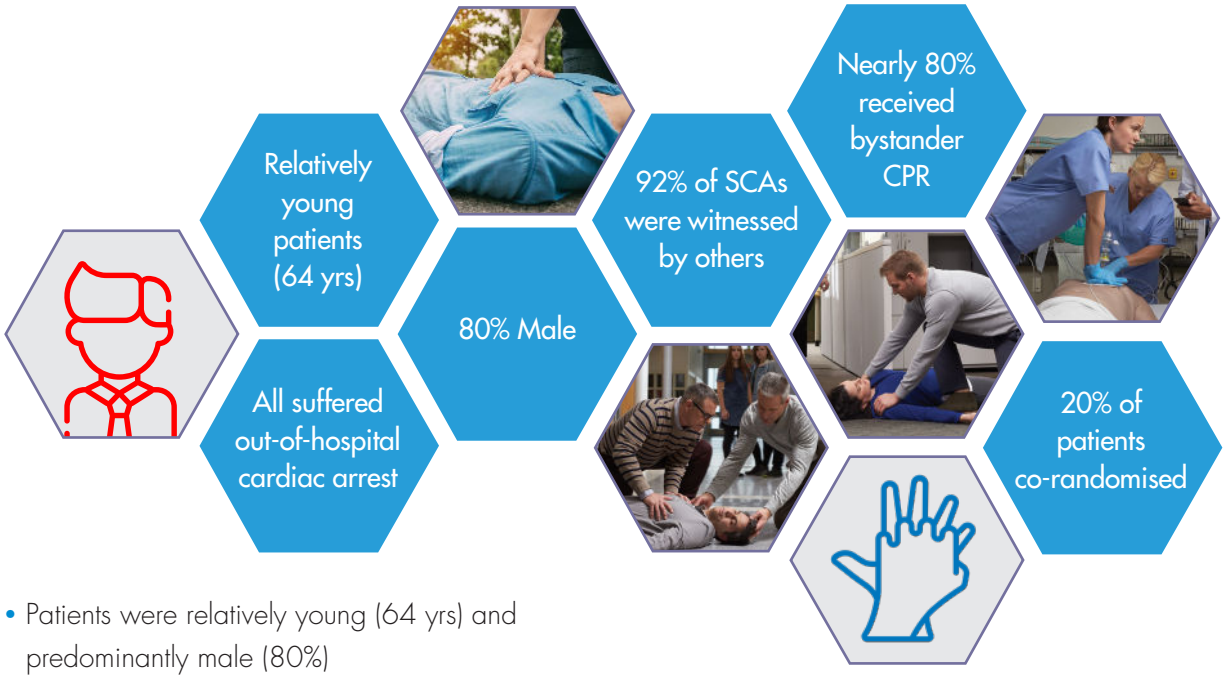
Targeted Temperature Management

TTM2 Trial Practicality and Generalizability

The TTM2 study, published in June 2021, examined the use of temperature management in 1,900 out-of-hospital cardiac arrest adult patients.[1]

One of the ongoing discussions on the results of the TTM2 trial focuses on the fact that the characteristics of the patient population do not reflect the patient population in the United States.

TTM2 Patient Characteristics



- Patients were relatively young (64 yrs) and predominantly male (80%)
- Presumed 100% cardiac cause
- 92% of arrests were witnessed and nearly 80% received bystander CPR

TTM2 Patient Population Is Different than What Is Seen in Europe

- 77% of patients in the TTM2 trial were in countries with CPR bystander rates above 70%, associated with a median no-flow time of < 1 minute.[1]
- In most of Europe, the rate of witnessed arrests and bystander CPR is in the range of 40% [8,9,10] with an average no-flow time of 9 minutes.[7] The longer no-flow time translates to a significantly longer hypoxia time compared to the TTM2 population.

TTM - Stay Up to Date

The Penn Medicine's TTM Academy Podcast with Benjamin Abella, MD, MPhil

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TTM2 Patient Characteristics - A Comparison

The TTM2 trial should not be generalized because of the major differences in population. This leads to one of most important questions to a clinician: "Is my patient population the same as TTM2?"

	TTM2[1], 2021	CARES, 2022[2]	Lim 2020[3]	Fischer, 2022[4]	HLR, 2021[5]	Mainsel, 2020[6]
Population	Europe, OHCA	All US, cohort all OHCA	Singapore, cohort all OHCA	All GER, all OHCA	Sweden cohort, all OHCA	France, cohort all OHCA
Witnessed Arrest	**92%**	**38%**	**61%**	**50%**	**46%**	**64%**
Bystander CPR	**80%**	**35%**	**46%**	**44%**	**33%**	**45%**
Initial rhythm shockable	**72%**	**16%**	**18%**	**20%**	**29%**	**6%**

EUROPEAN RESUSCITATION COUNCIL

The European Resuscitation Council (ERC) guidelines were updated together with the European Society of Intensive Care Medicine (ESICM) in 2022. They recommend continuous monitoring of core temperature and active fever prevention (>37.7°C) for at least 72h in patients who remain in coma after cardiac arrest. There was insufficient evidence to recommend for or against temperature control at 32-36°C or early cooling after cardiac arrest. In addition, comatose patients with mild hypothermia should not be actively rewarmed after return of spontaneous circulation (ROSC) to achieve normothermia. Prehospital cooling with rapid infusion of large volumes of cold intravenous fluids is not recommended after ROSC.[11]

Conclusion

The ERC guidelines emphasize the importance of TTM for IHCA/OHCA. The European patient population is much different from the TTM2 trial population; therefore, the trial results should not be generalized. Clinicians must consider the individual needs of their patients in order to deliver high-quality temperature management.

CIRCULATION ACADEMY

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