A Case of Three Patients with Severe Hypothermia Rewarmed with ECMO

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## Introduction

Severe accidental hypothermia, defined as a core body temperature <28°C, is associated with multiple neurologic, cardiac, and metabolic complications. Here we report outcomes of three patients with severe hypothermia and cardiovascular collapse rewarmed and supported on ECMO.

## Discussion

Rewarming therapies are classified as either passive (warm blankets, overhead heaters) or active (infusion of warm fluids, lavage of the peritoneal and thoracic cavities), with active methods recommended for severe hypothermia. In hypothermic cardiac arrest, the time to regain normal body temperature is the most influential parameter for a good recovery.

The most common cause of death from severe hypothermia is cardiac arrest, resulting from slowing of conduction velocity in the myocardium and subsequent ventricular fibrillation (VF). The myocardium will quickly recover normal, organized electrical activity when rewarmed; consequently, aggressive warming techniques should accompany standard CPR in hypothermic cardiac arrest. While body temperature can be raised 2-4°C using warm saline infusion, increases as high as 12°C per hour have been noted with the use of extracorporeal membrane oxygenation (ECMO).

In hypothermic cardiac arrest, the time to regain normal body temperature is the most influential parameter for a good recovery. A recent study found an association between ECMO in CPR and higher survival rates with good neurologic outcomes.

In two of our cases, the use veno-arterial of ECMO rapidly rewarmed our patient's core body temperature and provided hemodynamic support in the peri-arrest period. In our third case, veno-venous ECMO was used to rewarm our patient and prevent continued cardiac deterioration.

ECMO should be considered early on as a primary means for rewarming in patients who present with severe accidental hypothermia.

## References: