

Targeted Temperature Management: Implementing an Updated Intensive Care Unit Protocol

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Problem Statement

- Sudden cardiac arrest (SCA) affects over a half a million of people annually in the community and hospital setting with an estimated survival rate of 20% (Mody et al., 2019).
- Targeted temperature management (TTM) is a therapeutic intervention implemented in the intensive care unit (ICU) and is clinically shown to improve survival rate among SCA patients (Zhang et al., 2018).
- The mortality risk increases by 20% for every hour TTM is delayed after return of spontaneous circulation (ROSC) after SCA (Leong et al, 2017).
- A critical aspect of care for SCA patients is to ensure that TTM is initiated immediately and consistently.
- Lack of a standardized TTM protocol may lead to variations among providers providing care for post-SCA patients.

Project Purpose

- The purpose of this quality improvement (QI) project is to implement a standardized updated TTM protocol in the ICU.
- The overarching aim is to improve current TTM practices among providers in the ICU and evaluate if an updated TTM protocol will improve ICU length of stay and mortality for SCA patients.
- In all post sudden cardiac arrest patients in the ICU, will the implementation of a standardized hospital wide targeted temperature management protocol improve sudden cardiac arrest patient's length of stay and mortality over 3 months?

Model and Nursing Theory

- **QI Model**
 - Plan-Do-Study-Act (PDSA) Cycles
- **Nursing Theory**
 - Change Theory by Kurt Lewin:
 - Unfreezing: identified variations in TTM among providers and need for an updated TTM protocol
 - Change: implemented updated TTM protocol and educated clinical significance among patient care
 - Refreezing: collaboration with key stakeholders to commit and maintain compliance in implementation

Methodology

- **Participants**
 - All comatose adult patients that achieve return of spontaneous circulation (ROSC) after in hospital or out of hospital cardiac arrest (IHCA/OHCA) and meet inclusion criteria for TTM.
 - 30 patients pre- updated TTM protocol
 - 30 patients post- updated TTM protocol
- **Settings**
 - 36-bed ICU at a local hospital
- **Instruments/Tools**
 - Project outcome is measuring the statistical difference in SCA patient's ICU length of stay and mortality post-TTM protocol implementation.
 - Flow-chart will be created and available as a pocket-sized guide for staff to navigate through implementation of TTM.
- **Interventions**
 - Educational in-service of finalized and approved updated TTM protocol and flow-chart will be provided to nursing staff and providers.
 - A 3-month retrospective chart review of pre-TTM protocol implementation for data collection.
 - A 3-month retrospective chart review of post-TTM protocol implementation for data collection.
 - All data collection will be entered into a Microsoft excel sheet including: TTM initiation, TTM discontinuation, targeted temperature utilized, utilization of sedation medications and any identified variations of TTM practice.
 - Variables will be utilized to create a t-test to determine if there is a statistical difference in ICU days between pre- and post- updated TTM implementation.
 - A Fisher's exact test was utilized to evaluate the impact of an updated TTM protocol on the mortality of patients upon ICU discharge.

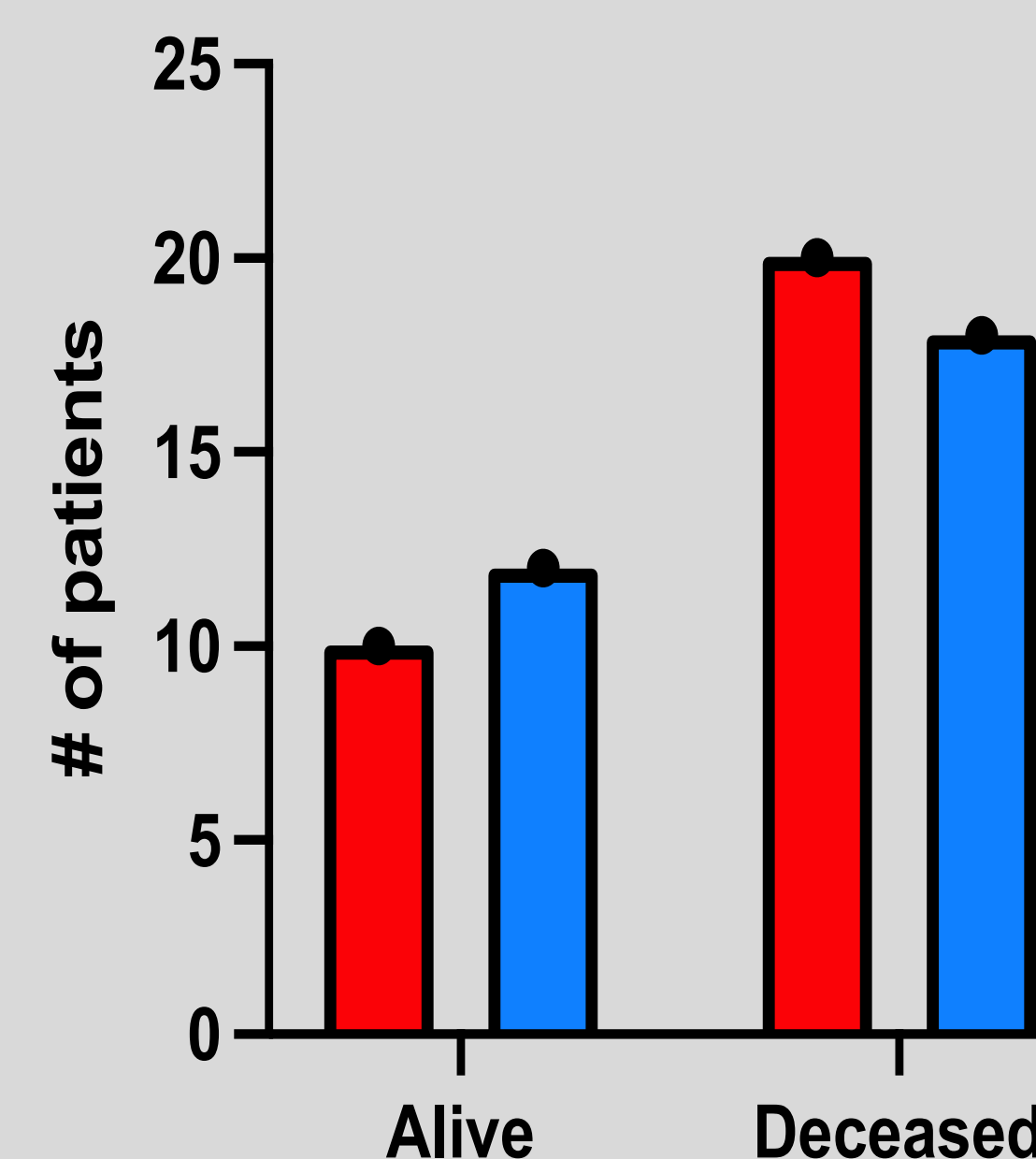
TTM Protocol and Flowchart

- Please scan QR Code to view updated TTM protocol and completed flowchart.

Results

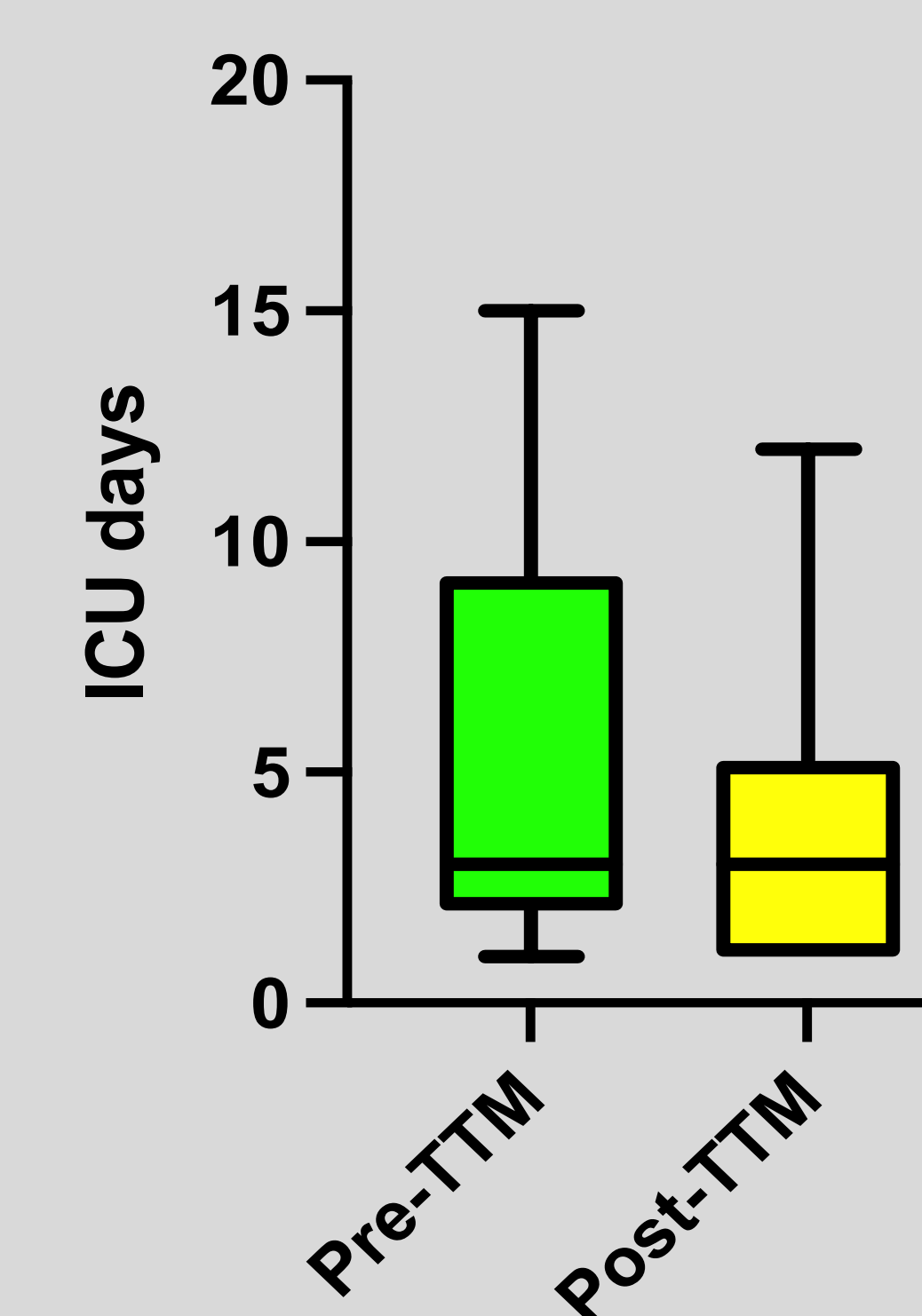
- **Pre-updated TTM:**
 - Dates: 12/28/2020 – 04/21/2021 (4 months)
 - Mean of ICU days: 5.567 days
 - 10 alive on ICU discharge: 6 IHCA / 4 OHCA
 - 20 deceased on ICU discharge: 7 IHCA / 13 OHCA
 - Variations:
 - Temperature, medications, TTM incompleteness
- **Post-updated TTM:**
 - Dates: 05/06/2021 – 07/10/2021 (2 months)
 - Mean of ICU days: 3.933 days
 - 12 alive on ICU discharge: 2 IHCA / 10 OHCA
 - 18 deceased on ICU discharge: 8 IHCA / 10 OHCA
 - Variations:
 - TTM incompleteness, medications
- **Pre- vs Post- TTM ICU days:**
 - P-value: 0.0881
 - Significantly different (P<0.05): No
 - Difference between Means: 1.633 days
- **Pre- vs Post- Mortality Upon ICU Discharge:**
 - P-value: 0.7892
 - Significantly different (P<0.05): No
 - Pre-TTM Alive Percentage: 33%
 - Post-TTM Alive Percentage: 40%

Mortality on ICU Discharge



- Pre-TTM over 4 months
- Post-TTM over 2 months

Length of stay



Discussion

- Data analysis reveal that an updated TTM protocol is not considered to be statistically significant on length of ICU stay or mortality on post-SCA patients.
- However, the mean difference show length of ICU stay is 1.6 days less post-TTM implementation.
- There is also a higher percentage of alive patients post-TTM implementation.
- Data reveals there is a positive trend in data to support the impact of an updated TTM protocol.

Nursing Implications for Advance Practice Nursing

- Maintaining current evidence-based practices and standardization of protocols will continue to provide and improve care for SCA patients among key stakeholders within this organization.
- This QI project enhances understanding and cultivates the culture of advanced nursing practice influence into clinical practice to positively impact patient care in the critical care setting.

Sustainability

- The standardized updated TTM protocol is available hospital-wide for reference among all key stakeholders for implementation in the care of post-SCA patients.
- The pocket-guide flowchart will assist nurses in the protocol driven intervention for nursing practice.

Limitations

- The constraints of the COVID-19 pandemic.
- The small sample size, limited to only 60 charts.
- The 3 months project timeline.

References



SCAN ME

Utilization of a standardized Targeted Temperature Management Protocol improves mortality and length of stay for post sudden cardiac arrest patients in the ICU.