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Reducing Brain Injury After Cardiac Arrest: American Academy of Neurology Practice Guideline

Therapeutic hypothermia (TH) (32-34°C for 24 hours) should be mandatory practice for patients who are comatose after being resuscitated from out-of-hospital cardiac arrest, if the initial cardiac rhythm is either pulseless ventricular tachycardia (VT) or ventricular fibrillation (VF), according to the American Academy of Neurology (AAN)'s newly published practice guideline Reducing brain injury following cardiopulmonary resuscitation.

The guideline, which is endorsed by the Neurocritical Care Society and published online in *Neurology*, is based on the evidence from studies conducted over the last 50 years on ways to reduce brain injury in people who are comatose after resuscitation from cardiac arrest.

The recommendation for patients who are comatose following resuscitation from cardiac arrest, in whom the initial cardiac rhythm is either VT/VF or asystole/pulseless electrical activity (PEA) after OHCA is for targeted temperature management (36°C for 24 hours, followed by 8 hours of rewarming to 37°C, and temperature maintenance below 37.5°C until 72 hours). The recommendation is Level B "should do", and the guideline notes that it is an acceptable alternative to TH. The guideline also states that there is insufficient evidence to support or refute the use of 32°C vs 34°C.

Lower strength recommendations are for patients who are comatose with an initial rhythm of PEA/asystole, in whom the guideline states that TH possibly improves survival and functional neurologic outcome at discharge vs standard care and may be offered (Level C - "might" be done). Prehospital cooling as an adjunct to TH is not recommended, as the available evidence is strong enough to say that it is highly likely to be ineffective in further improving neurologic outcome and survival. The guideline states that it should not be offered (Level A). In addition, other pharmacologic and nonpharmacologic strategies (applied with or without concomitant TH) are also reviewed.

The guideline recommends that future studies try to find optimal target temperatures and rates of cooling and rewarming the body as well as examining which cooling methods work best.

In an accompanying editorial, Gregory Kapinos, MD, MS, a neurointensivist at North Shore Long Island Jewish Health System and Assistant Professor, Hofstra Northwell School of Medicine and Lance B. Becker, MD, chair and professor of emergency medicine at the Hofstra Northwell School of Medicine, write, "The keen semantic nuances used in these AAN guidelines send the correct message to the neurologic community (Yes we cool!) to prevent ongoing misinterpretation of the study by Nielsen et al. [2013]." They suggest that the guidelines could have been "more precise" on prehospital cooling and should have only recommended against the methods that have been proven to be potentially deleterious: 4°C fluid loads or intranasal cooling, adding that it's "premature to close the door on all methods of prehospital TH induction." They write: "We concur with the AAN experts that less is not more and cooling should be harder, better, faster, stronger, in the sense that neurologists should be hardliners who embrace cooling as a default mode for nearly all cardiac arrest survivors, making it harder to exclude patients, while using cooling techniques that are the better ones, starting as quickly as possible after ROSC, and that 33°C is stronger than 36°C."

The AAN said that families of patients who have suffered cardiac arrest should ask if their loved one qualifies for therapeutic hypothermia. "People who are in a coma after being resuscitated from cardiac arrest require complex neurologic and medical care and neurologists can play a key role in improving outcomes by providing body cooling," said the chair of the guideline committee, Romergryko G. Geocadin, MD, of Johns Hopkins University School of Medicine in Baltimore, and a Fellow of the American Academy of Neurology. "This guideline recommends that cooling is used more often for patients who qualify."

Geocadin told ICU Management & Practice in an email, "We know that implementation of this therapy is really low (6% to 30% in the USA) despite the strong scientific evidence. Families need to know that they have this option—we are empowering families because cardiac arrest survivors are comatose and could not advocate for themselves."

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