



Therapeutic Hypothermia Rarely Used for In-Hospital Cardiac Arrests



The brain-preserving cooling treatment known as therapeutic hypothermia is rarely being used in patients who suffer cardiac arrest while in the hospital, despite its proven potential to improve survival and neurological function, researchers from the Perelman School of Medicine at the University of Pennsylvania report in the June issue of *Critical Care Medicine*.

The authors suggest that scarce data about in-hospital cardiac arrest patients and guidelines that only call for health care providers to consider use of therapeutic hypothermia, rather than explicitly recommending it, may explain the study's results.

In a prospective study between 2003 and 2009 of over 530 hospitals in the United States, the Penn team found that 98 percent of over 67,000 patients who went into cardiac arrest in the hospital received only conventional post-resuscitation care—leaving just 2 percent who received therapeutic hypothermia, which has been credited with saving the lives of a growing number of patients who arrest outside hospitals.

"We know it's being used in patients who went into cardiac arrest in their homes, at work, or anywhere else outside of a hospital, but little was known about how often it's used in patients who arrest in the hospital," said Mark E. Mikkelsen, MD, MSCE, assistant professor in the division of Pulmonology, Critical Care and Allergy at Penn Medicine. "We found that even though most hospitals have the capability to treat these patients with therapeutic hypothermia, it's not being used. And even when it was used, in nearly half the cases, the correct target temperature was not being achieved.

"Several factors could explain this: there is little data, which is often conflicting, to support its use for patients in the hospital, and we have national guidelines that only have clinicians considering its use, which may lead to hesitation and lack of institutional protocol."

Cooling the body down to about 89.6 degrees after cardiac arrest protects it against neurological damage initiated by the lack of blood flow and oxygenation, several studies of out-of-hospital cardiac arrest patients have shown. It has also been shown to improve survival – a welcome development, since cardiac arrest survival statistics remain grim, with less than 10 percent of patients surviving in most cities across the U.S.

More than 300,000 people who go into cardiac arrest out of the hospital die each year in the United States; thousands of others are left neurologically devastated.

About 210,000 patients a year go into cardiac arrest while in the hospital – many of those patients may have other conditions that point to a poor prognosis, and a substantial portion may be terminally ill patients who are

not candidates for hypothermia.

National recommendations established in 2005 call for out-of-hospital cardiac arrest patients to be treated with hypothermia when they remain comatose after resuscitation. In-hospital recommendations, however, are less direct. The International Liaison Committee on Resuscitation guidelines recommend providers to "consider its use," while the American Heart Association recommends that therapeutic hypothermia "may be considered" after a patient goes into cardiac arrest caused by non-shockable rhythms.

For the study, the team analyzed treatments of 67,498 patients at 538 hospitals participating in the American Heart Association's Get With the Guidelines-Resuscitation database from 2003 to 2009. Of those patients, 1,367 patients were given therapeutic hypothermia. The use of therapeutic hypothermia increased slightly, from 0.7 percent in 2003 to 3.3 percent in 2009.

Younger patients and patients who were treated in a non-ICU location and a teaching hospital were more likely to get therapeutic hypothermia. Even when it was used, however, target temperature (32–34o Celsius, or 89.6 —93.2 degrees Fahrenheit) was not achieved in 44.3 percent of the patients within 24 hours, and 17.6 percent were overcooled.

"These rates are particularly important to examine, given that the incidence of in hospital events appears to be increasing," said Dr. Mikkelsen. "I believe there is potential for therapeutic hypothermia to benefit this population, but traction can only be made after clinical trials investigating safety and effectiveness are initiated—which are certainly warranted. Results of those studies could strengthen the case for stronger recommendations and increase use."

Other Penn Medicine authors of the study include Jason D. Christie, MD, MSCE, Benjamin S. Abella, MD MPhil, Meeta Prasad Kerlin, MD, MSCE, Barry D. Fuchs, MD, William D. Schweickert, MD, Frances S. Shofer, PhD, and David F. Gaieski, MD.

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