# Revitalizing a Targeted Temperature Management (TTM) Program in a Community Hospital

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### Purpose and Scope

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  - Improve delivery of TTM at Mease Countryside Hospital (MCH).
- ☐ Scope
  - Phase II: Revitalization of MCH's TTM infrastructure through a longitudinal quality improvement project.

### Background

- ☐ Each year, nearly 600,000 people suffer a sudden cardiac arrest (SCA) in the U.S..
- ☐ Survival ranges from 5.5 24%
- ☐ Anoxic brain injuries (ABI) account for two-thirds of SCA related deaths.
- ☐ The economic burden of SCA is estimated at \$35 billion annually.
- ☐ TTM has emerged as a safe/cost effective strategy to improve functional survival by 2–3 fold after SCA.
- ☐ Result of Phase I showed:
  - A 6% TTM utilization rate among eligible patients at MCH.
  - No statistical difference in survival in the TTM cohort (41 vs 42%).
  - NMBAs were overused (92%)
  - Elderly patients were disproportionately excluded from TTM.
- ☐ Phase I of this longitudinal quality improvement project recommended TTM infrastructure revitalization to improve the consistency and delivery of care and ultimately improve the functional survival of SCA victims.

### Objectives

- ☐ The goals of Phase II were to develop an evidence-based TTM protocol and standardized workflow process consistent with national guidelines.
- ☐ The overarching aim of this longitudinal quality improvement project is to improve functional survival of SCA victims within the community hospital setting.

### Setting

- ☐ MCH is a 311-bed community hospital in Safety Harbor, FL that treats approximately 58,000 patients annually.
- ☐ TTM patients are treated in MCH's emergency department and two 14 bed intensive care units.

### Methods

- ☐ The theoretical framework for this project was the Donabedian Quality Improvement Model.
- ☐ An integrative literature review was performed, and critically appraised using the Johns Hopkins Nursing Evidence-Based Appraisal tool. Results showed:
  - TTM is safe and effective following SCA.
  - The use of evidence-based protocols and standardization of care improves TTM outcomes.
  - There is no single comprehensive clinical guideline.

### Multiphase Implementation

#### Phase I: Evaluation

Evaluated current TTM program and outcomes

#### Phase II: Infrastructure Revitalization

- A multidisciplinary team of key stakeholders from MCH was assembled to develop a shared vision for the project.
- II. A comprehensive protocol was synthesized from national guidelines and high-quality evidence.
- III. A workflow process was designed to promote consistency of TTM care.

#### Phase III: Education & Implementation

Provide staff education and implement the protocol

#### Phase IV: Re-evaluation

Evaluate the impact on functional survival

### Discussion

- ☐ The project was evaluated by an assessment of the capacity of the work to influence quality by the faculty supervisor, end users, and MCH leaders.
- ☐ Several challenges and limitations arose during the project:
  - Limited access to critical care providers at MCH
- Due to the complexity of the project, staff education had to be reassigned to Phase III.

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#### Overview of TTM Workflow and Protocol **Determine TTM Eligibility** Inclusion **Exclusion** DNR ROSC Refractory Shock Age ≥ 18 Severe Sepsis Temp > 34°C Uncontrolled Bleed GCS ≤ 8 **Relative Contraindications** Terminal Illness Significant Medical Co-morbidities Poor Baseline Neurologic Function Pregnancy Age < 18 Continue ACLS Protoco Consider Alternative Page Freeze Team Treatment Determine Eligibile =Yes= **Target Temperature** 36°C 33°C **▼** Neuroprognostication High Risk of Multimodal Approach All Eligible Bleeding Unable to Patients tolerate 33°C Neuroimaging Clinical Exam Neurophysiology Biomarkers Rapid Induction of TTM 48hrs 72hrs 72hrs Post Rewarming with Cooling Device NSE NSE NSE GCS Clinical Exam S-100B C-GRapH MRI Brain S-100ß CT Brain SSEP Continuous BIS Monitoring Continuous **EEG** Monitoring Cardiac Cath Intensive Disposition **Determine CPC Score** Care Unit Lab CPC 1: Mild Deficit; Able to Work Functional CPC 2: Mod Disability; Performs IADLS CPC 3: Severe Disability; ADL Dependent Poor Neurologic - CPC 4: Coma; Persistent Vegitative State CPC 5: Brain Death Outcome **Phases of TTM** Maintenance Induction Normothermia Rewarming 24 Hrs at Achieve Targe Rewarm at Lasts 24 Hrs Target Temp Temp ≤ 4 H 0.3°C/Hr Avoid TTM Target Temp Shivering Fever!!! Order Set Hemodynamics Do not Stop NMBAs Invasive **Prognosticate** Electrolytes at 36°C Procedures Ventilator Wean Sedation Diagnostics Liberation Sedation Cold Diuresis Rehabilitation Watch Consults Worklist K+ and Mg+ **Timeline of TTM in Hours**