

Position Statement

THERAPEUTIC HYPOTHERMIA AFTER CARDIAC ARREST¹ ILCOR Advisory Statement, October 2002

BACKGROUND

- Induction of moderate hypothermia (28°C to 32°C) before cardiac arrest has been used successfully since the 1950s to protect the brain against global ischemia that occurs during some open heart surgeries.
- Successful use of therapeutic hypothermia after cardiac arrest was described in the late 1950s but was abandoned because of uncertain benefit and difficulties with its use.
- Induction of hypothermia after return of spontaneous circulation (ROSC) has been associated with improved functional recovery and reduced cerebral histological deficits in various animal models of cardiac arrest.
- Previous recommendations did not address the use of therapeutic hypothermia after resuscitation from cardiac arrest due to insufficient evidence to support its use in humans. In 2002, two prospective randomized clinical trials were published and provide evidence to support its use in selected groups of patients.
 - A European study found that 75 of the 136 patients (55%) in the hypothermia group had a favorable neurological outcome (able to live independently and work at least part of the time) at 6 months compared with 54 of 137 (39%) in the normothermia group.
 - An Australian study found that 21 of 43 patients (49%) treated with hypothermia had good neurological function at discharge (to home or rehabilitation facility) compared with 9 of 34 (26%) in the normothermia group.
- Careful monitoring of temperature is important during use of therapeutic hypothermia. The incidence of complications such as arrhythmias, infection, and coagulopathy is likely to increase if the core temperature falls considerably below 32°C. A bladder temperature probe and an in-situ pulmonary artery catheter are the most reliable techniques for monitoring temperature.

RECOMMENDATIONS

The Heart and Stroke Foundation of Canada recommends that:

1. Unconscious adult patients with spontaneous circulation after out-of-hospital cardiac arrest should be cooled to 32°C to 34°C for 12 to 24 hours when the initial rhythm was ventricular fibrillation (VF).
2. Therapeutic cooling (32°C to 34°C for 12 to 24 hours) may also be considered for rhythms other than VF or for in-hospital cardiac arrest.
3. Therapeutic cooling should be initiated as soon as possible after return of spontaneous circulation but can be considered even if delayed (e.g. 4 to 6 hours).
4. Core temperature should be continuously monitored by use of a bladder temperature probe or an in-situ pulmonary artery catheter.
5. Shivering should be prevented by the use of a neuromuscular blocker and sedation.
6. Normothermia should be restored slowly as rebound hyperthermia is common and should be avoided.



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7. Until further data are available, therapeutic hypothermia should not be used for patients with severe cardiogenic shock or life-threatening arrhythmias, pregnant patients, or patients with primary coagulopathy.
8. There is currently insufficient evidence to make a recommendation on the use of therapeutic hypothermia in children resuscitated from cardiac arrest. Until additional pediatric data become available, clinicians should tailor therapy for individual patients on the basis of their assessment of the risks and benefits of hypothermia.
9. Hospitals should develop site-specific guidelines for therapeutic cooling of unconscious patients with return of spontaneous circulation after cardiac arrest.

REFERENCES

1. Advanced Life Support Task Force of the International Liaison Committee on Resuscitation. Therapeutic hypothermia after cardiac arrest. An advisory statement by the Advanced Life Support Task Force of the International Liaison Committee on Resuscitation. *Circulation* 2003;108:118-21.

**The evidence contained in this Position Statement is current as of:
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