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### 1039

#### SLEEP AND DAYTIME ACTIVITY AMONG MECHANICALLY VENTILATED ADULTS DURING EARLY CRITICAL ILLNESS

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**Introduction:** The purpose of this study is to report 5 consecutive days' descriptive data for sleep efficiency (SE), total sleep time (TST), and daytime activity ratio (DAR) among critically ill mechanically ventilated adults from 9 intensive care units (ICU) across two hospitals. To our knowledge, this is the first study to describe sleep and activity patterns among mechanically ventilated adults during the early critical illness period.

**Methods:** We enrolled 31 critically ill mechanically ventilated subjects within 48 hours of ICU admission. Daytime periods were defined as 06:00-21:59; nighttime periods were defined as 22:00-05:59. Actigraphy estimated nighttime SE, TST, and the DAR. We calculated mean DARs [ $\text{DAR} = (\text{daytime activity count per minute} / 24\text{-hour activity count per minute}) \times 100$ ], which may be an indicator of altered rest/activity cycles. In our study, a DAR of >80% was used to define normal rest/activity patterns. Descriptive analyses were used for this sub-analysis of our parent randomized controlled trial.

**Results:** Among the 31 subjects included, the mean age was  $59.6 \pm 17.3$  years, 41.9% were male, 80.6% were White, and 67.7% were Hispanic/Latino. The mean nighttime SE and TST over the 5-day ICU period were  $83.1\% \pm 16.1$  and  $6.6 \pm 1.3$  hours, respectively. The mean DAR over the 5-day ICU period was  $66.5\% \pm 19.2$ . Only 17.5% of subject days (14 days out of a total of 80 recorded days) met the definition of normal rest/activity patterns (DAR >80%).

**Conclusion:** Throughout the early ICU period, among mechanically ventilated patients, both the sleep/wake as well as the rest/activity cycle were disturbed. Intervention studies targeting the optimization of nighttime sleep consolidation and daytime activity should be investigated.

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### 1040

#### POST-ICU DAYTIME SLEEP AND ACTIVITY IMPACT HOSPITAL DISCHARGE OUTCOMES FOR OLDER ICU SURVIVORS

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**Introduction:** The aims of this study were to: describe post-ICU daytime sleep and activity among older ICU survivors within 24-48 hours post-ICU discharge, and to examine differences in post-ICU daytime sleep and activity by prospective acuity of discharge disposition at time of hospital discharge.

**Methods:** Within 24-48 hours of ICU discharge, we enrolled 30 ICU survivors who were at least 65 years old, functionally independent prior to hospitalization, and mechanically ventilated while

in ICU. Actigraphy was used to estimate daytime total sleep time (TST, hours) and daytime activity (mean activity counts/minute) for one daytime period (06:00 AM to 22:00 PM) within 24-48 hours post-ICU discharge. Independent samples t-tests examined differences in mean daytime TST and daytime activity counts, between subjects who were discharged home versus those who were discharged to a facility (inpatient rehabilitation facility, skilled nursing facility, or long-term acute care hospital).

**Results:** The mean age was  $71.37 \pm 5.35$  years; 63.3% were male and 76.7% were White non-Hispanic/Latino. The mean daytime TST was  $7.61 \pm 4.31$  hours; the mean daytime activity count was  $41.2 \pm 28.24$  counts/minute. Subjects who were discharged to a facility ( $8.88 \pm 3.69$  hours) slept significantly longer than those discharged to home ( $5.54 \pm 4.21$  hours;  $t(26) = 2.083$ ,  $p = .047$ ). Additionally, subjects who were discharged to a facility ( $32.96 \pm 24.26$  counts/minute) were significantly less active during the daytime than those discharged to home ( $54.42 \pm 29.30$  counts/minute;  $t(25) = -2.157$ ,  $p = .041$ ).

**Conclusion:** Older ICU survivors who were ultimately discharged to a facility slept significantly longer and were less active during the daytime hours immediately following transition out of ICU, compared to subjects who were discharged home. Intervention studies should investigate whether increasing daytime activity while promoting nighttime sleep consolidation following transfer out of ICU improves discharge outcomes.

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### 1041

#### SLEEP QUALITY MEDIATES THE RELATIONSHIP BETWEEN FEAR OF CANCER RECURRENCE AND PSYCHOLOGICAL DISTRESS IN YOUNG ADULTS WITH CANCER

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**Introduction:** Fear of cancer recurrence is common in young adults with cancer and also related to poorer psychological outcomes. Sleep may be disrupted by anxious thoughts about cancer, causing long-term psychological distress. Thus, the current study tests sleep as a putative mediator of the association between fear of cancer recurrence and overall psychological distress in young adult cancer survivors.

**Methods:** In a national cross-sectional survey of Canadians, 436 young adults diagnosed with cancer between the ages of 15-39 (current age range 20-39,  $m=32.39$ ,  $SD=4.70$ ; 88% female) completed the Pittsburgh Sleep Quality Index, the Fear of Cancer Recurrence Inventory—Short Form, and the Kessler 10 Distress Inventory. Mediation was estimated using PROCESS. Age, sex, and on/off treatment status were entered into models as covariates.

**Results:** In the current sample, average fear of cancer recurrence was above the clinical cut-point ( $m=22.92$ ,  $SD=6.84$ ), psychological distress was high ( $m=25.18$ ,  $SD=7.81$ ), and sleep quality was poor ( $m=9.11$ ,  $SD=3.95$ ). Females reported significantly higher fear of cancer recurrence than males [ $F(1, 435)=15.49$ ,  $p < .001$ ]. Patients on treatment reported significantly higher fear of cancer recurrence [ $F(1,435)=11.43$ ,  $p=.001$ ], poorer sleep quality [ $F(1,435)=6.48$ ,

$p=.011$ ], and greater psychological distress [ $F(1,435)=4.73$ ,  $p<.001$ ] than patients off treatment. Using a bootstrapping model with covariates, higher fear of cancer recurrence was related to poorer sleep quality and, in turn, higher psychological distress as indicated by the indirect effect's confidence interval not containing 0 (indirect effect=.13; 95%CI=0.081, 0.189).

**Conclusion:** Sleep quality may play an important role in connecting the common experience of fear of cancer recurrence to psychological distress in young adult cancer survivors. Future longitudinal research is needed to examine this possible mediator of young adult cancer patients' psychological distress outcomes over time.

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## 1042

### SLEEP CHARACTERISTICS IN EHLERS DANLOS PATIENTS WITH HYPERMOBILE TYPE: A POLYSOMNOGRAPHIC STUDY

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**Introduction:** Ehlers-Danlos syndrome (EDS) is an heritable collagen disorder with various multisystemic clinical manifestations affecting primarily skin, ligaments and joints, blood vessels and internal organs. The clinical spectrum is very large from mild skin and joint hypermobility to severe physical disability. Patients with Ehlers-Danlos syndrome often complain of poor sleep quality and fatigue with impaired quality of life. The purpose of this study was to assess any objective sleep disturbances in EDS by polysomnography.

**Methods:** In this case-control study, we included 47 patients EDS type III (hypermobility type) (29 F et 18 M) which were one to one strictly matched to 47(29 F et 18 M) controls according to sex, age, and BMI. Participants underwent level-1 polysomnography for a complete sleep study.

**Results:** The two groups were strictly similar for age and BMI (mean age  $29.3 \pm 9.2$  years, BMI  $23.3 \pm 4.4$  kg/m<sup>2</sup>). Total Sleep time (TST) was significantly reduced in EDS ( $343.7 \pm 69.3$  min versus  $395 \pm 74.8$  min;  $F=11.9$ ;  $p<0.01$ ). Sleep quality was significantly impaired, with a decreased Sleep efficiency (SE):  $74.4 \pm 10.5$  versus  $90.2 \pm 7.8$   $F=68.5$ ;  $p<0.001$ ), an increased wake after sleep onset (WASO) time ( $116.5 \pm 45.7$  min versus  $43.3 \pm 36.8$  min;  $F=73.2$ ;  $p<0.01$ ) and micro arousal index ( $14.8 \pm 7.8$  versus  $6.5 \pm 4.3$ ;  $F=41.2$ ;  $p<0.01$ ). We also found a significant reduction of slow wave sleep length, but REM sleep was not affected. The apnea-hypopnea index (IAH) and periodic leg movement index (PLMI) were higher in EDS patients (IAH:  $10.8 \pm 4.8$  versus  $5.8 \pm 3.9$ ;  $F=30.4$ ;  $p<0.01$  et PLMI:  $4.5 \pm 4.6$  versus  $2.6 \pm 2.5$ ;  $F=6$ ;  $p<0.01$ ). In patients with EDS type III, the prevalence of OSA (AHI>10/hour) was 75% versus 7.1 % in the control group (OR 5.1 (95% CI 2.3 to 14.7);  $p<0.001$ ).

**Conclusion:** PSG may help in better understanding the diagnosis and treatments of EDS patients.

**Support:**

## 1043

### THE RELATIONSHIP BETWEEN NIGHTTIME EATING AND BODY MASS INDEX

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**Introduction:** Late night eating has been associated with higher odds of being overweight or obese. This study aims to evaluate the relationship between late night eating and body mass index in a nationally representative sample.

**Methods:** Actigraphy was used to estimate the average bedtime, waketime, duration and midpoint of sleep in the National Health and Nutrition Examination Survey 2003-04 and 2005-06 cohorts. Given the circular nature of clock time, the average was calculated to be the point that minimized the sum of squares of differences between time points. Dietary data was collected through two detailed interviews of the participants. Nighttime calories were defined as the average amount of calories consumed between the average bedtime and the average midpoint of time-in-bed, based on the data recorded during the dietary interviews.

**Results:** Higher average nighttime caloric consumption (in units of 100 kcal) was associated with higher BMI [B(95% CI): 0.062 (0.003, 0.121)]; this remained significant after adjustment for age, gender, and race [B(95% CI): 0.084 (0.026, 0.142)]. Higher nighttime caloric consumption (as a percentage of total average daily calories consumption) was associated with higher BMI [B(95% CI): 1.522 (0.312, 2.733)]. This remained significant after adjustment for age, gender, and race [B(95% CI): 1.718 (0.505, 2.931)].

**Conclusion:** Higher nighttime caloric consumption, both in average amount (in units of 100 kcal) and as a percentage of average daily calories consumption, was associated with higher BMI. Additional study is needed to further elucidate the relationship between nighttime eating habits and body mass index.

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## 1044

### ADEQUATE SLEEP IS ASSOCIATED WITH IMPROVED DIABETES KNOWLEDGE AND HBA1C

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**Introduction:** Although 55 % of the people with T2DM have low quality of sleep that may affect their physical and emotional wellbeing, and present challenges to the management of their condition, many Diabetes Self-Management Education Programs (DSME) that aim to improve knowledge of T2DM, don't include information on healthy sleep. This study will examine the relationship between adequate sleep on improved T2DM knowledge and diabetes maintenance (HbA1c).

**Methods:** The Sleep Integrated with Diabetes Education (SLIDE) Trial tests whether including four brief healthy sleep hygiene sessions within an existing traditional Diabetes Self-Management Education Program improves healthy sleep, motivation for change, and biopsychosocial outcomes for 50 patients with DM who are under and uninsured. This study uses descriptive and ANOVAs to examine the relationship between adequate sleep and change in diabetes knowledge (Diabetes Knowledge Test) using self-report. EMR was used to link HbA1c and other biological measures.