

Delayed or Intermittent CPR in Primary severe Hypothermia

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Commentary and concepts

Delayed and intermittent CPR for severe accidental hypothermia[☆]



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Dr John Ellerton, MR England and Wales and ICAR Medcom
on behalf of the authors

- Current hypothermia guidelines recommend that **CPR** is started as soon as Cardiac Arrest is diagnosed and continued until the patient is rewarming^{1,2}
- **However, good quality continuous CPR during transport may not be possible³**

¹ Brown DJA, Brugger H, Boyd J, Paal P. Accidental hypothermia. N Engl J Med 2012;367:1930–8

² Soar J, et al. European Resuscitation Council Guidelines for Resuscitation 2010. Resuscitation 2010;81:1400–33

³ Wik L, et al. Quality of cardiopulmonary resuscitation during out-of-hospital cardiac arrest. JAMA 2005;293:299–304.7

Possible solutions?

Mechanical Chest Compression devices
Logistic and Environmental issues

Intermittent CPR?

*Evidence from surgery under
Deep Hypothermia Cardiac Arrest
Animal studies and Case reports*

Evidence from animal studies and surgery

- Brain function can recovery completely if the brain has been cooled to $\sim 18^{\circ}\text{C}$ before Cardiac Arrest
- Surgeons use this when they need to operate on the heart when no blood flow is possible. ^{1,2} “Give the brain a drink”

¹ Percy A, et al. Deep hypothermic circulatory arrest in patients with high cognitive needs. Ann Thorac Surg 2009;87:117–23.13

² Ziganshin BA, et al. Straight deep hypothermic circulatory arrest for cerebral protection during aortic arch surgery: safe and effective. J Thorac Cardiovasc Surg 2014;148:888–900

Case reports - delayed CPR

- 42 yr old severe hypothermia. Apparently dead. Flown hospital where, 70 min after rescue, CPR was started. The patient was rewarmed and made a full recovery.

(Old report)

Case report - Intermittent CPR

- A 29 yr old skier (avalanche). Severe hypothermia. Rescue-related Cardiac Arrest. CPR stopped for 15 min flight. Rewarmed and made a full recovery
- 57 yr old lost during a snowstorm. Rescue-related Cardiac Arrest. 1 min CPR then 1 min evacuation for 25 min. Rewarmed; mild disability.

Proposed guidelines for hypothermic CA

- Make a careful accurate diagnosis with ECG and core temperature measurement.
- **Start immediate, continuous CPR if safe to do so.**
- Minimize interruptions and apply mechanical chest compression device as soon as possible.

Proposed guidelines for hypothermic CA

- **CPR can be delayed by up to 10 min to allow rescuers to move the casualty to a safer location**
- **Only if continuous CPR is impossible consider performing intermittent CPR**

Proposed guidelines for hypothermic CA

- **20-28 °C or unknown: perform at least 5 min CPR and then evacuate for ≤ 5 min without CPR**
- **<20 °C: perform at least 5 min CPR : ≤ 10 min without CPR**
- **Resume continuous CPR as soon as feasible**

Summary

- Intermittent CPR should be regarded as a hypothesis (to be tested)
- Times suggested are based on a very few cases
- These guidelines are for **PRIMARY** accidental hypothermia

Thanks to Mike, Karen, Johannes, Greg, and Les

Workshop Stage 1



Thanks to all delegates that took part



Learning points

- The quality of CPR should be **'200%'** -regular training is essential
- Crew Resource Management is essential
- Intermittent CPR is only for **PRIMARY** accidental hypothermia where continuous CPR is impossible

Thank you for your attention