

# Targeted Temperature Management

## The Facts about Fever Management

Body temperature is more than just a vital sign that should be recorded. In fact, the management of temperature—and specifically fever—is especially important in the intensive care unit (ICU) setting, as fever is closely tied to higher mortality and poor outcomes in critically ill patients.<sup>1</sup> Here we address key questions pertaining to fever management, also known as fever prevention.

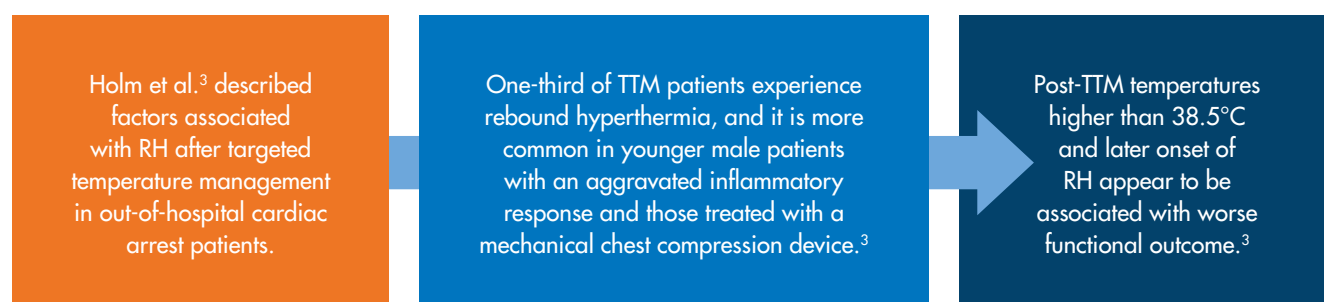
### How is fever defined in the ICU setting?

Fever in an ICU patient is defined as a single temperature of  $\geq 101^{\circ}\text{F}$  or  $\geq 38.3^{\circ}\text{C}$ , according to the joint task force of the American College of Critical Care Medicine (ACCCM) and Infectious Disease Society of America (IDSA).<sup>2</sup> The exact febrile temperature or range may depend on institutional protocols and regional definitions of fever.

### What clinical effects does fever have on critically ill patients?

For neuro patients, fever is strongly associated with an increased length of ICU and hospital stay, as well as a higher mortality rate and worse overall outcomes.<sup>1</sup>

In addition, rebound hyperthermia (RH) is common after completion of targeted temperature management (TTM) in patients post-cardiac arrest and is associated with poor neurological outcomes,<sup>3,4</sup> as illustrated in the graphic below.



### How does fever affect a patient's length of stay (LOS)?

Fever is an important predictor of hospital stay, mortality rate, and hospital disposition in critically ill neurologic and neurosurgical patients.<sup>1</sup> Diringer et al. examined a large cohort of neurologic ICU patients and found that, after controlling for illness severity, diagnosis, age, and complications, fever was independently associated with a longer ICU and hospital LOS (2 additional ICU days and 4.3 additional hospital days).<sup>5</sup> Fever was also associated with a higher mortality rate and worse outcomes.

## What do clinical societies say about the need for fever management?

Current ILCOR guidelines recommend continuous monitoring of core temperature and actively preventing fever (> 37.7°C) in adult patients who are comatose after resuscitation from cardiac arrest, regardless of cardiac arrest location or initial rhythm.<sup>6</sup> In addition, the American Academy of Neurology (AAN) guidelines state that the use of temperature management is strongly supported by available published data.<sup>7</sup>



## Conclusion

Fever is associated with worsened neurologic injury in critically ill patients. Therefore, the importance of fever management post-cardiac arrest has been highlighted in recent studies. Current guidelines recommend continuous monitoring of core temperature and actively preventing fever in adult patients who are comatose after resuscitation from cardiac arrest, regardless of cardiac arrest location or initial rhythm. **The use of targeted temperature management in fever prevention has been shown to improve neurological function as well as reduce oxidative stress levels and complications during hospitalization.**<sup>8</sup>

## Additional Resources



On-demand webinar: From Patients to Protocols: Tailored and Standardized Approaches to Temperature Management

**Use the QR code to register and watch today.**



<sup>1</sup> Greer DM, et al. Impact of fever on outcome in patients with stroke and neurologic injury. *Stroke* 2008, 39(11), 3029–3035. <https://doi.org/10.1161/strokeaha.108.521583>

<sup>2</sup> Chamorro C, et al. Fever in critically ill patients. *Crit Care Med*. 2008 Nov;36(11):3129–30.

<sup>3</sup> Holm A, et al. Factors Associated with Rebound Hyperthermia After Targeted Temperature Management in Out-of-Hospital Cardiac Arrest Patients: An Exploratory Substudy of the Time-Differentiated Therapeutic Hypothermia in Out-of-Hospital Cardiac Arrest Survivors Trial. *Crit Care Explor*. 2021 Jul 6;3(7):e0458.

<sup>4</sup> Makker P, et al. Clinical Effect of Rebound Hyperthermia After Cooling Postcardiac Arrest: A Retrospective Cohort Study. *Ther Hypothermia Temp Manag*. 2017 Sep;7(3):137–140.

<sup>5</sup> Diring MN, et al. Elevated body temperature independently contributes to increased length of stay in neurologic intensive care unit patients. *Crit Care Med*. 2004 Jul;32(7):1489–95.

<sup>6</sup> Soar J, et al. Temperature management in adult cardiac arrest consensus on science with treatment recommendations Brussels, Belgium: International Liaison Committee on Resuscitation (ILCOR) Advanced Life Support Task Force. 2021.

<sup>7</sup> Geocadin RG, et al. Practice guideline summary: Reducing brain injury following cardiopulmonary resuscitation. *Neurology*. 2017 May 30; 88(22):2141–2149.

<sup>8</sup> Wang Y, et al. Target temperature management and therapeutic hypothermia in severe neuroprotection for traumatic brain injury: Clinic value and effect on oxidative stress. *Medicine* 2023;102(10):e32921.