Selective Brain Cooling Through The Cisterna Magna

Tech ID: 34835 / UC Case 2025-880-0

BRIEF DESCRIPTION

A minimally invasive method for selectively cooling the brain to prevent injury while avoiding complications of whole-body hypothermia.

FULL DESCRIPTION

This technology selectively cools the brain by delivering cooled saline into the cerebrospinal fluid of the Cisterna Magna via a needle inserted through the back of the neck, guided by real-time ultrasound and stabilized with a neck brace. It enables deep hypothermia of the brain without significantly lowering body temperature, reducing risks such as pneumonia, cardiac arrhythmias, and bleeding associated with systemic cooling. Developed through research including animal models and human cadaver studies, it promises rapid deployment in emergency care and cardiovascular surgery settings.

SUGGESTED USES

- Cardiovascular surgery requiring brain protection during circulatory arrest.
- Emergency treatment of cardiac arrest and severe brain injury.
- Neuroprotection in pediatric and adult patients with low cerebral blood flow.
- Pre-hospital and hospital rapid intervention for brain cooling.
- Therapeutic hypothermia in critical care and intensive care units.
- Potential integration in trauma and stroke management protocols.

ADVANTAGES

- Targeted cooling of the brain avoids systemic hypothermia complications.
- Rapid induction of deep hypothermia within minutes.
- Minimally invasive with real-time ultrasound guidance for safety.
- Can be applied even without active circulation, beneficial in cardiac arrest.
- Cost-effective and simpler than current surgical deep hypothermia methods.
- Stabilization via neck brace prevents dislodgement during transport.
- Preserves vital brain structures and pathways critical to memory and autonomic function.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Devices
  - Disease: Cardiovascular and Circulatory System
  - Disease: Central Nervous System
  - Imaging
  - Rehabilitation

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