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Characterization of Sleep Disturbances in the ICU at UCSF and Feasibility of Sleep Assessment

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Background

- Critically ill patients often experience **poor sleep quality** in the hospital:
 - Disruptions in sleep-wake cycle
 - Discomfort (e.g. anxiety, pain),
 - Environmental changes (e.g. noise, bright lights)

Background

- Poor sleep can impact delirium,
 - Associated with worse outcomes
- **The Richards-Campbell Sleep Questionnaire (RCSQ)**
 - The only validated sleep questionnaire in critically ill intubated and non-intubated patients.

| Modified Richards-Campbell Sleep Questionnaire | |
|--|--|
| Measure | Question |
| 1. Sleep Depth | My sleep last night was: light sleep (0) ... deep sleep (10) |
| 2. Sleep Latency | Last night, the first time I got to sleep, I: just could never fall asleep (0) ... could fall asleep almost immediately (10) |
| 3. Awakenings | Last night, I was: awake all night long (0) ... awake very little (10) |
| 4. Returning to sleep | Last night, when I woke up or was awakened, I: couldn't get back to sleep (0) ... got back to sleep immediately (10) |
| 5. Sleep quality | I would described my sleep last night as: a bad night's sleep (0) ... a good night's sleep (10) |
| 6. Noise [*] | I would describe the noise level last night as: very noisy (0) ... very quiet (10) |

Objectives

1. To compare **sleep metrics and barriers to sleep** between cardiac, medical-surgical, and neurointensive ICU patients
2. To **evaluate feasibility of the modified Richards-Campbell Sleep Questionnaire (mRCSQ)** among ICU subpopulations.

Endpoints

- **Primary endpoint:** Characterize sleep metrics via mRCSQ in ICU subgroups
- **Secondary endpoints:** Determine feasibility of sleep assessment in ICU, identify and compare barriers to sleep in adult ICU patients

Methods

- Single center prospective observational cohort study of ICU patients from September 2019 - March 2020
- Patient **inclusion criteria** is as follows:
 - Adult medical, surgical, neurological, cardiac ICU patients admitted to ICU for ≥ 24 hours
- Patient **exclusion criteria** is as follows:
 - Pregnant; prisoners; active alcoholic withdrawal, active illicit substance use, primary neurologic problem (SAH, AIS, status epilepticus, ICH, etc), Alzheimer's, dementia

Methods

- The **mRCSQ** evaluated sleep depth, latency, awakenings, quality, ability to return to sleep, and noise on a 0-10 scale
 - Lower score on the mRCSQ scale = lower quality of sleep
 - Higher score on the mRCSQ scale = higher quality of sleep
 - Mean RCSQ score correlates overall perception of sleep
- Further data points included self-reported symptoms precluding sleep, Richmond Agitation and Sedation Scale (RASS), and the Confusion Assessment Method for the ICU (CAM-ICU) to assess delirium.

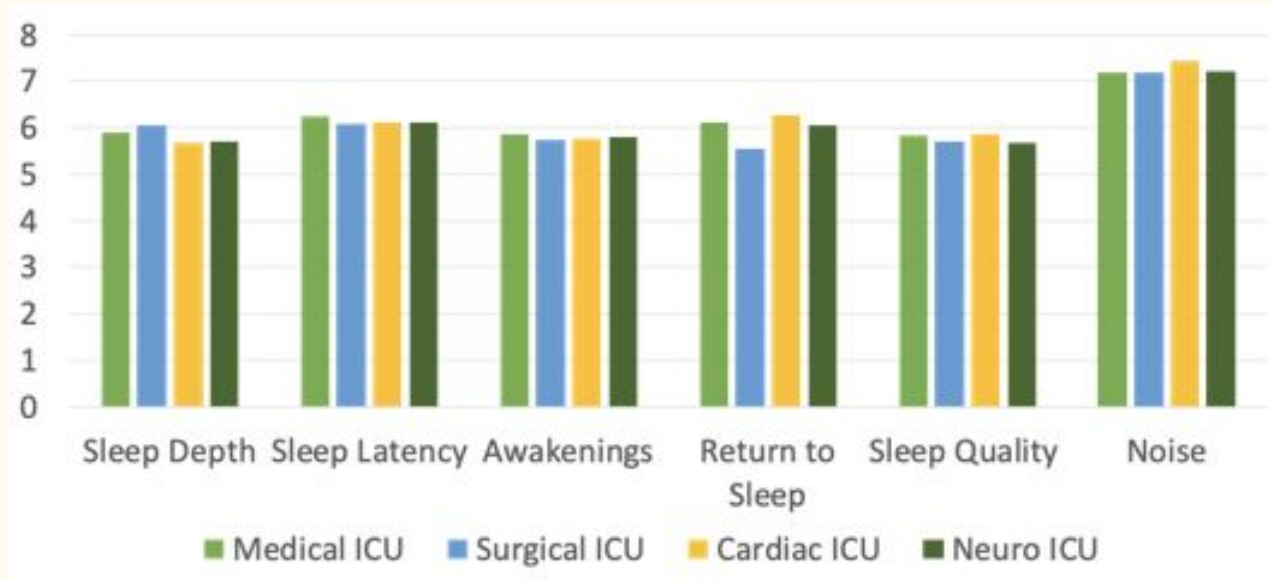
Table 1: Population Demographics

| | Medical ICU | Surgical ICU | Cardiac ICU | Neuro ICU |
|---|-------------|---------------|-------------|----------------|
| Characteristic (N=patients) | N=55 | N=66 | N=55 | N=76 |
| Patient age, median (IQR) | 64 (55, 72) | 62 (49, 71.5) | 64 (58, 72) | 64 (55, 71.25) |
| Male, n (%) | 23 (41.8) | 35 (53) | 28 (50.9) | 31 (40.8) |
| ICU length of stay, mean ± SD | 10.1 ± 28.5 | 13.1 ± 45 | 15.2 ± 32.9 | 9.7 ± 28.8 |
| Hospital length of stay, mean ± SD | 20.3 ± 37.3 | 22 ± 46.3 | 28.4 ± 45.9 | 19.3 ± 35.4 |
| Additional Sleep Assessment Data Points | N=143 | N=141 | N=123 | N=152 |
| Intubated > 48hrs, n (%) | 59 (40.9) | 23 (19.7) | 28 (21.5) | 38 (27.1) |
| Trached, n (%) | 43 (29.9) | 7 (5.9) | 11 (8.5) | 23 (16.4) |
| Steroids administered within 24hrs, n (%) | 75 (52.5) | 49 (41.9) | 39 (30.2) | 87 (62.1) |
| Vasopressors on overnight, n (%) | 26 (18.3) | 25 (21.6) | 44 (34.7) | 42 (30.2) |
| Other meds administered overnight, n (%) | 103 (71.5) | 75 (64.1) | 88 (68.8) | 85 (60.7) |
| RASS Score, mean ± SD | -1.2 ± 2 | -0.8 ± 1.7 | -1.0 ± 1.7 | -1.7 ± 2.2 |
| CAM-ICU Positive, n (%) | 15 (10.5) | 16 (11) | 14 (11) | 16 (10.5) |
| CPOT Score Pos (≥ 3) , n (%) | 4 (2.8) | 1 (0.813) | 5 (3.55) | 3 (1.97) |
| Numerical Rating Scale Pain, mean ± SD | 4.6 ± 2.9 | 4.6 ± 2.9 | 4.6 ± 2.9 | 4.6 ± 2.9 |

Table 2: Self-reported Assessment Points

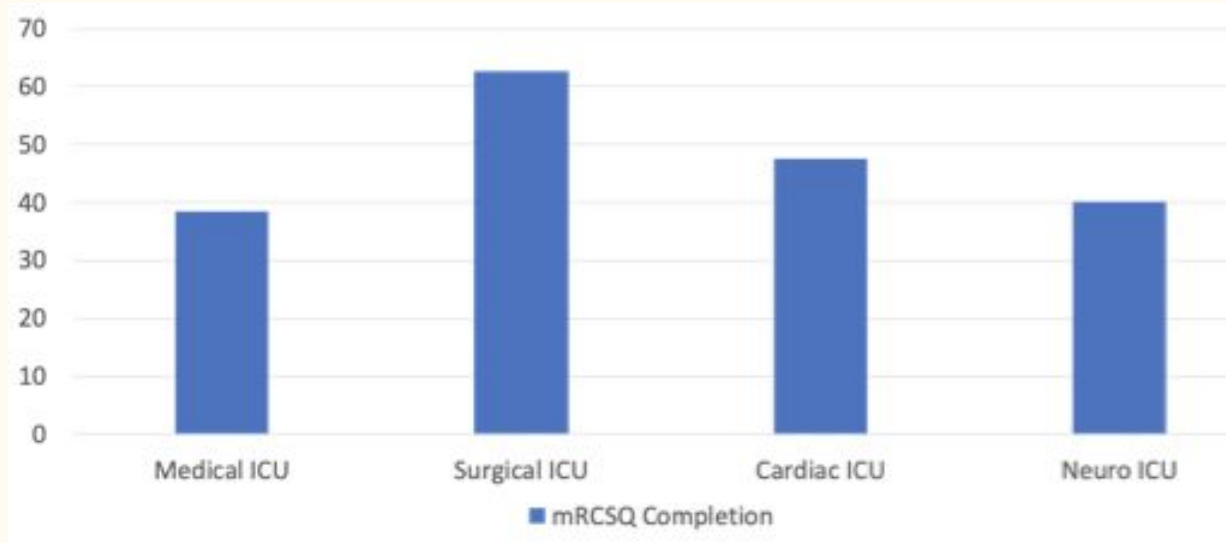
| | Medical ICU | Surgical ICU | Cardiac ICU | Neuro ICU |
|--|--------------------|---------------------|--------------------|------------------|
| Symptoms | N=143 | N=141 | N=123 | N=152 |
| Anxiety precluding sleep (%) | 9.8 | 6.5 | 7.1 | 7.9 |
| Pain precluding sleep (%) | 5.6 | 11.4 | 6.4 | 15.1 |
| Hunger precluding sleep (%) | 4.2 | 2.4 | 3.5 | 5.3 |
| Thirst precluding sleep (%) | 7.7 | 9.8 | 5 | 9.2 |
| N/V precluding sleep (%) | 3.5 | 1.6 | 2.1 | 5.3 |
| Reported difficulty sleeping at night, n (%) | 90 (52) | 44 (51.2) | 50 (49) | 107 (44) |
| Sleep quality described as good, n (%) | 67 (46.9) | 58 (41.4) | 43 (34.9) | 60 (39.5) |

Results



mRCSQ averages for each ICU: Sleep quality and awakenings had the lowest reported outcome compared to other mRCSQ questions

Results



mRCSQ feasibility %: The questionnaire was least feasible in medical and neurological ICU subpopulations

Conclusions

- Roughly 40-50% of patients able to complete the sleep assessment experienced difficulty sleeping in all ICUs.
- Characteristics of sleep that were **most impaired**
 - Sleep quality, depth, and awakenings
- The mRCSQ was feasible in **48.2% of all ICU patients** able to answer
 - **Least** feasible among medical and neuro ICU patients
- Primary barriers to participation
 - Altered mental status, sedation, and delirium

Conclusions

- Patients' self-reported difficulty sleeping at night was similar across ICUs
- Surgical ICU patients reported the lowest quality sleep and medical ICU patients reported the highest quality, despite fewer completed mRCSQ responses
- The length of the question correlated to difficulty in response.
- Pain, anxiety, and thirst were the most common reported symptoms precluding sleep, respectively

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Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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Nothing to Disclose

Approved by the UCSF Institutional Review Board