QUIET TIME FOR NONVERBAL PATIENTS IN A MEDICAL INTENSIVE CARE UNIT

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• **Sleep disruptions are common in critical care** (Honkus, 2003)
  – Environmental factors include noise, lighting, frequent patient care interactions for monitoring, treatment and medications

• Extended time without sleep can lead to malfunction of multiple body systems (Tembo & Parker, 2009)

• **Sleep deprivation and delirium both frequently occur in the critically ill population** (Figueroa-Ramos et al., 2009)

• Loss of sleep can cause memory loss and impaired communicative abilities within 36 hours and sleep deprivation in ICU patients is associated with irritability, inattention, delusions, hallucinations, slurred speech and memory loss (Patel et al., 2008)

• **ICU delirium is an independent predictor of higher mortality, and associated with increased length of stay and ventilator days, cognitive impairment at discharge, as well as placement in long term care** (Desai, Chau, & George, 2013).
• Frequent patient interruptions prevent sleep in the ICU, which may contribute to delirium

• Few studies have examined the effects of a non-pharmacological quiet time period for critically ill patients

• No studies to date have examined the effects of a quiet time for nonverbal ICU patients

• No studies to date have examined the potential effects of consecutive quiet times on sedation use in the ICU

PROBLEM

• Examine the effects of a quiet time on nonverbal patients in the medical intensive care unit setting

  – How many interruptions occur during a quiet time?
  – What is the nurses perception of patient sleep quantity and quality?
  – What is the level of nursing satisfaction with quiet time?
  – Does quiet time decrease the frequency of sedation doses 24 hours after a patient has received a quiet time?
  – Does a quiet time have an effect on delirium scores?
  – Does sleep during periods of consecutive quiet time have an effect on patient measures such as heart rate, respiratory rate, mean arterial blood pressure, and sedation scores?
Conceptual Framework: Based on Topf’s Environmental Stress Model (ESM)

- **Quiet Time Intervention**
- **Environmental Variables**
  - Ambient Noise
  - Patient Interruptions
- **Patient Variables**
  - Delirium
  - Analgesics
  - Sedatives

**Sleep quality and quantity**
GOALS

• Reduce ambient noise and patient interruptions associated with nursing cares, tests and procedures, thereby increasing the quantity and improving the quality of uninterrupted sleep.

• Decrease the overall frequency of sedatives administered over the subsequent 24 hours after a patient has received a quiet time.

• Consecutive quiet times will promote more RASS scores of zero and CAM-ICU negative scores after the intervention.
• 26 Bed Medial ICU of a 460 bed, level 1 adult trauma and Midwestern academic medical center
• Convenience sample of non-verbal adult (18 or older) patients
  – Power analysis provided estimate of 100 patient recordings for a small effect size (0.13), power 0.80, and alpha 0.05

• Nonverbal patients were defined as those who are intubated or unable to communicate needs due to current medical condition

• Exclusions:
  – Those who are on neuromuscular blocking medications
  – Undergoing hypothermia therapy
  – Richmond Agitation-Sedation Scale (RASS) score of -4 or -5
  – Those undergoing brain death testing or possible organ donation
  – Procedural sedation within the last 4 hours of the possible quiet time
  – Hemodynamic instability
  – Those undergoing withdrawal or cessation of critical care therapies
ETHICAL CONSIDERATIONS

• This study was approved by the Institutional Review Board for Froedtert Hospital

• Consent for patient enrollment in the study obtained from the patient’s legally authorized representative (usually family members)

• Nurses who participated were made aware that answering the questionnaire related to quiet time was voluntary (cover letter) and filling out the form implied consent
**PROCEDURE**

- Quiet time period designated as 2-4pm daily (per recommendations from prior studies)

- Nursing staff, patient care technicians, physicians and other ancillary departments educated on quiet time protocol

- Unit lights turned down prior to the start of the quiet time

- Sign placed on enrolled patient’s doors
  - Lights in patient room are dimmed, the door is closed and television is turned off
  - Nursing care is clustered before and after the quiet time as much as possible, however, as necessary care proceeded as usual
  - Upon completion of the quiet time data collected from patient’s EMR
  - Questions asked of nursing staff related to quality and quantity of patient sleep
RESULTS

Demographics

• 72 participants
  • n = 72 patients for QT1
  • n = 50 patients for QT2
  • n = 35 patients for QT3
  • n = 22 patients for QT4
• 210 individual patient quiet times
• Range of 1 to 11 consecutive quiet times
  • Average of 2.92 QTs (SD 2.108)

![Patient Gender](chart)
DEMOGRAPHICS

- Patient Age
  - Range of 19 to 85
  - Mean = 58.96 (SD = 15.1)
- ICU Days
  - Range of 2 to 35
  - Mean = 13.17 (SD = 9.358)
- Ventilator Days
  - Range of 0 to 33
  - Mean = 9.69 (SD = 8.817)

Pie chart showing:
- AMS/Neuro
- Sepsis
- Respiratory
- Cardiac
- Cancer
- GI/Liver
INTERRUPTIONS

Frequency of QTs

- Nursing Care
- Procedure
- Noise
- Change in condition
- Other/RT

Bar chart shows:
- 0
- 1 to 2
- 3 to 4
- 5 or more

Pie chart shows:
- Nursing Care (dominant)
- Procedure
- Noise
- Change in condition
- Other/RT
NURSE PERCEPTION OF QT

What is the level of Nursing Satisfaction with QT?

- Scale of 0 to 10 for nurse satisfaction with QT
- Mean = 7.39 (SD 2.38)
- Median = 8

How quiet was the environment?

- Scale of 0 to 10
- Mean = 7.50 (SD = 1.76)
- Median = 8

What is the nurses’ description of the quality and quantity of patient sleep?

- Sleep in minutes (120 minutes = goal)
  - Mean = 73.49 (SD = 37.41)
  - Median = 90 minutes
  - Range of 0 to 120 minutes

- Quality?
  - Scale of 0 to 10
  - Mean = 7 (SD = 2.60)
  - Median = 8
TYPES OF SEDATION AND ANALGESIC

**Types of Sedation**
- Ativan
- Precedex
- Versed
- Propofol
- Haldol

**Types of Analgesic**
- Fentanyl
- Tylenol
- Morphine
- Dilaudid
- Other
NUMBER OF TIMES SEDATION GIVEN BEFORE AND AFTER QT

Frequency of QTs

<table>
<thead>
<tr>
<th>Sedation Level</th>
<th>No sedation</th>
<th>1 time</th>
<th>2 times</th>
<th>3 times</th>
<th>6 times</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreQT Frequency</td>
<td>30</td>
<td>55</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PostQT Frequency</td>
<td>40</td>
<td>50</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Legend:
- Blue: PreQT
- Green: PostQT
IS THE FREQUENCY OF SEDATION DECREASED AFTER QT?

• For the entire sample of QTs (QT is unit of analysis) a Related Samples Wilcoxon Signed Rank test was not significant (p = .061)

• A related samples sign test for all QTs WAS significant .045

• So after a QT there were more patients NOT receiving sedation, but it was not statistically significant
DOES QT HAVE AN EFFECT ON DELIRIUM SCORES?

- **Pearson Chi-Square for QT1**
  - \( p = .000 \)
  - significant

- **Unable to run Chi-Square for other QTs due to need for expected value of each cell to be 5 or more**
DOES QT HAVE AN EFFECT ON DELIRIUM SCORES?

Overall percentage of post CAM-ICU scores

<table>
<thead>
<tr>
<th></th>
<th>Negative</th>
<th>Positive</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM-ICU for QT1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAM-ICU for QT2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAM-ICU for QT3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAM-ICU for QT4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DOES QT HAVE AN EFFECT ON DELIRIUM SCORES?

Overall percentage of CAM scores
DOES SLEEP DURING PERIODS OF CONSECUTIVE QUIET TIME HAVE AN EFFECT ON HEART RATE?

Repeated measures ANOVA
Sphericity Assumed $p = .272$
No significant difference
Does sleep during periods of consecutive quiet time have an effect on respiratory rate?

Repeated measures ANOVA
Sphericity Assumed
\( p = .434 \)
No significant difference
DOES SLEEP DURING PERIODS OF CONSECUTIVE QUIET TIME HAVE AN EFFECT ON MEAN ARTERIAL PRESSURE?

Repeated measures ANOVA
Sphericity Assumed
$p = .545$
No significant difference
DOES SLEEP DURING PERIODS OF CONSECUTIVE QUIET TIME HAVE AN EFFECT ON SEDATION SCORES?

Repeated measures ANOVA
Sphericity Assumed
$p = .512$
No significant difference
A CLOSER LOOK AT SEDATION SCORES

Frequency of RASS scores

RASS scores

- PreRASS1 (n = 70)
- PostRASS1 (n = 70)
- PreRASS2 (n = 48)
- PostRASS2 (n = 46)
- PreRASS3 (n = 37)
- PostRASS3 (n = 32)
- PreRASS4 (n = 22)
- PostRASS4 (n = 19)
**ANY SIGNIFICANT DIFFERENCES WITH JUST ONE QT?**

- Ran paired samples t test to look at this

<table>
<thead>
<tr>
<th>Measure</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR pre to post</td>
<td>p = .877</td>
</tr>
<tr>
<td>RR pre to post</td>
<td>p = .489</td>
</tr>
<tr>
<td>MAP pre to post</td>
<td>p = .052 (approaches significance)</td>
</tr>
<tr>
<td>RASS pre to post</td>
<td>.387</td>
</tr>
<tr>
<td>SBP pre to post</td>
<td>.173</td>
</tr>
<tr>
<td>DBP pre to post</td>
<td>.033 (significant)</td>
</tr>
</tbody>
</table>
**LIMITATIONS**

- Inaccurate or missing documentation in the EMR
- CAM-ICU scores not accurate and issue of “not applicable”
- RASS scores and CAM-ICU scores were the most often missing data
- Unable to assess frequency of sedation if patients were on a drip
- Smaller sample sizes for QT2, 3,4

**CHALLENGES**

- Catching the family member/slow accrual
- Patients meeting the criteria
- Not approaching at the right time
- “Come back later”
- “We have too much going on”
- Patient condition changes
- Concern that a quiet time was not the right intervention (want to sing and talk)
- Turned off by consent process
- Inability to protect quiet time
CONCLUSIONS/IMPLICATIONS

- Nurses were satisfied with QT and rated the quality of patient rest high
- The environment was quiet
- Patients usually had 1-2 interruptions during QT
- Quiet time may influence the frequency of sedation doses
- Quiet time did influence CAM-ICU scores
  - fewer positives after QT intervention
- Consecutive Quiet time did not significantly change patient HR, RR, MAP, or sedation scores
- MAP (approached significance) and DBP was significantly different after one QT
- Further research is needed to understand the implications of QT in nonverbal, ICU patients
- QT may be a useful intervention to decrease the frequency of sedative medications and positive delirium screenings
REFERENCES


THANK YOU!

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DATA COLLECTION – PATIENT MEASURES

MR# __________________
Date of Quiet Time (MM/DD/YR) __________
Start of Quiet Time ________
BP (pre-QT) __________
invasive or manual (circle source)
HR (pre-QT) __________
RR (pre-QT) __________
CAM-ICU (pre-QT-record CAM-ICU scores from 24 hours prior to start of QT)
Date/time: CAM score: positive or negative (circle)
Date/time: CAM score: positive or negative (circle)
Date/time: CAM score: positive or negative (circle)
RASS (pre-QT) __________
Last PAINAD Score __________
Time and date of last analgesic (24 hours prior to QT) __________
Is the patient on an analgesic drip? Yes or No
If yes, circle drug type: fentanyl  morphine  dilaudid
Time and date of last sedative (24 hours prior to QT) __________
Is the patient on a sedative drip? Yes or No
If yes, circle drug type: ativan  versed  precedex  propofol
Number of times analgesic was given in the last 24 hours __________
Type(s) of analgesic (list all that apply for IVP or drip) __________
Number of times sedation was given in the last 24 hours __________
Type(s) of sedative (list all that apply for IVP or drip) __________
Is the patient intubated  Yes ____ No ____ Ventilator Mode ________

Time that Quiet Time ended __________
BP (post QT) __________
HR (post QT) __________
RR (post QT) __________
CAM-ICU (record all scores over the subsequent 24 hours after quiet time)
Date/time: CAM score: positive or negative (circle)
Date/time: CAM score: positive or negative (circle)
Date/time: CAM score: positive or negative (circle)
Number of times analgesic given 24 hour after the Quiet Time period __________
Type(s) of analgesic (list all that apply for IVP or drip) __________
Is the patient on an analgesic drip? Yes or No
If yes, circle drug type: fentanyl  morphine  dilaudid
Number of times sedative given 24 hours after the Quiet Time period __________
Type(s) of sedative (list all that apply for IVP or drip) __________
Is the patient on a sedative drip? Yes or No
If yes, circle drug type: ativan  versed  precedex  propofol
RASS (post QT) __________
Age (in years) __________
Gender (check one) M _____ F _____
Patient Diagnosis ____________________________________________
Date admitted to critical care (MM/DD/YR) __________
Date discharged from critical care (MM/DD/YR) __________
Length of ICU stay ________
Number of ventilator days ________
DATA COLLECTION - NURSING MEASURES

Appendix B

Nurse Perception of Quiet Time

* Sleep is defined as a state in which the patient has his or her eyes closed, and there is a decrease in overall body movement and responsiveness.

How would you rate the overall quality of the patient’s sleep?

Were the lights turned down in the patient’s room during quiet time?

Yes ___ No ___

How would you rate the quietness of the environment during the quiet time?

Not quiet at all 1 2 3 4 5 6 7 8 9 10 Very quiet

Not satisfied

How satisfied were you with the Quiet Time?

Very satisfied

How many interruptions did your patient experience during QT?

0 ___

1-2 ___

3-4 ___

5 or more ___

If an interruption occurred during quiet time, what was it?

(1) Nursing care
(2) Procedure
(3) Change in patient condition
(4) Noise
(5) Other (describe)_________