

Cooling children after cardiac arrest provides no significant benefit

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Although body-cooling has long been a standard of care in treating adults after heart attacks, a recently published multi-center study has concluded that the same procedure—known as "therapeutic hypothermia"—does not confer any survival-with-quality-of-life benefit for children who are resuscitated after suffering out-of-hospital cardiac arrest. The study noted hypothermia is no more effective than maintaining normal body temperature by preventing fever in the children being treated.

These surprising results, published April 25, 2015, in the *New England Journal of Medicine*, have major implications for [critical-care](#) pediatricians who treat children in the wake of [cardiac arrest](#) that takes place outside the hospital.

"What this study tells us is that there's no significant advantage to using a lower-than-normal [body] temperature when caring for children who've experienced cardiac arrest," said Dr. Meert.

"I think the take-home message for clinicians is very important. This large study of nearly 300 children who were treated after cardiac arrest at 38 different pediatric health care facilities in the United States clearly indicates that lower-than-normal body temperature is not necessary," Dr. Meert added. "That finding is very helpful, because body-cooling is a time-consuming and complex therapy that can also put additional physical stress on the children being treated. Thanks to the study, we now know that such lower-than-normal body temperature is not necessary."

Because about two-thirds of the 6,000 U.S. children who undergo cardiac arrest (often from choking or near-drowning) each year die or suffer permanent neurologic damage, finding ways to improve their odds during treatment has been an urgent quest among pediatric critical-care providers. Until recently, however, there had been no large-scale multi-center studies aimed at determining whether the demonstrated positive effects of body-cooling in adults after heart arrest could also be counted on to help similarly affected children.

The trials, funded by the National Heart, Lung, and Blood Institute (NHLBI) U01-HL-094339 and U01-HL-094345 of the National Institutes of Health and titled "Therapeutic Hypothermia after Out-of-Hospital Cardiac Arrest in Children," were based on treatment data collected by dozens of investigators at 38 children's hospitals. The study included nearly 300 participants (two days to 18 years old) who were brought to hospitals after cardiac arrest.

Using specially designed, water-cooled blankets over a period of five days, the caregivers lowered [body temperatures](#) in half of the post-heart arrest subjects by about six degrees Fahrenheit below normal, on average. In the other half of the cohort, the normal body temperature of approximately 98.6 degrees was maintained during the same period.

Because maintaining normal body temperature required that the treating clinicians prevent fever, it now seems clear that effectiveness of body cooling among adult heart-arrest patients (documented during studies in the early 2000s) was likely the result of fever prevention, Dr. Meert said.

While noting that the recent NIH-supported trial will soon be accompanied by a second study designed to evaluate body-cooling therapy among children who suffer in-hospital cardiac arrest, Dr. Meert pointed out that the new findings provide a compelling example of how "clinical care and [clinical research](#)" are essential to establishing the

highest-quality treatment for pediatric patients.

"Doing clinical research as both a caregiver and a scientist is very important," she said. "Taking care of patients at bedside is how we learn what questions need to be asked - and doing the scientific research later is how we come up with answers to those questions in an organized, systematic fashion.

"I also want to emphasize the importance of collaborative research in pediatric critical care," added Dr. Meert, who has published numerous studies in her field during more than 25 years as a Children's Hospital of Michigan critical care pediatrician. Thanks to the collaborative efforts from researchers across the country and specifically at the University of Michigan, and University of Utah's School of Medicine, we were able to come up with a finding that has the potential to help children better recover from cardiac arrest in the future."

Dr. Meert was also quick to praise the efforts of the Children's Hospital of Michigan pediatric researcher and WSU Professor of Pediatrics Seetha Shankaran, M.D. (also a co-author)- - a nationally recognized pioneer in perinatal research aimed at helping infants who suffer brain injury from oxygen deprivation during birth.

"Thanks to their tireless efforts—and those of the courageous investigators who went into the children's hospitals and interviewed stressed family members soon after the children were brought there as a result of cardiac arrest—we've taken another important step in being able to identify the best and most effective therapy for children who urgently need care," Dr. Meert said.

While reflecting on the new NEJM study and its implications for critical care in pediatric cardiac arrest patients, Children's Hospital of Michigan Chief of Pediatrics and WSU Chair of Pediatrics Steven E. Lipshultz,

M.D., said that "Dr. Meert's and Dr. Shankaran's new study is a powerful reminder for all of us at the Children's Hospital of Michigan about the importance of linking the best clinical care with the best clinical research that we're capable of. As this study shows, putting those two together is the key to achieving our goal of providing [children](#) with the best medical care to be found in Michigan and the rest of the country, 24 hours a day, seven days a week."

Provided by Wayne State University

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