

Alpine Notfälle

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Kärntner Notfalltage 2024



Besondere Umstände

Besondere Herausforderungen

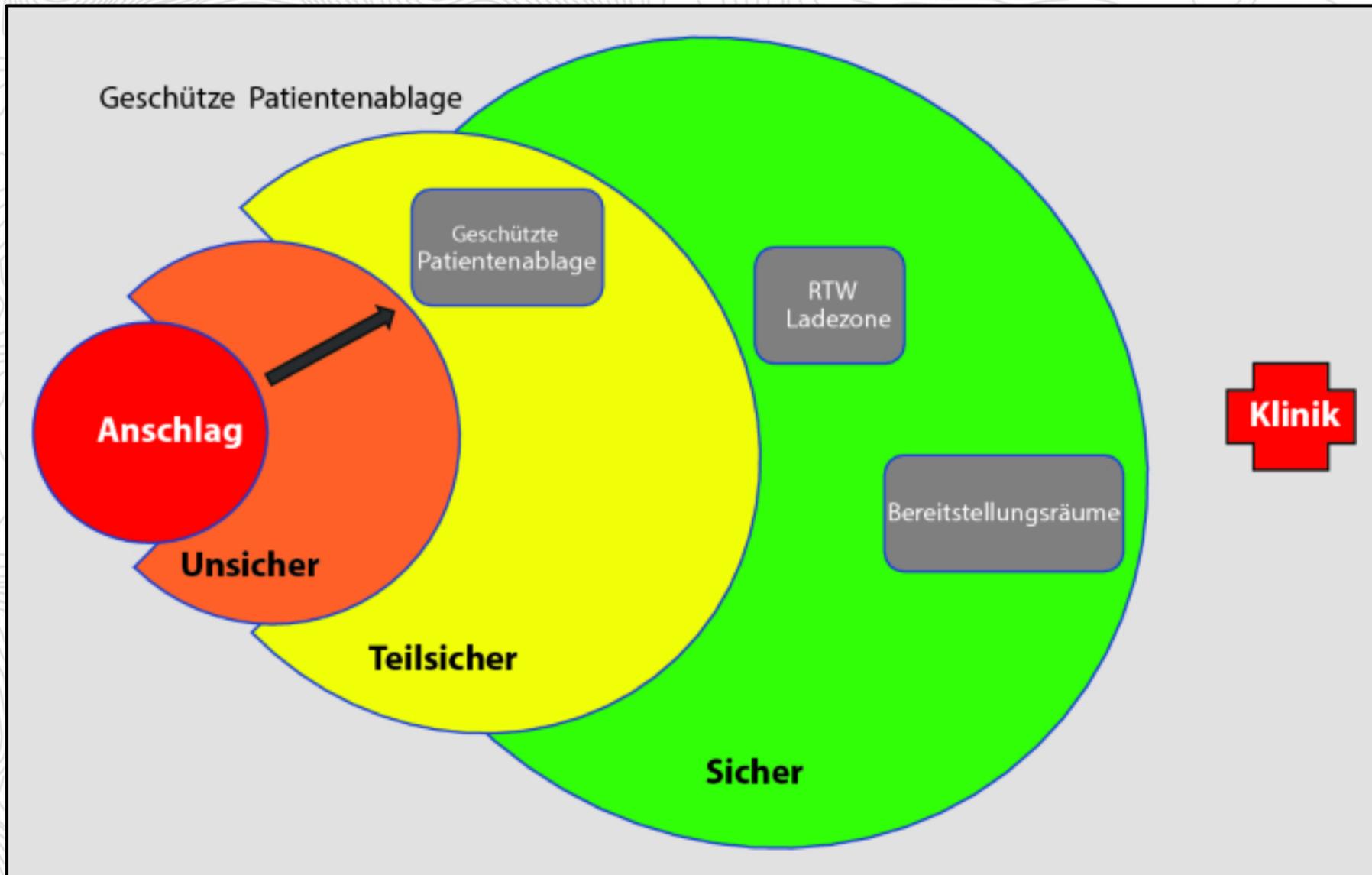














Zone Rot (care under fire)

Gefahr durch Steinschlag, Lawinen

mangelnde oder schlechte
Sicherungsmöglichkeiten für die Retter

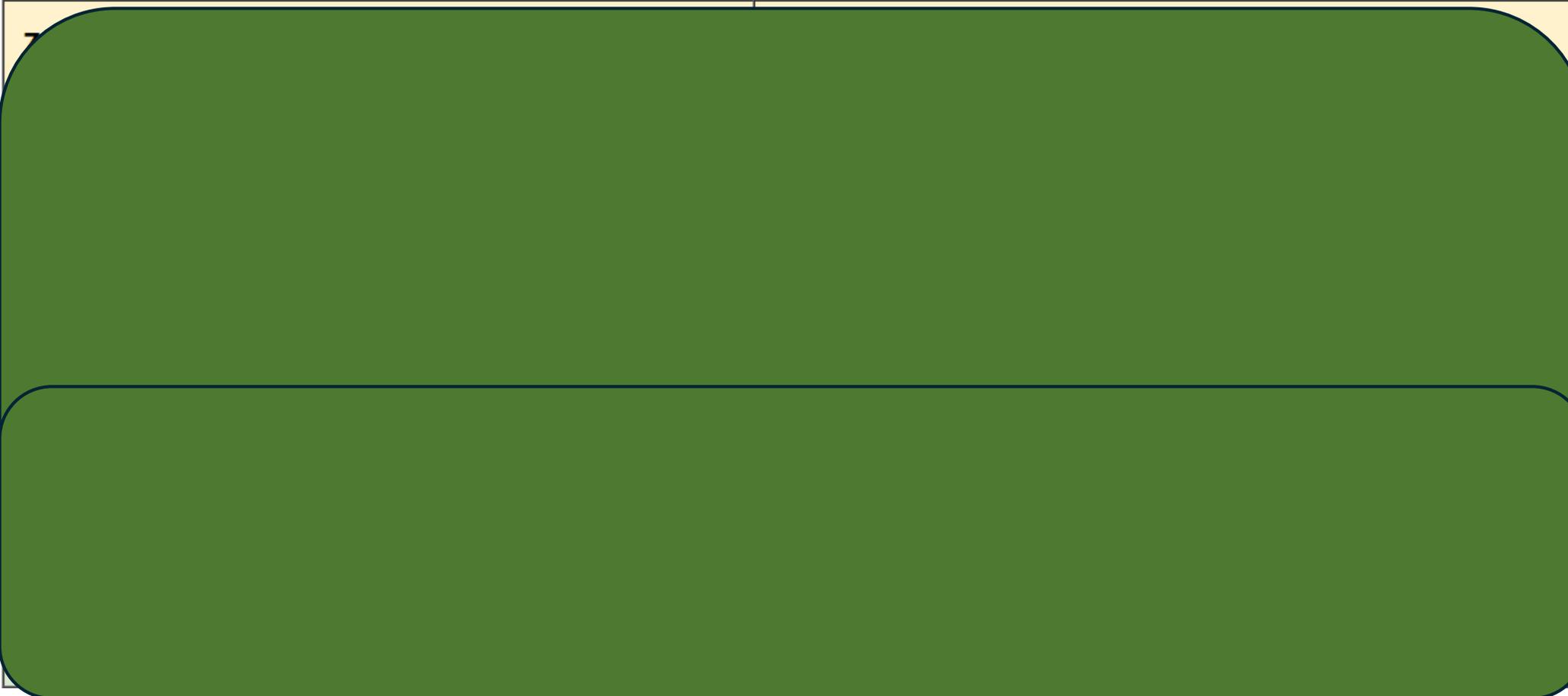
Motto: "load and go!"

evtl. Verzicht auf Bergung

nur so viele Retter wie unbedingt nötig

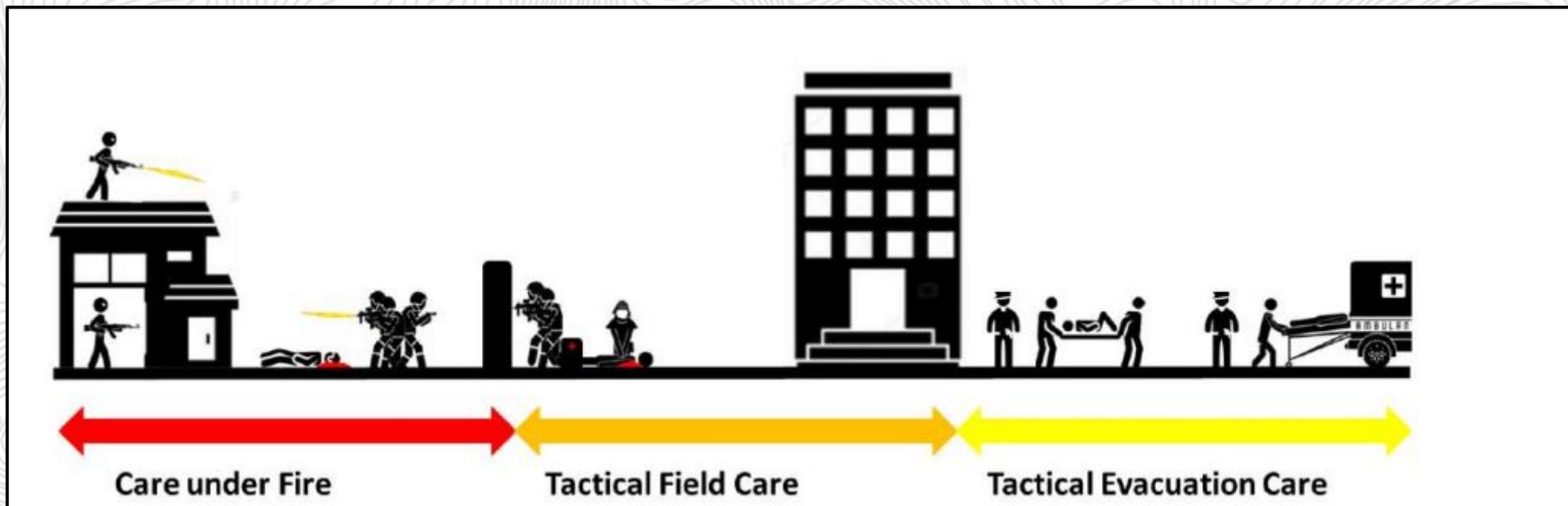
Crash-Bergung - Minimalversorgung
(Halskrause, Rettungsdecke, evtl. Tourniquet)

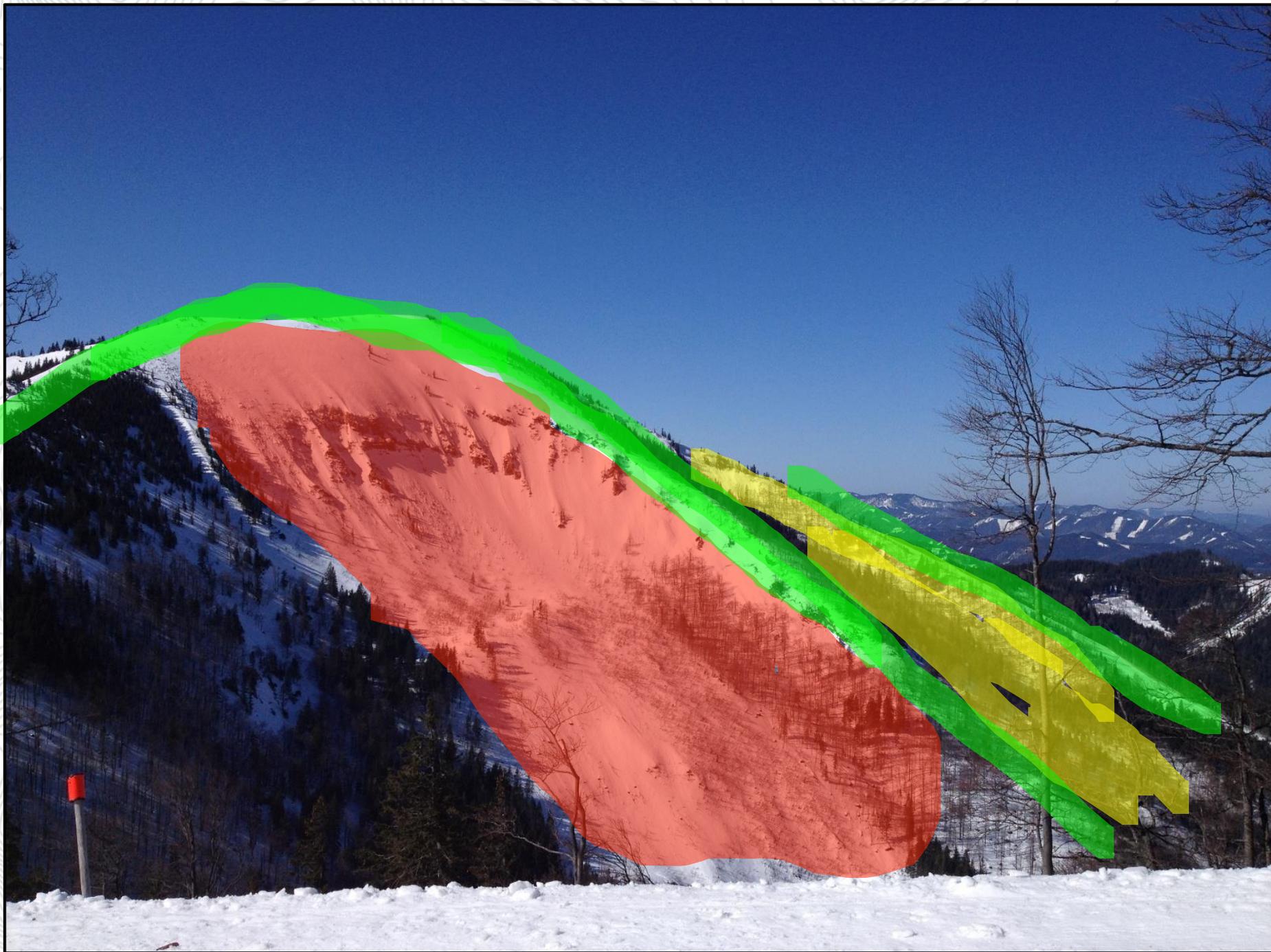
sofortiger Transport in gelbe oder grüne Zone



Einschätzung der Gefahrenlage (Gelände)

Rote Zone	Gelbe Zone	Grüne Zone
Crash-Bergung evtl. Verzicht	Rasche Versorgung und Bergung	Optimale Versorgung
Cr	ABCDE	ABCDE





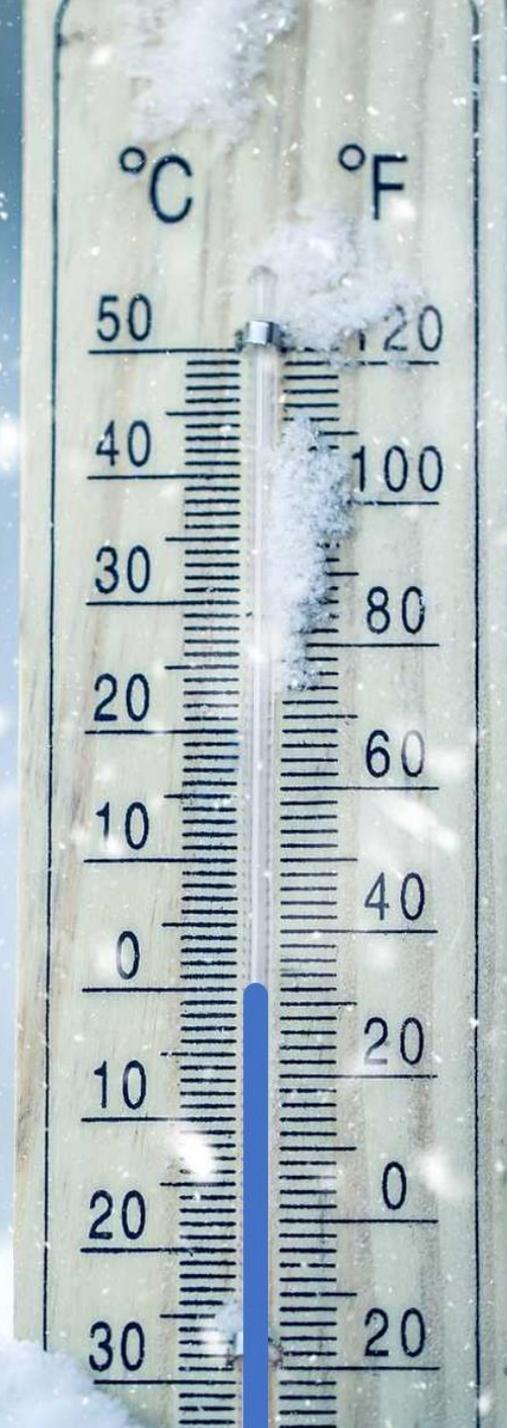




Besondere Umstände

Besondere Krankheitsbilder

Hypothermie





Hypothermie
^{IS}
COMING



ACIDOSIS



TRAUMA TRIAD OF DEATH

@PhysicianDoodles



HYPOTHERMIA



COAGULOPATHY







Schweizer Stadienmodell

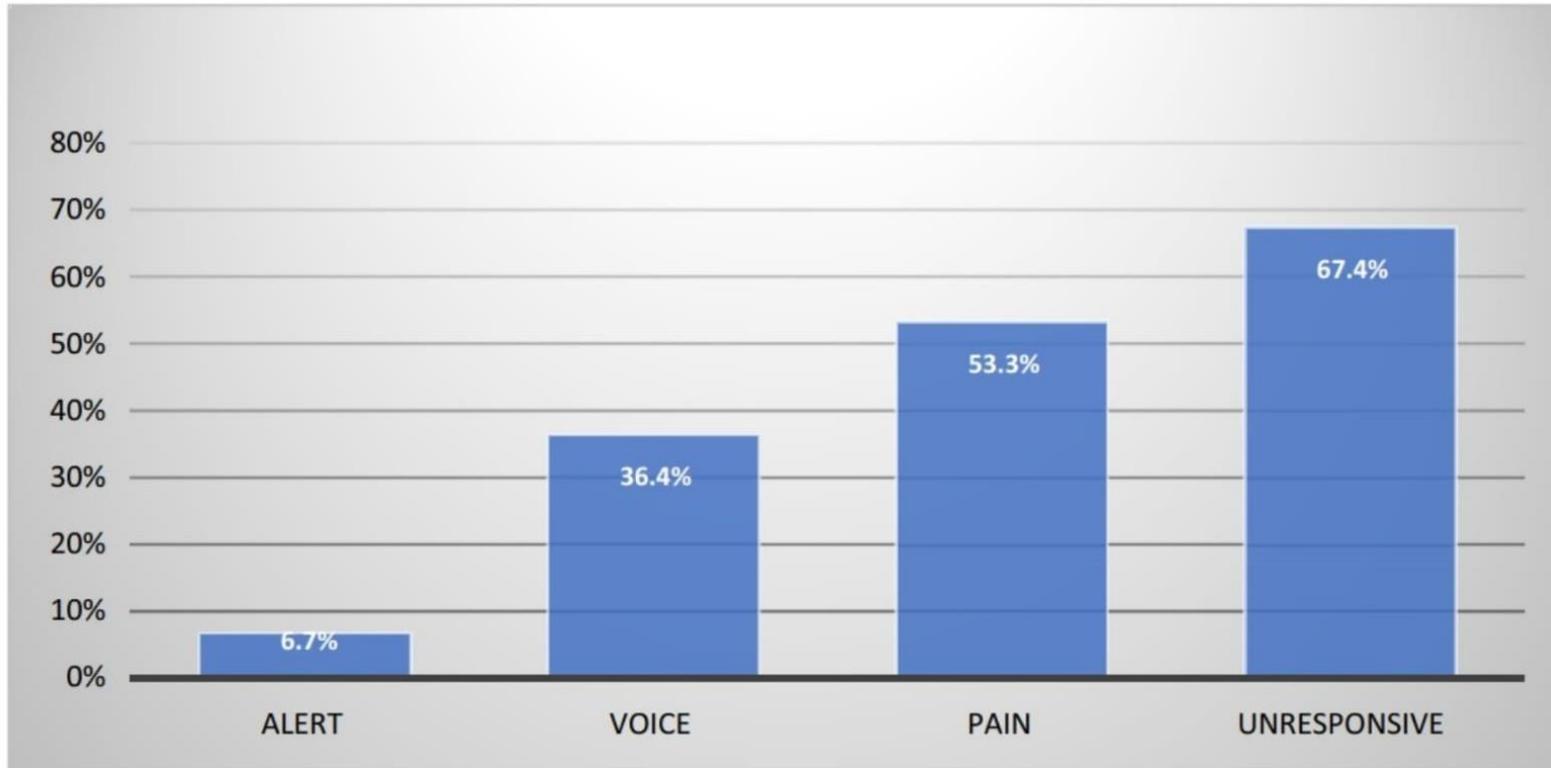
- In Europa weit verbreitet
- 2021 Update



	Stage 1	Stage 2	Stage 3	Stage 4
Clinical findings ^a	“Alert” from AVPU	“Verbal” from AVPU	“Painful” or “Unconscious” from AVPU AND Vital signs present	“Unconscious” from AVPU AND No detectable vital signs ^b
Risk of cardiac arrest ^c	Low	Moderate	High	Hypothermic cardiac arrest



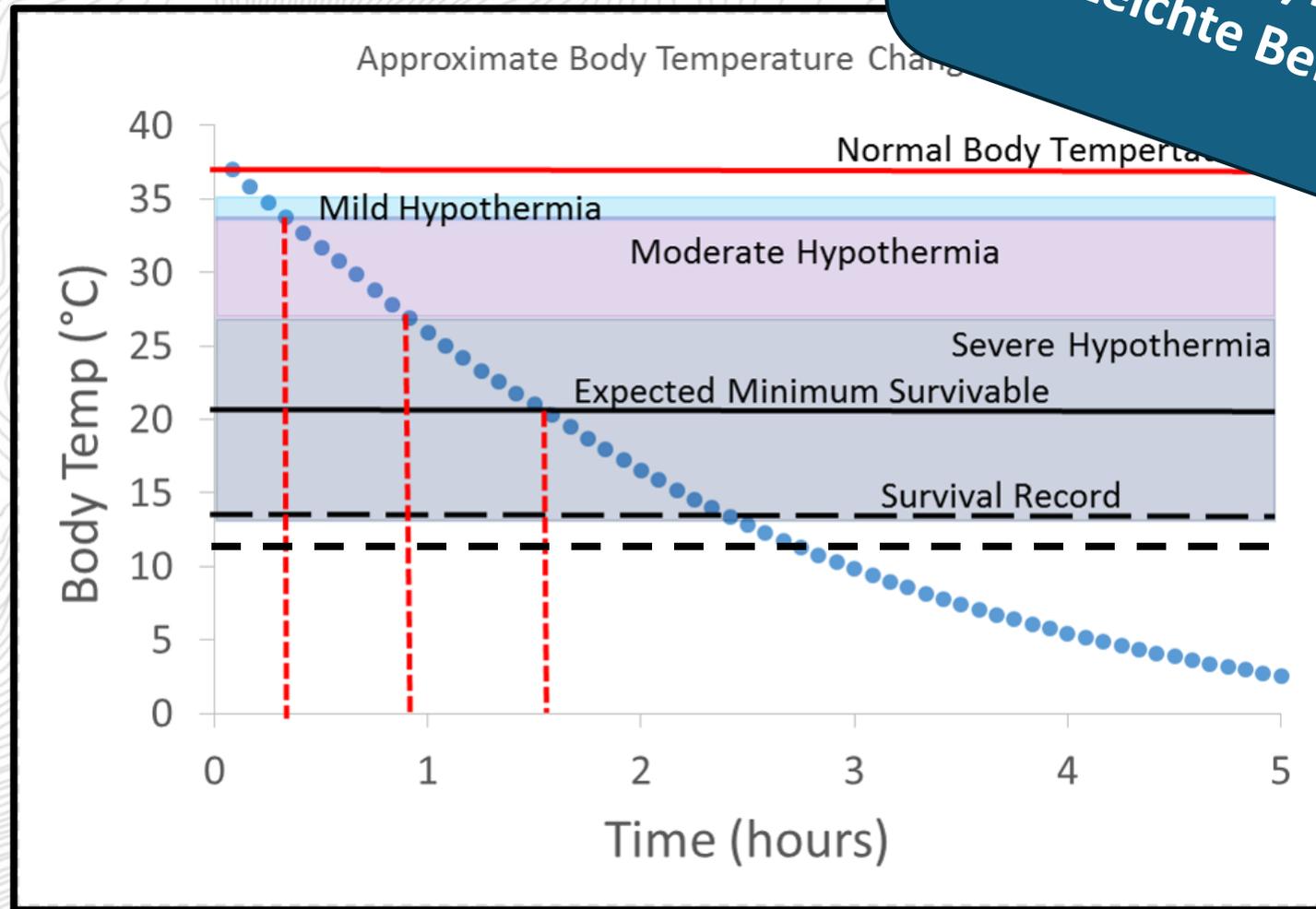
Risk of hypothermic cardiac arrest



Cooling Rate



80kg Körpergewicht
25°C
15km/h Wind
Leichte Bekleidung



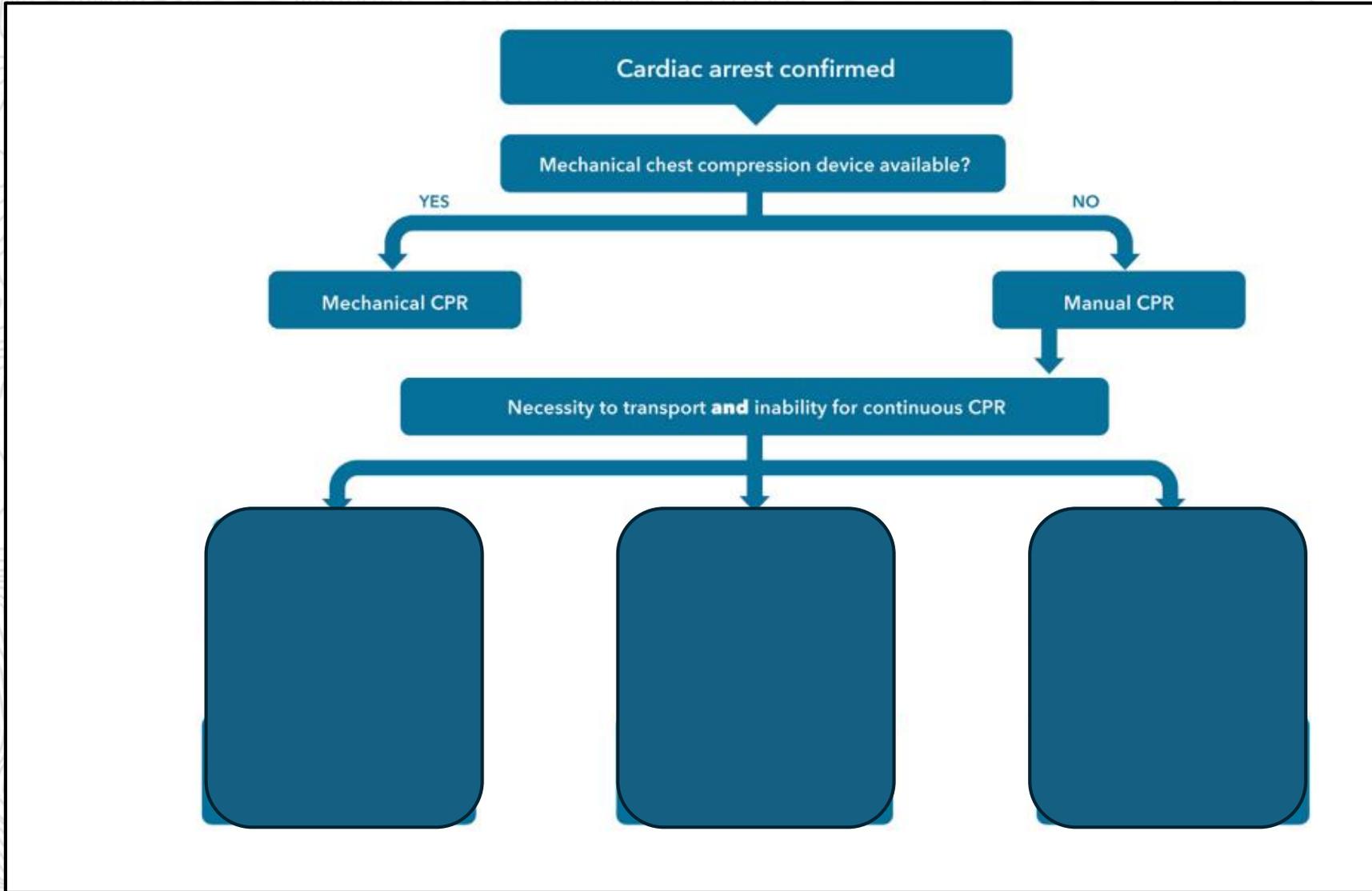


90%

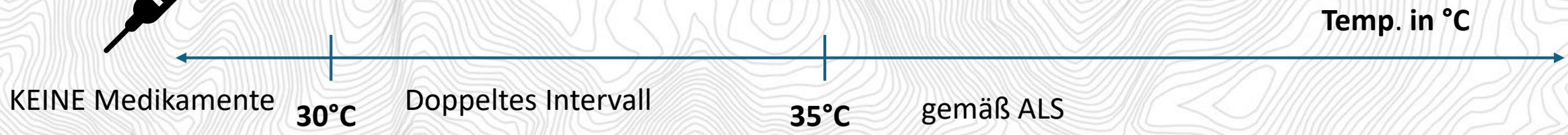
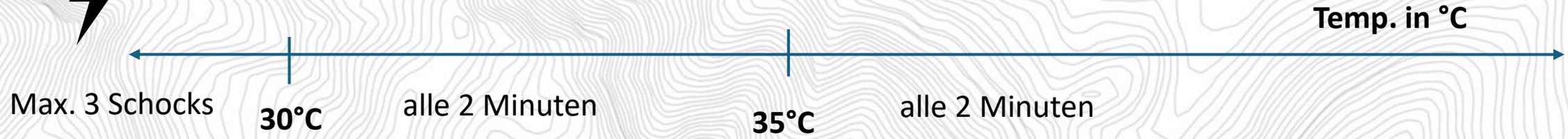
Wir tun alles, damit unseren Patienten noch kälter wird...

Surrogat Parameter





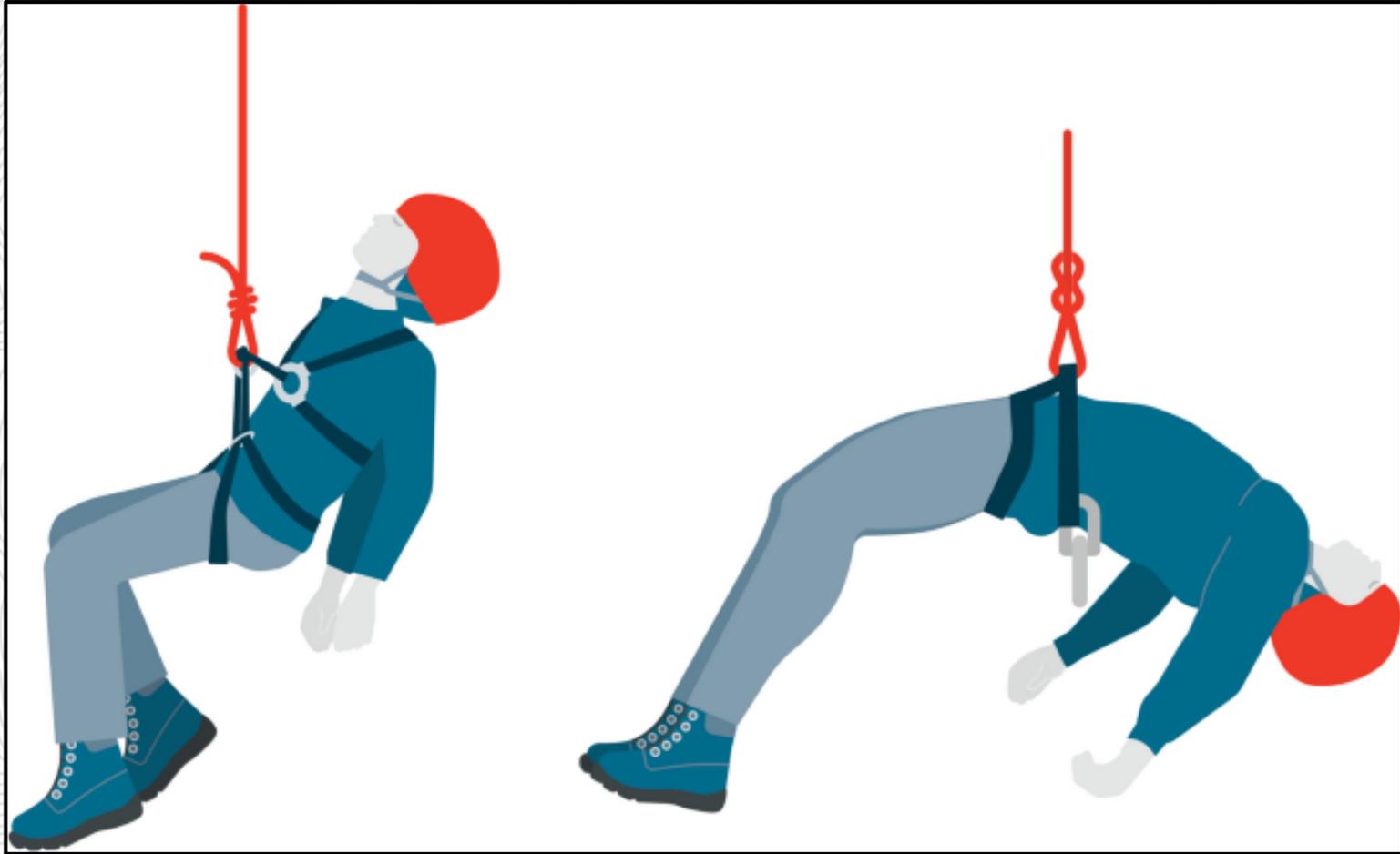
Der hypotherme cardiac arrest



Hängetrauma

- Selten
- potenziell lebensbedrohlich
- Pathophysiologie unklar
 - Neurocardiogener Reflex







Lagerung nach Hängetrauma

- „Expert opinion“ Bergrettungsärztetagung Innsbruck 1972

Review | [Open access](#) | Published: 09 December 2023

Suspension syndrome: a scoping review and recommendations from the International Commission for Mountain Emergency Medicine (ICAR MEDCOM)

[Simon Rauch](#) , [Raimund Lechner](#), [Giacomo Strapazon](#), [Roger B. Mortimer](#), [John Ellerton](#), [Sven Christjar Skaiaa](#), [Tobias Huber](#), [Hermann Brugger](#), [Mathieu Pasquier](#) & [Peter Paal](#)

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine **31**, Article number: 95 (2023)

| [Cite this article](#)



No.	Recommendation	Grade
1	Rope work should be done only with proper equipment and knowledge on how to use it correctly. Rope work should never be conducted alone	1C
2	Persons suspended in a harness should be rescued as soon as possible, even if the casualty is asymptomatic, as time to near or actual syncope and potentially cardiac arrest is variable and unpredictable [11]	1B
3	While awaiting rescue, persons suspended freely on a rope should move their legs to reduce venous pooling [11, 38]	2B
4	If no adjoining structures are in reach, foot loops should be used to step in and increase the activation of the muscle pump [1, 3, 11, 42]	2B
5	If the casualty is no longer able to act and it is safe to do so, 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 [11, 42]	2C
6	Once the casualty is on the ground, the casualty should be positioned supine. Assessment and treatment should follow standard advanced life support algorithms. Reversible causes of cardiac arrest, including hyperkalaemia and pulmonary embolism, should be considered, and managed appropriately [1, 3, 11, 42, 43, 45, 46]	1A
7	After prolonged hanging (> 2 h), patients are at risk of developing hyperkalaemia and acute kidney injury and should therefore be transported to a hospital with the capability of performing emergent renal replacement therapy [2, 3, 7]	2C



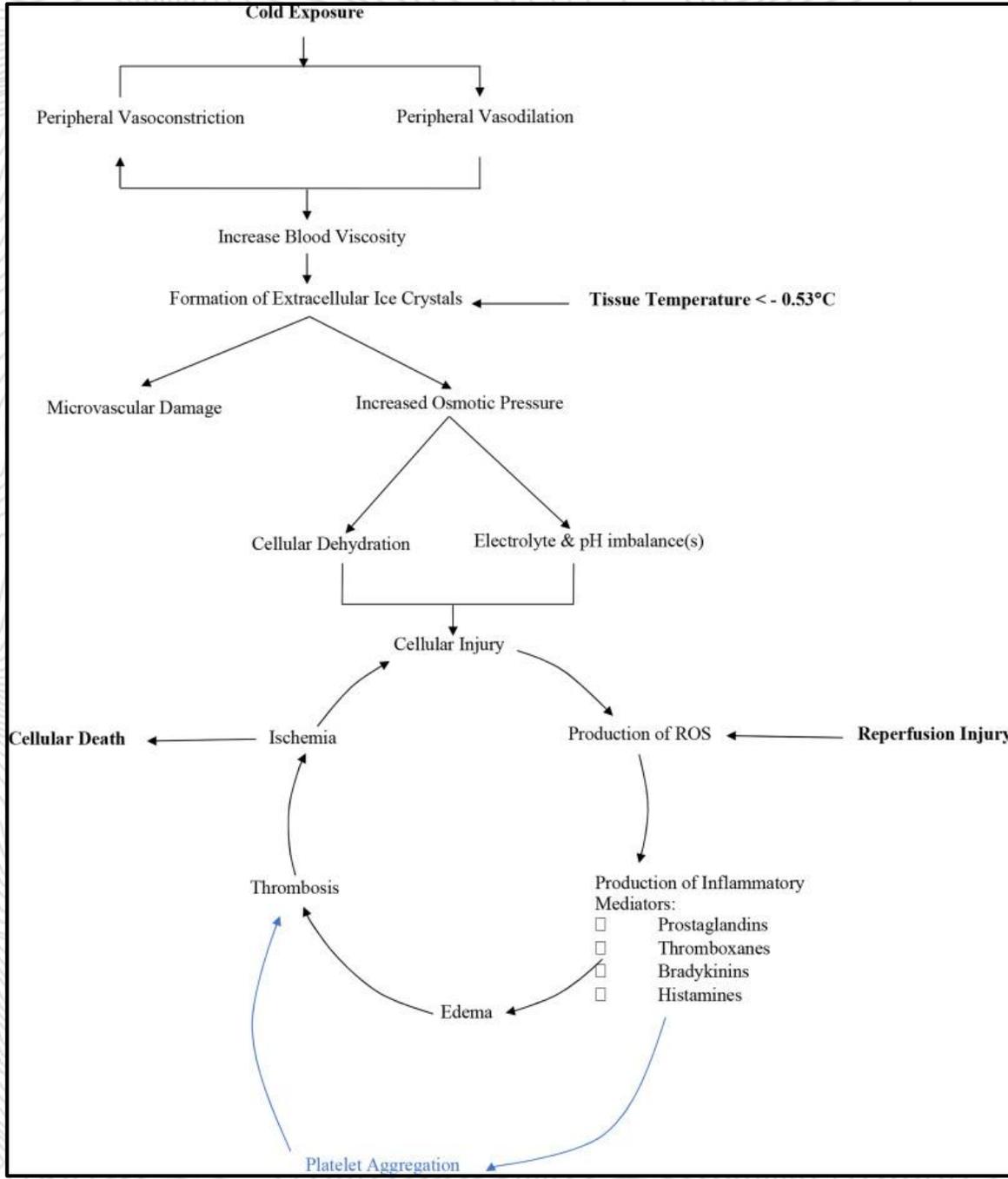
CAVE

- Hyperkaliämie
- Rhabdomyolyse
- Crush-Niere





Erfrierungen





	<i>Extent of cyanosis after rewarming</i>	<i>Bullae after rewarming</i>	<i>Bone Scan findings at day 2</i>	<i>Hand</i>	<i>Foot</i>	<i>Prognosis</i>
Grade 1	Absent	Absent	N/A			No amputation risk
Grade 2	Only on distal phalanx	Clear Bullae	Hypofixation of radiotracer uptake area			Amputation risk 1%
Grade 3	Proximal phalanx involvement	Hemorrhagic bullae on digits	Absence of radiotracer uptake area on the digit			Amputation risk 23-83%
Grade 4	Carpal/ Tarsal involvement	Hemorrhagic bullae over carpal/tarsal	Absence of radiotracer uptake area on the carpal/tarsal			Amputation risk 99%



Therapie präklinisch Do's

- Vor weiterer Auskühlung schützen
- Warm und trocken einpacken
- Immobilisation
- Warmwasserbad (max. 42°C, ~1h)

Therapie präklinisch Don'ts

- Rubbeln
- Massage
- Trockene Hitze



Therapie innerklinisch

- Thrombolytische Therapie
 - tPA (i.v. oder i.a.) // Iloprost
 - Heparin i.v.
 - T-Ass (f. bis zu 3 Monate)
- Antiinflammatorisch
 - Ibuprofen
 - Dexamethason
- Chirurgisches Debridement



Case Report

23h verschüttet

23°C KKT





Therapieregime

- Ibuprofen 6 mg/kg alle 12 h
- Dexamethason 0,1mg/kg
- Iloprost 0,5ng/kg/min für 5d
- Plexus axillaris Katheter
Ropivacain 0,2% 4ml/h f. 4d
- Catheter directed thrombolysis
mit Alteplase
- Enoxaparin 6.000 IE
- Multimodale Schmerztherapie



„Schützengrabenfuß“

- „non freezing cold injury“
 - NFCI
- Kalt und Feucht







Eigene Entität – eigene Therapie

- Warum und trocken
- Langsame – passive - Wiedererwärmung
- In späterer, hyperämischer Phase trockenes Abkühlen (15-18°C)
- Amitryptilin

To come to an end...

- Alpine Notfallmedizin ist vielseitig
- Besondere Ausbildung für besondere Umstände
- Besondere Ausbildung für besondere Krankheitsbilder

A photograph of a wooden cross standing on a snow-covered mountain peak. The cross is made of two weathered wooden poles. In the background, a valley filled with evergreen trees stretches out, with snow-covered mountains in the distance. The sky is a mix of orange and blue, suggesting a sunset or sunrise. The overall scene is serene and quiet.

Fragen?

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