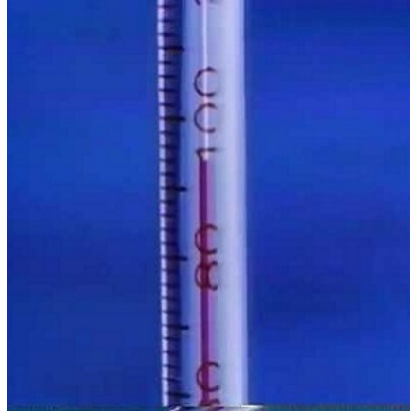




## Targeted Temperature Management: Intravascular vs. Surface Cooling



Targeted temperature management (TTM) is recommended after out-of-hospital cardiac arrest and may be achieved using either intravascular or surface cooling devices. Results of a review published in Critical Care show that there was no difference in adverse events, mortality or poor neurological outcomes between patients treated with intravascular and surface cooling devices.

See Also: [Therapeutic Hypothermia Decreases Chances of Survival](#)

TTM is divided into induction, maintenance, rewarming and fever control phases. Ideal devices achieve target temperature quickly, allow for accurate maintenance and slow, controlled rewarming.

"Intravascular and surface cooling was equally effective during the induction of mild hypothermia. However, surface cooling was associated with less precision during the maintenance phase. Although the clinical significance of this is not known, this may have implications for the management of patients at 36°C," write Guy W. Glover, MD, a consultant at the Department of Intensive Care, Guy's and St Thomas' Hospital, King's College London, UK, and co-authors.

The study is the largest to date on the difference between intravascular and surface cooling devices. Researchers conducted a retrospective analysis of data from the Targeted Temperature Management trial. This randomised controlled trial of two levels of temperature management (33°C versus 36°C) after out-of-hospital cardiac arrest recruited 950 patients in 36 centres in Europe and Australia between November 2010 and January 2013.

Of the 950 patients in the TTM trial, 934 were available for analysis. A total of 240 patients (26 percent) managed with intravascular versus 694 (74 percent) with surface devices. Devices were assessed for speed and precision during the induction, maintenance and rewarming phases in addition to adverse events. All-cause mortality, as well as a composite of poor neurological function or death, as evaluated by the Cerebral Performance Category and modified Rankin scale, were analysed.

Researchers found that, for patients managed at 33°C, there was no difference between intravascular and surface groups in the median time taken to achieve target temperature, maximum rate of cooling, the number of patients who reached target temperature, or episodes of overcooling. In the maintenance phase, cumulative temperature deviation, number of patients ever out of range and median time out of range were all significantly greater in the surface group although there was no difference in the occurrence of pyrexia.

Overall, adverse events were not different between intravascular and surface groups. There was also no statistically significant difference in mortality (intravascular 46.3% vs. surface 50.0%;  $p = 0.32$ ), Cerebral Performance Category scale 3–5 (49.0% vs. 54.3%;  $p = 0.18$ ) or modified Rankin scale 4–6 (49.0% vs. 53.0%;  $p = 0.48$ ).

"The results of the TTM trial, and the recent change in the ILCOR (International Liaison Committee on Resuscitation) recommendation to a target temperature of 32–36°C may, on the face of it, make any small differences in device performance during maintenance appear less relevant. On the other hand, if more clinicians are targeting 36°C, accurate temperature control to avoid the risk of pyrexia may be of greater importance," the authors write.

Source: Critical Care  
Image Credit: YouTube

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