cold. As high altitudes are generally also very cold, medical equipment may not perform as expected. He has looked at batteries, point of care laboratory tests, and bag-valve masks among other things and will have some very interesting research reports out soon. Many of us practice in very cold environments so this information will be useful. Dr. Roy is also re-evaluating literature on altitude illness prevention to develop a model to predict who needs prophylaxis and when. His data is yet unpublished.

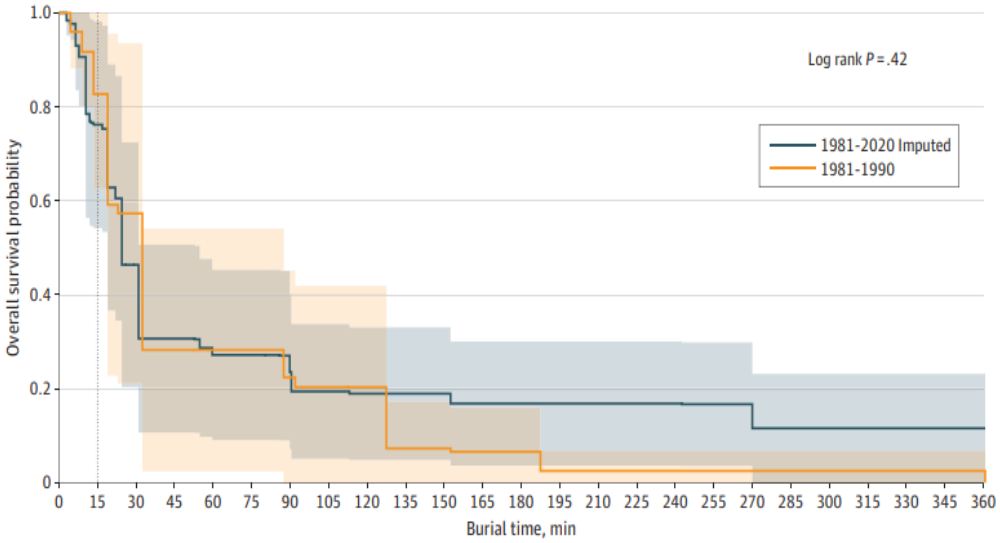
Dr. Ane Hellend and Sigurd Mydsky, Norwegian Mountain Medicine Research Group, presented a hypothermia study in which researchers intentionally cooled volunteers in an ice cave to 35 degrees C in Norway. Half the study group were given medications to suppress shivering in this cross-over study. They observed warming trends with passive rewarming (control) and active external rewarming. Although the patients were technically cold-stressed, not hypothermic, and shivering was suppressed with medications, some interesting and unexpected results were seen. After-drop, or rescue collapse, thought to occur when cold blood from the periphery returns to the core causing significant core temperature drop, can be bi-phasic. At least one patient had a second, larger drop in core temperature, after rewarming when ambulating out of the lab. This research is also unpublished but expect more from this group doing their work in a carved out glacier.

Dr. Aaron Reilly, University of New Mexico, presented ultramarathon medicine. He discussed the value for students of Wilderness Medicine to participate in these events as they offer novel types of medical problems in remote and austere environments. Ultramarathons and trail running are exploding in popularity globally; often runners are under equipped and going farther and deeper into the backcountry. Fatigue hampers decision making. Soft tissue injuries like blisters and trauma can be incapacitating.

Dr. Sven Christjar Skaiaa, Royal Norwegian Air Force, presented a retrospective review of 54 cases of intubated patients as live external cargo (helicopter hoist). Manual ventilation was difficult, in 2 cases BVM disconnected during hoist. Of the cases, 37% (20) were completed with battery-operated ventilator; this was determined to be better because no operator is required. Mechanical chest compressions were considered better than intermittent CPR because no operator was needed offering options of short haul or hoist. Overall, 58% survived. These were not necessarily SAR patients.

Dr. Hermann Brugger, EURAC, presented the first update on the avalanche survival curve in 30 years. Overall survival rates increased from 43.5% to 53.4%. The probability of survival from companion rescue increased from 68% to 75%. The probability of survival from professional rescue increased from 14% to 23%. While survival longer than 130 minutes increased from 2.6% to 7.3%, the short term survival inflection point after trauma or asphyxia went from 15 minutes down to 10 minutes. Why these changes occurred is multifactorial including more comprehensive accident reporting, increased safety awareness, better companion rescue training, and faster helicopters. Overall, the shape of the avalanche survival curve is the same. Once under the snow, time is critical. Avoidance is still the best way to save lives.

Figure 3. Cumulative Probability of Survival by Time Buried Under Avalanche in Minutes

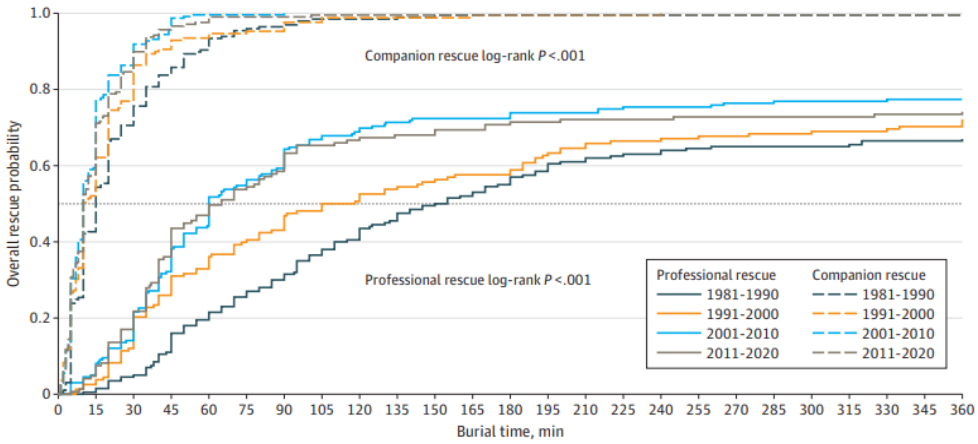


No. at risk

1981-2020 Imputed	1643	849	380	195	138	123	94	68	62	58	56	47	46	43	42	39	38	37	36	25	25	25	25	25	25
1981-1990	416	263	146	62	52	48	33	27	25	8	8	7	7	2	2	2	2	2	2	2	2	2	2	2	2

Dark blue line represents new data from 1981 to 2020, with missing times imputed; orange line, data from 1981 to 1990 as used in the study by Falk et al,[1] with missing times imputed; vertical dotted line, 15-minute reference mark.

Figure 4. Probability of Rescue by Rescue Type and Time Buried Under Avalanche in Minutes

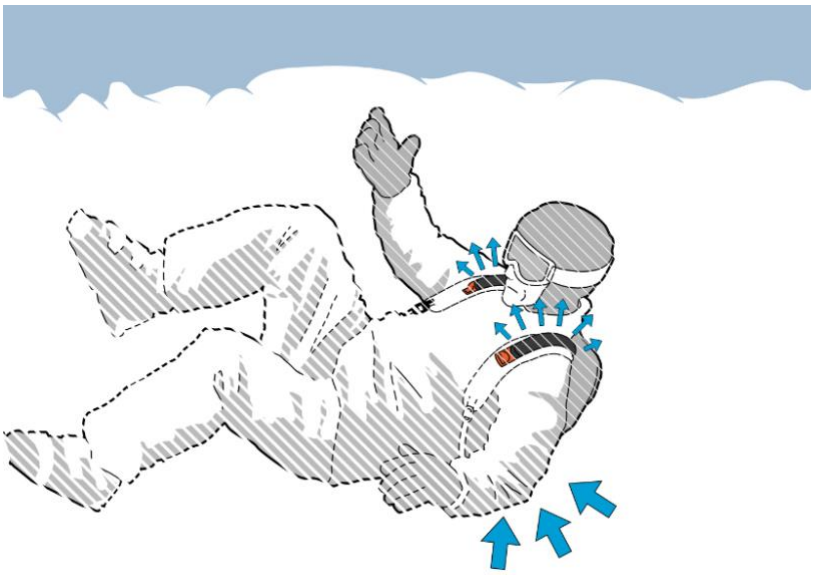


No. at risk

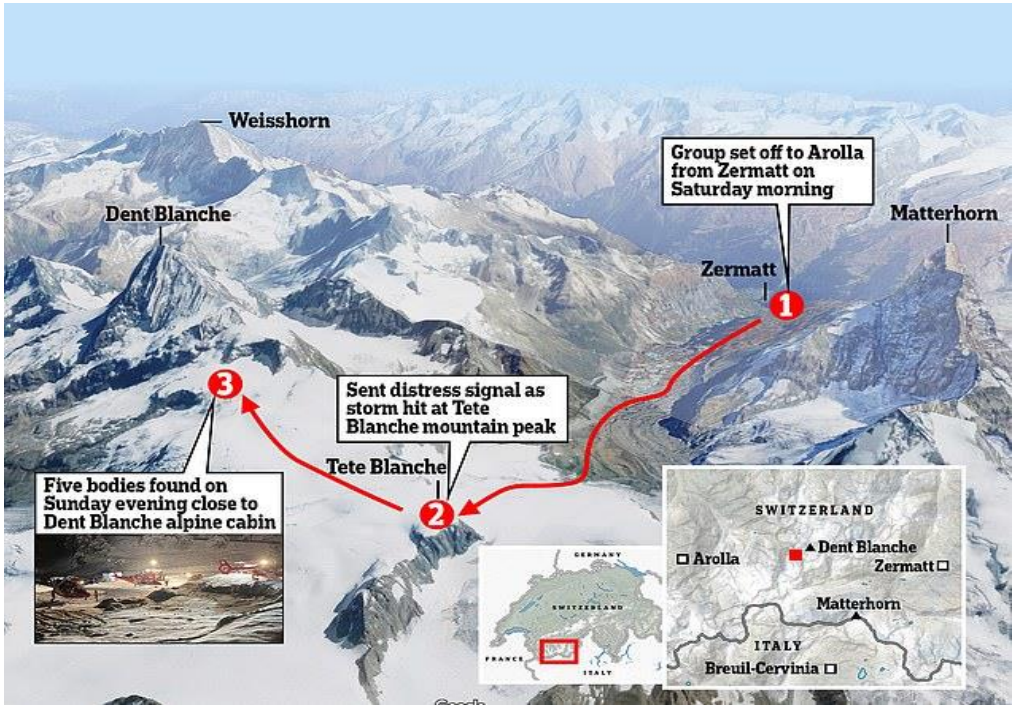
Professional rescue																									
1981-1990	200	199	191	178	161	149	140	127	119	109	101	96	90	83	78	75	74	71	70	70	70	70	67	67	67
1991-2000	158	154	139	117	106	95	90	82	78	73	70	67	67	59	56	53	53	52	51	50	50	49	49	47	47
2001-2010	199	189	171	135	111	90	81	66	62	57	55	55	55	52	52	50	49	49	47	47	46	46	46	45	45
2011-2020	147	140	122	94	78	68	61	51	49	47	47	45	43	42	41	41	41	40	40	40	40	40	39	39	39
Companion rescue																									
1981-1990	197	113	58	32	19	9	7	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1991-2000	169	81	39	16	11	9	8	4	2	2	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0
2001-2010	234	95	32	10	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011-2020	208	88	32	9	5	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Horizontal dotted line indicates rescue probability of 50%.

Dr. Giacomo Strapazzon, also from EURAC, discussed the importance of an air pocket and open airway in avalanche survival. Safeback, a new avalanche safety device, shows improved PO2 when buried. The battery powered air supplier takes “fresh” air out of the surrounding snow, from behind the patient, and delivers to the face. This has been shown to increase levels of PO2 and decrease levels of CO2 on capnography in simulated burials.



There were a variety of presentations regarding SAR triage and training protocols in Canada, Japan, France, and the Himalaya. As different as these places are they all deal with the same issues as we do in the MRA around recruitment, training, fitness, retention, psychological stress and working with other agencies. Several major rescue missions were reviewed including one from Switzerland eerily similar to the Pigne D’Arolla disaster in 2018. Six people left Zermatt in March of 2024 on skis to Arolla but were stranded due to weather at 3500 meters near Tete Blanche. Wind to 120km/hr, wind chill -30C and 30cm of new snow made for a difficult rescue. Unfortunately, there were no survivors, all succumbed to hypothermia. One person was not found until August.



On a happier note, after the conference, 4 of the 8 MRA ICAR delegates were able to climb Mount Olympus, 2918 m. We ran into a number of other ICAR delegates at the hut and on the summit. The weather was perfect, and the camaraderie of the SAR community was outstanding. In 2025 the ICAR congress will be in Jackson Hole, Wyoming. If you have interest in ICAR or in becoming a delegate, you should plan on attending as the conference rarely comes to North America. Save the date October 7-11, 2025, we hope to see you there.

Brian Stube, Alison Sheets, Tom Wood, Steph Petri, Dale Wang, Rich Seimer
Mytikas Summit, Mount Olympus, October 21, 2024