9h00	Opening of the meeting	A. Kottmann
9h15	Prehospital iv pain management in a Swiss alpine helicopter medical service	L. Vizzolo
9h35	Locoregional anesthesia in a Swiss alpine helicopter emergency service	A. Moser
9h55	Point of care ultrasound in cave rescue - three short case reports	K. Habegger
10h10	Pause	
10h40	Damage control surgery in mountain rescue	O. Reisten
11h00	Avalanche survival rates in Switzerland, 1981-2020	U. Pietsch
11h20	Overview of Rega's research projects in relation to mountain rescue	J. Knapp
11h40	Return of experience of the rescue at Tête Blanche	P. Métrailler, G. Bueche
12h10 13h30	Lunch break: raclette!	
13h30	Noncompressible chest wall in critically buried avalanche victims with cardiac arrest	D. Eidenbenz
13h50	From the region, for the region	S. Bernard
14h10	Defibrillation in patients with accidental hypothermia and core temperatures ≤30°C	E. Cools
14h30	Sub-glacier canyoning rescue	J. Picart
14h50	Pause	
15h20	Guide medic course	O. Samuel
15h40	Intensification of basic medical care in mountain regions through alpine rescue	A. Bardill
16h00	Short report on the expedition of the SAC expedition team in India in 2022	R. Thalmann
16h20	Closing of the meeting and award of the Bruno Durrer prize by LOWA (500 CHF) for the best presentation	

Im Anschluss: Generalversammlung der SGGM

Pre-hospital intravenous pain management in a Swiss alpine helicopter medical service

L. Vizzolo[1,2], C. Luyet[3,4], P. Metrailler[4,5], A. Moser[1,4,6]

1: Anesthesia Department, Hospital of Fribourg, Fribourg, Switzerland
2: Emergency Department, Réseaux Hospitalier Neuchâtelois, Neuchâtel, Switzerland
3: Anesthesia Department, Lindenhofspital, Bern, Switzerland
4: Air Glaciers SA, Sion, Switzerland
5: Emergency Department, Centre Hospitalier du Valais Romand, Sion, Switzerland
6: Swiss Alpine Rescue, Zürich, Switzerland

Introduction

The literature about ketamine has proven its safety profile and its efficacy as an analgesic tool within the prehospital context[1,2]. Despite the data, opioids are often preferred, exposing patients to their side effects. We report a retrospective analysis of data on the employment modality of intravenous analgesics with a special focus on ketamine within the context of the Swiss helicopter emergency medical service (HEMS) Air Glaciers in 2023.

Methods

Among 2103 primary trauma calls, single extremity traumas (limb fractures or dislocations) were retrieved for further analysis. These 1220 cases were further classified according to NACA (National Advisory Committee for Aeronautics) score, type of provider, and specialty training type of the physician (anesthesia, non-anesthesia), when present. We classified the results into four classes: (1) WHO step 1 analgesic drugs; (2) fentanyl only; (3) ketamine only; (4) fentanyl + ketamine. Primary output measure was the difference in pain treatment according to the NACA score. Secondary output measure was difference in pain treatment in relation to the specialty training of the medical doctors and time on scene relative to the NACA severity index. Statistical analyses were calculated using the student t-test.

Results

In 2023 Air Glaciers received 2103 primary trauma calls, of which 19 compelled orotracheal intubation (0.9%). For the analysis concerning pain treatment, only limb trauma cases were retrieved. Of the 1220 cases 25 patients (1,2%) were classified as NACA 1, 520 (24,7%) as NACA 2, 633 (30,1%) as NACA 3 (fentanyl was the drug of choice for these cases), 41 (1,9%) as NACA 4 (the choice of intravenous drug leans towards

ketamine) (*figure 1*). One case was classified as NACA 5. Ketamine was exclusively administered by medical doctors with a positive correlation to the increasing NACA score. Ketamine was rarely administered as sole analgesic tool. When administered, neither the dosage of ketamine nor that of fentanyl varied according to specialty training type of the providing physician. Time on scene was not significantly correlated to NACA score.

Conclusions

Amongst others, one of the leading challenges the medical provider must withstand is pain treatment in austere environments due to the impending technical and physical constraints that these missions entail: limited access to the victim, environmental risk, and isolation. Effective and safe analgesia is imperative. Scientific data about the employment of ketamine in the pre-hospital setting has only recently emerged[3] with auspicious outcomes: significant pain reduction, infrequent side effects that can be hindered by adding a benzodiazepine, and improved patient outcomes and satisfaction[2,3]. Concomitant opioid employment may also lengthen the analgesic effect. Nonetheless, our analyses report rather hesitant providers, a finding that could be due to lack of local protocols and to modest experience with the molecule. Since 2016 the use of ketamine has been increasing[4]. Nevertheless, specialty training in anesthesia does not seem to affect the decision-making process: higher NACA scores are associated with the introduction of ketamine as part of the treatment plan, mixed with fentanyl in the vast majority of cases. We believe that the utilization of ketamine alone may improve pre-hospital analgesia due to its negligible side effects[1,2,3]. Moreover, opioid-related adverse events can be completely obviated. Early ketamine administration may also improve outcomes as it could be subsidized by adequate dosage-limited, paramedic-executed, medically prescribed protocols.

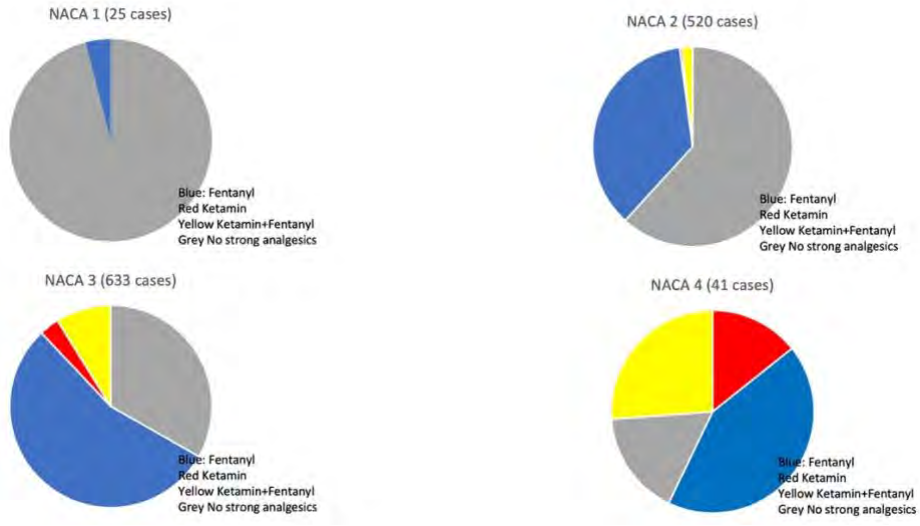

Figure 1 : IV medication according to case severity

1. Guo J, Zhao F, Bian J, Hu Y, Tan J. Low-dose ketamine versus morphine in the treatment of acute pain in the emergency department: A meta-analysis of 15 randomized controlled trials. Am J Emerg Med. 2024 Feb;76:140-149. doi: 10.1016/j.ajem.2023.11.056. Epub 2023 Dec 3. PMID: 38071883.
2. Häske D, Eppler F, Heinemann N, Schempf B. Patient-reported side effects and satisfaction of pre-hospital analgesia with low-dose esketamine: a cross-sectional study. BMC Emerg Med. 2023 Nov 4;23(1):130. doi: 10.1186/s12873-023-00898-4. PMID: 37924027; PMCID: PMC10625244.
3. Vanolli K, Hugli O, Eidenbenz D, Suter MR, Pasquier M. Prehospital Use of Ketamine in Mountain Rescue: A Survey of Emergency Physicians of a Single-Center Alpine Helicopter-Based Emergency Service. Wilderness Environ Med. 2020 Dec;31(4):385-393. doi: 10.1016/j.wem.2020.06.004. Epub 2020 Sep 8. PMID: 32912718.
4. Eidenbenz D, Taffé P, Hugli O, Albrecht E, Pasquier M. A two-year retrospective review of the determinants of pre-hospital analgesia administration by alpine helicopter emergency medical physicians to patients with isolated limb injury. Anaesthesia. 2016 Jul;71(7):779-87. doi: 10.1111/anae.13462. Epub 2016 Apr 18. PMID: 27091515.

AIR GLACIERS

LOCOREGIONAL ANESTHESIA IN A SWISS ALPINE HELICOPTER EMERGENCY SERVICE

L. VIZZOLO[1,2], C. LUYET[3,4], P. METRAILLER[4,5], A. MOSER[1,4,6]

1: Anesthesia Department, Hospital of Fribourg, Fribourg, Switzerland

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4: Air Glaciers SA, Sion, Switzerland

5: Emergency Department, Centre Hospitalier du Valais Romand, Sion, Switzerland

6: Swiss Alpine Rescue, Zürich, Switzerland

SION COLLOMBEY LEYSIN GAMPEL LAUTERBRUNNEN GSTAAD

21 YEARS AGO[1]

TABLE 1. Aforementioned Side Effects Related to Analgesia and/or Anesthesia During Out-of-Hospital Management

Respiratory	Respiratory depressant effect
	Hypoxemia
	Esophagal intubation
	Difficult intubation
	Mainsteam intubation
	Pulmonary aspiration
	Laryngospasm
	Bronchospasm
	Pulmonary oedema
	Hypercapnia
	Pneumothorax
Miscellaneous	Nausea
	Vomiting
	Rash
	Anaphylactic shock
	Device dysfunction
Cardivascular	Hypotension
	Hypertension
	Bradycardia
	Tachycardia
	Arrhythmia
	Collapse
	Cardiac arrest

1:Ricard-Hibon A et al. Am J Emerg Med. 2003

18 YEARS LATER

FULL LENGTH ARTICLE · Volume 268, P634-642, December 2021 Download Full Issue

Pre-Hospital Administration of Opioids in Trauma Patients: Is Dose Associated With Outcomes?

Letitia Bible, MD · Omar Obaid, MD · Muhammad Khurrum, MD · ... · Tanya Anand, MD · Meera Kapadia, MS · Bellal Joseph, MD ... Show more

Affiliations & Notes Article Info

Results

In total, 709 patients were included in the analysis. Cutoff values of 200 mcg F and 15 mg MS were significantly associated with adverse outcomes. Overall, the ED hypotension rate was 14.4%, ED intubation rate was 6%, and ED mortality rate was 3.1%. On regression analysis, higher dosages of both pre-hospital F and pre-hospital MS were independently associated with increased odds of ED hypotension, ED intubation, and discharge on opioid medications, but not with ED mortality.

ADDICTION


PubMed
opioid crisis
Search
Advanced
Create alert
Create RSS
User Guide
RESULTS BY YEAR
1953
2025

OPIOPHOBIA

> J Clin Med. 2021 Mar 25;10(7):1353. doi: 10.3390/jcm10071353.

Opiophobia in Emergency Department Healthcare Providers: A Survey in Western Switzerland

Sarah Bertrand [1], Gabriel Meynet [1], Patrick Taffé [2], Vincent Della Santa [3], Daniel Fishman [4], Yvan Fournier [5], Vincent Frochaux [6], Vincent Ribordy [7], Olivier T Rutschmann [8], Olivier Hugli [9]

The fear of side effects and of addiction were the major contributors of opiophobia among ED healthcare providers; opiophobia was also associated with their personality traits.

OLIGOANALGESIA

British Journal of Anaesthesia **110** (1): 96–106 (2013)
Advance Access publication 11 October 2012 · doi:10.1093/bja/aes355

BJA

Undertreatment of acute pain (oligoanalgesia) and medical practice variation in prehospital analgesia of adult trauma patients: a 10 yr retrospective study

E. Albrecht[1], P. Taffe[2], B. Yersin[3], P. Schoettker[1], I. Decosterd[1] and O. Hugli[3]*

[1] Department of Anaesthesiology, [2] Institute of Social and Preventive Medicine, and [3] Emergency Department, Lausanne University Hospital, Bugnon 46, 1011 Lausanne, Switzerland

Methods. Patient records of conscious adult trauma victims transported by our air rescue helicopter service over 10 yr were reviewed retrospectively.

Results. A total of 1202 patients and 77 physicians were included in the study. NRS at the scene was 6.9 (1.9). The prevalence of oligoanalgesia was 43%.

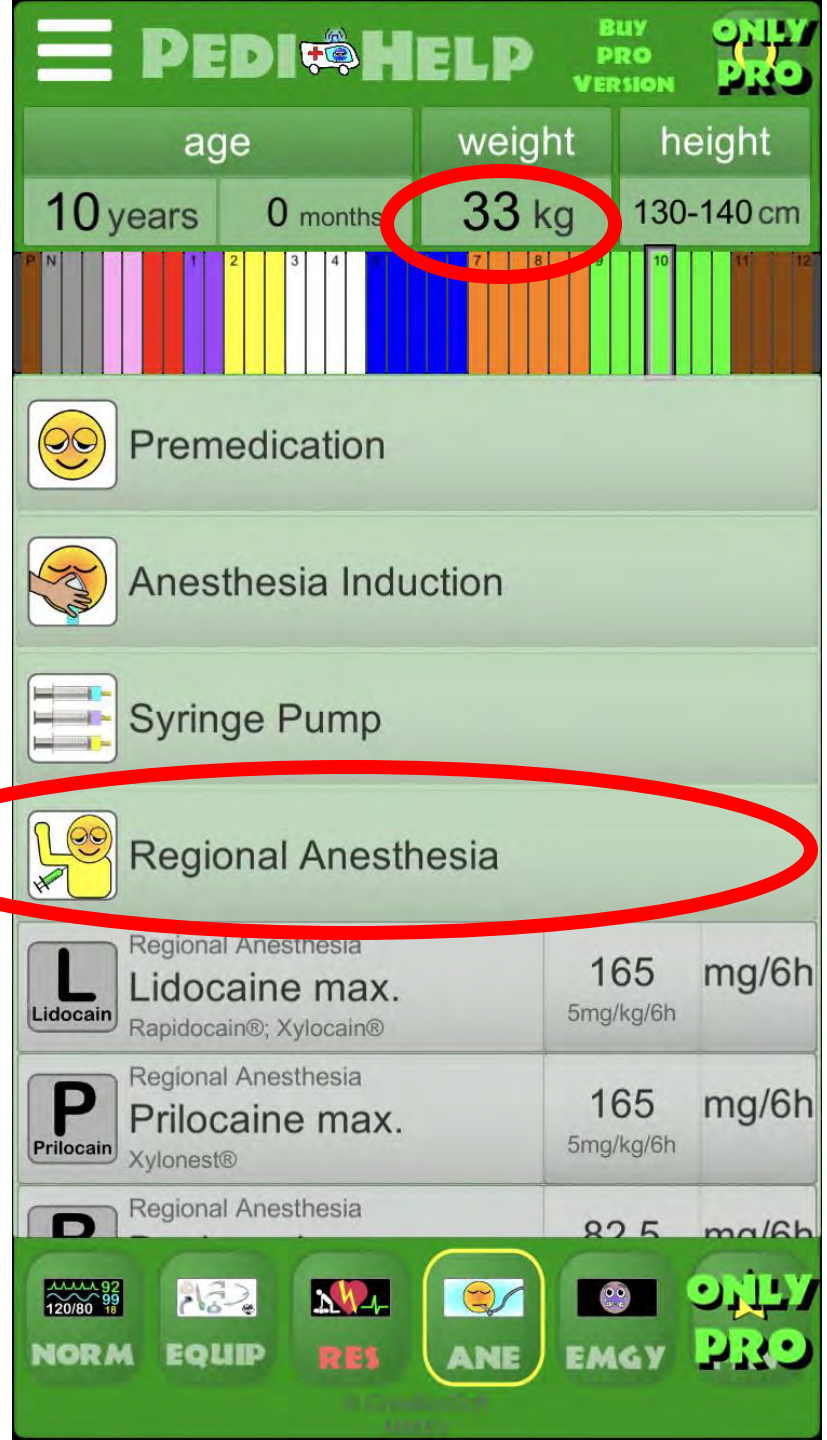
Editor's key points

- There is evidence of undertreatment of pain in trauma patients at the prehospital stage.

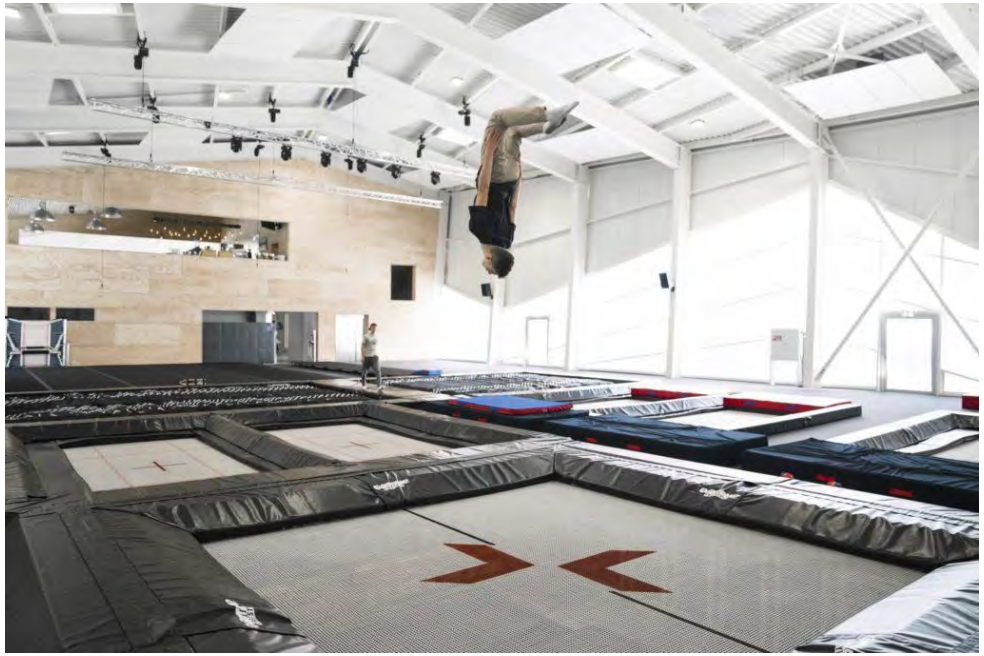
A (YOUNG) CASE

/helico/2e echelon/10 an(s), 20kg environs, Homme, Conscient, Respire.
CODE: 30B01: Région du corps POSSIBLEMENT DANGEREUSE

/helico/2e echelon/**10 an(s)**, 20kg environs, Homme, Conscient, Respire.
CODE: 30B01: Région du corps **POSSIBLEMENT DANGEREUSE**


PEDI HELP
Buy PRO Version
ONLY PRO
age
weight
height
10 years
0 months
33 kg
130-140 cm
Premedication
Anesthesia Induction
Syringe Pump
Regional Anesthesia
Regional Anesthesia
Lidocain
Lidocaine max.
Rapidocain®; Xylocain®
165
5mg/kg/6h
mg/6h
Regional Anesthesia
Prilocain
Prilocaine max.
Xylonest®
165
5mg/kg/6h
mg/6h
Regional Anesthesia
NORM
EQUIP
RES
ANE
EMGY
ONLY PRO

SITUATION



- Trampoline accident
- Closed femoral shaft fracture
- VAS 10/10 at rest
- No mobilisation possible
- 7 y.o and not 10 → 25Kg (easier for calculation)
- Paramedics on scene: Fentanyl i.n. 2x20mcg → VAS 10/10
- HEMS for analgesia management

MANAGEMENT

- Establishing a venous access (24G) on the trampoline
- Fentanyl 25mcg iv + 2mg Ondansetron iv → VAS 10/10 (at rest)
- Fentanyl 2x12,5mcg iv (total 50mcg = 2mcg/Kg) → VAS 7-8/10 (at rest)
- Ketamine 10mg iv (0,4mg/Kg)
  - Femoral traction
  - Evacuation from trampoline with femoral traction
- Fascia Iliaca Compartment Bloc (FICB) with ultrasound guidance (in plane)
  - 110mg Lidocaïne 1% (4,4mg/Kg)

EVOLUTION

SPO2	FC	TA	GCS	DOULEUR
100 %	104 / min	106 / 71	4/5/6	10
100 %	96 / min	105 / 70	4/5/6	10
100 %	98 / min	104 / 68	4/5/6	8
100 %	105 / min Régulier		4/5/6	8
100 %	101 / min	105 / 69	4/5/6	7
	101 / min	121 / 81	3/5/6	2
	97 / min	117 / 74	3/5/6	1
100 %	97 / min	114 / 75	3/5/6	0

WHAT WE WANTED TO KNOW

- How prehospital LRA is used in our HEMS over a period of 35,5 months
  - Frequency
  - Type of block
  - Ultrasound guidance or anatomical technique

- Time on site
  - With ultrasound use vs without

- Does prehospital LRA reduce the need for opoids and/or sedatives?
  - Evolution of pain scores
  - Complementary medication administered before and after the procedure

- Complication

- Simple descriptive statistics and unpaired Student t test

WHAT WE FOUND OUT

PLAN B

84 YEARS AGO IN WARTIME[1]

Field Block for Cranial Surgery in World War II

LTC Robert J. Medell, USAF MC
Maj David B. Waisel, USAF MC
Maj Scott A. Eskuri, USAF MC
Capt Randy W. Calicott, USAF MC

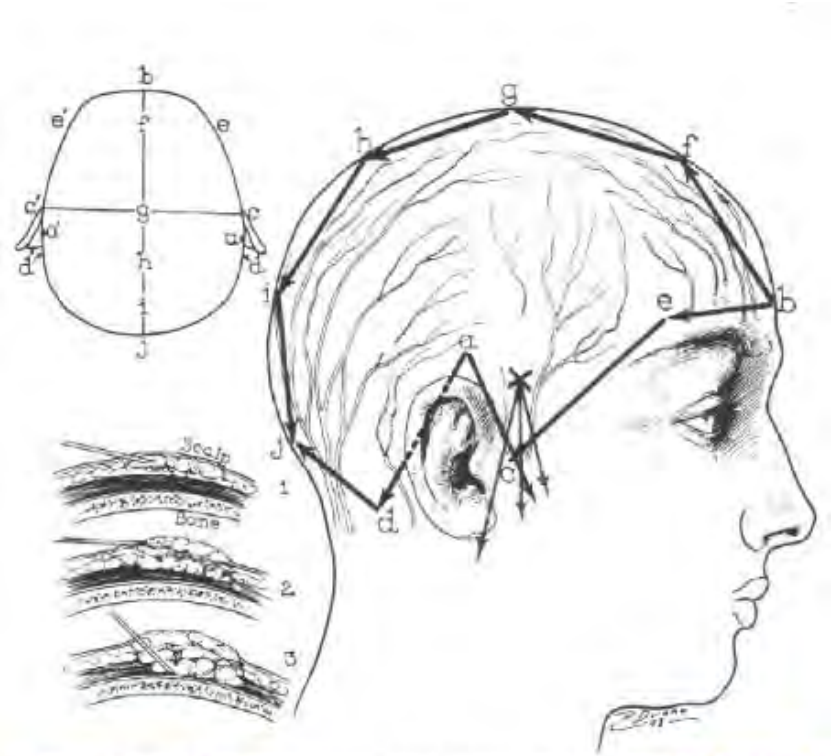
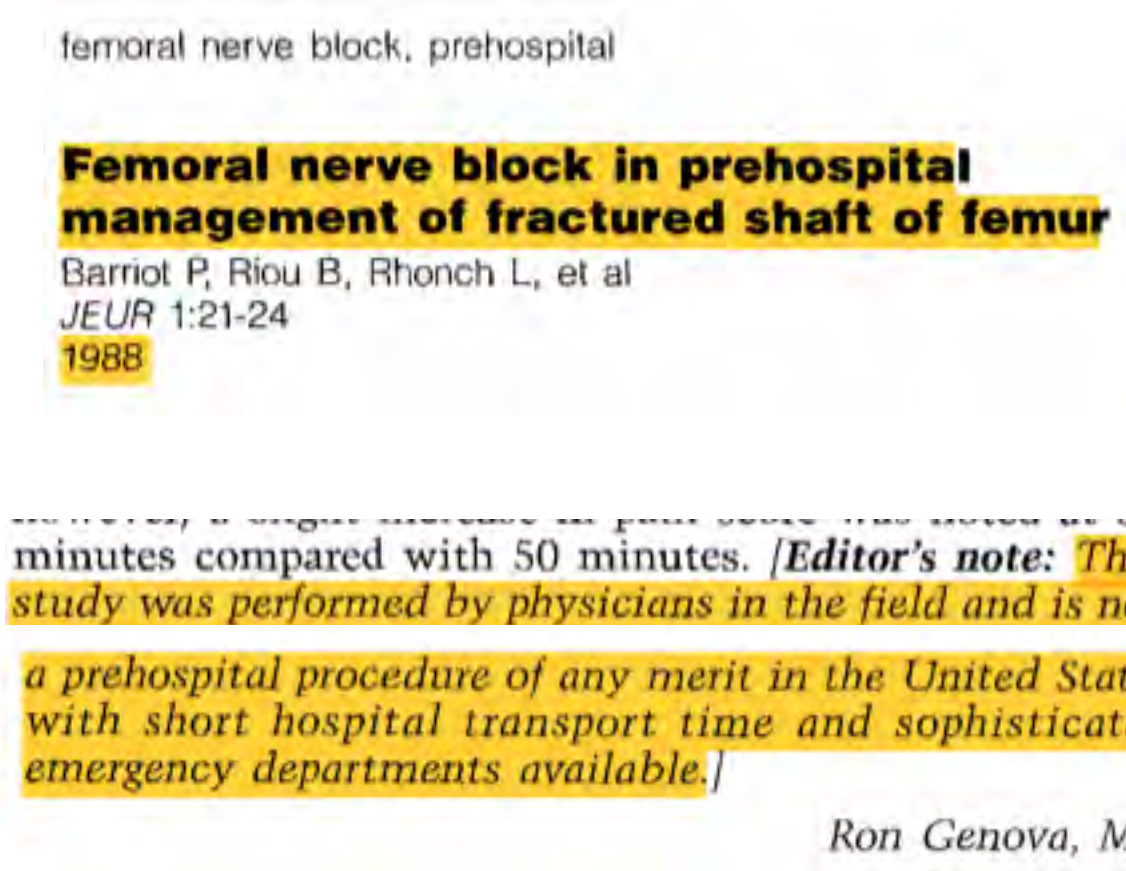


Fig. 1. Figure 9 from *Clinical Anesthesia*, showing the technique for field block for cranial operations.[4]

1: Medell et al. Military Medicine. 1998

36 YEARS AGO: FIRST PUBLICATION[1]



femoral nerve block, prehospital

Femoral nerve block in prehospital management of fractured shaft of femur

Barriot P, Riou B, Rhonch L, et al
JEUR 1:21-24
1988

minutes compared with 50 minutes. *[**Editor's note:** This study was performed by physicians in the field and is not a prehospital procedure of any merit in the United States with short hospital transport time and sophisticated emergency departments available.]*

Ron Genova, MD

1: Barriot et al. Anals of Emergency Medicine. 1988

EVERYTHING WE DO IN THE HOSPITAL CAN BE DONE OUTSIDE[1]

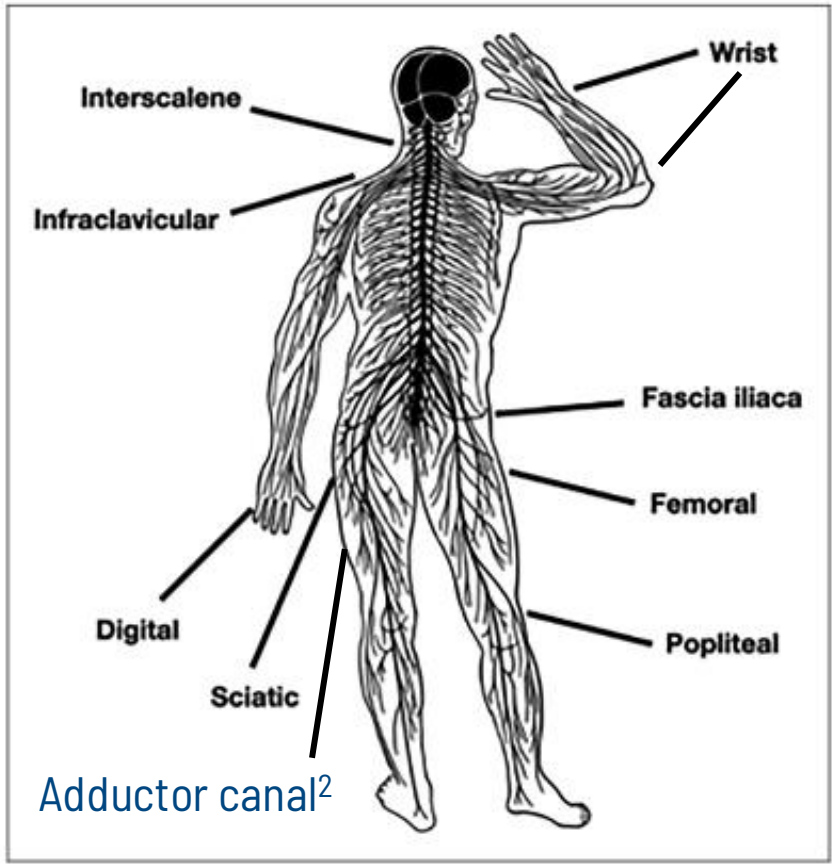


Figure 2. A range of regional anesthetic blocks performed in the prehospital setting (picture by NA).

1: Anderson et al. WEM. 2024
2: Petrucci et al. WEM. 2018

IN A SMALL TOWN

Fascia iliaca block

This is our preferred procedure for the analgesia of isolated femoral shaft fractures. It should preferably be done under ultrasound guidance and using ropivacaine.

https://sydneyhems.com/resources/curriculum/fascia-iliaca-block/

SWITZERLAND[1, 2, 3]

1: Carron P.-N et al. Médecine d'urgence préhospitalière. 2013
2: Pasquier M et al. High Altitude Medicine & Biology. 2012
3: Moser et al. WEM. 2023

SETTING

AIR GLACIERS

COMPLICATIONS[1-5]

– Only 5 cases in the prehospital literature

- 1x breathing problems post ISB[1]
- 1x rapid resorption with tachycardia, hypertension and headache [2]
- 2x arterial puncture (without ultrasound guidance)[3]
- 1x LAST with Intralipids use[4,5]

1. Gross et al. An Fr Anesth Rea. 2008
2. Gozlan et al. An Fr Anesth Rea. 2005
3. Barriot et al. An Fr Anesth Rea. 1990
4. Jones et al. Pilot Feasability Stud. 2019
5. Evans et al. BMJ open. 2019

Point of care ultrasound in cave rescue - three short case reports

BRM Tagung November 2024

Abstract

Innerklinisch wird Point- of- care Ultraschall (POCUS) routinemässig bei verschiedenen diagnostischen Fragestellungen und therapeutischen Verfahren eingesetzt. Durch technische Fortschritte stehen zunehmend auch präklinisch portable Ultraschallgeräte zur Verfügung. In vielen Rettungsdiensten in der Schweiz wurden diese in den letzten Jahren sukzessive eingeführt und werden erfolgreich genützt. Besonders in abgelegenen Einsatzgebieten, wo die medizinischen Mittel beschränkt sind, kann der Ultraschall dazu beitragen, Diagnosen zu stellen oder zu festigen und interventionelle Therapien sicher zu gestalten.

Die Höhlenrettung ist ein Beispiel der terrestrischen Rettung, wo lange Hilfsfristen und Transportzeiten oft unvermeidbar sind. Der Transport eines nicht mehr gehfähigen Patienten kann bereits für kurze Strecken sehr ressourcenintensiv werden. Bei Patienten mit Mehrfachverletzungen stellt auch die adäquate Analgesie die Behandelnden oft vor grosse Herausforderungen aufgrund der langen Transportzeiten und der eingeschränkten Monitoring-Möglichkeiten.

In der Schweizer Höhlenrettung (Speleo Secours Schweiz) wurde 2022 erstmals POCUS sowohl diagnostisch und therapeutisch im Einsatz genutzt. Soweit bekannt, war dies europaweit eine der ersten Anwendung im Rahmen eines Primäreinsatzes. Zwei weitere Fälle kamen in den letzten beiden Jahren dazu.

Fall 1:

Polytrauma nach Sturz aus ca. 10m Höhe, multiple Frakturen; unter anderem distale Radiusfraktur links, Claviculafraktur links, OSG Luxationsfraktur rechts. Diagnostisch wurde ein eFAST durchgeführt. Die systemische Analgesie über 3 WHO-Stufen war für den Transport insuffizient, sodass eine Regionalanästhesie einerseits der linken Schulter und des Arms (ISB single shot) sowie des rechten Unterschenkels (Poplitealblock) erfolgte.

Fall 2:

Steinschlag. Der Patient beklagte immobilisierende Schmerzen im Bereich der Hüfte. Durchgeführt wurde ein eFAST und eine Regionalanästhesie der Hüfte (Fascia iliaca plain block) zur Bergung.

Fall 3:

Schulterluxation. Durch Einsatz einer Regionalanästhesie (ISB single shot) gelang die Reposition und der Patient konnte die Höhle schmerzfrei selbstständig verlassen. Ein aufwändiger Transport in der Trage konnte durch die Intervention verzichtet werden.

Durch Einsatz des point-of-care Ultraschalls konnte in diesen drei Fällen die Patientensicherheit deutlich erhöht, die Einsatzzeiten verkürzt und der Patientenkomfort massgeblich verbessert werden. Das Potential der ultraschallgestützten Diagnostik und Therapie in der präklinischen Patientenversorgung ist gross und wird in der Höhlenrettung in ebenfalls weiterverfolgt werden.

Oliver Reisten

DCS - Damage control surgery in mountain rescue

Bleeding is the most common reason for death in serious mountain accidents. DCS can stop blood loss in locations inaccessible for well known treatment such as pressure bandage or tourniquets. Depending on the incidence emergency medical services are more or less prepared to manage serious trauma in Central Europe. An effective and consequent prehospital surgical treatment standard regarding international guidelines is not guaranteed. Which emergency surgical interventions should be performed by mountain rescue medical services? Are we obliged to provide certain procedures? What are the indications? Which are the limitations and ethical considerations?

Urs Pietsch

The NEW avalanche survival curve, ANY CHANGES OVER TIME?

Modern avalanche transceivers, shovels and probes are now standard in ski touring. Along with a rise in the uptake of avalanche courses and increasingly efficient rescue teams, quicker detection and rescue of buried victims has also improved. The result: increased survival rates in avalanche burials over the past four decades.

“Up until 1990, 43.5% of buried victims survived; now, it’s 53.5%”. “We analyzed data from 1981 to 2020 and compared it with a 1994 Nature study that covered a ten-year period.

The new analysis also shows that the survival probability for long-term burials (over 130 minutes) has increased from 2.6% to 7.3%. The average rescue time has dropped from 45 minutes to 25 minutes. Rescue time decreased from 15 to 10 minutes in cases when a companion was present, while organized rescue times fell from 153 to 90 minutes. However, the phase where survival probability exceeds 90% has shortened from 18 to just 10 minutes.

The findings are published in JAMA Network Open. Rauch S, Brugger H, Falk M, et al. Avalanche Survival Rates in Switzerland, 1981-2020. JAMA Netw Open. 2024;7(9):e2435253. doi:10.1001/jamanetworkopen.2024.35253

“In 1994, we divided the survival curve into different phases and discovered that the first phase, when survival rate is very high, lasted up to 18 minutes. This became a global reference point in mountain rescue, but it now needs to be modified,” says Hermann Brugger of Eurac Research, author of the original 1994 study and co-author of the current one.

There are only hypotheses for the drastic reduction in this time window. “It could be that due to climate change and other factors, snow density has increased. The denser the snow, the less air it contains, making it harder to breathe under the snow,” Rauch suggests. However, this theory has yet to be confirmed by data.

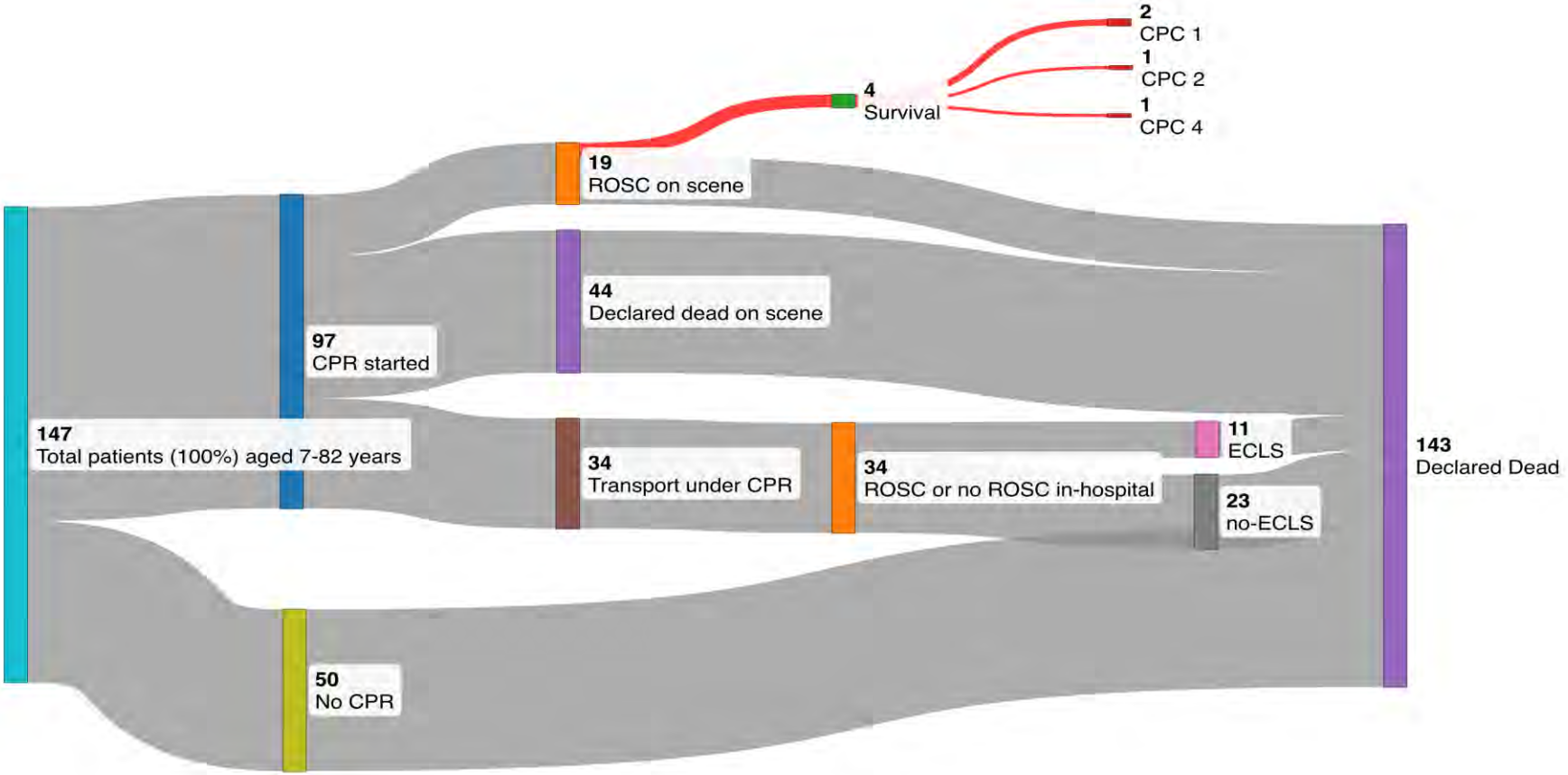
“Time is the critical factor, and ten minutes is not long. Therefore, it’s essential to understand that the survival chances in an avalanche burial are three times higher when excursion companions are able to dig out the victims, rather than when organized rescue teams are involved,” Rauch emphasizes.

The study also highlights preventive measures such as avalanche warning services, training for ski tourers, and advancements in location and rescue techniques, along with improved emergency medical care, have significantly reduced the mortality rate for avalanche victims in recent decades.

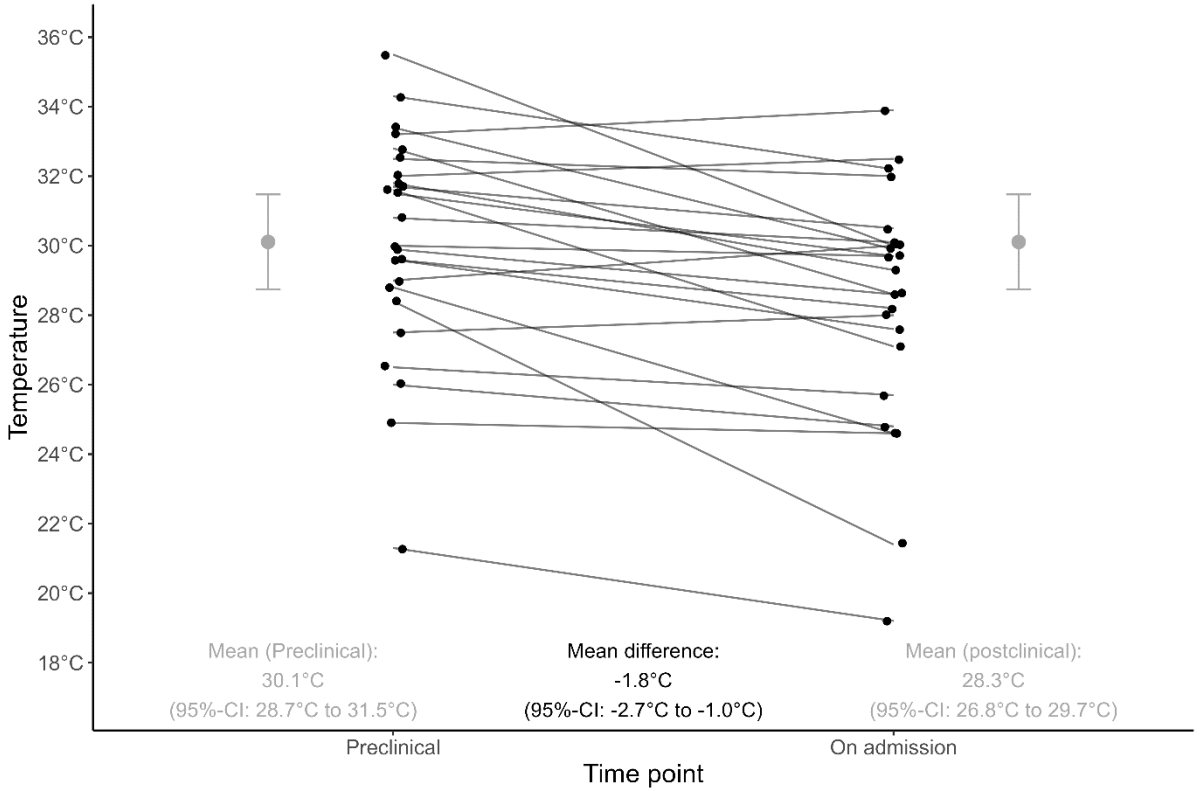
Overview of Rega's research projects in relation to mountain rescue

Jürgen Knapp

2.11.2024


147
Total patients (100%) aged 7-82 years
97
CPR started
50
No CPR
19
ROSC on scene
44
Declared dead on scene
34
Transport under CPR
4
Survival
2
CPC 1
1
CPC 2
1
CPC 4
34
ROSC or no ROSC in-hospital
11
ECLS
23
no-ECLS
143
Declared Dead

Undertreatment (n=20)	Number of cases
Termination of CPR instead of transport to ECLS center despite unknown relevant prognostic factors (burial time, ECG rhythm, presence of an air pocket) and no certain signs of death	7
Transport to non-ECLS center despite burial <60 min and temperature <30°C or unknown temperature	6
Transfer to non-ECLS center despite cardiocirculatory instability after ROSC	5
CPR duration <20 min with temperature ≥30°C despite no obstructed airway or lethal trauma	1
Transport to non-ECLS center despite witnessed cardiac arrest after rescue ("rescue collapse")	1
Potential undertreatment (n=2)	**Number of cases**
Transport to non-ECLS center with ROSC despite unknown temperature (in-hospital core body temperature 29°C)	1
Transport to non-ECLS center although ECLS center would have been indicated according to body temperature due deviation in temperature measurement pre-hospital vs. in-hospital	1
Overtreatment (n=5)	**Number of cases**
Secondary transport to ECLS-center under ongoing CPR despite serum potassium >8 mmol/l	1
Transport under CPR without indication (asystole, burial time >60 min, temperature ≥30°C, and out-of-hospital CPR >20 min)	4

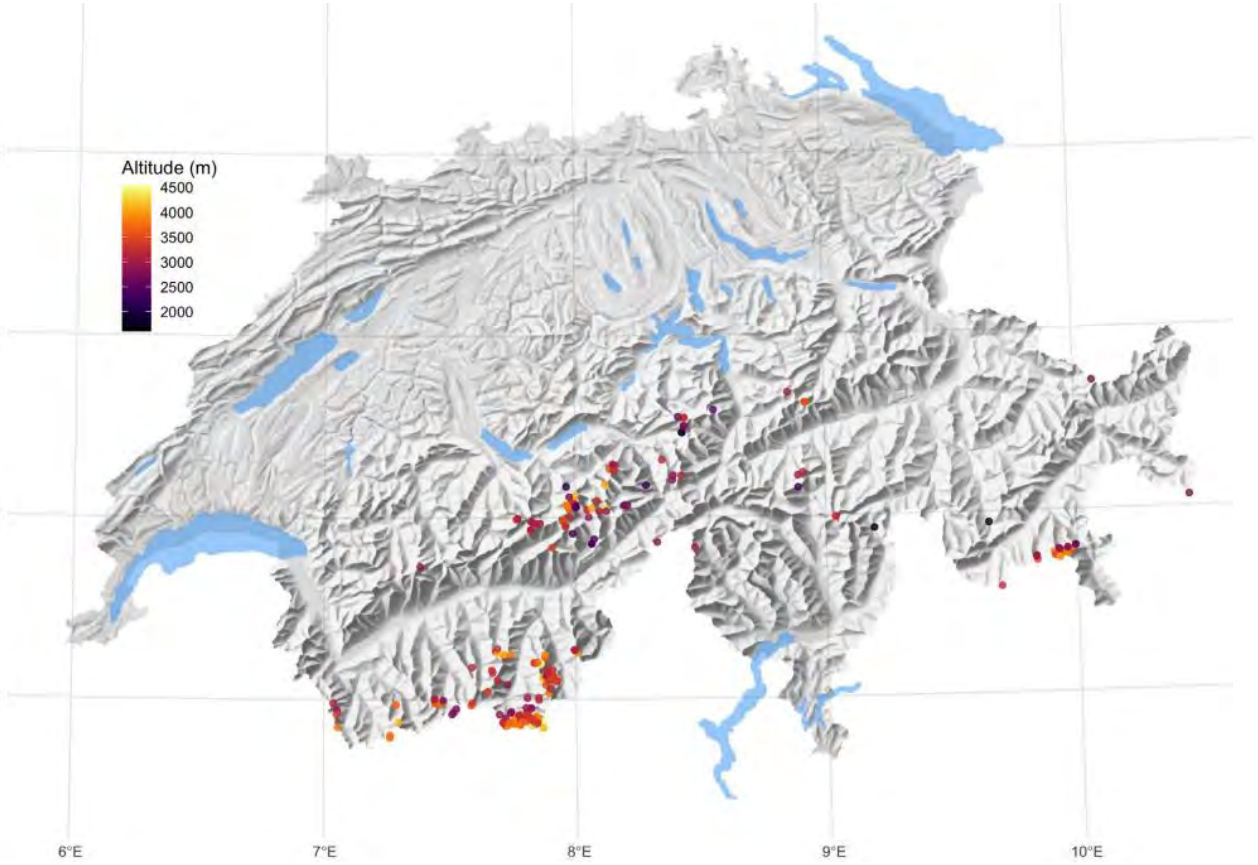

36°C
34°C
32°C
30°C
28°C
26°C
24°C
22°C
20°C
18°C
Temperature
Mean (Preclinical):
30.1°C
(95%-CI: 28.7°C to 31.5°C)
Mean difference:
-1.8°C
(95%-CI: -2.7°C to -1.0°C)
Mean (postclinical):
28.3°C
(95%-CI: 26.8°C to 29.7°C)
Preclinical
On admission
Time point

JAMA Network | Open

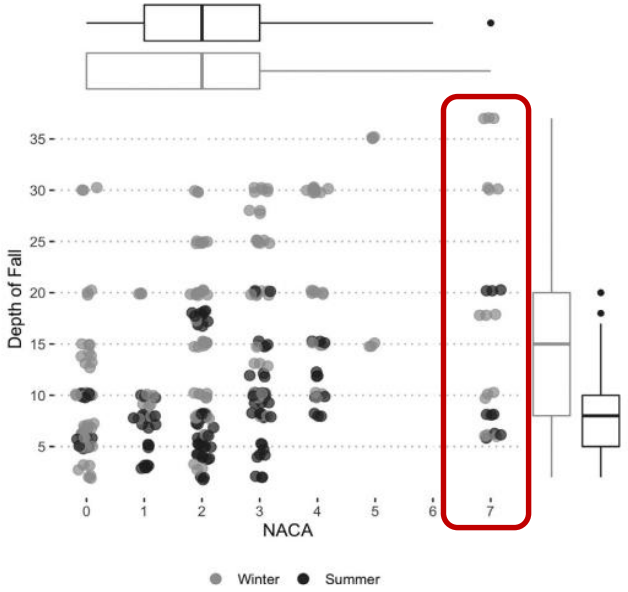
Original Investigation | Emergency Medicine

Avalanche Survival Rates in Switzerland, 1981-2020

Simon Rauch, MD, PhD; Hermann Brugger, MD; Markus Falk, MSc; Benjamin Zweifel, PhD; Giacomo Strapazzon, MD, PhD; Roland Albrecht, MD; Urs Pietsch, MD



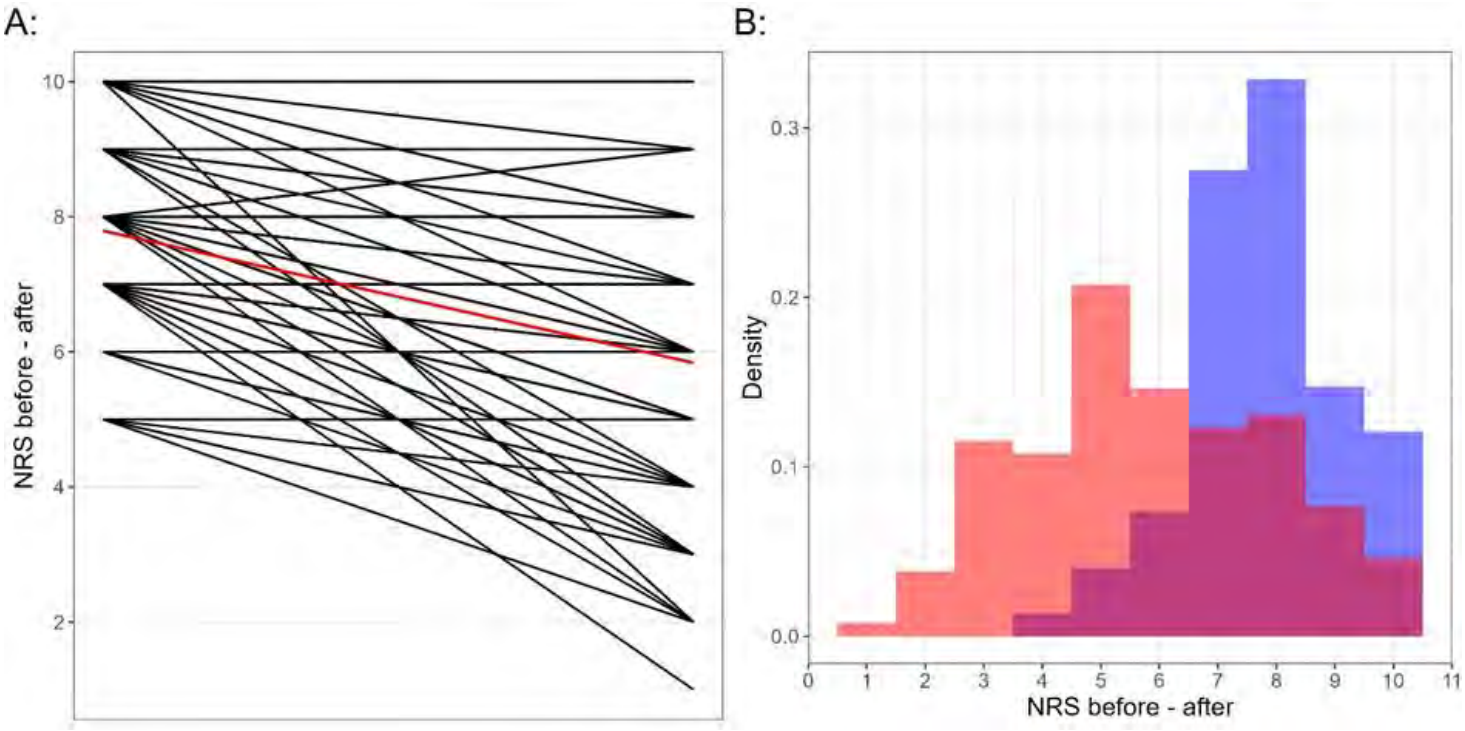
- 2010-2020
- 405 crevasse falls
- 21 dead on scene



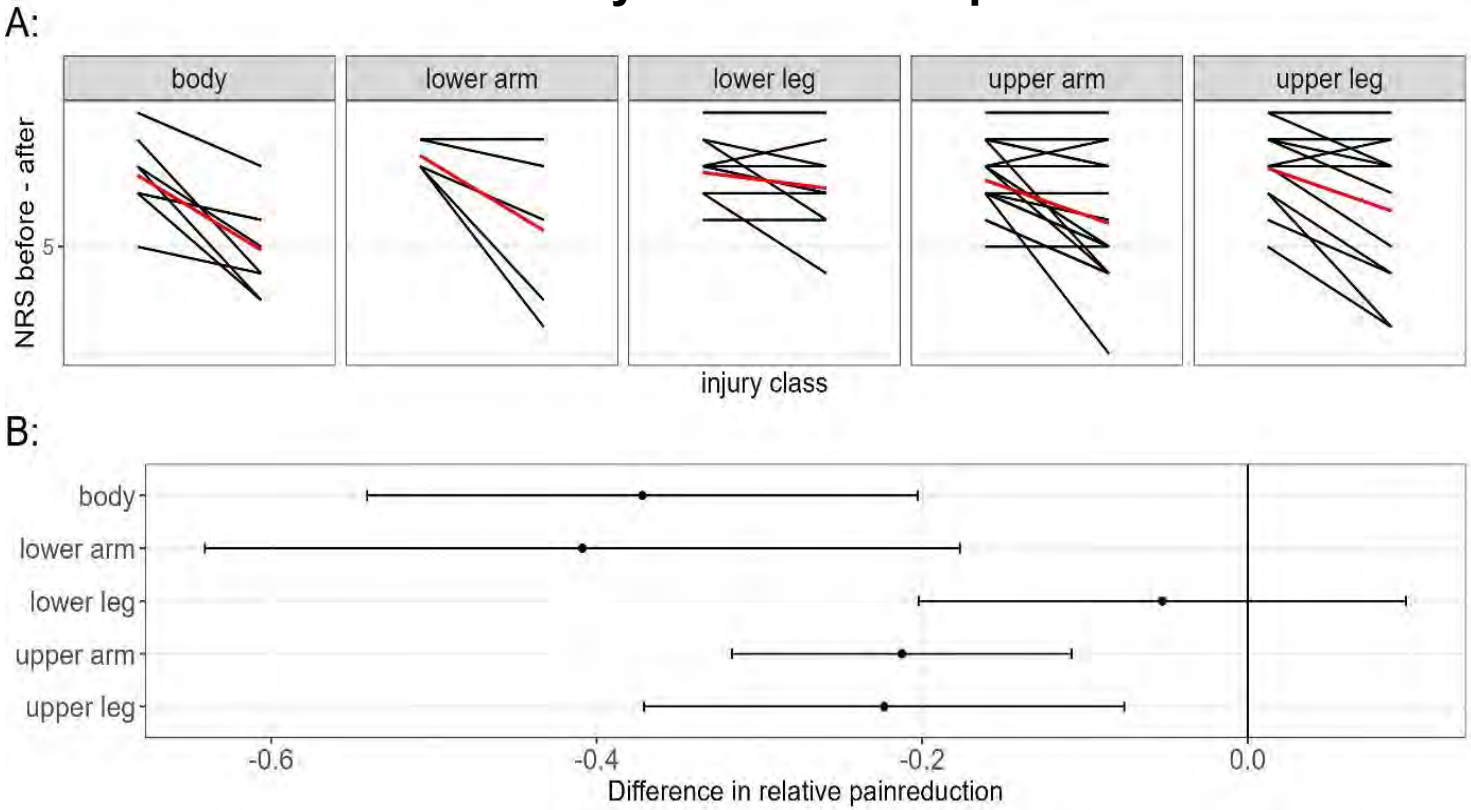
- 55% winter, 45% summer
- Overall mortality 6.5%
  (Pasquier 2014: 11%, Hohlrieder 2010: 16%)
- Mortality winter > summer
- NACA ≥4 in 9.4%
  (Pasquier 2014: 23%)
- NACA 0-2 in 82%
  (Pasquier 2014: 52%)
- 82% male
- 59% foreigners


Rega 14
Notarzt

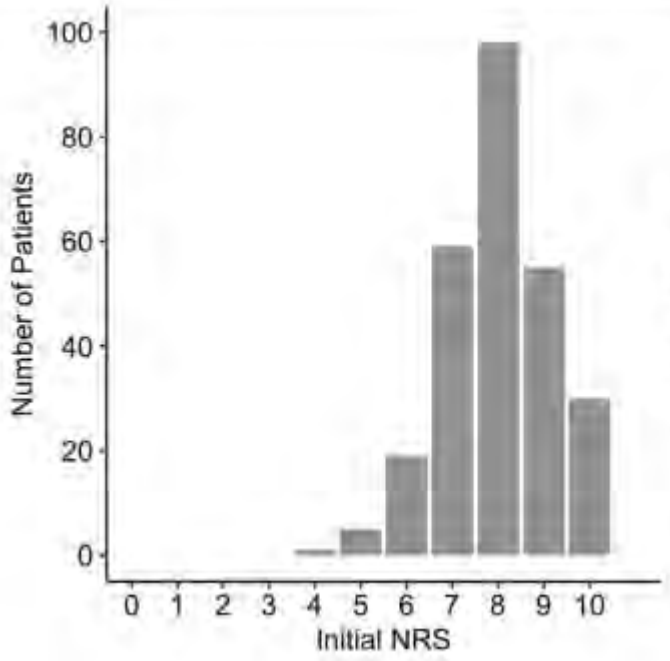
Methoxyflurane for ski patrol?

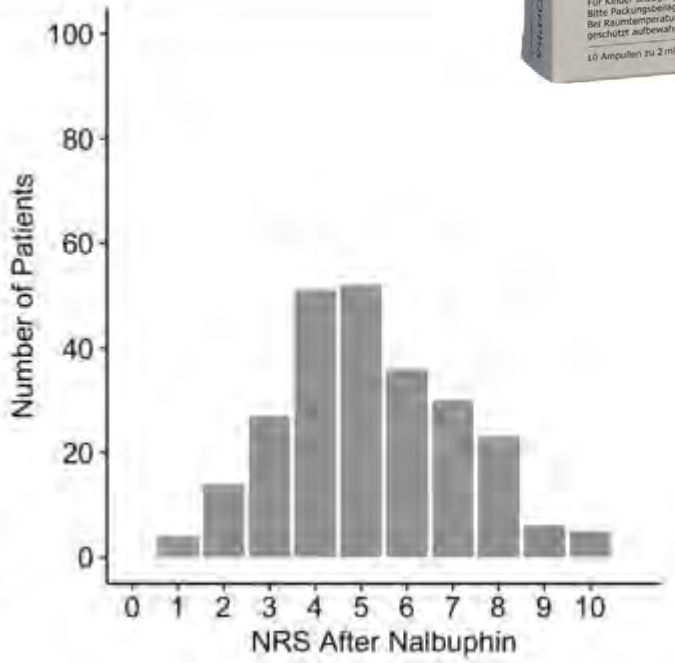


Methoxyflurane for ski patrol?

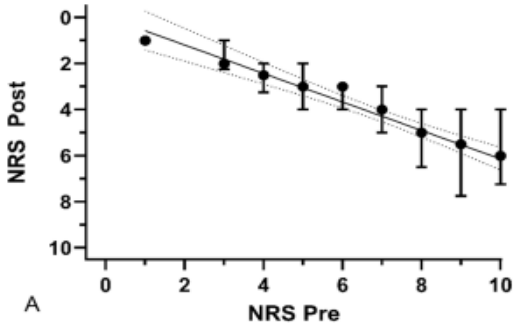


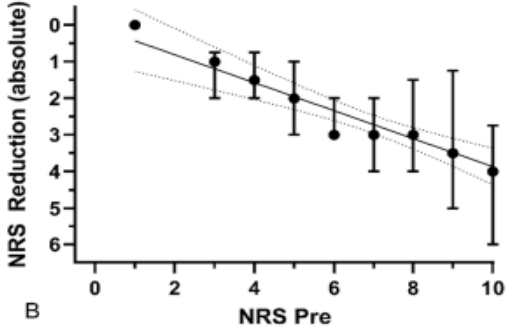
Nasal Nalbuphine for ski patrol?





Oral transmucosal fentanyl





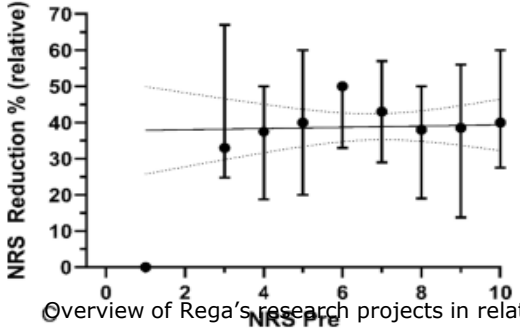


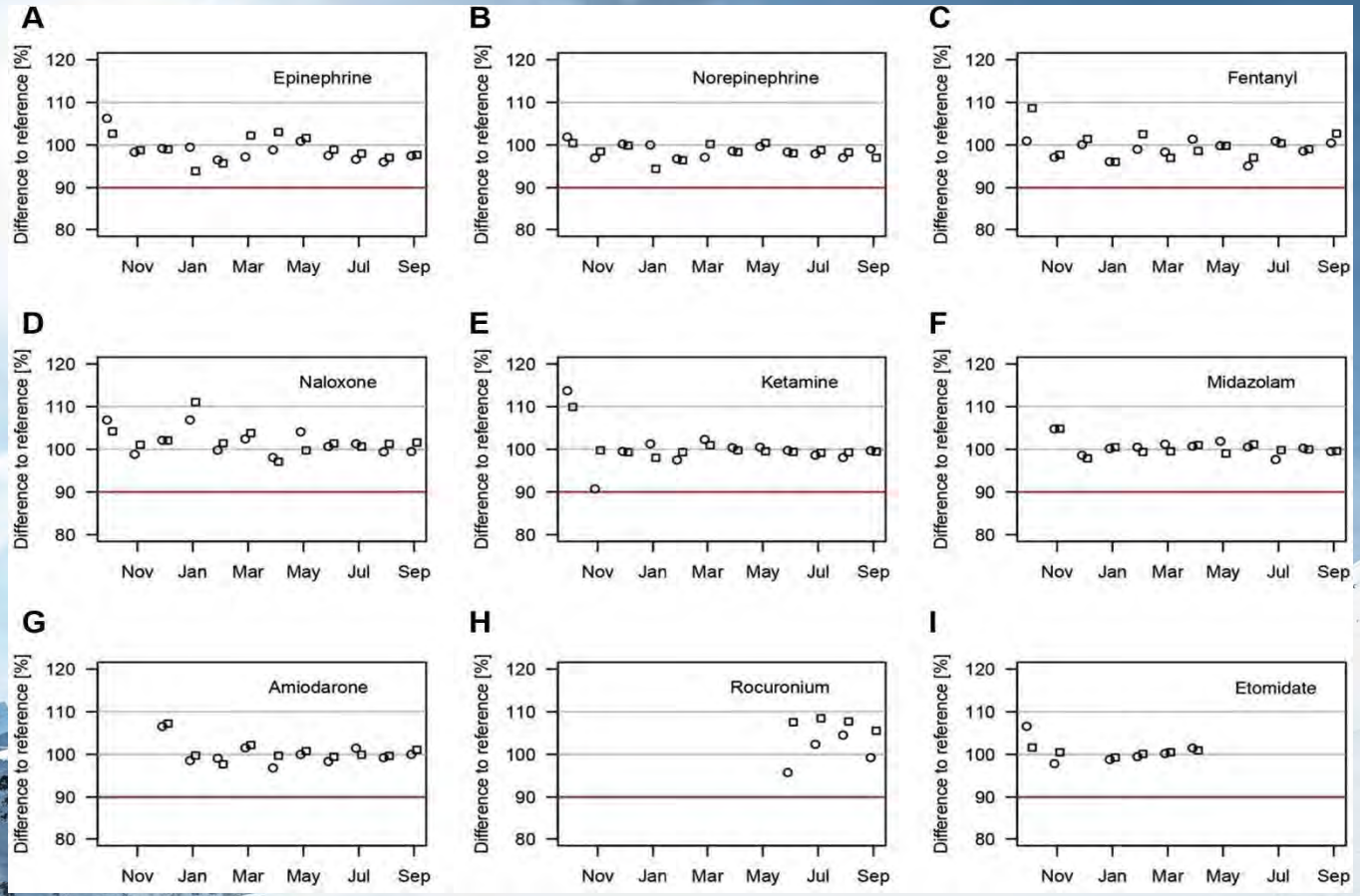
Table 2 Pain reduction in different subgroups

Subgroup	NRS initial, n (IQR)	NRS after OTFC, n (IQR)	NRS Reduction absolute, n (IQR)	Pain Reduction Percentage (SD)	*P* value
Men	7 (6–8)	4 (3–6)	3 (2–4)	39.8% (24.6%)	$P<0.0001$
Women	7 (5–8)	4 (3–5)	2 (1–3)	37.4% (23.6%)	$P<0.0001$
Age < 20	7 (6–8)	4 (3–5)	3 (2–4)	43.8% (26.9%)	$P<0.0001$
Age 20–60	7 (5.25–8)	4 (3–5.75)	2 (1–4)	38.1% (23%)	$P<0.0001$
Age > 60	7 (5.75–9)	5 (3–7.25)	2.5 (1–4)	34.5% (26.6%)	$P<0.0001$
Upper Extremities	7 (6–8)	4 (3–6)	2 (1.75–4)	36.7% (22.4%)	$P<0.0001$
Lower Extremities	7 (5–8)	4 (2–5)	3 (1–4)	39.8% (26.2%)	$P<0.0001$
Thorax, Abdomen and Spine	7 (6–8)	3 (3–5.5)	3 (2–5)	45.7% (25%)	$P<0.001$


EBSG
MEDIKAMENTENSTUDIE OKT. 2020 BIS MÄRZ 2021
PAX
September 2021
September 2021
August 2021

Active Pharmaceutical Ingredient

Mean in percent to reference sample. Both helicopters.



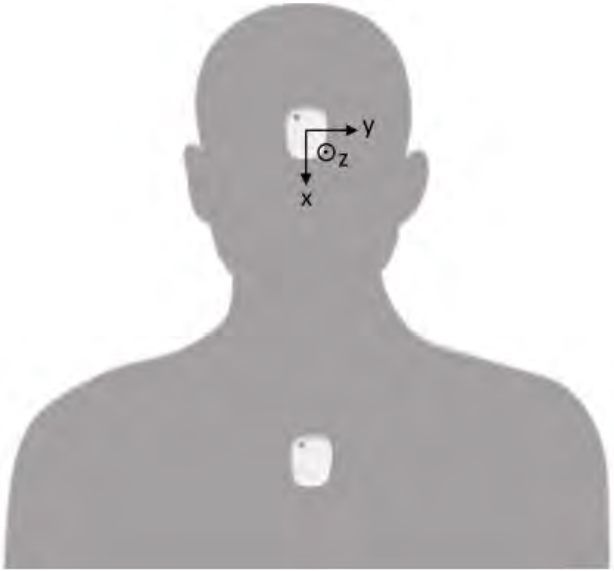
Danke für die Folien
Dr. Johannes Moeckel

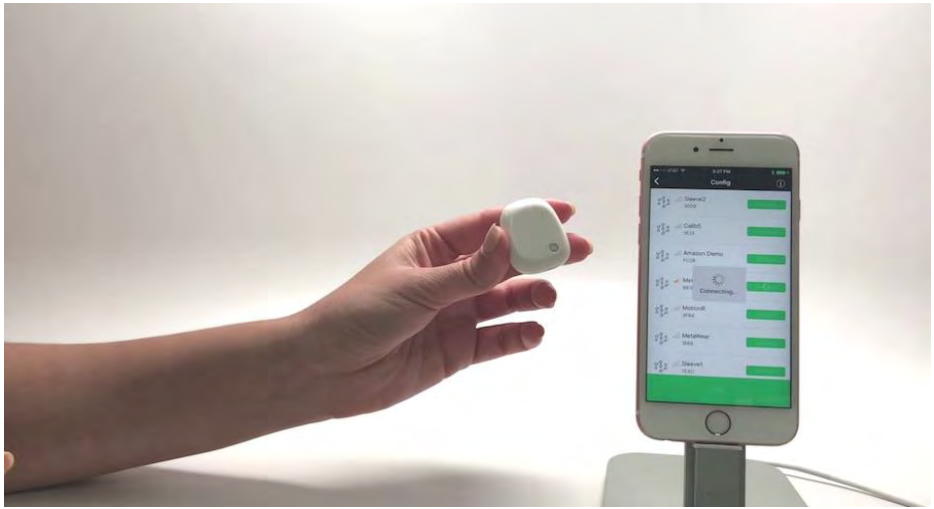
rega

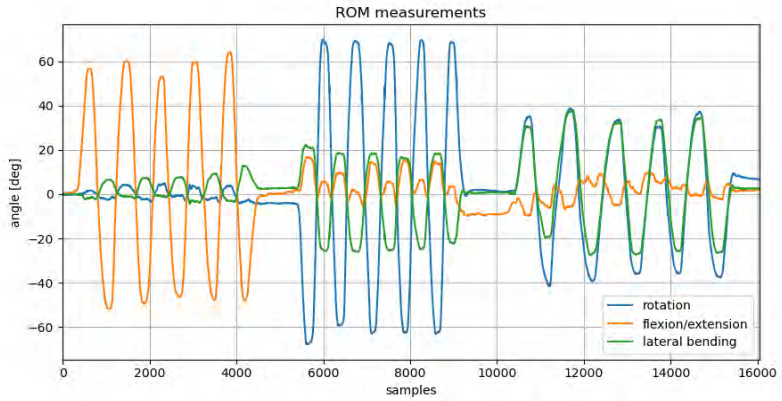

PA 41
WC 65
Q3 09:01

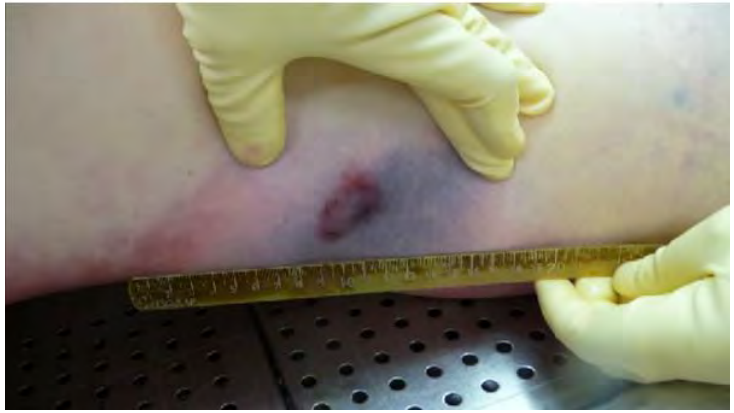
Cevical collar often difficult to attach in alpine settings

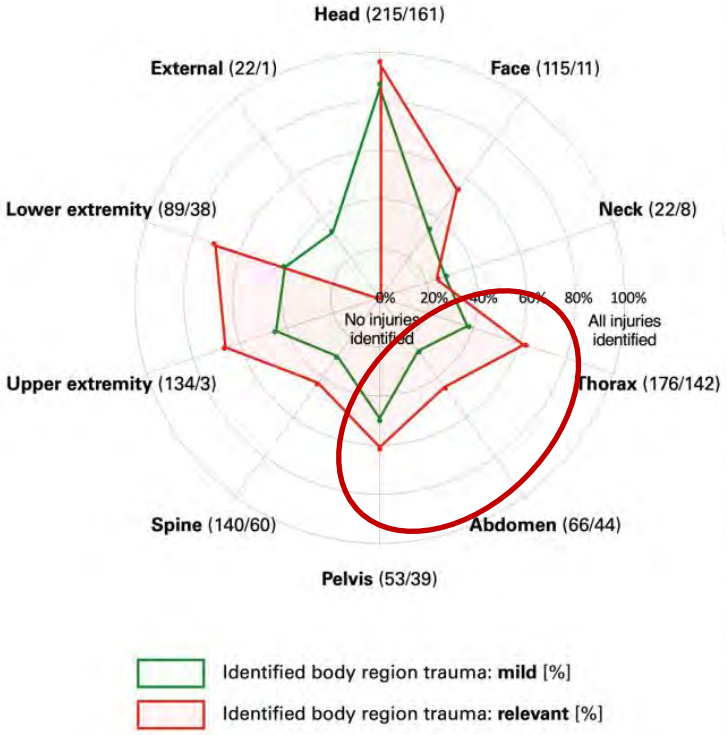
Vacuum mattress and headstraps easier, faster and just as safe?

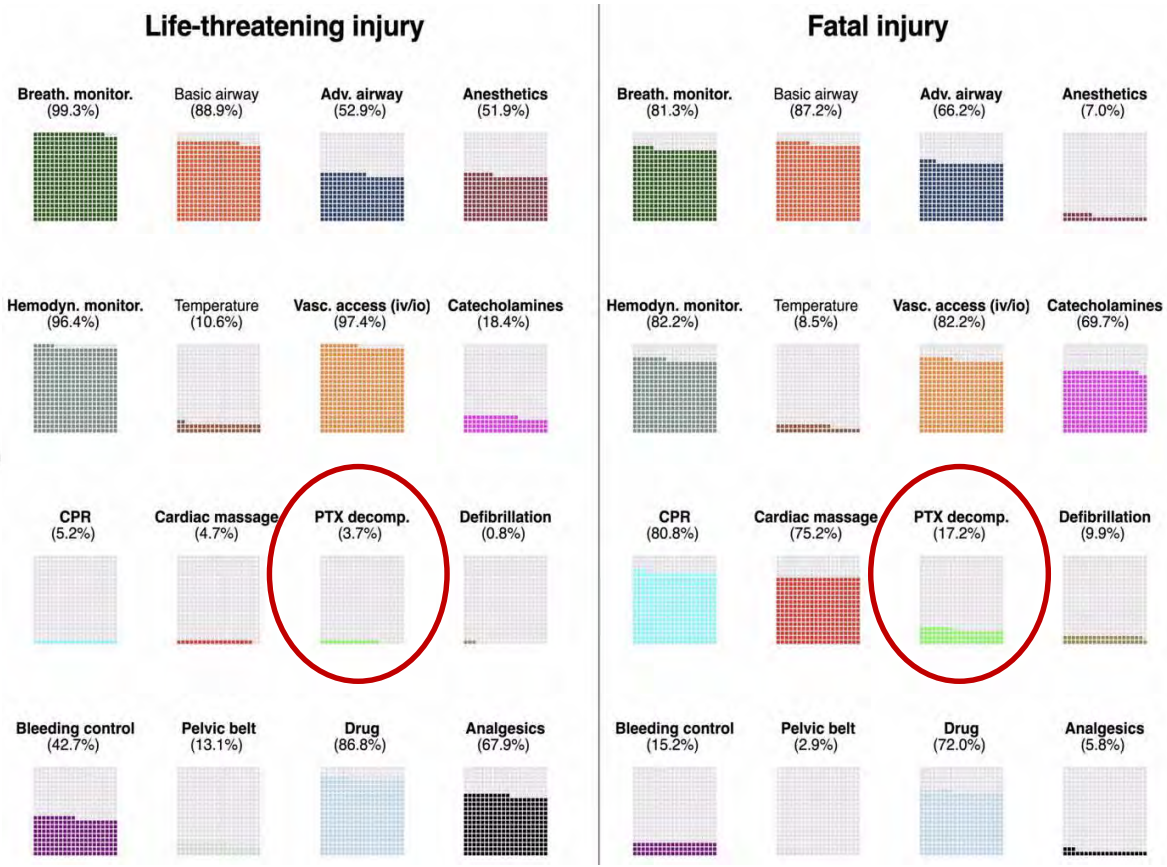

y
z
x




ROM measurements
angle [deg]
samples
rotation
flexion/extension
lateral bending
60
40
20
0
−20
−40
−60
0
2000
4000
6000
8000
10000
12000
14000
16000




Head (215/161)
Face (115/11)
Neck (22/8)
Thorax (176/142)
Abdomen (66/44)
Pelvis (53/39)
Spine (140/60)
Upper extremity (134/3)
Lower extremity (89/38)
External (22/1)
0%
20%
40%
60%
80%
100%
No injuries identified
All injuries identified
Identified body region trauma: mild [%]
Identified body region trauma: relevant [%]


Life-threatening injury
Fatal injury
Breath. monitor. (99.3%)
Basic airway (88.9%)
Adv. airway (52.9%)
Anesthetics (51.9%)
Breath. monitor. (81.3%)
Basic airway (87.2%)
Adv. airway (66.2%)
Anesthetics (7.0%)
Hemodyn. monitor. (96.4%)
Temperature (10.6%)
Vasc. access (iv/io) (97.4%)
Catecholamines (18.4%)
Hemodyn. monitor. (82.2%)
Temperature (8.5%)
Vasc. access (iv/io) (82.2%)
Catecholamines (69.7%)
CPR (5.2%)
Cardiac massage (4.7%)
PTX decomp. (3.7%)
Defibrillation (0.8%)
CPR (80.8%)
Cardiac massage (75.2%)
PTX decomp. (17.2%)
Defibrillation (9.9%)
Bleeding control (42.7%)
Pelvic belt (13.1%)
Drug (86.8%)
Analgesics (67.9%)
Bleeding control (15.2%)
Pelvic belt (2.9%)
Drug (72.0%)
Analgesics (5.8%)

Benefit of pre-hospital POCUS

Rehn et al. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine
(2020) 28:32
https://doi.org/10.1186/s13049-020-00724-x

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine

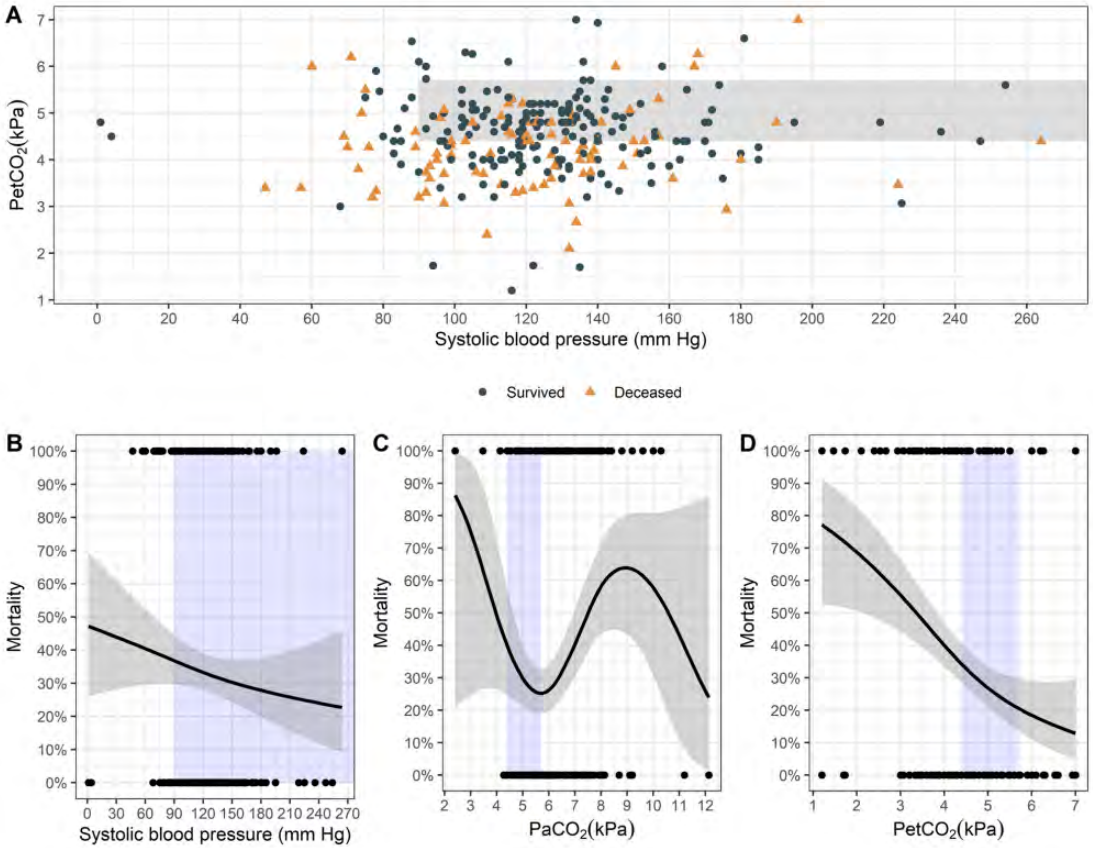
EDITORIAL Open Access

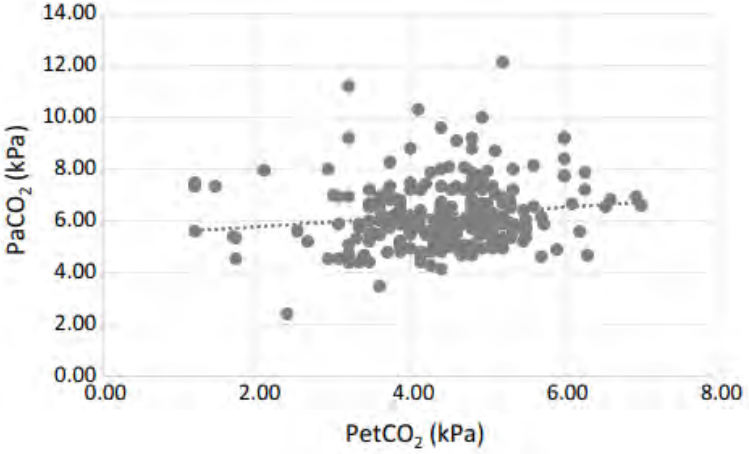
Top five research priorities in physician-provided pre-hospital critical care – appropriate staffing, training and the effect on outcomes

Marius Rehn[1,2,3], Kristi G. Bache[1,4*], Hans Morten Lossius[1] and David Lockey[5]

- Quality of POCUS diagnosis
- Impact on pre-hospital therapeutic (medication, interventions) or operational management (destination hosptial, pre-announcement)

Traumatic brain injury





Noncompressible Chest Wall in Critically Buried Avalanche Victims with Cardiac Arrest: A Case Series

David Eidenbenz, Alexandre Kottmann, Ken Zafren, Pierre-Nicolas Carron, Roland Albrecht and Mathieu Pasquier

High Alt Med Biol. 00:00–00, 2024.

Abstract

Introduction: In avalanche victims with cardiac arrest, a noncompressible chest wall or frozen body is a contraindication to initiating cardiopulmonary resuscitation. The evidence sustaining this recommendation is low.
Objective: To describe the characteristics and prehospital management of critically buried avalanche victims declared dead on site, with and without noncompressible chest walls.
Methods: Retrospective study including all critically buried avalanche victims declared dead on site by physicians of a helicopter emergency medical service in Switzerland, from 2010 to 2019. The primary outcome was the proportion of victims with a noncompressible chest wall reported in medical records. Secondary outcomes included victims' characteristics and the relevance of the criterion, noncompressible chest wall, for management.
Results: Among the 53 included victims, 12 (23%) had noncompressible chest walls. Victims with noncompressible chest walls had significantly longer burial durations (median 1,125 vs. 45 minutes; $p < 0.001$) and lower core temperatures (median 14 vs. 32°C; $p = 0.01$). The criterion, noncompressible chest wall, assessed in six victims, was decisive for declaring death on site in four victims.
Conclusion: The presence of a noncompressible chest wall does not appear to be a sufficient criterion to allow to declare the death of critically buried avalanche victims. Further clinical information should be sought.

secoursalpinsuisse

La région pour la région.

From the region, for the region

12ème rencontre suisse de médecine d'urgence et de sauvetage en montagne

Présentation

Steve Bernard

- Sauveteur III / Station de Secours 07.02 SARO
- Conducteur de chien avalanche LW + surface GS

A partir du 01.01.2025

- Remplaçant du Chef des secours station 07.02
- Responsable technique + formation 07.02

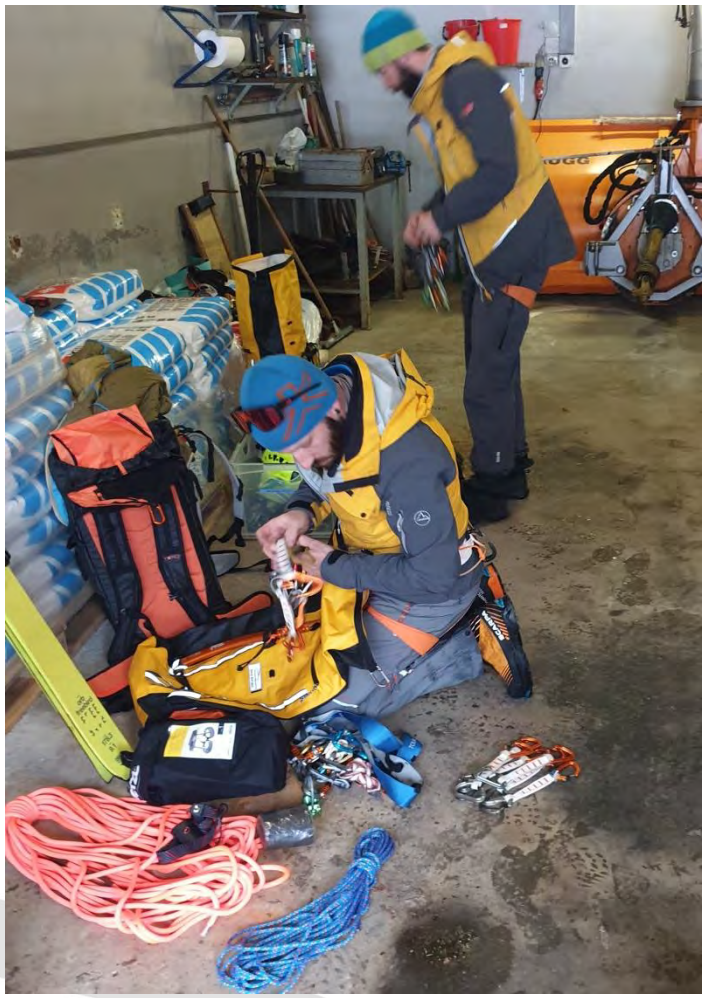
Contexte

- 5 février 2022 – 14h30 alarme
- Alpes Vaudoise / Région Grand-Muveran
- Itinéraire à ski – pente raide 45-50° TD 4.3 / E3
- 4 personnes bloquées dans le couloir du trou d'Aufalle au rappel N° 1

La région pour la région

Gestion PC

Le PC a été installé à mon domicile et la base matériel au local communale au Plans-sur-Bex



La région pour la région

Sauveteurs locaux engagés

4 Sauveteurs III

1 Sauveteurs II

1 Spécialiste médical

1 Agriculteur (externe à la station)

1 Pilote de motoneige (externe à la station

Déroulement de l’intervention

Accès au couloir

Accès au couloir du trou d’Aufalle via le valon de Nant en motoneige.

PC avancé au refuge de Pont de Nant

Déroulement de l’intervention

Accès aux patients

Ascension du couloir dans des conditions météorologique très défavorable

<u>Tous les sauveteurs ont déjà skié cet itinéraire</u>

Déroulement de l'intervention

Accès aux patients

Installation de cordes fixe à la montée afin de sécuriser la descente

Les patients étaient en bonne santé malgré la température, contrôle de leur matériel et prise en charge.

Déroulement de l’intervention

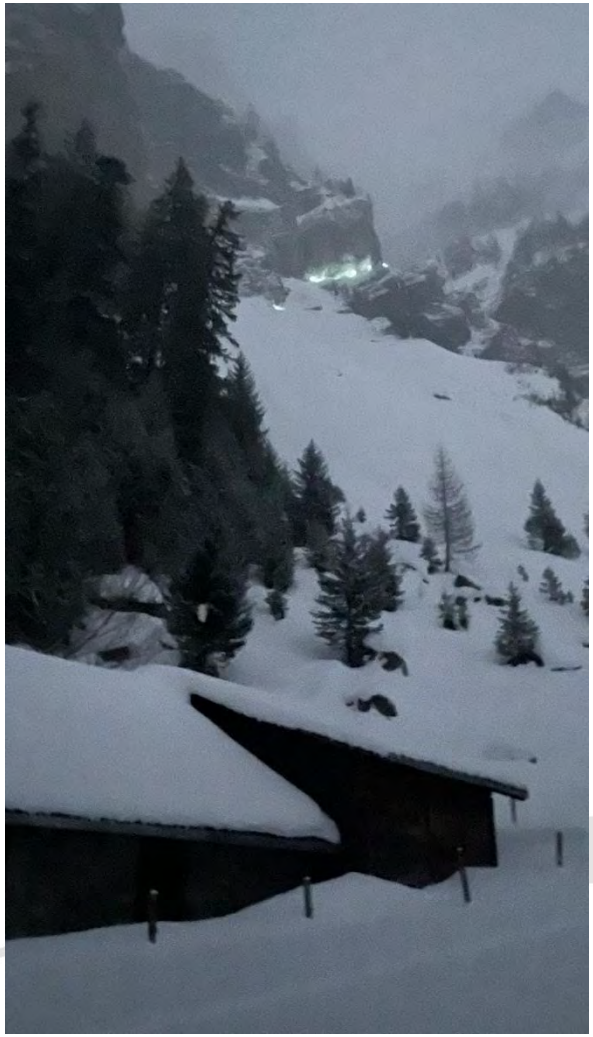
Evacuation des patients

Descente en rappel et à pied avec les patients

Retrait de tout le matériel effectué par les sauveteurs pendant la descente

secoursalpinsuisse

Déroulement de l’intervention



SECOURS EN MONTAGNE
VILLARS 07.02
BEX - GRYON - LAVEY -OLLON

Questions?

Remerciement !

Au nom du comité de la Station de secours 7.02 nous vous remercions pour votre attention et pour l'intérêt porté au Secours Alpin Romand

Defibrillation in patients with accidental hypothermia and core temperatures ≤30°C – a retrospective observational study

Evelien Cools, Delphine S. Courvoisier, Peter Paal, Peter Mair, Ken Zafren, Robert Blasco, Paweł Podsiadło, Tomek Darocha, Simon Rauch, Hermann Brugger, Beat Walpoth, Mathieu Pasquier

Abstract

Background: Defibrillation often fails in patients with hypothermic cardiac arrest. The optimal number and timing of defibrillation attempts in patients with core temperatures (Tc) ≤30°C is not known.

Aims: To determine the incidence of successful defibrillation in patients in cardiac arrest with shockable rhythms and Tc ≤30°C, Tc at the time of successful defibrillation, number of shocks necessary, and factors facilitating successful defibrillation.

Method: Retrospective observational study from the International Hypothermia Registry of patients with hypothermic cardiac arrest with Tc ≤30°C undergoing defibrillation before and during rewarming.

Results: Forty-nine patients met the inclusion criteria. The overall success rate of defibrillation was 28/49 (57%). Defibrillation was attempted in 26 patients before rewarming and in 23 patients during rewarming, using extracorporeal life support (ECLS) in 20. Defibrillation success was higher during rewarming (23 of 23 patients (100%) vs. 5 of 26 patients (19%); p<0.001). Shocks were given at higher temperatures during rewarming (28.6°C±1.5°C vs. 24.3°C±3.0°C, p<0.001). No defibrillation with Tc <25°C resulted in return of spontaneous circulation (ROSC). Defibrillation was successful in 89% with ≤3 attempts. The Tc at the time of successful defibrillation ranged from just under 25°C to 30°C Higher Tc and ECLS rewarming were associated with greater defibrillation success.

Conclusions: Defibrillation may be successful in patients before rewarming despite Tc ≤30°C. Use of ≤3 shocks is optimal in patients with persistent shockable rhythms and Tc ≤30°C. Rewarming in an ECLS-centre is likely to achieve ROSC. During rewarming, defibrillation should be attempted when Tc ≥25°C. Defibrillation is often successful at Tc <30°C during ECLS rewarming.

AIR GLACIERS

GLETSCHERHÖHLENRETTUNG: Auf dem Weg zu einer neuen Art von Rettung?

Spiez, SSMM, Nov. 2024, Dr Jeanne Picart

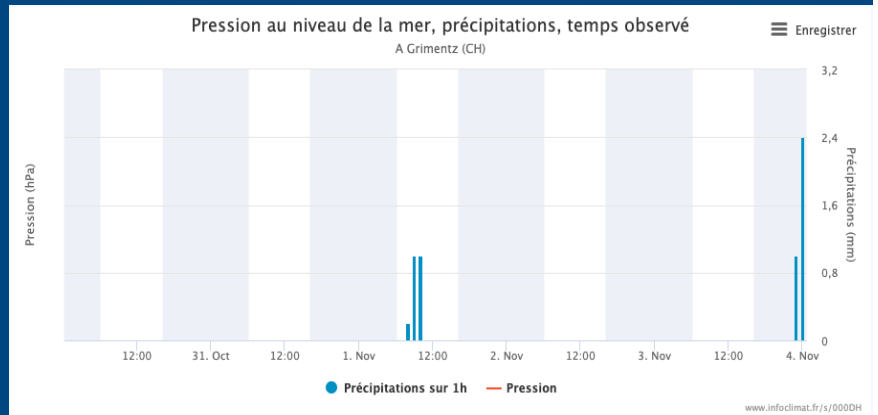
SION COLLOMBEY LEYSIN GAMPEL LAUTERBRUNNEN GSTAAD

ZWEI GESCHICHTEN

Das Team im Gletscher

EIN SCHÖNER TAG FÜR EISHÖHLE FORSCHUNG

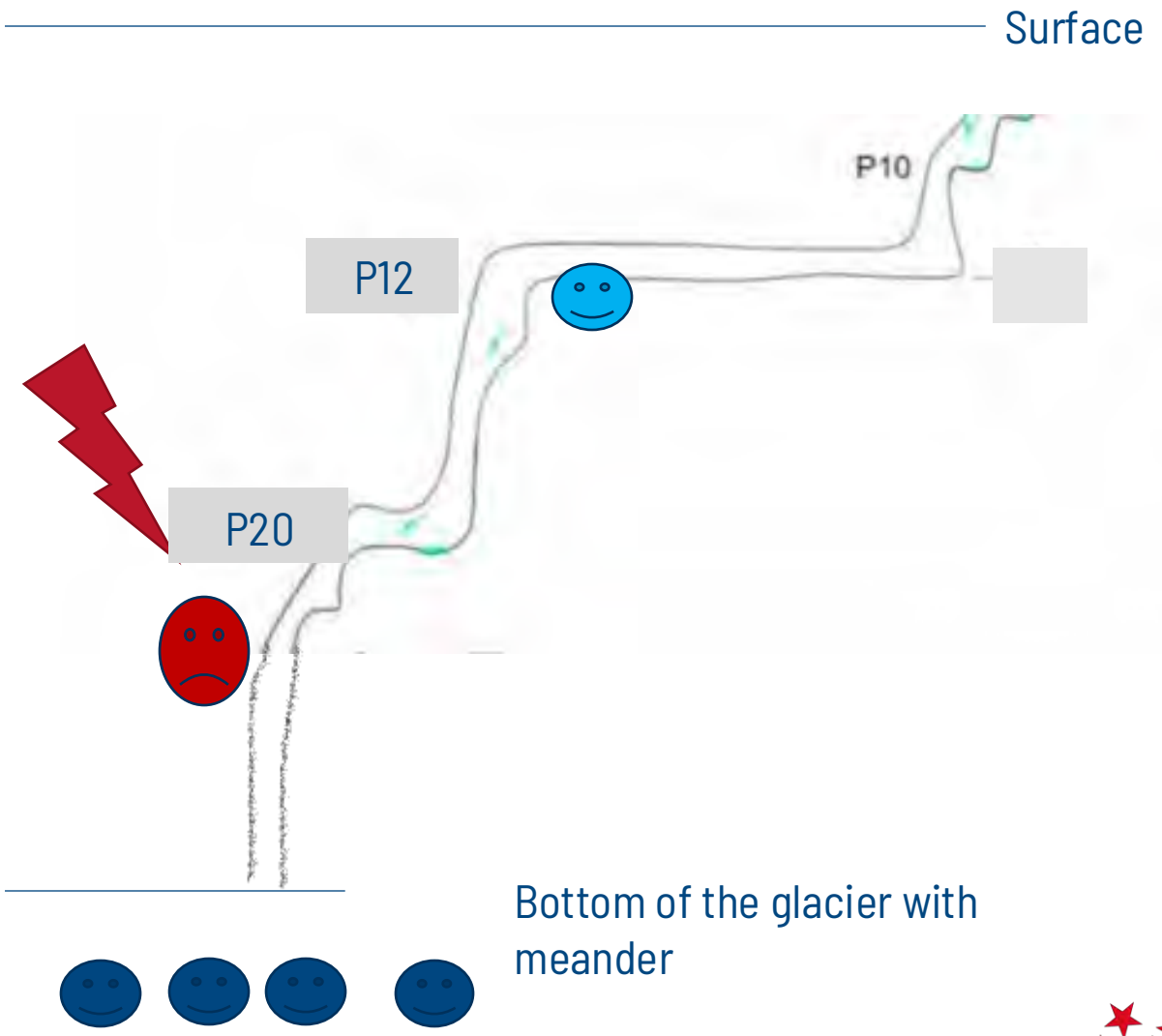
- November 2022, 6 «erfahrenden Canyonisten»
- Halb Tag: Wetter, Strasse
- Material: Winter Canyoning Material + Eisklettern (Balakov hook, Eisschrauber) + Strinlampen/ ggf Höhle Forschung Material



AIR GLACIERS

DER UNFALL

- **Sturz von 15 m** auf den Gletscherboden (Fehler mit den Seilen)
- Bewusstlos 10 Sekunden
- Rasche Entscheidung, dass der Letzte aufsteigt, um die Rettung zu rufen (die Letzte ist auch die Ärztin)



DER UNFALL

- Kurzer Anruf: Telefonnummer, Ort auf Moiry-Gletscher, Sturz in Gletscherspalte, 15 m

- Lange bitten, dass ein zweiter kommt, um wieder mit einem anderen Gerät anzurufen. Zweitens Kommunikation mit einem zweiten Gerät über Whatsapp möglich (5G, kein Signal für Anruf)

- Kommunikation mit dem Rest des Teams unmöglich

ZWEI GESCHICHTEN

Die Retter

DER UNFALL

SMS von 144 : Sturz, Gletscherspalte Moiry, 15m

-> Gletscherspalt Material (Jag Kit, Seilen, Stativ), Such nach einem dritten Bergführer

GPS-Punkt: Moiry Glacier (keine genaue Lokalisierung)

Kein Hinweis auf Eishöhlen oder Lokalisierung

DIE RETTUNG

- Ankuft vom Heli: kurzes Briefing von der Geschichte
- Die Rettung wird eine «Gletscherhöhlenrettung»
- Arzt = Ärztin vom Canyoning Team (schon ausgerüstet, kennt den Spalt und kennt das Rettungsteam)
- Entscheidung : keine zusätlisches Material zur Zeit

AIR GLACIERS

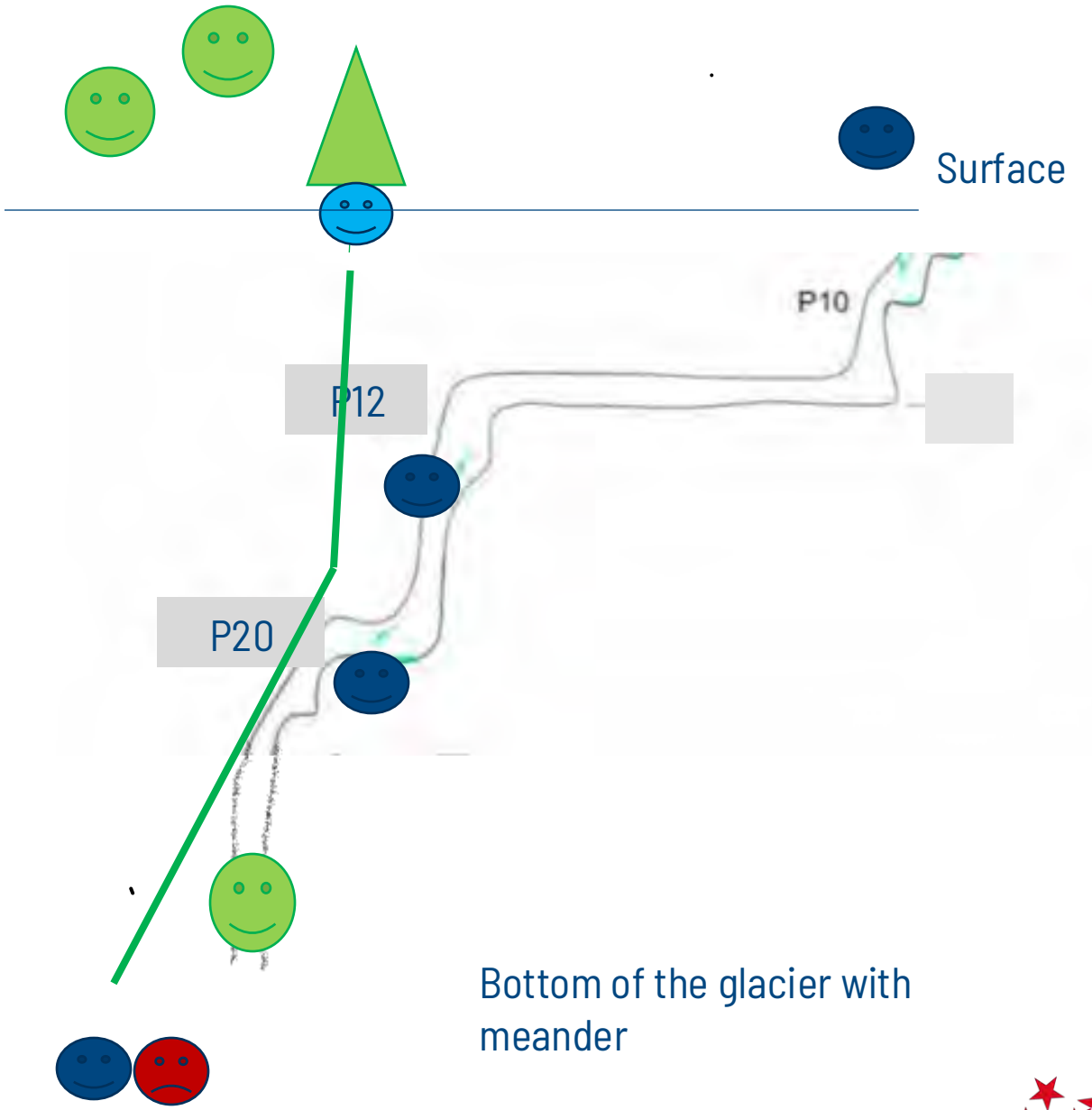
DIE RETTUNG

Ein Retter geht in der Höhle

2 Retter + Ärztin vorbereiten sich

Ärztin:

Minimal Material: 1 2L-Sack mit 4 Ampullen (Schmerzen?, Agitation?, Herzstillstand?), 2 Venflon, KED/Halsband/Beckgurt



Bottom of the glacier with meander

IM GLETSCHER

- Verletzt:
  - A: ok, Hals ok
  - B: keine Schmerzen, keine Atemnot/Cyanose
  - C: radialis pulse ok, keine Blutung, Beck stabile aber schmerzhaft
  - D : verlangsamt
  - E zittert nicht, Temperature?

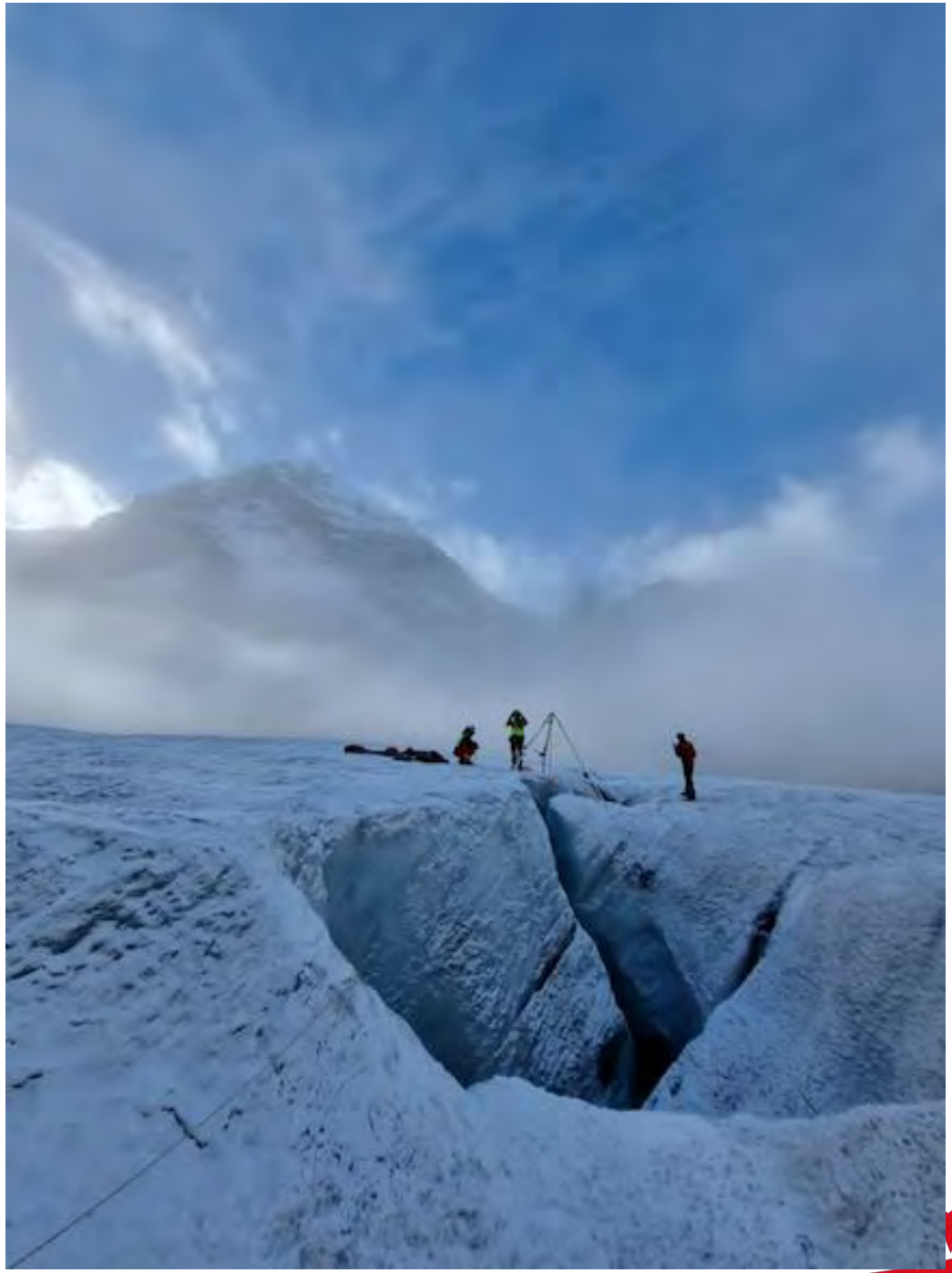
IM GLETSCHER

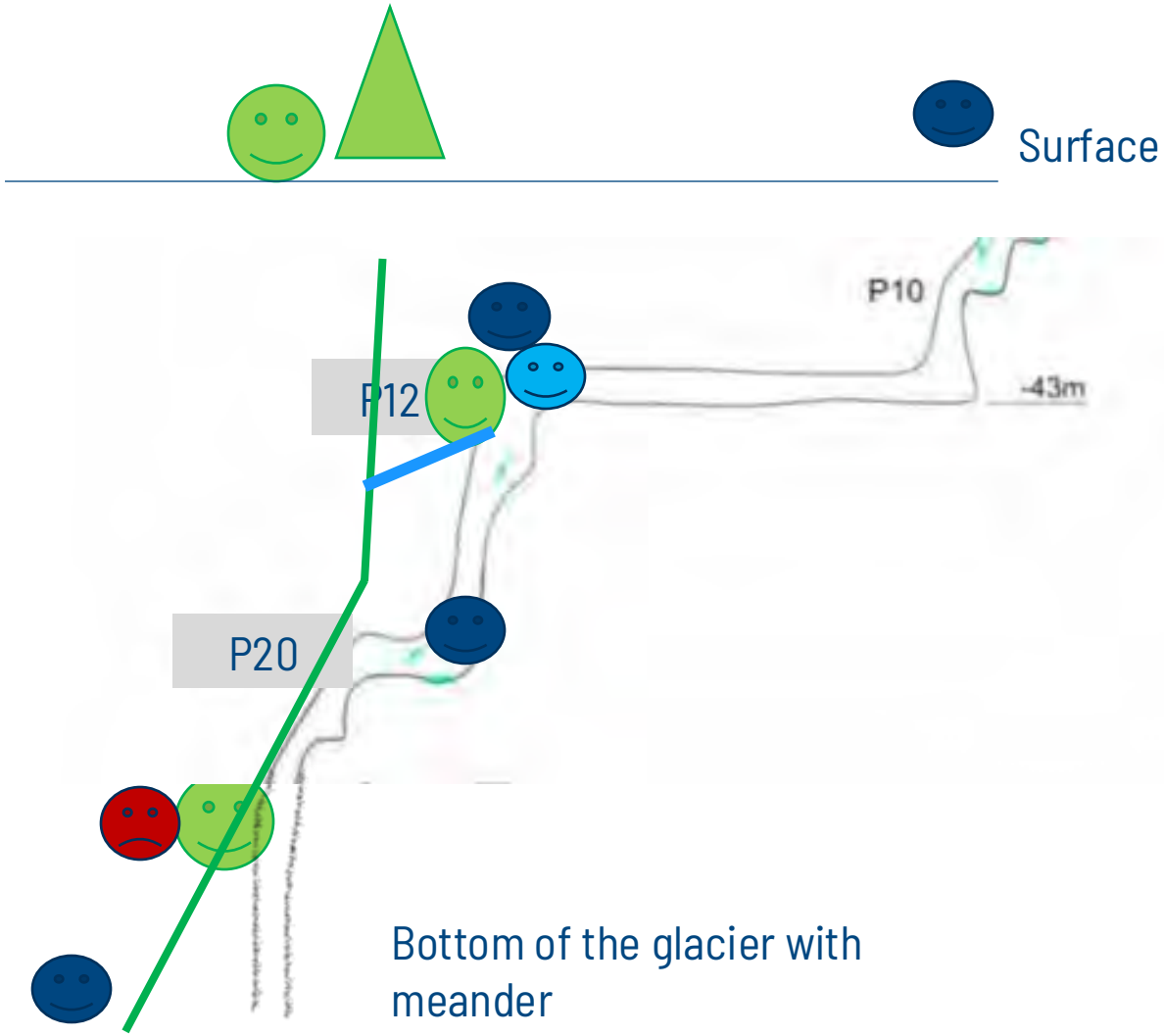
– KED/Hals/Beckgurte

– Venflon

– Beginning von Extraction (Vertical)

[TITLE] | [AUTHORS] | [





Bottom of the glacier with meander

IM SPITAL

- Hämmoragie :
  - Intraparietal
  - Beck

- Frakturen:
  - LWS
  - Becken
  - Ellbogen
  - Sprungelenk

- Temperature: 35 Grad (Neoprene Anzug)

IM SPITAL

- Kein dringendes OP
- Transfusion
- Verlegung nach Slovenien für die verschiedenen OP

ANALYSE

SCHWIERIGKEITEN

- Wenig Details (Problem mit dem Telefon)
- Erste Rettung in Eishöhle : neue Technick?
- Instabiles Wetter
- Ärztin=Kollegin

ANALYSE

SCHWIERIGKEITEN

- Wenig Details (Problem mit dem Telefon)
- Instabiles Wetter

SPEZIFISCH

- Wenig Details :
  - Wenn mehr Details (Eishöhle): **bessere Lampen, trockene Anzüge, mehr Material** ?
- Instabiles Wetter : mehr Kommunikation

ANALYSE

SCHWIERIGKEITEN

- Erste Rettung in Eishöhle : neue Technick?

RETTER

- **Mehr Kommunikation mit der Radio** (das Team unten hatte keine Ahnung vom Wetterswechseln)

- Neue Technick ?
  - Nur **eine Versammlung von was wir schon wissen** !
  - Aber es kann schwieriger das nächste Mal sein (Speleo Secours ?)

ANALYSE

SCHWIERIGKEITEN

- Ärztin=Kollegin

  - aber kennt die Umwelt (Geschwindigkeit) und wusste schon was sie braucht (in einer engen Umwelt)

  - Emotion/Abstand? (Zeit mit dem Venflon?)

ANALYSE

ETHICS, ECONOMICS AND OUTCOME: EDITED BY HARTMUT BUERKLE

The ethics of treating family members

Hutchison, Colin[a]; McConnell, Paul C.[b]

Author Information

Current Opinion in Anaesthesiology 32(2):p 169-173, April 2019. | *DOI:* 10.1097/ACO.0000000000000687

Wherever possible avoid providing medical care to yourself or anyone with whom you have a close personal relationship

UK's General Medical Council

FAZIT

- Kann länger und dunkeler als gewisse Gletscherspaltsrettung sein (Radio mit regelmässige Feed Back, guten Lampen, trockene Anzüge)
- **Strategie und Leader** sehr wichtig
- Braucht ggf mehr Material/Team: Speleo Secours ?
- E +++ (**Sicherheit gg Geschwindigkeit)**
  - **Geschwindigkeit auch wichtig wegen Erhöhung der Temparaturen, des Wasserstands am Nacmittag, und wegen Hypothermie**

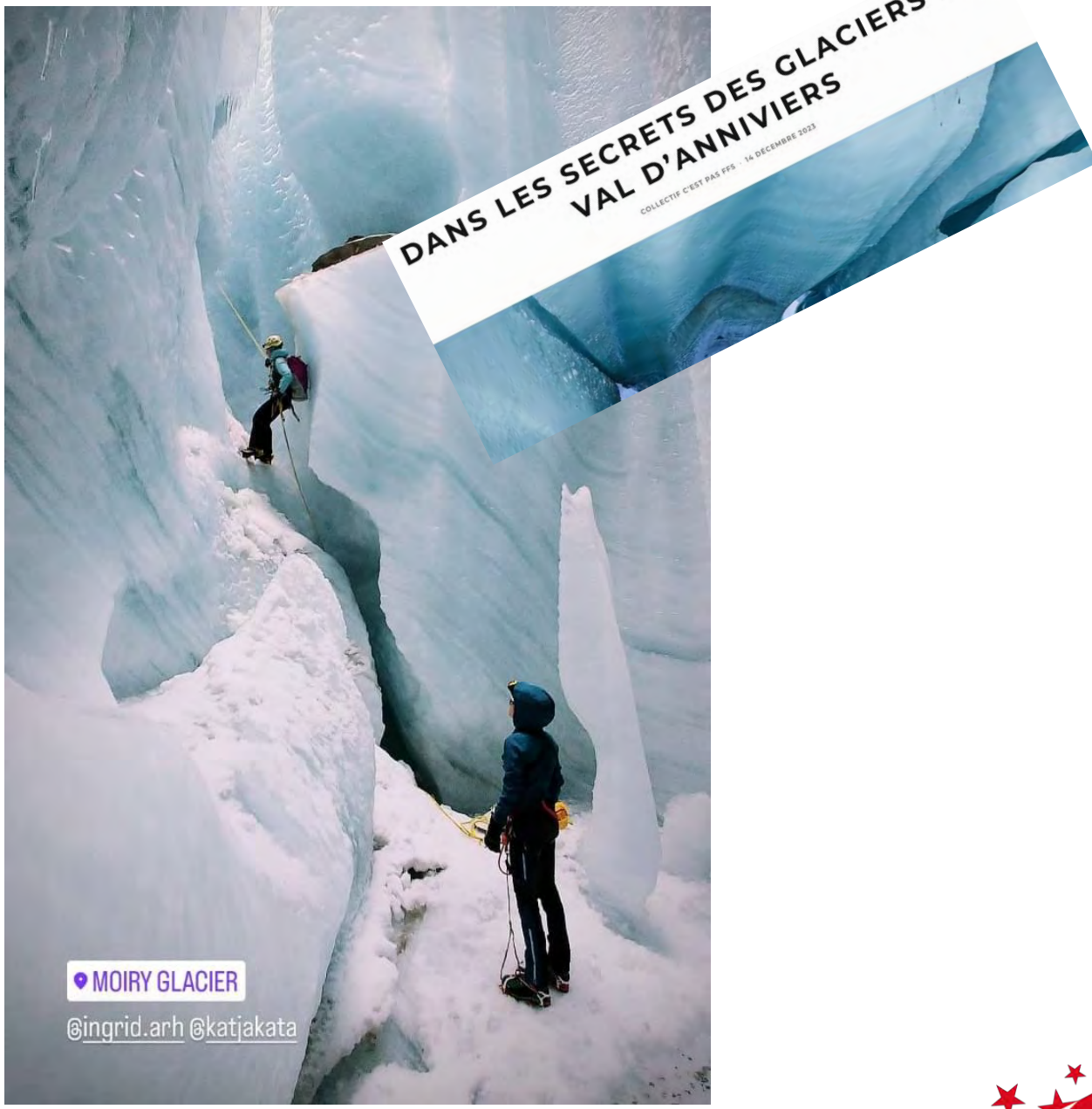
FAZIT

EISHÖHLE RETTUNG

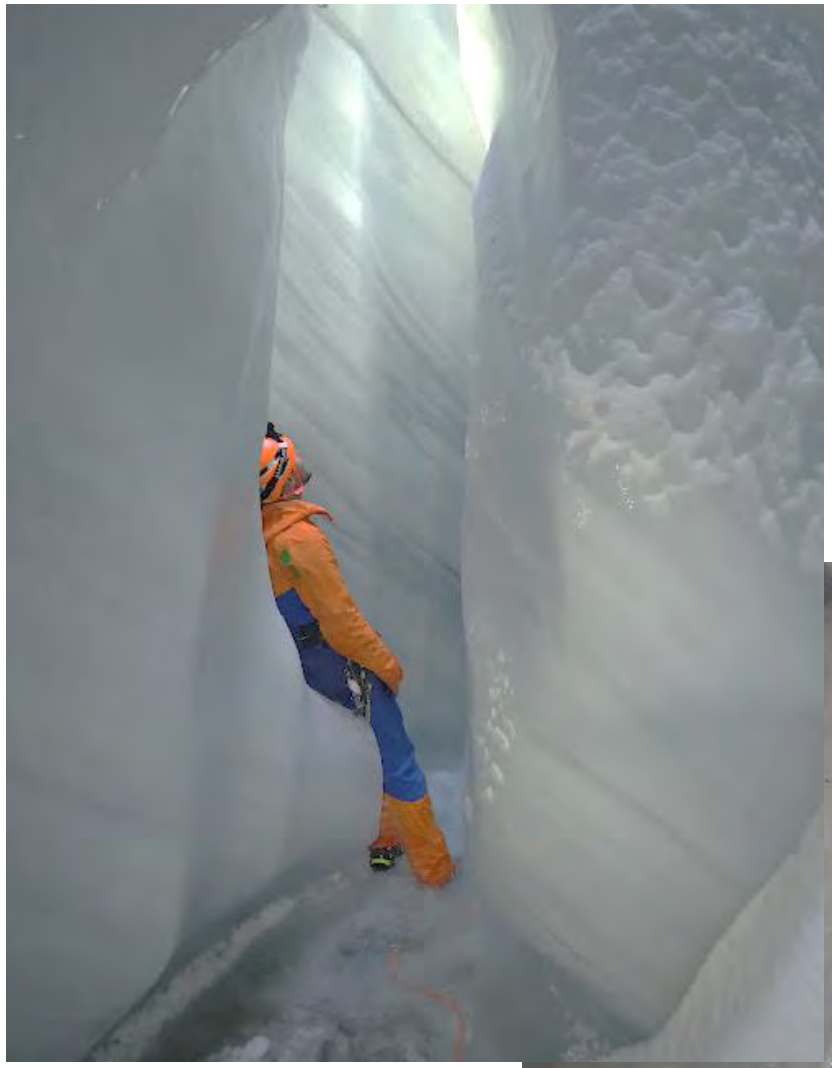
– Bekannt seit 20 Jahren, mehr die letzte Jahren (soziale Medien, Buch)

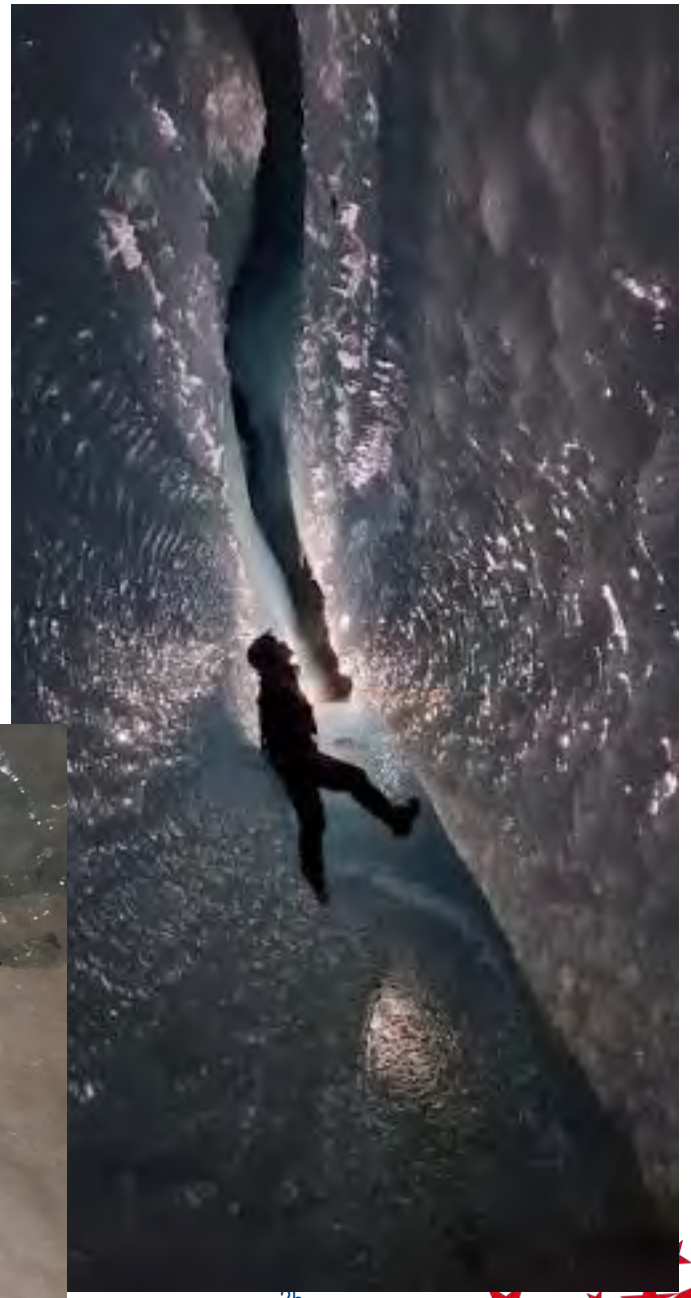
– Geschwindigkeit vieilleicht wichtiger (Temperaturen vom Gletscher oder vom Verletzt)

– Für die Zukunft: Zusammenarbeit mit dem SpeleoSecours? Team von Experten?



MERCI FÜR EURE AUFMERKSAMKEIT





Guide Medic

SGGM | SSMM
Schweizerische Gesellschaft für Gebirgsmedizin
Société Suisse de Médecine de Montagne
Società Svizzera di Medicina di Montagna

Spiez, 2 November 2024

Owen Samuel

Guide Medic

15 minutes

1. Guide Medic Concept

2. 76 guides already trained

3. Are the SGGM/SSMM interested in developing the course in Switzerland?

4. Questions

Guide Medic course Staff

Pierre Muller

Rocio Siemens

Owen Samuel

Dr Arnaud Peytremann
Dr Barbara Weith
Guide rescue specialist Christophe Berclaz

What is the Guide Medic course?

Mountain ~~First Aid~~ Medicine

A 3-day training course

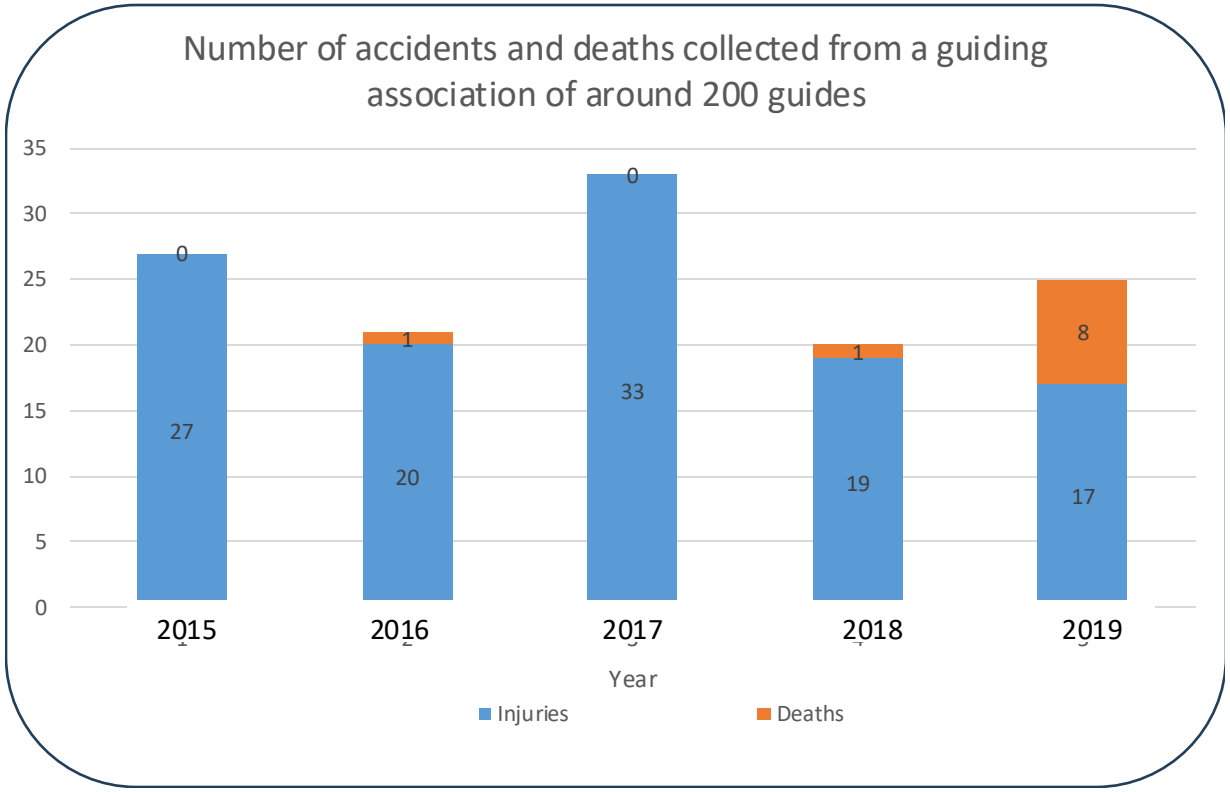
Delivering more *advanced care* & better transfer of information

Starting to think and perform more like a medic than a first aider, so understanding our role in the *chain of survival*

Practice and encourage further *improvisation*

Why is it useful to have advanced medical skills?

Stats collected from a small guiding association



Approximately 25.2 incidents per year

For 100 active guides = 1:4 chance per year of needing to deal with a first aid incident

When and where

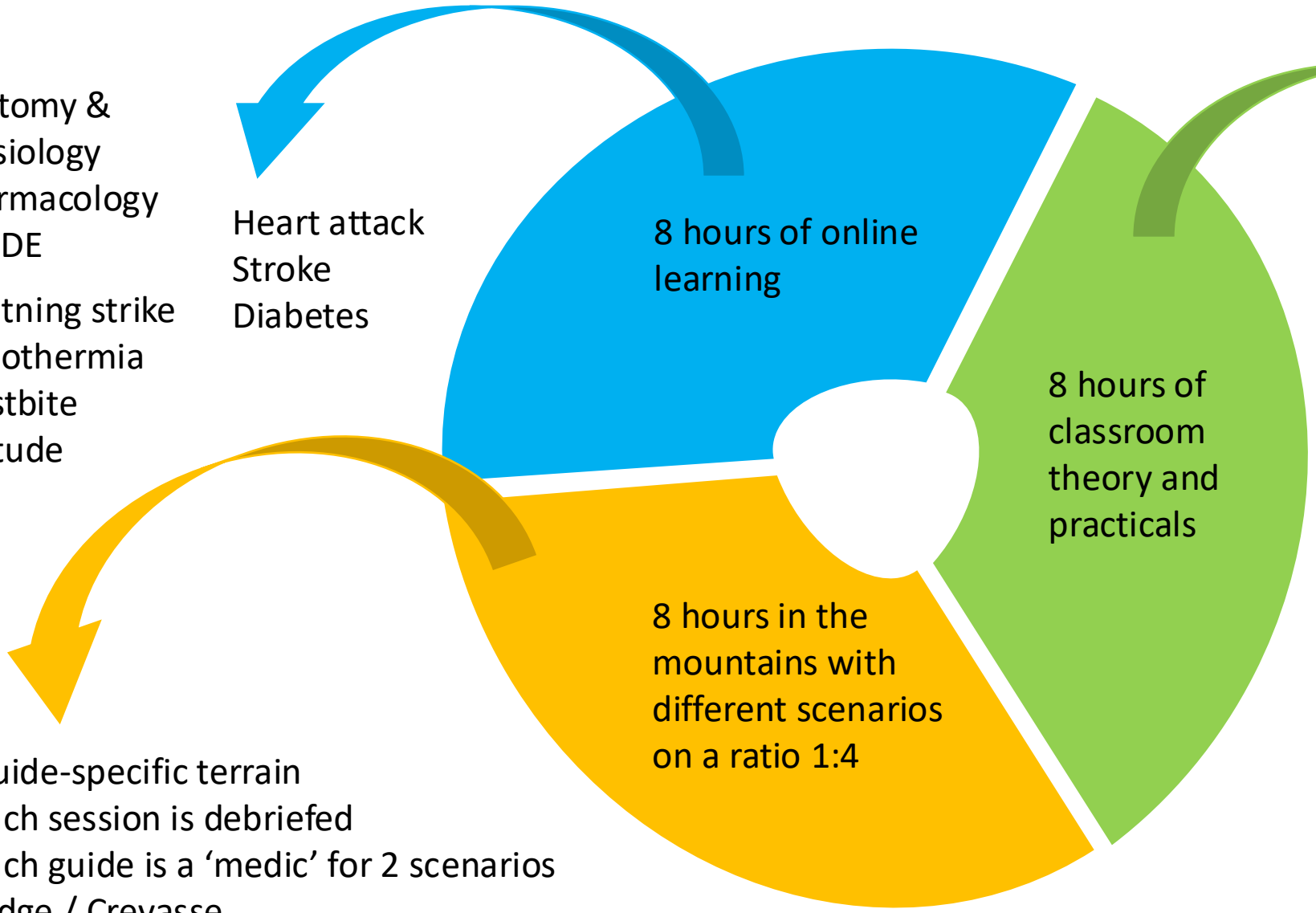
Remit of your new skills

- Remote location
- Far from help
- Delayed rescue

Your responsibility as a Guide Medic

- Use drugs table and casualty card to provide written documentation
- Check in with a Guide Medic provider after an intervention – monitoring and feedback.

Guide Medic course content



Anatomy &
Physiology
Pharmacology
ABCDE

Heart attack
Stroke
Diabetes

Lightning strike
Hypothermia
Frostbite
Altitude

Pathological problems with the respiratory and cardiovascular systems

Casualty card
Drugs card

Immobilisation and improvised splinting
Use of drugs such
Penthrox, Altitude drugs

Guide-specific terrain
Each session is debriefed
Each guide is a ‘medic’ for 2 scenarios
Ridge / Crevasse

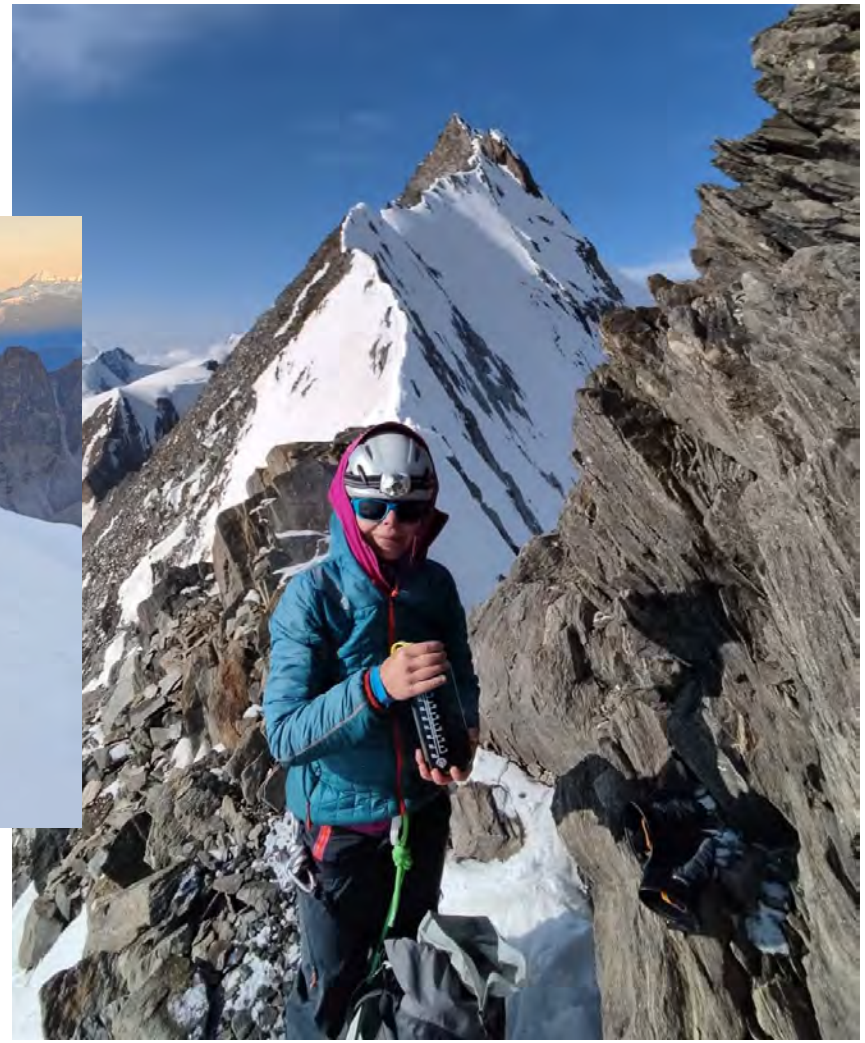
76 Guides form 7 different nations have now taken the training over 7 courses North Wales, Chamonix , Briancon

James Clapham Mountain Guide SNGM

Participant of the 1st Guide Medic in 2021

Mountaineering incident with a client in Summer 2023

James revalidated the Guide Medic June 2024



Guide Medic – The future

- **UIAA – Accreditation?**
- **IFMGA – International Guide Medic course at an IFMGA meeting…**

Anticipate that a patient in the Swiss mountains may have already received more advanced care (Drugs)

Question to you :

Would there be medics in the audience interested to help me develop the course in Switzerland?

Thanks for your time!

Any further questions?

Andres Bardill

Verdichtung der notfallmedizinischen Grundversorgung im Berggebiet durch die Alpine Rettung

Unterstützung der präklinischen notfallmedizinischen Grundversorgung in Berggebieten oder weniger gut erschlossenen Regionen durch lokale Einsatzkräfte der Alpinen Rettung Schweiz ARS als neue Herausforderung.

Andres Bardill, Geschäftsführer ARS vermittelt einen Einblick in die Entstehungsgeschichte und die aktuelle Einbindung von Rapid und First Responder plus in lokale notfallmedizinische präklinische Einsatzdispositive. Mit Erweiterung der Einsatzdispositive der traditionellen SAC-Bergrettungsstationen und Unterstützung der präklinischen Notfallmedizin entstanden neue Herausforderungen in den Bereichen Ausbildung, Logistik und Zusammenarbeit mit lokalen und kantonalen Partnerorganisationen und Leitstellen.

Die Erfahrungen aus Aufbau und Betrieb entsprechender kantonaler und kommunaler Einsatzdispositive sind durchwegs positiv und sind aber auch künftig auf die Unterstützung aller Beteiligten und Partnerorganisationen angewiesen.

Short report on the SAC Expedition Team in India 2022

The phisician point of view

Reto Thalmann

Bergrettungsmedizin Tagung 2024

pressure

O_2 21% 25% 8000m

O_2 21% ↑40% ~50% 5000m

Pre-Acclimatisation

15%

O_2 21% 12% 4000m

N_2 78% 84

pH ↑ alkaline ↓ acid

LUNG

O_2 ↓ → Breathing ↑ → O_2 ↑ blood (dO)

→ exhale more CO_2 → pH ↑

KIDNEY

pH ↓ ← excretion HCO_3 * (2-4d)

HEART ↑ (dO)

more urine → dehydrate

AMS

Acute Mountain Sickness

"hang over"

Headache

- gastric
- dizzyness
- tired

HACE

High-altitude cerebral Edema

Ataxia

Behaviour

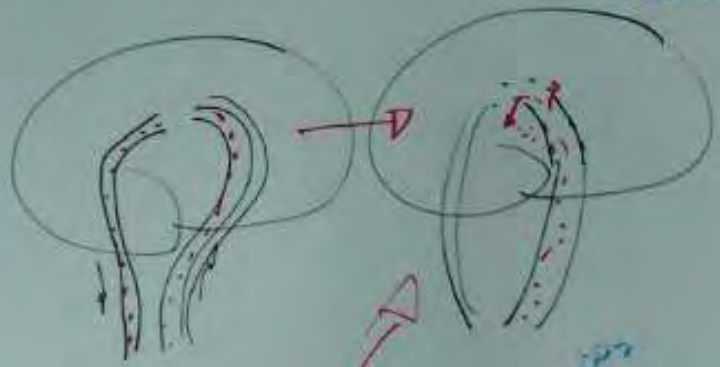
HAPE

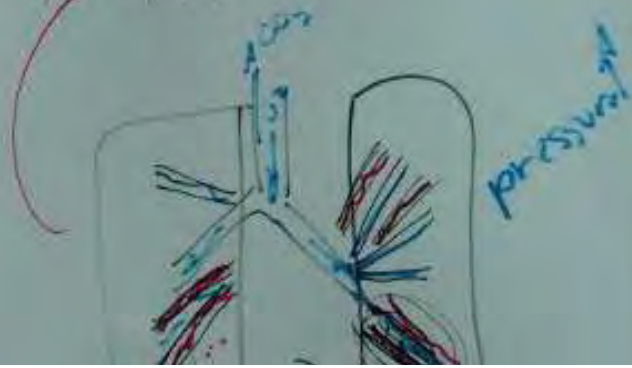
High-altitude pulmonary Edema

Shortness of breath at rest

Coughing blood

Exercise power





Disease	Up to date? Yes	No	Recommendatio
Hepatitis A	X	☐	
Hepatitis B	X	☐	
Diphtheria	X	☐	
Tetanus	X	☐	
Poliomyelitis	X	☐	
Typhus	☐	**X**	Vivotif (3 recomme
MMR	X	☐	
Rabies	☐	**X**	2 doses (i
Varicella	?	?	If you ever h your life, no
FSME	X	☐	Not needed doses, then

MEDIZINISCHE
ANGABEN/INFORMATIONS MÉDICALES

Allergien/Allergies:

☐ Ja/Oui ☐ Nein /Non

- falls ja, welche/si oui, quelles:

Medikam

☐

- fa
(Name/N
Einnahme

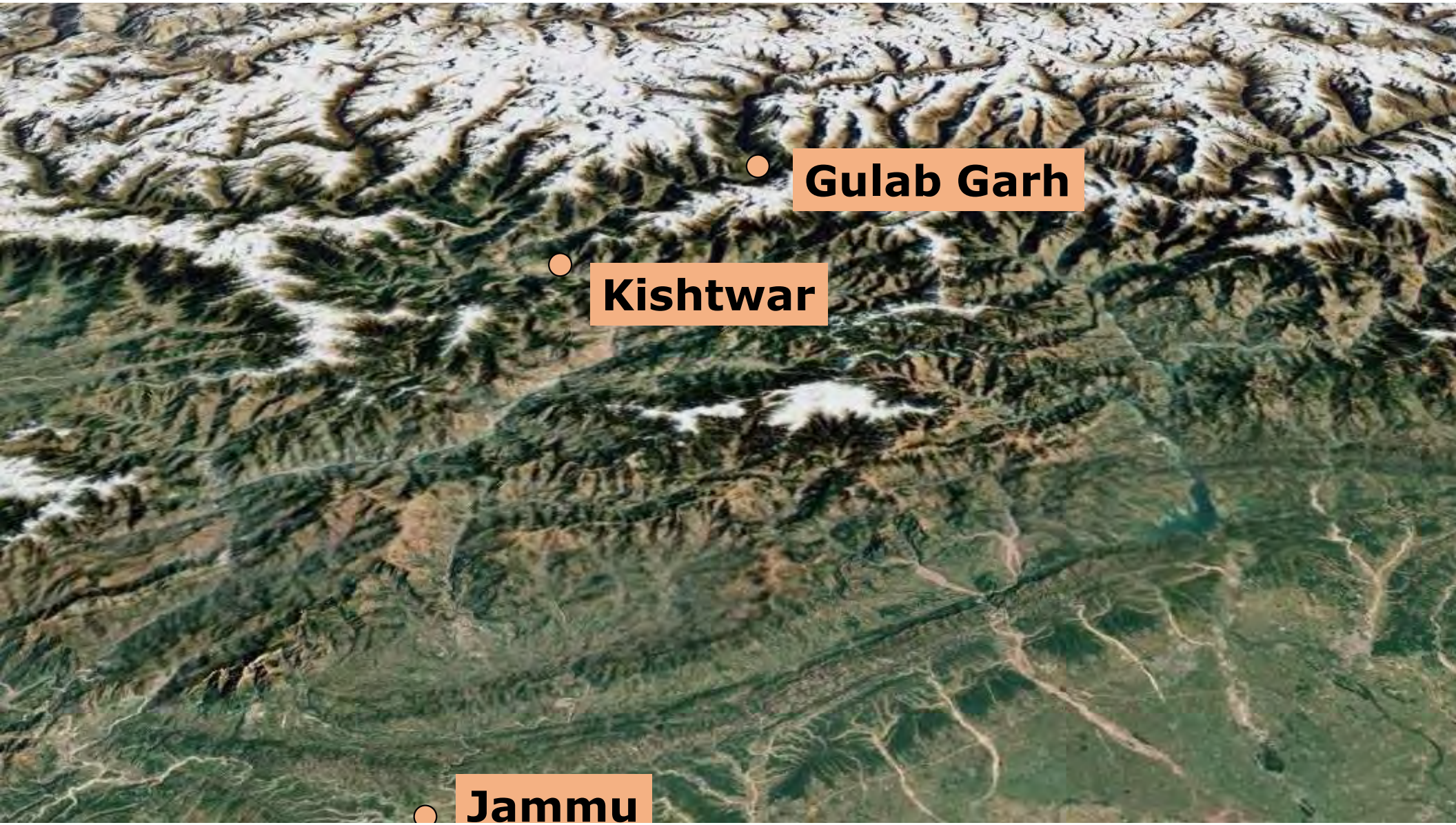
.....

Clipboard | Font | Alignment

D95

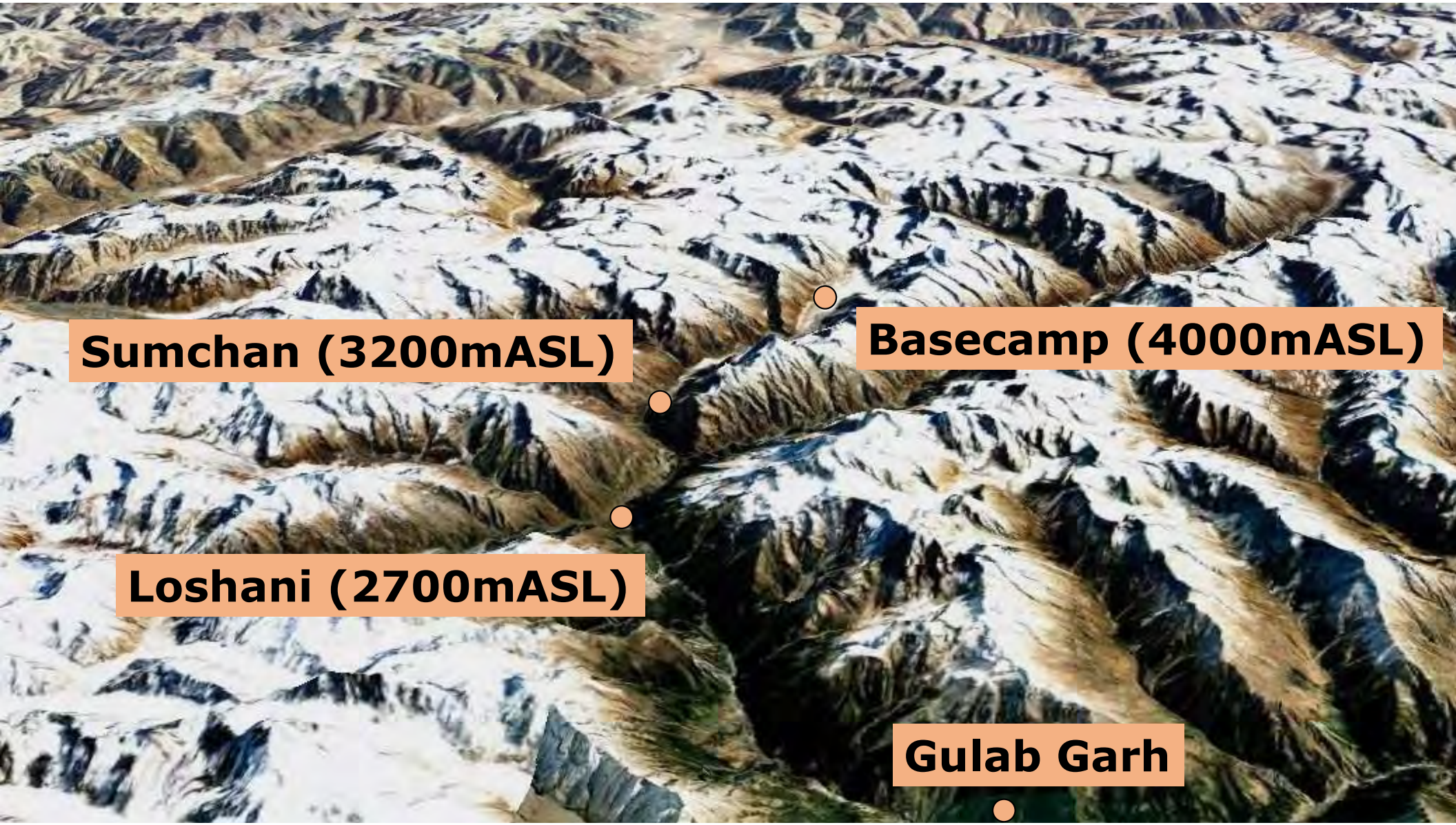
	A	B	C	D	E	F	G	H
1	**Medikamentenliste Expeditionsteam**							
2	Anzahl Teilnehmer	8						
3	Anzahl Rucksackapotheken	8		**Teamapotheke**				
4	Medikament	Einheit	Anzahl Tabl/Salben pro Behandlung	Anzahl Behandlungen pro Gruppe	Anzahl Behandlungen pro Person	Anzahl Zusatzbehandlungen	Anzahl Behandlungen in **Rucksackapotheke**	**Anzahl Tabletten/Salben total**


Jammu


Gulab Garh
Kishtwar
Jammu

© Foto: Kaspar Grossniklaus

© Foto: Thomas Senf


Sumchan (3200mASL)
Basecamp (4000mASL)
Loshani (2700mASL)
Gulab Garh

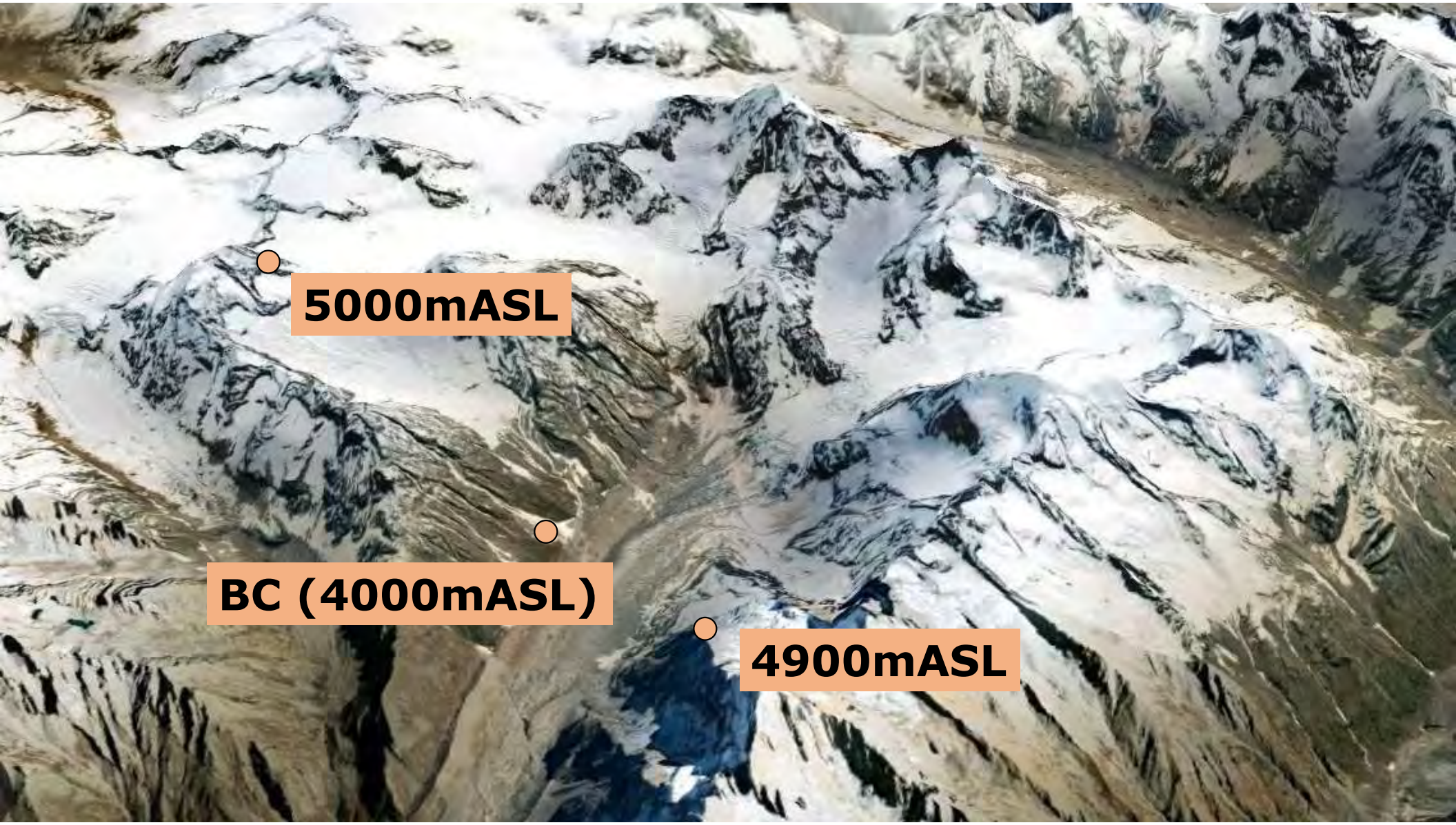
© Foto: Matthias Gribi

© Foto: Hugo Béguin


Basecamp (4000mASL)

© Foto: Kaspar Grossniklaus

© Foto: Hugo Béguin


5000mASL
BC (4000mASL)
4900mASL

© Foto: Hugo Béguin

© Foto: Kaspar Grossniklaus

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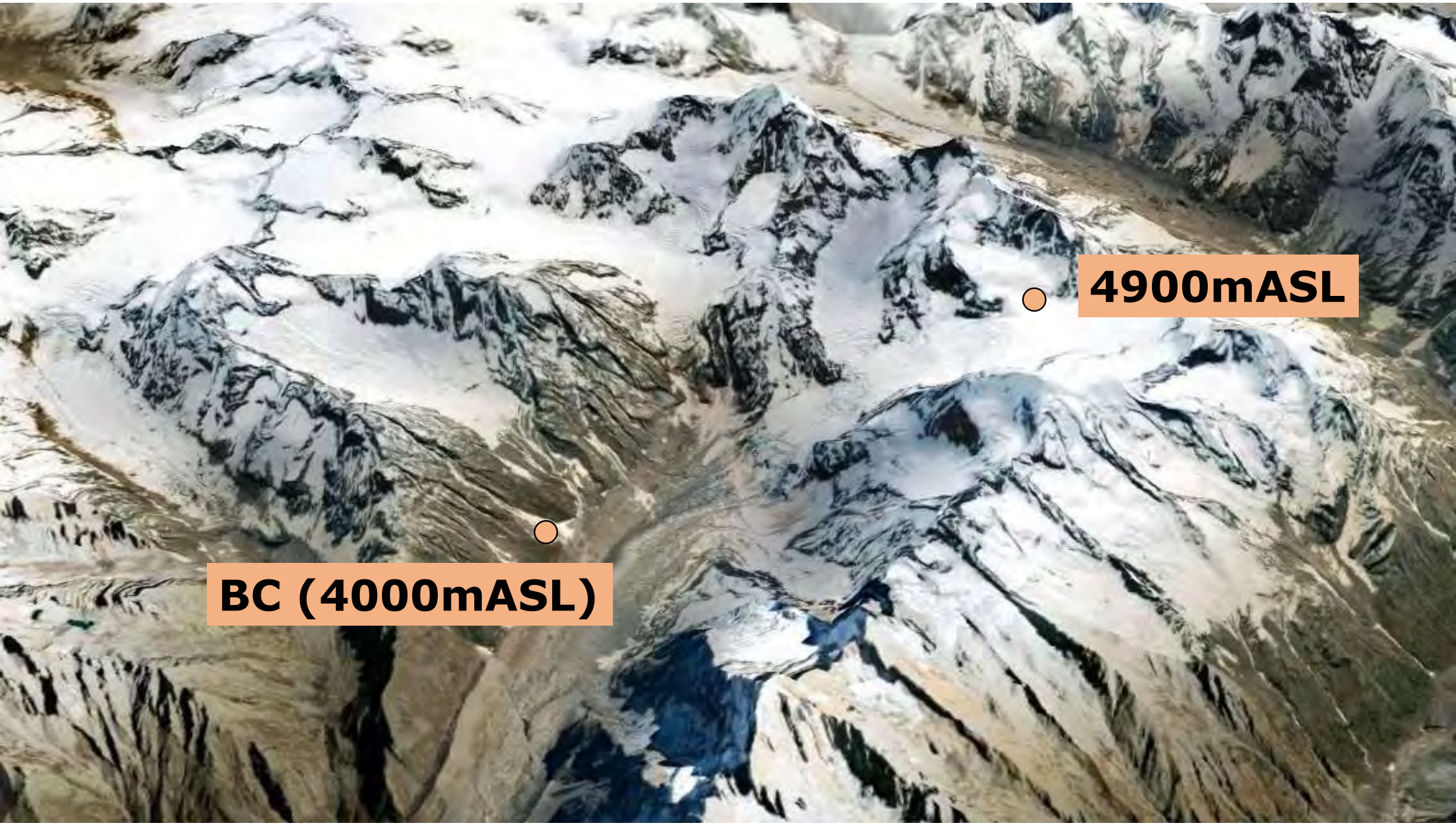
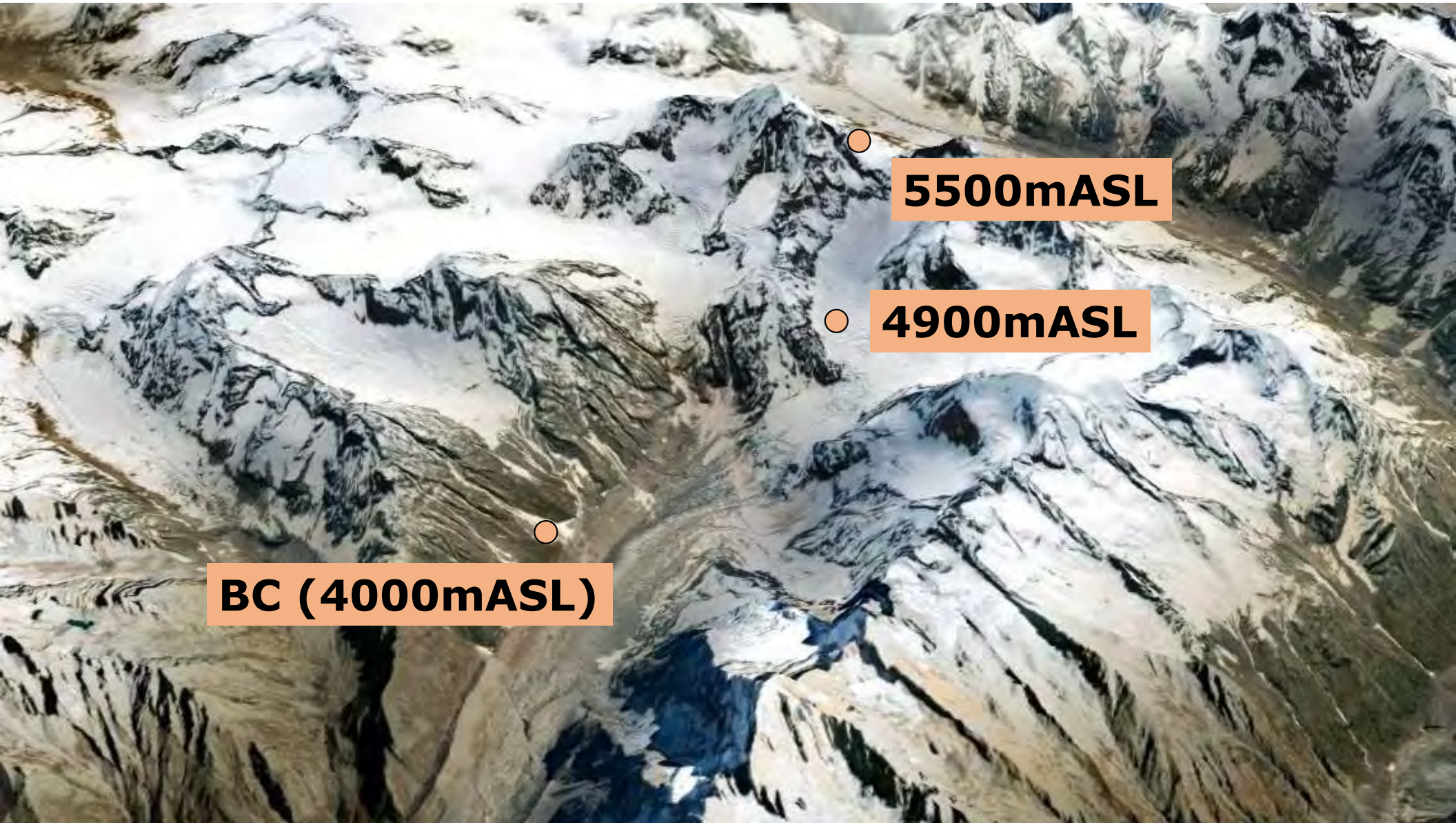

4900mASL
BC (4000mASL)


5500mASL
4900mASL
BC (4000mASL)

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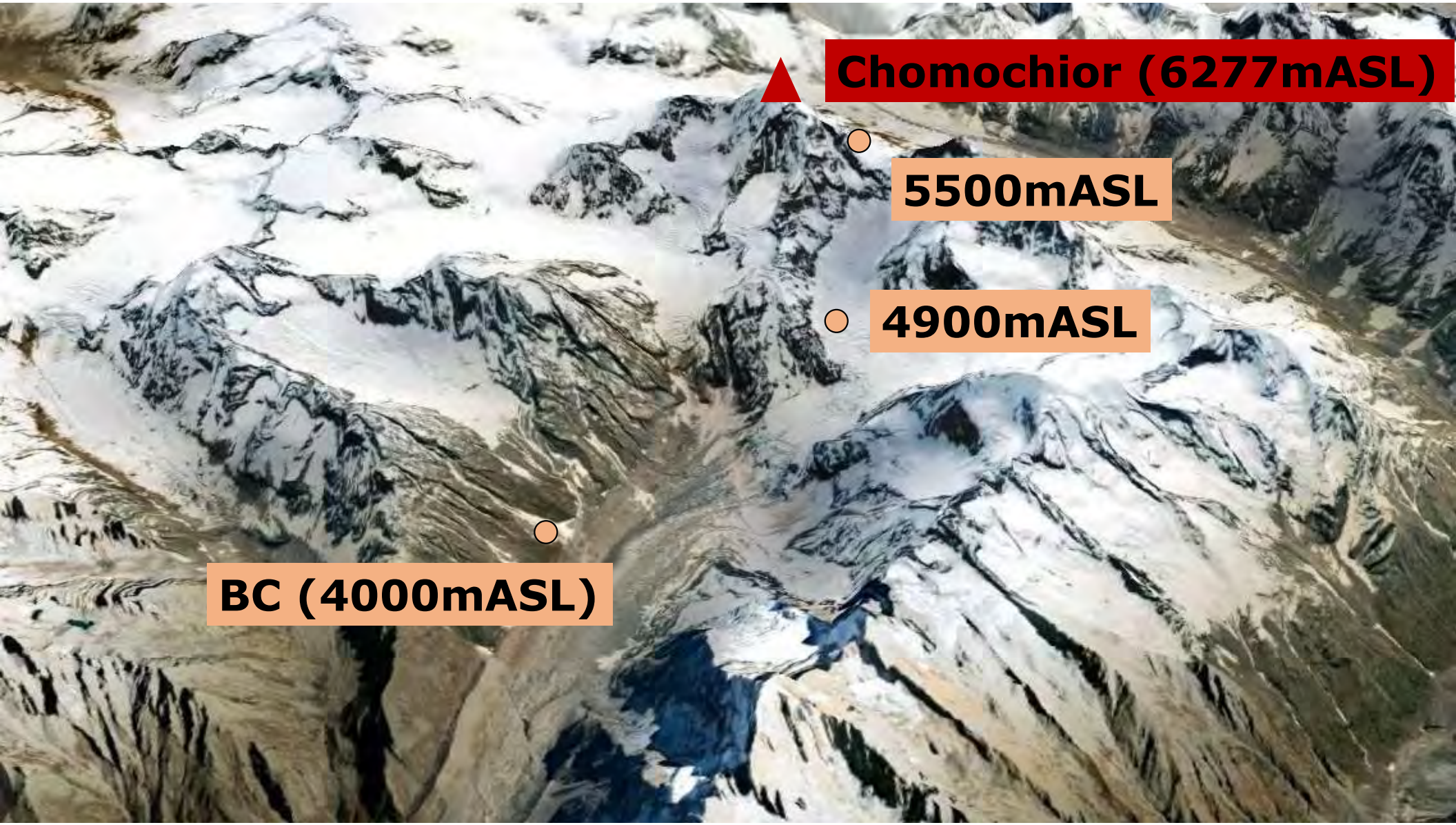
Chomochior (6277mASL)
5500mASL
4900mASL
BC (4000mASL)

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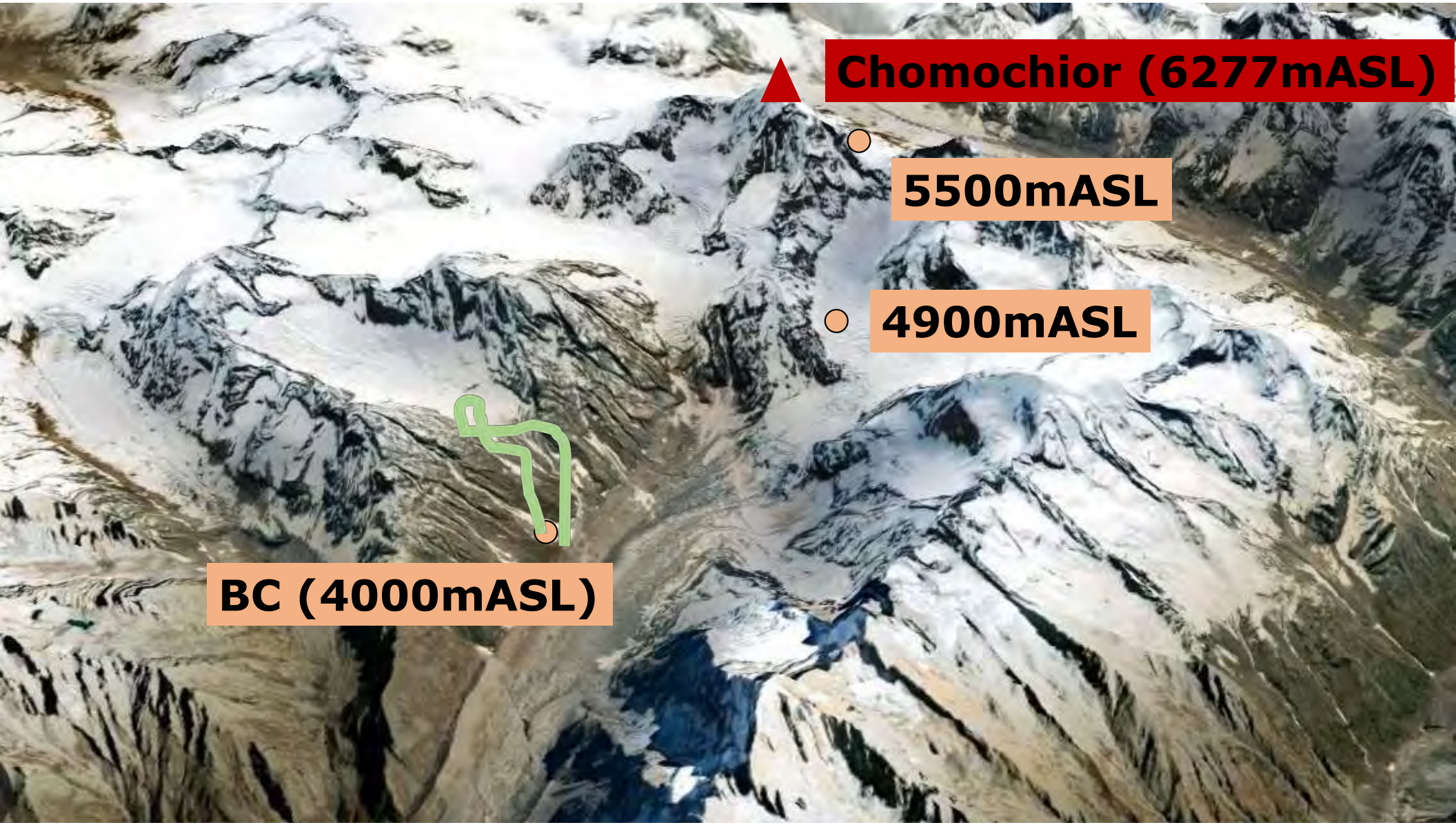
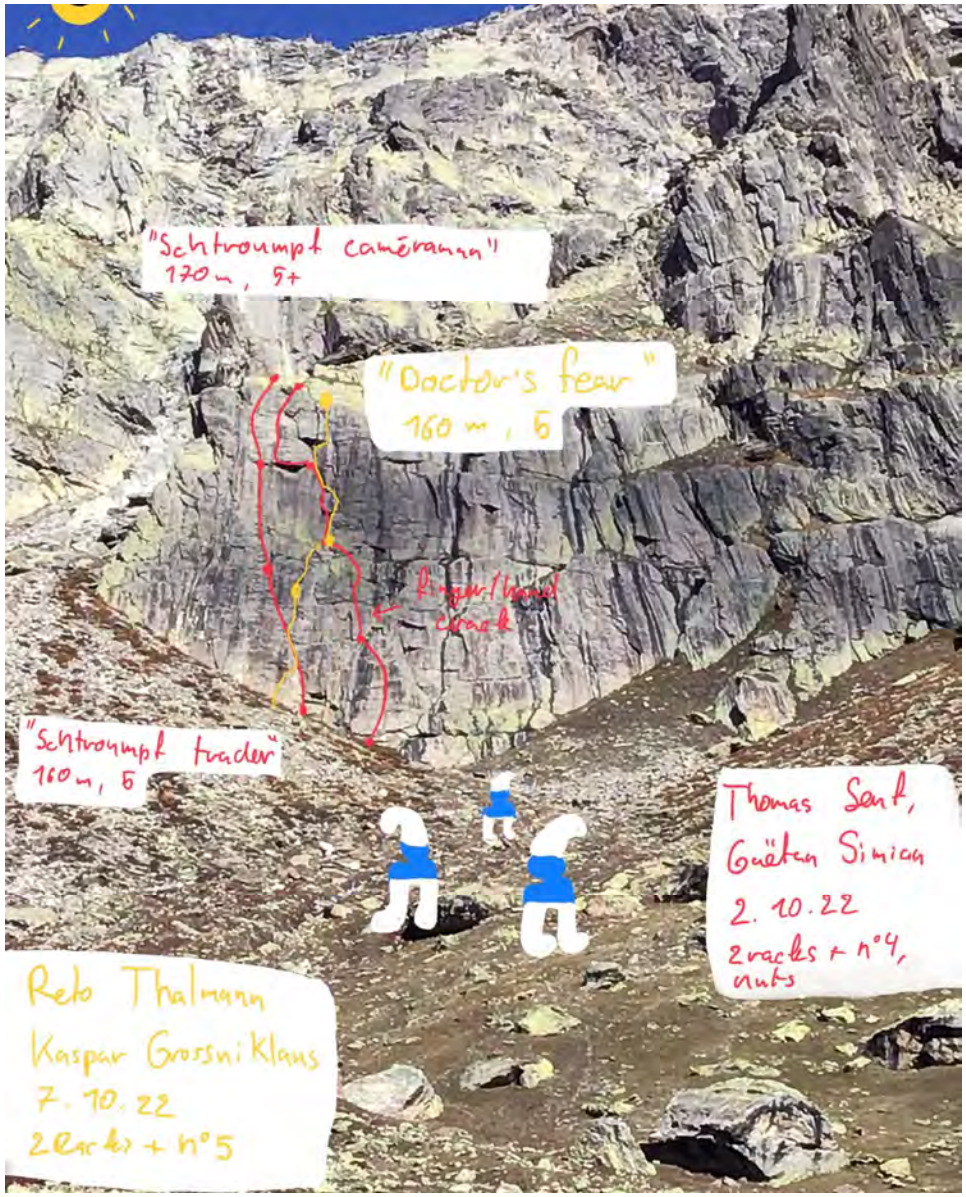

Chomochior (6277mASL)
5500mASL
4900mASL
BC (4000mASL)

© Foto: Reto Thalmann



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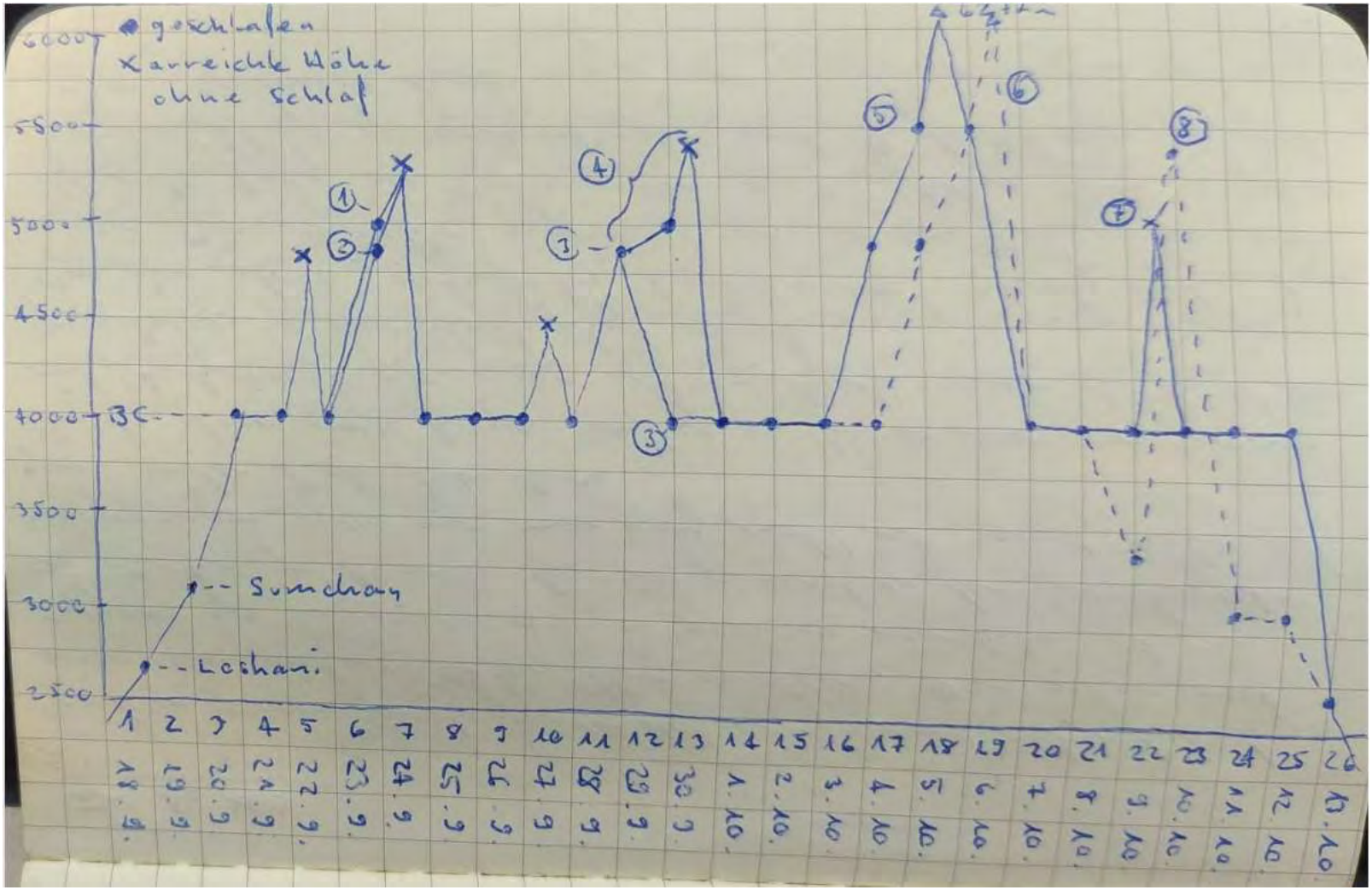
Anhang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Kurzeichle Höhe
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23 10.10.
24 11.10.
25 12.10.
26 13.10.

Antibiotika SAC Männerteam Kihstwar 2022

Indikation		1. Wahl	2. Wahl/Penicillinallergie
Pneumonie		**Co-Amoxi** 1g/8h (5d)	**Azithromycin** 500mg/24h (5d) od. **Doxy** 100mg/12h
Enteritis	Bakterielle Enteritis	**Azithromycin** 500mg/24h (3d)	**Ciprofloxacin** 500mg/12h (3-5d)
	Shigella	**Ciprofloxacin** 500mg/12h	**Azithromycin** 500mg/24h
	Amoebiasis/Giardiasis	**Metronidazol** 500mg/8h (7-10d)	
	Empirisches Vorgehen bei heftigem/blutigem Durchfall/starken Bauchkrämpfen: 1. **Azithromycin** 500mg/24h (3d) (bakterielle Enteritis, Shigella). Bei fehlender Besserung: 2. **Ciprofloxacin** 500mg/12h (3-5d) (auf Azithromycin resistente Bakterien, Cholera, Shigella) 3. **Metronidazol** 500mg/8h (7-10d) (Amoebiasis, Giardiais)		
Appendizitis		**Co-Amoxi** iv 2.2g/8h oder 1g/8h po (7-10d)	**Ciprofloxacin** 500mg/12h plus **Metronidazol** 500mg/8h (7-10d)
Erysipel		**Co-Amoxi** 1g/8h (5-7d)	**Bactrim** 1/12h od. **Doxy** 100mg/12h
Komplizierter HWI (Männer)/Pyelonephritis		**Ciprofloxacin** 500mg/12h (7d, Pyelo)	**Bactrim** 1/12h (komplizierter HWI)

Somit sind notwendig: Co-Amoxi (iv und po), Azithromycin, Metronidazol, Ciprofloxacin, Bactrim. Ev. Doxycyclin