# Therapeutic hypothermia after return of spontaneous circulation: Should be offered to all?

Resuscitation 83 (2012) 671–673

**Reporter: PGY 許家綸**

- Out-of-hospital cardiac arrest (OHCA) has an incidence of 52.1 per 100,000 population
  - ➢ Only 1/3 of OHCA patients get to the hospital with return of spontaneous circulation (ROSC)
  - ➢ 2/3 of these die before discharge from the hospital

- Post-cardiac arrest treatment aims to minimise brain injury
  - ➢ Avoiding fever, hypotension and hyperglycemia may reduce brain injury
  - ➢ Therapeutic hypothermia (32–34 ◦C) for 12–24 h starting as early as possible but preferable within 6 h

## Targeted temperature management

Hx:

➢ Initially report 1940,1950

(Duration, temperature, indication were inconclusive)

➢2002, two randomized study:

↓ Abandon

- ✓ Improved neurological outcome at hospital discharge,6 months later
- ✓ Using TTM (32–34 ◦C) initiated within minutes to hours after ROSC and maintained for 12-24 h.

## What kind of patient will benefit from TTM

- Unreliable:
  - ➢clinical signs (pupillary light, corneal and vestibulo-ocular reflexes)
  - ➢biochemical markers (e.g., neuronal specific enolase, S100 protein)
  - ➢test findings (somatosensory evoked potentials)
  - ➢Imaging modalities

Contents lists available at SciVerse ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper

Prediction protocol for neurological outcome for survivors of out-of-hospital cardiac arrest treated with targeted temperature management☆

Kazuhiro Okada[a,*], Sachiko Ohde[b], Norio Otani[a], Toshiki Sera[a], Toshiaki Mochizuki[a], Mitsuhiro Aoki[a], Shinichi Ishimatsu[a]

**CPC 1: good cerebral performance;**
**CPC 2: moderate cerebral disability;**
**CPC 3, severe cerebral disability, conscious but dependent;**
**CPC 4, coma;**
**CPC 5, death.**
**1,2 = good / 3,4,5 = poor**

➢ Inclusion … n the center of Tokyo … years

➢Neurolog … erebral Performance Categories scale

## Predictors of good neurological outcome

- Arrest-to-first cardiopulmonary resuscitation attempt interval ≤5 min
- Ventricular fibrillation or ventricular tachycardia in the first monitored rhythm
- Absence of re-arrest before leaving the emergency department
- Arrest to-return of spontaneous circulation interval ≤30 min
- Recovery of pupillary light reflex

## 5-R score( 0-7分)

Initial Rhythm<1>, starting Resuscitation<2>, Return of spontaneous circulation<2>, light Reflex<1>, absence of Re-arrest<1>

- if 5 R score≧5
  - sensitivity of 82.5%
  - specificity of 92.3%

## Pitfall

406 OHCA pts
==========
96 TTM
66 included
==========
16 extracorporeal life support
8 cessation due to unstable
3 GCS >8 at ED
1 different hypothermia protocol
2 transfer from other hospital

406人中只有96人使用TTM
消失的人數:少的310人未交代原因
需要prospective study

40/66 (60.6%) were discharged with good neurologic outcome (CPC1 or 2)

## Conclusion

- A Canadian study,

" 99% of emergency and critical care physicians were aware of TTM but only 68% of them had used it in clinical practice"

- A simple and highly specific tool will provide emergency physician to predict potential benefic from TTM

## Further

- Optimal techniques
- Duration of cooling,
- Maximum delay in achieving target temperature
- Optimal method to maintain cooling
- Preferred rate of rewarming

## Thank you