

The ICAR MEDCOM

Commission for Mountain Medicine
of the International Commission for Alpine Rescue

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ICAR MEDCOM RECOMMENDATION

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Version	1.0
Title	Clinical staging of accidental hypothermia: The Revised Swiss System Recommendation of the International Commission for Mountain Emergency Medicine (ICAR MedCom)
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1. Background

Clinical staging of accidental hypothermia is used to guide out-of-hospital treatment and transport decisions. Most clinical systems utilize core temperature, by measurement or estimation, to stage hypothermia, despite the challenge of obtaining accurate field measurements. Studies have demonstrated that field estimation of core temperature is imprecise. We propose a revision of the original Swiss Staging system. The revised system uses the risk of cardiac arrest, instead of core temperature, to determine the staging level. Our revised system simplifies assessment by using the level of responsiveness, based on the AVPU scale, and by removing shivering as a stage-defining sign.

Clinical staging of accidental hypothermia: the Revised Swiss System				
	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

^a In the Revised Swiss System, “Alert” corresponds to a GCS score of 15; “Verbal” corresponds to a GCS score of 9-14, including confused patients; “Painful” and “Unconscious” correspond to a GCS score <9. While shivering is not used as a stage-defining sign in the Revised Swiss System, its presence usually means that the temperature is >30°C, a temperature at which hypothermic CA is unlikely to occur.

^b No respiration, no palpable carotid or femoral pulse, no measurable blood pressure. Check for signs of life (pulse and, especially, respiration) for up to 1 min.

^c The transition of colours between stages represents the overlap of patients within groups. The estimated risk of cardiac arrest is based on accidental hypothermia being the only cause of the clinical findings. If other conditions impair consciousness, such as asphyxia, intoxication, high altitude cerebral oedema or trauma, the revised Swiss System may falsely predict a higher risk of cardiac arrest due to hypothermia. Caution should be taken if a patient remains “alert” or “verbal” showing signs of haemodynamic or respiratory instability such as bradycardia, bradypnoea, or hypotension because this may suggest transition to a stage with higher risk of cardiac arrest.

2. Recommendations

Nr.	Recommendation	Grade
1	Suspected accidental hypothermia should be confirmed by an accurate measurement of core temperature, if possible.	1C
2	If core temperature cannot be measured, the Revised Swiss System should be used to estimate the risk of hypothermic cardiac arrest in order to guide treatment, choice of destination hospital, and the need for ECLS rewarming.	1C

3. Literature

Link to the original publication:

Musi ME, Sheets A, Zafren K, Brugger H, Paal P, Hölzl N, Pasquier M. Clinical staging of accidental hypothermia: The Revised Swiss System: Recommendation of the International Commission for Mountain Emergency Medicine (ICAR MedCom). Resuscitation. 2021 Mar 3;162:182-187. doi: 10.1016/j.resuscitation.2021.02.038. Epub ahead of print. PMID: 33675869.

[https://www.resuscitationjournal.com/article/S0300-9572\(21\)00096-4/fulltext](https://www.resuscitationjournal.com/article/S0300-9572(21)00096-4/fulltext)

Further Literature:

- [Pasquier M, Carron PN, Rodrigues A, Dami F, Frochaux V, Sartori C, Deslarzes T, Rousson V. An evaluation of the Swiss staging model for hypothermia using hospital cases and case reports from the literature. Scand J Trauma Resusc Emerg Med. 2019 Jun 6;27\(1\):60. doi: 10.1186/s13049-019-0636-0. PMID: 31171019; PMCID: PMC6555718.](#)
- Durrer B, Brugger H, Syme D; International Commission for Mountain Emergency Medicine. The medical on-site treatment of hypothermia: ICAR-MEDCOM recommendation. High Alt Med Biol. 2003 Spring;4(1):99-103. doi: 10.1089/152702903321489031. PMID: 12713717.XXX

4. The Grading System of the American College of Chest Physicians

Grade	Description	Benefits vs risks and burdens	Methodological quality of supporting evidence
1A	Strong recommendation, high-quality evidence	Benefits clearly outweigh risks and burdens or vice versa	RCTs without important limitations or overwhelming evidence from observational studies
1B	Strong recommendation, moderate-quality evidence	Benefits clearly outweigh risks and burdens or vice versa	RCTs with important limitations or exceptionally strong evidence from observational studies
1C	Strong recommendation, low-quality or very low-quality evidence	Benefits clearly outweigh risks and burdens or vice versa	Observational studies or case series
2A	Weak recommendation, high-quality evidence	Benefits closely balanced with risks and burdens	RCTs without important limitations or overwhelming evidence from observational studies
2B	Weak recommendation, moderate-quality evidence	Benefits closely balanced with risks and burdens	RCTs with important limitations or exceptionally strong evidence from observational studies
2C	Weak recommendation, low-quality or very low-quality evidence	Uncertainty in the estimates of benefits, risks, and burden; benefits, risk, and burden may be closely balanced	Observational studies or case series

American College of Chest Physicians classification scheme for grading evidence and recommendations in clinical guidelines. RCT, randomized controlled trial.

Source: Guyatt et al. Chest 2006;129:174-81.