

Reducing Fever and Improving Outcomes In The Neurologically Compromised Patient

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REDUCING FEVER AND IMPROVING OUTCOMES IN THE NEUROLOGICALLY COMPROMISED PATIENT

Rachel Gross RN, Erin Holman RN, Leah Marchise RN
NSICU

Background/Significance

Evidence shows that patients with neurologic injury who develop “fevers” are at increased risk of further insult to their already damaged brains. In existing literature there is no example of a neuroscience unit that has developed an effective protocol for combating “neuro fevers”. Traditional modalities such as antipyretics, ice, and cooling blankets have been shown to have limited efficacy when used. Because we know that patient outcomes are poorer in the presence of even low grade fevers, increasing cost and length of stay, it is imperative that effective treatment measures are utilized early and consistently among neuro patients. Therefore, the value of developing a protocol that defines “fever” and enables nurses to use multiple treatment modalities to combat neuro fevers cannot be understated. Improving prognoses, decreasing length of stay and reducing cost are just a few of the positive results that a Fever Management Protocol may yield for patients that have suffered a neurologic event.

PICO QUESTION

- **P (population)** In neurologically compromised patients, does
- **I (intervention)** consistent intervention (at a temp of 99.5 F) with **PO/rectal Tylenol and ice packs**
- **C (comparison)** decrease the need for **IV Tylenol and advanced cooling methods**
- **O (outcome)** and improve fever reduction?

TRIGGER?

- Knowledge v. Problem
 - Identification of clinical problem: inconsistent treatment initiation and maintenance for varying degrees of fever in neuro patients
 - Among NSICU nurses there is no common definition of what constitutes “fever”. As a result, treatment is initiated at temperatures as low as 99.0 or as high as 101.5. The treatment modalities used and the order in which they are initiated are also inconsistent, raising the question of whether there should be a unit based protocol in place for the treatment of neuro fevers

EVIDENCE

- Search Engines Used
 - CINAHL, Google Scholar, PEPID

- Key Words
 - Neuro, fever, treatment, outcomes, Tylenol, nursing, ICU, central fever, fever protocol

- Evidence/Synthesis Table Information
 - See Printouts

EVIDENCE

- The majority of Neuroscience Units don't have a fever reduction protocol in place. Nurses are often the primary decision makers in fever management.
- Nurses on dedicated neuroscience units articulate specific differences in fever management more than those working in mixed units.
- Much of the evidence suggests that treatment of neuro fever at temperatures as low as 99.5 F(37.5C)improves patient outcomes, decreases length of stay, reduces morbidity and mortality.
- There is a strong association between fever and poor outcome after severe neuro injury.

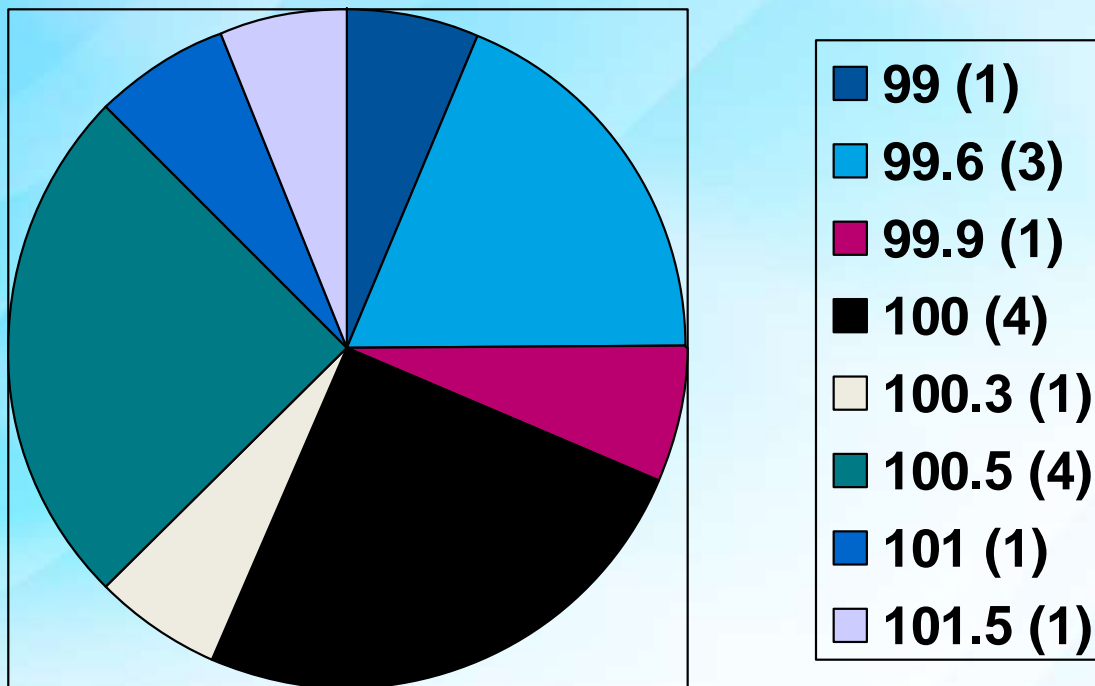
EVIDENCE

- Hyperthermia, even if delayed, worsens ischemic and traumatic injury.
- Patients with a high fever burden (high fever for brief period of time or a low grade fever for extended period) have at least 6 fold increased odds of death or discharge to hospice.
- Evidence is growing to suggest that fever reduction improves brain metabolism.
- Moderate brain cooling appears to be neuro protective in clinical head injury.

Current Practice at LVHN Fever Survey of NSICU RNs

We asked:

**At what temperature do you typically treat a
“neuro fever”?**



IMPLEMENTATION

1. Inconsistencies in literature and on NSICU when defining and treating neuro fevers
2. Treatable fever is defined at varying temperatures from 99.0 to >102
3. Review existing literature, survey NSICU staff, collate data, develop Fever Management Protocol
4. Surveyed 17 NSICU RNs about fever management on their unit
5. RNs on NSICU define and start treating fever at varying temperatures from 99.0-101.5. They use varying treatment modalities as primary and adjunct cooling measures. All agree that a Fever Management Protocol would be helpful.
6. Based on our research of the literature and input from NSICU RNs we will attempt to develop a Fever Management Protocol to test on NSICU
7. If successful, Fever Management Protocol can be shared with other units with the problem of neuro fevers, i.e. Trauma-Neuro ICU

Practice Change

- Based on our literature review of neuro fevers and their effects on patient outcomes, we suggest developing a protocol for the Neuroscience ICU nurses to help them treat fevers effectively. By reducing fevers on our unit we hope to reduce cost, decrease length of stay, and improve patient outcomes.

RESULTS

■ Key Findings

- Early treatment of neuro fevers is conducive to better patient outcomes
- Treating fevers early reduces the need for advanced cooling measures (IV tylenol, cooling blankets, etc.) and reduces cost for LVHN as well as patients
- Treatment of fevers among NSICU RNs is inconsistent
- A fever protocol is needed for consistent treatment of neuro temps

■ Next steps

- Educate physicians, RNs and technical partners on importance of treating neuro fevers early and consistently
- Collaborate to develop a fever algorithm/protocol for treatment of elevated temperatures
- Repeat survey among NSICU RNs to assess compliance/education

Implications for LVHN

Our hope is that a fever reduction protocol will assist LVHN in:

- Maintaining normothermia in more patients on NSICU
- Reducing cost associated with advanced cooling measures (i.e. IV Tylenol, decreasing length of stay)
- Improving patient outcomes by preventing secondary brain injury related to hyperthermia

Lessons Learned

**Early Consistent
Treatment of
Neuro Temps**

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graph TD; A[Early Consistent Treatment of Neuro Temps] --- B[Better Outcomes For Patients]; A --- C[Decreased Cost Associated with Advanced Cooling Measures]; A --- D[Decreased Length of Stay for LVHN patients];
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**Better Outcomes
For Patients**

**Decreased Cost
Associated with
Advanced Cooling
Measures**

**Decreased Length of
Stay for LVHN
patients**

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Strategic Dissemination of Results

Plan for Dissemination

- Discuss evidence for early treatment of neuro fever with unit physicians to standardize treatment plan (i.e. Acetaminophen 500mg q6h prn)
- Develop an algorithm to treat fever once infection is ruled out
- Educate RNs and technical partners about evidence for better patient outcomes associated with early treatment of neuro fever
- Repeat survey of NSICU RNs to see if treatment of neuro fever has changed

Make It Happen

Questions or Comments?

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