

## Poster

ID: 578

## Basic Research

## Sleep patterns and correlation with quality of life among the pantanal population in Brazil

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**Introduction:** Sleep habits and quality of life vary among human populations. **Aim:** This study evaluated sleep patterns and sleep disorders, correlating them with the general quality of life of residents of the Pantanal region in Brazil. **Methods:** The sample, of 789 individuals, was stratified by age and gender. Data were collected using a sociodemographic questionnaire, the Pittsburgh Sleep Quality Index (PSQI) instrument, the Berlin Questionnaire (BQ), and the World Health Organization Quality of Life Scale Brief Version (WHOQOL-BREF). Univariate analysis involved comparing proportions using the chi-square test and comparing means. Independent variables showing significant association with dependent variables (PSQI and BQ) on the univariate analysis were entered into a multiple linear regression analysis model scaled for each variable. A significance level of 5% ( $p < 0.05$ ) was adopted throughout. **Results:** Similarities were detected in age distributions among subjects reporting good and poor sleep quality (Mann–Whitney test,  $p = 0.244$ ), with mean ages of 33.1 years ( $n = 347$ ) for good-quality and 32.1 years ( $n = 427$ ) for poor-quality patterns. Student's t-test for heterogeneous variances (Levene's test,  $p = 0.003$ ) was applied to compare WHOQOL domain indices and yielded significantly higher means for subjects with good-quality sleep (72.3%) compared to those with poor-quality sleep (65.3%). BQ data revealed a significant increase in the proportion of sleep disorders with increasing age bracket, a finding corroborated by the comparison of age distributions (Mann–Whitney test,  $p < 0.001$ ), with mean ages of 30.1 and 36.7 years in the groups reporting sleep disorders ( $n = 413$ ) or otherwise ( $n = 261$ ), respectively. The opposite effect was observed for education ( $p = 0.005$ )—i.e., there was a reduction in the proportion of sleep disorders with increasing educational level. Sleep disorders were more frequent among women with high-school or lower level of education. Other groups did not differ significantly ( $p = 0.541$ ) with regard to education. For marital status, occupational inactivity (retirement), and alcohol use, p-values (of 0.069, 0.066, and 0.099, respectively) were not statistically significant, but indicated

a tendency toward disordered sleep. **Conclusions:** Sleep habits and disorders correlated directly with quality of human life.

ID: 581

## Basic Research

## Educational stories to prevent children sleep disorders (SD).

VALLE, L E L R

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**Introduction:** Little is known about the educational effects of stories in sleep. In the Preoperative phase (Piaget), the child seeks models to construct its concepts and patterns of imitation. **Aim:** To test stories as strategies for behavior modeling of sleep, relating subjective observations of children between their sleep habits and consequences. **Methods:** 45 children from the Preparatory period II answered ten questions about sleep: five on Sleep Practices and the others about complaints verified in bad sleepers for comparison related to: a) changes in bedtime; b) restless activities before bedtime; c) noise and mess in the room; d) excessive feeding before bedtime; e) annoyances and fight before bedtime. The obtained preliminar results indicated that “there was no statistically significant correlation between the fact of changing the bedtime and the questions about the consequences of sleep ( $p > 0.05$ ). There was no correlation between doing restless activities before sleeping and the consequences of sleep ( $p > 0.05$ ). The responses in relation to the environment show that the higher the degree of noise and mess in the room, the greater the degree of distraction ( $R = 0.428$  and  $P = 0.003$ ); The higher the frequency of food consumption before sleep, the higher the frequency of irritability and somnolence ( $R = 0.313$  and  $r = 0.432$  respectively); The more frequent the contrariness to sleep more frequent is the delay in sleep and daytime drowsiness ( $r = 0.371$  and  $P = 0.012$ ) “. A book on Sleep Hygiene was presented and the children heard the story “The Treasure of Sleep” and they participated in activities of interpretation of story, relating it to their own sleep experiences. At the end, they were asked: “Why is sleep so important?” **Results:** All participating children showed understanding of the principles of Sleep Hygiene. Analyzing their own sleep behavior facilitates the understanding of the importance of sleep. The results of this study are consistent with findings from literature on behavior and formation of thought (Vygotsky), suggesting that sleep can be mediated by children's stories. **Conclusions:** Stories are intervention options to aid healthy children sleep. Orientation of sleep

in playful form of stories can be an educational tool to support parents in implementation of healthy sleep habits and SD's prevention. Other researches are necessary to intervene in sleep from access to children's imaginary.

**ID: 582**

### Basic Research

#### Association of LEP-rs7799039 and ADIPOQ-rs2241766 polymorphisms with sleep quality in 4- and 6-year-old children: The PREDI Study

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**Introduction:** Sleep disorders in children can be identified through several parameters, including sleep duration and sleep quality. Changes in the circadian cycle are an important characteristic associated with children's sleep disorders. Some studies suggest that alterations in the secretion of leptin and adiponectin may influence the circadian cycle in children. The LEP-rs7799039 and ADIPOQ-rs2241766 polymorphisms are associated with leptin and adiponectin secretion, and thus may influence the child's sleep quality **Aim:** The aim of this study was to evaluate the association of the leptin rs7799039 and adiponectin rs2241766 gene polymorphisms with sleep quality in 4- and 6-year-old children. **Methods:** Data were obtained from the "Predictors of Maternal and Child Excess Body Weight - PREDI Study", a larger cohort study conducted in Joinville – Brazil (baseline in 2012). The current study is a cross-sectional study, which was carried out in the homes of the participants between July 2016 and August 2017 (2nd Follow-up, 4 years old), and in 2018 (3rd Follow-up, 6 years old). The sleep quality was assessed by the "Sleep Habits Inventory for Preschool Children", self-reported by the mothers. The minimum score on the Sleep Habits Inventory was considered as a better sleep quality. Genotyping analysis was performed in blood samples by the polymerase chain reaction (PCR)-restriction fragment length polymorphism (RFLP) technique. **Results:** There was no statistically significant association of the ADIPOQ or LEP gene polymorphism with sleep quality at 4 and 6 years of age. However, carriers of at least one risk allele (TG+GG) of the ADIPOQ gene polymorphism were more prevalent among children with poor sleep quality when compared to those carrying the wild-type genotype (TT), in both 4- and 6-year-olds (42.3% vs 28.4%,  $p=0.06$ ; 32.6% vs 19.2%,

$p=0.07$ , respectively). **Conclusions:** Poor sleep quality in children at 4 and 6 years of age may be influenced by the adiponectin rs2241766 gene polymorphism. New studies involving a larger number of children are needed to better explain the relationship between sleep quality and adiponectin polymorphism.

**ID: 583**

### Basic Research

#### Sleep quality and ergonomic evaluation of truck drivers' rest locations

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**Introduction:** Inadequate work organization is known to be associated with sleep disturbances among long haul truck drivers. Some studies showed strong evidences of daytime sleepiness, poor sleep quality, and high prevalence of obstructive sleep apnea syndrome. Other health problems such as high cholesterol and triglyceride levels, systemic arterial hypertension and high body mass index are some examples noticed in the academic recent literature. However, the nature of truck drivers' work organization often requires rest to be taken in various locations. **Aim:** To evaluate the drivers' rest locations and their association with sleep quality. **Methods:** This study was conducted in a large Brazilian transportation company with branches in two different cities. An adapted version of the Ergonomic Work Analysis (EWA) was used to assess the quality of rest locations, and sleep quality was evaluated by the Pittsburgh Sleep Quality Index (PSQI). This study was approved by the Faculdade de Saúde Pública ethics committee, protocol number: 2.995.488. **Results:** 31 rest locations were assessed using EWA by the researcher as well as by 60 truck drivers. Rest locations were dorms in truck depots (6.45%) and truck cabin sleeper berths (93.5%). Spearman correlation test indicated positive correlations between the researcher evaluation and the driver regarding the quality of rest place ( $r=0.6$ ,  $p=0.0001$ ), illumination ( $r=0.7$ ,  $p=0.0001$ ) and noise ( $r=0.5$ ,  $p=0.0001$ ). Regarding sleep quality, 50.6% drivers who sleep in dorms and 49.4% who slept in cabin sleeper berths reported poor quality of sleep. Moreover, there was a positive correlation between the PSQI score and the average of kilometers travelled ( $r=0.36$ ,  $p=0.05$ ), in which the worse sleep quality the higher average of kilometers. **Conclusions:** PSQI mean scores and EWA's subjective variables indicate, respectively, poor quality of sleep and poor evaluations of rest locations, truck depots and truck cabin sleeper berths. Therefore, it is quite

relevant to improve the quality of truck depots and truck cabin sleeper berths in order to increase their sleep quality.

**ID: 584**

### Clinical Studies

#### Sleep quality is associated with musculoskeletal injuries

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**Introduction:** Sleep quality is an important factor which deserves to be taken into account in evaluations of high-performance athletes. Purpose: An important factor to evaluate high-performance athletes is sleep quality. The present study proposed to investigate a relationship between sleep quality/quantity and muscular injuries in elite soccer players, in addition to comparing those of athletes with good and poor sleep quality. **Aim:** The present study proposed to investigate a relationship between sleep quality/quantity and muscular injuries in elite soccer players, in addition to comparing those of athletes with good and poor sleep quality. **Methods:** The current investigation was a prospective cohort study of elite soccer players competing for two teams at the highest level of Brazilian competition. Data were collected from 23 players for 6 months. A specific database for injury recording was assembled and completed in conjunction with the medical team of each team on the day of the athlete's injury. Furthermore, the players's sleep behaviour was monitored using self-reporting sleep diaries and a wrist activity monitor for 10 consecutive days. **Results:** Our results indicated a moderate negative correlation between sleep efficiency and injury characteristics of the 23 soccer players (Absence time:  $r=-0.524$ ,  $p=0.01$ ; Injury severity:  $r=-0.674$ ,  $p<0.01$ ; Amount of injuries:  $r=-0.624$ ,  $p<0.01$ ). The linear regression analysis indicated that the amount of injuries (number) decreased by 0.06 ( $R^2 = 0.44$ ) and the absence time after injury (days) decreased by 1.43 ( $R^2 = 0.23$ ) for each increase in the score for sleep efficiency. Additionally, the results showed that the amount of injuries increased by 0.02 ( $R^2 = 0.30$ ) for each increase in the Wake After Sleep Onset. **Conclusions:** Therefore, soccer players with poor sleep quality or non-restorative sleep are prone to the risks of musculoskeletal injuries. Acknowledgements: The authors want to thank the Universidade Federal de Minas Gerais, the Centro de Estudos em Psicobiologia e Exercício (CEPE), Centro Multidisciplinar em Sonolência e Acidentes

(CEMSA), Fundo de Amparo à Pesquisa de Minas Gerais (FAPEMIG), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and the Conselho Nacional de Pesquisa (CNPQ).

**ID: 586**

### Clinical Studies

#### Frequency and predictors of obstructive sleep apnea in patients with chronic kidney disease

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**Introduction:** Recent evidence suggests that obstructive sleep apnea (OSA) is common in patients with chronic kidney disease (CKD) and may accelerate the loss of renal function. The AOS has been related to increased oxidative stress, endothelial dysfunction and inflammatory states, which are known mechanisms of renal injury. **Aim:** To evaluate the frequency and predictors of OSA in patients with non-dialytic CKD. **Methods:** This is an observational cross-sectional, analytical study. We evaluated 79 patients with non-dialytic CKD, glomerular filtration rate (GFR)  $<60\text{mL} / \text{min} / 1.73\text{m}^2$ , age between 30 and 64 years. All patients underwent a clinical evaluation, sleep questionnaires (Berlin questionnaire and Epworth sleepiness scale) and portable polysomnography for diagnosis of OSA (apnea and hypopnea index – AHI  $\geq 5$  e / h). **Results:** Results: OSA was diagnosed in 65 patients (82%, 95% CI: 73-90%). Mild OSA (AHI  $\geq 5$  e / h) and moderate / severe OSA (AHI  $\geq 15$  e / h) was present in 26 (33%, 95% CI: 23-43%) and 39 (49%, 95% CI: 38-60%) patients, respectively. The Berlin questionnaire presented low sensitivity and specificity (58% and 47%, respectively) as an AOS predictor (AHI  $\geq 5$  e / h) in this population and the severity of OSA was not associated with daytime sleepiness. A logistic regression for the determination of OSA predictors in this population found in the multivariate analysis that age  $> 50$  years (OR = 7.8; CI: 1.2 - 50.7;  $P = 0.03$ ), male sex (OR = 4.6; CI: 1.4 – 15,1;  $P = 0.01$ ), and body mass index (BMI) - (OR = 1,3; CI: 1.1 -1,5 ;  $P=0.001$ ) were independently associated with OSA. **Conclusions:** Conclusion: OSA is common in patients with non-dialytic CKD. Advanced age, male gender and elevated BMI are predictors of OSA in this population. Sleep questionnaires should be interpreted with caution in these patients.

ID: 591

## Clinical Studies

## Hepatic steatosis in preoperative bariatric surgery patients with obstructive sleep apnea

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**Introduction:** Obstructive sleep apnea (OSA) is a global burden disease with increasing incidence associated to obesity incidence, along with its comorbidities, the main one being metabolic syndrome. Characterized by recurrent upper airway obstruction during sleep results in hypoxemia cycles. Obesity is the main risk factor for OSA. Intermittent hypoxemia resulting from OSA may lead to increased insulin resistance and a change in lipid metabolism, which may precipitate hepatic steatosis. **Aim:** To evaluate the association of hepatic steatosis in patients undergoing preoperative evaluation of bariatric surgery diagnosed with OSA. **Methods:** Retrospective study, with data collected from 1.416 preoperative bariatric private services, from which ultrasound (US) and polysomnography (PSG) data were obtained, resulting in 87 OSA cases. Anthropometric data, grade of hepatic steatosis according to US and PSG data were collected. **Results:** The average age was 39.5 (sd  $\pm$  11.4); 60% of sample was women. The body mass index (BMI) was 39.2 (s.d.  $\pm$  4.45); slow wave sleep (SWS) was 12.5 (sd 12.5); REM sleep was 16.2 (sd  $\pm$  7.1); of the micro-arousals was 39.1 (sd  $\pm$  25.4); the apnea and hypoapnea index (AHI) was 33.5 (sd  $\pm$  38.9); minimum saturation was 73.9 (sd 9.8); saturation below 90% was 23.1 (sd  $\pm$  27.2); oxygen desaturation index (ODI) was 41.3 (sd  $\pm$  34.1), sex ( $p > 0.002$ ). Splitting the AHI by severity where AHI  $< 15$  or AHI  $> 15$ , we respectively found 36% and 64%. The steatosis grade differs by AHI severity ( $p < 0.001$ ) and sex ( $p < 0.001$ ). Of all women evaluated, 20.7% had no steatosis, 33.9% grade 1, 37.7% grade 2 and 7.54% grade 3. There was a difference between the apnea severity groups for age ( $p = 0.0018$ ), slow wave sleep (SWS;  $p = 0.027$ ), REM ( $p = 0.004$ ), micro-arousals ( $p < 0.001$ ), minimum saturation ( $p = 0.005$ ), ODI ( $< 0.001$ ). After adjusting several variables through multiple regression, only the female gender was a predictor of steatosis grade. **Conclusions:** This study found a high prevalence of steatosis in OSA patients. The evaluation between the steatosis grade showed no difference for BMI and polysomnography data, but rather for OSA severity, gender and age, thus being female sex a independent predictor factor to steatoses grade.

ID: 592

## Clinical Studies

## Sleep and Musculoskeletal Injuries in Adolescent Athletes

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**Introduction:** Sleep restriction is common in athletes, especially before competitions, and can impact their performance, as well as favoring the appearance of injuries. **Aim:** Correlate the quantity of sleep and musculoskeletal injuries in adolescent athletes. **Methods:** Nineteen athletics athletes (both sex) from the Centro de Treinamento Esportivo in the speed and jump categories, which competed at regional and/or national level, with an mean age of  $16.89 \pm 2.74$  years and a mean BMI of  $21.09 \pm 1.42$  kg/m<sup>2</sup> participated in this study. The sleep variables were assessed by actigraph, participants were instructed to use it for ten days and maintain their usual sleep-wake cycle. The monitoring of musculoskeletal injuries was performed during the 6-month training period. Spearman's correlation coefficient and simple linear regression model were estimated for sleep and injuries variables. The significance level was  $\alpha \leq 5\%$ . **Results:** The mean total sleep time (TST) was 07h13min  $\pm$  44min, sleep latency was  $20.18 \pm 10.47$ min, sleep efficiency was  $82.49 \pm 3.68\%$  and the mean wake after sleep onset was  $46.02 \pm 12.42$ min. During this period, the incidence of eight musculoskeletal injuries was observed. The results showed significant negative correlation between TST and amount of injuries ( $r = -0.736$ ;  $p = 0.001$ ). The amount of injuries can be significantly explained by the reduction of TST ( $R^2 = 0.37$ ;  $\beta = -0.611$ ;  $p = 0.05$ ). **Conclusions:** The quantity of sleep is related and was able to predict the amount of musculoskeletal injuries in adolescent athletes, thus emphasizing the importance and impact of sleep on the athlete's health and sports performance.

ID: 593

## Clinical Studies

## Risk and factors associated with Obstructive Sleep Apnea Syndrome in the elderly of Primary Health Care

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**Introduction:** The aging process brings significant changes in relation to the numerous sleep disorders, which constitute a serious public health problem and 50% of the elderly have sleep-related complaints. Insomnia is the most common sleep disorder in the elderly, followed by Obstructive Sleep Apnea Syndrome (OSAS). The prevalence of OSAS in the elderly varies from 27% to 75% in the studies, depending on the definition adopted, and the incidence may vary from 2.9% to 39.5%, in the age group of 60 and 80 years, especially in men. **Aim:** To evaluate the risk and factors associated with OSAS in the elderly of primary health care. **Methods:** Cross-sectional study conducted with elderly assisted in Primary Health Care, from January to August 2018, selected through medical consultations held in this Unit during 2017. Sociodemographic questionnaires, clinical, anthropometric data, geriatric depression scale, and the STOP-Bang instrument were used to assess the risk of OSAS. The research was approved by the Research Ethics Committee under Opinion 1.861.003. Data were processed and analyzed using the SPSS program, version 22.0 for Windows, duly registered for the research. The statistical treatment to verify the normality of the distribution by group of quantitative variables was the Shapiro-Wilk test. The chi-square test and the non-parametric Kruskal-Wallis test were applied, with a confidence interval of 95% and  $p \leq 0.05$ . **Results:** 72.9% of the female participants were identified with intermediate risk and high risk of OSAS, 55.7% and 18.6% of the elderly respectively. 54.3% overweight elderly. There was a statistically significant difference in the variables gender ( $p = 0.032$ ), Arterial Hypertension ( $p = 0.019$ ), depression ( $p = 0.014$ ) and Body Mass Index ( $p = 0.005$ ) in relation to the risk for OSAS. **Conclusions:** The elderly had a higher intermediate risk of OSAS and an association of risk factors: Gender, Body Mass Index and comorbidities (Systemic Arterial Hypertension and Depression). Thus, the investigation of OSAS in the elderly is relevant, since the number of health professionals that diagnose this syndrome is insufficient, being possible the treatment through non-pharmacological therapies, behavioral interventions: weight loss, smoking cessation, discontinuation of alcohol use and holistic sleep positioning guidance.

**ID: 594**

### Case Reports

**Sleep speech-language therapy: considerations on two cases of elderly individuals with severe obstructive sleep apnea**

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**Introduction:** Obstructive sleep apnea (OSA) may affect individuals in several age ranges, yet the incidence increases with age. CPAP is considered the gold standard in the rehabilitation of sleep breathing disorders (SBD), yet the literature presents several case reports in which the adherence to the use of CPAP is a therapeutic challenge. The other treatment options for SBD include the speech-language therapy – Orofacial Myofunctional Therapy (OMT). **Aim:** To describe two cases of male elderly individuals with severe OSA, aged 77 and 78 years (patients 1 and 2), both referred by the sleep medicine specialist for speech-language treatment due to refusal to use the CPAP. **Methods:** Individuals with OSA submitted to evaluations - MBGR protocol – Orofacial Myofunctional Clinical Examination and polysomnography – before and after the OMT program. Based on the initial data, the following therapeutic planing was established for 4 months: patient 1: 12 weekly sessions; patient 2: 4 weekly, two bimonthly and two monthly sessions. For both patients, the therapy addressed the orofacial functions of breathing, mastication, swallowing and myotherapeutic exercises, aiming to balance the orofacial muscle dynamics, reduce the intensity and frequency of snoring and obstructive breathing episodes during sleep. The patients were instructed to perform the orofacial exercises 3 times a day, control the orofacial functions and position during sleep. After 4 months of OMT, the patients were submitted to speech-language re-evaluation and returned to the sleep medicine specialist, who requested another polysomnography. **Results:** The following results were observed for both patients: reduction of tongue width and height, greater recruitment of palatal vault muscles and adequacy of orofacial functions. The polysomnography revealed changes in the following parameters: Patient 1: AHI (before 39.7/h x after 6.9/h) and oxygen saturation (before: mean 91% and minimum 77% x after: mean 92% and minimum 88%). Patient 2: AHI (before 36.6/h x after 4.5/h) and time with SpO2 <90%\* (before: 2.3% x after: 0%). **Conclusions:** In the literature, there is no recommendation of OMT for elderly individuals with severe OSA. However, it was observed that OMT was effective to reduce the AHI and enhance the oxygen saturation. Further investigations should be conducted on cases of elderly individuals with severe OSA who refuse to use the CPAP.

**ID: 595**

### Basic Research

**Mental health and sleep in a population in the east of Minas Gerais**

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**Introduction:** Mental health problems are causes of comorbidities worldwide. It is estimated that 700 million people are affected by this condition, according to WHO. Minor psychic disorders (MPD) are known to negatively impact in sleep and MPD are related by symptoms such as anxiety, fatigue, depression, insomnia, irritability, and memory and concentration deficit. **Aim:** The aim of this study was to evaluate the prevalence of MPD and the impact on sleep in a population in the Eastern Minas Gerais. **Methods:** This study is characterized as a descriptive, cross-sectional and quantitative research that was conducted in 2017/18. We used data from interviews conducted during a Health Fair, totaling 169 respondents. Participants were invited to attend the fair to monitoring health by forming a convenience sample. In the interview, questions were applied for sociodemographic characterization and sleep quality. To analyze the prevalence of common mental disorders we used the Self-Reporting Questionnaire (SRQ-20), an instrument with 20 questions aimed at screening for psychic morbidity. These were collected by medical students, previously trained in the application of research instruments. A descriptive analysis of the data was performed using frequency tables and calculation of measures of central tendency (mean) and dispersion (standard deviation) using the SPSS® program. **Results:** Participaram desta pesquisa 169 voluntários, com idades variando entre 14 e 83 anos (med=49,9). Em relação ao sexo, 53,8% eram mulheres. A maioria dos voluntários eram casados/as (60,94%) e com ensino fundamental incompleto (46,74%). A prevalência do DPM foi de 39,05%. Houve maior prevalência no sexo feminino (50,55%), comparado aos homens (25,64%); 33% deles eram casados. Cerca de 30% dos entrevistados referiram dormir mal. A duração média de sono foi 7,8 ( $\pm 1,9$ ) horas. Em relação à faixa etária, nota-se maior prevalência em idosos acima de 73 anos, uma vez que tendem a ser mais vulneráveis às limitações e problemas de saúde. **Conclusions:** It is recognized that the presence of depressive symptoms negatively affects various aspects of an individual's life, including sleep quality and duration. Therefore, it is necessary to identify and treat individuals with MPD, to maintain the integrity of mental health, positively interfering with sleep and quality of life.

**ID: 596**

### Basic Research

**Sleep heterogeneity among the different students**

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**Introduction:** College years are believed to be those in which sleep is most neglected, whereas several studies have shown that sleep quality has consequences for learning. We made a comparative study with students of three different college courses to study this matter. **Aim:** This research was developed to compare excessive daytime sleepiness and sleep quality among undergraduate students of Law, Civil Engineering and Medicine. Also we performed the correlation between course load, sleepiness and sleep quality. **Methods:** A cross-sectional study was carried out at a University Center. The students filled out the Epworth Sleepiness Scale (ESE), Pittsburgh Sleep Quality Index (PSQI) and a simplified sociodemographic questionnaire. The analyzes were done in the semesters with the heaviest course load, which was requested to the coordination of the course. Descriptive analyzes were performed (frequencies, means and standard deviations), the Analysis of Variance (ANOVA) was calculated for sleepiness levels and sleep quality for the three courses, followed by the Test T. Pearson's Correlation Coefficient, to compare sleep quality with the compulsory course load. Statistically significant values were considered when  $p < 0.05$ . **Results:** The sample (mean age: 22.27,  $SD=4.47$ ) consisted of 55 Law students, 107 Civil Engineering and 167 medical students. The results showed that the average daytime sleepiness was 11.58 points ( $SD=3.77$ ) for Law, 10.55 ( $SD=3.42$ ) for Civil Engineering and 11.10 ( $SD=3.33$ ) for Medicine. As for sleep quality, the results were 8.77 ( $SD=2.18$ ), 7.17 ( $SD=2.18$ ) and 8.62 ( $SD=2.55$ ), respectively. No significant differences were found in sleepiness ( $f=1.13$ ;  $p>0.05$ ), while in sleep quality there were significant differences ( $f=8.15$ ;  $p<0.00$ ). The course load and sleep quality were not correlated in Law ( $r=-0.05$ ;  $p>0.05$ ), Civil Engineering ( $r=-0.09$ ;  $p>0.05$ ) and Medicine ( $r=0.17$ ;  $p>0.05$ ). **Conclusions:** The study showed no significant differences in sleepiness among students of the 3 courses, however all individuals had high levels of daytime sleepiness. In terms of sleep quality, as Civil Engineering students have the best sleep quality, while in Medicine and Law there was no significant difference. The research also revealed that it is not possible to correlate the course load with sleepiness and sleep quality.

**ID: 601**

### Clinical Studies

**The Comparison of Sleep Quantity in Different Stages of Training in Adolescent Track Athletes**

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**Introduction:** Athlete sleep is an important factor for recovery and maintenance of performance. Athletes may have significant changes in sleep at different stages of training and especially near major competitions. **Aim:** Comparison of sleep quantity in different stages of training in adolescent track athletes. **Methods:** The sample consisted of 19 athletics athletes from the Centro de Treinamento Esportivo aged 12 to 21 years, who participated in regional, national and international track competitions. Quality and quantity of sleep were assessed by actigraphy at three stages: Preparation Phase, Competitive Phase, and Non-Competitive Phase, with each phase obtaining a two-month interval between actigraphy assessments. The athletes were instructed to use on the non-dominant wrist an actigraphy continuously for 10 days and to maintain their usual sleep-wake style during each phase evaluated. Statistical analysis was performed using repeated measures ANOVA to compare sleep in the three phases of training, with a  $\alpha$  5%, the effect sizes (ES) was evaluated. **Results:** Total sleep time showed a significant decrease in the competitive phase (416.41+46.44) when compared to the non-competitive phase (453.10+59.95) ( $p=0.01$ ;  $ES=0.71$ ). The number of awakenings after sleep onset was lower in the non-competitive phase (36.13+15.28) when compared to the preparation phase (46.02+12.42) ( $p=0.001$ ;  $ES=1.49$ ). Sleep efficiency ( $p=0.447$ ) and sleep latency ( $p = 0.201$ ) showed no differences between the three phases evaluated. **Conclusions:** We can conclude that the athletes had a shorter total sleep time during the competitive phase and a higher number of awakenings during the preparatory phase compared to the non-competitive phase. Demonstrating that near and during competitions, sleep was fragmented and worse quality.

**ID: 604**

### Clinical Studies

#### Association between sleep complaints and musculoskeletal injuries in young track athletes

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**Introduction:** Sleep is a physiologic process that plays a crucial role in human metabolic functions and it is essential for muscular recovery. Sleep restriction increases technical errors and affect decision making, which can

be related to musculoskeletal injuries. Adolescents might be more exposed to situations that are detrimental to sleep quality. **Aim:** To associate sleep complaints with musculoskeletal injuries in young track athletes. **Methods:** The sample consisted of 30 athletes from Centro de Treinamento Esportivo, aged between 13 and 22 years and mean BMI of  $21.21 \pm 1.37$  kg/m<sup>2</sup>. Participants answered the Sleep Complaint Questionnaire and retrospective musculoskeletal injuries data were collected from team's physical therapy department (considered last six months). Spearman's correlation coefficient was used to obtain the association between the variables of the Sleep Complaint Questionnaire and injuries. Finally, linear regression was performed. The significance level was set at  $\alpha \leq 5\%$ . **Results:** The results showed that 23.3% of athletes reported poor sleep, 40% reported good sleep and 36.7% reported very good sleep. The mean of total sleep time was  $07h22min \pm 63.55$  min (recommended 9 to 10h sleep for athletes) and the mean severity of injuries was  $1.47 \pm 1.24$  UA (1= no absence and 5 = severe or absence over 28 days). Significant negative correlations were found between the variables sleep complaint and total sleep time ( $r = -0.438$ ;  $p = 0.016$ ), sleep complaint and sleep quality ( $r = -0.472$ ;  $p = 0.009$ ) and significant positive correlation between somnambulism and injury severity ( $r = 0.577$ ;  $p = 0.006$ ). Linear regression data showed that sleep complaint influence 45% on total sleep time ( $R = 0.456$ ;  $\beta = -0.456$ ;  $p = 0.011$ ); sleep complaint influence 49% on sleep quality ( $R = 0.494$ ;  $\beta = -0.494$ ;  $p = 0.006$ ); and somnambulism is influenced 64% by injury severity ( $R = 0.646$ ;  $\beta = 0.646$ ;  $p = 0.002$ ). **Conclusions:** The presence of sleep complaints has negative implications on sleep duration and quality of young athletes, as well as implies in the increase of the severity of injuries.

**ID: 607**

### Basic Research

#### Impact of chronotype and sleep quality on academic performance in medical students: which phase of the course is most critical?

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**Introduction:** Sleep disorders have a high prevalence in college students, especially in medical students, and are related to impairments in physical, cognitive and mental

health. **Aim:** To evaluate the sleep of medical students and to establish their possible correlations with academic performance parameters across the phases of the medical course. **Methods:** This is a cross-sectional observational field study which was conducted with 250 medical students from a university, located in the city of João Pessoa, Brazil, from February to April 2019. Participants were divided into three groups according to the phase of the medical course: basic and clinical cycles and internship. The Pittsburgh Sleep Quality Index (PSQI) and the Morningness-Eveningness Questionnaire (MEQ) were used for the evaluation of sleep variables. Specific questionnaires for the evaluation of sociodemographic, general health and academic performance variables were also used, including the Student Revenue Coefficient, an attitudinal evaluation and the grade regarding a learning check of a discipline randomly chosen in each semester. **Results:** The medical students of the present study were characterized by mean age of 22,78 ( $\pm$  4,71) years, intermediate chronotype in MEQ (48,28  $\pm$  10,49 points), poor sleep quality in PSQI (7,31  $\pm$  3,41 points), sleep latency of 26,22 ( $\pm$  25,49) minutes, sleep duration of 6h13min ( $\pm$  1h09min), mean sleep onset time of 23h30min ( $\pm$  1h10min) and mean wake-up time of 6h15min ( $\pm$  1h02min). There was no statistically significant relationship between the PSQI total score and the academic performance measures from the total sample and between the course phases. However, sleep latency, sleep onset and end times, and the MEQ score correlated with academic performance [( $r=-0,152$ ;  $p=0,026$ ) ( $r=-0,136$ ;  $p=0,047$ ) ( $r=-0,15$ ;  $p=0,036$ ) ( $r=0,178$ ;  $p=0,008$ ), respectively]. Similar results were found in the basic cycle, except for the time of end of sleep [( $r=-0,301$ ;  $p=0,005$ ) ( $r=-0,246$ ;  $p=0,035$ ) ( $r=0,288$ ;  $p=0,004$ ), respectively]. **Conclusions:** It was observed that medical students have poor sleep quality, so those students who have a higher sleep latency, sleep later and have a lower MEQ score presented a lessened academic performance, especially in the basic cycle of the medical course. Higher attention to medical students should be offered by educational institutions, aiming at minimizing the health problems caused by sleep disorders.

**ID: 608**

### Clinical Studies

#### Is there an association between Sleep Bruxism and Obstructive Sleep Apnea syndrome? a systematic review

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**Introduction:** Sleep bruxism (SB) is a masticatory muscle activity characterized by repetitive clenching or grinding of the teeth and/or by bracing or thrusting of the mandible, usually associated with sleep arousals. Obstructive Sleep Apnea (OSA) is a sleep-related condition and, thus, share a common physiologic pathway with SB. OSA is a respiratory disorder characterized by total (apnea) or partial (hypopnea) airway obstruction leading to arousals in response to respiratory effort. **Aim:** To elucidate current knowledge on the potential association and causality between Sleep Bruxism (SB) and Obstructive Sleep Apnea (OSA) using full-night polysomnography. **Methods:** Search strategies were developed to PubMed, Web of Science, Cochrane, LILACS, MEDLINE and BBO-ODO and conducted until May 2019. The methodological quality was evaluated using Qu-ATEBS tool. **Results:** Identified 270 articles and after independent screening of abstracts by two authors, 17 articles underwent full text reading, 10 articles were excluded for not meeting inclusion criteria and 7 were included in qualitative synthesis. Four studies support the association between SB and OSA: (a) a subtype of OSA patients may have SB as a protective response to respiratory events (b) most episodes of bruxism occur shortly after the end of apnea / hypopnea (AH) events (c) bruxism episodes occur secondary to arousals arising from AH events (d) there is a correlation between the frequency of SB and AH events. And three studies do not support: (e) AH episodes are related to non-specific SB oromotor activities (f) SB episodes are not directly associated with the end of AH events (g) patients with OSA did not experience more SB events than control group. **Conclusions:** There is no scientific evidence to support a conclusive relationship between SB and OSA. Further well-designed and randomized studies with control groups are need to investigate whether possible mechanisms common to SB and OSA exist and whether OSA treatment could improve SB negative oral health outcomes in patients with SB and comorbidity of OSA.

**ID: 609**

### Clinical Studies

#### Comparison of the effects of Adenotonsillectomy and Rapid Maxillary Expansion on obstructive sleep apnea in children - Prospective Randomized Controlled Trial

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**Introduction:** Obstructive Sleep Apnea (OSA) affects about 2% of pre-school children and is associated with different comorbidities, some of which have implications in adult life. It is an under-diagnosed and under-treated disease. **Aim:** To evaluate the effect of rapid maxillary expansion (RME) and adenotonsillectomy (ADT) on the subjective and objective parameters of sleep, echocardiography, spirometry and quality of life of infant with obstructive sleep apnea. **Methods:** Children with adenoid and tonsil hypertrophy grade III and IV, with complaints of snoring and respiratory arrest at night and craniofacial alterations that favored the RME were consecutively selected in the otorhinolaryngology clinic of the Federal University of Uberlândia. The children were submitted to polysomnography (PSG), those with AHI  $\geq 2$  were selected and randomized by individual lottery in two groups: ADT (n=13) and RME (n=17). PSG and spirometry examinations were performed by trained technicians. The echocardiogram was performed by cardiologists. The questionnaires OSA-18 and SBQ were applied by dentists. All reports were made by examining physicians and blinded for both the pathology being investigated and the time of treatment the child was in. The exams and questionnaires were applied before and after 4 months of the interventions. **Results:** The sample consisted of 30 children, of whom 15 were male, aged  $8 \pm 2$  years; BMI:  $18.5 \pm 4.7$  kg / m<sup>2</sup>. After the therapeutic interventions, there was a significant improvement in AHI ( $p < 0.001$  /  $p = 0.003$  /  $p = 0.007$ ), saturation ( $p = 0.01$  /  $p = 0.006$  /  $p = 0.03$ ), quality of life ( $p < 0.001$  /  $p < 0.001$  /  $p = 0.04$ ) and sleep behavior ( $p = 0.01$  /  $p = 0.009$  /  $p = 0.60$ ) for the total sample, ADT and RME respectively. However, only 46% of the patients submitted to surgery and 23% of those submitted to orthodontic treatment had normalization of the AHI after the intervention. When comparing the two interventions, therapeutic superiority was observed for adenotonsillectomy in the parameters of total score (0.01), symptoms during sleep ( $P = 0.01$ ), and the informant's opinion ( $p = 0.005$ ) of OSA-18, as well as in the total SBQ score ( $p = 0.009$ ). **Conclusions:** Both treatments reduce AHI significantly, but for children with craniofacial changes and grade III or IV tonsil hypertrophy, only one of the interventions failed to normalize all polysomnographic parameters. The overlap of therapies and multiprofessional care is recommended.

**ID: 612**

### Clinical Studies

**The relation between serum vitamin d and sleep quality on female workers of day and night shift in a hospital of western paran**

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**Introduction:** Vitamin D deficiency is an increasing problem in modern society and may be associated with concomitant increase in sleep disorders; and this may be associated with working shifts. **Aim:** To perform an investigation of the association between serum levels of vitamin D and the sleep quality of day and night shift workers. **Methods:** We selected two groups of female shift workers who did not perform vitamin D supplementation. They answered a questionnaire with variables of: age, race, sleep duration, daily sun exposure and with the Pittsburgh Sleep Quality Index. Serum vitamin D levels were measured at the study site and correlated with the variables. Statistical analysis using Fisher Exact Test established the associations between the variables. **Results:** The average age of participants was 41 years. Most are in the sun  $< 30$  minute daily and slept for five to eight hours. Both night-shift workers and day-shift workers had poor sleep quality and vitamin D deficiency. There were no significant associations between vitamin D levels and sleep quality in shift workers. **Results:** Some previous studies have shown a similar result to the one obtained; whereas others have found a significant association between vitamin D levels and sleep quality in shift workers. **Conclusions:** Regardless of whether participants worked day or night shifts, vitamin D deficiency and poor sleep quality were prevalent in most of the study participants.

**ID: 613**

### Clinical Studies

**Sleep quality of medical students and university performance**

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**Introduction:** Sleep is a fundamental biological function and disturbances of this process can cause significant losses, including cognitive performance, compromising the quality of life. However, due to the urban, intense routine, the sleep time of medical students is reduced, which has a negative impact on health, compromising cognitive functions, for which academic performance is a priority. **Aim:** To verify if there is a relationship between student's sleep quality and academic performance, based

on test scores, applied to the 4th year Medicine students in 2017. **Methods:** A prospective, cross-sectional and descriptive study was performed. The sample consisted of 41 students. Data collection was based on the Pittsburgh Sleep Quality Index (PSQI), a self-administered questionnaire. Regarding the student's grades, they were acquired through the subject's representatives, and the test scores were averaged. The SPSS software was used and non-parametric analysis was performed. **Results:** With a sample composed by 28 males and 13 females, average age of 24 years. The academic performance average was 71.3 (range 60-82), based on the result of the PSQI, the group with good sleep had a grade average of 73.6; the group with poor sleep 71.5; and those with sleep disorder 69.2. No statistically significant difference was observed regarding sleep quality and academic performance ( $p = 0.340$ ). **Conclusions:** The study showed that students with higher PSQI scores, meaning those with poor sleep quality and / or disturbance, had a slightly lower average test scores than students with good quality.

**ID: 614**

### Clinical Studies

#### How sleep deprivation and disturbance in the circadian rhythm affected health in a nursing group

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**Introduction:** Shift workers don't have a typical working schedule in the morning and in the afternoon. Their work rhythm represents a risk factor to health and well-being because interferes with circadian rhythms and sleep wake cycle. The most common consequences of this misalignment include decrease in attention, cognitive functions, mood, social and in work, besides health. **Aim:** This research aims to assess sleep quality and the prevalence of depressive symptoms in shift workers. **Methods:** It is an observational study with cross-sectional design. We evaluated the nursing staff of a hospital in Santa Catarina with a sociodemographic questionnaire, the Pittsburgh Sleep Quality Index and the Beck Depressive Inventory II during their work shift. We analyzed the results using t Student test and chi square with a 5% level of significance. **Results:** Sixty-four nursing staff members were enrolled in the current study, 32 (50%) were in the morning shift and 32 (50%) in the night shift. Among night shift workers, 59.4% is overweight or obese, 68.8% do not engage in physical activities, 71.9% do not sleep well or has sleep disturbance and only 6.3% shows symptoms for moderate or severe depression. **Conclusions:** This study did not show an

association between shift work and a higher prevalence of depressive symptoms and did not show a worst quality of sleep in shift workers when compared to daytime workers. The questionnaire used and data collection method can partially explain that. Furthermore, the healthy-worker effect, described by Anders Knutsson, shows that some people tend to adjust to shift work. However, the study showed a higher possibility for overweight and obesity for shift workers and higher tendency to indisposition for daily activities associated with longer sleeping cycles in off work nights.

**ID: 616**

### Clinical Studies

#### Laryngopharyngeal motor dysfunction and obstructive sleep apnea in Parkinson's disease

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**Introduction:** Obstructive sleep apnea (OSA) is a common sleep disorder in Parkinson's disease (PD), but the relationship between these two conditions remains uncertain. Upper airway (UA) dysfunction in PD is well documented in some patients and is believed to be a reflex of the motor involvement of laryngopharyngeal muscles. **Aim:** The aim of this study is to determine whether UA dysfunction and laryngopharyngeal motor dysfunction (LMD) are involved in the obstructive phenomenon of OSA in PD. **Methods:** Forty-eight PD patients underwent polysomnography for OSA diagnosis, physical examination, functional evaluation of the UA by spirometry and a clinical protocol for analysis of laryngopharyngeal muscles, where we evaluated presence of hypophonia, difficulty in protruding at least one third of the tongue, difficulty in coughing voluntarily, difficulty in clearing the throat voluntarily, and difficulty in elevating the palate during open-mouth inspection and vocalization of the /ah/ phoneme. Participants with at least one of these symptoms were considered to have LMD. **Results:** Thirty-one participants (64.6%) fulfilled the criteria for OSA, according to Internacional Classification of Sleep Disorders 3rd edition. UA obstruction was observed in 25% of participants and LMD in 60.4%. Among the clinical indicators of LMD, hypophonia was the most common (58.3%). Participants with LMD had a threefold greater chance of presenting with OSA than did those without LMD (OR = 3.49, 95% CI: 1.01 - 12.1,  $p = 0.044$ ). Individuals with LMD had more UA dysfunction (37.9 vs 10.5%,  $p = 0.037$ ), higher scores on UPDRS III (20 vs 15,  $p = 0.0005$ ) and the Hoehn-Yahr scale (2.5 vs 2.0,  $p = 0.008$ ), and higher frequencies of postural changes (51.7 vs 21.1%,  $p = 0.033$ ) and motor phenomena (65.5 vs

31.6%,  $p = 0.021$ ). Obesity, snoring, neck circumference, and the Mallampati score did not correlate with OSA in PD. **Conclusions:** The results of this study indicate that LMD may be a factor involved in the occurrence of UA obstructive phenomena in OSA in patients with PD. LMD can help identify which PD patients should be monitored in regard to the development of OSA as most of the characteristics commonly associated with OSA in the general population do not apply to parkinsonians.

**ID: 617**

### Clinical Studies

#### Subjective sleep quality, sleep complaints and sleepiness in elite athletes

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**Introduction:** Sleep with adequate duration and quality is vital for high performance athletes, because it acts in the process of physical and cognitive recovery, which ensures improved sports performance. In this way, it is essential to monitor the sleep of athletes to propose interventions that seek to improve it. **Aim:** To describe the subjective quality of sleep, sleep complaints and sleepiness of elite athletes and to analyze the impact of complaints on sleep quality. **Methods:** The sample consisted of 107 elite athletes (with or without disabilities), with an mean age of  $29 \pm 9$  years. Data were collected online using the following questionnaires: Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS) and Sleep Complaint Questionnaire (SCQ). However, 107 athletes answered to the SCQ, 62 athletes answered to the PSQI and 75 athletes answered to the ESS. Data were presented as mean and standard deviation, as well as absolute and relative frequency. In addition, simple linear regression was performed to analyze the impact of sleep complaints on sleep quality (PSQI). **Results:** It can be observed that 106 (99%) athletes had at least one sleep complaint, 26 (35%) had excessive sleepiness and 51 (82%) had poor sleep quality. The complaints with higher incidence were insufficient sleep (71; 66%), wake up during the night (69; 65%) awakenings at night (64; 60%), moving a lot during sleep (61; 57%). In the simple linear regression model, we observed  $R^2 = 0.367$  ( $\beta = 3.881$ ;  $p = 0.001$ ), thereby, sleep complaints impact 37% on the athletes' sleep quality. **Conclusions:** Elite athletes have poor sleep quality and possible sleep disorders due to the presence of complaints that they reported. From this, it is essential to monitor athletes' sleep to identify complaints, as they impact 37% on the sleep quality of this population and thus ensure the

best sports performance.

**ID: 618**

### Clinical Studies

#### Prevalence of edentulism and sleep disturbances following stroke

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**Introduction:** Many authors have demonstrated the association between edentulism and various clinical, neurological (e.g. stroke) and sleep disorders such as obstructive sleep apnea (OSA). Edentulism may influence the prevalence of sleep disturbances, including OSA, as well as poor sleep quality, excessive diurnal somnolence and restless leg syndrome in participants following stroke, and thus having consequent higher disabilities and negative outcomes. **Aim:** To investigate the prevalence of edentulism, sleep quality, risk of obstructive sleep apnea and excessive daytime sleepiness, the type of stroke, and the potential association between edentulism and these sleep related factors in stroke patients attending the Neurovascular Outpatient Clinic at our University. **Methods:** This study assessed the prevalence of different types of stroke in 130 patients, and the influence of sleep disturbances using questionnaires on sleep quality, risk of obstructive sleep apnea, and excessive daytime sleepiness complaints. We also investigated the number of teeth and the nocturnal use of dental prostheses. **Results:** The prevalence of ischemic stroke was 94.6%, with minor stroke severity and no significant disability or slight disability. Regarding the evaluation of sleep, our sample had poor sleep quality, higher risk of obstructive sleep apnea, but presented no excessive daytime sleepiness. We also found a high prevalence of missing teeth, or edentulism, as the majority used full removable dental prostheses and half of the sample slept with them. **Conclusions:** Despite the complex and sometimes bi-directional relationships between edentulism, obstructive sleep apnea, sleep and stroke, we found a higher prevalence of poor sleep quality and a higher risk of obstructive sleep apnea in edentulous patients following stroke with a minor severity. This indicates the need for further studies on treating and preventing sleep disturbances and edentulism in stroke patients.

**ID: 619**

### Basic Research

#### Relationship between iron, sleep, physical exercise in an animal model of sleep-related movement disorders

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**Introduction:** One of the risk factors for the increased incidence of Restless Legs Syndrome (RLS) in pregnant women is anemia, since iron deficiency during pregnancy can have serious consequences for the mother and her baby, such as cognitive deficits and behavioral changes. On the other hand, there is evidence in the literature that the practice of physical activity presents neuroprotective properties, modulating different brain functions. **Aim:** The objective of the present study was to observe in the offspring of rats, treated with diet presenting different concentrations of iron (control, restriction and supplementation), alterations caused in sleep, locomotor activity and in the receptor and dopaminergic transporter. In addition, the impact of a physical exercise protocol on these variables analyzed in the offspring was evaluated.

**Methods:** For this, pregnant Wistar rats were distributed in groups that received control diets, supplementation and iron restriction. After weaning, the offspring of each group were divided into two groups: 1) Physical exercise and 2) Sedentary. Sleep assessments (Polysomnography), behavior (Open Field), gene expression (PCR) and protein content (WB) of dopamine receptor (D2) and dopamine transporter (DAT) were performed after 8 weeks of physical exercise (swimming). **Results:** In the Open Field test the exercised offspring of supplementary mothers showed a significant increase in the freezing parameter when compared to all other groups at most times (Repeated measures ANOVA  $p \leq 0.05$ ). Through polysomnography it was verified that the sleep pattern of the offspring of the restriction group (sedentary and Physical Exercise) presented an increase in the number of awakenings and paw movements during 24h of registration in relation to the supplementation group (Repeated measures ANOVA  $p \leq 0.05$ ). In the analysis of gene expression between sedentary groups and exercise according to diet, the exercise restriction group increased D2 compared to sedentary (Test T  $p \leq 0.05$ ). No difference was found in protein content of D2 and DAT between sedentary groups (one-way ANOVA  $p \leq 0.05$ ). **Conclusions:** In this context, we can suggest that the iron diet during pregnancy and the physical exercise performed by the offspring in adulthood may present some changes in the behavior and sleep pattern in this offspring evaluated. However, the results suggest that the presence of iron deficiency during pregnancy is not a predisposing factor for offspring to have movement disorders in adulthood.

ID: 623

## Basic Research

### Sleep disorders and the risk of temporomandibular disorders: systematic review and meta-analysis

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**Introduction:** According to the American Academy of Orofacial Pain, temporomandibular disorders (TMD) are defined as a “group of disorders involving the masticatory muscles, the temporomandibular joint (TMJ) and associated structures”. Efforts have been made in order to identify related disorders concerning TMD’s multifactorial etiology, with the purpose of providing the best healthcare for the patients in need. Among those conditions, sleep disorders stand out. **Aim:** The study aims to evaluate the relation between sleep disorders and TMD based on the available literature, as well as to verify the distribution of sleep disorders in the different diagnostic groups presented by the DC/TMD questionnaire. **Methods:** The research protocol was registered in PROSPERO (CRD42018109382). A systematic review was performed in the PubMed, Embase, Lilacs, Web of Science, Scielo, Cinahl and Cochrane Central databases. Manual search and gray literature search were also performed. Only observational studies that were published since 1992 were included. Two reviewers participated independently. Quality analysis on the included papers was conducted according to the Ottawa-Newcastle Scale. The extracted data were submitted to heterogeneity calculation, publication bias analysis and meta-analysis. **Results:** 1071 articles were found after the online search. 3 papers were added manually. Duplicate exclusion was carried out. According to the eligibility criteria, 131 articles were selected for full-text reading. 30 were included in the final work. Meta-analysis indicates a positive relationship between sleep disorders and TMD in all DC/TMD diagnostic groups, except for axis 1 group II (disc displacements). The calculated Odds Ratio was 3.48. **Conclusions:** Based on the obtained results, there is a positive relationship between sleep disorders and TMD (except for the diagnosis of disc displacements). There is a 3.48 times increased risk of TMD for individuals who suffer from sleep disorders compared to those without this diagnosis.

ID: 624

## Clinical Studies

## Respiratory therapists keeping up with new technologies in sleep field.

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**Introduction:** Technology has been changing the way we deal with CPAP adherence. Respiratory therapists involved in sleep field have to keep up with new developments such as devices and masks. **Aim:** Establish the profile of age and related comorbidities in sleep apnea patients; quantification of different positive pressure devices with different programming; quantification of different masks models that patients adapted. **Methods:** Retrospective analysis of first evaluation data including age and comorbidities and quantitative analysis of CPAP devices and masks models applied from years 2014 to 2019 in patients of private sleep clinic in first evaluation. **Results:** 50 patients were analyzed, 37 were male, average age: 58,2 ( $\pm 12,45891206$ ), minimum age 25 and maximum age 87. Regarding comorbidities 24% had hypertension, 18% were obese, 12% had diabetes, 8% had psychiatric disorders, 6% had had brain stroke or sinusitis or Alzheimer or heart disease, 2% had cancer or fibromyalgia or leg thrombosis or insomnia or hypothyroidism. 12% of the patients had no other health problems. For CPAP devices 64% were S9 Resmed®, 10% S10 Resmed®, 8% System One Philips Respironics® or S8 Resmed®, 6% Remstarpro Philips Respironics®, 2% Dreamstation Philips Respironics® or Cpap Transcend®. The mask types that best adapted were 16% Prong Nuance Pro Philips Respironics®, 12% Nasal Swift FX Resmed®, 10% Nasal Mirage FX Resmed® or Full Face Mirage Quattro Resmed®, 8% Full Face Quattro Fx Resmed®, 6% Nasal Eson Fisher&Paykel® or Nasal Mirage Activa Resmed®, 4% Full Face AmaraView Philips Respironics® or Nasal Eson 2 Fisher&Paykel® or Nasal Mirage Micro Resmed® or Nasal Pico Philips Respironics® or Nasal Swift FX Nano Resmed® or Nasal Wisp Philips Respironics®, 2% Nasal DreamWear Philips Respironics® or Full Face Airfit Resmed® or Full Face Mirage Activa Resmed® or 0% Nasal Softgel Resmed®. **Conclusions:** The profile of comorbidities and age fits other studies of sleep apnea patients. Eight different positive pressure devices were used along with seventeen different masks from years 2014 to 2019. The respiratory therapist must keep up with new devices and masks to adapt the sleep apnea patient using the best technology available in Brazil.

ID: 626

## Clinical Studies

## Does sleep deprivation alter muscle, core and thermographic temperature?

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**Introduction:** Body temperature is a robust physiological of sleep-wake cycle marker and of thermal homeostasis under different environmental conditions. **Aim:** The objective of this study was to verify the muscle, core and thermographic temperatures of the adults before and after nocturnal sleep deprivation. **Methods:** Fourteen male adults (mean age of  $24.36 \pm 3.67$  years; mean BMI of  $25.12 \pm 2.14$  kg/m<sup>2</sup>) were participated in the study. The body temperatures measurements were performed over two days (D1 and D2). An actigraph was used to verify the time awake and the absence of naps during the sleep deprivation protocol. The muscle, core and thermographic temperatures were recordings in ten moments (8:00, 11:00, 14:00, 17:00, 20:00 on D1 and D2) during the protocol. The muscle temperature (mT) were measured by Insulation Disk Method (IDisk) on the Braquial Triceps (mTBT), Trapezius (mTTR), and Vastus lateralis thigh (mTVL). The core temperature (CT) and skin temperature (Tt) were measured by rectal probe (10-12cm into the anus) and by thermographic camera (Thermovisor) respectively. The General Linear Model (GLM) was used to compare the three body temperatures before and after nocturnal sleep deprivation. The  $\alpha$ -level for all analysis was set at 0.05. **Results:** We found there was a significant effect of time to the Tt ( $F=5.91$ ,  $p<0.01$ , PES=0.18; OP=0.95), mTBT ( $F=7.49$ ;  $p<0.01$ , PES=0.22, OP=0.98), mTTR ( $F=4.63$ ,  $p=0.01$ , PES=0.15, OP=0.81), and mTVL ( $F=15.62$ ,  $p<0.01$ , PES=0.37, OP=1.00) respectively. However, no significant differences were observed in the CT after the sleep deprivation ( $F=2.54$ ,  $p=0.09$ , PES=0.09, OP=0.48). Therefore, there was an increase of muscle and thermographic temperatures after sleep deprivation ( $p<0.05$ ). **Conclusions:** The muscle and thermographic temperatures increased after nocturnal sleep deprivation. However, the core temperature was not influenced by sleep deprivation. In general, sleep-deprived people are tired and have increase the physical effort to stay awake and not falling asleep. As a physical effort result there is an increase skin vasodilatation and peripheral temperatures. Additionally, an elevated skin temperature while core temperature does not decrease should be an

alarm to inform thermoregulatory systems about the desynchronization of thermoregulatory mechanisms. Acknowledgment: FAPEMIG, CEPE, CEMSA, AFIP, CAPES, CNPq, UFMG.

**ID: 627**

### Clinical Studies

#### Partial sleep restriction impairs alertness and psychomotor performance of students

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**Introduction:** The students, athletes, shift workers as well as general populations has been sleep restricted in favor of social, economic, professional and personal commitments. **Aim:** The aim of this study was to verify the sleep restriction effects on alertness and psychomotor performance of the students. **Methods:** Sixteen male students (mean age of  $25.0 \pm 6.3$  years) participated in the study. Participants studied at night (07:00am-10:30 pm) and worked at the day (8:00 am to 5:00 pm). The sleep-wake cycle was measured by actigraph for 10 days (before protocol) and mean Total Sleep Time (TST) was analyzed (mean TST = 8.02 hours). Participants were requested to sleep for at least 7 hours on the night before protocol (mean TST= 7.12 hours). At the first day of protocol was calculated 50% sleep restriction by the individual mean TST (10 days of actigraph). In addition, psychomotor performance and sleepiness were measured using the Psychomotor Vigilance Task (PVT) and Karolinska Sleepiness Scale (KSS) at the three moments (M1, M2, M3) for 24 hours: basal moment (M1 - 8:00 am), before the sleep restriction (M2 - 8:00 pm) and after the sleep restriction (M3: 8:00 am). At the second day the participants slept in the lab at 2:00 am until 6:00 am in a controlled and comfortable thermoneutral environment. In order to avoid sleep inertia, M3 evaluations started at 8:00 am (2 hours after awakening). Paired-Samples ANOVA was used to compare the PVT and KSS variables at the moments (M1, M2, M3). The significance level considered was 5% ( $p < 0.05$ ). **Results:** After the sleep restriction, the mean time reaction (mTR) increased in M3 compared to M1 ( $F = 14.51$ ;  $p < 0.01$ ;  $PES = 0.49$ ;  $OP = 0.99$ ) and M2 ( $F = 14.51$ ;  $p = 0.01$ ;  $PES = 0.49$ ;  $OP = 0.99$ ), as well as there was an increased lapses of attention (LA) in M3 compared to M2 ( $F = 5.46$ ;  $p = 0.04$ ;  $PES = 0.27$ ;  $OP = 0.68$ ). However, there was no significant difference on False Starts (FS) between M3 and M1 and M2 ( $F = 1.68$ ,  $p = 0.13$ ;  $F = 1.68$ ,  $p = 0.88$ ) respectively. The sleepiness increased

at M2 ( $F = 77.45$ ;  $p < 0.01$ ;  $PES = 0.84$ ;  $OP = 0.99$ ) and M3 ( $F = 77.45$ ;  $p < 0.01$ ;  $PES = 0.84$ ;  $OP = 0.99$ ) compared to M1. **Conclusions:** Our findings suggest that 50% sleep restriction decreased psychomotor performance and alertness of night shift students, which may impair occupational activities, specialty classroom performance and daily life activities, as well as increased risk of lapses and accidents. Acknowledgment: CEPE, CEMSA, AFIP, CAPES, FAPEMIG, CNPq.

**ID: 628**

### Basic Research

#### Sleep quality and excessive daytime sleepiness in women with urinary incontinence

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**Introduction:** Urinary incontinence is defined as any complaint of involuntary loss of urine. One of the main symptoms in women with urinary incontinence is nocturia, characterized by the need to awake one or more times per night to void. Repeated nocturnal voiding can leads to chronically disturbed sleep, which negatively affects the sleep quality (SQ). The sleep fragmentation causes excessive daytime sleepiness (EDS), a difficulty to maintain wakefulness or alertness at appropriate situations during the day. The gold standard to measure sleep objectively is polysomnography, however, wrist actigraphy supports large-scale, is cheaper, and can be useful to investigate sleep/wake patterns for prolonged observations in non-laboratory environments. **Aim:** Therefore, the aim of the present study was to evaluate sleep quality and excessive daytime sleepiness in women with urinary incontinence. **Methods:** We evaluated 66 women with urinary incontinence. They used the Fitbit Charge 3, an activity tracker, for 7 days to objectively evaluate the SQ and Epworth sleepiness scale to assess EDS. **Results:** The patients were aged:  $57.7 \pm 11.2$  years, body mass index (BMI):  $29.1 \pm 4.2$  kg/m<sup>2</sup>, 59% had mixed urinary incontinence ( $n = 39$ ), 28% stress urinary incontinence ( $n = 19$ ) and 12% ( $n = 08$ ) urge urinary incontinence. According to actigraphy data: total sleep time (TTS):  $6.10 \pm 0.95$  hours; Total time in bed (TTB):  $7.0 \pm 1.0$  hours; Awakening episode per night (WE):  $19.1 \pm 6.7$  events; Awakenings after sleep onset (WASO):  $0.88 \pm 0.16$  hours and sleep efficiency (SE):  $87.4 \pm 2.3\%$ . The total score for the Epworth sleepiness scale was  $11.1 \pm 6.2$ , characterizing the presence of EDS. **Conclusions:** According to the results, despite the presence of EDS and

shortened sleep time, it was showed that the women with urinary incontinence had good sleep efficiency. Future research is suggested to correlate sleep data obtained with actigraphy with those obtained by polysomnography in women with urinary incontinence, since there are evidences indicating overestimation of sleep efficiency by the actigraphy.

**ID: 631**

### Clinical Studies

## Polysomnographic features and OSA prevalence in adult with Down Syndrome

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**Introduction:** Oropharyngeal hypotonia, is common in individuals with Down syndrome (DS), resulting in several impairments including the total or partial obstruction of the airways during sleep, leading to snoring and to obstructive sleep apnea (OSA). It is associated with a high risk of morbidity and mortality in individuals with DS. Several works investigated the sleep disorders in children with Down syndrome, but few studies are available in this adult population. **Aim:** This study aimed to assess the polysomnographic features and the prevalence of OSA in adult with Down syndrome. **Methods:** Medical and dental anamnesis were performed in order to investigate the overall health, to address anthropometric data, dental status and parafunctional habits. Patients underwent the polysomnography (PSG) type II (Embla Embletta MPR+PG ST+Proxy, Natus, California-USA). The inclusion criteria included the presence of symptoms of OSA, preserved cognitive function to respond to verbal commands and informed and written consent. The exclusion criteria included body mass index (BMI) > 35 Kg/m<sup>2</sup>, and have been exposed to physiotherapy treatment at least 6 months prior to the study. **Results:** The entire group consisted of 23 patients (14 men and 9 women), with a mean age of 22.7±6.5 years, mean body mass index (BMI) of 28.5±6.8 kg/m<sup>2</sup> and mean neck circumference of 39±4.0. Moderate to severe tooth wear was present in all patients. All patients presented Mallampati IV and, 73% and 27% tonsil grade II and III, respectively. The polysomnography showed a mean apnea/hypopnea index (AHI)=42.0±3.0, with a mean duration of apnea and hypopnea events of 15.1±6.3 and 18.6±7.0,

respectively. N3= 19.25± 6.0 REM sleep=9.1±4.2, arousal index = 35.1±17.5, desaturation index (ODI)= 36.9±3.0, SaO<sub>2</sub>mean =92.0±4.0 and SaO<sub>2</sub>nadir=75.0±12.3. Mean sleep latency showed normal values (25±3.8), but mean REM latency was increased (203.0±78.0), with a reduced sleep efficiency (79.1±14.0). AHI was not correlated to BMI, neck circumference and age. All patients presented snoring. Only 2 (8.7%) did not present sleep bruxism (SB). The prevalence of OSA and SB was 100% (mild=21.7%, moderate=47.0%, severe=31.3%) and 91.3%, respectively.

**Conclusions:** Adults with DS often presents coexistent sleep disorders. Due to the high prevalence of OSA in this population, added to a high ODI and marked sleep fragmentation, adults with Down syndrome should be screened for OSA with polysomnography routinely.

**ID: 632**

### Clinical Studies

## Short-term CPAP or moderate aerobic exercise do not improve oxidative stress and inflammatory biomarkers in obstructive sleep apnea

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**Introduction:** Previous studies have shown that the levels of oxidative stress, inflammatory and cell-free DNA (cfDNA) markers are increased in individuals suffering from obstructive sleep apnea (OSA). The effects of medium to long-term CPAP therapy and physical activity in decreasing these levels have been somewhat explored, unlike short-term interventions. **Aim:** Evaluate oxidative stress marker, pro-inflammatory cytokines, anti-inflammatory cytokines, and cfDNA levels before and after 8-week CPAP treatment or moderate-intensity aerobic training in moderate to severe OSA. **Methods:** Thirty-nine patients diagnosed with OSA were randomly divided into CPAP (n=18) – with and without humidifier – and exercise (n=21) groups. They were all submitted to the Epworth Sleepiness Scale and the Pittsburgh questionnaire. Blood samples were taken for the quantification of lipid oxidation (TBARS), protein oxidation (AOPP) and antioxidant (SOD) biomarkers, as well as pro-inflammatory (TNF- $\alpha$ , IL-1 $\beta$ , IL-6, IL-8, IL-17A) anti-inflammatory cytokines (IL-4, IL-10) and cfDNA, before and after 8 weeks of either CPAP therapy or moderate-intensity aerobic exercise. Comparisons between averages were made with the Student's t test for dependent samples when the Shapiro test indicated parametric and, if not, the Wilcoxon

test. A 95% confidence interval and a significance level of 5% were considered. **Results:** After 8 weeks of either CPAP therapy or exercise no significant differences were observed in the levels of cfDNA, oxidative stress and inflammation markers, except for an increase in AOPP ( $6.6 \pm 3.9 / 10.5 \pm 6.8$ ,  $p=0.02$ ) and IL-17A ( $21(8.4) / 29(6.7)$ ,  $p<0.001$ ) levels in individuals who went through CPAP, which were higher when the CPAP device was used without the humidifier (AOPP:  $6,13 \pm 2,74 / 10,67 \pm 7,06$ ,  $p<0.05$  and IL-17A:  $21,4 \pm 7,42 / 33,7 \pm 14,82$ ,  $p<0.05$ ). The 8-week CPAP therapy promoted a significant decrease in the Pittsburgh scores, while ESS scores remained unaffected. No significant changes were observed in these parameters after the exercise treatment. **Conclusions:** Short-term treatment for OSA, be it CPAP therapy or moderate-intensity aerobic exercise, was not sufficient to alter either the oxidative stress and inflammatory profiles or the cell-free DNA levels of moderate to severe OSA patients. However, short-term CPAP did improve self-reported sleep quality.

**ID: 633**

### Clinical Studies

#### Test-retest of measurements of the electromyographic signal on masseter and temporal muscles in patients with Down syndrome

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**Introduction:** To our knowledge, no studies have accessed the reliability or the reproducibility of the nonlinear surface electromyography (sEMG) variables of the masseter and temporalis muscles in adults with DS. Therefore, it is important to determine the variation in EMG signals measurements (intra-day and inter-day reliability) prior to suggest the use of EMG as a tool for evaluating the efficacy of therapies applied to the investigation and improvement of the masticatory muscles function in this population. **Aim:** The aim of the present study was to evaluate intra-day (test) and inter-day (re-test) reliability of surface electromyography (sEMG) signals of the masseter and temporal muscles in individuals with Down syndrome (DS). **Methods:** The reliability of the EMG variables was verified in twenty-three individuals with DS. The inclusion criteria were adult individuals aged between 18-35 years-old, preserved cognitive function (ability to understand and respond to

verbal commands necessary to perform this study, such as “open the mouth”, “close the mouth”, “bite”, “relax”), agreed to participate by free will and written consent signed by patient or patient’s responsible. The sEMG was performed at rest, at maximum voluntary clenching effort (MVC) and at maximum habitual intercuspation effort (MHI). The EMG signal was analyzed using the root mean square amplitude (RMS), mean frequency (MNF), median frequency (MDF) and approximate entropy (apEn). Values near 0 indicate the presence of illness or dysfunction and values near 2 indicate the absence of illness or dysfunction. **Results:** The intraclass correlation (ICCs) for the three trials recorded in MHI in two session (test and retest) revealed excellent within-and-inter session reliability (range: 0.76 to 0.97) for all EMG parameters and muscles recorded in MHI. At rest position it was seen an excellent reliability for RMS and ApEn (range: 0.75 to 1.00); good and excellent reliability MDF e MNF (range: 0.64 to 0.93). **Conclusions:** Test-retest showed the reliability and the reproducibility of the nonlinear sEMG variables of the masticatory muscles in adults with DS. These measures will give confidence to professionals perform studies on masticatory muscles behavior (e.g. sleep and awake bruxism), as well as evaluate the results of treatment, with high confidence, in this population. In addition, it will be useful to choose the best therapeutic approach in DS individuals.

**ID: 637**

### Clinical Studies

#### Obstructive Sleep Apnea is Associated with Higher Left Ventricle Hypertrophy Frequency in Patients with Resistant Hypertension

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**Introduction:** Obstructive Sleep Apnea (OSA) is common in patients with hypertension, especially in those with Resistant Hypertension (RH). However, it is unclear whether OSA can contribute to target-organ damage (TOD) in patients with non-resistant hypertension (NRH) and in patients with RH. **Aim:** To compare the presence of left ventricular hypertrophy (LVH), one of the major TOD, in patients with NRH and RH according to the presence of OSA. **Methods:** We recruited consecutive cases of adult patients with NRH and RH (as defined by standardized criteria) from our Hypertension outpatient unit. To avoid potential confounders, we excluded patients with diabetes, smokers or significant chronic

kidney disease (estimated glomerular filtration rate <45 mL/min). All patients underwent sleep monitoring with portable sleep monitor (Embletta Gold®) for the diagnosis of OSA. We defined OSA by an apnea-hypopnea index (AHI)  $\geq 15$  events / hour. The patients also performed other procedures including office blood pressure (BP), ambulatory BP monitoring (ABPM) and transthoracic echocardiography. After performing the proposed procedures, the patients were divided into four groups: patients with NRH without OSA (NRH-OSA); patients with NRH with OSA (NRH+OSA); patients with RH without OSA (RH-OSA) and patients with RH with OSA (RH+OSA). All analyses were performed without previous access to OSA and RH status. We compared the BP and echocardiograph data using analysis of variance (ANOVA). **Results:** We initially screened 248 patients. So far, 50 subjects (mean age:  $54 \pm 8$  years old, 60% female, body mass index:  $29.8 \pm 4.0$  kg/m<sup>2</sup>) were included in the analysis. As expected, patients with RH took more anti-hypertensive medications than NRH but no significant differences were observed in patients with and without OSA. In patients with RH (n=24), the presence of OSA (58%) was associated with a strong tendency towards a higher frequency of LVH (RH+OSA: 92% vs. RH-OSA: 50%,  $p=0.05$ ). This finding was not observed in patients with NRH (NRH+OSA: 31% vs. NRH-OSA: 33%,  $p=1.00$ ). Data from office BP measurements and ABPM did not show significant differences in patients with and without OSA regardless of RH status. **Conclusions:** Our preliminary data suggest that the presence of OSA may contribute to higher cardiac remodeling in patients with RH.

**ID: 638**

### Clinical Studies

#### Quebec Sleep Questionnaire: Reliability of the Brazilian Version of a Specific Quality-of-life Instrument for Obstructive Sleep Apnea

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**Introduction:** Obstructive Sleep Apnea (OSA) is a highly prevalent disease and is associated with significant impact on patient's quality of life (QOL). As such, reliable and valid instruments for the assessment of QOL in OSA are necessary. The Quebec Sleep Questionnaire — QSQ — is the only instrument adapted to Brazilian Portuguese for the measurement of QOL in OSA patients. **Aim:**

To scrutinize the reliability properties of the Brazilian version of the QSQ — specific health-related quality of life instrument for OSA. **Methods:** This is a cross-sectional study that included 125 OSA patients (AHI  $\geq 5$ ) in whom QOL was measured by using the Brazilian version of the QSQ. Reliability was assessed by item-to-total correlation (the correlation of the item to the domain summated score) and by internal consistency with Cronbach's alpha. Finally, a sub-sample (n=26) was used for the analysis of test-retest stability. **Results:** The item-to-total analysis demonstrated good correlation between all the items and the scores of their related domains. Item 25 “loud snoring” and the domain “nocturnal symptoms” demonstrated the lowest correlation (Pearson's  $r$  0.53;  $p < 0.001$ ) whilst “daily symptoms” domain and the item 17 “feeling decreased energy” presented the highest correlation (Pearson's  $r = 0.89$ ;  $p < 0.001$ ). Global internal consistency was excellent (Cronbach's alpha 0.95) and internal consistency within each domain ranged from 0.67 for “social interaction” to 0.93 from “diurnal symptoms”. Test-retest intraclass correlation coefficients for each domain were: daytime sleepiness, ICC = 0.86; diurnal symptoms, ICC= 0.86; nocturnal symptoms, ICC=0.81; social interactions, ICC=0.74; and emotions, ICC=0.55. **Conclusions:** The research provided evidence for the reliability of the Brazilian Version of the QSQ. Additional studies will be needed in order to assess the validity of the instrument.

**ID: 641**

### Clinical Studies

#### Clinical profile of a type 1 narcoleptic population from a Brazilian tertiary outpatient clinic

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**Introduction:** Narcolepsy type 1 is a rare pleomorphic disease with generally difficult and late diagnosis, especially in emerging countries. We present a clinical profile of a sample of type 1 narcoleptic patients from a large Brazilian center and its peculiarities. **Aim:** Our purposes were to identify general clinical aspects of our Brazilian narcolepsy patients and to evaluate the sleep quality of our narcoleptic patients, in addition to determine the severity of the narcoleptic symptoms. Secondly we aimed to characterize the treatment in use (anticatapletics and stimulants). **Methods:** Physical examination and evaluation of the medical records of 51 patients with a established diagnosis of type 1 narcolepsy. Also we applied clinical sleep scales: Epworth Sleepiness Scale (ESS), Pittsburgh

Sleep Quality Index (PSQI) and Narcolepsy Severity Scale (NSS). **Results:** The majority (58,8%) of the patients was female. The mean age at the time of the evaluation was  $36.74 \pm 12.48$ , and the mean age at the beginning of follow-up in our service was  $32.87 \pm 12.45$ . Mean ESS was  $15.7 + 5.4$ , PSQI  $11.76 + 4.17$  and NSS  $33.92 + 11.32$ . Despite an unfavorable treatment profile, with only 31.4% using both stimulant and anti-cataplectic antidepressant, the severity of the patients was not directly correlated with the use of medications or not. We observed high index of overweight 27.3% and obesity 56.8%, with the mean body mass index (BMI) of  $32.87 + 12.34$  and abdominal circumference  $98.3 + 18.89$ . There was a correlation of BMI with the PSQI (Pearson 0.384), but there was no correlation with ESS (Pearson 0.008) and NSS (Pearson 0.056). Of our patients, 56.9% experienced bad dreams or nightmares more than once a week. **Conclusions:** Our observed narcolepsy population presents clinical severity higher than that found in the literature, but not directly related to the therapeutic regimen in use. We observed a high rate of overweight and obesity correlated with general bad sleep quality. Oniric symptoms were more frequent in narcoleptic patients than general population in our study.

**ID: 642**

### Basic Research

#### Effect of exercise and pramipexol on gene expression of proteins associated with restless legs syndrome in shr rats

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**Introduction:** Restless Leg Syndrome (RLS) is a sleep-related movement disorder characterized by an uncontrollable desire to move the body (legs) to relieve uncomfortable sensations. Changes in dopaminergic transmission, as well as variations in PTPRD (Protein Tyrosine Phosphatase Receptor Type Delta) gene expression may be associated with RLS. Its treatment may be pharmacological or non-pharmacological. **Aim:** This study aims to characterize PTPRD gene expression in SHR (Spontaneously Hypertensive Rats) animals; to compare PTPRD, dopamine transporter (DAT), tyrosine hydroxylase enzyme (TH) and dopaminergic receptor (DA-2) gene expression between Wistar-Kyoto and SHR rats (control), and to verify the influence of pramipexole (PPX) and physical exercise (PE) treatment on gene expression of these proteins in SHR animals. **Methods:** The rats were distributed in 5 groups: 1) Standard control (Wistar-

Kyoto); 2) Control - CTRL (SHR); 3) SHR PE; 4) SHR PE + PPX; 5) SHR PPX. The treatment of control group and PE group consisted of saline vehicle. PE + PPX and PPX groups received a dose of 0.125 mg / kg. The PE was performed on a treadmill, with 5 sessions per week lasting 1h (moderate intensity). The intervention lasted 4 weeks. Gene expression analyzes were performed on the striatum by qPCR. Data were analyzed by Statistica software. The effect size was calculated using the Hedges g formula. **Results:** The results of the PTPRD gene characterization, although not significant, showed that SHR CTRL animals demonstrated to express lower levels of transcript of this gene compared to Wistar-Kyoto group. Regarding the comparison of the other genes between the SHR CTRL and Wistar-Kyoto groups, it was observed that the SHR CTRL animals showed a significantly lower reduction ( $p = 0.05$ ) in the DAT gene expression. In addition, it was observed that the SHR PE + PPX group showed a tendency ( $p = 0.07$ ;  $g = 0.75$ ) of higher TH gene expression compared to the SHR PPX group. Although not statistically significant, the SHR PE + PPX ( $g = 0.25$ ) and SHR PPX ( $g = 0.25$ ) groups showed increased PTPRD gene expression, while the SHR PPX ( $g = 0.5$ ) group showed increased levels of DAT gene expression. **Conclusions:** It is suggested that reduced levels of PTPRD gene transcripts in SHR animals may be associated with RLS. In addition, PE in combination with PPX, as well as PPX alone, suggest to increase levels of SPI-related protein gene expression.

**ID: 643**

### Case Reports

#### Sleep extension, performance and heart autonomic modulation: brazilian paralympic athlete, world record holder

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**Introduction:** In high performance sports, frequent exposure to high intensity training programs and competitions increases the need for recovery and therefore may increase the overall sleep demand and affect physiological adaptations. **Aim:** Considering the growing body of evidence suggesting that sleep extension may aid improvements in reaction time and overall assessments of physical and mental well-being, the aim of the study was to analyze the effect of sleep extension (25% of total bed time). On performance parameters and cardiac autonomic modulation of the Brazilian swimmer, visually impaired (S13), world record holder and medalist at Parapan-Americans of Lima, in 2019. **Methods:** Data collection

was performed at the Brazilian Paralympic Center. The actigraphy (10 days baseline and 7 days extension), was used for sleep analysis, considering total sleep time, latency, efficiency and awake period after sleep onset (WASO). The sleepiness questionnaires (Epworth and Karolinska) and the sleep quality questionnaire (Pittsburgh-PSQI) were applied. Autonomic modulation analysis was performed from the beat-to-beat photoplethysmography record and the performance analysis (50 meters at maximum speed) considering the total time at 50m and the reaction time. **Results:** The results indicated that the athlete had a positive PSQI score (7) and had a sleep extension of 28% of total bed time. In addition, at sleep extension there was a reduction in sleep latency (12%), WASO (30%) and an increase in sleep efficiency (7.4%). Regarding sleepiness, the scores were lower during the period of sleep extension (Epworth: basal (8); extension (7) and Karolinska: basal (2); extension (1). Considering performance results and modulation variables, in the sleep extension period, there was an increase in RR pulse interval (5.4%), as well as a reduction in sympathetic modulation (LF - 54.4%) and sympathovagal balance (LF / HF). 86.85%). No changes in blood pressure variability and total reaction time were identified. **Conclusions:** In this context, the results suggest that sleep extension had positive aspects in sleep and autonomic modulation variables, not indicating changes in time of total reaction.

**ID: 646**

### Clinical Studies

#### Adaptation of the use of actigraphy for the study of the sleep-wake cycle in undergraduate medicine students: a pilot study

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**Introduction:** Actigraphy is a diagnostic method to evaluate disturbances in the sleep-wake cycle. It provides data about sleep in the natural environment of an individual through the parameters: subjective latency of night sleep, time of onset and ending, WASO (Wake After Sleep Onset), number of night awakenings, total time in bed in minutes, total time of night sleep in minutes and sleep efficiency. It's done through an accelerometer called actigraph. Sleep-wake cycle alterations common in individuals who are exposed to stressful situations, such as medical students, a group subject to physical and/or mental disturbances, may be measured through

actigraphy. This work is a pilot study that aims to adequate instruments and procedures used in the full study. **Aim:** to execute a pilot study, through actigraphy, in order to optimize the collection and registering of data. **Methods:** The study was submitted and approved by the Committee of Ethics and Research. From the list of students enrolled from the 1st to the 12th semesters, 50 students were randomly drawn and invited, by e-mail, to take part in the research and were communicated about the procedures to schedule a visit to wear the actigraph. In the scheduled date, the participants received the necessary instructions and were notified to take notes of complications or of the need to remove the device before the scheduled hour. The actigraph was to be worn for 7 days. **Results:** No replies were obtained from the invitations sent by e-mail, so it was necessary to invite presentially with nominal listing of interested subjects. The main difficulty was the absence of recorded data. From the total sample (50), we did not obtain data from 14 participants (28%). Norms of use by the manufacturer were followed. This impasse engendered an adaptation in the aforementioned norms for this study, namely the sequential deactivation and reactivation of the software in subsequent placements. **Conclusions:** we realized that an additional phase is necessary, based on the frequency in which the actigraph was used in this pilot study involving multiple volunteers in a sequentially. This additional phase is not necessary when the evaluation is done less frequently. The adaptations made will be useful in the definitive data collection (in the full study). Considering that Medical school is highly demanding, the sleep evaluation done in the full study will be able to guide and aid these future health professionals.

**ID: 647**

### Clinical Studies

#### Sleep-wake cycle in newborns monitored with amplitude integrated electroencephalography

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**Introduction:** The incidence of impaired outcomes in

neonates at high risk for brain injury is high and represents a challenge in neonatal care. Amplitude-integrated electroencephalography (aEEG) consists in a non-invasive, bedside and simplified method of continuous brain monitoring, which is used to access brain function in NICU. Sleep-wake cycle (SWC) is a marker for neurological development and the onset helps to determine a prognostic factor in newborn. Precise evaluation and early diagnosis of brain injury plays is important to prevent neurological impairment, and the brain monitoring with aEEG can give information about neurological status and prognosis. Data from SWC in wide groups of infants is still scarce. **Aim:** To describe the indication of brain monitoring using aEEG and to identify SWC in newborns at high risk for brain injury. **Methods:** We analyzed the database from a private company that works with remote and centralized brain monitoring using aEEG in 20 hospitals in Brazil. Monitored infants from July 2017 up to June 2019 were included in this study. We identified SWC and classified it into present or absent. The indications for brain monitoring with aEEG were identified and SWC was analyzed in each group of indication. Statistical analysis was descriptive, and data was presented according to absolute and relative frequency. **Results:** A total of 1639 patients were analyzed, 59% were male and 67% were caesarean section. According to the indication for brain monitoring, was found 335 (20%) of suspected seizure, 274(17%) of asphyxia + therapeutic hypothermia(TH), 166(10%) of previous seizure, 142(9%) of neonatal anoxia, 127(8%) extreme prematurity, 115(7%) asphyxia >35weeks, 91(6%) congenital heart disease(CHD), and 389(24%) of other 28 different indications. The SWC was present in 774(47,2%) of the total of newborns, being 160(47,8%) of newborns with suspected seizure, 129(47,1%) asphyxia + TH, 69(41,6%) previous seizure, 90(63,4%) neonatal anoxia, 36(28,3%) extreme prematurity, 67(58,3%) asphyxia >35weeks, 16(17,6%) CHD, and 207(53,2%) other indications. **Conclusions:** Absence of SWC was common in the population, as we found presence of SWC in less than 50% of newborns, and this varied according to the clinical condition. The group of extreme prematurity and CHD showed the major absence of SWC. Brain monitoring allows real time access to the brain function and SWC, which may be related with neurodevelopmental outcomes.

**ID: 649**

### Clinical Studies

**The domains of physical activity are not able to predict sleep quality in older adults with low back pain: A longitudinal study**

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**Introduction:** For healthy aging, the regular practice of physical activity has been indicated as it generates further health benefits. However, it is unknown in a single cohort if physical activity domains can predict improvement in sleep quality and clinical outcomes in the elderly with low back pain. **Aim:** To verify the predictive ability of physical activity domains on sleep quality in older adults with low back pain. **Methods:** Older adults with low back pain were recruited and assessed through a home interview at baseline and after 6 months. This was a longitudinal study with a 6-month follow-up. Multivariate linear regression analyses were performed to verify whether the levels of physical activity in leisure time, sports and household tasks, measured by the Baecke Physical Activity Questionnaire Modified for the Elderly, predict an improvement on sleep quality at 6 months follow-up. The analysis was adjusted by the following covariates: age, gender, body mass index (BMI), mental state, depression, comorbidities, and somnolence. **Results:** A total sample of 231 older adults with low back pain were included, between March 2017 and December 2018, consisting of 177 (76.6%) women, mean age of 71 years. Final regression models showed no evidence of association between the domains of baseline physical activity with sleep quality at 6 months follow-up, domestic, sports, and leisure. **Conclusions:** Our findings suggest that the different domains of physical activity do not influence the sleep quality in older adults with low back pain at 6 months follow-up.

**ID: 650**

### Clinical Studies

**Newborns undergoing therapeutic hypothermia: a relationship between sleep-wake cycle, amplitude-integrated electroencephalography background activity and seizures**

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**Introduction:** Hypoxic-ischemic encephalopathy (HIE) affects 3 to 20/1000 live births and is an important cause of neonatal mortality and morbidity. Therapeutic hypothermia (TH) is a standard therapy for newborns with HIE, showing reduction of mortality and major neurodevelopmental disability. Amplitude integrated electroencephalography (aEEG) provides continuous observation of brain activity and allows the assessment of brain injury and adverse outcomes. Sleep-wake cycle (SWC) is considered a marker for neurological wellbeing and the onset on aEEG is important to determine a prognosis. **Aim:** To identify the SWC and to describe the association with aEEG background activity and presence of seizures in newborns undergoing TH. **Methods:** We analyzed the database from a private company that works with brain monitoring of newborns with aEEG at 20 hospitals in Brazil. Newborns undergoing TH from July 2017 up to June 2019 were included in this study. SWC was categorized as present or absent, aEEG background activity was categorized as pathological and non-pathological, and seizure activity was categorized as present or absent. We observed the association between the SWC and aEEG background activity, and the association between the SWC and seizures. Data will be presented according to absolute and relative frequency. **Results:** 274 patients were included in this study, 164(59,8%) were male and 138(50,4%) were born by caesarean section. SWC was present in 129(47%) of monitored infants. Pathological aEEG background activity was shown in 110(40,1%), and 95(34,7%) had the presence of seizures. The majority (76; 80%) of seizures were subclinical, 15(15,8%) were clinical and 4(4,1%) were clinical + subclinical. In newborns with SWC absent, pathological aEEG background activity was identified in 90(62%). In contrast, when the SWC was present, pathological aEEG background activity was shown in only 20(16%) of newborns. Seizures were present in 57(39%) when SWC was absent, but seizures were present in 38(29%) when the SWC was present. **Conclusions:** More than half of newborns at high risk for brain injury had SWC absent. The importance of brain monitoring was demonstrated since most diagnosed seizures were subclinical and detected only because of aEEG monitoring. Absence of SWC was more common in newborns with pathological aEEG background activity or seizures. Newborns with abnormal aEEG and seizures have alteration in the SWC.

**ID: 652**

## Clinical Studies

### Can sleep quality be associated with falls in older adults? A cross-sectional study

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**Introduction:** Falls in older people is a public health problem that impacts the functionality of this population. It is still not clear in the literature whether poor sleep quality constitutes as a risk factor for falls in older adults. **Aim:** To investigate whether sleep quality is a risk factor for falls in the elderly. **Methods:** The participants were interviewed at home. Only individuals over 60 years old and who had good cognition were included. The sleep quality was assessed by the Pittsburg Sleep Quality Index Questionnaires and the Center for Epidemiologic Studies Depression scale (CES-D) was applied to assess depression. Participants reported the presence or absence of falls in the past year. Anthropometric and demographic variables were also obtained. **Results:** The final sample of this study included 513 participants. Among them, 324 (63%) reported falls after 60 years and 183 (35.6%) fell in the last year. According to the logistic regression analysis, older people who have poorer sleep quality are 8% more likely to have a fall in the last year. Age also contributed to falls. Every 1 year of age, the chance of a fall increased by 3%. **Conclusions:** Poor sleep quality was a risk factor for falls in the elderly, even after controlling for covariates. Therefore, health professionals need to be aware of the sleep quality of their patients over 60 years. Sleep assessment should be included in their conducts, as sleep impairment can negatively impact, not only the quality of life, but also contribute to falls, generating even more spending for the public health system.

**ID: 653**

## Case Reports

### Anti-IgLON5 subclass IgG1 disease: case report

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**Introduction:** A number of autoantibodies are recently being associated with sleep disorders. In the last 5 years, cases of a novel tauopathy associated with IgLON5 antibodies are being recognized in patients with obstructive sleep apnea, stridor, REM sleep disorders, bulbar symptoms and dysautonomia. Anti-IgLON5 subclass IgG1 and IgG4 are related to the disease, but its phenotype differences are not known yet. **Aim:** To report a case of Anti-IgLON5 disease with the less common subclass IgG1 antibody. **Methods:** Several clinical evaluations and follow-up of the patient. **Results:** A 75-year-old man reported insomnia since 40 years old, followed later by snoring, and sleep fragmentation, being diagnosed at age of 68 with moderate obstructive sleep apnea (OSA). He presented severe symptomatic bradycardia, so it was implanted a permanent pacemaker. By 70 years, the patient evolved with progressive dysphagia, dysarthria and nocturnal laryngeal stridor. Otorhinolaryngological evaluation showed vocal cord paralysis. After recurrent pneumonia, he was submitted to tracheostomy that occurred with laryngeal stenosis, treated with serial dilations without improvement and later laryngectomy. He also refers symptoms of restless legs syndrome, REM sleep behavioral disorder (RBD), sleep talking, and nocturnal myoclonus. No cognitive impairment or extrapyramidal symptoms. From the diagnostic suspicion, we investigated and demonstrated HLA-DRB1\* and HLA-DQB1\* in homozygosis and CSF analysis with anti-IgLON5 subclass IgG1. Head CT without significant abnormalities, polysomnography with low sleep efficiency, poor structured NREM sleep, severe OSA, PLMS, and REM sleep without atonia. CPAP was titrated and initiated to OSA control and clonazepam 0.5mg for RBD with good response. Submitted to 3 immunoglobulin cycles without clinical improvement. Evolved with ophthalmoplegia. We prescribed rituximab and the patient responded with good tolerance and had mild improvement of visual symptoms. **Conclusions:** Anti-IgLON5 disease is a rare sleep condition, which may develop sleep disordered breath, bulbar symptoms, dysautonomia and gaze palsy. It is not known yet whether subclass IgG1 and IgG4 antibodies lead to clinical different diseases.

**ID: 654**

## Case Reports

### Oral Appliance Dental Side Effects in Severe Obstructive Sleep Apnea – A Case report

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**Introduction:** Oral Appliance (OA) as a clinical

management of Obstructive Sleep Apnea (OSA) is shown to present better efficacy in mild to moderate patients. The last clinical practice guidelines recommend that sleep physicians prescribe OA for adult patients who are intolerant of CPAP therapy or prefer alternate therapy. OA treatment can present some dental side effects, mainly through prolonged use. Since it is a long-term treatment, it is mandatory to follow-up patients in terms of treatment efficacy and side effects. **Aim:** Report a case of severe OSA patient successfully treated with OA, and the long-term follow-up on dental side effects. **Methods:** MFS, 46 y. O., male, with complaints of snoring and excessive daytime sleepiness (EDS) was indicated for OA treatment. **Results:** On baseline polysomnography (PSG), AHI was 56.7 events/hour and total sleep time (TST) with oxyhemoglobin below 90% was 3.6%. PSG with CPAP (8cm H2O) shown efficacy (AHI=4.7 events/hour) and 0.7% of the TST with oxyhemoglobin below 90%, but he did not adapt to CPAP. He presented atresic hard palate, dental crowding and gyroversions, midline deviation, dental Class II, skeletal Class II, grade IV Mallampati, grade I tonsils and absence of septal deviations. Patient was submitted to an orthodontic radiographic and photographic documentation. From a total mandibular range of 14 mm, the OA was started with 4 mm and titrated until 9 mm, with the improvement of snoring and EDS. A PSG performed with OA shown AHI of 0.5 events/hour and no desaturation and no more snore complaints. After one year of OA, the patient was keeping the successful results, but he presented the first side effects: an increase in mesialization of lower premolars. After three years of use, he presented posterior bite opening, and four years later, more evident vestibularization of the lower incisors and lingualization of the upper incisors. Despite dento-occlusal alterations, the patient did not present functional and/or aesthetic complaints and was satisfied with the treatment results. **Conclusions:** OA is an alternative treatment to severe OSA in patients who did not accept CPAP. Despite the dental side effects observed, the success of the treatment prevailed in the decision of continuity by the patient.

**ID: 655**

## Clinical Studies

### Rhythmic masticatory muscle activity (RMMA) index does not decrease with age, conversely to self reports of sleep bruxism: data from sleep laboratories of 3 continents

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**Introduction:** Prevalence of Sleep bruxism (SB) self-report decrease with age. There are no studies assessing prevalence of rhythmic masticatory muscle activity index (RMMA)/hr, one of the SB biomarker scored on PSG. We hypothesize the RMMA index will follow the same trajectory as self-reports. **Aim:** Describe the RMMA prevalence according to age in clinical and epidemiological populations of three sleep laboratories. **Methods:** Retrospective analyses of PSG-RMMA sleep laboratory data were collected in 3 centers (Montreal, Canada; Osaka, Japan; Sao Paulo, Brazil). SB subjects (18-70 y. O.) were recruited: for experimental-physiological studies (Montreal, Osaka (M&O sample)), and from a general representative population sample (Sao Paulo-EPISONO study (SP sample)). The n was 428 subjects: 159 SB and 169 controls. PSG data from second night in M&O sample and first night in SP sample were analyzed. RMMA episodes were scored based on AASM criteria. Distribution of RMMA/h, below/over 40 yo. were analyzed with linear regression according to cut off index ( $<$  and  $\Rightarrow$  2/hr) for control and SB subjects. Analyses were done: with clinical diagnosis (+ tooth grinding history & PSG) and only with PSG cut off RMMA index. **Results:** Data from M&O sample revealed decrease in RMMA index prevailing in subjects below 40 yo. with the Pearson analysis for SB subjects ( $R^2=0.048$ ,  $p=0.015$ ; explaining 4.8% of variability) and with a decrease Spearman for both controls and SB subjects ( $Rho=-0.249$ ,  $p=0.009$ ;  $Rho=-0.193$ ,  $p=0.03$ ). The overall age analysis did not reveal any global decrease in RMMA index for either control and SB subjects with Pearson analysis, although a significant but marginal decrease with Spearman for controls only was seen ( $Rho=-0.287$ ,  $p<0.001$ ). Taking in consideration the PSG RMMA index cut-off alone,  $< 2$  or  $\Rightarrow 2$ : - In the M&O sample, a mild drop in RMMA index for all ages for the  $< 2$  group was significant ( $R^2=0.085$ ,  $p<0.001$ ;  $Rho:-0.34$ ,  $p<0.001$ ), which explains 8.5% of variability in RMMA index drop (0.8 to 0.3 RMMA/h from 20 to 60 yo.). This effect was again positioned in the group below 40 yo. ( $Rho=-0.264$ ,  $p=0.01$ ). With the RMMA/hr  $\Rightarrow 2$ , a nonsignificant rise (4.5 to 6.0 RMMA/h) was noted between 20 and 60 yo. without age effect. - In the SP sample, the RMMA index  $< 2$  also did not reach significant value; with the RMMA episode/hr  $\Rightarrow 2$ , a nonsignificant 35% rise (+1.7 RMMA/h) between 20 and 70 yo. was noted. **Conclusions:** Contrary to the decrease of SB self-reports with aging, the PSG-RMMA index remained relatively stable over ages. It remains to be investigated if presence of critical sleep conditions, e.g, insomnia and apnea, influence or bias how patient respond to SB self-report surveys.

**ID: 656**

## Case Reports

### Speech Therapy Performance in OSAS Patients and the Contribution to CPAP Beginners Use

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**Introduction:** A person with OSAS obstructive Sleep Apnea Syndrome usually comes to the office complaining of snoring, choking and frequent waking up with breathlessness and excessive tiredness during the day. And we know that most patients who are referred for CPAP ContinuousPositiveAirwayPressure use have poor performance and adherence. Speech therapy is necessary to adapt the breathing posture training for the physiological and functional strengthening of organs of the oro pharyngeal region and speech therapy intervention in mouth breathing syndrome and temporomandibular disorders which influence the use of CPAP. The speech therapy work was essential to the success of the treatment. **Aim:** The adequate therapeutic effect on OSAS and adherence to CPAP use, was the objective in this case study. **Methods:** 60 year old patient; BMI:23,2; Women. Complaint:Frequent headaches; strong snores; daytime tiredness. Speech Therapy exercises for the adaptation of aero-dynamic forces; myofunctional exercises; nasal breathing training using nasal mask and CPAP therapy to adjust pressure level in 7-10cmH<sub>2</sub>O was defined on titration polysomnography and is the pressure needed to supply sleep apnea. Monitoring the results of CPAP use for 30 days; 3 months and 6 months. The patient was instructed to maintain the same spontaneous breathing rhythm avoiding trying to follow the CPAP rhythm. Relaxation and the use of habitual breathing reassures the patient and avoids discomfort and shortness of breath. **Results:** Already after the 10 sessions of speech therapy, she was able to use CPAP. Comparing the exam rates we have: Polysomnography1: AHI:58,5 events per hour; Polysomnography2 with CPAP: AHI: 16,2 events per hour; Treatment Compliance Report 90 days: AHI:1,1 events per hour. Guidelines on sleep hygiene + CPAP use was important to get positive results to snoring. During the treatment the patient showed satisfaction with the results. **Conclusions:** Comparing the polysomnography exams it can be seen that the apnea and hypopnea index using CPAP decreases but still maintains a moderate level change in AHI 16,2 events per hour. Concluding that through speech therapy sleep monitoring we achieved treatment success as found in the treatment compliance report demonstrating an AHI 1,1 events per hour. Effective treatment and adherence to CPAP requires myofunctional therapy follow-up and monitoring. The adaptation to CPAP and the fall in apnea and hipopnea events return the patient to health and disposition daily.

ID: 658

## Clinical Studies

**Effect of a high-protein meal during a night shift on food perceptions and dietary intake the following day according to chronotype: a randomized crossover study**

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**Introduction:** Nutritional strategies are needed to promote healthy food choices and thus avoid weight gain in night workers. These strategies should consider chronotype - a variable associated with food choices of different populations. However, this subject is little explored among shift workers. **Aim:** The aim of this study was to compare the acute effect of a high-protein (HP) versus normal protein (NP) meal served at night on the food perceptions and consumption the following day in shift workers with different chronotype. **Methods:** The study was conducted with 14 male nurses. After being followed-up for 7 days before each night intervention in relation to eating and sleeping habits, participants underwent two different isocaloric dietary conditions at 1:00 h of the night shift, with a 6-day washout period between them: high-protein meal containing 45% carbohydrate, 35% protein and 20% fat; and normal protein meal containing 65% carbohydrate, 15% protein and 20% fat. Participants consumed a standardized breakfast with high carbohydrate content. After that, they answered a food register including food perception data of all food consumed at the moment and the following day of each condition. Chronotype was calculated using the time of midsleep time adjusted for sleep debt. Generalized estimating equations analyses were used to examine the effect of each meal test on food perception and consumption of energy and macronutrients. **Results:** Evening types enjoyed NP meal more than HP meal (9.37 versus 7.75, respectively;  $p=0.025$ ), and more than morning chronotype (9.37 versus 6.77, respectively;  $p=0.004$ ). For evening types, satiety was better after NP meal compared to HP meal (8.50 versus 6.75, respectively;  $p=0.032$ ). For standardized breakfast, evening types enjoyed more the meal served after HP meal compared NP meal intervention (8.25 versus 7.25, respectively;  $p=0.009$ ). Evening types presented a higher percentage of fat consumption after HP meal than after NP meal (32.4% versus 18.5%, respectively;  $p<0.001$ ). **Conclusions:** Different meal composition consumed at night influences the food consumption and perception the following day in shift workers of different chronotypes. This study was supported by FAPEMIG and CNPq.

ID: 659

## Clinical Studies

**Obstructive sleep apnea syndrome prior to stroke: a risk stratification study**

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**Introduction:** The prevalence of obstructive sleep apnea syndrome (OSAS) in the general population is 3-7%, while the prevalence of OSAS in patients who have had stroke is 30 to 70%. Since stroke affects 16.9 million people each year and is the second leading cause of death worldwide, prevention of its risk factors such as systemic arterial hypertension is important. Since OSAS is an under diagnosed risk factor for stroke and an independent risk factor for hypertension, which increases the risk for stroke by 3 to 4 times, the aim of this study was to apply validated scales in the literature for OSAS screening. **Aim:** To evaluate the presence of OSAS through the STOP-BANG and SOS score questionnaires in patients with ischemic stroke. **Methods:** Cross-sectional study. The study population consisted of individuals over 18 years of age, after acute stroke in the Hospital Nossa Senhora da Conceição, from September 2018 to February 2019 in the city of Tubarão - SC. Data were obtained through the application of STOP-Bang and SOS score scales, and a questionnaire on socio-demographic profile prepared by the researchers was also applied. In addition, the area affected by stroke was evaluated through the first imaging exam performed after the patient's admission to the hospital. **Results:** 50 patients participated in this study and what could be observed was that the prevalence of OSAS risk by SOS score was 80%. According to the STOP-Bang scale, 70% of the patients were classified as high risk and 24% as intermediate risk. The percentage of men who were at high risk for OSAS by the SOS score was 17.8% and women 22.7%. On the STOP-Bang scale, 85.7% for males and 50% for females for OSAS risk. The relationship between systemic arterial hypertension (HAS) and risk of sleep apnea was high on both scales. **Conclusions:** It was concluded that the studied population had a high risk of OSAS assessed by STOP-Bang and SOS score and the association between OSAS and HAS was frequent, showing a high prevalence of hypertension in the studied population.

ID: 660

## Basic Research

**Health perception, musculoskeletal pain and insomnia in motorcycle taxi drivers from Rio Branco, Acre**

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**Introduction:** Background: Research has found evidence of association between pain and insomnia. Motorcycle taxi drivers are workers susceptible to musculoskeletal pain and commonly report sleep impairment, difficulty sleeping or insomnia. **Aim:** Objective: To evaluate the association between health perception, musculoskeletal pain and insomnia in motorcycle taxi drivers from Rio Branco, Acre. **Methods:** Methods: Cross-sectional study with 296 male motorcycle taxi drivers from Rio Branco, Acre. The variables were obtained by applying structured questionnaires. The insomnia report was investigated by the question “Do you often have insomnia or difficulty sleeping?”, from health perception “How do you rate your health?”. The Nordic Musculoskeletal Questionnaire was used to survey musculoskeletal pain for the last 7 days. Prevalence and prevalence ratios were calculated at a significance level of 5%. **Results:** Results: The motorcycle taxi drivers had mean age of 39.4 years (SD 8.2, min.19, max.60), working average of 63.2 hours per week, 60% and 30% working 6 and 7 days a week, respectively. Among the sample, 9.5% were smokers, 23.3% consumed alcohol, 37.5% were sedentary and 83.8% were overweight or obese. Still, 48% reported poor perception of health, 42.5% reported presence of musculoskeletal pain in the last 7 days and 22% reported having insomnia or difficulty sleeping. Among motorcycle taxi drivers with insomnia, 29.0% were unsatisfied with their health and 28.6% reported musculoskeletal pain. Unsatisfied motorcycle taxi drivers were 1.9 times ( $p = 0.013$ ) more likely to report insomnia when compared to those who reported health satisfaction. Similarly, those who reported musculoskeletal pain were 1.67 times ( $p = 0.039$ ) more likely to report insomnia when compared to those who did not report pain. In assessing the association of musculoskeletal pain by body region, motorcycle taxi drivers with wrist / hand pain were more likely to have insomnia (RP = 1.94,  $p = 0.044$ ). **Conclusions:** Conclusion: The perception of health satisfaction and the presence of musculoskeletal pain was associated with insomnia in motorcycle taxi drivers in Rio Branco, Acre. Health promotion actions should be applied to this group of workers in order to improve sleep quality by reducing insomnia.

**ID: 661**

## Clinical Studies

### The relation of the sleep-wake cycle with amplitude-integrated electroencephalography background activity and seizures in newborns

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**Introduction:** The incidence of impaired outcomes in newborns at high risk for brain injury is high. Amplitude-integrated electroencephalography (aEEG) is a non-invasive, bedside and simplified method for brain monitoring to access brain function, presence of seizures and sleep-wake cycle (SWC). The presence of SWC is associated with a better prognosis for babies, this involves endogenous brain activity and has impact on cognitive, psychomotor and behavioral development. **Aim:** To describe SWC with aEEG background activity and presence of seizures in newborns. **Methods:** Retrospective and descriptive analysis of the database of a private company that works with brain monitoring of newborns with aEEG at 20 hospitals in Brazil. All monitored newborns from July 2017 up to June 2019 were included in this study. SWC was categorized as present or absent, aEEG background activity was classified as pathological and non-pathological, and the seizure was categorized as present or absent. We described the concomitant occurrence of SWC and aEEG background activity, and concomitant occurrence of SWC and seizures. The data was presented according to absolute and relative frequency. **Results:** In this study were included 1,639 newborns. SWC was present in 774(47.2%) newborns. The pathological aEEG background activity was shown in 442(27%), and 376(23%) had the presence of seizures. Almost the totality (276; 73.4%) of seizures were subclinical, 74(19.7%) clinical and 29(7.7%) clinical + subclinical. In newborns with SWC absent (865; 52.8%) aEEG pathological background activity was shown in 378(43.7%). However, in the pathological aEEG background activity was shown only in 64(8.3%) when the SWC was present. At the absence of SWC, 244(28.2%) of the newborns had the presence of seizures, but when the SWC was present, 641(82.8%) did not have seizures. There was a difference of the aEEG background activity between newborns with and without SWC. Seizures were more common when SWC was absent. Newborns with brain dysfunction had alteration in SWC. **Conclusions:** More than half of newborns at high risk for brain injury had absence of SWC. The importance of brain monitoring was pointed when more than 70% of diagnosed seizures were subclinical and detected only because of aEEG monitoring, this helped to guide the

treatment and, possibly, improved the prognosis. Brain monitoring detects brain dysfunction, to screen for seizures and to assess the presence of SWC.

**ID: 665**

### Case Reports

#### Obstructive sleep apnea as a manifestation of relapsing polychondritis: case report

Fernandes, M D, Passini, V V, Lacerda, C B, Cano, T, Vasconcelos, B S, Yanagimori, M, Uneda, C B, Genta, P R, Lorenzi Filho, G

**Introduction:** Relapsing polychondritis (RP) is a rare connective tissue disease in which recurrent bouts of inflammation involve the cartilage of the ears, nose, larynx, tracheobronchial tree and cardiovascular system. The cause of RP is still unknown. It is considered an immune-mediated disease with an annual incidence around of 3.5 cases per million. **Aim:** We report a 22 year-old woman complaining of snoring and nocturnal stridor associated with occasional awakenings and daytime sleepiness in the last 05 months. **Methods:** The patient had a tracheal t-tube due to tracheal stenosis. Stridor and snoring started after her t-tube was changed to a shorter cannula. Oropharyngeal inspection did not show any findings suggesting the reason for her OSA: Friedman stage 2, with tonsil size grade 1 and Mallampati grade 1. Her body mass index was 18.5 kg/m<sup>2</sup>, and her awake oximetry was 98%. **Results:** Polysomnography showed an of AHI: 103.1 events per hour, associated with reduced sleep efficiency (44.3%) and a large wake after sleep onset (WASO) time: 230.5 min. A Drug Induced Sleep Endoscopy (DISE) was performed to identify the site of the obstruction. Respiratory flow was simultaneously recorded using a nasal mask attached to a pneumotachograph (see video accessing QRcode). The patient underwent a spirometry that revealed a fixed inspiratory and expiratory obstruction. A thoracic CT scan showed narrowing of the bronchial tree. During DISE, obstruction at the level of the glottis was observed. The velopharynx, oropharynx, tongue and epiglottis had a normal appearance. A fibrotic aspect of lower airway distal to the t-tube was observed. **Conclusions:** Due to the impossibility of t-tube opening during sleep, CPAP was titrated to 8cmH<sub>2</sub>O. Obstructive events were abolished (residual AHI = 4.7 events per hour). After 30 days, the patient referred important quality of sleep improvement and resolution of daytime sleepiness.

**ID: 668**

### Case Reports

#### Even when the treatment works, unknowledge is a big problem: an obesity-hypoventilation syndrome case report

Costa, C C, Athayde, R A B, Leite, I C P R, Santos, C R B, Fernandes, G S, Barreto, R T S, Carvalho, T H F

Centro Universitário Pessoaense - João Pessoa - Paraíba - Brasil

**Introduction:** Obesity Hypoventilation Syndrome (OHS) is defined as the presence of obesity (BMI  $\geq$  30 kg/m<sup>2</sup>) and daytime arterial hypercapnia (PaCO<sub>2</sub>  $\geq$  45 mmHg), in the absence of other causes of hypoventilation. One third of obese patients admitted to internal medicine services may have OHS. OHS is often neglected or misdiagnosed as other causes of hypoventilation, especially COPD. The importance of recognizing OHS is a high morbidity and mortality, if not treated. **Aim:** We report a case of OHS in which, despite previous treatment improvement, the lack of syndrome's diagnosis led to further worsening. **Methods:** Case report. **Results:** Woman, 47 years-old, admitted in the ER due to dyspnea and cough with sputum. Her husband referred a history of snoring, nocturnal gasping and daytime sleepiness. She had hypertension, was non-smoker, without previous respiratory symptoms or risk exposures. About 30 days before, presented an episode of progressive dyspnea, evolving to acute respiratory failure (ARF). In that moment, it was performed an early tracheostomy, with significant improvement and quick discharge from ICU. Nearly 9 days before, the tracheostoma was closed. She had respiratory distress and BMI = 50 kg/m<sup>2</sup> at the physical examination. A case of pneumonia was diagnosed in the ward, and antibiotics were initiated, with laboratorial improvement but clinical worsening. As it evolved to ARF, the patient then was transferred to the ICU. Previous arterial blood gas analysis presented PCO<sub>2</sub> = 52,4mmHg and Bicarbonate=29,7 mmol/L. There was a clinical and respiratory improvement just after intubation and mechanical ventilation, with PCO<sub>2</sub> = 42,5mmHg. A tracheostomy was redone and was the treatment option due to social and healthcare limitations, being stable during the follow-up at the outpatient clinic. **Conclusions:** We report an OHS case that underwent tracheostomy due to ARF. After discharge, the tracheostomy was reversed without any additional measures, which led to further worsening. The importance of identifying OHS is due to the high mortality in untreated patients. Treatment aims to normalize ventilation during sleep. In 90% of the cases, it is associated with Obstructive Sleep Apnea (OSA). Tracheostomy, the first treatment reported, is now considered a last option. The treatment of choice is the use of continuous positive airway pressure (CPAP) as it mitigates obstructive events.

**ID: 668**

### Case Reports

#### Even when the treatment works, unknowledge is a big problem: an obesity-hypoventilation syndrome case report

Costa, C C, Athayde, R A B, Leite, I C P R, Santos, C R B, Fernandes, G S, Barreto, R T S, Carvalho, T H F

Centro Universitário Pessoense - João Pessoa - Paraíba - Brasil

**Introduction:** Obesity Hypoventilation Syndrome (OHS) is defined as the presence of obesity ( $BMI \geq 30 \text{ kg/m}^2$ ) and daytime arterial hypercapnia ( $PaCO_2 \geq 45 \text{ mmHg}$ ), in the absence of other causes of hypoventilation. One third of obese patients admitted to internal medicine services may have OHS. OHS is often neglected or misdiagnosed as other causes of hypoventilation, especially COPD. The importance of recognizing OHS is a high morbidity and mortality, if not treated. **Aim:** We report a case of OHS in which, despite previous treatment improvement, the lack of syndrome's diagnosis led to further worsening. **Methods:** Case report. **Results:** Woman, 47 years-old, admitted in the ER due to dyspnea and cough with sputum. Her husband referred a history of snoring, nocturnal gasping and daytime sleepiness. She had hypertension, was non-smoker, without previous respiratory symptoms or risk exposures. About 30 days before, presented an episode of progressive dyspnea, evolving to acute respiratory failure (ARF). In that moment, it was performed an early tracheostomy, with significant improvement and quick discharge from ICU. Nearly 9 days before, the tracheostoma was closed. She had respiratory distress and  $BMI = 50 \text{ kg/m}^2$  at the physical examination. A case of pneumonia was diagnosed in the ward, and antibiotics were initiated, with laboratorial improvement but clinical worsening. As it evolved to ARF, the patient then was transferred to the ICU. Previous arterial blood gas analysis presented  $PCO_2 = 52,4 \text{ mmHg}$  and  $Bicarbonate = 29,7 \text{ mmol/L}$ . There was a clinical and respiratory improvement just after intubation and mechanical ventilation, with  $PCO_2 = 42,5 \text{ mmHg}$ . A tracheostomy was redone and was the treatment option due to social and healthcare limitations, being stable during the follow-up at the outpatient clinic. **Conclusions:** We report an OHS case that underwent tracheostomy due to ARF. After discharge, the tracheostomy was reversed without any additional measures, which led to further worsening. The importance of identifying OHS is due to the high mortality in untreated patients. Treatment aims to normalize ventilation during sleep. In 90% of the cases, it is associated with Obstructive Sleep Apnea (OSA). Tracheostomy, the first treatment reported, is now considered a last option. The treatment of choice is the use of continuous positive airway pressure (CPAP) as it mitigates obstructive events.

**ID: 669**

### Clinical Studies

## Validation of a portable monitoring system for the diagnosis of obstructive sleep apnea in

## patients with chronic obstructive pulmonary disease

de França Pereira Silva, M V, Lustosa Mattos, T C, Silva Clímaco, D C, G Couto Silva Patriota, T L, Lins-Filho, O L, Rodrigues, V K, Pereira de Oliveira Neto, L D a, Magalhães, J A, Pinho Queiroga Júnior, F J, Pedrosa, R P

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**Introduction:** Portable polysomnography (PSG) has been used to diagnose obstructive sleep apnea (OSA) in several populations. However, its use has not been validated in patients with chronic obstructive pulmonary disease (COPD) and OSA. The objective of the study was to validate portable PSG (ApneaLink plus™, ResMed, San Diego, CA, USA) for the diagnosis of OSA in patients with COPD. **Aim:** Validate portable PSG (ApneaLink plus™, ResMed, San Diego, CA, USA) for OSA diagnosis in COPD patients. **Methods:** This is a cross-sectional validation study. Patients with COPD recruited at three reference centers were simultaneously submitted to PSG and portable PSG for the diagnosis of OSA. The high risk for OSA was verified by the Berlin, NoSAS and Stop-Bang questionnaires. Sensitivity, specificity, positive predictive value and negative predictive value were calculated for the portable PSG for the 5, 15 and 30 events / hour apnea hypopnea index cut-offs (AHI), as well as for the questionnaires used. The Bland-Altman plot and correlation analysis between the PSG AHI and the portable PSG were also performed. **Results:** A total of 62 patients ( $67.5 \pm 12.5$  years, 55% men) participated in the study. The Stop-Bang questionnaire presented the highest sensitivity [94.4 (72.7 - 99.9%)] for the diagnosis of OSA among the questionnaires. The sensitivity of portable PSG decreased and specificity increased as the AHI cut-off increased from 5, 15 and 30 events/hour (87.0%, 66.7% and 44.4% and 40.0%, 78.6% and 100.0% respectively). The Bland-Altman analysis indicated good acceptance limits ( $AHI = 5.5 \pm 11.7$  events / hour). The AHI of the portable PSG showed a strong and positive correlation with the PSG AHI ( $p < 0.0001$ ,  $r = 0.70$ ). **Conclusions:** This study demonstrated that portable PSG may be a useful equipment for the diagnosis of OSA in patients with COPD due to its ease of use and accuracy in diagnosis.

**ID: 672**

### Clinical Studies

## Quantitative evolution of compulsory notification infectious diseases that may have sleepiness as a sign or symptom in brazil

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**Introduction:** According to the Virtual Health Library, linked to the Brazilian Ministry of Health, sleepiness is one of the main signs of infectious and parasitic diseases. Thus, there may be a misperception of sleep disorder when there is a decrease in cognition, perception, emotional state, and behavior that also frequently occur in infectious diseases. Such altered perception may interfere in the characterization of chronobiological aspects. Thus, careful observation of epidemiological aspects of the participants of sleep-related researches is essential. **Aim:** Perform a comparative analysis of data on the quantitative development of compulsory notification infectious diseases in Brazil that may manifest sleepiness as a sign or symptom. **Methods:** From the National List of Compulsory Notification - present in Brazilian Ministry of Health Ordinance No. 204 of 2016 - we selected infectious diseases, based on International Statistical Classification of Diseases and Related Health Problems – ICD, that are quantitatively monitored by the Disease Notification Information System. Then, the number of confirmed cases reported from 2007 to date was compared in order to follow the evolution of these diseases in the national territory. **Results:** In this context, we present the number of reported cases of infectious diseases from 2007 to date. Finally, we reached a total of 11,038,416 confirmed cases reported in Brazil of infectious diseases that may show drowsiness as a sign or symptom. Very significant number that shows the relevance of considering the variable infectious disease in sleep research in the Brazilian territory. **Conclusions:** From this research, it is intended to highlight the need for a broader view related to infectious conditions that may influence the characterization of chronobiological aspects in research on chronotypes and social jet-leg. In addition to providing a better understanding of the role of sleep in these pathological conditions, such integrated knowledge has the potential to assist in the development of more effective sleep-related researches strategies. Thus, it is expected to contribute to the optimization of the format of sleep questionnaires and diaries and to increase scientific knowledge about chronobiological characteristics and their relation with infectious diseases. In line with health promotion actions proposed by the World Sleep Society and the Brazilian Sleep Association.

**ID: 673**

### Clinical Studies

**Contributions to the Professional Profile of Speech-Language Pathologists in the area of**

## Sleep Medicine

**NAVARRO, C A, GAMA, M R, BIANCHINI, E M G**

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**Introduction:** Currently, we observe an increase in the participation of speech-language pathologists in the sleep area. **Aim:** the objective of this study was to contribute to information about the professional profile of the speech therapist, regarding their area of expertise, specialty, as well as their interest with the positive airway pressure equipment (CPAP/PAP). **Methods:** This study was conducted through an online questionnaire survey sent to the main groups of studies in sleep speech therapy in Brazil. **Results:** A number of 44 speech therapists related to different specialties answered it: 73% orofacial myofunctional therapy, 22% neurofunctional, 16% language, 11% audiology, 5% voice, and 16% other specialties. The practice in the therapeutic area had the highest performance index and the lowest one in the hearing area. More than 80% of them operate in the São Paulo state and the others are distributed among other states. Most of the participants (91%) consider it important for the speech therapist to have knowledge about how to adjust the PAP and 96% suggest myotherapy exercises in order to help the PAP acceptance process. Speech therapists working with snoring and apnea need knowledge of how to adjust PAP and 27% work directly with PAP equipment. They have all completed either a specific training course to assist with PAP adaptation, including counseling, supervision of other health professionals (12), trainings at companies providing PAP (7), Congresses (7), other speech therapists (6), internet courses (2), and others (2). 50% of all said they did not take any courses although they feel the need for acquiring knowledge about the subject. Among the activities performed in their care, in addition to myotherapy follow-up (24), it is performed the sleep hygiene (23), guidance on cleaning and use (10), chip reading and its reporting issue (9), (5) adjusting and marketing (4). As for treatment requests, it is the otorhinolaryngologists (23) who refer patients more often, followed by neurologists (12), cardiologists (9), orthodontists (2), and other professionals (14). **Conclusions:** it was observed that in addition to the performance already recognized of the speech therapist in the snoring and apnea myotherapy area, this has also been helping in the fitting processes of PAP, indicating a new tendency for speech therapy within sleep medicine.

**ID: 675**

### Case Reports

**Childhood narcolepsy mimicking epileptic seizures: case report**

Vasconcellos, B S, Fernandes, M D, Lacerda, C B, Linares, I M P, Yanagimori, M, Toscanini, A C, Borges, D G S, Bueno, C, Soster, L S A

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**Introduction:** Narcolepsy type 1 is a chronic neurologic disorder defined by excessive daytime sleepiness, cataplexy, sleep paralysis, hallucinations and disrupted nocturnal sleep, typically with onset during childhood/adolescence. The peculiar presentation of symptoms in narcoleptic children could in part explain the misdiagnosis. Hypotonia and the complex hyperkinetic movements that characterize cataplexy close to the onset could be misdiagnosed as a movement disorder or as other neurologic conditions, as epileptic seizures with consequent therapeutic delay. In healthy children without history of epileptic seizures, incidence of abnormalities in EEG was 2–4%. **Aim:** To report a case of a 8-years-old narcoleptic patient misdiagnosed with epilepsy. **Methods:** The following report was made through retrospective analysis of the patient's medical records and interviews with the patient and her mother. Review of the literature about the subject was conducted. **Results:** The patient is a female who, at 8 years-old, began having excessive daytime sleepiness, with recent increase of total sleep time from 9 hours to 14 hours a day, due to increase of daytime sleep, maintaining the same pattern of sleep at night. She also started presenting sudden episodes of loss of strength in the whole body without losing consciousness, and episodes of ptosis and mumbled speech, which lasted seconds to a few minutes with no identifiable triggering factors at the time. Patient reported weight gain, impairment in the social and school performance due to the symptoms. Few months later she was diagnosed with anemia, without response to its clinical treatment. About a year later, she kept hypersomnia symptoms and was submitted to an electroencephalogram, which evidenced epileptiform discharge. At the time, it was introduced Carbamazepine, titrated up to 600mg/day with no improvement of the symptoms. She was then referred to a sleep practitioner, performed a polysomnography with a latency time to NREM sleep of 2,8min. No MLST was conducted at the time because of the patient's age. Cataplectic symptoms became clearer and she was diagnosed with type-1 Narcolepsy due the clinical symptoms. It was introduced Sertraline 50mg a day and methylphenidate with improvement of the symptoms. **Conclusions:** In this case report, cataplexy was mistaken as epileptic seizure, which was reinforced by the exam finding in one EEG, which might have no significant repercussion. In children, cataplexy is more difficult to identify due to its particularities.

ID: 676

### Clinical Studies

## The relationship between insufficient sleep and obesity in a stricto sensu post graduation course

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**Introduction:** Insufficient sleep is considered a risk factor for obesity. Sleep deprivation modifies the hormones that regulate the appetite and raises the calories intake, affecting both sides of energy balance. The influence obesity and sleep deprivation have on the post graduation student's physical and mental health cannot be ignored. Multiple environmental factors, such as changes on waking up and going to bed time, the increase of study time and the decrease of extra curricular activities time make such students potentially at risk of circadian rhythm rupture. **Aim:** To investigate the relationship between sleep quality and obesity in post graduation students. **Methods:** Observational research with quantitative approach, made with stricto sensu post graduation students from a federal university located in Rio de Janeiro. The study was sent through Zip Code under the approval number 2.022.926. The variables used were: Sleep quality: bad (PSQI  $\leq 5$ ) and good (PSQI  $> 5$ ), defined by the Pittsburgh Sleep Quality Index (PSQI); Total Time of Night Sleep in Minutes (TTNSM) measured by the actigraph for 24 hours; Body Mass Index (BMI) – height<sup>2</sup>/ weight; and Body Mass Index Classification: appropriate weight (BMI  $< 25$ ) and overweight (IMC  $\geq 25$ ). The statistical analysis was made with the program Rcommander. The correlation between TTNSM and BMI was assessed by the Spearman correlational test. In order to compare the TTNSM with the BMI classifications, Wilcoxon test was used. The chi-squared test was used to check the relationship between BMI categories and sleep quality. It was considered statistically relevant when  $p < 0,05$ . **Results:** The sample was made of 32 post graduation students, from which 69 % presented poor quality sleep and 69% were considered overweight. However, the relationship between these variables was not relevant (chi-square = 0.86,  $p = 0.34$ ). The average and medium TTNSM of the overweight sample was 391.9 and 412 minutes respectively and with appropriate weight 358 and 360 minutes. Despite the overweight post graduation students sleep less, no significant difference was found (Wilcoxon –  $p = 0.14$ ). The correlation between TTNSM and BMI was negative, but not significant (Rho = - 0.22,  $p = 0.2$ ). **Conclusions:** Although it was a small sample, the results show the necessity of a more comprehensive approach regarding the monitoring of post graduation students' sleep. The situation demands an intensified formation of professionals who have a concern about their lifestyles

ID: 677

### Clinical Studies

## Effects of a sleep educational program on sleep knowledge, habits and pattern in high school students

**FERREIRA, L G D F, CARVALHO, D A F D, BRUIN, P F C D**

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**Introduction:** One of the ways to promote better sleep quality in adolescents is the implementation of sleep education programs with information dissemination, encouraging health preservation, changing habits and values related to sleep. Thus, adolescents can consciously choose the behavior to be adopted. **Aim:** To evaluate the effects of an intervention, through a health education program on sleep, on the knowledge, habits and sleep pattern in high school students. **Methods:** This is a longitudinal and intervention design, with evaluation before and after a sleep-wake sleep education program, conducted with adolescents from 01 public school in Teresina, Piauí, Brazil. Students were divided into control group (CG) and intervention group (GI). The study took place in three stages: Stage I (evaluation), in which participants answered questionnaires to collect sleep variables such as habits, knowledge, chronotype, pattern and quality of sleep; Stage II consisted of a Sleep Health Education Program (PESS) with 04 meetings of 50 min; and Stage III (reevaluation) occurred after 1 month after the end of the PESS, and the instruments of Stage I, an intervention evaluation form, were reapplied. The research protocol was approved by the Research Ethics Committee. **Results:** 163 students participated, 91 in GI and 72 in CG, 54.6% female, mean age  $16.6 \pm 0.7$  years. In the reassessment, there was an increase of right answers in 7 (41.2%) questions in GI and none in CG. As for sleep-related habits, it revealed a significant change in the “not being able to sleep thinking about things to do” behavior with the absence of habit going from 24.4% to 45.1% in GI. There was also an increase in the percentage of 12.1% of students with good sleep quality in GI in Stage III. **Conclusions:** It is concluded that educational interventions may change students’ knowledge, but they are not enough for behavioral change. Finally, educational measures must be combined with other aspects, such as changing hours and parental involvement, to maximize benefits.

**ID: 679**

### Clinical Studies

#### Evaluation of quality of life, sleep and psychosocial factors in caregivers of individuals with Down Syndrome.

**Rezende, T G G P, Dutra, M T, Giannasi, L C, Gomes, M F, Oliveira, W, Oliveira, T A, Rode, S M**

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**Introduction:** There is a need that is increasingly discussed in the scientific environment to shift the focus of attention from the disease to the person. The humanization of care and health care led to the triad disease / patient / caregiver. This caregiver can be both a professional and one who stays at home taking care of your loved ones, often compromising your own health. **Aim:** This study aimed to evaluate through questionnaires the quality of life, quality of sleep, and symptoms of depression, anxiety and stress in caregivers of individuals with Down Syndrome. **Methods:** Nineteen caregivers (19) of individuals with Down Syndrome (DS) participated in this study. Inclusion criteria were fluency in the Portuguese language to answer the following validated questionnaires: Quality of Life Questionnaire (SF-36), Sleep Quality Index of Pittsburgh (PSQI) and Depression, Anxiety and Stress Scale (EADS-21). In addition to the questionnaires, the participants answered the following questions: age, marital status, gender, kinship and period devoted to caring for the relative with DS, working time, presence of the following factors that could influence sleep quality: caffeine drink consumption after 18h, tobacco use, physical exercise after 20h and use of medications. This research is linked to a main project that received FAPES research assistance and approval by CEPH ICT - UNESP (CAAE: 64173616.4.0000.0077). **Results:** The caregivers had a mean age of  $54.57 \pm 10.43$ , with a minimum of 27 and a maximum of 75 years. The sample consists mainly of married individuals (63.15%), female (78.94%), who are fully dedicated to the care of relatives with DS (47.36%). The SF-36 showed that the domains vitality, general health and pain were the ones with the lowest averages,  $46.78 \pm 22.50$ ;  $51.36 \pm 19.12$  and  $52.42 \pm 33.03$ , respectively. The PSQI showed that 62.15% of caregivers have poor sleep quality and 31.37% some sleep disorder. In the EADS-21 the average stress, anxiety and depression scales were  $7.26 \pm 6.20$ ;  $4.8 \pm 5.24$  and  $4.52 \pm 5.32$ , respectively. **Conclusions:** The evaluations made evident some important aspects about the physical and emotional health of caregivers of individuals with Down Syndrome, making their health care essential. The data obtained in this research will allow us to establish the diagnosis of the pathologies studied and the indication of individualized therapies, envisaging new studies.

**ID: 680**

### Clinical Studies

#### Sleep and awake bruxism in adult with Down syndrome

**Giannasi, L C, Dutra, M S T, Rezende, T G G P, Nacif, S R, Oliveira, E F, Oliveira, L V F, Oliveira, W, Pereira, B D, Gomes, M F**

Centro Universitário de Anápolis Uni-Evangélica - Anápolis - Ceara - Brasil, Hospital do Servidor Público Estadual de São Paulo-IAMSPE-HSPE - Sao Paulo - Para - Brasil, ICT-UNESP/SJC - Sao Jose dos Campos - Sao Paulo - Brasil

**Introduction:** To our knowledge, no studies have accessed awake bruxism (AB) and stage by stage sleep bruxism (SB) in adults with Down syndrome (DS). The gold standard for SB diagnosis is polysomnography type I, but recent works have shown that the accuracy of portable PSG systems for SB is considered good even in absence of audio-video recording. **Aim:** To evaluate the prevalence of awake and stage-by-stage sleep bruxism in adult with Down syndrome through questionnaire answered by caregivers and PSG type II. **Methods:** Twenty-three adults with DS were enrolled in this study. Clinic examination, dental anamnesis and RDC-TMD were performed in order to address anthropometric data, dental status, parafunctional habits and temporomandibular symptoms. The history of SB/AB was answered by caregivers. A portable PSG type II system (Embla Embletta MPR+PG ST+Proxy, Natus, California-USA) was used to perform a full-sleep study at patients' home. Sleep data were visually scored according to the AAMS criteria and SB was scored according to the published rules. RMMA activity was defined as low ( $>1$  and  $<2$  episodes/h of sleep), moderate ( $>2$  and  $<4$  episodes/h of sleep), or high ( $>4$  episodes/h of sleep). Subjects received the PSG diagnosis of SB if RMMA index was  $>2$  episodes/h of sleep. **Results:** The sample was composed by 23 adults with DS (mean age  $21.7 \pm 4.3$ ; 9 females, 14 males). All patients presented moderate to severe tooth wear and indentations on tongue. Muscular and temporomandibular joint (TMJ) palpation presented 8.7% and 0% for local myalgia and TMJ pain, respectively. According to caregivers reporting, all patients presented AB and only 13.1% SB. PSG data showed a SB prevalence of 91.3%, with a mean RMMA index  $40.0 \pm 30.0$ /h. When the RMMA index was separated by frequency, it was found 17.4% low RMMA, 21.7% moderate RMMA and 43.5% high RMMA. Only 2 showed RMMA index of 0.0/h. SB episodes/h were 30.4%, 8.7%, 21.7% and 26.1% in N1, N2, N3 and REM sleep stage, respectively. Clinical data showed probable AB. In addition, all patients presented obstructive sleep apnea  $32.8 \pm 28.6$  and snoring per hour was  $26.2 \pm 15.0$ . Despite the raised RMMA index, the majority of patients did not present TMD symptoms. Comparing caregivers reports with PSG data, they seem not be aware of the presence of SB. **Conclusions:** The high prevalence of definitive SB and probable AB, added to the high prevalence of obstructive sleep apnea and snoring, point to the recommendation for the PSG in adult with Down syndrome, routinely. Parents seem not to be aware about the presence of SB.

**ID: 686**

## Clinical Studies

### Relationship between headaches and sleep: a longitudinal study

Lucchesi, L M, Tempaku, P F, Smith, A K A, Togeiro, S, Hachul, H, Andersen, M L, Tufik, S, Poyares, D

**Introduction:** Evidence in the literature showed an association between headache and sleep disturbances, especially when headaches occur during the night or early morning. Our group has demonstrated that waking up during the night with headache was prevalent (8.4%) in the Sao Paulo general population. **Aim:** Objective: We aimed to assess the incidence and associate sleep variables of "Nocturnal awakening with headache (NAH)" in a prospective 8-year follow-up study. **Methods:** Methods: From 1,042 volunteers enrolled in the baseline study, 712 agreed to participate to the follow-up study. Questionnaires and scales were applied and polysomnography (PSG) and actigraphy were performed. Sleep disorders were determined through sleep questionnaires, and also DSM-IV was used to characterize insomnia. Frequent NAH was defined by symptoms of at least once a week, occasional NAH was defined by symptoms frequency of less than once a month or 1 to 3 times a month and absence of NAH was defined by a negative response. **Results:** Results: From the 712 participants, 702 completed their NAH questionnaire. In the follow-up setting, 84.5% referred no NAH, 8.4% had occasional headache and 7.1% had frequent headache. There was a significant association between baseline frequent NAH with occasional NAH, as 17.7% of frequent NAH changed to occasional NAH. In the follow-up, frequent NAH was associated with female gender, higher body mass index (BMI), insomnia DSM-IV, lower self-reported sleep duration, higher insomnia severity index (ISI), objective longer sleep latency and higher mean wake time at actigraphy. After adjustment for sex and BMI, self-reported sleep duration, DSM-IV insomnia, ISI score, and objective sleep onset latency remained significantly associated with frequent NAH. **Conclusions:** Conclusions: Our study shows that NAH was highly prevalent in the São Paulo population in both the baseline and follow-up studies with some sleep-related risk factors, mainly insomnia.

**ID: 688**

## Clinical Studies

### Interventional psychodiagnosis in preschool insomnia

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**Introduction:** Complains of insomnia in preschool children is very common in pediatric offices. When their causes are not organic, we should evaluate their possible psychological causes, in view of this stage of development. These include external factors such as: birth of a sibling, entry into school, separation or tension between parents, maternal depression or loss of a loved one or pet. Among the intra-psychoic factors, which may or may not relate to external events, we find the typical childhood fantasies of this phase as: ambivalence between good and evil; love and hatred; voracity, omnipotence and persecutory anguish arising from an incipient and cruel superego, symbolized by fairy tales. **Aim:** To evaluate the effectiveness of interventional psychodiagnosis in children with complaints of insomnia in this age group. **Methods:** Thirty-six preschool children, between two and six years old, between 2015 and 2017, ( 19 girls and 17 boys), with initial and intermediate insomnia complaints were evaluated. The method used was interventional psychodiagnosis, which is characterized by seeking diagnostic understanding in the psychodynamic aspect and at the same time, briefly intervening in a model of therapeutic consultations. Two to three interviews with parents were conducted, and two to four consultations with children (with or without parental presence). The instruments used were: semi-directed interviews with parents, with specific interventions. Playful observations and other projective techniques, such as story drawings, with timely interventions focused on sleep quality. Feedback interviews are included in this process. **Results:** Of the 36 children, we obtained positive responses and improved insomnia in 90% of the subjects, according to their parents' feedbacks, after two months of psychological intervention. **Conclusions:** The onset of insomnia in this age group is very common, however, even if transient, it is a symptom that generates great family stress and if not well managed, can condition a poor quality sleep for a long time. Interventional psychodiagnosis proves to be a quick and effective instrument for listening and welcoming the anxieties and parental conflicts and the child himself. It allows the understanding of each family dynamics and the child's own, and because it is interventional, punctuates, discriminates and guides the impeding aspects of a peaceful sleep for the child and their parents.

**ID: 691**

### Case Reports

#### The influence of speech therapy in the adherence of continuous positive airway pressure devices in sleep apnea syndrome: case report

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**Introduction:** Studies show that some patients have difficulty on Continuous positive airway pressure (CPAP) adherence in the treatment of Obstructive sleep apnea syndrome (OSAS). **Aim:** To present a case report of OSAS which the myofunctional therapy improved adherence to CPAP. **Methods:** Patient, female, 73 years old, diagnosed with sleep apnea syndrome and heart arrhythmia, presenting difficulty using CPAP. She was referred by the sleep physician to speech therapy. Initially, she reported that she was having trouble to sleep, developing panic in the sleep time, described as breathing discomfort, fear and accelerated heartbeat. Her husband reported the presence of intense snoring on the nights that she could sleep. During daytime, she was very tired and sleepy. In her first polysomnography (2012), the AHI was 26,5/hour, classified as moderate sleep apnea, and minimum oxygen saturation of 86%. She tried CPAP therapy, but she could not adapt and ended up abandoning treatment. When she returned to the sleep physician, a new polysomnography (split night) was requested (2015), which indicated a therapeutic pressure of 10,5cm H<sub>2</sub>O. She was referred to CPAP therapy again, although this time with combined speech therapy. In the myofunctional therapy, breathing exercises were used with and without the mask in the seated position until reaching the lay down position. Information about sleep hygiene, sleep schedule and rhythm were also given during therapy sessions. Daily exercises were suggested, 3 times a day, involving intraoral sensitization of the tongue; and isometric and isotonic exercises associated with oropharyngeal muscle strengthening and mobility, and facial as: snapping and tongue pressure on the palate, elevation and rotation of tongue in the oral vestibule, /B/ prolonged, fry laryngeal; Crackling, protrusion and retraction of lips, and blowing and sucking with different resistances. The sessions started weekly and, as time went by, semiannually. **Results:** Nowadays, she uses CPAP all night, 5,27h/night on average, with significant reduction of symptoms, besides the control of the arrhythmia, leading the cardiologist to gradually decrease the dose of amiodarone from 200mg, to 100mg and, currently, to suspend it. The patient has been using CPAP for 3 years, with good adherence and AHI 1/hour. **Conclusions:** The myofunctional therapy assisted in the adherence to CPAP treatment and the improvement of patient's quality of life.

**ID: 692**

### Case Reports

#### Myofunctional therapy as an Oral Appliance Therapy adjunct in moderate OSA patient with Sleep Apnea Digital Monitoring home test follow-up

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**Introduction:** Obstructive Sleep Apnea Syndrome (OSAS) is a highly prevalent condition affecting people with an increasing public health burden. Oral Appliance Therapy (OAT) is recommended in clinical practices in OSAS non-adherent patients or who refused CPAP therapy. In OSAS patients, the hypoglossal nerve structure and genioglossus muscles function are always abnormal. In addition, the tongue does not always move simultaneously with the mandible when an Oral Appliance (OA) is being used. Sometimes, the genetic and environmental influences can interfere in clinical endpoint, as malocclusion and oropharyngeal muscles hypotonia. Thus, some patients with OSAS, malocclusion and stomatognathic dysfunction may benefit from myofunctional therapy (MFT) as an OAT adjunct for treatment efficacy. Furthermore, the polysomnography (PSG) is a gold standard study for diagnosis and monitoring of OSAS patients; however, the test is expensive, time-consuming and difficult to access. Therefore, other methods have been proposed such as Sleep Apnea Digital Monitoring (SADM), which is a home-styled oximetry diagnosis to detect severe OSA that uses the Oxygen Desaturation Index (ODI). **Aim:** We show an OSAS patient who refused CPAP therapy, and was treated with OAT and MFT, his monitoring and following-up with SADM before final PSG sleep study. **Methods:** Caucasian 63-year-old man with class III dental occlusion and 24 BMI, with moderate AHI and intense snoring who refused CPAP therapy. Patient with clinical history of diabetes II, hypercholesterolemia, hypertension who was submitted to septal deviation surgery. At first OAT was prescribed and after that, MFT. The OA used induced lip sealing, mandible and tongue protrusion. MFT induced neuromuscular and functional balance for stomatognathic system. Clinical evaluation, Epworth Sleepiness Scale, polysomnography and SADM were evaluated in 12 months of follow-up. **Results:** An improvement in objective and subjective parameters were shown as: BMI(24.5 to 23.9), SaO<sub>2</sub> min(79 to 86%), SaO<sub>2</sub> max(93 to 96%), Arousal Index(29,7 to 7.1/h), IDO=10 to 8, ESE (13 to 7) and Snore (intense to mild). **Conclusions:** Patient demonstrated as being compliant with OAT and MFT as an adjunct therapy. An improvement in respiratory parameters and daytime sleepiness were achieved. In this case report the SADM demonstrated to be a good tool for OAT and MFT monitoring and follow-up before final PSG sleep study.

**ID: 693**

### Clinical Studies

## The relevance of sleep impairment in alzheimer's dementia

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**Introduction:** Alzheimer's disease is the most common form of dementia present in the elderly population above 65 years old. Losses in sleep architecture, already present in elderly, are often found together with the disruptive behavioral symptoms of Alzheimer's dementia, sleep impairments can have a substantial impact on cognitive activity. Interference in the sleep-wake cycle, given by the fragmentation of sleep with nocturnal awakenings and consequent daytime sleepiness, suggest a deficit of cognitive functions and possible demential progression. **Aim:** Evaluate presence of sleep impairments in Alzheimer's dementia. **Methods:** This is a retrospective analytical study with a quantitative and qualitative descriptive approach. It was conducted by applying a specific questionnaire based on the Neuropsychiatric Inventory, The Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale, Stanford Sleepiness Scale and selected articles covering questions about sleep pattern in patients with the diagnosis of Alzheimer's disease retrospectively. **Results:** The study analysis include 17 participants. The age range varies from 60 to 92 years, with mean of 79.88 years. Most patients had an average daily sleep time of 6 to 8 hours. 38.4% of those interviewed had symptoms of nocturnal psychomotor agitation, with frequent interruptions at night. Research data show the high prevalence of sleep-deprivation-related disorders, which affect approximately 41% of patients. As for the quality of sleep, only 35.2% of patients reported not having a peaceful and deep sleep all night. Of these, approximately 23.5% reported difficulties in initiating sleep, and around 29.4% of respondents reported having difficulty maintaining sleep for a satisfactory period of time. Of those who had sleep disorders, only 29.4% of this appeared in the past and 41%, appeared after the diagnosis of Alzheimer's dementia. Regarding the relationship of disorders with Alzheimer's progression, 47% of patients had shown a worsening of sleep deprivation disorders after diagnosis. **Conclusions:** This study evidences a probable involvement between sleep impairment, mainly sleep disruption, and the Alzheimer's dementia.

**ID: 695**

### Basic Research

## Prevalence of insomnia in shift workers: a systematic review

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**Introduction:** Insomnia is a sleep disorder of high prevalence with somatic and psychic repercussions. **Aim:** The present study aimed to describe the prevalence of insomnia in shift workers, as well as the following associated variables: sex, age, marital status, profession and shift work schedule. **Methods:** A systematic review was performed using the descriptors “insomnia” AND “shift work”, in the databases PubMed, Scielo and LILACS. The inclusion criteria were: studies addressing the frequency of insomnia in shift workers; studies published from 01/01/2008 onwards, with the intention of contemplating the most updated studies; studies in English or Portuguese languages; studies with participants aged 18 years or older; studies conducted only with human beings. The exclusion criteria were: review articles; studies whose participants presented other comorbidities that justified the presence of insomnia; studies whose participants were undergoing treatment for sleep disorders; studies with pregnant women and articles without abstracts. **Results:** From 402 studies identified, 4 were included in the analysis, with a total sample of 9,410 participants, of which 3,674 shift workers. The prevalence of insomnia in shift workers ranged from 12.8% to 76.4%, higher than that estimated for the general population. In addition, there was a higher prevalence among women and single people, and there was no significant variation with age and occupation. On the other hand, the relation between the shift work schedule and the onset of insomnia still seems controversial. **Conclusions:** The present systematic review identified a high prevalence of insomnia in shift workers compared to the general population. Moreover, a higher prevalence was observed among women and single people and there was no significant variation with age and occupation. On the other hand, the relationship between shift work schedule and the emergence of insomnia still seems controversial. This review therefore suggests an important association between insomnia and shift work, with the following consequences: a decrease in professional and social performance and repercussions on physical and mental health, which reinforces the need for early identification and intervention on the potential damage to the health of these workers.

**ID: 696**

## Case Reports

### Correlation between sleep paralysis and frontal lobe tumor

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**Introduction:** Sleep paralysis (SP) involves a period of inability to perform voluntary movements at the onset of sleep or awakening. **Aim:** To describe a clinical case about the correlation between sleep paralysis and frontal lobe tumor, as well as to perform a brief literature review. **Methods:** Qualitative and individualized analysis of a rare clinical case on brain neoplasia-related sleep disorder, following the patient's evolution from diagnosis, therapy and prognosis. **Results:** A 24-year-old male patient complains of an early feeling of suffocation on sleep, with difficulty waking up in these episodes since two months ago. He reported that at sleep he felt paralysis of the body and the sensation of trying to move, scream and fail. Initially it was indicative of apnea, reflux or sleep paralysis. Polysomnography detected moderate apnea. Upper digestive endoscopy found erosive reflux esophagitis. After treatment, on return patient reported worsening sleep paralysis and was prescribed benzodiazepine without improvement after 30 days. Thus, a magnetic resonance imaging of the brain was requested, which showed expansive lesion with infiltrative characteristics of the right frontal lobe. He was referred for neurosurgery and tumor resection was performed. Pathological examination revealed morphological pattern compatible with grade 2 diffuse astrocytoma. After tumor removal the patient did not have sleep paralysis again. The etiology of sleep paralysis tends to be multifactorial: hereditary factors, physical health problems, stress and trauma may develop. And it also appears to be associated with posttraumatic stress disorder (PTSD), narcolepsy and panic attacks. The pathophysiology of sleep paralysis is due to faulty brainstem structures. This paralysis is a result of skeletal muscle tone suppression by the pons and ventromedial cord, exerted by the  $\gamma$ -aminobutyric acid and glycine neurotransmitters, which inhibit the motor neurons of the spinal cord. Brain lobes are interconnected, so any damage to their structure can lead to changes in behavior. The frontal lobe is responsible for social behavior and motor planning. Therefore, an injury to the frontal cortex can lead to paresis. **Conclusions:** It is relevant to highlight the scarcity in the literature of the correlation between sleep paralysis and frontal lobe tumor, as well as the rarity of identifying similar clinical cases.

**ID: 697**

## Clinical Studies

### Comparing the OSA severity and symptoms among patients from the private and public health systems

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**Introduction:** Obstructive sleep apnea (OSA) is a common disorder among adults. Despite of a high prevalence, OSA remains underdiagnosed and undertreated, especially in underdeveloped countries. In Brazil, very few public services offer OSA diagnosis and treatment. Our laboratory is one of a few in our state that performs polysomnography (PSG) for the public health system. Our hypothesis was that patients referred from the public health system would have more severe OSA than patients coming from the private sector due the differences in access to polysomnography between these populations. **Aim:** The aim of this study was to compare anthropometric characteristics, sleepiness, and OSA severity among public and private patients referred for PSG with a suspicion of OSA. **Methods:** We analyzed data from 1381 patients that underwent PSG at our Sleep Laboratory from January 2017 to December 2018. Studies with inconsistent data ( $n = 69$ ), portable devices ( $n = 47$ ), research protocols ( $n = 386$ ), titration studies or split night studies ( $n = 153$ ) were excluded. Anthropometric, clinic and polysomnographic data were collected. Statistical analysis was performed in GraphPad Prism software version 7. **Results:** A total of 726 patients were included in this study, of which 410 were from the public health system (Group 1) and 316 from the private health system (Group 2). The proportion of men was higher among private health system patients (59.1% men) as compared to public health system patients (45.4% men) ( $P=0.0003$ ). Age was similar in both groups ( $56.8 \pm 13.7$  years and  $57.0 \pm 15.4$  years, Group 1 and 2, respectively;  $P=0.7345$ ). Body-mass index (BMI) was higher in Group 1 ( $32.8 \pm 7.4$  vs.  $29.6 \pm 5.6$  kg/m<sup>2</sup> in Group 2;  $P < 0.0001$ ). OSA severity was higher in Group 1 ( $36.4 \pm 29.4$  versus  $30.3 \pm 25.9$  events per hour;  $P=0.0123$ ). Epworth Sleepiness Scale was higher among public sector patients as compared to private sector patients ( $11.4 \pm 6.2$  and  $9.6 \pm 5.0$ , respectively;  $P=0.0002$ ). **Conclusions:** Patients from the public health system are sleepier and have higher OSA severity as compared to private health system. These findings may reflect a greater difficulty for public health system patients to access specialized sleep diagnostic centers when compared to patients from private health assistance.

**ID: 698**

### Basic Research

#### Is it possible to verify relationships between low vision and sleep patterns through actigraphy?

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**Introduction:** Sleep disorders have been the subject of research in the world, however, when we relate visually impaired and actigraphy, we find little research. **Aim:** We evaluated the sleep/wake cycle of a paratleta (ICD 10-H54.2; F12), 38 years, complaining of poor quality of sleep (seem CEP 3.383.966). **Methods:** For 30 days we used ActTrust-Actimeter/Condor® associated with sleep diary and sociocultural questionnaires, chronotype and PSQI. The audiograph data were evaluated in the ActStudio software. **Results:** She began her professional career at the age of 22, in the modalities of weight throwing, darts and disc. It has daily training routine in the afternoon. Before sleeping makes use of the mobile phone for about 1:30. She never used application or calendar to control the reproductive cycle, subjectively calculating the probable date of next menstruation. When in PMS, reported headache, difficulty sleeping, agitated sleep, increases in chocolate intake and aggressiveness, the latter, according to her, positive when it coincides with tournament and/or competition. Regarding the circadian profile, she was indifferent, preferring to perform her training in the afternoon. Research indicates that profiles with a tendency to indifference have preference for the afternoon period. PSQI scored 8, featuring poor quality sleep. Periodogram with circadian rhythm and sleep efficiency of 89.37%, with an average of six awakenings per night. Bed time at night was, on average, 06h30m and, sleeping, 05h48m. Presence of irregularities in bedtime and waking up on weekends and various daytime rest periods throughout the week. Comparing sleep diary, socio-cultural questionnaire and actogram, we see low perception in relation to time between bedtime and sleep, delay in relation to the probable date of next menstruation, mood changes and greater agitation during sleep, the latter, possibly related to PMS. **Conclusions:** The actigraphy, when combined with other methodologies, can contribute to the clarification in relation to self perception of sleep, in addition to directing actions of measures of hygiene of sleep, to improve sleep efficiency, with gains in quality of personal and professional life.

**ID: 699**

### Clinical Studies

#### Impact of multiprofessional residence on sleep quality and mental health

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**Introduction:** Residence is a period marked by several changes in lifestyle, leading to impairment in physical

and mental health, impacting on quality of life. **Aim:** To investigate the impact of multiprofessional residency on sleep quality and mental health in multiprofessional health residents. **Methods:** This is a cross-sectional study with quantitative data. The target audience was multiprofessional health residents (R1 and R2) of a university hospital in the state of Piauí, Brazil. Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS) and Preliminary Burnout Identification Questionnaires were used. This study was approved by the Research Ethics Committee. **Results:** The sample consisted of 28 residents, 82.1% female, mean age  $25.5 \pm 0.69$  years. It observed an average sleep duration of  $5.9 \pm 0.6$  with significant difference between first and second year residents ( $p = 0.03$ ). As for sleep quality, a mean PSQI score of  $8.18 \pm 3.0$  ( $> 5 =$  poor sleep quality) will decrease with 67.9% of poor sleep quality. The Epworth Sleepiness Scale showed a mean score of  $10.4 \pm 4.3$  ( $> 10 =$  excessive daytime sleepiness - EDS) with 46.4% showing more sleepy EDS for R2. Regarding Burnout Syndrome, an average score of 57.3 was observed, and 61.4% of R2 reported “onset of installation” or “executable phase” of the syndrome that occurs in this case of difference between groups R1 and R2 ( $p < 0.01$ ). There is no significant correlation between sleep and burnout variables. **Conclusions:** It is concluded that residents are affected by sleep deprivation and burnout symptoms, and it is highlighted that residents R1 are similar to R2.

**ID: 700**

### Case Reports

#### Differential diagnosis between nocturnal temporal lobe epilepsy (NTLE) and parasomnia: case report and literature review

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**Introduction:** Nocturnal epilepsy may be a difficult condition to diagnose. It can often be mistaken as sleep disturbance and has a high mortality rate related to sudden unexpected death in epilepsy (SUDEP). Nocturnal complex partial seizures of temporal lobe are sometimes responsible for phenomena resembling sleep terror or somnambulism and may be associated with violence. We report a case of a patient with a typical history of NREM parasomnia that was diagnosed as nocturnal temporal lobe epilepsy after clinical evaluation and polysomnography. **Aim:** The purpose of this report is to show the importance of evaluating differential diagnoses facing complex movement during sleep. **Methods:** A 39-year-old woman was evaluated

at our sleep clinic reporting abnormal movements and confusional awakenings during sleep. Symptoms had started 15 years before and were characterized by muscle contractions and occasional urinary incontinence. The patient also mentioned that sometimes she woke up in other rooms of the house, with faucets turned on or home appliances plugged in and running. Since the beginning of the condition phenobarbital and clonazepam were prescribed without improvement of symptoms. **Results:** A polysomnography showed two epileptic seizures during slow wave sleep. These episodes lasts approximately four minutes and presented an electroencephalographic pattern of epileptiform activity in all channels. Subsequently, she performed a long-term video-electroencephalography, which evidenced epileptiform discharges like sharp waves over the right temporal region. We diagnosed NTLE and the patient was treated with carbamazepine 200mg twice daily, with significant improvement of her clinical condition. Seizure during sleep is not a classical feature of NTLE, in these cases, usually there are infrequent and non clustered seizures, with rare familial history of epilepsy. NTLE usually presents during adolescence with seizures nearly exclusively at nighttime sleep. In most cases, seizures are characterized by sudden awakening from sleep with a sensory aura, which progresses to a focal seizure with impaired awareness. It is often associated with amnesic automatisms, mimicking a confusional arousal and are responsible for late diagnosis in several cases. **Conclusions:** Distinguishing nocturnal epileptic seizures from complex movement disorders and parasomnia can be challenging. Knowing the differential diagnosis and the diagnostic criteria are essential to properly conduct this case.

**ID: 704**

### Basic Research

#### Correlation of the masticatory biomechanics, adiposity and sleep disorders in patients with Down syndrome

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**Introduction:** Down Syndrome (DS) is a genetic disorder characterized by an extra copy of chromosome 21 (Hsa21). The muscle hypotonia is one of the main phenotypical features of this syndrome which can be a deleterious condition for total or partial obstruction of the airways during sleep, causing Obstructive Apnea of Sleep (OSA). **Aim:** This study assessed the masticatory biomechanics

by means of electromyographic records of the masseter and temporal muscles at rest and in function, as well as the maximum bite force (MBF) and the maximum mouth opening (MMO). These findings were correlated with body fat distribution and risk of sleep disorders in patients with DS. **Methods:** Twenty-four patients with DS were enrolled in this study to evaluate the electrical activities of the masseter and temporal muscles, bilaterally, at rest and in maximum voluntary clench (MVC). The MMO and MBF were also measured. The overcomes were compared with non-syndromic healthy individuals which were described in the literature. Furthermore, the body fat distribution (body mass index, BMI; neck and abdomen circumferences, NC and AC; and waist to hip ratio, WHR) and the subjective diagnosis for sleep disorders (Epworth Sleepiness Scale, STOP-BANG and Fletcher & Luckett questionnaires) were investigated. **Results:** The electromyographic records and the MBF, in function, showed lower values in our patients with SD than in non-syndromic healthy individuals. The MMO was slightly high in the DS group, probably, due to the relaxation and the stretch of the studied muscles. The body fat levels were high in BMI, NC, AC, and WHR in both the genders; however, the NC was only superior in men. The results showed that our patients were overweight or obese (obesity grade I), indicating risks for developing obesity-related diseases. The excessive daytime sleepiness, high risk of OSA, and impaired sleep quality were evidenced in women (42,8%, 42,8% and 14,3%) and men (35,3%, 64,7%, and 11,76%). **Conclusions:** We concluded that the hypofunction of the temporalis and masseter muscles was found in our patients with DS, configuring a masticatory muscle hypotonia in these individuals. High MMO amplitude was also evidenced, probably, due to the extensibility of the studied muscles. The masticatory muscle hypotonia, associated with excess body fat, influenced the high risk of OSA, especially in men.

**ID: 705**

### Basic Research

## Mother-baby dyad interaction and sleep-wake cycle development: a longitudinal study of the newborn during the first year of life

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**Introduction:** Introduction: Sleep is an active state, responsible in the early years of life for the Central Nervous System maturation processes. Sleep is so important in young infants

that its need is increased in this age group. Thus, few aspects of child health have as significant an impact on well-being as sleep disorders, especially considering the characteristics of modern life and its effect on the family environment. **Aim:** Objective: To monitor the development of the sleep-wake cycle of infants (from birth to twelve months) and to correlate the results for two groups of mother-baby dyads: a study group, composed of emotionally fragile mothers, due to prenatal diagnosis of a structural alteration in their child; and a control group of dyads with no diagnosed changes. **Methods:** Methods: We followed 50 mother-baby dyads at six different stages of their lives: first as a newborn and then at two, four, six, nine and twelve months old. The mothers completed both the Infant Behavior Questionnaire - Revised and the Sleep Habit Questionnaire for Babies Under 12 Months - CSHQ-I when their infants were nine months of age. The former questionnaire allows the assessment of a variety of domains (such as Feeding and Sleeping) by checking how often certain behaviors tend to manifest. **Results:** Results: The infants kept the inclusion criteria with typical development according to the screening and evaluation protocols used. In addition, there was a significant difference between some statistical variables, but these did not include variables that verified the quality of the Sleep construct. Finally, there was no significant difference regarding the analysis of the grouped variables of all domains. **Conclusions:** Conclusion: The presence of structural alteration in the baby had no negative effect on sleep-wake cycle development. Some babies had difficulties such as frequent nighttime awakenings, sleeping resistance, infant dependence to fall asleep alone, and excess electronic devices, but these characteristics did not reach statistical significance between the groups. Therefore, the development of the sleep-wake cycle in the first year of life deserves especially individualized attention and care, considering its immense importance in the child's future development.

**ID: 707**

### Case Reports

## Sleep disorders in amyotrophic lateral sclerosis: by the way of a case

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**Introduction:** Sleep disorders are a common and can be an early manifestation of amyotrophic lateral sclerosis (ALS), but can be undetected until the later stages of disease. Abnormal breathing during sleep is frequently present and may occur even in patients with normal respiratory function and no signs of diaphragmatic denervation. Various studies have reported obstructive and central apneas as well as non-obstructive hypoventilation in patients with ALS. **Aim:** Describe

sleep disorders caught on polysomnography in a patient with amyotrophic lateral sclerosis and a literature review about sleep disorders in ALS. **Methods:** The study was conducted from the examination analysis of a patient who underwent polysomnography in the sleep laboratory of a school hospital. **Results:** RFL, 76 years old, three months after diagnosis of ALS, presented alterations of the sleep-wake cycle. Polysomnography findings were: extremely short total sleep time, normal sleep latency and slightly decreased for REM sleep. Alteration of sleep architecture was also found at the expense of increased N1 and N2 phase content, decreased REM sleep and absence of N3 phase. There was also an increase in the rate of respiratory disorders, all of obstructive pattern, being exacerbated during REM sleep. **Conclusions:** Amyotrophic lateral sclerosis represents a multi-faceted disorder of multiple genetic preponderance, with disturbance of respiratory function and sleep a key component and early indicator of respiratory compromise. Not only is REM sleep the period of greatest vulnerability for developing nocturnal hypoventilation, a marked reduction of REM sleep duration has been shown to be associated with reduced survival in ALS.

**ID: 712**

### Clinical Studies

## Chronotypes of individuals with temporomandibular disorders

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**Introduction:** Temporomandibular disorders (TMD) are the second most prevalent musculoskeletal condition, affecting the temporomandibular joint, its associated muscles and all the related structures that are innervated by the trigeminal complex. As it is known, the sleep can be influenced, in an unfavorable way, by many conditions that cause pain. Chronotype refers to preferences for activities during certain times of the day and is a behavioral manifestation underlying circadian rhythms. Several studies have shown that the chronotype can influence the interpretation of pain. Studies with chronic pain, fibromyalgia, depression and some musculoskeletal disorders, that are comorbidities commonly encountered in individuals with TMD, have shown that evening chronotype are more sensitive to pain. **Aim:** The aim of this study was to identify the chronotype of individuals with TMD in order to find other ways to minimize the pain. **Methods:** This is a descriptive study where forty individuals with TMD of muscular origin, according

to the Research Diagnostic Criteria for TMD, were invited to fulfill the Morningness-Eveningness Questionnaire (MEQ-SA). It is composed by 19 multiple-choice questions regarding sleep characteristics and preference. Subjects are defined as late rising, moderately late rising, intermediate, moderately early rising and early rising. We also evaluate duration and intensity of pain. **Results:** The participants' mean age was 41 years old and the visual analogic scale median was 6.2. They had an average of pain duration from six months to 12 years. Regarding the MEQ-SA, the results show: one (2.5%) late rising, 3 (7.5%) moderately late rising, 23 (57.5%) intermediate, 12 (30.0%) moderately early rising and one (2.5%) early rising. **Conclusions:** Although several studies show the association of late types with more pain, our study could not show the relationship between TMD individuals with pain and late types. In contrast, it could be observed that the most prevalent chronotype in individuals with TMD is intermediate, followed by moderate early rising.

**ID: 713**

### Case Reports

## Obstructive sleep apnea preceding acromegaly diagnosis

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**Introduction:** Obstructive sleep apnea may be caused by endocrine disorders such as acromegaly and hypothyroidism. Acromegaly is a benign and rare disease characterized by excessive secretion of growth hormone (GH) and insulin-like growth factor (IGF1). Acromegaly is associated with increased mortality due to cardiovascular and respiratory complications. Obstructive sleep apnea (OSA) is the most typical respiratory comorbidity. OSA diagnosis can precede acromegaly diagnosis. **Aim:** This case report is about an OSA patient with typical symptoms of acromegaly yet undiagnosed. **Methods:** A 48-year-old male patient was referred to the outpatient sleep medicine clinic due to loud snoring, nocturnal respiratory pauses and daytime excessive sleepiness (Epworth 18/24). When asked, he mentioned that his voice became low-pitched in the last few years and that he had to cut his wedding ring twice due to an increase in the diameter of his ring finger. He brought old photos which revealed that his face enlarged, his jaw protruded, his nose wings enlarged and his lip thickened. A polysomnography and serum IGF1 were requested. **Results:** The polysomnography showed severe obstructive apnea (89.2 events/h), IGF1=843ng/ml (normal range 53-215 ng/ml). The patient was referred to the neuroendocrinology service for treatment. CPAP

and weight loss were recommended. Two months after the OSA diagnosis, the patient was using CPAP regularly (use=28/30 days; CPAP level=7cmH20 and residual AHI=0.2 events/h). The patient reported improvement in both sleep quality and excessive daytime sleepiness (Epworth 14/24). **Conclusions:** One must pay attention on clinical signs and symptoms of acromegaly among patients with OSA.

**ID: 714**

### Case Reports

#### Impact of continuous positive pressure (CPAP) treatment in patients with systemic arterial hypertension (SAH) and obstructive sleep apnea syndrome (OSAS): case report

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**Introduction:** The association between hypertension and OSAS it is considered worrying because they involve conditions that lead to serious cardiovascular problems with consequent increase in deaths, if not properly treated. It has been reported that in hypertensive patients the prevalence of OSAS is 35%, so it is relevant to consider the appropriate therapy for this association. The treatment of isolated hypertension is known to involve the selection of medications and an increase in lifestyle change. However, in OSAS, CPAP predilection is considered the ideal standard; however, there is no consensus on the exact CPAP values to lower systolic and diastolic pressures. **Aim:** To demonstrate the management of CPAP treatment in two patients with refractory hypertension and severe and moderate OSAS. **Methods:** study of two cases, a 53-year-old man (A) and another 68-year-old woman (B) from medical services and referred after polysomnography examination to a specialized sleep physiotherapy service in the metropolitan region of Porto Alegre/RS. Patient A's hypopnea apnea index (AHI) was 113 events with a minimum SatO<sub>2</sub> of 85%, and patient B had AHI of 23 events and a minimum SatO<sub>2</sub> of 81%. Both had symptoms of excessive sleepiness, complaints of memory loss and poor occupational and home-based performance. Self-titration exam (automatic equipment) was performed for 6 nights accompanied by physiotherapist. Satisfactory when considered to be 4 hours per night / use, without significant leakage, > 24 liters per minute for, ≥ 30% of use time and a residual AHI (measured by the device) ≤ 5 events / hour. **Results:** After titration, follow-up and educational guidance (explanation about the disease, equipment, treatment and adherence factors), patient A evolved with 13 cm H<sub>2</sub>O fixed pressure equipment and 3.5 events AHI, maintaining 80% adherence in 49

patients. days of use and patient B with a fixed pressure of 7 cmH<sub>2</sub>O, AHI of 5 and 77% adherence at 89 days of use. Both had a reduction in blood pressure values documented by an attending physician. **Conclusions:** Self-titration accompanied by professional, educational guidelines were able to ensure treatment and adherence of the association of hypertension and OSAS.

**ID: 715**

### Clinical Studies

#### Diagnosis and treatment of sleep apnea patients in the public health system

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**Introduction:** The Obstructive Sleep Apnea (OSA) is a common disease among adult population. However, the majority of patients remain undiagnosed and untreated. Polysomnography is the gold-standard for OSA diagnosis, but inaccessible and very expensive for our population. The Home Sleep Apnea Test (HSAT) evaluates respiratory variables and can be used when there is a high risk of OSA. The effective treatment to moderate and severe OSA is the Continuous Positive Airway Pressure (CPAP). However, this device is so expensive for population of Public Health System of Brazil (SUS). **Aim:** Describe a model available for management of sleep apnea patients from public health system in Southern Brazil. **Methods:** One hundred and thirty patients were referred to sleep clinic of Santa Casa de Misericórdia de Porto Alegre/RS. All patients underwent a clinical evaluation and those with high probability of OSA performed to HSAT (Stardust II©) from March 2018 to March 2019. The severity of OSA was classified according to the apnea/hypopnea index (AHI) as mild (5 to 14,9), moderate (15 to 29,9) and severe (≥ 30 events/h). Patients with severe OSA and moderate OSA with cardiovascular comorbidities or excessive daytime sleepiness were referred to CPAP treatment. Oral appliance (OA) and maxillomandibular advancement surgery (MMA) were other forms to OSA treatment in select cases. Weight loss was indicated for all overweight and obese patients. **Results:** Were studied 106 patients, 61% female (n=65), mean age 58 years and mean body index 32±6,5kg/m<sup>2</sup>. Most patients (63%) had excessive daytime sleepiness (ESS 12 [2-24]). HSAT was performed 285 days after clinical evaluation and confirmed the OSA diagnosis in 87 patients (82%). Mean AHI was 21 events/h and most of the sample was moderate to severe OSA (n=51). Only 8,5% of the sample (n=9) needed to repeat the HSAT and oximetry loss represented the

mainly reason for the repetition (n=6). Among 51 patients with moderate to severe OSA, 42 had indication for CPAP treatment, but few patients were using the device (n=12) due to financial constraints. Four patients were referred to OA and one to MMA. **Conclusions:** The HSAT is an accessible model for OSA diagnosis among patients with high probability of OSA. However, the waiting time to perform the HSAT is still long in the public health system. Similarly, after OSA diagnosis, few patients have access to treatment, especially those with indication for CPAP treatment.

**ID: 717**

### Basic Research

#### Inhibition of endogenous melatonin by luzindole induces small intestinal inflammation and morphology alterations in mice

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**Introduction:** Acute blocking of the endogenous melatonin (MLT) receptors by luzindole without MLT supplementation have not been explored. **Aim:** To investigate the effects of luzindole administration, a high affinity MLT receptor antagonist (MT1 and MT2) in mice small intestine, where MLT concentration is substantially higher. The intestinal aggressor lipopolysaccharide (LPS) was administered for comparison. **Methods:** Swiss mice (24) were treated with either saline (0.35mg/kg, i.p), luzindole (0.35mg/kg, i.p) or LPS (1.25mg/kg, i.p). After 90-min, jejunum samples were evaluated regarding intestinal morphometry, i.e. histopathological crypt scoring and PAS-positive villus goblet cell counting; plus inflammatory (Iba-1, IL-1 $\beta$ , TNF- $\alpha$ , NF $\kappa$ B, and MPO) and oxidative stress (NP-SHs, CAT, GSH, MDA, and nitrate/nitrite) markers. **Results:** Animals treated with luzindole or LPS showed shortening of villus height compared to saline. The LPS group had worse histopathological score of the crypts. Luzindole treatment and LPS reduced the amount of goblet cells immunolabelled with PAS and increased Iba-1-immunolabelled cells as compared to saline. Immunoblotting for IL-1 $\beta$ , TNF- $\alpha$ , and NF $\kappa$ B was more intense in the luzindole group. Mice treated with LPS showed higher tissue alterations, and MPO activity

than the saline and luzindole. There was a reduction in the activity of CAT enzymes in the luzindole and LPS when compared to saline. The luzindole group showed an increase in GSH. **Conclusions:** The acute blockade of endogenous MLT with luzindole, a MT1 and MT2 receptor inhibitor, induces precocious and prominent inflammatory and pro-oxidant effects with altered intestinal morphology. As compared, LPS induced mucosa pathological changes. It is proposed that high concentrations of endogenous MLT in the intestine have a primordial function blocking inflammation and oxidative stress. This research was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brazilian Research Council

**ID: 719**

### Case Reports

#### Polysomnography Findings in Patients with Restless Legs Syndrome: by the way of a case

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**Introduction:** Sleep disturbances and their sequelae are the most common complaints of patients with restless legs syndrome (RLS). The consequences of chronic sleep loss have been investigated intensively in recent years. **Aim:** Describe sleep disorders caught on polysomnography in a patient with restless leg syndromes and do a literature review about restless legs syndrome. **Methods:** The study was conducted from the examination analysis of a patient who underwent polysomnography in the sleep laboratory of a school hospital. **Results:** SDS, 72 years old, presents alterations of the sleep-wake cycle. Evaluation in the pre-sleep questionnaire, the patient answered positively to the 4 diagnostic criteria defined by the International Restless Leg Syndrome Study Group. Polysomnography result was consistent with increased sleep latency for non-REM and REM. Presented fragmented sleep and importante increased wakefulness after sleep onset and consequent reduction in sleep efficiency. It also presented a slight change in sleep architecture at the expense of increased N2 phase content, and reduced REM sleep content. The alteration of REM sleep, with reduction of REM sleep duration and increase of REM sleep latency, is a novel finding. It might have occurred as a consequence of sleep interruptions which were in turn due to the nocturnal occurrence of RLS symptoms. The consequences of chronic sleep loss have been investigated intensively in recent years. Chronic sleep deprivation, as in untreated RLS, may lead to increased risk of insulin resistance and type 2 diabetes or to impairment of sleep-dependent memory consolidation. Prefrontal cognitive deficits

similar to those reported for loss of one night of sleep were shown recently in patients with RLS. **Conclusions:** The findings show markedly fragmented sleep with deterioration of both NREM and REM sleep in RLS. The long-term consequences of sleep loss in this patient population should be investigated further.

**ID: 720**

### Clinical Studies

#### Does sleep quality predict different physical activity levels? Cross-sectional study in older adults with low back pain

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**Introduction:** Sleep quality changes due to the aging process. It is not yet clear in the literature whether poor sleep quality can influence the intensity of physical activity in the elderly with low back pain. **Aim:** To investigate whether sleep quality can predict different levels of physical activity in older people with low back pain. **Methods:** This study was designed as a cross-sectional. Participants aged 60 and over were recruited. A face-to-face interview was performed at their homes and data were collected using the Modified Baecke Elderly Questionnaire, the Pittsburgh Sleep Quality Index, the Daytime Sleepiness Scale, and participants were asked about the presence of low back pain at moment of the interview and/or in the last three months. **Results:** The final sample of this study included 225 elderly with low back pain. Among the participants, 77% were women. The mean age (standard deviation) was 71.07 years and the Body Mass Index averaged 28.27 (5.09) kg/m<sup>2</sup>. The mean low back pain intensity of those participants was 4.52 (3.18), the average sleep quality was 10.92 (6.86), and the average total physical activity was 4.82 (4.03). The linear regression analysis demonstrated that sleep quality is not associated with physical activity of older adults with low back pain ( $\beta=-0.01$  CI=-1.67 to 0.15 and  $p=0.95$ ). **Conclusions:** The results from this study showed sleep quality was not able to predict the levels of physical activity of the older population. This result may be due to the fact that our participants present a previous health condition, such as low back pain. Future studies should investigate the domains of the sleep questionnaire related to physical activity levels.

**ID: 721**

### Clinical Studies

#### Can sleep quality or daytime sleepiness be associated with physical disability in older adults? A cross-sectional study

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**Introduction:** Low back pain is a major cause of disability worldwide. Reports in the literature show that 60% of patients with low back pain have sleep complaints. At the moment, the relationship between sleep and disability in older adults remains unclear. **Aim:** To investigate whether sleep quality is associated with disability in older adults with low back pain. **Methods:** The study was designed as cross-sectional. Inclusion criteria for participation were age over 60 years, low back pain in the last 12 weeks or at the moment of the interview, and absence of cognitive impairment. The questionnaires applied were Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index, and the Roland Morris Questionnaire. To perform the statistical analysis, the multivariate regression model was applied and adjusted for covariates. **Results:** The sample consisted of 225 older adults with low back pain. The average (standard deviation) of sleep quality was 10.33 (3.24) points in the Pittsburgh Sleep Quality Index questionnaire, the average daytime sleepiness scale of 5.01 (3.37), and the mean disability questionnaire in this population was 10.92 (6.6). After the covariate-controlled multivariate linear regression analysis, the final model showed that the daytime sleepiness scale was associated with disability in patients with low back pain  $\beta=0.20$  (0.001 to 0.40) and  $p=0.04$ , meaning that, at each point on the sleepiness scale, patients increased 0.20 points on the disability questionnaire. **Conclusions:** Our results suggest that daytime sleepiness was associated with an increase in physical disability in older people with low back pain. Future studies should investigate if there is a relationship of causality.

**ID: 723**

### Basic Research

#### Effects of hydroxychloroquine on blood pressure control in sleep apnea

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**Introduction:** Obstructive sleep apnea (OSA) is recognized as independently associated with high blood pressure. Protocols of chronic intermittent hypoxia (CIH) increase blood pressure (BP) in animal models. Hypertension has been linked to inflammation. Hydroxychloroquine (HCQ) has been proven to exert anti-inflammatory effects through down-regulation of pro-inflammatory cytokines. **Aim:** We hypothesized that CIH simulating sleep apnea causes hypertension via inflammation-mediated mechanisms and that hypertension could be inhibited by the anti-inflammatory action of HCQ. **Methods:** Seventeen male 12-week-old Wistar rats were submitted to telemetry sensor implantation surgery (DSI®, USA) for continuous BP verification. After surgical recovery, they underwent 14-day CIH protocol with either injection of 35mg/kg/day of HCQ diluted in saline (Sigma-Aldrich, USA) (CIH+HCQ group, n=5) or saline vehicle (CIH group, n=6) or sham hypoxia with saline vehicle injection (sham group, n=6). The hypoxia protocol was performed by introducing nitrogen into the cages reducing the oxygen fraction from 21% to 7±1%. The rats underwent CIH daily during 8 hours, simulating an apnea/hypopnea index of 51/h. The BP recordings were performed in the morning and in the afternoon. Averages of individual BP values were calculated for each day. For the present analysis, only mean arterial pressure (MAP) data were used. P values were obtained from generalized estimating equations with Bonferroni's correction for multiple comparisons. **Results:** No baseline MAP difference was seen (day-1: Sham, 123±2mmHg; CIH, 114±6mmHg; CIH+HCQ, 117±4mmHg), but at 14-day follow-up (day-14: Sham, 105±5mmHg; CIH, 121±3mmHg; CIH+HCQ, 115±2mmHg) a significant difference existed between sham and CIH groups (p=0.01). The HCQ group effect on delta MAP from day-1 to day-14 exposure against CIH and sham groups showed statically significant time × group interaction (p<0.001). **Conclusions:** The CIH model is capable of increasing significantly MAP, confirming previous reports of the OSA role on the pathogenesis of high blood pressure. Our data suggests a potential inflammatory pathway in the OSA-hypertension relationship, which is mitigated by the use of HCQ. Studies in humans are needed to assess the effect of HCQ as adjunctive therapy in OSA.

## Clinical Studies

### Frequency and Predictors of Sleep Duration Misperceptions: Data from 2,036 participants from the ELSA-Brasil Study

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**Introduction:** Accumulating evidence links short and/or long sleep duration (SD) with several metabolic and cardiovascular diseases. However, the majority of the previous studies used self-reported SD. It is unclear, however, the magnitude and the factors associated with SD misperceptions that may potentially limited the utility of using subjective SD. **Aim:** To evaluate the frequency and predictors of Sleep Duration (SD) misperceptions in a large cohort of participants not referred to sleep laboratories. **Methods:** Participants from the ELSA-Brasil study underwent clinical and sleep evaluation (including mean subjective SD and wrist actigraphy for 7 days). We considered a significant SD underestimation (underSD) and overestimation (overSD) when the differences between subjective and objective SD reached at least -1 hour/+1-hour, respectively. The Bland-Altman method and Pearson correlation coefficients (r) were assessed for exploring potential bias and agreement between the self-reported and actigraphy data. We used logistic regression analyses for identifying characteristics associated with SD misperceptions. **Results:** Data from 2,036 participants were used in the final analysis (42.7% males; mean age: 49±8 years). Subjective SD revealed poor correlations and low agreement with objective SD. The overall frequency of significant SD misperceptions was 39.1% (underSD: 19.4%; overSD: 19.7%). The predictors of underSD included: black race (OR: 1.88; 95% CI: 1.35, 2.64), mixed race (OR: 1.57; 95% CI: 1.18-2.09); excessive daytime sleepiness (OR: 1.46; 95% CI: 1.12-1.91); longer wake time after sleep onset time, WASO (OR: 2.38; 95% CI: 1.34-4.26), and longer objective SD (OR: 2.98; 95% CI: 2.52-3.52). Longer WASO (OR: 2.24; 95% CI: 1.33-3.79), and higher number of awakenings (OR: 1.02; 95% CI: 1.00-1.03) were independently associated with overSD. Interestingly, married status, high education levels and higher sleep efficiency were associated with good SD perceptions. **Conclusions:** Subjective has poor correlations and agreement with objective measurements of SD contributing to a significant rate of SD misperceptions. While underSD was more associated with black/mixed race, daytime sleepiness, longer SD and

ID: 724

WASO, overSD was specifically associated with markers of sleep fragmentation. Considering the available technology, these results underscore the need for stopping the use of subjective data for SD definitions.

**ID: 726**

### Clinical Studies

#### Cheeks asymmetry is not associated with sleep apnea severity

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**Introduction:** Obstructive sleep apnea (OSA) is a prevalent health condition among adults and one of the most underdiagnosed diseases worldwide. Polysomnography is the golden standard assessment to precisely diagnose sleep-related disorders. Craniofacial anatomical phenotypes are established risk factors for OSA in children and adult populations. Abnormalities such as mandibular deficiency, maxillary hypoplasia, inferior position of the hyoid bone, a narrowed posterior air space in adults are risk factors for OSA. Therefore, investigating the facial symmetry may be of clinical interest in OSA adult population. **Aim:** Verify whether cheeks appearance asymmetry is a predictor of OSA risk. **Methods:** Adult patients with sleep complaint were assessed in a sleep clinic between October of 2018 and March of 2019. They underwent overnight polysomnography and face photography was taken by one of the evaluators while assessing them in loco. Two other blinded and independent evaluators assessed all the patients based on photographic data. The cheeks appearance evaluation was based on the volume and the tone of the structures, assessing the right and the left cheek separately. **Results:** A total of 248 subjects were included (mean age, 46 years; 147 [59 %] male; 114 [46 %] obese). 29% were non-OSA cases, 26% had mild OSA, 23% had moderate OSA and 22% had severe OSA. 33 (13.3%) of the subjects had cheeks asymmetry based on the protocol used. The results show no statistical difference in AHI when comparing the symmetric ( $19 \pm 23/h$ ) to the asymmetric cheeks groups ( $18 \pm 15$ ;  $p=0.15$ ) when associating to apnea-hypopnea index (IAH). The binary logistic regression analysis including cheeks asymmetry as dependent variable and adjusting for BMI, age and gender remained non-significant. **Conclusions:** Cheeks appearance asymmetry is not related to OSA severity and does not seem to imply in a higher risk for OSA, suggesting that soft tissue asymmetry is irrelevant as OSA predictor.

**ID: 728**

### Clinical Studies

#### Interactions between Obstructive Sleep Apnea and Sleep Duration with Subclinical Atherosclerosis Evaluated by Coronary Calcium Score: Cross-sectional Data from ELSA-Brasil study

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**Introduction:** Recent data suggest that sleep disorders like Obstructive Sleep Apnea (OSA) and extremes of Sleep Duration (SD) are associated with coronary artery disease. However, the interaction of OSA and SD with subclinical markers of the coronary atherosclerosis remains to be determined. **Aim:** To Test the association of OSA, SD and their interactions on subclinical atherosclerosis evaluated by coronary artery calcium (CAC) score. **Methods:** We consecutively evaluated participants from ELSA-Brasil, a cohort study of adult civil servants. All participants were submitted to a single night portable sleep monitoring (Embletta Gold™) to determine OSA status and wrist actigraphy during one week (Actiwatch 2™) for the objective ascertainment of the SD. An apnea-hypopnea index (AHI) <5 events per hour was considered normal; AHI 5-14.9 and IAH  $\geq 15$  events/hour were classified as mild OSA and moderate-severe OSA, respectively. Computed tomography using a Philips Brilliance 64-detector scanner (Philips Healthcare, Andover, MA) was performed to assess the calcium score by a standard protocol adjusted for each participant's biotype. Subclinical atherosclerosis was defined as a CAC >100 score. Analysis of adjustment for potential confounding factors was performed, including age, sex, and cardiovascular risk factors and drug use. **Results:** We studied 2,169 participants (age:  $49 \pm 8$  years; 56.6% female). The frequency for OSA was 32%. We observed a progressive increase in the frequency of CAC >100 in parallel to the severity of OSA: No OSA: 4%, mild OSA: 8% and moderate-severe OSA: 12% ( $p$  trend: <0.001). Interestingly, participants with long SD (>8 hours) presented higher frequency of CAC >100 (15%) as compared to subject with SD 6-8 hours (7%) and SD <6 hours (9%;  $p$  trend: 0.01). In the logistic regression, moderate-severe OSA (OR 1.18; IC 95%: 0,85 1,64) or SD >8 hours (OR 1.39; IC 95%: 0,88 2,21) were not associated with CAC >100. However, the interaction of OSA with SD >8 hours was independently associated with CAC >100 (OR 2.78;  $p=0.01$ ) when compared to the reference group (no OSA, SD <8 hours). **Conclusions:** We observed an interesting interaction of OSA with long

SD (>8 hours) with almost three-fold chance to present relevant subclinical atherosclerosis (defined by a CAC >100).

**ID: 729**

### Clinical Studies

## Obstructive sleep apnea and heart rate variability assessed by ambulatory blood pressure monitoring in seniors with diabetes. A propensity score matched case-control study

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**Introduction:** Impaired heart rate variability (HRV) in continuous ECG recordings is an index of cardiovascular risk. Increased HRV during sleep, estimated from ambulatory blood pressure monitoring (ABPM-HRV), has been described as a predictor of cardiovascular events in type 2 diabetes mellitus (T2DM). Obstructive sleep apnea (OSA) is common in T2DM and could explain the increased nighttime ABPM-HRV in T2DM. **Aim:** Identify whether the HRV is higher in diabetic seniors in comparison with non-diabetic seniors controls. **Methods:** Community-dwelling and physically independent persons aged 65 years and older of both sexes were recruited from an ongoing cohort study that performs respiratory polygraphy and ambulatory blood pressure monitoring at 15-minute intervals during the day and 20-minute intervals during the night. ABPM-HRV was estimated from the standard deviation (SD) and coefficient of variation (CV) of heart rate. Non-diabetic controls were matched by age, sex and body mass index using the propensity score Diabetic vs. non-diabetic and OSA vs. non-OSA comparisons were performed to assess their associations with daytime and nighttime ABPM-HRV. **Results:** Among the 429 subjects in the cohort, we found 90 T2DM cases and were able to match 90 non-diabetic controls. In univariate analysis, participants with T2DM showed a 24-hour ABPM-HRV CV lower than the controls:  $11.7 \pm 4.2$  vs.  $13.4 \pm 4$ , respectively;  $P=0.006$ . Adjusting for AHI and usual confounders the difference is still significant ( $P=0.017$ ). **Conclusions:** Reduced HRV was independently associated with T2DM. This may contradict a previously reported hypothesis that OSA could participate in increasing nighttime ABPM-HRV in T2DM. The present results in seniors warrant further research on the mechanisms of the OSA-HRV relationship.

**ID: 730**

### Basic Research

## Association between children's sleep habits and blood pressure at six years of age

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**Introduction:** Sleep habits play an important role on health maintenance and prevention of non-communicable chronic diseases in childhood and adulthood. **Aim:** To evaluate the effect of sleep habits on blood pressure of six-year-old children. **Methods:** This research is a part of a bigger study denominated Predictors of Maternal and Infant Excess Body Weight – PREDI Study that was performed in Joinville-SC, Brazil. Data were collected at the homes of mothers and children that participated in the third follow-up of the PREDI Study in 2018. Sleep habits of the children were obtained by self-reports of the mothers by using the “Inventory of Sleep Habits for Preschool Children”. Children’s Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) were measured by a health professional through the auscultatory method and according to the “2017 Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents”. Instructional therapeutic play was used as a strategy to avoid embarrassment to the children and to facilitate blood pressure assessment by the health professional. **Results:** Of the 178 children that participated in the study, 21 (11.8%) presented elevated SBP ( $\geq P90$ ). Among these children, there was a greater prevalence poor sleep quality (57.1%). Additionally, children classified as having inadequate sleep habits showed significantly greater mean of SBP in comparison to children with adequate sleep habits, 61.5mmHg e 52.8mmHg respectively. The logistic regression analysis revealed that children with inadequate sleep habits had greater odds of having SBP $\geq P90$  when compared to children with adequate sleep habits even after adjustment for nutritional status and years of education (OR=5.3, 95%CI=2.0-13.9,  $p=0.001$ ). **Conclusions:** Children with inadequate sleep habits have greater odds of developing high blood pressure at six years of age. Taking care of sleep quality in preschool age is essential to avoid the development of chronic-degenerative diseases that can last until adulthood.

ID: 731

## Basic Research

## Anxiety, Mood and Sleep Quality of Basketball Elite Athletes in a Competition

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**Introduction:** It is known that anxiety and sleep quality can influence athletes' performance, so these are important factors in a competition. **Aim:** To evaluate athletes' sleep quality, anxiety and mood in a competition day. **Methods:** This cross-sectional study assessed nine basketball male athletes in a state competition, using actigraphy, sleep diary, Brunel Mood Scale (BRUMS), short-form version of Competitive State Anxiety Inventory-2 and State-Trait Anxiety Inventory (STAI). Anxiety and mood questionnaires were applied in the morning after the studied night. Pittsburgh Sleep Quality Index (PSQI) and Morningness-eveningness questionnaire were used to classify usual sleep quality and chronotype, respectively. **Results:** Athletes had  $18.4 \pm 0.7$  years old. During competition they slept on mattresses disposed on the floor of a classroom school. The team complained about the poor quality of the mattress and environmental noise as causes for awakenings. They had poor sleep quality, with a mean PSQI score of  $5.5 \pm 3.2$ . Regarding the chronotype, six (67%) athletes were intermediate, two (22%) morning and one (11%) evening type. The total sleep time was  $359.5 \pm 56.7$  minutes, with efficiency of  $91.1 \pm 6.1\%$ . Sleep latency ( $46.0 \pm 46.8$  minutes) and wake after sleep onset ( $34.0 \pm 27.3$  minutes) indicate a poor sleep quality. Subjective sleep quality (SSQ) was  $5.2 \pm 1.4$ , with 43% of athletes evaluating their night as "bad". In subsequent morning, six athletes (67%) reported waking up at least once during the night. BRUMS indicated that the positive psychological state (vigor) was apparently superior ( $7.0 \pm 3.0$ ) to the fatigue ( $4.0 \pm 3.0$ ), tension ( $4.0 \pm 1.2$ ), confusion ( $0.0 \pm 1.9$ ), angry ( $0.0 \pm 1.3$ ) and depression ( $0.0 \pm 0.7$ ). There was a positive correlation between SSQ and vigor ( $p=0.02$ ). Regarding competitive anxiety, self-confidence ( $2.8 \pm 0.5$ ) was higher than cognitive anxiety ( $2.0 \pm 0.7$ ) and somatic anxiety ( $1.3 \pm 0.4$ ). Somatic anxiety was positively correlated with sleep latency ( $p=0.03$ ) and negatively with total sleep time ( $p=0.02$ ). Self-confidence was positively correlated with SSQ ( $p=0.05$ ). STAI indicated that anxiety trait ( $15.0 \pm 1.4$ ) was apparently superior to state anxiety ( $13.0 \pm 1.8$ ).

**Conclusions:** Anxiety and mood results indicate adequate psychological preparation for competition. Athletes had bad sleep quality, which could have been influenced by the competition environment. It is emphasized the need for awareness to improve competitive Brazilian athletes' sleep conditions.

ID: 732

## Case Reports

## Treatment of zolpidem abuse and dependence in an insomniac patient

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**Introduction:** Zolpidem is a gamma-aminobutyric acid agonist that binds on the benzodiazepine site of its pentameric receptor. It has a hypnotic action with only minor anxiolytic, myorelaxant and anticonvulsant properties. Although zolpidem has a low dependency risk, there is current evidence in literature that at higher than recommended doses, its pharmacology resembles that of benzodiazepines and consequently potential for abuse. **Aim:** The purpose of this report is to show a case of zolpidem dependence in which high doses of zolpidem were used not only to improve insomnia but also to induce anxiolytic effects. **Methods:** A 50-year-old woman with chronic insomnia complaint for 15 years (initiated after a period of alcohol and cocaine abuse) was seen in our Sleep Center. At that moment, for insomnia treatment, she received a prescription of zolpidem 10mg at night with improvement of the initial symptoms. The patient started to use zolpidem without medical prescription in adverse life situations, like when her mother passed away. Two years before the patient was evaluated at our Sleep center, she sought medical help for insomnia and started to use low doses of quetiapine and clonazepam, but also maintained the use of zolpidem. During the last year, while she was feeling sad, she was taking at least 150mg/day of zolpidem trying to get the anxiolytic effect of the drug. **Results:** When she started the treatment under our medical care, she was given an outpatient treatment with valproic acid 500mg/day, quetiapine 100mg/day and initial doses of clonazepam 3mg/day, at which time she was able to stop using zolpidem. As a side effect, it was seen an important weight gain and valproic acid was replaced by topiramato 50mg/day. Her anxiety symptoms are now stable and she maintains a good sleep pattern. **Conclusions:** It is now known that zolpidem can be misused by some insomniac patients to induce an anxiolytic effect. At high doses, zolpidem may lose its selectivity for hypnotic effects, and

show all the other effects of common benzodiazepines. Patients with a past history of any substance abuse may be at risk for zolpidem abuse.

**ID: 735**

### Basic Research

## Inflammatory mechanisms in the healing process influenced by sleep deprivation

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**Introduction:** The inadequate sleep pattern can be associated to a series of consequences related to sleep disorders, such as autoimmune diseases, increased risk of cardiovascular, metabolic diseases and inflammation. Inflammation is a natural and essential defense mechanism of the body, responsible for combating antigens, restoring homeostasis and repairing tissue damage, such as wound healing. The wound healing process is complex and involves soluble mediators, blood cells, extracellular matrix and parenchymal cells. It is understood that the interactions between the biological mechanisms of sleep and inflammation reinforce a path for the development of treatments that modulate healing. **Aim:** To investigate inflammatory mechanisms of paradoxical sleep deprivation under the inflammatory aspect in the skin healing process in an animal model, as well as the sleep pattern. **Methods:** The study will be conducted on male C57B16 mice. Animals will be randomly assigned to the control group, wound group or paradoxical wound sleep deprivation group, and their respective control groups. With regard to skin wound induction, the animals will be anesthetized with xylazine and ketamine and an area on the skin of the dorsal region will be scraped and removed by surgery. The evaluation of skin wound closure will be by daily photographs from day 0 to 14. Electrode implantation will be performed by stereotactic procedure, to assess sleep pattern through electrocorticogram and electromyogram signals. In addition, paradoxical sleep deprivation will be performed by the multiple platform method for mice. Finally, the animals will be euthanized and consequently the tissues will be collected for proper histological analysis and determination of cytokine concentrations by Elisa. **Results:** No results. **Conclusions:** Paradoxical sleep deprivation is expected to further increase the levels of inflammatory cytokines in animals with skin lesions. And consequently, the transition from the wound inflammation stage to the proliferation stage is more effective due to the induction of anti-inflammatory mediators and growth factors. Considering that, the literature points out that the lack of sleep affects the skin only when associated with the age factor.

**ID: 736**

### Clinical Studies

## Age-related sleep fragmentation

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**Introduction:** Obstructive sleep apnea (OSA) is associated with sleep fragmentation. The ventilatory disruption ultimately causes physiological changes that affect arousal control in central nervous system (CNS). Arousals are, in fact, a diagnostic criterion for marking hypopneas in the polysomnography (PSG). Age is also related to sleep maintenance. Current evidence suggests that arousal index increases with age. However, to date, it is not known any study with a large group of individuals evaluating the arousal index (AI) in the PSG in relation to age, controlling to other causes of sleep disruption. **Aim:** This study aimed to evaluate the correlation of AI with age, controlling for apnea and hypopnea index (AHI) and periodic leg movement index (PLMI). **Methods:** A retrospective analysis of all 30159 PSG studies performed between 2008 and 2016 in patients of a large sleep center was conducted. Exclusion criteria were repeated PSG of the same patient, split-night or CPAP PSG studies, age below 18 years and use of sleep-inducing drugs in the night of the PSG. Thus, 21961 eligible PSG reports were analyzed. A multiple regression analysis was conducted, with AI as dependent variable and age, AHI, and PLMI as independent variables. **Results:** There were positive correlations between increased AI and AHI (beta=0.68, p<0,001), PLMI (beta=0.10, p<0,001), and age (beta=0.01, p=0.01). **Conclusions:** As expected, the main predictor factor of arousal index was AHI, and the second was PLMI. Even controlling for those two main causes of sleep fragmentation, age continued to be significantly related to the arousal index. This result gives new insights about CNS resilience to arousing stimuli changing with aging.

**ID: 737**

### Clinical Studies

## Effects of hypnotic drugs on macroarchitecture of sleep

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**Introduction:** Insomnia has a high prevalence in adulthood and has great impact on social and cognitive performance. The pharmacological treatment might involve benzodiazepines, non-benzodiazepines hypnotics (Z-drugs), sedative antidepressants and other drugs; each of them may present different effects on sleep macroarchitecture. Long term use of benzodiazepines is associated with an increase of stage 1 non-REM sleep (N1), reduction of stage 3 non-REM sleep (N3) and REM sleep, and increase of sleep latency (SL) and REM sleep latency (REML). Z-drugs show little or no alterations on the macroarchitecture of sleep, and trazodone (a largely used sedative antidepressant) increases REM sleep compared to benzodiazepines. **Aim:** The objective of this study was to compare the effect of different sleep-inducing drugs on the macroarchitecture of sleep. **Methods:** The macroarchitecture of sleep (N1, N2, N3, REM, SL, SREM, and sleep efficiency - SE) was analyzed in 30159 polysomnographic reports (PSG), grouped according to the medication used or not by the patient in the night of the exam. Exclusion criteria were repeated PSG of the same patient, split-night or CPAP PSG reports, age below 18 years, apnea-hypopnea index > 5/hour and periodic limb movement index > 15/hour. The resulting sample had 7360 patients, aged 18 to 86, divided in no-drug (n=6893), benzodiazepines (n=209), z-drugs (n=77), trazodone (n=62), other drug (n=72) and multiple drugs (n=47) in order to run ANOVA with Games-Howell post-hoc tests. **Results:** Benzodiazepines showed, compared to no-drug, increase of SL (4 min), REML (32 min), and N2 (7 percentage points - pp), and reduction of N3 (5 pp) and REM sleep (2 pp). The use of trazodone resulted in significant increase of N3 compared to benzodiazepines (10 pp) and no-drug (5 pp), and was the only group that did not lower REM sleep, compared to no-drug. **Conclusions:** The results suggest that trazodone have a more benefic profile than benzodiazepines in preserving normal sleep macroarchitecture. These alterations caused by benzodiazepines might affect sleep functions, such as memory consolidation, restoration of individual performance, among others.

**ID: 738**

### Clinical Studies

#### Circadian alterations in bipolar disorder

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**Introduction:** The sleep-wake cycle is important for affect regulation. Alterations in sleep timing or duration are observed in depressed and manic patients and may

precipitate episodes of bipolar disorder. Bipolar patients often complain of longer time in bed, fragmented sleep, unstable and irregular sleep-wake cycles. The exact mechanism of interaction between affect and sleep is still unknown, but it has been hypothesized that interventions toward good sleep habits might prevent relapse. **Aim:** The objective of this research is to detect relations of alterations in sleep-wake cycle and affective symptoms and functionality in patients with bipolar disorder. **Methods:** Outpatients attending a psychiatric service specialized in bipolar disorder (DSM-5 criteria) were recruited to participate in a larger study that is investigating response predictors to the disease. As part of the screening, in the initial interviews, individuals completed the Hamilton Depression Scale (HAM-D), Young Mania Rating Scale (YMRS), Biological Rhythms Interview of Assessment in Neuropsychiatry (BRIAN), and Functional Assessment Staging (FAST). Response of the scales had a maximum time-lapse of 30 days, and interviews were held between March 2017 and January 2018. Ethics Committee approved the study. **Results:** After excluding those individuals with unstable clinical status and current substance use, 32 patients (17 women) were recruited, with mean age of 44.7 years (27 - 62). Spearman's correlations were significant for BRIAN and HAM-D ( $r_s=0.40$ ,  $p=0.04$ ) and for BRIAN and FAST ( $r_s=0.56$ ,  $p=0.002$ ). HAM-D was related to YMRS ( $r_s=0.41$ ,  $p=0.02$ ) and to FAST ( $r_s=0.42$ ,  $p=0.03$ ). After controlling for the other variables, only BRIAN and FAST remained significant ( $r=0.53$ ,  $p=0.02$ ). **Conclusions:** Circadian alterations related to depressive symptoms and not to manic symptoms. After controlling for other variables, only the alterations in biological rhythms predicted the functionality of bipolar patients. However, the neuropsychological profiles of the patients were not evaluated. Regularity and rhythmicity in behavior in bipolar patients are important in maintaining their functionality.

**ID: 739**

### Clinical Studies

#### Sleep quality in bipolar disorder

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**Introduction:** Sleep and mood are intimately related. Alterations in sleep timing or duration are observed in depressed and manic patients and may precipitate episodes of bipolar disorder. Bipolar patients often complain about the quality of their sleep, delay in start sleeping, fragmented sleep, difficulty to maintain enthusiasm, and using sleep-inducing medications. The mechanisms of interaction

between affect and sleep, though, are still unknown. **Aim:** The objective of this study is to evaluate relations between sleep quality and both depressive and manic symptoms and functionality in patients with bipolar disorder. **Methods:** A cross-sectional evaluation of bipolar outpatients (DSM-5 criteria) were conducted between March 2017 and January 2018, as part of a larger study, which is investigating response predictors to the disease. Individuals completed the Hamilton Depression Scale (HAM-D), Young Mania Rating Scale (YMRS), Functional Assessment Scale (FAST), and The Pittsburgh Sleep Quality index (PSQI) in the initial interviews, and those questionnaires will be repeated regularly throughout 94 weeks. Response of the scales had a maximum time-lapse of 30 days. Only responses from the first wave have been included so far. Ethics Committee approved the study. **Results:** Thirty-two patients met inclusion and exclusion criteria (unstable clinical status, current substance use). The mean age was 44.7 years (27 - 62) and 53% (n=17) were women. Data were not normally distributed, so the non-parametric Spearman's correlation was conducted between numeric variables. The only significant correlation was between PSQI and FAST ( $r_s=0.44$ ,  $p=0.03$ ). **Conclusions:** Sleep quality is an important component of quality of life and, in this study, related significantly with functionality. However, it did not relate to depressive or manic symptoms. This result stresses the importance of maintaining good sleep habits in bipolar patients.

**ID: 741**

### Case Reports

#### Vagus nerve stimulation may induce obstructive sleep apnea : a case report

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**Introduction:** Frontal lobe epilepsy is relatively common and often presents with nocturnal seizures. Vagus nerve stimulation can be an alternative treatment for refractory patients. The left vagus nerve is stimulated using an implanted device at the level of the neck. Obstructive sleep apnea may impair seizure control. **Aim:** Report a case of obstructive sleep apnea secondary to vagus nerve stimulation for epilepsy treatment. **Methods:** We report a 29-year old male patient with a diagnosis of frontal lobe epilepsy under treatment with vagus nerve stimulation that was referred to the sleep medicine outpatient clinic due to snoring and daytime sleepiness. His epilepsy started during childhood. Vagus nerve stimulation was indicated due to inadequate control of seizures with

clobazam and lamotrigine. After stimulator implantation, the patient observed better control of the number of seizures but noticed intermittent hoarseness. Six months after cervical electrode implantation the number of seizures had increased again. The patient noticed daytime sleepiness and snoring. Polysomnography was requested to investigate possible obstructive sleep apnea. **Results:** Polysomnography revealed obstructive respiratory events at regular intervals and with a similar duration in all events. An electrocardiogram artifact was also noticed during respiratory events. AHI was 27,0 hour . A few cases of vagus nerve stimulation inducing OSA have been reported. Obstructive events are caused by vagus nerve stimulation of upper airway muscles. Reduction of stimulus intensity, switching the device off or CPAP may be necessary to control obstructive respiratory events. **Conclusions:** Obstructive sleep apnea may be a side effect of vagus nerve stimulation that may affect seizure control.

**ID: 742**

### Case Reports

#### Use of Intraoral Appliance in Light-to-Moderate Obstructive Sleep Apnea - Case Series Report

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**Introduction:** Obstructive sleep apnea is a prevalent disease associated with cognitive damage and increased risk to cardiovascular disease. The use of intraoral appliances is a treatment option for patients with light-to-moderate obstructive sleep apnea. **Aim:** To evaluate the effectiveness of the use of the intraoral appliances in the treatment of patients with obstructive sleep apnea. **Methods:** Case series report. All patients were evaluated by a sleep medicine doctor and submitted to a sleep evaluation with full night polysomnography. Patients with light to moderate obstructive sleep apnea (AHI between 5 to 29.9 events per sleep hour), without indication of surgery, were referred to a dental assessment for the use of a mandibular advanced intraoral appliance. All intraoral appliances were made by Odonto Knoll (R). After 30 to 60 days of intraoral appliance use, patients were submitted to another polysomnography using the intraoral device. Results of polysomnographies were compared. **Results:** 100 Patients were assessed. 8 patients did not made de device. N = 92. Average age: 52 YEARS. 56% were men. Total sleep time (mean, SD): 374.4 (190-475) Minutes; Number of respiratory events (mean, SDE): 78 (34-162) events; AHI (mean, SD): 12.3 (4.3 - 23.9) events/h; Nadir varied

between 61-93%. Average mandibular advance was 3.3 mm (varying from 2.5 to 4.5 mm); The use of intraoral appliance reduced significantly the number of respiratory events and AHI, but there was no modification of total sleep time, as follow: Total sleep time (mean, SD): 374.8 (288-453) minutes, ( $P > 0.05$ ); Number of respiratory events (mean, SD): 53 (3-165) events, ( $P < 0.05$ ); AHI (mean, SD): 7.16 (0.5-22.1) events/h, ( $P < 0.05$ ); Nadir varied between 74-91%. **Conclusions:** Intraoral appliance significantly reduced the number of respiratory events and, therefore, AHI in these patients with light-to-moderate obstructive sleep apnea. These findings show the importance of intraoral appliance in the roll of obstructive sleep apnea treatment and the importance of a multidisciplinary evaluation.

**ID: 745**

### Clinical Studies

#### Exercise as a modifier of glycidic and lipid metabolism in sleep-deprived mice

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**Introduction:** Repeated deprivation of a fundamental need, such as sleep, results in physiological adaptations and phenotypic changes. Sleep deprivation (SD) is known to be associated with adverse consequences for individual health and well-being. Weight management and glycemic control are negatively affected by SD. To date, in vivo systemic and local metabolic shift patterns associated with SD and the modifying factors need more clarification.

**Aim:** To evaluate metabolic alterations associated with SD in mice and to further investigate the influence of associated exercise. **Methods:** Three-month-old swiss mice were divided into four groups: control, SD, exercise (EX) and previous exercise followed by SD (EX+SD). Exercised animals were submitted to motorized treadmill (9m / s) for 8 weeks. Sleep deprived mice were submitted to the modified multiple platform model (72h). The metabolite profiles of mice cortex, in all groups, were analyzed using liquid chromatography/mass spectrometry. Data were expressed as Mean  $\pm$  Standard Error of Mean (E.P. M.). ANOVA, followed by Newman-Keuls test was performed and significance was considered at  $p < 0.05$ . Statistical analysis was performed using GraphPad Prism® 5.01 software. **Results:** EX mice showed high levels of serum glucose ( $144.40 \pm 8.27$  mg/dL), lactate ( $98.50 \pm 4.56$  mg/dL) and triglycerides ( $227.10 \pm 28.03$

mg/dL) ( $p < 0.05$ ). Serum triglycerides were reduced in mice with SD ( $72.18 \pm 3.96$  mg/dL) and in EX+SD mice ( $p < 0.05$ ) ( $81.90 \pm 3.93$  mg/dL) as compared to the control group ( $137.4 \pm 8.62$  mg/dL). Serum cholesterol was uniform in all groups. Glycogen was elevated in the liver of EX ( $4.77 \pm 0.35$  mg/100mg) mice as well as in muscle ( $0.6474 \pm 0.0067$  mg/100mg), although the latter had only a moderate increase. A degree of homogeneity was found among the other groups. Hepatic triglycerides were reduced in SD ( $8.32 \pm 0.95$  mg/100mg) and high in EX + SD mice ( $20.72 \pm 2.67$  mg/100mg). Furthermore, hepatic cholesterol was elevated in EX + SD ( $3.84 \pm 0.48$  mg/100mg) mice. **Conclusions:** Sleep deprivation and association with exercise modify serum glucose, lactate, and triglyceride levels, as well as liver and muscle glycogen stores. Muscle levels were maintained under direct control, as expected. Previous exercise increased cholesterol and trygliceride levels in the liver of SD mice. Our findings suggest that exercise provide a biologic advantage in adverse condition such as extreme sleep deprivation.

**ID: 746**

### Basic Research

#### Untargeted-metabolomics of mice cortex subjected to sleep deprivation – the modifying effects of exercise

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**Introduction:** Sleep deprivation/restriction (SD) occur in association with sleep disorders such as insomnia and sleep apnea. Cognitive impairment and dementia are also associated with these sleep disturbances. Exercise has been found to have a positive influence on sleep and on cognitive impairment and dementia. It has recently been shown that several metabolites are altered in the brain in association with sleep fragmentation. **Aim:** The aim of this study was to evaluate the effects of chronic aerobic exercise on metabolomics of the cortex of mice subjected to sleep deprivation. **Methods:** Three-month-old swiss mice were divided into four groups: control, SD, exercise (EX) and previous exercise followed by SD (EX+SD). Exercised animals were submitted to motorized treadmill (9m / s) for 8 weeks. Sleep deprived mice were submitted to the

modified multiple platform model (72h). The metabolite profiles of mice cortex, in all groups, were analyzed using liquid chromatography/mass spectrometry. **Results:** A deep chemometrics analysis revealed distinctive metabolic profiles between the SD, EX+SD, EX and Control groups. Aerobic exercises induced the production of lactate, n-acetylaspartic acid, creatine, taurine while a decrement of the content of ethanol, alanine, gamma-aminobutyric acid, myo-inositol, choline, and acetate was observed. Sleep deprivation induces acetate production while decreasing the content of ethanol, lactate, alanine, gamma-aminobutyric acid (GABA), n-acetyl aspartic acid, creatine, choline, taurine and myo-inositol in the cortex. Importantly, the cortex from EX+SD mice and control samples presented a similar composition. **Conclusions:** This untargeted metabolomics study shows that previous exercise reestablished scores of SD mice cortex to similar values as in control. These findings provide further mechanistic explanation for the beneficial effects of exercise in conditions of sleep deprivation/restriction that commonly occurs in many sleep disorders

**ID: 751**

### Case Reports

#### Hypothyroidism as differential diagnosis in children with down's syndrome and obstructive sleep apnea – case report

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**Introduction:** Obstructive sleep apnea (OSA) is common in children with Down's syndrome (DS) due to anatomic abnormalities that results in an airway collapse during sleep time. Hypothyroidism in children mimetizes the clinical situation of a patient with OSA. Thus, the Polysomnography exam, recommended in all children with DS from 4 years old, is essential to allow the differential diagnoses and, therefore, to treat the primary cause of symptoms by improving the quality of life of these patients. **Aim:** To highlight the differential diagnosis of hypothyroidism in children with Down's syndrome and Obstructive Sleep Apnea through a case report and literature reviews. **Methods:** J.I.S, male, Down's syndrome, four years old, accompanied by his father, complaining of agitated sleep. The father reported that his son often had night sweats and restless sleep. Routinely woke up at night and showed episodes of soliloquy and nocturnal enuresis. Occasionally he felt tired when he woke up, snored lightly,

slept during daytime activities and had learning disabilities due to DS. Regarding previous history, he was born with congenital heart disease that was surgically corrected and underwent adenotonsillectomy, but had persistent symptoms even after surgery. Has hypothyroidism, in treatment with Puran (levothyroxine), and hypertension, in use of Captopril. **Results:** Polysomnography showed a moderately elevated index of breathing disorders, high index of arousals and normal oxyhemoglobin desaturation, snoring, sleep efficiency, with proportionate sleep stages. The patient was diagnosed with OSA and treated with CPAP. Returned with improved sleep quality and daytime sleepiness. **Conclusions:** The child with DS had a classic OSA condition but, at first, was diagnosed with hypothyroidism. Thus, the case becomes relevant once identifies an OSA through polysomnography and discards the differential diagnosis, which has a very similar clinic that makes the early diagnosis harder. Therefore, it is important to know the differential diagnoses of patients with OSA to obtain their early, effective recognition and to optimize results with time to avoid complications and increase the life expectancy of these children.

**ID: 755**

### Case Reports

#### Clinical management of patients with sleep breathing disorder: obstructive sleep apnea and central sleep apnea with Cheyne Stokes breathing

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**Introduction:** Central apnea is defined as > 90% reduction in oronasal flow for at least 10 seconds associated with loss of respiratory effort, while in obstructive apnea effort is observed even during the absence of flow. When a central apnea is associated with Cheyne Stokes breathing, it has risk factors for CHF, stroke, and renal failure. The treatment is with positive pressure devices. **Aim:** To analyze or therapeutic management with positive pressure devices in patients with obstructive sleep apnea and central sleep apnea with Cheyne Stokes breathing. **Methods:** Male, 70 years old, insomnia and snoring for 1 year, in addition to excessive daytime sleepiness, breathing interruptions, frequent awakenings. Has hypertension, heart failure. STOP - BANG of 7; Epworth scale of 13. Submitted to polysomnography type 1 that shows an apnea and hypopnea index of 110.92/h with predominance of central apnea and crescendo-decrescendo breathing pattern. **Results:** A new polysomnography was performed for CPAP

titration, where an optimal pressure of 10cmH<sub>2</sub>O with event resolution was determined. Epworth is reapplied after 1 month of treatment, scoring 8. The CPAP device is an initial option for central apnea because upper airway obstruction is important in the pathophysiology of hypercapnic and non-hypercapnic central apnea. Positive bilevel ventilation exacerbates central apnea and periodic breathing. Adaptive servo-ventilation (ASV) devices compatible with expiratory, inspiratory support, and responses that consider variation in ventilation or flow may be used and are primarily designed for patients with non - hypercapnic central apnea. Treatment with ASV is more tolerated than CPAP and is effective in suppressing central apnea, improving oxygenation in the presence of heart failure. Regarding sleep quality, sleepiness and quality of life there is not much difference between the adaptive servo-ventilation and CPAP. **Conclusions:** In patients with central apnea, appropriate pressure therapy is essential to prevent worsening of sleep disordered breathing.

**ID: 756**

### Clinical Studies

#### Sleep disordered breathing (SDB) after palate re-repair in children with cleft palate: preliminary findings

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**Introduction:** Individuals with cleft palate are at risk for sleep-disordered breathing (SDB) due to facial abnormalities, maxillomandibular deformities, nasal airway impairment and palatal defects. The treatment involves several steps, including primary surgical closure of the palate and secondary correction of residual velopharyngeal insufficiency (VPI). The most commonly surgery used for VPI treatment has been the pharyngeal flap (PF) technique which promotes partial mechanical obstruction between the oro- and nasopharynx favoring VP closure. However, studies from our laboratory have shown that the PF is an additional risk factor for SDB in this population. In contrast, the Sommerlad palate re-repair, characterized by dissection and repositioning of velar muscles, seems to be less obstructive than the PF. **Aim:** Objective: To investigate the frequency of SDB symptoms in nonsyndromic children with repaired cleft palate±lip who underwent the Sommerlad palate re-repair and correlate findings with pharyngeal patency indicators.

**Methods:** Methods: Fifteen subjects with VPI, aged 6 to 17 years (10 years, on average) were included in the study so far. None of them had enlarged tonsils. All were assessed before and after surgery (13 months, on average). Snoring and excessive daytime sleepiness (ES) were investigated using standardized questionnaires (Sleep Disturbance Scale for Children-SDSC and Epworth Sleepiness Scale). Nasopharyngeal area and speech nasalance (the acoustic correlate of nasality) were assessed by rhinomanometry and nasometry, respectively. Informed consent was obtained (institutional ERB No.1,905,404). **Results:** Results: Before surgery, snoring was reported by 5(33%) of the parents and ES by 4(27%). After surgery, the number increased to 7(47%) and 6(40%). The differences were not significant ( $p>0.05$ ). No surgery complications such as bleeding, airway obstruction, dehiscence and fistula were observed. Confirming clinical observations, subnormal nasopharyngeal area and hyponasality, suggesting decrease in pharyngeal patency, were not observed on the instrumental methods. **Conclusions:** Conclusion: Preliminary data suggest that the Sommerlad palate re-repair has less impact on sleep breathing than the one reported for PF surgery. Identifying a lower effect of Sommerlad's surgery on sleep quality will be a relevant contribution for the treatment of cleft-related VPI.

**ID: 757**

### Clinical Studies

#### Effects of chronotype on sleep duration and psychomotor performance throughout a complete shift rotation schedule: a prospective study in a real-life condition

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**Introduction:** Recent evidence demonstrates that shift work is associated to negative effects on psychomotor performance, which include cognitive impairments such as attention drop. One of the main triggers for such impairments seems to be deterioration of the sleep pattern. Individual worker characteristics - such as the chronotype - could also be associated with psychomotor performance. **Aim:** To evaluate the effect of chronotype on the sleep duration and psychomotor performance in industrial workers throughout a complete shift rotation schedule. **Methods:** Thirty shift workers participated in this observational and prospective study. Sociodemographic characteristics, health behaviors and Munich Chronotype Questionnaire -(MCTQ) were collected. Individuals were followed for all seven consecutive days carried out as follow: two days (D1 and D2) working during the day

(08:00- 16:00); two days (D3 and D4) working during the evening (16:00 – 00:00); two days (D6 and D7) working during the night (00:00 – 08:00). Evaluations regarding the work performance by Psychomotor Vigilance Test (PVT) and sleep by actigraphy were assessed over the seven days. The Generalized Linear Models (GLM) were used to analyze the effect of chronotype, shift rotation and its interaction on sleep duration and psychomotor performance variables. **Results:** Intermediate (I-type) and late types (L-type) – but not evening types (E-type) - had a longer sleep duration in day work than night work (I-type: 08:17:16 ± 0:20:45 and 05:29:38 ± 0:37:36, respectively; L-Type: 08:10:52 ± 0:21:06 and 4:30:49 ± 0:35:17, respectively;  $p < 0.001$  for all). We found that L-type had a higher number of lapses of attention during day work ( $06.18 \pm 2.68$ ) than E-type and I-type ( $1.0 \pm 0.63$  and  $1.67 \pm 0.59$ , respectively;  $p < 0.001$ ). During evening work, the I-type had a lower number of lapses of attention ( $0.87 \pm 0.22$ ) than E-type and L-type ( $3.44 \pm 0.73$ ,  $6.31 \pm 1.98$ , respectively;  $p < 0.001$ ). For the night work, the L-type had a higher number of lapses of attention ( $4.06 \pm 1.18$ ) than I-type ( $1.50 \pm 1.98$ ,  $p < 0.001$ ). **Conclusions:** Late chronotype workers presented a greater mean of lapses of attention in all shifts of the schedule, while the E-type group increased the number of lapses of attention from morning to evening and night shift. Intermediate chronotypes oscillated less in the number of attention lapses

**ID: 758**

### Clinical Studies

#### Prediction of sleep bruxism diagnosis with concomitant insomnia complaints: a mid-age sub-group in general population

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**Introduction:** Sleep bruxism (SB) is characterized by rhythmic masticatory muscle activity (RMMA) during sleep with occasional tooth grinding. It is reported by 8-12% of the population. Screening of SB in clinic include reports of tooth grinding sounds, tooth wear, jaw muscle fatigue or pain. SB risk factors and concomitant sleep complaints or disorders include age, gender, body mass index (BMI), sleep quality, insomnia and obstructive sleep apnea (OSA). **Aim:** The aims of the present study are to: i) assess if among the above variables which are the predominant ones in a

general population for SB, ii) if these variables can help to better predict presence of SB/RMMA on PSG. **Methods:** Individuals from a general population participated 2 times in the EPISONO Sao Paulo, Brazil, sleep study (20 to 80 y. O; time 1, 2007: n= 1042 and time 2, 2015: n=712. SB and insomnia symptoms were self-reported and insomnia was further scored with DSM-IV criteria, for both time 1 and 2. From a one night of PSG scoring used 2 RMMA/hr and over and AHI of 5/hr criteria. Tests used were: logistic regression, identification of predictor variable with CHAID decision tree mathematical analysis. The validation of predictor assessment was done with time 2 follow up data. Cluster were identified by correspondence analysis. **Results:** With questionnaires data there is an higher risk of being a SB subject (n=127) if a subject is a male (Prevalence ratio 1.5), overweight & obese (PR 3.3 & 2.7, respectively), reporting insomnia corresponding to DSM IV (PR 2.7) and presenting AHI over 30 (PR 2.8). With PSG data (n=56) overweight and DSM IV had a PR of 3 regardless age or gender. Using the CHAID tree analysis decision, SB complaints correctly classifies non-SB subjects/+SB in 87.7% of cases with questionnaires data ( $p = 0.001$ ). SB subjects present higher frequency of DSM-IV insomnia (21.3%/10.7% for good sleepers). Using PSG data RMMA/h of 2 and over correctly classifies non-SB subjects/+SB at 91% ( $p = 0.008$ ). SB subjects again present higher frequency of DSM-IV insomnia (17.7%/7.8% for good sleepers). The follow-up revealed that the prediction values is still acceptable since it correctly discriminate non SB, based on 2 RMMA/hr, at 70.1 % with a male gender dominance for SB subjects. The correspondence analysis revealed 3 age sub-groups of SB subjects. **Conclusions:** Concomitant insomnia is a predictive variable for SB diagnosis. In mid-age female subjects' insomnia is comorbid to SB as is OSA in older obese man.

**ID: 759**

### Basic Research

#### Sleep assessment in medical students at a university in southern Brazil

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**Introduction:** Sleep is a physiological condition which relates to various functions of the body. Therefore, its disturbances can worsen the lives of individuals. Among sleep disorders, excessive daytime sleepiness is relevant due to its association with changes in physical and psychosocial health. Studies revealed that college students

have more sleep disorders than the general population. As other college students, medical students may have changes in sleep quality and excessive daytime sleepiness due to the full-time workload, extracurricular activities, pressure, stress and the pursuit of high academic performance. This study aims to demonstrate the importance of education and the maintenance of healthy sleep habits. In addition to this, it may show the need for curriculum changes that enable adequate sleep for the full cognitive and behavioral development of medical students. **Aim:** Analyze and describe the quality of sleep and the presence of excessive daytime sleepiness in medical students at a university in south Brazil. **Methods:** Observational cross-sectional design. Sample: 328 students from the 1st to the 8th semesters of the School of Medicine in southern Brazil from September to December 2018. Instruments: self-administered questionnaires containing sociodemographic questions, Epworth Sleepiness Scale (for assessment of excessive daytime sleepiness) and Pittsburgh Sleep Quality Index. Statistics: The EPI info 7.0 and STATA 12 statistical packages were used. Univariate analysis was performed to obtain frequencies of all variables for sample characterization, bivariate analysis using Pearson chi-square test. A significance level of 5% was adopted. **Results:** The prevalence of excessive daytime sleepiness (EDS) was 62,8% being 18% severe EDS. Pittsburgh Sleep Quality Scale, showed a prevalence of 80.8% of bad sleepers. In the evaluation of sub-items of this scale 52% of students think their sleep is bad or very bad, 70% of them have less than expected total sleep time, 91.5% show some degree of sleep deprivation and about 25% have a poor sleep efficiency. About sleeping medications, 22.57% used it in the last month and 11.5% use it at least once / week. **Conclusions:** Our academics are experiencing lower than expected quality of sleep, excessive daytime sleepiness and sleep deprivation. These data point to a real and urgent need to reassess curriculum changes and implement actions aiming to improve sleep hygiene and quality of life for our student population.

**ID: 760**

### Clinical Studies

## Adiposity indicators as criteria for polysomnography in shift workers

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**Introduction:** To verify the discriminatory power of adiposity indicators in the prediction of obstructive sleep apnoea (OSA) in shift workers. **Aim:** The main objective of the study is to correlate the body composition of

shift workers with sleep disorders. **Methods:** A cross-sectional study was performed in 118 male shift workers from an iron ore extraction company, who presented with at least one overall risk factor for cardiovascular disease. Anthropometric data were collected, and polysomnography (PSG) was performed. **Results:** The frequency of OSA in the sample was 84.7%. The adiposity indicators used to predict OSA ( $\geq 5$  events/hour) with a sensitivity of more than 70% were the body mass index (BMI), waist circumference (WC), waist-to-height ratio (WHtR), and total body fat (TBF). Visceral fat (VF), neck circumference (NC), and neck-to-height ratio (NHtR) showed specificity values of more than 70% and thus were the most effective in correctly identifying workers without OSA. The areas under the receiver operating characteristic (ROC) curves for WC and NHtR were greater than 0.7, which indicated the effectiveness of the test for the discrimination of individuals with OSA. **Conclusions:** The use of abdomen and neck adiposity indicators as a screening method for PSG is effective since alterations in these indicators demonstrate a significant relationship with the presence of OSA. WC and NHtR are considered good tools for OSA prediction.

**ID: 762**

### Clinical Studies

## Relationship between Stress and Sleep in the Behavior of Children and Adolescents

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**Introduction:** Sleep is a complex and highly organized process that interferes with the behavior of children and adolescents. The stress of daily life strikes young people and it worries parents and teachers, so it needs to be better understood. **Aim:** The aim of this study was to describe the quality of sleep and the presence of stress in adolescents to evaluate if there is a relationship between sleep quality and the presence of stress behavior. **Methods:** Descriptive exploratory research with a population of 118 young people, mostly female (61%), with an average age of 13 years (SD = 2.4 years). The instruments used were the Pittsburgh Sleep Quality Inventory (PSQI) and the Lipp Stress Inventory for Adolescents (SAI). The presence of stress and stress phase were described according to quality of sleep using chi-square or likelihood tests (Kirkwood and Sterne, 2006) and SPSS analyzes, with a significance level of 5%. **Results:** More than half of adolescents had poor sleep quality or presence of sleep disorders (61.9%). It was found that 25.4% of adolescents presented

stress, with the psychological domain being the most predominant (11.1%) and the most frequent was phase of resistance (8.7%). The presence of stress (psychological, cognitive, physiological and interpersonal) is statistically associated with poor sleep quality or the presence of sleep disorders ( $p = 0.002$ ). Virtually all adolescents with some type of stress had poor sleep quality or sleep disorders ( $p < 0.001$ ); only 2 adolescents with good sleep quality had stress in the interpersonal field. The results show that the presence of total stress was statistically associated with worse subjective sleep quality, higher number of sleep disturbances, higher latency and lower habitual sleep efficiency and higher frequency of daytime sleepiness ( $p < 0, 05$ ). Short sleep duration was statistically significantly associated only with total stress ( $p = 0.004$ ). **Conclusions:** The results of the tests show the influence between stress and sleep of young people, recognizing that cognitive issues affected their behavior. Further studies would be needed to attend this demand.

**ID: 763**

### Basic Research

#### Analysis of sleep, learning and quality of life of high school students from São Caetano do Sul

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**Introduction:** Sleep is very important in daily life, since it has great impact in physical and psychological development of young people, and influences the behavior and learning (Valle, 2009). Considering that, the Brazilian Sleep Association states that teenagers “have more difficulty anticipating sleep and waking hours to adapt to morning school class, especially those starting before eight o’clock”. They also point out that sleep restriction is associated with health problems, and affects academic performance “by increasing sleepiness, reducing attention and learning readiness, which also compromises memory consolidation”(ABS, 2017). **Aim:** Understand sleep and its relationship with school hours, and the impact on learning and quality of life of high school students of São Caetano do Sul. **Methods:** The study was conducted from April 2018 to August 2019. After literature review, 148 students from the first to the third year of high school from a private school in São Caetano do Sul, were analyzed through the Pittsburgh Scale, Epworth Sleepiness Scale, and the SF-36 Quality of Life Questionnaire, as well as other informations such as their age and gender. Results were tabulated and statistically analyzed. **Results:** The results analysis showed that 51,35% of the students have

Excessive Daytime Sleepiness, and 18,91% reported causes of sleep problems such as unregulated sleep, anxiety, insomnia, concern about school and studies; 21,62% rated the quality of their sleep as poor or very poor, and 34,46% report difficulty staying awake while doing activities during the day. Moreover, 13,51% of students feel tired all the time, 23,65% feel tired most of the time, 22,29% feel tired currently, and only 3,37% never feel tired. Still, 52,7% feel very nervous during “most of the time” and “all the time”, and 30,4% feel discouraged and downcast during “most of the time” and “all the time”. All students stay in school from 7:20 am to 1:00 pm, and it’s seen that 98,65% of them go to bed after 22 pm, what suggests that adolescents sleeping habits and morning classes are related. **Conclusions:** It is observed that the physiological alteration of circadian rhythm of adolescents and school hours anticipate students wake-up time, and have a big impact on their learning process, behavior and life quality. Therefore, it’s important to discuss about school hours and advise students’ sleeping habits, in order to encourage sleep hygiene and prevent future consequences on their mental and physical health.

**ID: 764**

### Clinical Studies

#### Sleep characteristics of blind volunteers

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**Introduction:** Many aspects of human physiology and behavior vary with circadian phase, including sleep, which has a sleep/wake circadian rhythm that is anatomically determined by the suprachiasmatic nucleus. Its function depends, among other factors, on the environmental information of light captured in the eye retina and conducted through the optic nerve. Thus, it is believed that people with visual impairment have changes in their sleep due to little or no perception of light. **Aim:** The aim of the study was to characterize the sleep of blind volunteers. **Methods:** It was a cross-sectional and descriptive study, conducted in a blind association center, between June and August 2019. The inclusion criteria were: visually impaired individuals, over 18 years. Written informed consent was obtained from all the study participants. The instruments used were a sociodemographic and sleep questionnaire and the Pittsburgh Sleep Quality Index (PSQI). Data were presented in mean  $\pm$  standard deviation, it was analyzed using descriptive statistics with Epi Info version 7.2 software. **Results:** Seventeen volunteers participated in the research, 58.8% male, with a mean age of  $50.5 \pm 16.4$  years, 41.2% of them studied until elementary school and

83.4% received one Brazilian basic salary. All participants use at least one assistive device, the most frequent being the cane (94.1%). Although most of them were classified as blind, 11.8% of participants could be able to see with some degree of vision in one eye, 64.5% reported light perception. They sleep, a mean of  $5.5 \pm 2.4$  hours, with a mean latency time of  $29.8 \pm 30.1$  minutes, 23.5% reported snoring at night. The mean PSQI was  $9.7 \pm 5.3$ , and 70.6% of the participants had a score greater than 5. **Conclusions:** Most of individuals had complete visual impairment, poor sleep quality, insufficient sleep time per night and sleep latency around 30 minutes.

**ID: 765**

### Case Reports

#### Young patient with Prader-Willi Syndrome and Obstructive Sleep Apnea-Hypopnea Syndrome - case report

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**Introduction:** The Prader-Willi syndrome is a genetic disorder caused by loss of function of some genes. As a consequence, patients can present craniofacial alterations, hypotonia, hyperphagia and mental retardation. The first three are directly related to the development of respiratory disorders as hypoventilation and Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS). The OSAHS is less seen in children, but patients with Prader-Willi syndrome shows a high prevalence of this disorder, demanding closer follow up to initiate treatment as soon as possible, reducing daytime symptoms and preventing future cardiovascular and other complications. **Aim:** To get attention on the importance of knowing the correlation between Prader-Willi syndrome and OSAHS in childhood, as well as the possible approaches (surgical or not) for better assist infant patients. **Methods:** A male 10 years-old patient, carrier of Prader-Willi syndrome, morbid obesity, hepatic steatosis and arterial hypertension, was referred to the otorrinolaringology service due to snoring and apnea witnessed by the mother. During the first attendance at this service, was observed STOP-BANG= 4 scale, Epworth= 19/21, cervical circumference= 38, II-degree septal deviation in Cottle's IV area, adenoid hypertrophy with 40% of cavum obstruction and III-degree tonsils. It was indicated whole-night polysomnography (Type 1), which showed an apnea and hypopnea index (AHI) of 7/hour and sleep fragmentation. Given the OSAHS polysomnographic diagnosis, it was decided to perform septoplasty and adenotonsillectomy, followed by a new polysomnography.

**Results:** After surgical procedure, patient was submitted to a new whole-night polysomnography in which was observed an 1,53 AHI, a significant decrease in arousal, snoring and daytime sleepiness. **Conclusions:** In patients with Prader-Willi syndrome we should always observe the possible association with OSAHS. Identifying the presence of apnea or hypopnea through the study, as well as asking for symptoms such as excessive daytime sleepiness, is essential for the proper treatment of the patient. In patients with Prader-Willi syndrome we should always observe the possible association with OSAHS. It is essential for proper patient management that this respiratory disturb and its symptoms be identified.

**ID: 766**

### Clinical Studies

#### Frequency of sleep disorders in patients with insomnia

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**Introduction:** Insomnia is a global healthcare problem and is defined by a subjective feeling of inability to start sleeping or the sensation of disturbed sleep or to maintain sleep. It affects both physical and mental spheres, thus reducing the life quality and sometimes even the lifespan. **Aim:** To identify the insomnia frequency in patients at a sleep clinic. **Methods:** This is a cross-sectional study. Study sample: Individuals who sought a sleep laboratory in Salvador (Ba) were evaluated. Project approved by the research ethics committee. Inclusion criteria: Patients complaining of insomnia who answered questionnaires with information about the characteristics of sleep which were applied between 2014 and October/2018 in individuals of any age, gender, who sought a sleep laboratory in Salvador (Ba). Exclusion criteria: Medical records with incomplete data. **Results:** This sample consisted of 362 patients, mean age = 47 (32-60) years, female frequency = 55.8%, median BMI = 25.9 (22.3-31.7) kg/m<sup>2</sup>, median Epworth Scale = 9 (5-13), mean of bedtime =  $22:51 \pm 1:40$  h, mean of wake-up time =  $6:14 \pm 1:38$  h, mean of total sleep time =  $7:13 \pm 1:44$  h. The most frequent sleep disorders in individuals who reported difficulty in initiating or maintaining sleep were: snoring (83.4%), tiredness when waking up (66.6%) and memory impairment (59.7%). Women presented a higher frequency of headaches on waking up when compared to men (40.1% vs. 25.6%;  $p=0.004$ ), as well as in relation to body pain (69.8% vs. 43.8%;  $p<0.001$ ), respectively. On the other hand, men presented a higher frequency of

assisted sleep apnea in relation to women (42.5% vs. 28.7%;  $p=0.006$ ); men also presented a higher frequency of snoring when compared to women (88.1% vs. 79.7%;  $p=0.032$ ).

**Conclusions:** In the present study it was possible to observe that insomnia was more frequent in women and it was associated with snoring, tiredness when waking up and memory impairment. Women with insomnia have a higher frequency of headache on waking up and body pain when compared to men, while men have a higher frequency of assisted apnea and snoring when compared to women.

**ID: 768**

### Clinical Studies

#### Effects of the mandibular advancement device on daily sleepiness and polysomnographical profile in intercity bus drivers with obstructive sleep apnea syndrome: a pilot study

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**Introduction:** Mandibular advancement devices (MAD) are indicated for the treatment of Obstructive Sleep Apnea Syndrome (OSAS), since they reduce the collapse of the upper airways and keep the jaw and tongue in a protruded position. **Aim:** To evaluate the effects of MAD on the polysomnographic profile and daytime sleepiness of intercity bus drivers with OSAS. **Methods:** This is a quasi-experimental pilot study that evaluated male intercity bus drivers from a municipality in the interior of Rio Grande do Sul-RS. The sample was accessed non-probabilistically and for convenience. After selection, anthropometric and labor data were collected, and the Epworth Sleepiness Scale was applied and the diagnosis of OSAS was made by type III polysomnography (ApneaLinkAir®, RESMED, Sidney, Australia). The Epworth Sleepiness Scale was evaluated before and after treatment with MAD, where it consists of 8 questions that demonstrate the presence of sleepiness (0 - 3 points). The score ranges from 0 to 24 points and when a score  $\geq 10$  indicates an increased daytime sleepiness. Type III polysomnography was performed before and after treatment, which was applied during his sleep night at the individual's home. The severity of OSAS was defined by the Apnea-Hypopnea Index (AHI), where 5 - 15 classifies it as mild, 15 - 29, moderate and  $\geq 30$ , severe. The treatment was performed through the prefabricated MAD (BluePro®, BLUESOM, Orvault, França), which allows the individualization of

the device for each individual. Each patient used the MAD, after the presence of OSAS was conformed by polysomnographic examination, and then personalized by a dentist with extensive clinical experience. After adaptation to the device, they remained for a period of 8 to 12 weeks. **Results:** Male sample ( $n = 5$ ) with an average age of  $46.20 \pm 11.32$  years old and body mass index of  $32.41 \pm 2.42$  Kg/m<sup>2</sup>. There was a significant reduction in sleepiness (Pre:  $10.80 \pm 6.30$  ® Post:  $7.60 \pm 4.77$ ) ( $p = 0.030$ ), as well as the AHI (Pre:  $36.88$  ev/h  $\pm 15.62$  ev/h ® Post:  $12, 26$  ev/h  $\pm 9.12$  ev/h) ( $p = 0.006$ ). **Conclusions:** In the evaluated sample, it was observed that drivers of intercity bus drivers with obstructive sleep apnea syndrome who used the mandibular advancement device obtained a reduction in daytime sleepiness and an improvement in polysomnographic profile.

**ID: 769**

### Clinical Studies

#### Frequency of sleep disorders in patients aged 65 years or older

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**Introduction:** The elderly may present changes in sleep, such as decreased total sleep time to less than 6 to 7.5 hours, more superficial sleep, and may predispose to the emergence of nocturnal awakenings, sleep fragmentation and afternoon nap. **Aim:** To evaluate the frequency of sleep disorders in patients aged 65 years or older. **Methods:** This is a cross-sectional study. Study sample: Individuals who sought a sleep laboratory in Salvador (Ba) were evaluated. Project approved by the research ethics committee. Inclusion criteria: Patients who answered questionnaires with information about the characteristics of sleep which were applied between 2014 and October/2018 in individuals aged 65 years or older who sought a sleep laboratory in Salvador (Ba). Exclusion criteria: Medical records with incomplete data. **Results:** This sample consisted of 115 patients, mean age =  $72.5 \pm 6.3$  years, female = 53%, BMI =  $27.7 \pm 6.9$  kg/m<sup>2</sup>, Epworth Scale = 8.5 (6-15), bedtime =  $22:15 \pm 1:43$  h, wake-up time =  $5:51 \pm 1:31$  h, total sleep time =  $7:30 \pm 1:48$  h. The most frequent sleep disorders were: snoring (89.6%), insomnia (47.8%), leg movements during sleep (46.1%) and assisted apnea (44.3%). Women presented greater difficulty to sleep when compared to men (62.3% vs. 31.5%;  $p < 0.001$ ), as it occurred in relation to

body pain (67.2% vs. 40.7%;  $p=0.004$ ), respectively. Men presented a higher frequency of excessive daytime sleepiness than women (46.3% vs. 16.4%;  $p<0.001$ ), respectively, and a higher frequency of sleep talking (24.1% vs. 6.6%;  $p<0.016$ ). **Conclusions:** When evaluating patients aged 65 years or older, at least 89.6% had some sleep disorder.

**ID: 770**

### Clinical Studies

#### Prevalence of major sleep disorders

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**Introduction:** Sleep disorders are changes in the patterns of sleep that can negatively affect the health quality of an individual. Thus, the high level of prevalence in the modern society is a major health problem that usually does not receive the equivalent attention by the medical community. **Aim:** To evaluate the frequency of sleep disorders in patients seeking a sleep laboratory. **Methods:** This is a cross-sectional study. Study sample: Individuals who sought a sleep laboratory in Salvador (Ba) were evaluated. Inclusion criteria: Patients who answered questionnaires with information about the characteristics of sleep which were applied between 2014 and October/2018 in individuals of any age, gender, who sought a sleep laboratory in Salvador (Ba). Exclusion criteria: Medical records with incomplete data. Project approved by the research ethics committee. **Results:** This sample consisted of 871 patients with mean age =  $45 \pm (31 - 59)$  years, male percentage = 52.7%, median BMI = 26.46 (22.4 - 31.2) kg/m<sup>2</sup>, median of the Epworth Scale = 10 (6 - 14.3), mean of bedtime =  $22:39 \pm 1:32$  h, mean of wake-up time =  $6:15 \pm 1:26$  h, mean of total sleep time =  $7:31 \pm 1:37$  h. The most frequent disorders were snoring (86.6%), followed by insomnia (72.1%) and leg movements (52.6%). Women wake up more during the night (76.9% vs 67.8%;  $p = 0.003$ ), they have more difficulty sleeping (49% vs 34.9%;  $p < 0.001$ ), they also report more tiredness when waking up (63.8% vs 54%;  $p = 0.003$ ), besides presenting more daytime sleepiness (62.4% vs 55.6%;  $p = 0.041$ ) when compared to men. Women reported more body pain (62.4% vs 39.7%;  $p < 0.001$ ), they also reported more irritation (49.3% vs 39%;  $p = 0.002$ ), as well as a weaker memory (58.3% vs 46.8%;  $p = 0.001$ ), and finally they reported more headache when waking up (34.5% vs 22%;  $p < 0.001$ ). Men have a higher frequency of daytime sleepiness (24% vs 14.6%;  $p < 0.001$ ), they snore more (90.2% vs 82.5%,  $p = 0.001$ ) and bother more third parties when they snore (61.1% vs 54.1%;  $p = 0.002$ ), they also have a higher frequency of assisted apnea (44.4% vs 30.8%;  $p < 0.001$ ) when compared to women.

**Conclusions:** Through the present study it was observed that the sleep disorders with higher prevalence were snoring (86.6%), insomnia (72.1%) and leg movements (52.6%).

**ID: 771**

### Clinical Studies

#### Sleep quality and sleepiness in visually impaired volunteers

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**Introduction:** The biological rhythm of the sleep-wake cycle is determined by some factors, specially, the light's sensory stimulation through vision. Thus, it is believed that the absence of light perception can negatively influence the visually impaired volunteers sleep. **Aim:** The aim of the study was to evaluate sleep quality and sleepiness in volunteers with visual impairment. **Methods:** It was a cross-sectional study, conducted in a blind association center, between June and August 2019. The inclusion criteria were: visually impaired individuals, over 18 years. Written informed consent was obtained from all participants. The instruments were a structured questionnaire for sociodemographic investigation, the Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESSE). Data were presented in mean  $\pm$  standard deviation, the Student's t-test was used to assess the association between sleep quality and excessive daytime sleepiness variables with sociodemographic variables, considering  $p < 0.05$ . Epi Info version 7.2 software was used. **Results:** Seventeen volunteers participated, 58.8% male, with a mean age of  $50.5 \pm 16.4$  years. Among them, 64.5% reported being able to distinguish a bright environment from a dark one. Nevertheless, 11.8% have some degree of vision in the left eye and no participant has degree of vision in the right eye. The average PSQI was  $9.7 \pm 5.3$ ; 70.6% of the participants had a score greater than 5. The ESE mean was  $7.8 \pm 4.7$ . Statistical association was observed between PSQI scores and the presence of some degree of light perception in the left eye ( $p = 0.0156$ ). **Conclusions:** Visually impaired participants had poor sleep quality, which could be influenced by the degree of vision, but it could not be observed sleepiness.

**ID: 774**

### Clinical Studies

#### Nasal and Oronasal Mask: literature x clinical practice

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**Introduction:** CPAP is considered the gold standard of treatment for OSA. The effectiveness of the treatment is associated with the proper use of the device and directly related to the type of mask used. Recent studies show that the nasal mask is the most suitable for providing greater comfort and effectiveness, but in clinical practice we still face the need for adaptation of the oronasal mask. **Aim:** To compare medium-term adherence, AHI, leakage and therapeutic pressure of OSA patients who use oronasal and nasal mask in a CPAP clinic. **Methods:** Retrospective design study, where patients with AHI  $\geq 30$  events/hour were selected, classified as severe on polysomnography examination, and subsequently titrated by polysomnography with CPAP. They should be in CPAP treatment for 90 to 360 days, using nasal or oronasal mask, aged 45 to 80 years, both genders. Patients who changed their mask during treatment were excluded. Good adherence was considered the percentage of use  $\geq 70\%$  and the average hours of use  $\geq 4$  hr. For excessive leakage, it was considered above 24 l/min using AirView-Resmed monitoring. **Results:** 220 patients were located, 201 wearing nasal masks and 19 oronasal. When matched for age, gender and severity, each group remained with 9 patients. The adherence of patients with nasal mask was 81.5% compared to 68.2% with oronasal mask ( $p < 0.05$ ). The difference in AHI was 4.7 events/hour ( $p < 0.05$ ). When comparing treatment pressure and mask leak we noticed that in the oronasal mask the leak is clinically higher, but without statistical difference. **Conclusions:** In clinical practice we still face the need to adapt the oronasal mask, but even in this scenario we have worse adherence and increased residual AHI.

ID: 776

### Basic Research

#### Sleep quality and daily sleepiness in medical schools of a amazon institution

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**Introduction:** College students are exposed to major psychological stress due to extensive workload, social demands and competitiveness of the labor market, thus may not consider sleep as a priority, reducing sleep time in favor of overtime dedicated to studies and developing

Unsatisfactory sleep habits, especially in the weeks in which they undergo evaluative tests. Studies with undergraduates around the world indicate that approximately more than half of them are poor sleepers. **Aim:** To evaluate the quality of sleep and the degree of daytime sleepiness among medical students from an Amazonian institution. **Methods:** Cross-sectional study with three questionnaires: Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESE) and sociodemographic questionnaire. G and Chi-square tests Adherence to univariate tables and Independence to bivariate comparisons. **Results:** 192 medical students from the 1st to the 4th year of graduation were interviewed. There was a significant incidence of participants consuming caffeine-containing substances. Regarding other substances, such as alcohol, anxiolytics, antidepressants and brain stimulants, there was no important difference in the proportion of people who consume them. As assessed by the PSQI, there was a predominance of students with poor sleep quality, with 29.7% classified as having sleep disorders, and over the years, the proportion of students with bad sleep increases. The ESS indicated absence of drowsiness among most students, with an increase in the proportion of absence of drowsiness over the years. It is pointed out that this discrepancy may be related to increased consumption of stimulant substances. There was no significance regarding gender and marital status differences. The results agree with those in the literature regarding the high frequency of altered aspects of sleep quality, which is not interpreted as a problem or disorder, which may cause harmful health repercussions. **Conclusions:** It is noted that health promotion actions are essential among the group of higher education students, such as proposals for the conversion of adopted health behaviors and the dissemination of sleep hygiene techniques associated with the suppression of bad habits, improving sleep quality. of this population.

ID: 778

### Basic Research

#### Sleep duration in hours of children and their nutritional status at 4 and 6 years of age

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**Introduction:** The maintenance of adequate sleep duration in preschool children is essential for childhood growth and development. Biological, cultural, behavioral and socioeconomic factors can alter the sleep pattern of children and consequently influence their nutritional status. **Aim:** To evaluate if there is an association between children's sleep duration in hours and their nutritional

status at 4 and 6 year of age. **Methods:** This research is a part of a bigger study denominated Predictors of Maternal and Infant Excess Body Weight – PREDI Study, a cohort study started in 2012 in Joinville-SC, Brazil. 221 mother-child pairs participated in this study when the children were four (2013-2014) and six (2016-2017) years of age. Data were collected during scheduled appointments at the families' homes. Sleep habits of the children were obtained from reports filled by mothers in which the "Inventory of Sleep Habits for Preschool Children" was used. Total sleep duration was informed by the mothers and classified according to the recommendations of the National Sleep Foundation. Ethical aspects: The development of this study was approved by the Ethical Committee of Research of the University of Joinville Region – UNIVILLE (number 107/2011). **Results:** The prevalence of excess body weight (risk of overweight and obesity) was 41.9%, 22.6% and 21.1% for children with sleep deprivation (<9 hours), 9-12 hours and ≥12 hours of daily sleep, respectively. There was no significant difference ( $p=0.075$ ) between the categories. In addition, time of sleep was associated to nutritional status of children at four years of age. **Conclusions:** Sleep duration in hours is not associated to the nutritional status of children at four and six years of age. However, more studies with a greater number of subjects must be conducted to better understand the effects of sleep in childhood nutritional status.

**ID: 781**

### Basic Research

#### Sleep quality in medical graduation: academic perception from a north Brazil institution

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**Introduction:** The change in the student scenario from high school to higher education, experienced by several medical freshmen, is permeated by countless doubts. It is considered the most critical period of adaptation and change, as teaching in medical schools requires the student's full-time effort and dedication to compromise their physical and psychosocial well-being. In this sense, the difficulty in facing stress and anguish situations, as well as the lack of a well-prepared family and institutional basis are factors that can directly affect the quality of life and sleep of these medical students and even predispose them to physical, mental illness. or social. **Aim:** To evaluate the sleep quality of medical students from a private higher

education institution located in the northern region of Brazil. **Methods:** Observational, descriptive and analytical study, where individuals from the eight initial periods of medical school of a private educational institution in Belém / PA were surveyed. The self-answering WHOQOL-bref questionnaire was used, which presents four research domains: physical, psychological, social relationship and environment, as well as a general domain related to quality of life and health. The research focused on the physical domain, specifically the analysis of students' sleep and rest quality. **Results:** The study included 398 medical students attending the first to eighth semester of the course, 236 (65.8%) female and 136 (34.2%) male. In a broad context, the physical domain for both sexes had lower quality scores in the 3rd and 7th semesters, while in the 1st and 6th they were higher on average. Summing the general values of physical domain, students have an average of 2.05 (median quality). As for the quality of sleep and rest, the students obtained an overall average of 3.1, considering higher values in the 1st semester (value = 3.4) and 8th semester (value = 3.5) generating the highest possible value of 70%. of satisfaction with sleep. The worst rates correspond to the 7th and 3rd semester, with values of 2.7 and 2.8 respectively, generating a value of 55% of satisfaction. **Conclusions:** Therefore, this research was fundamental to recognize that the student loses quality of sleep during the first 8 periods of medical school, recognizing that the 7th and 3rd period of curing are the moments that have lower quality of sleep and rest when compared to too much.

**ID: 783**

### Case Reports

#### Sleep apnea in pycnodysostosis: case report

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**Introduction:** Pycnodysostosis is a rare autosomic recessive skeletal dysplasia due to a defect in the cathepsin K enzyme gene. Both sexes are affected and it's characterized by short stature, osteosclerosis, mandibular hypoplasia, delayed fontanel closure, separated cranial sutures, abnormal dental development, clavicle dysplasia, and terminal phalanx aplasia. Obstructive sleep apnea, characterized by prolonged and intermittent upper airway obstruction, is severe in children with pycnodysostosis due to the craniofacial skeleton pattern they present, which may lead to cardiorespiratory disorders. Several anatomical and functional mechanisms may contribute to upper airway obstruction in pycnodysostosis. In particular, the arched shape of the palate, the maxillary hypoplasia and obtuse

mandibular angle may cause retroposition of the base of the tongue and reduction of airway diameter. **Aim:** Report a case of Pycnodysostosis and its repercussion on obstructive sleep apnea. **Methods:** RSL, female, 13 yo, diagnosed with picnodisostosis, complains about nocturnal stop breathing, snoring and excessive diurnal somnolence. Tonsillectomized. STOP BANG 3; Epworth scale 13. Clinical examination highlighting, prognathism, left septal deviation, ogival palate and class III bite, thick uvula. Nasolaryngofibroscopy: estimated adenoid hypertrophy of 70% of rhinopharynx, epiglottis in omega, reduction of pharyngeal anteroposterior diameter. Polysomnography type 1 was performed, with serious AOS diagnosis with apnea-hypopnea index of 55 events/hour. diagnosed. **Results:** The clinical and nasofibrosopic evaluation of the patient allowed the detection of two different sites of obstruction: nasopharyngeal area, due to the presence of adenoid vegetation and hypopharyngeal area with reduction of posterior anterior diameter. Therefore, the surgical treatment proposed was the adenoidectomy to improve the nasopharyngeal space, and posterior orthodontic evaluation to perform maxillary disjunction and advancement to improve the hypopharyngeal space. While the patient is on surgical preparation, she was followed by an important improvement of the respiratory pattern and complaints with positive continuous pressure device. **Conclusions:** The patient's obstruction degree was very marked. The obstructive apnea has a multifactorial etiology and the treatment usually consists in a "multilevel" surgery.

**ID: 784**

### Clinical Studies

#### Influence of light type exposure at nighttime on resting time and 6-sulfatoxymelatonin level of postpartum women in the rooming-in unit

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**Introduction:** The Postpartum woman's sleep and wake cycle changes to attend the demands of the newborn. Thus, constant exposure to artificial light can compromise total sleep time and synthesis of 6-sulfatoxymelatonin, a hormone that synchronizes biological rhythmicity. **Aim:** To evaluate the influence of artificial light types at night on rest time and the 6-sulfatoxymelatonin level of hospitalized postpartum women. **Methods:** Clinical trial performed with puerperal women admitted to a University

Hospital in São Paulo-Brazil. Postpartum women aged of 18 years or over, whose child was born at term, healthy and breastfeeding, had a postpartum period greater than or equal to 12 hours, single pregnancy, no history of psychiatric, thyroid and/or sleep disorders, who did not use illicit drugs during pregnancy, and have not worked at night for the past three years were included. Blind women, taking beta-blockers, diuretics, corticosteroids and/or central nervous system depressant medication were excluded. Eligible postpartum women were allocated randomly in the rooms with different light. The control group was characterized by mothers who were exposed to white light (Osram®), commonly used by the service. In the experimental group, the puerperal women were assigned to the room with long wavelength emission light (Align PM®). Data were obtained between 2018 and 2019 after approval of ethical merit. The total resting time and 6-sulfatoxymelatonin level were measured during 24 hours, respectively, by ActTrust® actimeter and ELISA method. Fisher, Shapiro-Wilks, Levene, Mann-Whitney and t-tests were used, with significance level of 5% and power of 80%. **Results:** Twenty-one postpartum women, 11 in the control group and 10 in the experimental group were analyzed. The average night rest time was similar ( $p = 0.89$ ) between the experimental (6.8 hours) and control (6.9 hours) groups. The mean diurnal and nocturnal percentage of the total 6-sulfatoxymelatonin load excreted was similar in the control groups (47.4 and 52.5  $\mu\text{g}/\text{period}$ ) and experimental (47.6 and 52.4  $\mu\text{g}/\text{period}$ ), respectively ( $p > 0.05$ ). **Conclusions:** The type of artificial lighting did not affect the rest time and 6-sulfatoxymelatonin level of hospitalized postpartum women.

**ID: 785**

### Clinical Studies

#### Sleepiness-insomnia phenotype and obstructive sleep apnea severity—is there an association?

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**Introduction:** The complaint of sleepiness in insomnia patients represents an apparent clinical paradox. Amidst the symptoms that aggregate with insomnia, sleepiness is especially defying since conditions as diverse as depression, circadian rhythm sleep-wake disorders, and narcolepsy cause sleepiness and insomnia. Both sleepiness and insomnia have been associated with obstructive sleep apnea since its first reports. Comorbid obstructive sleep apnea (OSA) is usually suspected in such cases. **Aim:** We investigated clinical and polysomnographic data regarding the sleepiness-insomnia phenotype of patients

from a sleep clinic. **Methods:** A database of consecutive patients referred to a university-affiliated sleep laboratory was analyzed. Besides polysomnography to assess sleep architecture, OSA, and periodic limb movement disorder (PLMD), usual insomnia criteria and validated instruments, including the Epworth sleepiness scale (ESS) and the Symptom Check List-90-R were employed. **Results:** Among 3808 adults included, 1437 had insomnia criteria (38%) and 2131 (56%) had an ESS score >10. Among the 2371 non-insomnia cases, 1383 (58%) had an ESS score >10. Among the 1437 individuals classified as insomnia cases, 748 (52%;  $P < 0.001$ ) had an ESS score >10, i.e., sleepiness-insomnia phenotype. This group had depression and anxiety scores that were significantly higher than in all other patients. Sleepiness-insomnia phenotype, categorized in three levels of ESS-based sleepiness (mild, moderate, severe), adjusted in multinomial model for confounders as sex, age, use of psychotropic drugs, OSA or PLMD severity, showed the following significant associations: 1) insomnia plus mild sleepiness and insomnia plus moderate sleepiness phenotypes were associated with both anxiety and depression upper-quartile scores; 2) insomnia plus severe sleepiness phenotype was associated with upper-quartile scores of depression and anxiety, and with obesity. **Conclusions:** Among insomnia patients, ESS >10 is only slightly less frequent than among sleep laboratory patients and unrelated to OSA. The sleepiness-insomnia phenotype was associated with depression, anxiety, and obesity, three conditions in which inflammation may be involved. Further research targeting inflammatory mechanisms involved in the sleepiness-insomnia relationship is warranted.

**ID: 787**

### Clinical Studies

#### Is obstructive sleep apnea associated with cognitive decline in seniors?

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**Introduction:** The prevalence of obstructive sleep apnea (OSA) increases with age. Previous studies have shown an association between OSA and a higher risk of cognitive impairment in middle-aged adults. The OSA-related mechanisms involved in cognitive impairment may include sleep fragmentation, daytime sleepiness, oxidative stress, and metabolic dysfunction. Nonetheless, the role of the OSA on the pathogenesis of age-linked cognitive impairment remains unclear. **Aim:** To determine whether

OSA is associated with cognitive impairment in seniors. **Methods:** Independent adults aged 65 years or older previously screened for OSA performed a home sleep apnea testing. OSA was defined by an Apnea-Hypopnea Index (AHI)  $\geq 5$ . Seniors included had their anthropometric information collected and their global cognitive function measured by the Mini-Mental State Examination (MMSE). A MMSE score  $\leq 26$  indicated seniors with cognitive decline. Subjects with score >10 points in the Excessive Sleepiness Scale (ESS) were considered sleepy. **Results:** In the study were included 296 seniors. The mean age was  $71 \pm 5$  years, 45% were men, mean BMI was  $28.5 \pm 4.7$  kg/m<sup>2</sup>, 34% scored >10 in the ESS, and 85% had OSA. Using MMSE were identified 106 seniors with cognitive decline. They had fewer years of schooling than those with MMSE >26. Among the seniors with OSA, 36% showed cognitive decline. The percentages of AHI <5 and AHI  $\geq 5$  were similar in seniors with cognitive decline. Percentages of hypertension, diabetes, and psychiatric disorders were significantly greater in seniors with MMSE score  $\leq 26$  than in seniors with MMSE >26. To predict MMSE score  $\leq 26$ , a multivariate binary logistic model was built adjusting for confounders from the following variables: female gender, age, BMI, AHI  $\geq 5$ , ESS >10, hypertension, diabetes, neurological disorder, and psychiatric disorder. The model with a Nagelkerke R square = 0.19 showed the following significant associations: female gender (OR 2.37, CI 1.14-4.93), diabetes (OR 3.52, CI 1.39-8.92), and psychiatric disorder (OR 2.84, CI 1.18-6.81). The variable AHI  $\geq 5$  was not associated with cognitive decline. **Conclusions:** In the present study, OSA in seniors does not seem to be significantly associated with cognitive impairment measured by MMSE. The data demonstrated that diabetes is the strongest predictor of cognitive impairment, followed by psychiatric disorders and female gender.

**ID: 788**

### Clinical Studies

#### Blood pressure levels and sleep characteristics: preliminary results of ambulatory blood pressure monitoring in a subsample of ELSA-Brasil

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**Introduction:** Daily blood pressure (BP) regulation is associated with pathophysiological alterations that occur during the sleep-wake cycle, suggesting that BP is particularly sensitive to sleep changes. However, the influence of sleep alterations on blood pressure levels, such as nocturnal dipping, BP variability, and morning surge, which are important predictors of cardiovascular risk, is unclear. **Aim:** To describe nocturnal dipping patterns (dipping, reduced/reverse dipping, extreme dipping) according to sleep duration and insomnia symptoms, BP levels (variability and morning surge), and sociodemographic factors in a sample of public servants. **Methods:** A descriptive study including 850 participants from the second wave of ELSA-Brasil whose BP was monitored for 24 hours using a Spacelabs 90207 device, programmed to perform measurements every 20 minutes during awake time and every 30 minutes during sleep. Nocturnal dipping was calculated by the difference between mean waking and sleeping BP. Variability was evaluated from the standard deviation of the mean and morning surge by means of the sleep-through morning surge classification. Self-reported sleep duration, insomnia symptoms, as well as sociodemographic data and lifestyle habits were also evaluated. R software, version 3.5.2 was used for the analysis. **Results:** The mean age was  $52 \pm 9.1$  years, with 50% men. The group classified with reduced/reverse dipping (32%) had a higher frequency of men (57%), black/brown color/ethnicity (48%), overweight and obesity (71%), and greater nocturnal BP variability compared to the groups dipping and extreme dipping. The prevalence of hypertension was higher among reduced/reverse dippers (48%) compared to dipping (39%) and extreme dipping patterns (36%). Morning surge was lower among reduced/reverse dippers, however, the elevation measures varied more in this group. Among individuals with reduced/reverse dipping, 54% reported short sleep duration and 23% reported insomnia symptoms, similar to those with pattern dipping. **Conclusions:** Participants classified with reduced/reverse nocturnal dipping presented a higher prevalence of hypertension and higher blood pressure variability than those with dipping or extreme dipping pattern. However, no differences were observed regarding alterations in sleep. Further analysis will contribute to our understanding of which sleep factors are associated with nocturnal dipping. Findings may support important public health policies.

**ID: 789**

## Clinical Studies

### Comparison of muscular fatigue according to social jetlag in young soccer players

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**Introduction:** The sleep pattern has gained prominence in sports training, as it can directly influence the athlete's performance (cognitive and muscular function). Since the last decades, a reduction of sleep time in 2 hours/day has been visualized. In the specific case of young athletes, the reduction in sleep time is linked by several behavioral and biological changes caused by the biological maturation process. Thus, associating the training load, psychological load, and trips to championships, which can influence the difference between the sleep of mid-week sleep and weekend called social jetlag. However, there is little scientific evidence to clarify the possible influence of social jetlag on the sports performance of young soccer players. **Aim:** Compare muscle fatigue index (FI) according to social jetlag classification in young soccer players. **Methods:** The sample consisted of 73 young soccer players aged 12 to 15 years ( $14.5 \pm 1.9$  years;  $58.7 \pm 13.9$  kg;  $172.4 \pm 11.7$  cm), belonging to two academy soccer teams from Londrina/Paraná. Were collect measurements of Body size (body mass, height), duration and quality of sleep and social jet lag (Actigraph GT3X+), bone age (hand and wrist radiography). Social jetlag was categorized as recommended  $\leq 2$ hs and not recommended  $\geq 2$ hs. To compare the FI between social jetlag groups, the Mann-Whitney U test was used. Statistical analysis was performed using SPSS 25.0 software and the adopted significance was 5%. **Results:** Difference was noted only for chronological age ( $P=0.02$ ), which the group classified as Not recommended has higher values. However, no significant difference was observed for FI ( $P=0.55$ ). **Conclusions:** It was concluded that FI didn't show any significant difference between social jetlag groups in young soccer players. Longitudinal studies are suggested to verify the causality between this phenomenon.

**ID: 792**

## Clinical Studies

### Are sleep quality and body mass index associated? A cross-sectional study in older adults with low back pain

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**Introduction:** High body mass index (BMI) elevated can negatively impact the health in older adults. Poor sleep and low back pain are common comorbidities in this population. The literature has shown that BMI can be influenced in pain and sleep in adults. It is unclear in the literature the relationship between sleep and BMI in older people with low back pain. The sedentary lifestyle may be linked with a consequence of these changes. **Aim:** To assess whether sleep quality can be associated with BMI in older people with low back pain. **Methods:** This is a cross-section study. The inclusion criteria were aged 60 years and over and had low back pain at the moment in interviewed or last 3 months and excluded those who did not agree to sign or informed consent and who did not have cognitive ability to answer questionnaires. Data on age, sex, education, smoking habits, alcohol consumption, income, mental status, depression, daytime sleepiness and number of comorbidities were collected through questionnaires. **Results:** A total of 212 participants were collected according to the inclusion and exclusion requirements. The mean (standard deviation) age was 70 (7.5). Most of the women sample was representing 77.4%. The average of BMI was 28.17 (5.0) and the mean sleep quality was 10.3 (3.19). Results from univariate regression analysis showed sleep quality was associated BMI. After adjusting of the covariables for age, gender, mental state, depression, and comorbidity, the sleep quality was not able to predict BM. **Conclusions:** Our findings showed that sleep quality was not associated with BMI in the older adults with low back pain. Future studies should evaluate the sleep quality objectively to control bias of memory.

**ID: 793**

### Clinical Studies

#### The use of the actigraphy in the assessment of the sleep-wake cycle according to body mass index: preliminar results.

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**Introduction:** The actigraphy records events during the sleep-wake cycle. **Aim:** To describe the characteristics of the sleep-wake cycles by actigraphy in the participants with different body mass indexes (BMI). **Methods:** This is a cross-sectional and descriptive study. A convenience sample of 15 participants was selected, nine females and six males, age range from 25-34 years (28.5±2.6). BMI was obtained and the participants were classified: normal weight (n=5), overweight (n=5) and obese (n=5). After,

the participants were instructed to maintain their usual lifestyle and was instructed to use the actigraph in the non-dominant wrist (ActTrust®) during four days and three consecutive nights. Sleep variables were obtained by actigraphic analysis and from subjective sleep diary. The variables were: latency period, wake after sleep onset (WASO), number of awakenings, distal skin temperature (DST), mean value of 5 continuous hours of lowest activity (L5) and mean value of 10 continuous hours of highest activity (M10). Descriptive analysis was performed consisting of frequencies, arithmetic means and standard deviations. **Results:** The results of sleep performance by actigraphy showed that the latency period was 100±0.17' in the overweight and obesity groups, and 52±0.10' in normal weight group, indicating difficulty in initiating sleep in all groups. Higher WASO values were observed in the obesity group (99±0.40') and low in the overweight and normal group 47±0.24' and 42±0.28', respectively. A higher number of awakenings was observed in the obesity group (15±8), compared to the overweight (9±5) and control groups (9±7). DST values ranged from 33°-34°C in the period from 02:20 to 04:30 for all groups, indicating the degree of skin vasodilation. Low M10 values indicated low activity during wakefulness observed in the obese group (16:59±01:24h), when compared to the normal weight group (17:02±07:43h). Low L5 values indicated low awakening sleep and less fragmented sleep in the normal weight group (01:01±00:20h). The increase in the value of L5 indicated the presence of awakenings during sleep, suggesting fragmented and short sleep, as observed in the overweight (02:39±00:20h) and obesity (03:01±00:31h) groups. **Conclusions:** Given the results obtained, it can be concluded that, the obesity group showed low physical activity, higher number of awakenings and fragmented sleep, when compared to the normal weight group, which presented acceptable activity, fewer arousals and less fragmented sleep.

**ID: 794**

### Clinical Studies

#### Sleep deprivation and human performance: a comparison between single and dual tasks

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**Introduction:** Sleep deprivation leads to physical and cognitive impairments. In addition, we commonly perform concurrent activities, which can generate even more psychomotor damage. **Aim:** To measure the effect

of 36 hours of sleep deprivation on the psychomotor performance of adults in single and dual task conditions. **Methods:** The following group participated in the study: 14 male subjects with mean age  $24,36 \pm 3,67$  years and BMI  $25,01 \pm 2,54$  kg/m<sup>2</sup>. The participants performed the Psychomotor Vigilance Task (PVT) every 12 hours during the protocol of sleep deprivation of 36 hours. The variables analyzed were: Mean of Reaction Time and the number of Attentional Lapses in a Single Task Condition (STC) and in a Dual Task Condition (DTC). In the STC, the participants performed the PVT seated and holding the instrument in their hands. In the DTC, the participants performed the PVT standing on a Force Platform and were oriented to maintain the body as static as possible during the entire test. The GLM (General Linear Model) test was used to compare the psychomotor performance of the participants in the STC and in the DTC on the 4 moments of application. The level of significance adopted was  $p < 0,05$ . **Results:** There was no statistical difference in the variables Mean of Reaction Time ( $F < 0,01$ ;  $p = 0,96$ ) and Lapses ( $F = 0,10$   $p = 0,92$ ) of the psychomotor performance between STC and DTC. However, there was time-effect between the 4 moments in the variables Mean Reaction Time ( $F = 9,88$ ;  $p < 0,01$ ) and Attentional Lapses ( $F = 12,43$   $p < 0,01$ ), showing that the psychomotor performance were negatively impacted by sleep deprivation in both conditions. **Conclusions:** The sleep deprivation of 36 hours reduced the participants psychomotor performance in the STC and in the DTC. Furthermore, we observed that a psychomotor task performed in a single task condition can identify the psychomotor performance of individuals who realize concurrent activities.

**ID: 795**

## Clinical Studies

### Sodium intake in men with severe obstructive sleep apnea

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**Introduction:** Water retention through high sodium intake is associated with hypertension and risk of developing obstructive sleep apnea (OSA). The displacement of fluid accumulated in the lower limbs to the periphery during the supine position increase pharyngeal collapsibility and OSA severity. **Aim:** To evaluate the association of sodium intake with the severity of obstructive sleep apnea in men. **Methods:** Men aged 18 and 60 years previously diagnosed with severe obstructive sleep apnea defined by apnea-hypopnea index (AHI)  $\geq 30$  events per hour of sleep.

Exclusion criteria were: previous treatment for apnea, predominantly central apnea, renal, cardiac, pulmonary or peripheral vascular insufficiency; use of diuretics or substances acting on the central nervous system. Anthropometric assessment and 24 hour urine collection were performed to assess sodium and aldosterone levels. Salt intake was calculated from 24 hour urinary sodium. The study was approved by ClinicalTrials.gov number: NCT01945801, and Research Ethics Committee of Hospital de Clínicas of Porto Alegre number: 13-0272. **Results:** Were included 54 men with a mean ( $\pm$  SD) aged of  $45 \pm 8.8$  years, body mass index (BMI)  $30 \pm 2.9$  kg/m<sup>2</sup>, blood pressure  $125 \pm 8.9/85 \pm 8.6$  mmHg. In 24-hour urine,  $204 \pm 78$  mEq/24h of sodium (equivalent to  $12 \pm 4.6$  grams of sodium/day) and  $11 \pm 5.2$   $\mu$ g/24h of aldosterone were detected. AHI averaged  $49 \pm 19$  events/hour and the minimum arterial blood oxygen saturation  $77 \pm 8.8\%$ . AHI correlated significantly with urinary sodium excretion ( $r = 0.29$ ;  $p = 0.031$ ). In the linear regression model to predict the AHI, urinary sodium was the only variable the remained significant ( $\beta = 0.41$ ;  $p = 0.02$ ), controlling for BMI, age and level of urinary aldosterone. The coefficient of determination R<sup>2</sup> of the regression model shows that adjusted explain 21% of the AHI variability ( $p = 0.027$ ). **Conclusions:** The severity of obstructive sleep apnea correlated with sodium intake. This association increase evidence that fluid displacement to the cervical region during sleep participates in the pathogenesis of OSA. Interventions reducing fluid retention could be play role in sleep apnea therapy.

**ID: 796**

## Basic Research

### Sleep fragmentation related to moon phases

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**Introduction:** There are ancient folk beliefs regarding the influence of moon phases on human behavior and physiology. Current literature data show conflicting results about the association between moon phases and sleep architecture. Most studies found less total sleep time (TST), lower sleep efficiency (SE), higher sleep latency (SL) and higher REM sleep latency (REML) in full moon, comparing to new moon. **Aim:** The objective of this study was to compare sleep architecture with moon phase. **Methods:** A retrospective analysis of all 30,159 polysomnography reports (PSG) performed between 2008 and 2016 in a large sleep center was conducted. Parameters were age, sex, TST, SE, SL, REML, arousal index (AI), and

percent time of sleep stages (N1, N2, N3 and REM). The moon phase was defined by setting the new moon day as zero and full moon either as 14 or 15 (depending on the month). Then phases were divided as New Moon (days 0 to 4), Intermediary Moon (days 5 to 9) and Full Moon (days 10 to 14 or 15). Exclusion criteria were repeated PSG of the same patient, split-night or CPAP PSG studies, age below 18 years, use of sleep-inducing drugs in the night of the PSG, apnea-hypopnea index (AHI) > 15/hour, and periodic limb movement index (PLMI) > 15/hour. Thus, 13,131 eligible PSG studies were analyzed. First, three-way ANOVA with Tukey post-hoc tests were conducted, with moon phase, sex, and age-range (18–35, 36–60, and >60) as group variables. After that, multiple regression analyses were conducted, with moon phase, sex, age, AHI, and PLMI as independent variables. The dependent variables in each test were TST, SE, SL, REML, N3, REM, and AI. **Results:** ANOVA results showed greater AI in the elder group comparing to the other two groups (+2.6/hour) and greater AI between middle-age group and the younger group (+1/hour). However, moon phase did not showed difference. The multiple regression analyses showed that PLMI (beta=0.14), AHI (beta=0.13), and age (beta=0.10) were significant in predicting AI; age (beta=-0.27), AHI (beta=0.06), and PLMI (beta=-0.05) in SE; PLMI (beta=-0.04), age (beta=-0.03), and AHI (beta=0.03) in N3; and AHI (beta=0.07) and PLMI (beta=-0.03) in REM. In none of the analyses the moon phase had significant effects. **Conclusions:** This is the only clinical-based, large study evaluating the moon influence in sleep architecture parameters. In contrast to the existing literature, moon phases had not a significant effect.

**ID: 797**

### Clinical Studies

#### Factors associated with sleep-disordered breathing

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**Introduction:** Obstructive Sleep Apnea and Hypopnea Syndrome (OSAHS) is characterized as a disorder caused by repetitive and intermittent closure of the upper airways during sleep, due to total collapse of the pharyngeal walls and it is associated with several symptoms and comorbidities. It is believed that about 33% of men of productive age are affected by the syndrome. **Aim:** To evaluate the factors associated with sleep-disordered

breathing. **Methods:** This is a cross-sectional study. Study sample: Individuals who sought a sleep laboratory in Salvador (BA) were evaluated. Project approved by the research ethics committee. Inclusion criteria: Patients with complaints related to sleep-disordered breathing who answered questionnaires with information about sleep characteristics which were applied between 2014 and October/2018 in individuals of any age, gender, who sought a sleep laboratory in Salvador (BA). Exclusion criteria: Medical records with incomplete data. **Results:** This sample consisted of 754 patients complaining of snoring, with a mean age of 46 (31.8-59) years, median BMI: 27 (23-31.6) kg/m<sup>2</sup>, mean of bedtime: 22:39 ± 1:33 hours, mean of wake-up time: 6:14 ± 1:27 hours, mean of total sleep time: 7:30 ± 1:38 hours. The main characteristics of these individuals were: sleep fragmentation (71.4%), snoring that bothers (67.5%), excessive daytime sleepiness (58.4%), and fatigue when waking up (57.3%). Women had greater difficulty in initiating and maintaining sleep when compared to men (47.5% vs. 34.1%; p<0.001). Men presented higher frequency of assisted apnea (47.1% vs. 35.6%; p = 0.001) and excessive daytime sleepiness (24.2% vs. 13.8%; p < 0.001). **Conclusions:** The present study showed that individuals with sleep-disorder breathing had sleep fragmentation, excessive daytime sleepiness and fatigue on waking. Women had greater difficulty in initiating and maintaining sleep when compared to men, while men had greater frequency of assisted apnea and excessive daytime sleepiness.

**ID: 799**

### Basic Research

#### Evaluation of Sleep Architecture in extended families in a Brazilian population: The Baependi Heart Study

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**Introduction:** Sleep traits are gaining increasing recognition as indicators of health, and impaired sleep is associated with increased risk of cardiovascular and metabolic disease. Therefore, we have initiated a project which adds polysomnography (PSG) to an existing cohort

study, the Baependi Heart Study. The aims of this project are to examine associations between sleep architecture, particularly slow-wave sleep, and cardiometabolic disease risk. **Aim:** In this project, we will collect data on 2,000 participants of a family-based study in semi-rural Brazilian population. We are conducting unattended, in-home PSG recordings, and assessing cardiovascular and metabolic risk. Sex and age differences in these measures will also be investigated. Here, we present preliminary PSG results. **Methods:** All current participants in the Baependi Heart Study will be invited to participate in our ancillary sleep study. PSG is recorded using a type 1 ambulatory device (Track-It, Nihon Kohden). PSG was staged using standard criteria. Sleep traits were analyzed for the full sample and stratified by sex and by age (<50 vs ≥50 years) excluding those with sleep <4 hours. **Results:** Preliminary results comprised PSG data from 98 participants (64 women), with an average age of 44 (±15) years (42% ≥50). For the full sample, mean (SD) of total recording and sleep time were 8.4 (±1.3) hours and 6.3 (±0.9) hours, respectively. Means (SD) for sleep stage percentages were: wake=22.6 (±12.8) %; N2=51.1 (±8.4) %; N3=15.4 (±5.9) %; REM=23.2 (±7.5) %. Women slept on average 6.4 (±0.9) hours, whilst men averaged 6.1 (±0.9) (p=.13). Sleep stage percentages for men|women were the following: wake=22.4|22.7; N2=50.5|51.4; N3=13.9|16.2; REM=22.7|23.4. The younger group slept an average of 6.5 (±1.0) hours, while the older group slept 6.1 (±0.9) hours on average (p=.045). Sleep stage percentages for young|old: wake=19.5|26.9; N2=50.3|52.1; N3=16.0|14.7; REM=24.6|21.1). These measures did not differ significantly between sexes, but wake and REM percentages were significantly different between age groups (p<.05). **Conclusions:** We have demonstrated that in-home unattended PSG is a feasible method of sleep measurement in Baependi, Brazil.

**ID: 800**

## Clinical Studies

### Association of Excessive Daytime Sleepiness with Anthropometric and Cardiovascular parameters

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**Introduction:** Sleep is defined as a state of temporary loss of consciousness from which an individual may be awakened naturally or through endogenous mechanisms which regulate the circadian rhythm. Sleep disorders may

generate disturbances in quality of life. Some external factors may cause restrictions and sleep fragmentation. Studies correlate sleep disorders to diabetes mellitus, arterial hypertension and obesity, as well as to their worsening. Stressful factors tend to decrease the amount of sleep and to desynchronize the sleep-wake cycle, resulting in decreased quality of sleep and, sometimes, in excessive daytime sleepiness (EDS). In regards to medical students, anxiety due to the approval and access to medical school and later due to scenarios in which they deal with matters related to sickness, suffering and death, besides the prospects of entering the job market, make them vulnerable to sleep disorders. Considering the aforementioned aspects, this work intends to demonstrate how medical students may be affected in their routines during their professional qualification. **Aim:** To analyse if anthropometric and cardiovascular parameters differ between different degrees of excessive daytime sleepiness. **Methods:** Observational, descriptive and analytical study submitted to the Committee of Ethics and Research (N.3.168.630). The sample totalized 77 undergraduate medical students from the first and last two years of the course. Socio-demographic and anthropometric data was gathered (height and weight for BMI calculation, neck circumference, abdominal circumference, arterial pressure and heart rate and the Epworth Sleepiness Scale (ESS) was used to evaluate excessive daytime sleepiness. The analyses and statistic tests were done in the program R Commander (R x64 3.6.0). Values of p<0.05 were considered significant. **Results:** Answer variables: EDS with arrive at home/min (Kruskal-Wallis P<0.03). GENDER with physical activity (qui- sq p<0.06)/CP.cm (Wilcoxon P<0.001)/ CA.cm (Test t Student p<0.001)/ PAS (Wilcoxon p<0.01)/ PAD (Test t Student p<0.01). AGE with arrive at home/min (Kruskal-Wallis p<0.06)/ IMC (ANOVA p<0.02)/ Interval between the beginning and end of graduation (Fisher p<0.001). **Conclusions:** Considering that these students may present risk factors for the development of an irregular sleep-wake cycle, it is necessary to intensify studies about excessive daytime sleepiness in order to prevent sleep disorders.

**ID: 801**

## Basic Research

### Chronotype, morning light exposure, sleep quality, daytime sleepiness and attention in adolescents

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**Introduction:** The sleep-wake cycle (SWC) and attention are modulated by the light-dark cycle. Studies suggest that nighttime light exposure may influence chronotype expression, sleep quality and daytime sleepiness in adolescents. **Aim:** The aim of this study was to evaluate the relationship between chronotype, morning light exposure, sleep quality, daytime sleepiness and attention in adolescents. **Methods:** 73 adolescents of both sexes participated (48 girls), mean age was  $15 \pm 0.7$  years, in the morning shift and early years of high school from Rio Grande do Norte-RN. Actiwatches were used for 10 days to collect information on SWC and light intensity (exposure from wake-up until classroom entry); Pittsburgh Sleep Quality Index and Pediatric Daytime Sleepiness Scale were answered; Attention was assessed by a Continuous Performance Task, measuring sustained and selective attention, tonic alertness and phasic alertness, and the overall stability of task execution. **Results:** Chronotype correlated with daytime sleepiness ( $r = -0.68$ ), sleep quality ( $r = -0.33$ ), percentage of hits of sustained attention ( $r = 0.20$ ) and selective attention ( $r = 0.18$ ), TA ( $r = 0.21$ ); and overall stability of task execution ( $r = -0.32$ ). The intensity of light from wake-up until the classroom entry tended to correlate with irregularity for bedtime ( $r = 0.23$ ) and with irregularity of sleep duration ( $r = -0.23$ ). **Conclusions:** This result indicates relationships among morning light exposure and bedtimes and sleep duration; however, a larger sample is needed to evaluate the role of light exposure in sleep-wake cycle and attention in adolescents.

**ID: 802**

### Clinical Studies

#### Prevalence and predictors of obstructive sleep apnea syndrome in an elderly sample

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**Introduction:** Obstructive sleep apnea syndrome (OSAS) is a great cause of morbidity. Polysomnography (PSG) is still expensive and poorly available in health systems especially in low- and middle-income countries. Thus, investigating OSAS using clinical tools, whose associations enable its prediction, are relevant and deserve study in different age groups. **Aim:** Estimate the prevalence of OSAS and verify its association with the Epworth Sleepiness Scale (ESS), Stop-Bang (SBQ), Berlin questionnaire (BQ), anthropometric measurements, and previous diseases

in a sample of elderly patients. **Methods:** Retrospective study, whose information was obtained from the Sleep Laboratory database of the Gaffrée and Guinle University Hospital, from June 2017 to June 2019. Individuals aged 60 years old or older were selected. The following variables were analyzed and compared to the PSG report, which determined the diagnosis of OSAS: gender, age, family income, education, weight, body mass index (BMI), cervical circumference (CC), abdominal circumference (AC), pelvic circumference (PC), ESS, SBQ, BQ, and previous diseases. T test or Wilcoxon was used to compare quantitative variables and Chi-square or Fisher's exact test for qualitative variables. All variables were applied in a univariate model. Odds ratio (OR) was verified for each variable that had a significant association in the model. It was considered significance of 5%. **Results:** 74 patients were found in our database, 57 of them had all the informations that have been investigated. From those, 39 were diagnosed with OSAS by PSG. The prevalence of the syndrome in the sample was 68.42%. The average age for those with OSAS was  $74 \pm 8.30$  ys and without  $74 \pm 8.10$  ys. Females were predominant, representing 82.1% of the OSAS group and 88.9% without OSAS. In exploratory analysis, AC (0.012) and BQ (0.047) were associated with OSAS. When applied in the univariate model, the variables with association were AC (0,019) and CC (0,037), both proved to be a risk factor for OSAS with OR of 1.07 (1.01-1.14) and 1.24 (1.01-1.52), respectively. **Conclusions:** In this sample of elderly patients with a predominance of females, a high prevalence of OSAS was found, in which abdominal and cervical circumference measures seem to be good predictors. These results need to be expanded to larger samples and investigated in other age groups, aiming to be considered as possible criteria for the suspicion of OSAS in the clinical context.

**ID: 803**

### Clinical Studies

#### Impact of prolonged use of continuous positive pressure in high airways on pressoric levels of patients with resistant arterial hypertension and obstructive sleep apnea

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**Introduction:** Obstructive sleep apnea (OSA) is independently associated with poor blood pressure (BP) control, worsening nocturnal descent and target organ damage, and a high prevalence of resistant hypertension (RH). It is not yet clear whether the use of CPAP

(continuous positive pressure in high airways) promotes significant BP reduction. Most studies have evaluated short-term therapeutic response, perhaps insufficient to reduce sympathetic activity and endothelial dysfunction. **Aim:** To prospectively evaluate changes in ambulatory blood pressure monitoring (ABPM) after prolonged use of CPAP, compared with a control group with moderate to severe OSA and RH. **Methods:** 115 patients (38.3% male, mean age 62 [8] years) diagnosed with moderate and severe OSA were divided into 2 groups for use (CPAP group) and non-use of CPAP (Control group). During follow-up, antihypertensive drugs were adjusted by 24-hour ABPM at baseline and at the end of the study. The median follow-up was 49 months (range 11 to 77 months). The intergroup comparison of BP changes was calculated by the linear model with group allocation as a fixed factor and adjusted by the respective basic BP values. A subanalysis was also performed only in patients with good CPAP adherence and another with those who started the study with uncontrolled ABPM. **Results:** 67 (58.3%) patients were included in the CPAP group and 48 (41.7%) in the control group, 71 (61.7%) diagnosed with severe OSA - both groups (CPAP and Control). Demographic, anthropometric, clinical and laboratory characteristics, with similar mean ABPM values. After 49 months, there were no significant changes in ABPM comparing the two groups. Control in ABPM increased from 37.5% to 41.7% in the control group and decreased from 37.3% to 31.3% in the CPAP group ( $p = 0.12$ ), with no significant changes in medication. In the subanalysis only with patients with good CPAP adherence ( $n = 58$ ), changes in BP were also similar in both groups. Analyzing those who had uncontrolled ABPM at the time of inclusion in the study, the control group ( $n = 30$ ) showed a linear reduction ( $p = 0.06$ ) in nocturnal diastolic BP compared with the CPAP group ( $n = 42$ ). **Conclusions:** The use of CPAP in resistant hypertensive patients with moderate and severe OSA had no benefit in blood pressure control.

**ID: 805**

### Case Reports

#### To what extent do infants present central or obstructive apneas events during sleep?

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**Introduction:** Obstructive apneas are the most frequent respiratory disturbance in pre-pubertal children during sleep. In infants, it is thought that, because of the immaturity of the central respiratory center, central apneas

are prevalent. **Aim:** Evaluate and classify respiratory events and the presence of immaturity of the respiratory patterns using polysomnographic daytime studies. **Methods:** Between January 2010 and March 2013 we undertook Polysomnographic daytime studies (of infants up to one year old) at the Instituto do Sono in São Paulo City. **Results:** The sample derived from sleep evaluations of 60 infants, 36 males, with  $4.3 \pm 2.9$  months age (16 days to 11 months). Corrected gestational age was  $58.3 \pm 14$  weeks (36 to 87 weeks). Total sleep time was  $103 \pm 32$  minutes. Obstructive apnea index was  $11.1 \pm 16.1$  (0 to 62 events). Central apnea index was  $13 \pm 18$  (0 to 92 events). Twenty-three (23) infants had predominantly central events, 32 obstructive events and 5 presented no abnormal index of respiratory events. Periodic breathing occurred during  $3.1 \pm 7.2$  % of the total sleep time. We noticed that 8 infants spend more than 5% of the total sleep time with periodic breathing and between these, 5 had a corrected conception age greater than 42 weeks. **Conclusions:** Polysomnographic daytime studies are a robust method to identify sleep respiratory disturbances and breathing immaturity in infants.

**ID: 806**

### Basic Research

#### Does academic demand, use of electronic device and domestic chores related to sleep/wake cycle of university students?

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**Introduction:** Admission to the university is considered a milestone in the lives of many young people. However, it can be a stressful experience and may contribute to the emergence of unhealthy habits which may interfere with the sleep/wake cycle. **Aim:** To evaluate the sleep/wake cycle of university students according to academic demand, electronic use and household chores during the week and weekend. **Methods:** This study was conducted with 297 university students of both sexes ( $\text{♂}=26,3\%$ ;  $\text{♀}=73,7\%$ ) from Nursing, Nutrition, Physiotherapy and Psychology undergraduate courses. Pittsburgh Sleep Quality Index, Epworth Sleepiness Scale, Munich Chronotype Questionnaire and "A Saúde e o Sono questionnaire" were used. The latter evaluates the sleep/wake cycle (SWC) at week and weekend, and the reasons reported by students for sleep and wake up times (academic demand, use of electronics devices and household chores). The students

were divided into two groups (presence or absence of report) and were compared by the Mann Whitney test. It was considered a significance level of 5%. **Results:** The average age of the students was  $21.2 \pm 4.0$  years. Regarding the reasons given for bedtime in the week, those who reported having academic demand showed higher daytime sleepiness ( $p = 0.003$ ), and those who reported using electronics devices showed worse sleep quality ( $p = 0.001$ ), slept 27 minutes later ( $p = 0.001$ ) and 31 minutes longer than those who do not use electronic device. Over the weekend, students who reported academic demand ( $p = 0.028$ ) and use of electronics devices ( $p = 0.009$ ) went to bed later and showed longer duration when compared to those who did not report. Regarding the reasons given for wake-up time in the week, only academic demand was related to greater irregularity in the SWC ( $p = 0.022$ ). However, over the weekend, students who reported wake-up due to academic demand or household chores showed less irregularity in the SWC, and they presented earlier bedtime and wake-up time; and longer duration compared to those who do not reported these reasons. **Conclusions:** The results indicated that the use of electronics devices and academic demand influence the sleep and wake pattern of the undergraduate's students.

**ID: 808**

### Clinical Studies

#### Is it important to evaluate symptoms of insomnia in older adults with hypertension?

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**Introduction:** Introduction: The increase in chronic diseases such as hypertension and their association with cardiovascular mortality in the elderly represents a public health priority. Persistent insomnia is associated with increased risk of hypertension and people with hypertension and symptoms of insomnia have a worse prognosis for the disease. In addition, older adults are more vulnerable to stressful life events and depressive symptoms, which have also been related to hypertension. **Aim:** Objective: To verify the relation of insomnia symptoms with depressive symptoms and stressful events in older adults with hypertension. **Methods:** Method: cross-sectional study conducted with 438 older adults (mean age 72.1 years, 71.5% female) with hypertension, participants of the Brazilian Older Adult Frailty Study (FIBRA-Campinas). Insomnia symptoms were the dependent variable, assessed by four questions in the Nottingham Health Profile: disorders of initiating and maintaining sleep, early awakening and non-restorative

sleep, grouped into categories by cluster analysis. Depressive symptoms were assessed using the Geriatric Depression Scale (GDS-15) and stressful life events using the Elders Life Stress Inventory (ELSI). Mann-Whitney, Kruskal-Wallis and chi-square tests were used, considering a significance level of 5%. **Results:** Results: Three categories were obtained from cluster analysis: Good Sleep; Bad Sleep; Early Awakening. When compared to older adults in the Good Sleep category, the older adults in the Bad Sleep and Early Awakening categories showed higher GDS-15 scores ( $p < 0.0001$ ), as well as reporting the occurrence of stressful events with greater intensity in the Finitude ( $p = 0.007$ ) and Well-being ( $p < 0.0001$ ) domains. There was a higher prevalence of stressful life events in the Well-being domain ( $p = 0.0002$ ) for the Bad Sleep category, and a lower prevalence of stressful life events in the Descendence domain ( $p = 0.017$ ) for the Good Sleep category. **Conclusions:** Conclusion: The approach to hypertension in health care should include an assessment of the older adults in their entirety, considering other common complaints at this age, such as sleep complaints and other psychosocial factors that imply detriment and failures during their treatment, such as depressive symptoms. This grouping of symptoms may affect the management of the treatment of their underlying chronic disease and the investigation of them should be expanded.

**ID: 809**

### Basic Research

#### Neurodegenerative diseases: what are the impacts of the exercise? A systematic review and meta-analysis of experimental models

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**Introduction:** The neurophysiological effects of exercise on brain and behavior and its mechanistic basis deserve clarification. **Aim:** This review and metanalysis examines the strength of scientific evidence on how exercise modifies brain and behavior in healthy mice, in Alzheimer's disease (AD) and Parkinson disease (PD) models **Methods:** Search (PubMed) included the words: "mice", "treadmill", "exercise", "physical exercise", "cognition", "brain", "depression", "anxiety", "memory", "learning" or "behavior" **Results:** In most studies, animals ( $N = 1,172$ ; 96 articles) exercised 4-8 weeks, 60 min/day and 10/12m/

min. Hippocampus followed by cerebral cortex, striatum and whole brain were more frequently investigated. Exercise improved learning and memory. Meta-analysis showed that exercise increased: cerebral BDNF, TrkB levels and neurogenesis. Exercise augmented amyloid clearance and reduced amyloid plaques in AD models. In PD models, dopaminergic neurons were increased. Evidence regarding inflammation, oxidative stress and energy metabolism were scarce. Studies on acute versus chronic exercise, extreme training and the durability of exercise benefit were rare. **Conclusions:** In conclusion, meta-analysis showed that exercise had positive effects on brain and behavior, directly and indirectly related to neurogenesis in healthy and dementia models. Exercise reduced toxicity and inhibited amyloid pathology in AD model. Few studies on PD models were reported. Vascular or glucose metabolism changes were rarely reported. The underpinning mechanism explaining exercise benefits on brain tissue needs clarification.

**ID: 810**

### Clinical Studies

#### Sleep patterns measured by actigraphy in adults of a city in southeastern Brazil: ISACAMP-sono study

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**Introduction:** Introduction: Quality of sleep and its relation to health habits constitute an important aspect of study in the current scenario of society and, therefore, the use of objective parameters for evaluation of sleep patterns is an essential tool for assessing sleep of the population. **Aim:** Objective: To describe sleep characteristics of adults from a city located in Southeastern Brazil, according to actigraphic records. **Methods:** Method: An observational, cross-sectional study with 270 individuals who constituted a sub-sample drawn from the Campinas Municipal Health Survey (Inquérito de Saúde do Município de Campinas - ISACamp) 2014/2015. Two groups were formed: Cases (people with sleep complaints, n=215) and Controls (people without sleep complaints, n=55). Participants used an Actiwatch 2® actigraph (Phillips Respironics, Inc.) for seven consecutive days, with 1-minute epoch lengths. The following sleep variables were estimated using the Actiware 6.0.8 software algorithm (Phillips Respironics, Inc.): time in bed (TIB), total sleep time (TST), sleep onset latency (SOL), sleep efficiency (SE), wakefulness after sleep onset (WASO) and number of awakenings. The following variables were also selected: gender, age, physical

activity, and chronic diseases (hypertension and diabetes). Data were analyzed using the SPSS® 20 software, with descriptive and inferential statistics (Mann-Whitney and Kruskal-Wallis tests, 5% significance level). The study was approved by the Research Ethics Committee of the institution. **Results:** Results: Among the participants, 52.9% were male and 50.7% were 60 years of age or over. Mean TIB of 474.2 minutes (SD=74.7), TST of 392.7 minutes (SD=70.5), SOL of 11.8 minutes (SD=9.1), SE of 82.9% (SD=6.2%), WASO of 58.6 minutes (SD=25.1) and mean number of awakenings 24.5 (SD=7.6) were observed. The SE was higher in the Control Group (p=0.003) and WASO was higher for the Cases (p=0.046). There was a significant difference between genders, with higher TST (p=0.013), lower SOL (p=0.043), higher SE (p<0.001), lower WASO (p=0.001) and lower number of awakenings (p<0.001) for the women. Higher SOL (p=0.013), lower SE (p=0.001) and higher WASO (p=0.003) were found among the participants that reported napping. **Conclusions:** Conclusion: Actigraphy showed to be useful in the evaluation of sleep of the population and may become an important and convenient measure for helping the adoption of practices that favor sleep quality.

**ID: 811**

### Basic Research

#### Sleep quality in adolescents studying in the morning shift at a public school at Cascavel (PR), Brazil.

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**Introduction:** In adolescence, a period characterized by profound changes, the sleep-wake cycle also changes: a sleep phase delay occurs. Despite this, the final grades of elementary school and high school are offered standardly in the morning (beginning between 7am and 7:30 am). Among adolescents there is a high use of electronic devices before they sleep may contribute to sleep difficulties, as it alters the modulation of the light-dark cycle of WSC. **Aim:** Evaluate quality of sleep and the use of electronic devices in adolescents studying in the morning shift in a public school in Cascavel (PR), Brazil. **Methods:** The research was designed as cross-sectional study, quantitative and descriptive, based on application of Pittsburgh Sleep Quality Index (PSQI), added a question, along the lines of the questionnaire, on the use of electronic devices (like cell phone, tablet and notebook) before bed. Students from a ninth grade elementary school and first, second

and third year vocational of high school (information technology) from a State College were evaluated. This study was approved by the Committee of Ethics in Human Beings (n. 3.451.752) and signed hose responsible for adolescents. We evaluated 73 students of both sexes (48 male and 25 female) aged  $15.37 \pm 1.23$ . Statistical analysis was made using the program IBM-SPSS. **Results:** 91.8% of students used electronic devices at bedtime; 72% of them three or more times a week. Total score of PSQI =  $5.75 \pm 3.02$ . 52.1% had PSQI > 5, indicating poor sleep quality, with 10.9% reaching score  $\geq 10$ . The PSQI components were reached these scores: 01 (subjective sleep quality:  $0.86 \pm 0.75$ ); 02 (sleep latency:  $0.88 \pm 0.87$ ); 03 (sleep duration:  $0.86 \pm 0.97$ ); 04 (habitual sleep efficiency:  $0.62 \pm 0.89$ ); 05 (sleep disorders:  $1.15 \pm 0.62$ ), 06 (use of sleeping medications:  $0.1 \pm 0.51$ ) and component 07 (daytime dysfunction:  $1.33 \pm 0.87$ ). The PSQI components that scored higher were component 05 (sleep disorder) and 07 (daytime dysfunction); with occurrences one or more times per week of 89.1% and 84.9%, respectively. **Conclusions:** Students presented high use of electronic devices at bedtime and most of them had poor sleep quality. Studies like this are needed to disseminate prophylactic sleep hygiene measures that contribute to improve sleep quality as well as contribute to a scientific effort to demonstrate that the morning school shift should start later, allowing adolescents to develop healthier.

**ID: 812**

### Basic Research

#### Sleep quality assessment in middle-aged and older servants of an university in Northeastern Brazil

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**Introduction:** The current world of work has presented triggers of illness and loss of quality of life, among which sleep disorders. Coupled with the fact that with aging people sleep less, have shorter deep sleep and can wake up more easily, this condition may have an impact on their ability to work. **Aim:** To evaluate the quality of sleep of middle-aged and older servants of an university in Northeastern Brazil. **Methods:** Cross-sectional study of servants ( $\geq 45$  years) from June to August 2019. Visits were made in workplace to collect information. To assess the quality of sleep, the following guiding question was used: "How is the quality of your sleep at night?" Participants

answered the question using a Likert scale from 0 to 10, where 0 means "very bad" and 10 "very good". Sleep quality on weekdays and weekends were evaluated. Data were collected through an electronic inquiry and subsequently exported to statistical treatment software (Mann-Whitney and Wilcoxon tests). The research was approved by the institution's Research Ethics Committee (CAAE10653019.4.0000.5568). **Results:** We analyzed 74 employees (20 teachers and 54 administrative technicians in education - ATE) with a mean age of  $55 \pm 6$  years, 44 (59%) males, 31 (42%) whites, average of 18 years of study and within the majority (74%) housed on Campus in the capital. As regards sleep quality, the servants had  $7.1 \pm 2.32$  points for sleep quality on weekdays and  $7.6 \pm 2.35$  points on weekends, the latter being significantly better ( $p < 0.001$ ). In a stratified analysis by housing (capital and interland), significant differences in sleep quality were found during weekdays  $7.2 \pm 2.2$  and weekends  $7.6 \pm 2.1$  only for the servants of the capital ( $p = 0.001$ ). The stratified comparisons by category (teacher and ATE) and gender did not show significant differences. **Conclusions:** The datapoint to a better quality of sleep on weekends compared to weekdays, more specifically of servants housed in the capital. This may occur due to the daily life of capitals and metropolitan regions. Future studies with larger samples and multivariate analyzes may provide more evidence.

**ID: 815**

### Basic Research

#### Sleep quality and its association with metabolic variables in medical students of an institution in the Amazon

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**Introduction:** A medical student's study routine is intense, with full-time classes plus nighttime activities. Taking up most of the student's time, overwork can end up interfering with the sleep quality of these individuals and can be a risk factor for the development of metabolic disorders due to the lack of control of their biological cycles. **Aim:** The present study aimed to correlate sleep habits and metabolic variables in medical students at an educational institution in the Amazon. **Methods:** This was an observational cross-sectional study of analytical character aimed at collecting information on habits and clinical aspects related to sleep quality in medical students from the 1st to the 8th period of the course. The study had two data collection instruments: an Epworth sleepiness scale

questionnaire, a questionnaire prepared by the researchers, containing 15 items (questions), which took as reference the students' day and night habits. An anthropometric measurement collection was also used, which included: weight, height, measurement of cervical, waist and hip circumferences and measurement of systolic (SBP) and diastolic (DBP) blood pressure, body mass index (BMI) and waist-to-hip ratio. **Results:** A total of 117 students who regularly attended medical school with a mean age of 22 years were evaluated. Of these, 59% had pathological sleepiness, most had poor sleep quality, 56% of the sample had fragmented sleep and 46% non-repairing. Nocturia ( $p = 0.02$ ) and use of stimulants ( $p = 0.007$ ) were the only sleep variables with statistical significance, and frequency and use (respectively) were higher in the 2nd, 3rd and 4th years. of course. In metabolic variables, the only one with significance was sedentary lifestyle ( $p = 0.03$ ), which increased in the 2nd, 3rd and 4th years. With the research, there was no correlation between metabolic variables and sleep quality. **Conclusions:** Most medical students, from the first to the fourth year of the course, have a poor quality of sleep, which is fragmenting most of the sample, on average less than 6 hours a night, non-repairing and during the day students have excessive drowsiness, and some use stimulants to stay awake and study.

**ID: 816**

### Clinical Studies

#### Evening preference in gestational diabetes is associated with poor sleep quality, depressive symptoms, insomnia and fatigue

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**Introduction:** Sleep problems are common in pregnancy and women with gestational diabetes (GD) are at increased risk of associated clinical complications and adverse maternal outcomes. Preliminary reports indicate that mother circadian preference may influence sleep problems in pregnancy and in early childhood. This study assessed circadian preference in women with GD. **Aim:** To investigate circadian preferences in woman with gestational Diabetes and correlate with other sleep and mood disorder. **Methods:** This cross-sectional study consecutively evaluated women with GD attending a public health care unity in the northwest of Brazil. DMG was defined according to WHO 2013 criteria. An in-person interview was performed to collect clinical and demographic data as well as assesses patient's Sleep quality (Pittsburgh Sleep Quality Index-PSQI), daytime sleepiness

(Epworth Sleepiness Scale-ESS), Depression symptoms (Edinburgh Postnatal Depression Scale – EPDS, used during pregnancy), insomnia (Insomnia Severity Index -ISI) and fatigue (Fatigue Severity Scale-FSS). Circadian preference was measured using the Horne-Östberg Morningness-Eveningness Questionnaire (MEQ); Eveningness was defined by a MEC score  $\leq 40$ . The study was approved by Federal University of Ceará ethic board, approval number 1.801.860 **Results:** During the second half of pregnancy, 242 women with GD, with age from 19 to 46 (33.2), mean BMI of 32,3 and mean gestational age of 28 weeks were evaluated. Hypertension was diagnosed in 21,4% and overweight or obesity in 78%. Among all, 19 were identified with evening preference (8.1%), and among them, the prevalence of hypertension was similar to rest of the group. MEQ lower scores (eveningness trend) were associated with higher PSQI index ( $r=-.016$   $p=.01$ ) and EDPS ( $r=.45$   $p<0.005$ ). Moreover, lower MEQ scores were correlated with increased levels of fatigue ( $r= -.30$   $p<0.005$ ) and insomnia ( $r=.53$   $p<0.005$ ). **Conclusions:** Women with GD and evening preference reported more frequent sleep and mood disturbances, including poor sleep quality, insomnia, depressive symptoms and fatigue. These results show that eveningness, in women with GD, is associated with more sleep complications. Given this evidence, and the known risk of poor pregnancy outcomes associated with GD, Sleep disorders and depression, studies evaluating the effects of light exposure in these patients are warranted

**ID: 817**

### Basic Research

#### Sleep and self-perception of stress and happiness in the post-graduation professors

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**Introduction:** The postgraduate programs professors have atypical conditions in their work routine due to the high institutional demands and the diversity of functions and activities. Hence, their quality of life is impaired by many factors, including working during days-off. **Aim:** This study aimed to analyze the association between sleep duration and self-perception of stress and happiness in a sample of professors of postgraduate programs from a public university in State of São Paulo, Brazil. **Methods:** The sample was composed for 66 professors ( $n = 66$ ) that completed 2 instruments for 10 consecutive days: Daily Activity Protocols (PAD) that records an amount of spent time on various activities, such as sleep duration, working time, leisure time, transportation time and feeding time; and, Visual Analog Scales (VAS) to

measure their happiness self-perception. For the sample characterization, a Sociodemographic, Labor and Health Questionnaires (QSLs) was also collected. **Results:** Among the 66 professors who completed the survey instruments, 17 (25.8%) worked an average of 18h41min more (SD = 15h40min; median = 17h; maximum value = 49h30min; 64.7% women; 58.8% work in capital campus) than those who slept more than they worked (sleep duration = 64h51min; SD = 12.22; median = 66h45min; minimum value = 39h30min) for 10 consecutive days (6 working days and 4 days off). On a scale from 0 to 10, these professors' self-perception mean of stress and happiness were 4.9 and 6.2, qualitatively worse than the mean of professors who sleep more than they worked (3.3 and 7.2). **Conclusions:** A quarter of postgraduate professors has overload work, and therefore, choose to work when they should be asleep. This influences your quality of life decreasing your sleep duration and self-perception of happiness while increasing their self-perception of daily stress. In this study, being a woman and working on São Paulo's campus were factors for a self-perception of stress and lack of happiness.

## ID: 818

### Case Reports

#### Micrognathia and obesity as determinant factors for severe obstructive apnea in a treacher collins syndrome individual.

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**Introduction:** Treacher Collins syndrome (TCS) is a rare congenital malformation which includes zygomatic arch and mandibular hypoplasia, choanal atresia, cleft palate and airway narrowing. **Aim:** This study aimed at evaluating, by means of polysomnography, the sleep of an individual diagnosed with TCS. **Methods:** Female patient, 18y, with Treacher Collins Syndrome, regularly registered at HRAC / USP. High-intensity snoring, breathing pauses during sleep, excessive daytime somnolence, lip cyanosis and mouth breathing during sleep were symptoms referred. Berlin questionnaire indicated high risk for obstructive sleep apnea (OSA). Anthropometric assessment revealed a grade III obesity: BMI=42, cervical circumference=41cm (ref. value<36cm) and abdominal circumference=113cm (ref. value<80cm). Common craniofacial features of TCS were observed such as zygomatic hypoplasia, micro- and retrognathia, represented by the cephalometric angles SNB=70° (ref. value = 80°±2°) and ANB=-13° (ref. value = 2°±2°) denoting a class II skeletal pattern. She

underwent a type 1 polysomnography examination at the Sleep Studies Unit (Laboratory of Physiology HRAC-USP) using an EMBLA N7000 system. **Results:** The main polysomnographic results were: number of arousals=12, arousal index=5,3, numbers of apnea/hypopnea=629, apnea/hypopnea index=77,5 (severe OSA), mean duration of apneas=47,4s, mean SatO<sub>2</sub>=86,9%, lowest SatO<sub>2</sub>=58% (22% below 80%). 3D tomographic analysis (Dolphin Imaging) of the airways was also performed and the pharyngeal volume and minimal cross-sectional areas corresponded to 12cm<sup>3</sup> (ref. values = 20±5cm<sup>3</sup>) and 40,7mm<sup>2</sup> (ref. values = 108±40mm<sup>2</sup>), respectively. **Conclusions:** Micrognathia, as a result of TCS, and obesity were determinant factors for the occurrence of a severe OSA condition in this patient. This case evidences the importance of multiprofessional follow-up for individuals with TCS and enforces the importance of pharyngeal dimensions in the genesis of OSA, probably due to the combination of two important risk factors, obesity and the craniofacial malformation itself.

## ID: 819

### Case Reports

#### Obstructive sleep apnea in an adult individual with Robin Sequence: case report

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**Introduction:** Robin Sequence (RS) is a rare craniofacial anomaly (between 1: 8,500 and 1: 30,000 live births) related to mutations in the SOX9, COL, TCOF1, PLOX1 and POLR1D genes. Clinically, it presents as a triad characterized by micrognathia, glossoptosis and airway obstruction, associated or not with cleft palate. Severe micro- and retrognathia, observed in neonates, remain in adulthood in a considerable number of cases, resulting in an extremely convex facial pattern. When associated with the occurrence of tonic dysfunctions of the peripharyngeal muscles and glossoptosis, retrognathia may lead to obstructive sleep apnea (OSA) **Aim:** To report the case of an adult patient with Robin Sequence (RS) seen at the Sleep Studies Unit (Laboratory of Physiology HRAC-USP) **Methods:** 17-year-old male patient with a repaired isolated cleft palate, with complaints of loud snoring and excessive daytime sleepiness. Physical examination revealed a BMI of 21,5 (eutrophy), cervical circumference = 32cm (reference value <40cm) and abdominal circumference = 66cm (reference value <94cm) **Results:** The main polysomnographic results, using EMBLA N7000 system, were: number of arousals = 21,

arousal index = 1,2, numbers of apnea/hypopnea = 50, apnea/hypopnea index = 10.1 (mild OSA), mean duration of apneas = 21s, mean SatO<sub>2</sub> = 94,6%, lowest SatO<sub>2</sub> = 88%, reduced sleep efficiency (59%), increased REM sleep latency (328min), and REM sleep reduction (15min–3%) **Conclusions:** Although this young individual does not present anthropometric characteristics that predispose to OSA, a (mild) apnea condition was detected, probably due to the presence of craniofacial conditions imposed by the anomaly and which justify the respiratory complaints frequently observed in this population.

**ID: 820**

## Clinical Studies

### Patients who refused CPAP have a safe option to treat severe obstructive sleep apnea: pilot study

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**Introduction:** Obstructive sleep apnea (OSA) is characterized by episodes of complete and/or partial pharyngeal collapse resulting in poor sleep quality. A non-reparative sleep can trigger systemic alterations related to a several co-morbidities including, hypertension, stroke, diabetes II, insulin resistance, depression/anxiety, obesity, neurocognitive deficits and others pathologies. OSA is progressive, life-threatening and multifactor disease, which demands a multiprofessional approach. The most common worldwide treatments are Continuous Positive Airway Pressure (CPAP) and mandibular advancement oral appliance (OAm). **Aim:** The aim of this study was evaluating the effects OAm on severe OSA, in patients who refused CPAP, comparing polysomnographic and Epworth Sleepiness Scale (ESS) data obtained prior to and during OAm treatment, after 6 month-period. **Methods:** A prospective study was carried out involving severe OSA patients, who did not accepted CPAP (continuous positive airway pressure) and were referred to treatment with an OAm. Subjects with complaints of snoring, gasping/choking during sleep, fatigue and daily sleepiness were evaluated by a sleep medicine specialist and the diagnosis of severe OSA with a basal polysomnography (PSG). The appliance chosen was PMPositioner®. After 6 months a new PSG was performed to evaluate the efficacy of OAm therapy. Subjective daytime sleepiness was evaluated by ESS questionnaire prior to treatment and at 6 months follow up. **Results:** Seventeen patients met the inclusion criteria and 13 finished the protocol. The following parameters improved significantly OSA severity

( $44.5 \pm 13.5$  to  $9.0 \pm 4.3$ ,  $p \leq 0.001$ ), ODI ( $46.8 \pm 11.6$  to  $12.1 \pm 9.1$  ( $p < 0.05$ )), REM ( $18.4 \pm 4.8$  to  $21.5 \pm 2.9$  ( $p < 0.05$ )) and SaO<sub>2</sub>nadir ( $75.7 \pm 9.4$  to  $87.0 \pm 3.6$ ,  $p < 0.001$ ), as well as ESS ( $p < 0.005$ ). Comorbidities were present in entire group, 9 with hypertension and with hypertension and diabetes II. Ten patients reported that the arterial pressure values reduced for systolic and diastolic parameters and among them, 3 patients reduced the hypertensive drug dose. **Conclusions:** The findings of the present study demonstrated that OAm is a safe and viable treatment option to severe OSA, when patients cannot tolerate or refuse CPAP therapy. Further studies should include thermosensitive microsensor to objectively measure the effectiveness of a long-term OAm therapy.

**ID: 822**

## Case Reports

### Monitoring for 8 years of serious case of controlled sleep apnea syndrome through lingual technique: case report

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**Introduction:** Obstructive sleep apnea syndrome (OSAS) is a sleep disorder caused by upper airway occlusion. It has a high prevalence, mortality and morbidity, with consequent reduction or absence of respiratory airflow causing nocturnal awakenings and oxyhemoglobin desaturation. Patients with OSAS have a reduced pharyngeal muscle contractile capacity and higher upper airway blockade pressure than those without OSAS. Intermittent hypoxia in the pharynx muscles and central nervous system represents a disease progression factor by altering the structure of the dilator muscles. The most efficient noninvasive treatment for OSAS control is the use of Continuous Positive Airway Pressure (CPAP) devices. However, the discomfort caused by the ventilatory mechanism causes many patients to opt for the use of oral appliances (OA). **Aim:** To demonstrate the performance of an oral device, based on the concepts of Lingual Technique, that uses a different mode of action. The mechanism, called 'Lingual Orthosis', is proposed as an alternative method of treatment for resistant CPAP patients. **Methods:** A patient with severe OSAS - 36.4 ev/h - and resistant to CPAP was submitted to a treatment with AIO Lingual Orthosis and was followed up for eight years. At the end of this period a second lingual orthosis

was made. This device, one of the components of the lingual arsenal techniques, acts controlling directly and actively with the purpose of containing the retroposition and consequent occlusion of the oropharyngeal canal. To attest the results, three polysomnographic (Icelera, São Paulo, Brasil) examinations were performed, one baseline and the other two with their respective devices installed. **Results:** Polysomnographs demonstrate that both devices were effective in controlling OSAS. The first device reduced the initial apnea hipopnea index (AHI) from 36.4 to 3.3 ev/h. The second device, eight years later, also reduced the AHI, scoring it down to 0.6 ev/h. **Conclusions:** The results of the polysomnographs demonstrated the effectiveness of the active and direct action proposed by Lingual Technique, represented here by the Lingual Orthosis device. The primary action of restraining the posterior sliding of the tongue was successful, thus ensuring AHI reduction.

**ID: 823**

### Clinical Studies

#### Effect of sleep-inducing drugs on central and obstructive apnea

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**Introduction:** Sleep apnea is a condition associated with repeated breathing pauses during sleep. It may be result of upper airway occlusion (obstructive sleep apnea) or altered automatic breathing control (central sleep apnea). Several medications have an effect on sleep respiratory physiology, including sleep-inducing drugs. Benzodiazepines, for instance, may cause muscle relaxation, leading to weakness of pharyngeal muscle tonus and obstructive respiratory events. **Aim:** The objective of this study was to evaluate the effects of sleep-inducing drugs on central and obstructive apnea. **Methods:** An cross-sectional study of polysomnography reports (PSG) performed between 2008 and 2016 was conducted, totaling 30159 reports. Exclusion criteria were repeated PSG of the same patient, split-night or CPAP PSG reports, and age below 18 years. Of the resulting 23,178 cases, 21,961 had taken no medication, 568 used benzodiazepines, 217 used z-drugs, 312 used other drugs, and 120 used multiple sleep-inducing drugs. Two one-way ANOVA with Games-Howell post-hoc tests were conducted, with medication as group factor and apnea-hypopnea index (AHI) and central apnea index (CAI) as dependent variables. **Results:** Patients who used medication before PSG were thinner (-5.9 BMI points,  $p < 0.001$ ), younger (-20.3 years,  $p < 0.001$ ), and women (67% X 41%,  $p < 0.001$ ). AHI was greater in no-medication

group comparing to z-drugs (+18.2/h), benzodiazepines (+14.2/h), and others (+14.6/h); there was no difference between drug groups. CAI was greater in no-medication group comparing to benzodiazepines (+3.2/h) and multiple drugs (+3.2/h); no other difference was significant. Those effects remained even after controlling for BMI, age and sex. **Conclusions:** As opposed to what was expected in the literature, sleep-inducing drugs had a protective effect in both obstructive and central apneas. One limitation of the study was that the information about the reason of the PSG was lacking. As people who used sleep-inducing drugs had the same epidemiological profile of insomniacs, one may infer that that was the reason for performing PSG in such group. Even though, drug classes did not differ in their effects on both types of apnea.

**ID: 824**

### Clinical Studies

#### Actigraphic assessment of patients with gestational diabetes shows severe compromise of sleep measures

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**Introduction:** Sleep pattern assessed by actigraphy has been seldom reported in gestational diabetes mellitus (GDM). Importantly, studies have shown that short sleep duration and later sleep midpoint have been linked to hypertension and GDM latter in pregnancy. These issues are vital because Hypertension, GDM and Sleep disturbances are frequent during pregnancy and can lead to adverse outcomes. **Aim:** To evaluate sleep/wake activity, with objective and subjective measures, using daily wrist actigraphy and behavior questionnaires. **Methods:** A cross-sectional study evaluated 53 GDM patients in the last trimester of pregnancy, attending a public health care unity in Brazil. Valid actigraphy recordings (5 to 7 days) were obtained from 41 patients. GDM was defined according to WHO 2013 criteria. Sleep onset latency, sleep duration, sleep efficiency and wake after onset of sleep (WASO) were analyzed. Patients were interviewed to complete the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale, Fatigue Severity Scale, Insomnia Severity Index and Edinburgh Postnatal Depression Scale (EPDS). Short sleep duration was defined if sleep duration was  $< 7$  hours; prolonged sleep latency if  $> 30$  minutes and reduced sleep efficiency if  $< 85\%$ . Pregestational

diabetes patients were excluded. The study was approved by Federal University of Ceará ethic board, approval number 1.801.860. **Results:** Forty-one GDM patients aged 27 - 46 y ( $35.2 \pm 4.8$ ), BMI 24.3 to 41.1 ( $31.5 \pm 4.4$ ) with a mean gestational age of 27 weeks were studied, showing normal sleep latency (0.50 to 29.3 min;  $8.5 \pm 8.0$ ), reduced sleep duration (148-455min;  $262.9 \pm 75.1$ ), reduced sleep efficiency (63.7-98.4%;  $84.5 \pm 8.5$ ) and increased WASO (3.8-150.4min;  $58.3 \pm 34.8$ ). Delayed midpoint sleep was detected only in three patients. Sleep efficiency correlated with fatigue (FSS  $r = -.42$   $p = .02$ ), depressive symptoms (EDP  $r = -.51$   $p = .007$ ), sleep quality (PSQI  $r = -.39$   $p = .04$ ) and there was a trend with insomnia (ISI  $r = -.34$   $p = .07$ ). WASO was correlated with fatigue (FSS  $r = .41$   $p = .03$ ), depressive symptoms (EDP  $r = .55$   $p = .003$ ), sleep quality (PSQI  $r = -.39$   $p = .04$ ), and insomnia (ISI  $r = .39$   $p = .04$ ). **Conclusions:** Actigraphic evaluation of GDM patients in the last trimester of pregnancy show severe compromise of sleep efficiency, short sleep duration and increased WASO. Actigraphic measures were associated with depressive symptoms; a less powerful association was found with behavioral questionnaires evaluating fatigue, insomnia and sleep quality.

**ID: 825**

### Clinical Studies

## Sleep Habits and Total Resting Time of School-Aged Children

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**Introduction:** Sleep is important for the mental and physical health of children. Insufficient time and sleep fragmentation are associated, for example, with obesity, poor performance at school, and behavioral and emotional problems. Good sleep habits are acquired in the family environment from birth, however, a decrease on the total sleep time has been noted, related to the habits of modern families regarding food, physical activity, and use of electronic equipment, as well as misuse of lighting at night. **Aim:** This study aimed to identify the sleep habits and total resting time of school-aged children. **Methods:** This is a cross-sectional and descriptive study and all the procedures were approved by the Ethics Committee (n°370/2018) of the Federal University of São Paulo. Children from the 1st to the 4th grades of a private elementary school in São Paulo - Brazil had their activity-rest cycle monitored for 15 consecutive days by an actimeter (ActTrust®) that was positioned on the non-dominant upper limb. Data analysis was performed using

the software ActStudio©. Sleep habits were registered by children and their parents in a sleep diary. **Results:** We analysed the sleep habits of 12 children, 6 boys and 6 girls, that were  $7.58 (\pm 1.09)$  years old in average. The mean of total resting time among the children was 479.89 ( $\pm 21.03$ ) minutes, the bedtime was 10:56pm and the arousal time was 7:49 am. According to the sleep habits, 50% of children have a TV set in the room, 16.7% used to keep some kind of light on during sleep, 33.3% used to eat stimulating food at night, and all children practice physical activity during the day. The average time use of electronic equipments by children was  $2.8 (\pm 1.86)$  hours a day. **Conclusions:** School-aged children are sleeping later and fewer than recommended in the literature, making extensive use of electronics equipments and eating stimulating foods just before bedtime. These habits can be changed to improve the quality and quantity of sleep.

**ID: 826**

### Clinical Studies

## Sleep quality of high-risk pregnant women in a Public Hospital Maternity

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**Introduction:** Sleep is essential in life, a very well organized and structured activity that depends on both personal and environmental factors, different and specific to each phase of human life. Insufficient or poor sleep quality during pregnancy may lead to several casualties as a higher risk of complications during pregnancy. A high-risk pregnancy is characterized by disorders that threaten the health of both mother and fetus and often leads women to hospital admission. Usually, people who have been admitted to a hospital have two hours less sleep than at home and poorer sleep since they are often disturbed at night. **Aim:** To evaluate the quality of sleep of high-risk pregnant women in a public hospital maternity ward. **Methods:** This is a cross-sectional and observational study that evaluated the quality of sleep of 67 high-risk pregnant women hospitalized in a public hospital maternity ward. Data to assess the quality of sleep of pregnant women were collected from the Brazilian version of the Pittsburgh Sleep Quality Index (PSQI-BR). **Results:** It was obtained an average of  $31 \pm 35$  minutes to fall asleep, and  $5.3 \pm 1.8$  hours of sleep a night. It was also possible to analyze that these pregnant women go to bed at approximately 9 p. M. and wake up at 5:30 a. M. The total sum of PSQI-BR showed poor sleep quality (total scores  $> 5$ ) in 59 of the 67 participants, 88.0% of the total, and sleep disturbance

(scores > 10) in 33 pregnant women, 49,3% of the total surveyed. The average PSQI score was  $10 \pm 3.8$ . The hospital factors that negatively interfered with sleep quality as reported by pregnant women were: number of people sharing the ward; each ward had 6 beds, the arrival of professionals late at night and the fact that they usually leave the lights on after performing the procedures were also causes of sleep disturbance, as well as uncomfortable beds, noise at night and homesickness. **Conclusions:** The majority of hospitalized pregnant women assessed by the study have poor sleep quality or sleep disorders.

**ID: 827**

### Clinical Studies

#### Comparative study of sleep quality and insomnia among climacteric women with regular menstrual cycle

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**Introduction:** One of the most common complaints of mid-life women is poor sleep. Poor sleep is more prevalent in women, with gender differences emerging around menarche and further increasing in mid-life. Perimenopause encompasses the menopausal transition and the first year after the final menstrual period. The term “climacteric” may also be used to describe peri-menopause and the part of the post-menopausal period in which climacteric symptoms occur. The passage between the reproductive and non-reproductive period of women, when they typically experience hot flashes and sweating, causing changes in their quality of life, which may interfere with sleep, with the most common complaint being nighttime awakenings and routine activities. **Aim:** To evaluate the sleep quality and insomnia level of climacteric women and compare it with women of the regular menstrual cycle. **Methods:** Personal data such as the last day of LMP and anthropometric data were collected. Three questionnaires were used: Brazilian version of the Pittsburgh Sleep Quality Index (PSQI-BR). And Insomnia Severity Index in both groups and the Kupperman Menopausal Index (IMK), applied only to the group of women who were in the climacteric. The frequencies of both groups were compared using the Chi-Square test. **Results:** The sample consisted of 53 women, 30 of them with the regular menstrual cycle and 23 during climacteric. The average age was  $45 \pm 9$  years, weight  $70 \pm 7$  kg and height  $158 \pm 4$  cm. Regarding the severity of climacteric symptoms, 61% of women had moderate symptoms and had poor sleep quality, only women in the climacteric were identified having a sleep disorder and 67% of women who were in

the climacteric had mild to moderate insomnia. There was a significant difference between sleep quality ( $p = 0.001$ ) and insomnia severity ( $p = 0.014$ ) comparing both groups. **Conclusions:** Climacteric women have worse sleep quality and mild to moderate insomnia compared to women who regularly menstruate.

**ID: 829**

### Clinical Studies

#### Sleep habits assessment of children in child maltreatment situations in the city of Canoas, RS

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**Introduction:** Sleep disorders (SD), present in children victims of violence, are associated with alterations in emotional, learning and social functions and may be a risk factor for the neurodevelopment of mental disorders. **Aim:** Recognize sleep alterations observed in children who experienced child maltreatment (CM) situations identified through a multidisciplinary assessment (medical, social assistance and psychology). The objective is to establish the main SD and to correlate the variables with each other – type of violence, age, gender and SD. **Methods:** The study analyzed the sleep pattern of 123 children (age range: from 2 to 10 years old), during the period of 11 months, who received care at an assistance center specialized in child maltreatment in the city of Canoas, RS. The analysis was based on the Children's Sleep Habits Questionnaire (CSHQ) through the perception of parents and caregivers. **Results:** Among the 123 children evaluated, 66,7% had SDs. The sample profile was predominantly female (59,3%) and aged between 4 and 7 years old (48,8%). Physical violence was found in 40,7% of the children, sexual (35,8%), psychological (24,4%), negligence (14,6%) and other types of violence - exposure to home violence - (4,5%). SD is significantly associated with sexual, psychological and other types of violence ( $p = 0,016$ ). Regarding the CSHQ subscales, there was a significant difference between the age groups in the bed resistance factor score (RS) ( $p = 0,033$ ). The RS characteristic typifies sexual (11,6 points), psychological and other types of violence (11,0 points each). Sleep anxiety (SA) typifies more psychological (7,9 points), sexual (7,5 points) and other types of violence (7,3 points). Night awakening (NA) typifies psychological (4,4 points), sexual and physical (4,3 points each) violence. According to the data by type of violence, significant differences in SA ( $p = 0,039$ ), NA ( $p = 0,026$ ) and RS ( $p = 0,004$ )

were found in the analysis. **Conclusions:** The outcomes highlight the association between SD and CM. The impact of the results contribute to the elaboration of appropriate therapeutic interventions in order to prevent violence and rehabilitate children regarding SD, aiming to avoid the development of future mental and physical disorders.

**ID: 830**

### Clinical Studies

#### Degree of concordance of the mallampati classification among specialists from different areas

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**Introduction:** Although it is controversial, the Mallampati classification is routinely adopted as an evaluation tool used to predict the presence and severity of Obstructive Sleep Apnea. The Oropharyngoscopy is a simple, minimally invasive examination, but it requires specific knowledge, and training. Given the growth of sleep medicine and the insertion of non-medical professionals in multidisciplinary teams, it is necessary to guarantee a consistency in its assessments. **Aim:** To verify the concordance of the Mallampati evaluation among professionals of different specialties. **Methods:** Analytical, observational and cross-sectional study with the participation of 144 individuals, of both sexes with a mean age 33.79 years. Approved N 2,891,458. The photograph was taken by a student of speech therapy and another of dentistry. Two records were taken for each patient as they and were told to open their mouths and swallow, relaxing the tongue. To select the images that were analysed, luminosity and better tongue relaxation position were considered. The images were sent separately to three evaluators, (a speech therapist certified in Sleep Medicine, an anaesthetist and an otorhinolaryngologist) along with a spreadsheet of answers. Professionals observed the relationship between the tongue and the oral cavity and classified it according to the Modified Mallampati score in grade I, II, III or IV. After analysis and completion, the spreadsheet was returned by e-mail and blindly forwarded for statistical analysis. To verify the degree of coincidence between the pairs of examiners, the weighted Kappa coincidence scores and confidence intervals were obtained for the parameter cited. The values for the three pairs of examiners and their confidence intervals were also obtained. The statistical program MEDCALC version 14.8.1 was used. The

intervals were obtained with a reliability of 95%. **Results:** Most assessments corresponded to grade 4 (percentages ranging from 61.8% to 68.1%). The percentages of Grade 1 ranged from 4.2% to 10.4%, grade 2 ranged from 6.9% to 15.3% and grade 3 from 11.1% to 20.8%. The weighted kappa value was higher among examiners 1 and 2 (0.92) indicating excellent concordance and 0.69 to 0.72 in the other two pairs (good concordance). The kappa value for the three pairs of examiners was 0.78 (good concordance). **Conclusions:** There was good concordance in the evaluation of Mallampati among speech therapists, anesthesiologists and otorhinolaryngologists.

**ID: 834**

### Clinical Studies

#### Factors associated with unintentional napping in adolescents: population based study

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**Introduction:** Adolescents present changes in sleep patterns, such as difficulty in sleeping and getting up early, which is frequently imposed on them by school and social commitments. This may result in sleep deprivation and poor sleep quality. Naps can be a compensatory response to sleep deprivation, especially when unintentional, and may be associated with factors that are detrimental to adolescent health. **Aim:** Objective: To analyze factors associated with unintentional napping in adolescents. **Methods:** Methods: population-based cross-sectional study conducted with data from the Campinas Municipal Health Survey (Inquérito de Saúde do Município de Campinas - ISACamp)-2014/2015, with participants from 10 to 19 years of age (n=1022), approved by the institution's Research Ethics Committee. Dependent variable was the intentionality of naps and independent variables were: sociodemographic characteristics, feelings of loneliness, life and health habits and sleep habits. Descriptive analysis, Rao-Scott chi-square test and Student's t-test were performed, considering a significance level of 5%. The Stata 14.0 software was used in survey mode for analysis. **Results:** Results: 50.9% were male and 84.0% were students; mean age was 14.6 (SD=2.7) years. Prevalence of unintentional napping was 8.2%, and was significantly lower in white adolescents (p=0.003), in those who often or always felt isolated (p=0.001) and that

never felt well disposed after awakening ( $p < 0.0001$ ). There was no significant difference in habits such as physical activity and alcohol consumption. Duration of sleep on weekdays was 437 (SD=191) minutes and on weekends, 541 (SD=117) minutes, with no significant difference from those who napped intentionally. Adolescents that napped unintentionally estimated that they needed a mean of 530 (SD=204) minutes of sleep to feel well disposed after awakening. **Conclusions:** Adolescents that napped unintentionally verbalized the need to sleep for longer periods, suggesting that they are sleep-deprived. They expressed unwillingness to wake up and feelings of isolation. Identifying the reasons related to napping can contribute to promote better sleep quality in this age group, as well as generate actions to improve health and even public policies, involving healthcare providers, educators and family members, in order to avoid damage to physical and psychological health of the adolescent.

**ID: 836**

### Basic Research

#### Analysis of sleep duration per study shift in adolescents from Rio Branco, Acre

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**Introduction:** Background: Sleep duration plays an important role in adolescent health. During adolescence there are biological and behavioral changes that lead to a phase delay in the sleep-wake cycle, which added to the social and school contexts, reflects a decrease in sleep hours. Studies show that adolescent students from different shifts experience different sleep durations, causing health impacts. **Aim:** Objective: To analyze sleep duration per study shift in adolescents from Rio Branco, Acre. **Methods:** Methods: Cross-sectional study with 1,733 adolescents aged 12 to 17 years, students of the morning or afternoon shifts in the capital Rio Branco, Acre, participants of the Study of Cardiovascular Risks in Adolescents - ERICA. The variable sleep duration was collected through a questionnaire. Mean sleep duration for school days (Monday to Friday), weekend (Saturday and Sunday), and weekly sleep duration (weighted average) were calculated. Absolute and relative frequencies were calculated. Comparison of proportions was performed by Pearson's chi-square test, the means by Student's t-test, with significance level of 5% between study shift groups. **Results:** Results: The average weekly and class days sleep duration of adolescents studying in the morning shift were lower than the averages of adolescents

studying in the afternoon,  $7.79 \pm 1.09$  and  $7.17 \pm 1.27$  ( $p < 0.0001$ ) respectively. The average weekend sleep duration of the morning shift adolescents was higher than the average of the afternoon shift,  $9.33 \pm 1.63$  ( $p = 0.016$ ), especially among boys ( $p = 0.007$ ), inferring the attempt to compensate sleep deficit during school days. Boys' sleep duration ( $8.00 \pm 1.06$ ) was shorter than girls' sleep duration ( $7.52 \pm 1.06$ ). The average sleep duration decreased markedly when considering only school days,  $6.83 \pm 1.23$  and  $7.45 \pm 1.23$ , for boys and girls, respectively. **Conclusions:** Conclusion: Morning shift adolescents had shorter sleep duration than afternoon shift adolescents during school days. However, over the weekend this group of teenagers try to compensate for their sleep deficit by sleeping more hours of sleep. Studying sleep duration and its consequences among adolescent students from different shifts can contribute to health promotion and better student performance.

**ID: 838**

### Clinical Studies

#### Heart rate reactivity to acute mental stress is blunted in individuals who sleep less than seven hours.

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**Introduction:** Inadequate sleep and stress both have negative impact on health, increasing the risk for negative outcomes such as cardiovascular disease, diabetes and depression. Moreover, the effects of a decrease in sleep time on physiological responses to acute stress still unclear. **Aim:** To evaluate heart rate reactivity (HRR) after an acute mental stress in individuals who sleep less or more than seven hours. **Methods:** All procedures in this study were approved by the Research Ethics Committee – UESC (CAAE: 94666418.0.0000.5526). A total of 28 undergraduate students (N=10 female) visited the Laboratory of Exercise Psychophysiology (LAPFISIO – UESC) between 08:00am and 11:00am. Volunteers completed seated rest for 15 minutes to measure baseline heart rate (HRBASE) (Polar RS800CX). Then, acute mental stress was induced by serial arithmetic addition test, where, after a period, the speed of numerical presentation increased. The numbers were presented on an audio recording and the volunteer responded verbally.

Heart rate was measured again immediately after the acute mental stress (HRSTRESS). HRR was defined as HRSTRESS minus HRBASE. Volunteers then received a self-reported sleep diary to fill and return after seven days. Finally, the volunteers were divided in two groups: Group  $\geq 7$  = Individuals who slept more than 7 hours ( $n = 16$ ,  $20.7 \pm 1.8$  years,  $65.2 \pm 9.4$  kg and  $169 \pm 7$  cm) and Group  $< 7$  = Individuals who slept less than seven hours ( $n = 12$ ,  $23 \pm 4.4$  years,  $68.1 \pm 15.1$  kg and  $170.5 \pm 7$  cm). **Results:** Independent t-test showed a statistical significant difference ( $P < 0.001$ ) in total sleep time in Group  $\geq 7$  ( $8.1 \pm 0.8$  hours) compared with Group  $< 7$  ( $6.17 \pm 0.7$  hours). In addition, the t-test showed a significant difference ( $P = 0.02$ ) in HRR in Group  $\geq 7$  ( $9.8 \pm 6.6$  bpm) compared with Group  $< 7$  ( $1.3 \pm 6.1$  bpm). Lastly, a significant negative correlation ( $P = 0.01$ ) was found between the HRR and total sleep time ( $r = -0.72$ ) only in the Group  $< 7$ . **Conclusions:** We conclude that a reduction in total sleep time is associated with a decrease in HRR after acute mental stress in sleep-restricted individuals. Furthermore, it could increase cardiovascular risk due to changes in sympathetic nervous system activity.

## ID: 839

### Clinical Studies

#### Polysomnographic variables and complaints of sleep disorders in elderly

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**Introduction:** Difficulty in initiating or maintaining sleep could indicate insomnia and/or obstructive sleep apnea (OSA). Complaints of sleep disorders in adults are already established, but the relationship in elderly over 80 years old is still poorly investigated. **Aim:** To evaluate complaints related to sleep disorders and polysomnographic variables in elderly over 80 years old. **Methods:** Subjects with suspect of sleep disorders were retrospectively gathered where they performed a full night polysomnography. Demographic data and clinical symptoms were self-described by the participants. Sleep efficiency of  $< 85\%$  was the standard to define insomnia and an apnea-hypopnea index (AHI)  $> 5$  events per hour was the one to diagnose OSA. **Results:** Were included 100 participants older than 80 years old and 156 control subjects with 60 exact years. As regards the total number of the participants,  $58\%$  ( $n=147$ ) had a sleep efficiency  $< 85\%$  and  $87\%$  ( $n=222$ ) AHI  $> 5$  on polysomnography. The main complaints among older and 60 years old, respectively (chi-square test adjusted residual analysis): “snoring” ( $27\%$  vs.  $56\%$ ;  $p < 0.001$ ), “sleep apnea” ( $15\%$  vs.  $11\%$ ;  $p = 0.33$ ),

“insomnia” ( $15\%$  vs.  $10\%$ ;  $p = 0.23$ ), “somnolence” ( $2.0\%$  vs.  $1.3\%$ ;  $p = 0.64$ ). In cases with 60 years old, woman and men had similar snoring and insomnia complaints. Among elderly over 80 years old and controls, the prevalence of sleep efficiency  $< 85\%$  were  $71.7\%$  vs.  $48.7\%$ , respectively with adjusted residual analysis ( $p < 0.001$ ). The sleep apnea diagnosed with AHI  $> 5$  was similar between cases and controls ( $88\%$  vs.  $87\%$ ;  $p = 0.85$ ). There was no association between apnea severity among cases and controls: AHI  $> 15$  ( $73\%$  vs.  $62\%$ ;  $p = 0.80$ ), AHI  $> 30$  ( $49\%$  vs.  $40\%$ ;  $p = 0.20$ ), respectively. **Conclusions:** There was no difference between complaints of sleep disorders among the studied groups, except for complaints about snoring, which was more prevalent in the 60 years old patients. Polysomnographic data showed that older people, over 80 years old, had higher insomnia criteria than 60 years old subjects. This is the first study to analyze the relationship of sleep disorder complaints with polysomnography test in elderly over 80 years old.

## ID: 840

### Case Reports

#### Efficacy of the stabilizer plate through electrognatography in bruxism with disc displacement and reduction: case report

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**Introduction:** The stabilizing occlusal plates act to reduce proprioceptive information that originates in the periodontium and temporomandibular joint, breaking the vicious cycle of sustained muscle contraction. Pain relief is obtained as the stabilizing plate promotes the condyle clearance from the articular cavity and the increase of its biological space, and its indication is due to the fact that such technique is configured in a less invasive and reversible method. **Aim:** To evaluate the efficacy of occlusal stabilizer plaque as the main therapy in the treatment of bruxism with reduced articular disc deviation. **Methods:** A 17-year-old female TTL patient with leucoderma sought the Dentistry Clinic of the Federal University of Pernambuco (UFPE), Recife - PE, complaining of orofacial pain and wear on the internal cusps of the posterior teeth support cusps. upper limbs with unilateral click in the right hemiface and impairment of mandibular opening and closing movements. Electrognatography (EGN) was performed by affixing a small magnet to the labial

surface of the lower incisors at the midline level, and the movements were immediately visualized through software (BioPAKSistem®, SQUIB, Brazil). The patient underwent the use of a thermopolymerizable stabilizing occlusal plate for the purpose of protecting the teeth, relaxing the muscles and stabilizing the stomatognathic system. Pain was measured by Visual Analogue Scale (VAS), which is a one-dimensional instrument for pain scale assessment. **Results:** It was observed that after the use of the occlusal stabilizer plate there was a decrease in the maximum mouth opening amplitude, a reduction in the lateral deviation to the right, a reduction in the maximum oblique opening of the mouth, an increase in symmetry between opening and closing in the mouth. sagittal plane, increased protrusion and retrusion of the mandible, increased velocity during opening and reduction during mandibular closure. Pain reduction from grade 8 to 3 was evidenced. **Conclusions:** The case report demonstrates the effectiveness of the occlusal stabilizer plate in reducing muscle and joint pain and promoting improvement in mandibular movement.

**ID: 841**

### Basic Research

#### Does cpap mitigate cardiovascular responses to submaximal effort in subjects with obstructive sleep apnea? a cross-sectional study

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**Introduction:** Obstructive sleep apnea (OSA) is a clinical condition characterized by repetitive upper airway obstructions during sleep. These transient episodes of hypoxemia-reoxygenation lead to increased oxidative stress, contributing to the development of cardiovascular diseases and reduced exercise tolerance. In this context, continuous positive airway pressure (CPAP), the gold standard treatment for moderate and severe OSA, reduces apnea/hypopnea events and restores the homeostasis of the cardiovascular system. **Aim:** The aim of this study was to compare cardiovascular responses in OSA subjects with and without CPAP treatment. **Methods:** It was conducted a cross-sectional study in 73 subjects diagnosed with moderate or severe OSA, who showed good adherence (at least 2 months, at least 4 h/night) to CPAP treatment (CPAP group: n = 36) and never used the device (nCPAP group: n = 37). All patients were aged between 30 and 70 years old and BMI between 18 and 45

Kg/m<sup>2</sup>. They underwent the six-minute step test (6MST) and the following variables were assessed: HR, SBP and DBP at rest and one minute after the cessation of 6MST. Data between groups were compared using unpaired t-test or Mann Whitney test. Results are expressed as mean ± standard deviation and confidence interval. **Results:** The groups were similar in age, weight, height, BMI, waist and neck circumference, excessive daytime sleepiness, apnea/hypopnea index, FEV<sup>1</sup> and FVC. Sleep quality was worst in nCPAP compared to CPAP group (PSQI score: nCPAP 6,19 ± 3,38 vs. CPAP 4,89 ± 3,37 (p = 0,048) and FEV<sup>1</sup>/FVC ratio was higher in nCPAP compared to CPAP group (nCPAP 84,85 ± 6,68%predicted vs. CPAP 77,93 ± 9,26%predicted; p = 0,001). Regarding the difference in the resting and first minute after 6MST blood pressure values, as well the SBP (nCPAP 24.2 ± 12,04% vs. CPAP 4.6 ± 7,31%; p = 0.000; CI 14.97 to 24.27), as the DBP (nCPAP = 5.5% ± 0,78% vs. CPAP 0.2% ± 4,33%; p = 0.000; CI 3.22 to 7.48) were higher in nCPAP compared to CPAP group. However, the difference in the resting and first minute after 6MST HR values were the same in the two groups (nCPAP 18.6 ± 15,34% vs. CPAP 15.08 ± 10,59%; p = 0.260; CI -2.65 to 9.68). **Conclusions:** The results suggest that OSA individuals treated with CPAP have an attenuated hemodynamic response to submaximal effort and a faster recovery compared to non-treated OSA subjects.

**ID: 846**

### Basic Research

#### Circadian measurements of visual contrast sensitivity of young adults

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**Introduction:** Circadian rhythms have characteristics that are important to analyze; one initial proposal is their relationship with the mechanisms of visual functions. **Aim:** Thus, this study used the staircase psychophysical method to investigate luminance contrast variation associated with the course of the daytime circadian clock. **Methods:** This study evaluated visual sensitivity to luminance contrast during a daily period. Twenty-eight young male adults (M = 24.85; SD = 2.4) with normal color vision and 20/20 visual acuity participated in this study. The circadian pattern was assessed using the Karolinska Sleepiness Scale (KSS), the Pittsburgh Sleep Quality Index (PSQI), and a sleep diary. To measure the luminance contrast, we used version 11.0 of the Metropsis software with sine-

element frequency stimuli for spatial frequencies of 0.2, 0.6, 1, 3.1, 6.1, 8.8, 13.2, and 15.6 cycles per degree of visual angle (cpd). The stimuli were presented on a 19-inch color cathode ray tube (CRT) video monitor with a resolution of  $1024 \times 786$  pixels, an update rate of 100 Hz, and a photopic luminance of 39.6 cd/m<sup>2</sup>. **Results:** There was a significant difference in KSS on the weekdays [ $\chi^2(2) = 20.27$ ;  $p = .001$ ] and in the luminance contrast for frequencies of 13.2 cpd [ $\chi^2(2) = 8.27$ ;  $p = .001$ ] and 15.6 cpd [ $\chi^2(2) = 13.72$ ;  $p = .041$ ]. Participants had a good sleep quality index ( $M = 5.09 \pm 2.6$ ). The Wilcoxon test of related measures showed significant differences at bedtime ( $Z = 2.37$ ;  $p = .018$ ), indicating that the participants went to sleep later on the non-working days of the week (01:35 min  $\pm$  72 min) when compared to the weekdays (00:55 min  $\pm$  71 min). There was a significant difference in KSS on the weekdays [ $\chi^2(2) = 20.27$ ;  $p = .001$ ] and in the luminance contrast for frequencies of 13.2 cpd [ $\chi^2(2) = 8.27$ ;  $p = .001$ ] and 15.6 cpd [ $\chi^2(2) = 13.72$ ;  $p = .041$ ]. The Spearman's rho correlation test showed a correlation in the following variables: spatial frequency of 6.1 cpd at 5:00 pm with the waking time on weekdays ( $\sigma = 0.44$ ;  $p = .039$ ); spatial frequency of 8.8 cpd also at 5:00 pm with the variables of bedtime on weekdays ( $\sigma = 0.46$ ;  $p = .029$ ) and waking time on weekdays ( $\sigma = 0.42$ ;  $p = .049$ ) and non-working days ( $\sigma = 0.44$ ;  $p = .032$ ). **Conclusions:** This article discusses the perceptual processes of circadian visual sensitivity. this study discusses nonlinear characteristics of circadian associated with the role of the visual timing system.

**ID: 847**

### Basic Research

## Salivary Diagnostic Biomarkers For Obstructive Sleep Apnea - A Systematic Review

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**Introduction:** Obstructive sleep apnea (OSA) is a highly prevalent disease, affecting individuals of all ages, and is a risk factor for cognitive disorders, metabolic disorders and cardiovascular diseases. Despite its impact on general health and quality of life, it remains underdiagnosed due to the high costs, and limited access to polysomnography. **Aim:** The aim of this systematic review was to evaluate the diagnostic value of salivary biomarkers in OSA compared to full-night polysomnography performed

in a sleep laboratory. **Methods:** Studies that compared healthy individuals and those with apnea, were based on polysomnographic results, and without restriction on age, language or year of publication were eligible for inclusion. This review was registered in PROSPERO under the number: CRD42016037278, adhered to the PRISMA check list and used QUADAS as a tool to evaluate methodological quality and calculate the risk of bias. We consulted: PubMed, Embase, MEDLINE, LILACS, BBO-ODO, Cochrane and Google scholar. **Results:** We found 232 studies, 15 of which were included for detailed analysis and extraction of salivary biomarker diagnostic predictors for OSA. However, 13 were excluded because they did not report sensitivity and specificity. This review suggests that  $\alpha$ -amylase and the alpha-2-HS- glycoprotein protein are potential salivary biomarkers. **Conclusions:** Although more studies are needed to confirm the observed results, we can say that salivary biomarkers associated with the phenotypic pattern of OSA are a potential simple, low-cost alternative diagnostic method.

**ID: 848**

### Basic Research

## Correlates of daily habits, quality of sleep and excessive sleepiness of morning and evening students

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**Introduction:** The circadian rhythm is the expression of different genes that keep in sync with environmental cycles. Circadian individual characteristics of behavioral styles correlate with activity and rest preference over a 24-hour period. **Aim:** Considering that students have excessive curricular and extracurricular academic demands associated with irregular behavioral patterns, this study aimed to evaluate the circadian typology (CT) of academics according to their daily rhythms, sleep quality and excessive sleepiness. **Methods:** Fifty-six students aged 17 to 34 years participated in this study ( $M = 20.89$ ;  $SD = 2.9$ ). Of these, 27 students were studying between the 1st and 3rd period and 29 students were studying between the 7th and 9th period. The instruments used were the Pittsburgh Sleep Quality Index (PSQI), the Morning and Evening Questionnaire and the Brief Social Pace Scale. After evaluating the PSQI, all participants answered the instruments for a period of 14 consecutive days. **Results:** MANOVA showed significant difference for daily sleepiness during working days [ $\lambda = 0.81$ ;  $F(4.47) = 451.53$ ;  $p < 0.05$ ], specifically for the 9 pm time [ $F(2, 5) =$

3.03;  $p < 0.05$ ]. In addition, ANOVA showed a significant difference between sleep quality and CT [ $F(2,30) = 4.61$ ;  $p < 0.05$ ] (Figure 2). Tukey HSD post hoc test showed that intermediate students ( $M = 8.08$ ;  $SD = 2.9$ ) had worse sleep quality compared to afternoon subjects ( $M = 5.62$ ;  $SD = 1.7$ ). **Conclusions:** It is concluded that students have poor sleep quality and generally try to compensate for the lack of nights of sleep during the week on weekends. The differences between circadian typologies must be understood from a broad perspective, leading us to assert that they are associated with different lifestyles.

**ID: 849**

## Clinical Studies

### Profile of sleep apnea patients and severa cardiopathy in the extreme south of Bahia

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**Introduction:** OSAS is a disease characterized by pharyngeal suppressions, causing hypoxia during sleep. Evidence points to the relationship between sleep disorders and diseases such as arterial hypertension (SAH), congestive heart failure (CHF) and arrhythmias. In addition, the number of deaths from cardiovascular events in OSAS patients has increased in recent years. **Aim:** To determine the profile of heart disease patients diagnosed with OSAS in the far south of Bahia. **Methods:** Quali-quantitative, descriptive, retrospective cross-sectional study. Data collection was performed at a clinic in the extreme south of Bahia, through medical records of 12 patients diagnosed with OSAS and severe heart disease. Data collected: age, gender, BMI, comorbidities, basal oxyhemoglobin saturation, HR, sleep efficiency and degree of apnea. Data were tabulated in a spreadsheet of Microsoft Excel Software and analyzed as descriptive statistics, calculating the distribution of frequencies and averages. **Results:** Within the sample, the severity of OSAS ranged from 41.6% mild, 33.3% moderate, 25% severe. Of the total, 11 were men with an average age of 62 years. An average BMI of 29.7 kg / m<sup>2</sup>. It was found that 50% of patients have arrhythmia, 16.6% have severe hypertension and 16.6% have CHF; 25% refer 1 AMI event, 16.6% refer 1 stroke event. Cardiovascular risk factors include dyslipidemia in 8.3% of patients, DM in 8.2%, obesity in 66.6%, hypertension in 66.6% and renal failure in 8.3% of cases. Life habits: smoking in 75% of cases and alcoholism in 50%. Daily medications: 83% of patients take 4 or more medications, 8.3% use antiarrhythmic drugs, and 50% use statins.

Polysomnographic examination: basal oxyhemoglobin saturation remained greater than 90% in all; average sleep efficiency 89.6% and average HR 64.5 bpm. **Conclusions:** The data indicate a prevalence of mild OSAS (41.6%), and the most frequent cardiac pathology arrhythmia (50%) followed by AMI (25%) in this group of patients. The most severe stages correspond to lower values of basal oxyhemoglobin saturation (90%) and presented as cardiac complications stroke and severe hypertension, using 4 or more medications (combined antihypertensive drugs and statins). However, less severe patients had considerable desaturation and heart problems such as arrhythmias, AMI and CHF. The data corroborate current studies relating OSAS as a multifactorial cardiovascular risk factor.

**ID: 850**

## Clinical Studies

### Epidemiological profile of patients submitted to polysomnography in the south of Bahia

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**Introduction:** OSAS is a disease described in 3 to 7% of the world population that affects the upper airways and is characterized by pharyngeal region suppression, causing interruption of respiratory flow during sleep. These interruptions in respiratory flow lead to arrest or reduction of respiratory flow (apnea or hypopnea). Examples of symptoms are snoring, breathing pauses during sleep, daytime sleepiness, irritability, etc. It is associated with several comorbidities such as type 2 DM, hypertension, COPD exacerbation, reduced quality of life, significant increase in the risk of occupational and traffic accidents, and is considered an independent risk factor for cardiovascular disease. **Aim:** To evaluate the epidemiological profile of patients with obstructive sleep apnea and hypopnea, living in the far south of Bahia. **Methods:** Qualitative and quantitative descriptive study (case study) with retrospective cross-sectional development. Data collection was performed in a clinic located in the extreme south of Bahia, through patient records. The variables analyzed were age, gender, weight, height, reason for the exam, comorbidities research and medication use. **Results:** A total of 620 medical records were analyzed, 60% (371) are men and 40% (249) are women. The mean age was 45.1 years (standard deviation 13.5), mean BMI 29.3 (standard deviation 5.9). The main reason for the exam was "snoring" (36%). In comorbidities stand out 37.3% of obesity; 27.4% have hypertension; 10.6% have gastritis and 5% have some heart disease. Among those who snore, 37.1% are associated with hypertension, 35.4% obesity, 9.7% diabetes and 6.6%

heart disease. Among those who reported having OSAS, 40.4% had SAH and 48.1% were obese. Of the total, 58.4% use medicines, of which 15.7% use statin/fibrate; 12.1% use hypoglycemic drugs, and 65.7% use antihypertensive drugs, of which 45.7% use ARB; 23.5% use thiazides; 30.6% use other classes. **Conclusions:** Given the analyzed, the most prevalent comorbidities were hypertension and obesity; Among the people who underwent the test for snoring, 37.1% have hypertension and 35.4% are obese. Among those already diagnosed with OSAS, 40.4% have hypertension and 48.1% are obese. These findings reinforce the strong indication of the relationship between OSAS, SAH and obesity, according to the literature.

**ID: 851**

### Clinical Studies

## Evaluation of Swallowing in Obstructive Sleep Apnea

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**Introduction:** Obstructive Sleep Apnea (OSA) may cause neuro / myopathy in the pharyngeal muscles of affected patients. Such alterations can lead to dysfunction in the swallowing process, since the reflex evocation and the spread of the bolus are dependent on adequate pharyngeal sensitivity and function. In most cases, however, the complaint of dysphagia is not mentioned spontaneously by OSA patients. **Aim:** To evaluate swallowing disorders in OSA through the Swallowing Video Endoscopy (VED) exam in asymptomatic patients. **Methods:** Twelve patients with snoring (older than 18 years), diagnosed with OSA by polysomnography, underwent VED. **Results:** The examination showed alteration in 8 patients (66.6%). The following alterations were found in the studied sample: 8 patients (66.6%) presented early bolus escape; 5 patients (41.6%), laryngeal penetration and 2 patients (16.6%), residue formation. All were referred for speech therapy treatment. **Conclusions:** Alterations in the swallowing process are frequent in this patient population, even in asymptomatic patients. Larger and controlled studies should be performed to better evaluate this finding. Thus, screening at risk patients can be considered for speech therapy referral and prevention of future symptoms.

**ID: 852**

### Clinical Studies

## CPAP Adherence Assessment and Therapeutic Strategies

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**Introduction:** Obstructive Sleep Apnea is considered the most prevalent Sleep Respiratory Disorder, affecting 1/3 of the world's population to some degree. Considered the "Gold Standard", CPAP therapy is effective in controlling moderate and severe OSAS. However, studies have shown that some CPAP users doesn't maintain satisfactory medium and long-term therapeutic adherence. Therefore, it is necessary to establish strategies that improve this adherence. **Aim:** To analyze CPAP therapeutic adherence after two years of adaptation; to suggest therapeutic strategies for the CPAP adaptation process based on clinical practice. **Methods:** Quantitative documentary research based on the collection and analysis of statistical data extracted from the reports provided by CPAP devices. Consultations were performed in a physiotherapy office, in Belém / PA, from January 2016 to July 2019. A sample of 32 patients (M: 19 and F: 13) aged 38 to 87 years old, previously submitted to type 1 PSG with moderate or serious AHI. All patients underwent the 4-week adaptation protocol, with 1 consultation and 3 returns. The analysis considered the % total use and % > 4h, both within the last six months after two years of treatment initiation. Patients used equipment with similar respiratory comfort features. **Results:** The average percentages of CPAP days of use and days of use >4h were 81% (M: 80%; F: 82%) and 66% (M: 65%; F: 68%), respectively. Patients with moderate AHI (n = 8) had a total% use of 72% and a %>4h of 56%. Patients with severe AHI (n = 24) had a total% use of 84% and %>4h of 70%. For patients up to 65 years (n = 19) the total% use was 78% and %>4h of 64%. For patients over 65 years (n = 13) the total% use was 85% and %>4h of 70%. **Conclusions:** The following aspects are considered fundamental for better engagement and adherence to PAP: (1) cognitive behavioral (management of the emotional aspects involved); (2) educational (sleep hygiene and understanding of the health-disease process); (3) technicians (gradual and customized adjustments of ventilatory parameters); (4) availability of interfaces; (5) weekly feedbacks during the adaptation period and half-yearly in the first two years.

**ID: 853**

### Basic Research

## Differences in sleep patterns and attention according to sex and school level in adolescents

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**Introduction:** Adolescents present a phase delay with the arrival of puberty. However, the morning school hours decrease sleep duration on weekdays, causing insufficient and irregular sleep, and may have a greater detrimental effect for women, whose have a greater sleep need. **Aim:** The objective of this study was to compare habits and quality of sleep, sleepiness on awakening and attention according to sex and school level (high school x college) in adolescents. **Methods:** Participants were 88 adolescents (54 girls and 34 boys), 48 from high school (G1 -  $15.5 \pm 0.7$  years) and 40 from college (G2 -  $20.4 \pm 3.2$  years). Sleep was evaluated by questionnaires and attention by a cognitive task. Students filled a Sleep log containing the Maldonado Sleepiness Scale for 10 days, the “Sleep and Health” questionnaire and the Pittsburgh Sleep Quality Index (PSQI). Attention components were evaluated by the Continuous Performance Task (CPT) applied in the morning. **Results:** G1 got up earlier ( $F(1,827) = 7,5, p < 0,05$ ), had the shortest time in bed ( $F(1,827) = 9,59, p < 0,05$ ) and most irregular time in bed in relation to G2 ( $F(1,82) = 6,7, p < 0,05$ ). Girls of both groups got up earlier ( $F(1,827) = 7,54, p < 0,05$ ), had the shortest time in bed ( $F(1,827) = 4,6, p < 0,05$ ) and most irregular time in bed compared to boys ( $F(1,82) = 4,24, p < 0,05$ ). G1 showed the worst sleep quality ( $F(1,88) = 19,9, p < 0,05$ ) and greater sleepiness on waking ( $F(1,82) = 4,62, p < 0,05$ ). The girls presented greater sleepiness on waking ( $F(1,81) = 4,24, p < 0,05$ ). G1 showed a longer reaction time in phasic alertness, a longer reaction time in selective attention compared to G2 (Anova,  $p < 0,05$ ). G1 also had a greater percentage in wrong answers and omissions for all attention components when compared to G2 (Anova,  $p < 0,05$ ). There was an interaction between groups and sexes, showing G1 girls with the worst performance in sustained attention compared to G2 girls (Tukey,  $p < 0,05$ ). **Conclusions:** Thus, high school students presented worse sleep quality, which is associated with higher levels of sleepiness and reduced attention, specially the girls. These sleep patterns and the impairment in attention may have a negative effect on academic performance.

**ID: 854**

## Case Reports

### Clinically Oriented Approach to Childhood Insomnia: A case of drug refractory childhood Insomnia responsive to a Over The Counter Medication

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**Introduction:** Childhood insomnia still is a challenging diagnosis. Although apparently secondary to child and caregiver relationship, there are current evidence that supports a clinically oriented approach. As different cases of insomnia with organic etiology may have different pathophysiology and better respond to specific drug approaches, when needed. **Aim:** The aim to report a case of a 2 year old child with Edwards Syndrome and refractory insomnia that responded only to an Over the Counter Medication. **Methods:** Meetings with parents and patient were conducted in Children’s Institute (University of Sao Paulo Medical School) Pediatric Sleep Clinic. **Results:** The patient is a 2 years-old female, who came to Pediatric Sleep Clinic with her parents, and a previous diagnosis of Edwards Syndrome and cow’s milk protein allergy. The parents complaint was that the patient had frequent arousals during the main sleep period and was unable to stay longer than 2h sleeping. Patient went to bed at 20h and had one arousal every 15min to 2 hours, crying, and returned to sleep after a few minutes. She was in a diet free of cow’s milk and its derivatives. She also had difficulties in falling asleep and was diagnosed as a combined type of insomnia (both with difficulties falling and maintaining sleep). She had been using Zolpidem, Periciazine, Risperidone, Chlorpromazine and Morphine for this insomnia with no improvement on sleep pattern. After a clinically oriented approach and psychoeducation for sleep hygiene and behavioral techniques she had little improvement. Two weeks later, hydroxyzine 2ml at 23h was introduced with a good response. The number of arousals lowered to once per night. **Conclusions:** Clinically oriented approach of insomnia is a more comprehensive approach that accounts clinical questions and behavioral issues to subtyping insomnia into three main probable physiologic pathways involved in childhood insomnia (serotonergic, histaminergic and dopaminergic). The patient had no response to previous drugs, including hypnotic agents. However, when hydroxyzine was introduced, the patient began responding, which shows that in this case, the histaminergic might have a correlation with the physiopathology.

**ID: 856**

## Clinical Studies

### Analysis of sleep quality in patients submitted to bariatric surgery.

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**Introduction:** Introduction: Obesity is one of the greatest public health problems in the world, and it can cause comorbidities as well as a high mortality rate. To treat this clinical picture, the importance of an effective treatment is observed for patients who have tried other non-invasive methods without success or for individuals in whom bariatric surgery is the best indication. Among the comorbidities of these individuals are sleep disorders, which are very significant in the life of these patients because they cause daytime sleepiness that is usually caused by snoring and sleep apnea and hypopnea syndrome; causing fragmentation of the sleep and tire hormonal changes, as well as alteration in the percentage of fat. **Aim:** The objective of this study was to analyze the effects of bariatric surgery on sleep quality after six months of surgical intervention. **Methods:** This is a quasi-experimental clinical trial, the study was carried out in patients referred from the outpatient clinic of Angelina Caron Hospital, 19 patients, female, aged between 20 and 65 years. The performed tests were total body mass, height measure, cervical/abdominal circumference and Pittsburgh sleep quality test. **Results:** The mean values before and after surgery were: total body mass: 109.5 kg and 81.6 kg, cervical circumference: 40.7 cm and 35.1 cm, abdominal circumference: 127 cm and 106.6 cm, respectively. There was a difference between the Pittsburgh sleep quality in the pre- and post-surgical period through the Wilcoxon test ( $p = 0.001$ ), as well as strong correlations between Pittsburgh components and their total and between pre and postoperative anthropometric indicators through correlation of Spearman. **Conclusions:** There was a significant improvement in sleep quality after six months of bariatric surgery according to patient's perception. Some parameters were highlighted in the postoperative period according to patient's perception, a subjective improvement of sleep quality, sleep efficiency, increased sleep duration and decreased daytime sleepiness.

**ID: 858**

### Basic Research

#### Sleep quality and body composition assessment in college students

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**Introduction:** Sleep, which is characterized as a basic human need whose preservation and maintenance are fundamental for the individual to lead a healthy life, has been studied in recent years. This is justified due to the correlation between habits, quality and sleep duration and sever-al other factors. Admission to college with

new activities, re-responsibilities and concerns can be considered an important risk factor for the development of health problems (Rodrigues, 2017). Sleep irregularities also compromise the attention, memory, and academic performance of these students. Due to impaired cognitive functioning, sleep should be an important concern for university students, for whom academic performance is a priority (Araújo, 2013). **Aim:** The aim of this study was to identify the characteristics and pattern of sleep and to verify if there is a correlation between the poor quality of sleep and the body composition of university students. **Methods:** A descriptive cross-sectional study, with a quali-quantitative approach, attended by 100 university students in of the Einstein Integrated College of Limeira. The subjects signed the consent term and began the fulfillment of the sociodemographic questionnaire and PSQI (Pittsburgh Sleep Quality Index). Individual anthropometric assessments were performed to analyze body composition of the individuals, at scheduled dates and according to the volunteer's availability. Anthropometric measurements of shoulder, chest, waist, abdomen, hip, thighs, arms and calves were used. The protocol used to measure the percentage of fat was the formula of 4 Pollock folds (triceps, subscapu-laris, suprailiac and abdominal). The collected data was transferred to Microsoft Office spreadsheet Excel® and analyzed through the software Prism 7 version 7.0. To evaluate the normality of the data, the Shapiro-Wilk test was used, and for proportions and distribution, the chi-square. **Results:** We observed that only 31% of the students were classified as Good Sleep and 69% as Bad Sleep. Among the subjects who don't practice physical activity, 53.6% have Bad Sleep Quality, according to the PSQI result. it was possible to verify correlation between higher body fat percentage and worse PSQI. **Conclusions:** The data from this research corroborate with others in the literature, in which students have poor sleep quality and may be related to the presence of disturbances, excessive daytime sleepiness and higher body fat values.

**ID: 859**

### Basic Research

#### Sleep quality and stress levels between private institution medicine schools in Belém do Pará

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**Introduction:** In recent years, the mental health of college students has become an important agenda and

of great attention of health experts. Within this scenario, the issue of sleep deprivation should be mentioned. **Aim:** To analyze sleep quality and psychological stress levels among medical students from a private institution in the city of Belém. **Methods:** An observational, cross-sectional, descriptive and analytical study of 120 medical students from a private Northern educational institution. About 15 students from each semester were selected. This number was chosen by estimating the researchers between the size of each class and the applicability of the questionnaires to the population. Information was collected through the Pittsburgh Sleep Quality Index (PSQI) and the translation of the Perceived Stress Scale. **Results:** Primary school students, especially those in the first and second semester, showed, with a high percentage (1st semester 71%, n = 10 / 2nd semester 78%, n = 11), that they were unexpectedly sad and feeling stressed, and nervous (1st and 2nd semester 50%, n = 7) and feel that they cannot overcome the difficulties faced daily in 50% of respondents. At the end of the basic cycle, which covers the third and fourth semester, the difference between the statements is remarkable: according to the interviewees, part of the students reports that they will never be able to overcome the difficulties encountered, while another part shows that The percentage of nervousness and stress decreased, which can be explained by the better organization acquired over time. Regarding the clinical cycle (from the fifth to the eighth semester), most students report that they consider their sleep quality to be good, and report that they can control daily situations even if they sometimes get out of control. In addition, especially in the eighth semester, students pointed out that they are dealing positively with the changes that happen in their lives, can control irritations and do not feel that daily situations are beyond their control. **Conclusions:** These students, who are constantly being charged by themselves, their families and the college itself, end up falling asleep to be able to fulfill their academic activities, since the amount of content charged is extensive.

**ID: 861**

## Clinical Studies

### Routes of Administration of Progestagen-only Contraceptives and Subjective Sleep Reports on Women in Reproductive Age

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**Introduction:** Progesterone has known hypnogenic effects and the use of hormonal replacement therapy in postmenopausal women has brought improvements in their sleep quality. Previous reports have suggested that progestagen-only contraceptives may be a more adequate option for premenopausal women who complain of insomnia. However, no information regarding the route of administration has been assessed to date. **Aim:** This study aimed to evaluate the impact of different route of administration of contraceptive (progestagens-only) using a sleep self-reported subjective study among premenopausal women. **Methods:** This was a web-based cross-section trial. A set of questionnaires evaluating contraceptive use, sleep-related characteristics and related features was available online between July 2016 and February 2017. The tools used to assess sleep were the Epworth Sleepiness Scale (ESS) and the Insomnia Severity Index (ISI). Only women between 18 a 40 years-old were considered eligible. Considering that the route of administration of the progestagens could have a potential effect on sleep, levonorgestrel-releasing intrauterine system (LNG-IUS) users were compared with the users of oral progestagen-only contraceptives. Sleep-related comparisons were initially performed without control (raw analysis). Further analysis were performed in a controlled way in which the effects of hormonal contraceptives were corrected by potential confounding factors (age, Body Mass Index and income). **Results:** A total of 2,055 premenopausal women between 18 and 40 years-old participated in answering an online questionnaire evaluating hormonal contraceptive use, sleep-related characteristics and other important health characteristics. Of this total sample, 1,286 participants met the inclusion criteria; of which only 70 were currently taking progestagens-only contraceptives. Comparisons between users of LNG-IUS and oral pill users of progestagen-only hormonal contraceptives demonstrated a lower sleepiness score, as measured by ESS, among LNG-IUS users in both raw and corrected analysis (LNG-IUS users:  $9.12 \pm 4.57$ ; Oral pills users:  $11.58 \pm 4.59$ ). **Conclusions:** Sleepiness was lower among LNG-IUS users when compared with oral pills progestagens-only users. LNG-IUS is a better contraceptive choice for premenopausal women who complain of sleepiness, as they seem to have smaller impacts on self-reported sleep variables. Funding: IBRO, AFIP, CAPES, CNPq.

**ID: 862**

## Basic Research

### Pulmonary function and sleep quality in asthmatic children and teenagers

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**Introduction:** Good sleep quality is a determining factor for productivity and daily activities. The Night awakening is an indicator of worsening asthma control and severity. Thus, the evaluation of sleep disorders in asthmatic patients is important to minimize symptoms and to improve quality of life. **Aim:** To evaluate the relationship between sleep quality and pulmonary function in asthmatic children and adolescents. **Methods:** It was a cross-sectional study in 40 children and adolescents diagnosed with moderate and severe asthma. To assess the sleep quality of the volunteers, patients completed the Pittsburgh sleep quality index (PSQI) and their guardians filled out the sleep behaviour questionnaire (SBQ). The evaluation of the pulmonary function was performed through spirometry. **Results:** The sample consisted of 32 (80%) boys and 8 (20%) girls with  $9 \pm 2$  years old. Regarding the PSQI score, 11 (27.5%) had good sleep quality, 4 (10%) had sleep disorder and 25 (62.5%) had poor sleep quality. 4 (10%) who had good sleep quality by the SBQ, only 2 (50%) had the same indication by the PSQI. Twelve (30%) had FEV1 <80% or FEV1 / FVC <70% of the predicted value, with unchanged FVC. Among these, 10 (83.33%) showed poor sleep quality by the SBQ, while 9 (75%) presented poor sleep quality by the PSQI. One (2.5%) participant had FVC <60% with FEV1/FVC > 70% of the predicted value, indicating sleep disturbance by PSQI and poor sleep quality by the SBQ. Fisher exact test showed an association between sleep efficiency and FEV1-75%/FVC ( $p = 0.001$ ) and FVC ( $p = 0.05$ ) measurements. **Conclusions:** There was no association between PSQI and SBQ overall scores and pulmonary function. All (100%) participants with a seemingly restrictive pattern of disturbance by spirometry (FEV1-75% / FVC > 1.5) had poor sleep quality by SBQ and poor sleep quality or sleep disturbance by PSQI. It is also suggested an association between sleep efficiency and restrictive ventilatory disturbances.

ID: 863

### Clinical Studies

## Cognitive Evaluation in Patients With Obstructive Sleep Apnea Syndrome

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**Introduction:** Cognitive disorders were described in patients with poor sleep quality. Obstructive sleep apnea syndrome (OSA) is a natural condition that allows and favors the study of cognition in people affected by the disease, since it is possible to separate individuals with different degrees of sleep fragmentation, changes in their macrostructure, efficiency, arterial saturation, and different levels of education. **Aim:** To evaluate possible differences in cognitive impairment (measured by validated instruments) in people with different degrees of OSA (evaluated by full-night polysomnography). **Methods:** A cross-sectional study with 200 patients over 18 years of age sent for polysomnographic examination conducted between 2015-2017. The outcomes were based on the cognitive performance tests: Scales of similarities, verbal fluency, Go-No-Go, metaphorical proverbs. The interest exposure was the diagnosis of OSA and, as potential confounders: schooling, arterial hypertension, smoking, age, weight, psychiatric disorders evaluated by the Montgomery and Hamilton scales. The analysis of the association between the presence of OSA and cognitive performance was analyzed by the non-parametric Mann-Whitney and Chi-square tests. **Results:** Subjects with OSA have a fragmented sleep, with % values of time in N1 and N2 higher, with % of time in N3 lower, with more nocturnal awakenings and with a longer sleep time with oxygen saturation below 92%. In the absence of confounders, the comparison between subjects with/without sleep apnea didn't reveal significant differences between these two groups in relation to cognitive performance on the similarity scale, Go-No-Go scale, more metaphorical proverbs scores, less metaphorical proverbs and the general score. Analyzes made with SPSS V21.0 software. When associating degrees of apnea with cognitive performance, no significant differences were observed between the absent, mild, moderate and severe groups. In addition, stratification was made between subjects according to schooling and no significant difference was found. **Conclusions:** Cognitive and emotional assessment data showed that there was no significant difference. The findings refer to people with basic and secondary education and can't be generalized to different levels of education. Therefore, one may suspect that in the studied group, sleep fragmentation did not worsen intellectual performance, or that the chosen instruments were not sensitive enough to distinguish people with cognitive disorders.

ID: 864

### Clinical Studies

## Acute effects of zolpidem versus exercise on sleep and serum serotonin of patients with chronic insomnia: preliminary results

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**Introduction:** The prevalence of chronic insomnia in the general population is between 10 and 15%. The therapy most commonly prescribed for its treatment is pharmacological, however, there are some negative effects of sleeping pills, including tolerance and dependence. Non-pharmacological alternatives have been studied, among them regular exercise. Although some studies have described positive effects of exercise on sleep in chronic insomnia, there are no studies comparing exercise and drugs in the treatment of chronic insomnia. **Aim:** To assess the acute effects of aerobic exercise or zolpidem on sleep and serum serotonin level in patients with chronic insomnia. **Methods:** Six patients with chronic insomnia (46.5 mean age [SD] 2.7; 83% female) were randomly assigned into two groups: EXERCISE (n=3) or ZOLPIDEM (n=3). The patients in the EXERCISE group did one day of treadmill exercise for 50 min at 50% heart rate reserve, at 12:00 ±1h. The ZOLPIDEM group consumed a 10mg tablet of zolpidem 5 min before bedtime. Actigraphy was used to evaluate objective sleep pattern. Serum levels of serotonin (5-HT) were measured by High-performance liquid chromatography (HPLC) method. **Results:** Difference between proportions tests by STATISTICA® showed sleep duration and sleep efficiency increased after zolpidem and exercise (35% and 4%; 10% and 9%, respectively). In addition, WASO and awakenings decreased after both treatments (63% and 41%; 43% and 29%, respectively). Serum serotonin increased after zolpidem and exercise (8% and 11%, respectively). **Conclusions:** The preliminary results suggest positive effects on sleep and serum serotonin levels after both zolpidem and exercise.

**ID: 865**

## Case Reports

### Sleep Disorders in Costello Syndrome

MATOS, I D M, Pompeu, C M R, Bezerra, G d A M, Sousa, J d C V, Muniz, C R, Silva, V C d, Damasceno, P G, Noronha, A C, Sobreira, E S T, Neto, M A S

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**Introduction:** Costello Syndrome (CS) results from a mutation in the protooncogene HRAS. The syndrome is characterized by craniofacial dysmorphisms, intellectual disability, and verrucous papillomatosis. Patients have a high prevalence of upper airway obstruction during

sleep, with snoring, episodes of apnea and hypopnea, and frequent arousals. **Aim:** We describe a case in which a child diagnosed with Costello syndrome had rhythmic sleep movement disorders as well as non-REM sleep parasomnias. **Methods:** A 6 years-old, male children, diagnosed with CS, had craniofacial dysmorphisms, hydrocephalus, and neuropsychomotor developmental delay. He also had snoring, nocturnal awakenings, mouth breathing, and episodes of witnessed apnea with cyanosis. His mother has reported rhythmic and repeated movements before sleep onset, characterized by lateral body movements. Besides this, she has complained of violent actions, suggestive of sleep terror, and episodes of confusional arousals. The children had poor sleep hygiene habits, with insufficient total sleep time. On examination, palatine tonsils were grade III. Nasofibroscopy has revealed adenoid remnants. Polysomnography has shown a reduced total sleep time, snoring, and obstructive apnea and hypopnea episodes (AHI = 7.4 events/ h), with a minimum O2 saturation = 74%. Neuroimaging, echocardiogram, and abdominal ultrasound were normal. **Results:** As far as we know, this is the first description of Sleep-related Rhythmic Movement Disorder and NREM sleep parasomnias in patients with CS. A previous study demonstrated rhythmic tongue movements in four patients with CS. On the other hand, the presence of OSA already described in this group of patient and, in this case, could be explained by retrolingual airway obstruction, related to craniofacial alterations and palatine tonsil hyperplasia, causing reduction of posterior respiratory space. **Conclusions:** We present a patient with CS with different sleep disorders (Obstructive Sleep Apnea, Sleep-related Rhythmic Movement Disorder, and NREM sleep parasomnias), highlighting the need for a detailed assessment of sleep disorders in CS patients.

**ID: 867**

## Basic Research

### Boosting problem-solving with a Siesta – Preliminary analysis of a replication study of the role of sleep on videogame based problem-solving

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**Introduction:** Sleep is fundamental for memory consolidation. Besides quantitative changes, sleep is thought to promote qualitative changes on memory by means of an active system consolidation process. The sleep effect on problem solving supports this hypothesis. **Aim:** To replicate the effect of sleep on a videogame based problem-solving task with a siesta protocol. **Methods:**

30 university students (20♀) participated. Subjects were randomly assigned to one of the two groups: Siesta or Wake. As soon as subjects arrived at the laboratory, they filled up a sleep habits questionnaire, the Epworth Sleepiness Scale (ESS), and were prepared for a simplified polysomnography recording. EMG, EOG were recorded as standard, and EEG was recorded from C3 and C4 using an OpenBciÒ amplifier. Following, began the practicing session playing the 3D-virtual maze videogame until being challenged by a non-solvable problem. Subjects who did not solve this challenge within 10min were assigned for the Wake or Siesta conditions with 90min of incubation interval. After the incubation interval subjects had another opportunity to solve the same challenging problem. Frequency of subjects who solved the problem were compared with X2-square and Students t test were applied to test control variables between groups. **Results:** We are presenting here preliminary results from behavioral data. From the Siesta group 13 (76%) out of 17 subjects were able to solve the challenging problem while 2 (16%) out of 12 from the Wake group solved it ( $X^2=10.07$ ;  $p=0.002$ , with a strong with an effect size of  $\Phi=0.59$ ). Groups were compatible according to the sex distribution, 12 and 8 females respectively at the Siesta and Wake groups ( $p=1.0$ ), age (Siesta  $23.11\pm 6.5$ ; Wake  $21.58\pm 3.8$ ;  $p=0.47$ ) and sleep duration on weekdays (Siesta  $458.88\pm 66.39$ min; Wake  $444.16\pm 49.67$ min;  $p=0.51$ ), however, subjects from the Siesta group presented higher scores for ESS (Siesta  $11.5\pm 3.43$ ; Wake  $7.75\pm 2.63$ ;  $p=0.003$ ). To check for another possible confounding factors, we compared subjects from the Siesta group who solved the problem with the ones who did not solve it. No significant difference was found. **Conclusions:** A siesta increases the chance to solve a videogame based visuospatial problem. This study replicates previous findings and raises support to the role of sleep on promoting qualitative changes on memories. Further analysis must evaluate electrophysiological aspects of sleep for a better understanding.

**ID: 869**

### Clinical Studies

#### Heart rate variability in obstructive sleep apnea patients submitted to one bout of inspiratory muscle training

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**Introduction:** The inspiratory muscle training (IMT)

is emerging as an alternative adjunct treatment for obstructive sleep apnea (OSA) improving apnea hypopnea index, sleep quality and excessive daytime sleepiness. The IMT is a home-based program, with previous orientation by the physiotherapist, but unsupervised in the execution of the exercise training. However, the acute responses of the cardiovascular system autonomic control to such exercise in OSA subjects remains unclear. **Aim:** To determine the immediate and late acute responses of the cardiac autonomic balance in patients with OSA submitted to IMT. **Methods:** 20 OSA subjects of both genders ( $52,15 \pm 11,00$  years old) were randomized to a) experimental group ( $n=10$ ) who performed IMT (powerbreathe®classicligh) with a load of 70% of the maximal inspiratory pressure (MIP), three sets of 30 respiratory incursions each and resting 1 minute between sets and b) control group ( $n=10$ ), carried out the same protocol, but with no load. The cardiovascular autonomic balance was assessed by the heart rate variability (HRV). The heart rate was continually registered (Polar RS 800Cx) at rest (10 min), immediately after (10min) and 1h after the IMT session (10 min). Then, the RR interval generates a tachogram that was analyzed in the frequency domain by Kubios HRV Analysis Software and decomposed into low (LF: 0.04–0.15 Hz) and high (HF: 0.15–0.4 Hz) frequency bands and the ratio HF/LF. HRV at rest, immediately after and 1h and after the IMT was compared using two-way, repeated-measures ANOVA. **Results:** Comparing the LF values, there were no inter ( $p=0,946$ ) or even intragroup (experimental group;  $p=0,835$ /control group;  $p=0,670$ ) differences. Regarding to the HF analyses, there were also no inter ( $p=0,94$ ) or intragroup (at the experimental group;  $p=0,845$ /control group;  $p=0,667$ ) differences. The ratio LF/HF also had no inter ( $p=0,797$ ) or intragroup (experimental group;  $p=0,455$ /control group;  $p=0,818$ ) differences. **Conclusions:** The HRV analyzes showed no inter and intragroup differences related to the LF and HF components of and to the HF/LF ratio, showing discreet changes in the autonomic cardiac modulation in response to one single session of IMT. Therefore, home-based IMT without supervision can be considered as a safe and viable training modality for patients with OSA.

**ID: 870**

### Clinical Studies

#### Sleep in Heathy Pregnancy: Preliminary Results

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**Introduction:** Sleep disruption is frequent during pregnancy. An increased prevalence of insomnia, sleep fragmentation due to increased urination and discomfort, excessive daytime sleepiness (EDS), sleep-disordered breathing and restless leg syndrome are reported. Nowadays the importance of sleep quality to a healthy pregnancy is warranted, and sleep disturbances may be recognized as a novel risk factor to adverse pregnancy outcomes such as preeclampsia, gestational diabetes, prematurity, prolonged labor and depression. Furthermore, the sleep profile can be influenced by regional characteristics. To date, studies evaluating sleep quality and circadian preference in healthy pregnancy are scarce in our country. **Aim:** To investigate the quality of sleep and circadian preference in healthy pregnant women (HPW) attending a low risk prenatal clinic in Northeast Brazil. **Methods:** A cross-sectional study designed to investigate sleep profile of HPW attending a primary care unit. Diabetes or hypertension backgrounds were excluded. Subjective sleep quality was evaluated by Pittsburgh Sleep Quality Index (PSQI); Insomnia (Insomnia Severity Index -ISI), EDS by the Epworth Sleepiness Scale (ESS). Circadian preference assessed by the Horne-Östberg Morningness-Eveningness Questionnaire (MEQ). The study was approved by Instituto para Desenvolvimento da Educação Ltda-IPADE ethic board, approval number 88692918.1.0000.5049. **Results:** Seventy two HPW aged 18 to 42 years (mean:  $28 \pm 6$ ), gestational age ( $28 \pm 7$ ) and BMI ( $28.2 \pm 4$ ) were evaluated. Poor sleep quality was found in 42% (PSQI:  $5.6 \pm 3$ ); EDS in 28% (ESS:  $7.6 \pm 4$ ), mild to moderate insomnia in 27.8% (ISI:  $5.3 \pm 3$ ). Short sleep was reported in 24.3%, and 15% slept > 10 hours/day. Overall, mean sleep duration was  $8 \pm 1.9$ . Sleep quality was not related to physical activity ( $p=0.2$ ), years of study ( $p=0.16$ ) marital status ( $p=0.6$ ). Eveningness was perceived in only 2 patients. Previous history of depression or anxiety was found by 12% and poor sleep quality and insomnia was present in 62% of them. As expected, insomnia score was significantly related to PSQI score ( $p=0.001$ ). **Conclusions:** In similarity with previously reported studies (SEDOV 2017; BOURJEILY 2013), these preliminary findings suggest that sleep disturbances are frequent in HPW. Interesting to note the low prevalence of eveningness, even in this young group. To our knowledge, this is the first report of sleep profile and circadian preference in HPW in the Northeast of Brazil

**ID: 874**

### Basic Research

## Relation between sleep and academic performance in ifrn students

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**Introduction:** From the neurobiological point of view, several studies validate the importance of sleep for the health and well-being of the population. At this stage, the brain is in an active state in which there is a rearrangement of neural networks associated with learning and memory consolidation. It is important to emphasize, however, that sleep expresses itself differently according to age group. Particularly for adolescents, there is a greater need for sleep compared to adulthood, as well as a natural delay in sleep onset time.

**Aim:** The aim of this study is to analyze the implications of morning shift school hours on the various aspects related to sleep and academic performance in students at IFRN's Natal-Central campus. **Methods:** The sample group consists of a randomized selection of students aged 14-19 years from the various high school integrated technical courses that contain 1637 enrolled students from the IFRN Natal-Central Campus. Data related to the academic performance of the sample group were obtained from the records of the Unified Public Administration System (SUAP). Students' sleep-related data were recorded and monitored using questionnaires, validated for the Portuguese language, containing information about students' sleep routine. Research already submitted and approved by the Research Ethics Committee. **Results:** According to data obtained from the Munich Chronotype Questionnaire, students who slept 08 or more hours per night had an average academic achievement index of 86.9; those who slept less than 08 hours, yield 77.57. In addition, according to the Horne and Ostberg Chronotype Questionnaire, 63% of students in the morning shift have more evening than morning or definitely evening chronotypes. Also according to the Pittsburgh Sleep Quality Rating Scale, only 6% of students sleep 8 or more hours of sleep per night. From this study, chronobiological aspects, hours and sleep quality per night influence the academic performance of IFRN adolescent students. **Conclusions:** From this study, chronobiological aspects, hours and sleep quality per night influence the academic performance of IFRN adolescent students. Thus, it is necessary to promote actions in order to optimize the formatting of some school activities and to deepen scientific knowledge regarding chronobiological characteristics and their relation with academic performance and biopsychosocial aspects in high school adolescents.

**ID: 878**

### Basic Research

## Sleep and quality of life of nursing students

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**Introduction:** Nursing undergraduate students, especially seniors students, may have sleep and quality of life affected by several factors experienced during clinical practice activities such as concerns about future professional life, working and double working shifts. **Aim:** To analyze the quality of sleep and life of senior nursing undergraduate students. **Methods:** Cross-sectional, comparative and quantitative study with undergraduate nursing students from a private institution in southern of Minas Gerais. For data collection, the Pittsburgh Sleep Quality Index (PSQI), the WHOQOL-bref quality of life questionnaire, and a sociodemographic characterization questionnaire were used. For data analysis, association, comparison and descriptive statistics tests were performed. **Results:** The sociodemographic profile data showed that of the 55 students, 80% were female, 74.5% worked and of these 41.8% were nursing technicians. Between the different periods, the results showed a significant difference regarding the psychological, social and environmental Whoqol domains, and PSQI score. Regarding to the presence of insomnia there was a significant difference for PSQI score and physical domain of quality of life. **Conclusions:** The environment of clinical practice has been configured as a possible factor to cause changes in sleep quality and reduced quality of life of nursing students who are close to becoming nurses.

**ID: 879**

## Case Reports

### Sleep microstructure evaluation in a gifted child

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**Introduction:** Gifted children are those who present remarkable performance in any of the following domains: intellectual ability, academic performance, creative or productive thinking, leadership, talent for arts or psychomotor ability. Some studies showed that gifted children present sleep disturbances, such as difficulties in initiating and maintaining sleep, shorter sleep duration, earlier morning awakenings, obstructive sleep apnea and parasomnias. **Aim:** The aim of this study is to report a case of a gifted child who presents sleep disturbance, to evaluate its sleep microstructure and to correlate with cognition. **Methods:** We used clinical history, physical examination, psychological assessment, polysomnography

and sleep microstructure evaluation by means of cyclic alternating pattern (CAP) to report this case of a 14-year-old male child. He was clinically evaluated in Associação Paulista para Altas Habilidades e Superdotação with a report including psychological, pedagogic and specific ability tests that showed above average abilities in such domains: artistic, linguistic, mathematical and musical areas. **Results:** On clinical history, patient reports difficulty in falling asleep, sleep fragmentation, nightmares and reduced total sleep time. Physical examination showed Mallampati II and palatine tonsils III. Polysomnography evidenced an increased apnea/hypopnea index (12.4 events/h), with a predominance of obstructive events and a minimum SpO<sub>2</sub> of 82%, with normal sleep efficiency and normal sleep architecture. CAP parameters showed an increased percentage of A1, decreased percentage of A2 and A3 subtypes and increased CAP rate in slow wave sleep. **Conclusions:** This case report shows CAP modifications in a gifted child and could represent a correlation of sleep oscillations with the degree of mental ability. Although we found obstructive sleep apnea (OSA) in this patient, OSA plays a different role in sleep microstructure (it reduces CAP rate and A1 index). Some studies showed that verbal skills are correlated with CAP rate in sleep slow waves and with high A1 index. There is an interaction between higher cognitive functions and the regulation of sleep. The increase in A1 CAP subtypes might point to a possible hyperfunction of these brain structures, which might play a role in a better cognitive performance. The decreased percentage of A2 and A3 subtypes may be associated with lower arousability, therefore, lower activation of posterior cortex.

**ID: 880**

## Basic Research

### Sleep's beneficial effect on problem solving is not additionally increased by Targeted Memory Reactivation

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**Introduction:** The active systems consolidation hypothesis proposes that memories undergo reactivations during sleep that can give rise to qualitative changes of the representations. These changes may allow for the generation of new knowledge such as gaining insights into solutions for problem-solving. Targeted Memory Reactivation (TMR) has been successfully applied to

improve memory consolidation during sleep, however, little is known about the effect of TMR on problem-solving. **Aim:** To test whether TMR during slow-wave sleep (SWS) and/or rapid eye movement (REM) sleep increases problem-solving beyond the beneficial sleep effect. **Methods:** Young healthy volunteers participated in one of two experiments. Experiment 1 tested the effect of sleep on problem-solving. Subjects were trained in a videogame-based problem-solving task until being presented with a non-solved challenge. Followed by an incubation interval filled with sleep (n=21) or wakefulness (n=21), subjects were tested on the problem-solving challenge again. Experiment 2 tested the effect of TMR on problem-solving, with subjects receiving auditory TMR either during SWS (SWSstim, n=18), REM sleep (REMstim, n=19) or wakefulness (Wakestim, n=21), using the same protocol as in experiment 1. Control tasks were applied to test for mood, sleepiness, working memory and psychomotor vigilance. **Results:** In Experiment 1, sleep improved problem-solving, with 61.9% of subjects from the Sleep group being able to solve the problem after the incubation interval in comparison to 23.8% from the Wake group ( $p=0.013$ , with a medium effect size of  $\Phi=0.39$ ). Subjects who solved the problem in the Sleep group presented more SWS in comparison to the ones who did not solve the problem ( $p=0.01$ ). No significant difference was found for control variables. In Experiment 2, TMR did not change the sleep effect on problem-solving: 55.6% of subjects from the SWSstim group and 57.9% from the REMstim group solved the problem, while 57.1% from the Wakestim group did so ( $p=0.86$ ). No associations with sleep stages were found and there were no significant differences in control variables. **Conclusions:** Sleep facilitates problem-solving. However, auditory TMR during sleep does not provide additional benefits, neither TMR during SWS nor during REM sleep. Future studies may test varying protocols of TMR, which may produce different results

**ID: 881**

## Case Reports

### Obstructive sleep apnea: far beyond sleepiness

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**Introduction:** Sleep related-eating disorder (SRED) is a condition characterized by recurrent episodes of unconsciously eating during sleep, preferably by caloric foods, and sometimes inedible items. Weight gain and obesity are common adverse effects. Obstructive sleep apnea related headache (OSAH) is associated with the use

of medications and comorbidities such as sleepwalking, restless legs syndrome, and OSA, and resolution with treatment. OSA-related headache is a type of problem that improves after controlling for respiratory events during sleep. **Aim:** We aims to describe a patient with SRED and OSAH, besides other commons symptoms of OSA. **Methods:** We reported a patient with Sleep-Related Eating Disorder (SRED) and Obstructive Sleep Apnea related headache (OSAH), with significant improvement after appropriate treatment. **Results:** Case presentation: Male, 48 years old, complaining of snoring, mouth breathing, nocturia cough, and sleep sweating. Besides this, morning dry mouth, and excessive sleepiness (ES). Patient and caregiver reported unconscious food intake during sleep, with a weight gain of 40kg in 5 years. An attempt was made to ingest cosmetic and automotive wax. He has a normal daytime eating behavior. Also, he complained about moderate to severe awakening headache, with improvement after 10 minutes. Previous diagnosis of Bipolar Affective Disorder using quetiapine and carbolotium. On examination, BMI of 42.21 kg/m<sup>2</sup>, Mallampati class 4, and macroglossia. Polysomnography showed a Respiratory Disturbance Index of 100.5 events/hour, with significant desaturation. Polysomnography for continuous positive pressure titration (CPAP) determined a fixed pressure of 15 cmH<sub>2</sub>O. After six months of regular CPAP use, he has reported a decrease in ES, an improvement in eating episodes during sleep, and other symptoms. **Conclusions:** It is essential in the evaluation of OSA to consider other symptoms in addition to widespread respiratory complaints, as well as related entities such as SRED and OSA-related headache.

**ID: 886**

## Basic Research

### Timing of food intake and meal-sleep relationships during pregnancy

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**Introduction:** Studies have suggested that timing of food intake and meal-sleep relationships, particularly eating close to sleep, plays a role in nutritional health, but this subject has not been sufficiently studied in pregnant women. **Aim:** We analysed the relationship between timing of food intake and meal-sleep relationships in a prospective cohort study conducted with 100 pregnant women. **Methods:** Data were collected once per trimester:

≥12; 20th to 26th; and 30th to 37th weeks. Food intake was evaluated by three 24-Hour Dietary Recalls, which was used to assess the time of eating episodes. The participants were asked to report usual bedtime, wake-up time, sleep-onset latency and usual sleep duration on weekdays and weekends during the pregnancy. Meal-sleep relationships were evaluated by the sleep end-first meal and last meal-sleep onset. Pregnant women were classified as early or late timing of first and last eating episodes if these values were below or above the median of the population, respectively (first eating episode=8:38h; last eating episode=20:20h). Generalised Estimating Equation models adjusted for confounders were used to determine the effects of timing - early or late - of the first and last eating episodes (independent variable) on the meal-sleep relationships (dependent variables). **Results:** The timing of food intake and meal-sleep relationships did not change during pregnancy. The Late/Early and Late/Late groups showed a higher prevalence of skipping breakfast and morning snacks, while the Early/Early and Late/Early groups present a higher prevalence of skipping night-time snacks during pregnancy. The Early/Early group (Mean±Std.Error: 1:31±0:10) presented a smaller sleep end-first meal interval compared to the Late/Early group (Mean±Std.Error: 2:18±0:14). In addition, the Late/Early group (Mean±Std.Error: 3:09±0:08) presented greater last meal-sleep onset than the pregnant women in the Late/Early (Mean±Std.Error: 2:04±0:08) and Late/Late groups (Mean±Std.Error: 2:16±0:11). **Conclusions:** Our results suggest that the timing of food intake and meal-sleep relationships are new variables to be considered in nutritional guidelines in antenatal care to assist in promoting maternal-foetal health.

**ID: 889**

### Case Reports

#### The effect of photobiomodulation on orofacial myofunctional therapy in a patient with obstructive sleep apnea and moderate snoring: case report

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**Introduction:** Orofacial Myofunctional Therapy (TMO) performed by speech therapists in individuals with snoring and Obstructive Sleep Apnea, has been consecrated in the scientific environment since 2009 by Guimarães, K., 2012 by Diaferia, G., 2014 by Ieto, V. and in 2015 by Kayamori, F. Already, photobiomodulation, is a new feature in Speech Therapy, in which the first work dates from 2015 (França, FP, Coelho, JF and Alves, GAS) and

so far, we have not found in the literature no studies using low power laser in OSA and snoring associated with BMT. Therefore, further studies are needed and that is why we started this research. **Aim:** The objective of this study is to verify the effect of photobiomodulation on the speech therapy treatment for mild OSA and moderate snoring, in a case study. **Methods:** SCGR patient, male, 53 years old, polysomnography with AHI: 12.2 / h, moderate to high intermittent snoring, sleep efficiency 88.1%, N3: 30.2%, REM: 19.4%, minimum SaO<sub>2</sub> 82 % and Micro Awakening Index at 17.7 / h. During sleep endoscopy, signs of previous nasal cavity surgery, multisegmental pharyngeal collapse with anteroposterior predominance in velopharyngeal and posterior laryngitis were found. The assessment and speech planning were based on the reference of Diaferia et al 2013 and 2017. For orofacial myofunctional assessment, the modified mallampati index, the quality of life scale and the snoring analog scale were considered. The speech therapy adapted to the patient addressed the lagged aspects of the evaluation, such as adequacy of orofacial functions, combined with strength, endurance and mobility exercises, to tone and rearrange the muscle groups of the oropharyngeal region, in addition to the use of laser and the ilib technique. **Results:** The results suggest that the orofacial muscles acquired strength and tonicity, with greater mobility in the palatine veil, tongue, and lateral and posterior pharyngeal regions, with a modified mallampati index reduction from 4 to 1.5; the quality of life scale from 4 to 3.2 and the analog snoring scale from 10 to 0. **Conclusions:** We conclude that the effect of photobiomodulation associated with TMO potentiated the effect of short-term treatment, besides providing improvement in sleep and sleep. patient's well-being. We consider photobiomodulation as an efficient therapeutic resource and we hope that speech therapists will research more about it.

**ID: 890**

### Clinical Studies

#### Influence of circadian patterns on emotional-behavioral symptoms: a community study

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**Introduction:** Disruption of the circadian system has a negative impact on mental health. In addition, the focus of the studies has been on the effects of sleep duration and sleep variability on emotional symptoms, and few have evaluated the impact of circadian patterns. **Aim:** This study investigated the influence of circadian sleep patterns on emotional and behavioral symptoms in a large community sample of Brazilian children and adolescents. **Methods:** This was a cross-sectional study of 454 school-aged children and adolescents (mean age  $12.81 \pm 2.56$  years; 58.6% female). The outcome, Clinical, Borderline and Non-clinical behavior, was classified by the Child Behavior Checklist. As factors, were considered school start time and circadian sleep parameters. Sleep parameters were assessed by self-reported sleep duration, bedtime and wake up time differences, sleep deficit, midpoint of sleep on weekdays and weekend, social jetlag and the Morningness-Eveningness Questionnaire. This study was performed according to international ethical guidelines (protocol number #12-0386 GPPG/HCPA). **Results:** Students with a morning school start time and classified as clinical group had shorter duration of sleep and earlier circadian sleep patterns. In a binary logistic regression model, the variables that predicted emotional and behavioral symptoms were older age, earlier midpoint of sleep on weekdays, shorter sleep duration on weekdays and morning school start time. **Conclusions:** These findings emphasize the importance of circadian sleep patterns and the effects of school start time on emotional and behavioral symptoms in children and adolescents.

**ID: 891**

### Clinical Studies

#### Does the practice of physical activity in the elderly preserve sleep quality

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**Introduction:** Elderly individuals commonly complain of sleep problems. Changing habits, as practice of physical activity, may improve sleep quality. **Aim:** The present study aimed to evaluate the influence of physical activity on the sleep quality in elderly. **Methods:** 34 elderly individuals, both genders, mean age of  $70 \pm 6$  years were prospectively assessed. Individuals who used sleep-inducing drugs were not included. Sleep quality was assessed by the Pittsburgh

Sleep Quality Index (IQSP), with scores greater than or equal to 5 considered suggestive of poor sleep quality. The practice of physical activity was assessed by the International Physical Activity Questionnaire (IPAQ). According to the IPAQ results, participants were divided into 2 groups: Irregularly active group (IA-G), consisting of 17 participants classified as sedentary ( $n = 2$ ) and irregularly active ( $n = 15$ ); and active group (A-G), consisting of 17 participants classified as regularly active. The results between groups were compared by the Fisher's test for qualitative variables and by Student's test or Mann-Whitney test for quantitative variables ( $p < 0.05$ ). **Results:** It was observed that 65% of the IA-G participants and 88% of the A-G were female. Regarding to the IQSP, it was observed that the IA-G showed a significantly higher mean score than the A-G ( $8 \pm 4$  and  $5 \pm 3$  points, respectively,  $p = 0.004$ ). Additionally, 82% of the IA-G participants had a score suggestive of poor sleep quality, compared to 59% of the A-G participants ( $p = 0,274$ ). **Conclusions:** The results suggest that the practice of physical activity can help to preserve sleep quality in elderly individuals. Thus, it is suggested that new researches should be carried out in order to promote the awareness of the population about the benefit of physical activity.

**ID: 892**

### Clinical Studies

#### Prevalence of obstructive sleep apnea in obese patients evaluated for bariatric surgery

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**Introduction:** Obesity has reached epidemic levels globally and is a strong predictor of overall mortality and directly associated with the presence of comorbidities such as diabetes, dyslipidemia and obstructive sleep apnea (OSA). Bariatric surgery should be provided as an option to patients with morbid obesity for whom the procedure induces weight loss and improves weight-related comorbidities. As untreated OSA seems to increase the overall surgery-associated risk, screening for OSA prior to bariatric surgery has been recommended. **Aim:** The aim of this study is to determine the prevalence and severity of undiagnosed OSA in a population of patients evaluated for bariatric surgery. **Methods:** Consecutive obese patients evaluated for bariatric surgery from August 2018 to August 2019 underwent a standard overnight polysomnography

(PSG) at a sleep study center. Each sleep study included supervised electroencephalography, electrooculography, electrocardiography, oxygen saturation, oral and nasal airflow, respiratory effort monitoring, and submental and tibial electromyography. Evaluation and interpretation of the PSG followed the American Society of Sleep Medicine criteria (version 2.5). Inclusion criteria included age > 18 years and a body mass index (BMI) > 30 kg/m<sup>2</sup>. Exclusion criteria included a previous diagnosis of OSA and incomplete data. **Results:** The analysis sample included 112 patients (83% female) with an average age of 36.1 ± 9.4 (range = 18–63) and an average BMI of 36.7 ± 2.3 (range = 32–42.3). More than two-thirds of the sample (77.7%) had OSA and nearly half had severe OSA (40.2%). Among female patients, average age was 35.8 ± 9.2 (range=18-63), average BMI was 36.5 ± 2.1 (range=32-42.3) and 74.2% had OSA and 33.3% had moderate to severe OSA. Among male patients, average age was 37.5 ± 10.3 (range=20-58), average BMI was 37.7 ± 2.5 (range=33-42.1) and 94.7% had OSA and 73.7% had moderate to severe OSA. Male gender was associated a higher prevalence of moderate to severe OSA (p=0.001). **Conclusions:** OSA is highly prevalent in obese patients evaluated for bariatric surgery, particularly in male subjects.

**ID: 893**

### Clinical Studies

#### Association between Homocysteine and sleep in postmenopausal women

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**Introduction:** Homocysteine (Hcy) is a sulfur amino acid, considered as an independent risk factor for cardiovascular disease. Excessive Hcy directly harms the endothelium and can lead to premature atherosclerosis, with progression to stroke and acute myocardial infarction. One of the causes of hyperhomocysteinemia (Hhcy) is hypoestrogenism. Low estrogen levels increase the cardiovascular risk as well as the occurrence of sleep disorders. Hhcy prevalence varies by population and its occurrence in postmenopausal women in Brazil is unknown. **Aim:** To evaluate the prevalence of Hhcy in postmenopausal women in the city of São Paulo, as well as to evaluate the association of Hcy levels with lipid profile, hot flushes and subjective sleep parameters. **Methods:** This research is part of the São Paulo Sleep Epidemiological Study (EPISONO), a population-based cross-sectional trial that included 1,042 volunteers living in the city of São Paulo in 2007. All

volunteers underwent blood sample collection for lipid profile analysis (Blood samples were collected for Hcy, total cholesterol, HDL, LDL, triglycerides) and filled out a set of sleep-related questionnaires (Pittsburgh Sleep Quality Index, Insomnia Severity Index and Epworth Sleepiness Scale were used). Women were classified as recent or late postmenopause according to the time of amenorrhea. Less than eight years recent. More than eight years late. The GzLM (Generalized Linear Model) was used to verify the association between the different variables. Dependent variables were used in binominal and gama distribution when needed. Study approved by the Ethics Committee (CEP #0593/06) and registered with ClinicalTrials.gov (NCT00596713). **Results:** The sample consisted of 193 postmenopausal women, with a mean age of 58 years (SD ± 9). The prevalence of Hhcy in this sample was 4.7%, while 14.7% had dyslipidemia 22.8% with hypertriglyceridemia and 29% with low HDL levels. There was an association between Hcy and HDL. There was no association between Hcy and hot flushes, Hcy and LDL, nor with Hcy and sleep parameters. **Conclusions:** The studied population presented low prevalence of Hhcy and there was no association between Hcy and sleep parameters. Acknowledgments: to funding agencies, CAPES, AFIP.

**ID: 896**

### Clinical Studies

#### Sleep disorders in elderly of long-term care institution in northeast Brazil

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**Introduction:** Sleep disorders increase the risk of institutionalization, as the prevalence of sleep problems in institutionalized older adults is high. Factors that contribute to sleep impairment in long-term care institution (LTCI) residents include changes related to age, the presence of sleep disorders, dementia, depression, various medical illnesses, as well as polypharmacy, institutional and environmental factors. **Aim:** This study aimed to verify if the sleep-related problems in the LTCI elderly at an underdeveloped country have a higher prevalence than the general population. Besides this, we checked the possible association of sleep disorders with the different variables related to institutionalization. **Methods:** A cross-sectional, observational study was carried out with institutionalized elderly at the Lar Torres de Melo institution, located in the city of Fortaleza, Ceará, Brazil. The control group

consisted of healthy elderly, matched by sex and age, from groups of older people in different parts of the city. We included a total of 208 participants. The study lasted 11 months, from June 2018 to May 2019. **Results:** LTICI patients presented lower values on the Epworth sleepiness scale, Bang STOP, and abdominal circumference in comparison to the control group. The LTICI elderly were more limited, used antidepressants more frequently, and had a higher prevalence of dementia in comparison to the control group. We did not observe significant differences in the other variables. **Conclusions:** Institutionalization, by itself, did not increase the frequency of problems related to sleep, as long as the elderly are attended and adequately treated.

**ID: 898**

### Clinical Studies

#### Sleep quality index in temporomandibular disorder patients submitted to conservative treatment

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**Introduction:** Temporomandibular Disorders (TMD) is a collective term embracing a number of medical and dental conditions affecting the temporomandibular joints, masticatory muscles and contiguous tissue components. They are the most common cause of non-dental pain in the orofacial region. The etiology of TMD is complex, multifactorial, and consistent with the biopsychosocial model of illness. As sleep disorders are a frequent manifestation in diseases where pain plays an important role, in the management of patients with painful manifestations, sleep quality should be evaluated. **Aim:** To evaluate the subjective quality of sleep in conservatively treated TMD patients. **Methods:** Thirty female individuals with a mean age of 41.3 years with a diagnosis of TMD (according to the validated Research Diagnostic Criteria for Temporomandibular Disorders) were analyzed. They also answered the PSQI-BR questionnaire (Brazilian version of the Pittsburgh Sleep Quality Index), which aims to measure the subjective quality of sleep. Ten patients were submitted to conservative treatment and evaluated by blind evaluator for six months and completed the questionnaires, PSQI-BR, OHIP-14 (Brazilian version of the short-form of the oral health impact profile), B-PCS (Brazilian version of the pain Catastrophizing Scale) and visual analogue scale at the beginning and end of treatment. **Results:** In 20 (66.6%) patients the quality of sleep is poor, 9 (30%) patients present sleep disturbance and 1

(3.33%) patient has good sleep quality. After treatment, according to the index, no patient showed improvement in PSQI\_BR, 9 (90%) patients, decreased PCS index, 8 (80%) patients had decreased OHIP-14 index, 05 (50%) patients. obtained clinical improvement according to pain scale. **Conclusions:** TMD patients have poor sleep quality. TMD patients in this study did not show changes in sleep quality after conservative treatment. This study suggests that individuals with TMD should be investigated about their sleep quality in order to establish an interdisciplinary treatment program between these two conditions in order to achieve satisfactory remission of symptoms.

**ID: 900**

### Clinical Studies

#### Pulmonary Function predict success in apnea-hipopnea index

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**Introduction:** The obesity impacts on respiratory function, being also a risk factor for obstructive sleep apnea (OSA). Bariatric surgery has been proposed for treatment of severe obesity and impacts with improve OSA, through decrease in apnea-hipopnea index (AHI). The role of respiratory function in this complex relation between OSA and obesity still object of study. **Aim:** This study aims to describe preliminary results of polysomnograms changes after bariatric surgery, and appoint possible predictable variables of respiratory function and polysomnographic data that influence on the OSA improvement. **Methods:** Prospective study, with consecutive volunteers, who agree to participate in the study and perform pre-operative Spirometry, Maximal inspiratory pressure (MIP), maximum expiratory pressure (MEP), full-night Polysomnography and body mass Index (BMI) measure. The AHI variance was analysed through t-test paired and multiple regression was performed to predict the variables involved in this variance. **Results:** Thirteen patients, 84.6% female. Mean (SD) age of 45.2(9.5) years, BMI 44.1(5.2) kg/m<sup>2</sup>, and pre-operative AHI 46.9 (38.6) events/hour, a mean AHI reduction was 30.1 (25.8; p= 0.0012). The means for respiratory capacity was: percentage of forced expiratory volume (VEF1) = 95.5% (5.7); Forced vital capacity (FVC) = 67% (19.8); MIP = 103.1 (25.6) and MAP = 97.7 (26.5). The multiple regression showed that the pre-operative AHI were independently associated with the improvements in AHI. **Conclusions:** In this study, a significant reduction in the number of events/hour in AHI was obtained with

bariatric surgery. The analysis has shown that preoperative AHI was the only independent predictor for this remission and none pulmonary function influenced.

**ID: 904**

### Clinical Studies

#### Long-term effects of bariatric surgery on obstructive sleep apnea in patients with grade 1 and grade 2 obesity: a sub analysis from GATEWAY study

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**Introduction:** Obesity is a well-established risk factor for obstructive sleep apnea (OSA). Weight loss is associated with OSA severity improvement. In this scenario, bariatric surgery may be an effective therapy for OSA in obese patients. Previous evidence (most observational) is limited by short-term analysis in obese grade 3. Here, we hypothesized that Roux-en-Y gastric bypass (RYGB) surgery has a long-term effect in the OSA severity in obese grade 1 or 2 patients. **Aim:** Here, we hypothesized that Roux-en-Y gastric bypass (RYGB) surgery has a long-term effect in the OSA severity in obese grade 1 or 2 patients and we aim to verify this hypothesis. **Methods:** This is a sub analysis of the GATEWAY study (Schiavon et al. *Circulation* 2018), a randomized controlled clinical trial addressing the impact of RYGB on blood pressure (BP) control in obese patients with body mass index (BMI) <40Kg/m<sup>2</sup>; Patients were randomly allocated to receive either RYGB plus optimized clinical treatment (OCT) or OCT treatment alone. During the ongoing trial, a subsample of patients was invited to perform portable sleep monitoring (Embletta Gold™) before and after 3 years follow-up. OSA was defined in mild (apnea-hypopnea-index, AHI 5-14.9 events/h), moderate (15-29.9 events/h) and severe (≥30 events/h) forms. We also evaluated excessive daytime sleepiness (>10 points) by Epworth Sleepiness Scale. All analyses were performed in a blinded fashion. **Results:** A total of 37 patients (n=24 allocated in the RYGB group and n=13 in the OCT group) were studied in this sub-analysis (83.7% female, mean age: 42±8 years and BMI: 36.7 (35.8-38.5) Kg/m<sup>2</sup>. Compared to the OCT group, RYGB presented a significant decrease in BMI (1.7 (-1.9 to 2.7 vs -10.6 (-12.7 to -9.2) Kg/m<sup>2</sup>; p< 0.001), neck circumference (-1.5 (-2.5 to 2) vs. -7.5 (-10.5 to -4.8 cm; p< 0.001), waist circumference (3 (-3 to 9) vs. -25 (-30.8 to -20) cm; p< 0.001) and AHI (5

(-4.2 to 12.7) vs. -13.2 (-22.7 to -7) events/h; p=0.001). The frequency of moderate to severe OSA (AHI (≥15 events/h) at baseline was 62.5% in the RYGB group vs. 46.2% in the OCT group; p=0.175. After the procedure, only 8.3% has moderate OSA (none with severe OSA) in the RYGB group vs 69.3% in the OCT group; p< 0.001. Consistently, the frequency of excessive daytime sleepiness did not showed significantly differences at baseline but lower rate in the RYGB group (20.8 vs. 69.2%); p< 0.006. **Conclusions:** In this sub analysis from Gateway study, bariatric surgery is an effective strategy for decrease long-term OSA severity in patients with obesity grade 1 or 2.

**ID: 905**

### Clinical Studies

#### Temporal trends in Polysomnography Request by Specialties in a Large Private Service in Brazil: the Importance of Cardiology in OSA diagnosis

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**Introduction:** In the last decades, Obstructive Sleep Apnea (OSA) has gained growing interest in the cardiovascular field by the evidence linking OSA with hypertension, atrial fibrillation, coronary artery disease, congestive heart failure and stroke. The translation of the scientific evidence into clinical practice is challenging, especially in nontraditional sleep-related areas such as in Cardiology. The lack of formal training in sleep medicine, medical inertia and the recent neutral results from large randomized trials addressing the impact of OSA treatment on cardiovascular disease may influence the OSA awareness in the Cardiology setting. **Aim:** Here, we tested this concept evaluating the temporal trend (11 years) of polysomnography (PSG) requesting from different specialties from a large private service of sleep medicine in Brazil. **Methods:** This is a retrospective study conducted by the Fleury™ group from 2008 to 2018. We revised all PSG performed at this 10 years period checking the medical specialty (based on the medical license number and database from the service) who requested the sleep study. For each year, we measured the percentage of PSG exams requested by each specialty. **Results:** During this period, a number of 16.670 PSG were performed at the Fleury™. Beyond the expected role of a sleep-related specialty in requesting PSG (Otorhinolaryngology was the top one with 29% of the total requests), Cardiology was surprisingly the second

most PSG requesting (16%), followed by Neurology (8%), Endocrinology (8%) and Internal Medicine (5%). In the temporal trend analysis, we observed a huge increase of PSG requesting by Cardiologists from 2009 to 2013 (2009: +7%, 2010: +22%, 2011: +59%, 2012: +11%, 2013: +30% as compared to 2008). From 2014 to 2018 we observed an oscillatory pattern, but Cardiology specialties remained in the second position during the whole period. **Conclusions:** Despite the aforementioned barriers for OSA awareness in the Cardiology setting, Cardiologists in Brazil may have an important role for triggering sleep studies for OSA diagnosis. Considering the huge frequency of OSA among the cardiovascular diseases, continuous efforts for provide formal training in sleep medicine in Cardiology may be useful for decreasing OSA underdiagnosis in clinical practice.

**ID: 906**

### Clinical Studies

#### The impact of Obstructive Sleep Apnea on Chronic Kidney Disease Incidence after Acute Cardiogenic Pulmonary Edema: A sub-analysis of OSA-CARE study.

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**Introduction:** Recent evidence suggests that obstructive sleep apnea (OSA) is associated with higher rate of acute cardiogenic pulmonary edema (ACPE) recurrence but whether OSA may impair the renal function in these patients is not clear. **Aim:** Evaluate whether OSA may impair the renal function in patients with ACPE after one year follow up **Methods:** We recruited consecutive cases with confirmed ACPE from the Emergency Unit Department at Heart Institute (InCor). After usual treatments for ACPE and clinical stabilization (~30 days), all patients were invited to perform a portable sleep monitoring (Embletta Gold™). OSA was defined by an apnea-hypopnea-index (AHI)  $\geq 15$  events/hour. We estimated the glomerular filtration rate (eGFR) using the Chronic Kidney Disease: Epidemiology Consortium (CKD-EPI) equations. We calculated the incidence of chronic kidney disease (CKD), defined by an eGFR  $< 60$  mL/min/1.73m<sup>2</sup> after one year follow up. **Results:** A total of 55 patients were studied in this sub-analysis (40% males, mean age:  $67 \pm 11$  years and body mass index [BMI]  $27.1(24.6-31.2)$  Kg/m<sup>2</sup>. The frequency of OSA was 63.6%. Compared to the baseline, the eGFR presented a

strong trend for higher decrease in the OSA versus no OSA subjects ( $-5.4 \pm 15.9$  vs.  $-2.03 \pm 21.3$  mL/min/1.73m<sup>2</sup>;  $p=0.053$ ). The incidence of CKD was higher in the OSA group (from 82.9 to 91.4%) as compared to no OSA (from 62.2 to 65%;  $p=0.05$ ). **Conclusions:** OSA is associated with higher CKD incidence in patients who recovered from an ACPE episode. This finding may partially explain the poor prognosis of patients with OSA who recovered from a previous ACPE.

**ID: 908**

### Clinical Studies

#### Awareness for OSA diagnosis in a tertiary cardiology center: a temporal survey

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**Introduction:** Despite the advancements on the evidence pointing the high frequency and potential cardiovascular (CV) impact of Obstructive Sleep Apnea (OSA), the sub diagnosis and overall acceptance of OSA among cardiologists may vary. This scenario may be exacerbated by the poor accuracy of sleep questionnaires in the Cardiology setting and the neutral CV results of OSA treatment from recent randomized controlled trials (RCTs) in patients with high CV risk. **Aim:** Evaluate the awareness and relevance of OSA as a CV risk factor decreased overtime. **Methods:** We applied a survey for staff physicians and physicians in training (residents) from the Cardiology Division at the Heart Institute (InCor). This survey was applied twice for the medical staff and once for each residence team that rotated in 2014 and 2019 in our Institution and comprised questions addressing the availability of sleep medicine classes during medical graduation, importance of OSA as a CV risk factor, number of consultations per month vs number of diagnostic suspicious of OSA as well as knowledge and clinical applicability of OSA screening methods (Berlin Questionnaire). **Results:** We applied the survey twice for 77 physicians. Of them 32.5% were staff physicians and 67.5% were residents. On average, the Cardiologists reported a mean number of consultations in the last month of  $153 \pm 89$  and  $176 \pm 118$  patients per month but only a mean number of suspected diagnoses of OSA of  $6 \pm 9$  and  $6 \pm 8$  in 2014 and 2019, respectively. Interestingly, the vast majority of them considered OSA a CV risk factor and the percentages did not significantly change overtime (from 97.4% in 2014 to 94.7% in 2019,  $P=0.44$ ). Regarding the questions about sleep, we

found that 14.3% of them asked about snore in 2014 vs 76.3% of them in 2019 ( $p < 0.001$ ). In contrast, we observed a significant decrease in using OSA screening questionnaires (from 80.5% in 2014 to 23.7% in 2019,  $P < 0.001$ ). We did not find any difference through the years regarding their self evaluation about knowledge of sleep medicine. **Conclusions:** the vast majority of the Cardiologists consider OSA as a CV risk factor but the sleep medicine field still remains largely unknown among them. We observed a significant decrease in the use of sleep questionnaires in the last five years (probably reflecting evidence showing low accuracy of these tools in screening OSA in the Cardiology setting).

**ID: 909**

### Clinical Studies

#### Association of Short Sleep Duration and Hypertension: The ELSA-Brasil study

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**Introduction:** Short sleep duration (SD) has been associated with hypertension (HTN). However, most of these studies evaluated SD in a subjective way and did not explore the potential influence of another sleep disorder, namely obstructive sleep apnea (OSA). **Aim:** To explore the association of subjective and objective SD with prevalent HTN and blood pressure (BP) levels in the ELSA-Brasil study, a cohort of adult civil servants. **Methods:** Consecutive participants performed a clinical evaluation including data on subjective SD. For capturing objective SD, we used pulse actigraphy for 1 week (Actiwatch 2TM). A home portable sleep monitor (Embletta GoldTM) for one night was used to evaluate the presence of OSA. The SD was stratified in the following categories: <5hs, 5-6hs, 6-7hs (reference group) and >7hs. OSA was defined by an apnea-hypopnea index  $\geq 15$  events/hour. BP was measured 3 times in the seated position after 5 minutes of rest (the mean of two last measurements were used for the analysis). HTN was defined by a BP  $\geq 140 \times 90$  mmHg or previous use of antihypertensive medications. A multivariate analysis was used to determine the independent associations of the SD categories with HTN (primary endpoint) and BP values (secondary endpoints). We built 4 models of adjustments: Model 1: unadjusted; Model 2: adjusted for age, gender, race, body mass index (BMI), alcoholism, and antihypertensive medications (the

latter variable was used only for BP endpoint); Model 3: model 2 + subjective insomnia and sleep efficiency; Model 4: model 3 + OSA. **Results:** We studied 2,010 participants (age  $49 \pm 8$  years; BMI:  $27.1 \pm 4.7$  Kg/m<sup>2</sup>, 42.6% of men). The frequency of subjective SD <5hs, 5-6hs, 6-7hs, and >7hs were 4.0, 43.3, 30.2, and 22.4%, respectively. The frequency of objective SD <5hs, 5-6hs, 6-7hs, and >7hs were 5.5, 21.8, 41.4 and 31.3%, respectively. OSA was observed in 658 participants (32.7%). The frequency of HTN was 26.1 % (525 participants). Participants with both subjective and objective SD <5hs had a higher frequency of HTN than the remaining groups. Consistently, systolic and diastolic BP values were higher in the objective SD <5hs group. In the fully adjusted multivariate analysis, no single SD category (for subjective or objective data) was independently associated with HTN or BP values. **Conclusions:** Both subjective and objective SD are not associated with HTN and BP levels in the ELSA-Brasil cohort.

**ID: 913**

### Clinical Studies

#### Association between Obstructive Sleep Apnea and Arterial Stiffness: data from the ELSA-Brasil cohort

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**Introduction:** Arterial stiffness is an independent marker for cardiovascular disease. Several factors may contribute to increase arterial stiffness such as age, smoking, diabetes and high blood pressure. Growing evidence suggest that Obstructive Sleep Apnea (OSA) may also contribute to increase arterial stiffness but the following issues remain unclear: 1) Is mild OSA associated with increased arterial stiffness?; 2) Does sleep duration modulate the association of OSA with arterial stiffness? **Aim:** The study aimed to compare a validated marker of arterial stiffness, namely pulse wave velocity (PWV), in participants without OSA (no-OSA; apnea-hypopnea index, AHI, <5 events/h), mild OSA (AHI 5-14.9 events/h) and moderate/severe OSA (AHI  $\geq 15$  events/h), adjusting for common cardiovascular risk factors and objective sleep duration. **Methods:** Participants from the ELSA-Brasil cohort (Sao Paulo center) were included in this study. The participants performed sleep assessments with portable polygraph (Embletta GoldTM) and 7-days of wrist actigraphy (Actiwatch 2TM). Common carotid artery and femoral

artery pressure waveforms were recorded noninvasively by using a pressure-sensitive transducer (Complior, Arthech Medicale, France). The final PWV value was obtained by the arithmetic average of 10 consecutive cardiac cycles in regular rhythm. The analysis was adjusted for the following risk factors: age, gender, education, body mass index, hypertension, diabetes, LDL-cholesterol, HDL-cholesterol, smoking, alcoholism and objective sleep duration. **Results:** The sample consisted of 1,993 participants (mean age  $49 \pm 8$  years, 57% female). There was a significant linear trend for increasing PWV across no-OSA ( $n=603$ ), mild ( $n=746$ ), and moderate/severe OSA ( $n=644$ ) ( $P$  for trend  $<0.001$ ). The estimated mean PWV after adjustment for confounding factors for no-OSA, mild and moderate/severe groups were 9.63 (95% CI: 9.43, -9.84), 9.90 (95% CI: 9.71, 10.08) and 10.12 m/s (95% CI: 9.94, 10.30), respectively. In the analysis of post-hoc differences adjusted for multiple comparisons using the Sidak method, there were significant differences between all three groups (no-OSA vs mild and moderate/severe groups, and mild vs moderate/severe groups,  $p < 0.05$ ). **Conclusions:** In this large cohort, all kinds of OSA severity (from mild to severe OSA) contributed to increase PWV regardless of traditional risk factors and objective sleep duration.

**ID: 915**

### Clinical Studies

#### Effects of oral melatonin associated with pulmonary rehabilitation on sleep quality and daytime sleepiness in COPD

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**Introduction:** Sleep problems are common in COPD. Melatonin (MLT), the main product of the pineal gland, is central to circadian rhythm regulation and its administration reportedly improves sleep in COPD. MLT has also been shown to improve lung oxidative stress in these patients. Pulmonary rehabilitation (PR) can increase exercise tolerance and quality of life and reduce symptoms but it is still unclear if it can improve sleep in patients with COPD. We hypothesized that concomitant administration of MLT could potentialize beneficial effects of PR. **Aim:** To investigate the effects of oral MLT (3 mg/day) associated with pulmonary rehabilitation for 12 weeks on sleep quality and daytime sleepiness in COPD. **Methods:** This was a double-blind, randomized, placebo-controlled trial. Thirty-nine patients [24 males; mean age ( $\pm$ SD) =  $66.6 \pm 10.4$  years] regularly attending a COPD outpatient

clinic at a University Hospital, who were referred for PR, were randomized to receive 3 mg MLT ( $n = 18$ ) or placebo ( $n = 21$ ) for the duration of the PR program (12 weeks). At baseline, sleep quality was assessed subjectively by the Pittsburgh Sleep Quality Index (PSQI) and objectively by actigraphy for 7 consecutive days. Daytime sleepiness was measured by the Epworth Sleepiness Scale (ESS). All patients filled a Two Week Sleep Diary. Measures were repeated at the end of the PR program for comparison.

**Results:** On average, patients who received MLT, but not placebo, showed a significant improvement in PSQI global score (respectively,  $9.44 \pm 4.47 - 4.39 \pm 1.88$ ;  $p < 0.05$  vs  $7.86 \pm 2.97 - 7.62 \pm 2.55$   $p = 0.6$ ). A reduction in the EES score was observed only for the MLT group (respectively,  $9.1 \pm 6.0 - 6.7 \pm 4.5$ ;  $p = 0.02$  vs  $10.1 \pm 5.0 - 9.5 \pm 5.1$ ;  $p = 0.2$ ). Data obtained from sleep diary showed an increase in total sleep time ( $329.1 \pm 667.0 - 391.9 \pm 73.0$ ;  $p < 0.05$ ) and sleep efficiency ( $80.64 \pm 9 - 87.44 \pm 6.7$ ;  $p < 0.05$ ) and a reduction in sleep onset latency ( $-27.40$  minutes;  $p < 0.05$ ) in patients who received MLT, but not placebo. Actigraphy showed a significant increase in sleep efficiency ( $68.5 \pm 14.1 - 80.3 \pm 12.9$ ;  $p < 0.05$ ) for the MLT group, despite no changes in sleep latency or duration. **Conclusions:** Melatonin supplementation 3 mg over a 12-week period can reduce daytime sleepiness and improve subjective sleep quality as well as some aspects of objective sleep quality in patients with COPD undergoing pulmonary rehabilitation.

**ID: 917**

### Clinical Studies

#### Duration and quality of sleep associated with food consumption among overweight night workers

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**Introduction:** Short sleep duration and poor sleep quality have been associated with inadequate food intake among night shift workers and may contribute to overweight. **Aim:** To evaluate the association between sleep duration and sleep quality with food intake among overweight night workers, according work day and one day off. **Methods:** We performed a double-blind randomized clinical crossover trial. The present study used only data extracted from the baseline, performed with 39 overweight

nursing professionals who worked permanent night shifts. Calories and macronutrients intake were assessed by food diaries (from 19:00 to 19:00 h) on one work day and one day off. Self-reported sleep quality was taken from a single question of the Pittsburgh Sleep Quality Index and overall sleep duration was calculated from the Munich ChronoType Questionnaire (MCTQshift). **Results:** The mean age of the participants was 39.2 years (SE=0.9 years). Most of them were nurses (51.3%) and married (64.1%). A total of 43.6% reported poor sleep quality and 20.5% had short sleep duration (<5 hours). The mean time working in the current night shift was 5.6 years (SE=0.6 years). On the working day, there was lower protein intake (65.8g, SE=8.2g) among those with poor sleep quality compared to those who reported good sleep quality (88.9g, SE=7.2g). There was a tendency of lower carbohydrate consumption, on the working day, among those who slept < 5h (166.4g, SE=32g) and reported poor sleep quality (189.3g, SE=22g) compared to those who slept ≥5h (232.1g, SE=16.3g) and reported good sleep quality (241.3g, SE=19,3g). There was no association between total calories and fat consumption with the aspects of sleep on the working day. No association was verified among the variables on the day off. **Conclusions:** A lower carbohydrate and protein intake was observed on the workday among the participants with short sleep duration and poor sleep quality, so these aspects of sleep did not impair the dietary pattern of these macronutrients.

**ID: 918**

### Clinical Studies

#### Emotional disorders and poor sleep quality among night workers

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**Introduction:** The conflict between social and biological clocks experienced by night shift workers has been associated with the occurrence of emotional disorders. These disorders, in turn, can aggravate poor sleep quality. **Aim:** To evaluate the relationship between mild emotional disorders and the self-reported sleep quality among overweight night shift workers. **Methods:** We performed a double-blind randomized clinical crossover trial. The present study used only data extracted from the baseline,

performed with 43 overweight nursing professionals who worked permanent night shifts. Self-reported mild emotional disorders (mild depression, tension and anxiety) were taken from the Work Ability Index and self-reported sleep quality was taken from a single question of the Pittsburgh Sleep Quality Index. **Results:** The mean age of participants was 39.8 years (SD=6.3 years), most were nursing technicians (51.2%), married (65.1%), with mean hospital working time of 8.3 years (SD=4.5 years) and night shift of 5.6 years (SD=3.8 years). A total of 25.6% of participants reported mild emotional disorders and 44.2% perceived their sleep quality as poor or very poor. It was verified that a higher proportion of those who reported no mild emotional disorders had good sleep quality (59.4%) compared to those who had poor sleep quality (6.3%). Among those who reported mild emotional disorders, a higher proportion of poor sleep quality (36.4%) was observed compared to those with good sleep quality (27.3%). **Conclusions:** Mild emotional disturbances were proportionally higher among the participants with poor sleep quality. It's noteworthy that night work can be determinant in this binomial between the presence of emotional disorders and the poor sleep quality, signaling that preventive measures and strategies are required in order to improve emotional health and sleep patterns among these workers.

**ID: 919**

### Clinical Studies

#### Polysomnographic findings on obese patients submitted to bariatric surgery

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**Introduction:** : The Obstructive Sleep Apnea Syndrom (OSAS) worses a variety of comorbitys and affects the quality of life. One importante risk fator is the obesity and the polysomnography is the gold standard to diagnosis. **Aim:** To analyze the sleep findings on obese patients on bariatric surgery preoperatory. **Methods:** Transversal study of 58 polysomnographies of patients on bariatric surgery preoperatory in sleep lab in the year of 2017. **Results:** 56,9% had obesity degree III and 43,1% degrees I and II; 84,5% females and 15,2% males. 70,7% had OSAS diagnosis and the Apnea-Hipopnea Index (AHI) stayed between 0 and 84,6 (media 19,47±22,89 /h). The Corporal Mass Index (CMI) situated between 33,30 and 66,90 (media 41,37±5,83 kg/m<sup>2</sup>). The variables that were statisticaly significant in the group obese degree III

versus degrees I and II: saturation time below 80% and 90% ( $p=0,02$  both), Respiratory Disturbance Index RDI ( $p=0,02$ ), AHI ( $p=0,02$ ), Hipopnea Index ( $p=0,006$ ) and minimal saturation ( $p=0,004$ ). The factors associated with increase of AHI are: weight ( $p=0,007$ ), CMI ( $p=0,03$ ) and minimal and mean oxygen saturation ( $p<0,00001$  both). The older age ( $p=0,04$ ) and female sex ( $p=0,03$ ) were more associated with OSAS. **Conclusions:** The high prevalence of OSAS in the study shows the importance of the polysomnography on bariatric surgery preoperative. The hipopneas are the main obstructive event in these patients.

## ID: 920

### Basic Research

#### Association between social jetlag and diet quality throughout pregnancy

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**Introduction:** Social jetlag (SjL) - a measure of the misalignment between biological and social time - is highly prevalent in modern society and has been associated with obesity and changes in food consumption. **Aim:** The focus of this study was to evaluate the influence of SjL throughout the gestational trimesters on diet quality. **Methods:** A longitudinal study was conducted with 100 pregnant women who were evaluated at the first, second and third trimester of pregnancy. Pregnant women were classified in four clusters according to the occurrence of SjL during pregnancy: without SjL during pregnancy (No-SjL); SjL in one trimester (1-SjL); SjL in two trimesters (2-SjL); and SjL in three trimesters (3-SjL). Food intake was evaluated by three 24-h food recall in each gestational trimester. Diet quality was assessed using the Brazilian Healthy Eating Index-Revised (BHEI-R). Generalized Estimating Equation models were used to determine the effects of the SjL in the diet quality during pregnancy. **Results:** Higher scores of the whole grains component ( $p=0.022$ ) were found in the "3-SjL" group when compared to pregnant from "NO-SjL", "1-SjL" and "2-SjL" clusters throughout gestation. Furthermore, higher scores of the sodium component ( $p=0.002$ ) were found in the "NO-SjL" cluster when compared to "2-SjL" and "3-SjL" clusters throughout gestation. **Conclusions:** Pregnant women presented a difference in the score of components of the BHEI-R, demonstrating that the occurrence of SjL during pregnancy seems to modify the quality of the diet.

## ID: 921

### Clinical Studies

#### The effect of urbanization on sleep and metabolic indicators

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**Introduction:** The urbanization process has been associated with an increase in risk factors to non-communicable diseases. **Aim:** To evaluate the sleep, biological rhythms and metabolism among workers of an Amazonian community of Acre, according to different degrees of urbanization. **Methods:** A cross-sectional study of rural and urban residents (22 and 20, respectively) from the municipality of Xapuri, Acre. Sociodemographic, life habits, anthropometric, metabolic parameter variables (triglycerides, total cholesterol and fractions, fasting glucose and insulin resistance), chronotype and food intake were evaluated. Sleep, light exposure and activity levels variables were obtained by actigraphy and daily activity protocols during 10 days. The studied groups were compared with Student's t and Mann-Whitney tests for anthropometric variables, food intake and metabolic parameters. ANOVA for repeated measures tests were performed to compare the sleep variables, light and activity levels between groups. **Results:** Urban residents showed higher averages to all anthropometric variables, fasting glucose levels, fasting insulin and insulin resistance ( $p<0.05$ ) when compared with rural residents. The lipid profile showed no statistically relevant differences among the groups. Rural residents showed higher averages of sleep length ( $p<0.01$ ) and earlier sleep onset ( $p=0.01$ ). **Conclusions:** The findings show an association between urbanization and the presence of risk factors like overweight, serum lipid level alteration, and insulin resistance.

## ID: 922

### Basic Research

#### Excessive daytime sleepiness in high school students

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**Introduction:** Excessive daytime sleepiness (EDS) has become one of the most common complaints among teenagers and affects 10% to 25% of them, especially in the final stages of puberty. In this step, the physiological and cyclical hormone variations in females can affect the sleep-wake cycle when compared to male teenagers. Exaggerated use of technological devices, such as smartphones and tablets, is also related to weight gain and change in sleep patterns in this population. **Aim:** Thus, the aim of the present work was to compare excessive daytime sleepiness in high school female and male teenage students. **Methods:** This is a cross-sectional study. One hundred and forty-nine (76 female teenagers and 73 male teenagers) high school students of a public school located in the state of Pernambuco were underwent to anthropometric evaluation and answered 1 (one) self-applied questionnaire (Epworth sleepiness scale) to assess excessive daytime sleepiness (EDS). Student's t-test for independent samples was used for statistical analysis. A  $p$  value less than 0.05 was considered statistically significant. **Results:** There was no gender difference in the sample characteristics (female teenagers:  $16.6 \pm 1.2$  years old vs. male teenagers:  $17.3 \pm 1.1$  years old;  $p = 0.181$ ); body mass index (BMI) (female teenagers:  $22.6 \pm 3.9$  kg/m<sup>2</sup> vs. male teenagers:  $22.2 \pm 4.3$  kg/m<sup>2</sup>;  $p = 0.512$ ). Regarding the evaluation of the EDS, female teenagers have shown a significantly higher score than male teenagers (female teenagers:  $11.1 \pm 4.8$  vs. male teenagers:  $9.6 \pm 4.0$ ;  $p = 0.035$ ). **Conclusions:** Our results corroborate the notion that EDS is more prevalent among females, even they were teenagers. It is suggested that prevalence studies, using objective methods for sleeping pattern assessment should be carried out to investigate the EDS associated factors between genders.

**ID: 923**

### Clinical Studies

#### Relationship between social jet lag and diabetes markers in overweight night workers

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**Introduction:** Night shift work promotes chronic discrepancy between social and biological clocks defined as social jetlag, which has been associated with an increased

risk of developing type 2 diabetes. **Aim:** To evaluate the association between social jetlag and parameters of diabetes control (HbA1c, glycemia and insulin) among overweight night workers. **Methods:** We performed a double-blind randomized clinical crossover Trial. The present study used only data extracted from the baseline with 43 female overweight night workers of the nursing team at a large hospital in São Paulo/SP. Parameters of diabetes control were assessed from a single 12 hour fasting blood sample. Social jetlag was quantified through the Munich Chronotype Questionnaire (MCTQshift). **Results:** The mean age of participants was 39.8 years (SD=6.3 years). Most of them were nursing technicians (51.2%) and married (65.1%). The mean time in the current night shift was 5.6 years (SD=3.8 years) and the mean social jetlag was 3:52h (SD=1:25h). There was no difference in proportions of the parameters of diabetes control according to social jetlag. Similarly, there was no association between social jetlag and HbA1 (2nd tertile OR=0.35, 95%CI 0.11-1.10), nor blood glucose (2nd tertile OR=0.47, 95%CI 0.18-1.23, 3rd tertile OR=1.06, 95%CI 0.38-2.94). Insulin modeling could not be performed due to the small number of participants with inadequate levels of this parameter. **Conclusions:** Although the participants experienced high levels (>2 hours) of social jetlag, it was not associated with the parameters of diabetes control. It is noteworthy that more studies are needed to understand what effects social jet lag can have on metabolic disorders in night workers.

**ID: 924**

### Clinical Studies

#### Comparison between group and individual cognitive-behavioral therapy for insomnia approach: a pilot study

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**Introduction:** Insomnia is the most common sleep disorder in the general population. Cognitive-behavioral therapy for insomnia (CBT-I) is a gold standard treatment and it's preferable to pharmacotherapy. However, there are few trials on the effectiveness of group CBT-I approach. **Aim:** To assess the clinical effectiveness of group mode of CBT-I compared with the individual CBT-I. **Methods:** This interventional study evaluated 25 subjects, recruited from 2015 to 2019 at a sleep clinic, all of whom met ICSD-3 criteria for a diagnosis of chronic insomnia. Subjects

were assigned successively to receive 6-8 sessions of either group cognitive-behavioral therapy (until 6 patients) or individual cognitive-behavioral therapy (control). Treatment evaluation was non-blind and used self-report scales and sleep diaries. The primary outcome measure was the improvement of insomnia as assessed by the Insomnia Severity Index (ISI) and Dysfunctional Beliefs and Attitudes about Sleep Scale 10 (DBAS-10). Secondary measures included scores on the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI), and the Epworth Sleepiness Scale (ESS). Successful treatment was considered when observed clinical remission of the insomnia symptoms and improvement of the sleep diaries parameters. **Results:** 25 patients were assigned to group CBT-I (13 subjects) or individual CBT-I (12 subjects) and followed-up for 2 months; 68% were women (84% in group CBT-I); mean age was  $54.4 \pm 11.8$  years in group CBT-I and  $51.5 \pm 14.3$  years in individual CBT-I ( $P=0.640$ ). Both arms of treatment improved subjective measures of sleep (sleep efficiency and awaked time in bed), and reduced ISI ( $-11.8 \pm 2.7$  and  $-6.2 \pm 8.7$ ;  $P=0.008$  and  $0.020$ , respectively, group and individual CBT-I) and DBAS-10 scores ( $-19.4 \pm 25.7$  and  $-26.8 \pm 26.3$ ;  $P=0.046$  and  $P=0.002$ , respectively, group and individual CBT-I). No statistically differences were found in the variations of ISI and DBAS-10 scores between group or individual CBT-I ( $P=0.279$  and  $0.558$ , respectively). Variations in psychometric features – depression, anxiety and sleepiness scores – between group and individual CBT-I, before and after intervention, had not statistically difference. **Conclusions:** Findings suggest that group CBT-I may have clinical effectiveness if compared to usual treatment and it could be an option for insomnia treatment. Further studies are needed to establish the most appropriate selection of patients for group CBT-I.

**ID: 925**

### Clinical Studies

#### Quality and Quantity of Sleep, Sleepiness and Cardiovascular Parameters of Bed Partners of Patients with Obstructive Sleep Apnea: Cross-sectional data from the SLEEP-PARTNERS study

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**Introduction:** Bed partners of patients with obstructive sleep apnea (OSA) frequently report sleep disruptions due to the loud snoring. It is not clear, however, the profile of sleep quality, sleep duration, daytime sleepiness and potential cardiovascular consequences of OSA in the bed partners. **Aim:** This is a cross-sectional analysis exploring sleep quality and quantity, excessive daytime sleepiness, ambulatory blood pressure monitoring (ABPM) and endothelial function in the bed partners of patients with untreated OSA. **Methods:** Consecutive bed partners from both genders of patients with moderate to severe OSA (apnea-hypopnea index  $>15$  events/hour) were recruited. The Pittsburgh sleep quality index (PSQI) and the wrist actigraphy for 1 week (Actiwatch 2™) were used to assess the sleep quality and quantity, respectively. The Epworth Sleepiness Scale was used to determine the subjective daytime sleepiness. 24hs-ABPM and a marker of endothelial function, namely flow-mediated dilation (FMD) in the brachial artery by ultrasound, were assessed to evaluate the cardiovascular risk. All measurements were performed without access to the severity of OSA. **Results:** We evaluated 26 bed partners (age:  $47 \pm 10$  years, 85% females, body mass index:  $27 \pm 4$  kg/m<sup>2</sup>). The mean PSQI score and sleep duration were  $7 \pm 3$  and  $6.5 \pm 1.1$  hours/night. 84% presented low sleep quality, 32% presented short sleep duration ( $<6$ hs) and 35% complained of excessive daytime sleepiness. The mean systolic 24-hs, daytime and nighttime blood pressure were  $111 \pm 10$ ,  $115 \pm 10$  and  $103 \pm 10$ mmHg, respectively. Interestingly, 42% presented systolic non-dipping pattern ( $<10\%$  reduction in blood pressure during sleep compared with during the awake period). The mean FMD varied from  $-1.87$  to  $16.55\%$ , revealing that 52% of them presented endothelial dysfunction. **Conclusions:** The bed partners of OSA patients presented a huge percentage of poor sleep quality and a significant proportion of short sleep duration, daytime sleepiness, non-dipping blood pressure and endothelial dysfunction. These findings suggest that OSA may contribute to sleep and cardiovascular consequences in bed partners.

**ID: 926**

### Clinical Studies

#### Sleep disorders in resident physicians and their influence on quality of life

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**Introduction:** Introduction: Medical residency is the most suitable model for the physician to specialize through

the practice with the supervision of more experienced professionals. Medical residency is considered the most suitable model for the physician to specialize. This period is characterized by major changes and challenges in the medical career since more attention and dedication is needed from the professionals who have chosen a form of specialization considered a gold standard". However, when medical residency offers inadequate working conditions, it can cause harm to the work and safety of resident physicians and their own patients. Among these problems we can mention sleep disturbances by the shift regime. **Aim:** Objectives: To evaluate the impact of hypersomnolence and quality of life in resident physicians and to evaluate the association between hypersensitivity and sociodemographic characteristics. **Methods:** Material and Methods: Nine hundred resident physicians were interviewed enrolled in the medical residency program of the São José do Rio Preto Base Hospital. The subjects answered a questionnaire containing instruments for assessing sleep, quality of life and risk of depression. Sleep assessment was performed using the Epworth Daytime Sleepiness Scale, a self-administered questionnaire to assess hypersensitivity. Quality of life was assessed through the Medical Outcomes Study 36, a 36-item multidimensional questionnaire and the risk of depression was studied through the Self-Reporting Questionnaire (SRQ-20) developed by the World Health Organization. **Results:** Results: Sociodemographic variables do not seem to influence the hypersomnolence of resident physicians. In relation to the quality of life scales, the risk of depression and functional capacity were not correlated with hypersomnolence, while the variables variables of general health status, vitality, social aspects and pain domain were predictors of somnolence. We observed that hypersomnolence interferes in the residents' quality of life, so that for all SF-36 domains, the mean score is lower for the hypersolent. **Conclusions:** Conclusions: There is a correlation between hypersomnolence and quality of life and that hypersomnia is a significant predictor for the perception of the quality of life of resident physicians. The sociodemographic characteristics do not seem to influence the sleep quality of these physicians.

**ID: 927**

### Basic Research

## Burnout syndrome, sleep quality and fitness level in university teachers

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**Introduction:** Burnout syndrome (BS) is defined as occupational stress in a workplace with low emotional reward. Regarding the relationship with teaching, the influence of technological, political and socioeconomic issues in the teaching environment, lead these professionals to handle the demands of the university career. High levels of stress are known to affect the quality of life and sleep and a good level of physical fitness can relieve the stress and improve the sleep quality. **Aim:** Thus, the objective of this study was to determine the relationship between burnout syndrome, sleep quality and physical fitness in university teachers. **Methods:** Thirty-one university teachers from the Federal Rural University of Pernambuco were evaluated. The assessment of burnout syndrome, sleep quality and physical fitness were made using the preliminary burnout identification questionnaire (QPIB), the Pittsburgh Sleep Quality Index (PSQI) and the International Physical Activity Questionnaire (IPAQ), short form, respectively. The Spearman correlation test was used to correlate the components and total score of PSQI, QIPB, and IPAQ. Statistical significance is defined as  $p < 0.05$ . **Results:** There was a moderate positive correlation between emotional exhaustion and subjective sleep quality ( $r = 0.558$ ;  $p = 0.001$ ) and sleep latency ( $r = 0.406$ ;  $p = 0.024$ ), emotional exhaustion and sleep disturbance ( $r = 0.558$ ;  $p = 0.001$ ), emotional exhaustion and daytime dysfunction ( $r = 0.429$ ;  $p = 0.016$ ). Moreover, there was showed a moderate positive correlation between depersonalization and sleep disorders ( $r = 0.538$ ;  $p = 0.002$ ), personal accomplishment and subjective sleep quality ( $r = 0.454$ ;  $p = 0.010$ ) and sleep disorders ( $r = 0.476$ ;  $p = 0.007$ ). A moderate positive correlation was observed between the total PSQI score and the total QPIB score ( $r = 0.530$ ;  $p = 0.001$ ). There was no correlation between the physical fitness and the total QPIB score ( $r = -0.216$ ;  $p = 0.243$ ). **Conclusions:** According to the results, the BS seems to compromise the quality of sleep in university teachers, but there was no association between BS and the physical fitness. It is suggested that studies using objective methods to determine the sleep quality and the physical fitness should be carried out to evaluate a more reliable relationship between these variables.

**ID: 928**

### Basic Research

## Evaluation of physical activity level, sleep and life quality in HIV/AIDS patients

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**Introduction:** Studies demonstrated that HIV/AIDS carriers presents an inactive lifestyle and bad sleep quality. Both parameters interfere negatively in these individuals' life quality. However, little is known about these indicators between this population. Then, this research hypothesizes that HIV/AIDS carriers has a reduce level of physical activity, bad sleep quality and compromised life quality. **Aim:** Evaluate physical activity level, sleep and life quality among HIV/AIDS carriers and the relation between life and sleep qualities. **Methods:** Observational study with quantitative approach has evaluated the physical activity level (PAL) by the IPAQ, short version; life quality (LQ) by WHOQOL-HIV-bref, sleep quality (SQ) by the Pittsburg Index (PSQI) and insomnia by the insomnia gravity index (IGI), between men with HIV/AIDS. Normalcy of the data was analyzed by the Shapiro-Wilk test, with the Effect Size test applied with life and sleep quality between the poorly active, the active and the largely active groups. For those, was utilized Cohen d and we considered the respectively sizes: small effect  $d > 0.2$ , moderate effect  $>0.5$ , and great effect  $d > 0.8$ , with the Kruskal-Wallis test used to evaluate the LQ, SQ and IGI between groups with PAL poorly, active and largely active levels. To evaluate the correlation between LQ, SQ and IGI, the Spearman Correlation test was used. A significance level of  $\alpha < 0.05$  was considered. **Results:** In this study, 39% of the subjects were considered largely active, 39% active and 22% poorly active. There was no statistic difference in sleep quality, insomnia and life quality in the evaluated groups ( $P > 0.05$ ). We noticed strong positive correlation between life and sleep quality ( $r = 0.757$ ;  $p = 0.000$ ) and negative correlation between sleep quality and the insomnia gravity index ( $r = 0.479$ ;  $p = 0.006$ ). **Conclusions:** In young adult male with HIV/AIDS, we checked that the physical activity level seems to interfere with life and sleep quality, and also with insomnia. There was correlation between life and sleep quality and between sleep quality and insomnia.

**ID: 929**

### Clinical Studies

#### Effectiveness of melatonin supplementation versus placebo on metabolic parameters among overweight night workers

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**Introduction:** Night shift work promotes chronic circadian desynchronization, which may lead to suppression of melatonin and metabolic disorders. **Aim:** To evaluate the effectiveness of melatonin supplementation versus placebo on metabolic parameters (glucose, glycated hemoglobin, insulin, total cholesterol, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol and triglycerides) of overweight night workers. **Methods:** A randomized, double-blind, placebo-controlled crossover trial conducted with 26 nursing professionals who worked permanent night shifts. Intervention was carried out in two phases (three months each) and consisted of the administration of 3 mg of fast-release melatonin and placebo in the nights between shifts and days off, that is, only when the sleep was performed at night. Metabolic parameters were assessed from a single 12 hour fasting blood sample at the baseline and after each phase of intervention. To compare the effectiveness of melatonin and placebo, the percentages of improvement or worsening of the parameters after the proposed interventions were evaluated and the difference between the baseline and each group of intervention was calculated. **Results:** The mean age of the participants was 37.8 years (SE=1.1 years). Most of them were nurses (53.8%) and married (65.5%). The mean time working in the current night shift was 4.8 years (SE=0.8 years). It was verified that 50% of participants had a significant improvement in HDL-cholesterol levels after melatonin supplementation whereas 42.3% showed an improvement among those who took placebo. Although the proportion of participants who showed an improvement in glucose levels (46.2%); glycated hemoglobin (53.9%) and insulin (46.2%) after melatonin supplementation was higher compared to placebo (30.8%, 42.3% and 38.5%, respectively), no statistically significant effects were observed. No differences in proportions of total cholesterol, LDL, VLDL and triglyceride levels were found according to the group of intervention. **Conclusions:** In comparison with placebo, melatonin supplementation was effective in improving HDL-cholesterol levels and showed a tendency to improve glucose, glycated hemoglobin and insulin levels.

**ID: 931**

### Case Reports

#### Schizophrenia, Hypoxemia or both: a Case Report

De Quadros, A C, Soares, C F d P, Godoy, L P, Schenider, L P B, Farias, I R, Lopes, P d M R, Rubert, L, Pinheiro, A F d C, Cordeiro, J d P, Hata, M M

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**Introduction:** Schizophrenia is a serious mental disorder characterized by distortions of thought and perception. The difficulty in achieving or maintaining restful sleep is a relevant symptom of this condition, in which a decrease on the duration and quality of REM sleep is commonly seen. Other sleep disorders can worsen schizophrenic symptoms. The current literature shows that Obstructive Sleep Apnea (OSA) is twice as frequent among schizophrenics than in general population. Animal studies showed that repetitive intermittent hypoxemia have an impact on dysfunction-dysregulation of dopaminergic and glutamate pathways in the striatum, mesolimbic area and pre-frontal cortex, and a few cases of improvement in schizophrenic symptoms after treatment of OSA have been reported. **Aim:** To illustrate with a case report the benefit of OSA treatment in schizophrenic patients. **Methods:** After obtaining patient's consent, the case description was made by reviewing medical records. **Results:** Male, 28 years, went through surgery to correct an Atrial Sept Defect in 1995 and has a mild mitral regurgitation since childhood was diagnosed with schizophrenia at 19 years old after he began to have visual and auditory hallucinations related to violent behavior. In use of Olanzapine and Clonazepam, he had already had aspiration pneumonia. Hospitalized with severe hypoxemia due to decompensated Primary Pulmonary Hypertension (PPH). Admission arterial gasometry: pH: 7,314; pCO<sub>2</sub>: 33,80mmHg; pO<sub>2</sub>: 41,80mmHg; HCO<sub>3</sub>: 17,20; O<sub>2</sub> saturation: 73,50%. After cardio-pulmonary stabilization, was discharged and referred to sleep specialist due to poor sleep quality, many awakenings, difficulty sleeping lying down and excessive daytime sleepiness. Polysomnography was performed, which found: REM sleep latency of 303 minutes, 5,8% of REM sleep, 99,8 awakenings per hour, apnea-hypopnea index (AHI) 88/hour, basal oxyhemoglobin saturation of 95%, with the average saturation 84% and minimum 74%, remaining 99,4% of the recording time with saturation below 90%. After initiation of treatment with BiPAP and hypoxemia improvement (post-treatment AHI: 3,3/hour) there was a significant improvement in schizophrenic symptoms, without hallucinations since 2017, but PPH difficult to control. **Conclusions:** This case illustrates the association between severe Obstructive Sleep Apnea and schizophrenic patient that has benefit of psychiatric condition and quality of life after OSA treatment.

**ID: 932**

### Clinical Studies

**Obstructive Sleep Apnea, Short Sleep Duration and Drug Adherence in Patients with Hypertension: The ELSA-Brasil study**

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**Introduction:** Hypertension (HTN) is the leading cause of cardiovascular mortality. One of the crucial steps for its successful treatment is the appropriate adherence to the anti-hypertensive therapy. It is conceivable that sleep disorders such as Obstructive Sleep Apnea (OSA) and Short Sleep Duration (SSD) may impair this adherence due to poor sleep quality and potential impact on cognitive performance but the evidence is scanty. **Aim:** To evaluate the association between OSA and SSD with the adherence to antihypertensive treatment in civil servants from the ELSA-Brasil cohort study. **Methods:** Consecutive participants with a previous diagnosis of HTN under specific drug treatment performed clinical evaluation, home sleep monitoring (Embletta Gold™) for one night and wrist actigraphy (Actiwatch2™) for seven days to determine OSA and SSD, respectively. OSA was defined by an apnea-hypopnea index  $\geq 15$  events/hour. SSD was defined by a mean sleep duration  $< 6$  hours. Adherence to therapy was evaluated by the 4-items Morisky questionnaire. We defined poor/medium adherence by the presence of  $> 0$  score. We performed a logistic regression analysis to evaluate the predictors of poor/medium medication adherence in these participants. **Results:** A total of 411 hypertensive participants were analyzed (mean age:  $54 \pm 8$  years, 47% men). Medium/low adherence to anti-hypertensive therapy were observed in 62%. Compared to the high adherence (score=0), the participants with medium/poor adherence had higher frequency of excessive daytime sleepiness (35.9 vs. 46.1%), lower frequency of high degree education (50.6 vs. 40%) and lower monthly per capita income (\$1021.9 vs. \$805.2). No differences were observed for OSA (50.6 vs. 47.5%) and SSD (24.4 vs. 29%). Logistic regression analysis showed that race other than whites (OR: 1.66;95% IC: 1.06-2.61), lower per capita income (OR: 1.76;95% IC: 1.05-2.94) and excessive daytime sleepiness (OR: 1.55;95% IC: 1.01-2.40) were the independent variables associated with medium/poor adherence to anti-hypertensive treatment. **Conclusions:** In a large cohort of patients with HTN, non white race, lower economical status, excessive daytime sleepiness, but not OSA or SSD, were associated to impaired adherence to anti-hypertensive therapy.

**ID: 934**

### Clinical Studies

**Reduction in calories and carbohydrates intake among overweight night workers after melatonin supplementation**

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**Introduction:** Night shift workers frequently report poor sleep quality. This aspect, in parallel to the nocturnal nibbling, seems to promote changes in dietary pattern and energy metabolism, resulting in overweight. **Aim:** To verify whether the effect of exogenous melatonin supplementation on sleep quality may alter food intake on the workday and the day off among overweight night workers. **Methods:** We performed a double-blind randomized clinical crossover trial in 27 female overweight night workers of the nursing team at a large hospital in São Paulo/SP. Intervention was carried out in two phases (three months each) and consisted of the administration of 3 mg of fast-release melatonin and placebo in the nights between shifts and days off, i.e. only when sleep was performed at night. Self-reported sleep quality was taken from a single question of the Pittsburgh Sleep Quality Index (PSQI). Total calories, carbohydrates, fats and proteins were assessed by food diaries on one workday and one day off (from 19:00 to 19:00 h) at the baseline and at the end of each phase. **Results:** Mean age of participants was 38.5 years (SE=1.2 years). Most of them were nurses (56%), married (64%) and 19.2% reported poor sleep quality. The mean time in the current night shift was 5.2 years (SE=0.9 years). On the workday, among those with good sleep quality, there was a significant reduction in caloric intake after melatonin supplementation (1363.4 kcal, SE=134.6 kcal) compared to baseline (1844.4 kcal, SE=190.3 kcal). However, carbohydrates intake were reduced after melatonin (158.9 g, SE=16.3 g) and placebo supplementation (180.5 g, SE=17.4 g) compared to baseline (247.9 g, SE=23 g). On the day off, among those with poor sleep quality, carbohydrates intake were reduced after placebo supplementation (140.2 g, SE= 140.2 g) compared to baseline (219.1 g, SE=17.1 g). There was no effect on caloric intake on the day off neither on fats and proteins intake both on the workday and the day off. **Conclusions:** Melatonin supplementation reduced caloric and carbohydrates intake on the workday among those with good sleep quality, however, the latter effect was also observed after placebo supplementation among those with poor sleep quality. Given its potential relationship with sleep and health outcomes, changes in the dietary pattern of night shift workers still needs to be better investigated.

ID: 935

## Basic Research

### Sleep and health variables of nursing professionals in different work shifts

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**Introduction:** The relationship between synchronizers and internal temporal organization can be disturbed by changes caused by shift work, manifesting as cardiovascular, metabolic and sleep disorders. **Aim:** To evaluate the sleep pattern, mean blood pressure, anthropometric data and blood glucose levels of nursing professionals into the different work shifts. **Methods:** A descriptive and cross-sectional study of 88 day and night shift nursing professionals, performed in public emergency services of a municipality in the southern state of Minas Gerais. For data collection, a sociodemographic questionnaire and the Sleep Diary were used. For the anthropometric data, a vertical anthropometer, malleable and inelastic measuring tape and digital scale were used. To measure blood pressure, the auscultatory method with aneroid sphygmomanometers with cuffs appropriate to the arm diameter of each participant was used. Capillary blood glucose was fasted with a portable glucometer. **Results:** Night shift workers had lower average night sleep quality, with more nap episodes, as well as lower average sleep duration compared to day workers. However, there was not statistically significant relationship between sleep data and the other variables. Mean arterial pressure was within the optimal value classification and there was no statistically significant difference in the comparison of this variable between work shifts. High BMI values were also observed in the studied sample, in which 59.09% of professionals are obese or overweight, as well as high waist circumference levels (70.46%). Workers also had a high rate of physical inactivity. The other variables studied did not show statistically significant difference in relation to shifts. **Conclusions:** The night shift may influence the quality and duration of sleep of its workers, but has no relationship with other variables. However, higher anthropometric values can lead to long-term health problems.

ID: 937

## Clinical Studies

### Pulmonary rehabilitation and its impact on the quality of life of patients with copd

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**Introduction:** Chronic obstructive pulmonary disease (COPD) is characterized by chronic airflow limitation, which is not completely reversible after bronchodilator use. Airflow limitation is often progressive and associated with the abnormal inflammatory response of the lungs to toxic gases or particles. This disease is one of the major causes of morbidity and mortality in the world, defined by such nomenclature due to the difficulty of differentiating pulmonary emphysema from chronic bronchitis (PRESTO and DAMÁZIO, 2005; ZANCHET et al, 2005 FERNANDES, 2009). Pulmonary rehabilitation (PR) is recommended for the treatment of COPD, as it generates improvement in exercise capacity, respiratory muscle strength and quality of life. Studies have found increased walking distance on the six-minute walk test, maximal upper limb load, maximal inspiratory pressure, and quality of life (ZANCHET et al, 2005). In relation to sleep, COPD causes intermittent hypoxemia with pulmonary alterations in patients, which can alter sleep and generate cough, dyspnea, decrease oxygen saturation and consequently worsen the quality of sleep and life of these individuals (MARTIN et al, 2018). **Aim:** The aim of this report is to show the importance of pulmonary rehabilitation in sleep and life quality in COPD patients. **Methods:** The experience took place through a meeting with the presence of 21 people, aged 50 to 80 years, with COPD, participants of a Pulmonary Rehabilitation program in a city in the interior of São Paulo. In the first moment, the COPD theme was approached with the participants and their families, in order to generate knowledge for them about their illnesses and enable them to recognize their potential and difficulties. After this presentation, a space was provided for participants, family members and / or companions present to reflect and discuss the theme and their experiences with the disease, in addition to exposing their doubts and sharing their progress after pulmonary rehabilitation. **Results:** Participants were pleased to participate, showing that opportunities such as these are critical for them to share their anxieties, answer questions and report on their progress. Moreover, they showed that participating in experiences such as these enables improvements in quality of life, even with the presence of the disease, and correct attitudes towards treatment. **Conclusions:** Pulmonary rehabilitation has been shown to be critical for patients with lung disease and COPD treatment.

**ID: 940**

### Basic Research

## Chronotype is associated with heart rate variability

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**Introduction:** In modern society, many individuals show conflict between circadian preferences and social schedules (working hours, early morning classes), so that the most affected are evening-type individuals. These individuals suffer a sleep debt, due to sleep deprivation on weekdays, trying to compensate on weekends by extending sleep, delayed start and midpoint times of sleep. This phenomenon is called social jetlag (SjL). Literature shows that sleep deprivation is associated with cardiovascular risk factors. Thus, SjL may be a measure of chronic sleep deprivation in these individuals and may indicate changes in the autonomic nervous system's control over the cardiovascular system. These changes in the autonomic nervous system can be measured by heart rate variability. **Aim:** The aim of this study was to investigate whether there is an association between SjL and chronotype with heart rate variability in university students. **Methods:** Volunteers answered the following questionnaires: Munich Chronotype Questionnaire (MCTQ), Morningness-Eveningness Questionnaire (MEQ), Epworth Sleepiness Scale (ESS), Pittsburgh Sleep Quality Index (PSQI) and were submitted to EKG monitoring, Bioimpedance, and Actigraphy. **Results:** The study had a final sample of 65 individuals, 63.1% female and 36.9% male. In the comparison between groups for SjL it was identified that individuals with  $SjL \geq 2$  hours had worse sleep quality when compared with individuals with  $SjL < 2$  hours. The groups did not present statistical differences on daytime sleepiness, anthropometric data and HRV parameters. Correlation tests showed correlation between MEQ score and heart rate ( $r = -0.350$ ;  $p = 0.005$ ), RMSSD index ( $r = 0.278$ ;  $p = 0.026$ ), SDNN index ( $r = 0.281$ ;  $p = 0.024$ ) and RR intervals ( $0.346$ ;  $p = 0.005$ ). **Conclusions:** This work suggests that eveningness is associated to reduction of HRV. However, no relation between SjL and HRV was found.

**ID: 942**

### Clinical Studies

## The relationship between lifestyle habits, physical and emotional health and the quality of sleep of university

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**Introduction:** Sleep disturbances are common grievances during the period of youth. Students who do not have a

good quality of sleep are prone to difficulties with their learning, impairment in problem solving, physical and mental health disorders, and changes in the performance of cognitive and psychosocial functions. Sleep deprivation brings disastrous repercussions in the period of youth and has compromising implications due to age demands. **Aim:** Assessing the quality of sleep of young undergraduate students of speech therapy and dentistry, according to lifestyle habits related to sleep, anxiety, stress and disease. **Methods:** Analytical, observational and transversal study, conducted in the period from August 2018 to February 2019, registered under opinion: No.: 2,891,458. 150 students of speech therapy and dentistry courses of both sexes participated, with a mean age of 22.83 years old. Data was collected using a specific instrument and a Pittsburgh questionnaire. Pearson's Chi-square and Fisher's exact test were used to identify association. To determine the percentage of students with a sleep disorder, an initial multivariate logistic regression model was adjusted with the variables that presented  $p < 0.20$  in the bivariate. The final model was determined by the Backward method with  $p < 0.20$ . The margin of error was 5%, intervals of OR with 95% confidence and the program used was IBM SPSS version 23. **Results:** The habit of making heavy meals ( $p = 0.004$ ), the use of relaxants ( $p = 0.025$ ), coffee or nicotine before sleeping ( $p = 0.001$ ), consumption of psychoactive substances for studying ( $p = 0.025$ ), being anxious ( $p = 0.001$ ) or stressed ( $p = 0.017$ ) may incisively compromise the quality of sleep. Although variables such as alcohol consumption ( $p = 0.562$ ), habits of abdicating sleep to study ( $p = 0.064$ ) and using electronics before sleeping ( $p = 0.321$ ) did not have significant effect, they may have contributed to poor quality sleep or sleep disturbance. **Conclusions:** The quality of sleep of the population studied is severely compromised and suffers the influence of life habits.

**ID: 944**

### Basic Research

## Effect of the interaction between rotating shifts and BMI on sleep duration: an observational and prospective study

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**Introduction:** Studies have highlighted that there is an association between irregular eating and sleeping patterns and obesity among shift-workers, caused by the shiftwork schedules. **Aim:** To evaluate the effect of the interaction

of rotating shift schedule and body mass index (BMI) on sleep duration among shift workers. **Methods:** The study included 30 males shift workers. The rotation shift schedule was carried out as follow: two days during the day (8:00 a. M. – 4:00p. M.); two days during the afternoon (4:00p. M. – 0:00a. M.); 24h free-day (0:00a. M. – 0:00a. M.); two days during the night (0:00a. M. – 8:00a. M.) and three days free. Sleep duration and the fragmentation of rest- activity rhythm (Intradaily Variability; IV) were evaluated by actigraphy. The effect of the interaction between shift and BMI on sleep duration was evaluated using Generalized Estimating Equations (GEE). The correlation between BMI and IV was accessed using Spearman's rho test. **Results:** The interaction between shift schedule and BMI had effect on sleep duration. Eutrophic subjects did not show differences on sleep duration throughout the shifts, while overweight and obese ones had a smaller sleep duration in the 24h free-day (overweight: 4.6h and obese: 4.5h) and in night shift (overweight: 5.8h and obese: 6.2h) than morning shift (overweight: 7.2h and obese: 8.2h) and free days (overweight: 7.1h and obese: 7.9h) ( $p < 0.05$ ). The BMI had positive correlation with IV ( $p < 0.001$ ). **Conclusions:** Excessive BMI influences the sleep duration throughout the rotating shift schedule, while the eutrophic subjects maintain a routine of sleep duration.

**ID: 945**

### Case Reports

## Sexomnia in a health professional and its Implications to clinical practice

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**Introduction:** Non-REM sleep parasomnias are a heterogeneous group of sleep disorders that occur in any age group. Pathophysiology is related to changes in sleep state stability, dissociation and expression of subcortical areas, without conscious cortical control, and genetic predisposition. Sexomnia is a variant of sleepwalking characterized by sexual behavior during sleep. Its occurrence in inappropriate environments can lead to embarrassing situations, as well as legal problems. **Aim:** To describe a clinical case of sexomnia **Methods:** Case report **Results:** We here describe a medical doctor, 26 years old, who came to our sleep outpatient clinic complaining of sleepwalking since her childhood. Family members describe episodes of getting up from bed, walking around the house and opening doors. Episodes were more frequent until 18 years of age. About a year ago, after she started a medical residency, she reported sexual activity with her husband during sleep, less than once a

month, between 1:00 and 2:00 am (she sleeps around 10:00 pm). She kisses, caresses him and practices oral sex and penile penetration. She then wakes up confused and does not remember anything about what have happened. She has positive familiar history for somnambulism. Her concern is about happening these episodes of sexsomnia during night shifts of medical residency colleagues. She sleeps 7 hours per night in the week and 10 hours in the weekends. She also has excessive daytime sleepiness (Epworth Scale 10). She does not have obstructive apnea of sleep or restless leg syndrome. Her physical exam has no abnormalities. We recommended sleep hygiene, environmental protection. We also prescribed melatonin during night shifts. **Conclusions:** This case exemplifies the social repercussion of this parasomnia, which although rare, impairs the quality of life of the referred patient. It is worth mentioning the family and previous pathological history of the patient with reported sleepwalking episodes. It is also necessary to report as a possible fragmenting factor sleep deprivation due to the beginning of medical residency. Although pharmacological treatment is performed in situations with frequent episodes, it may be initiated in situations involving risk to the patient. However, the possible side effects of clonazepam, such as amnesia, awakening difficulties and cognitive impairment make it impossible to use in the workplace.

**ID: 947**

### Basic Research

#### Study of cardiometabolic risk factors and social jetlag in teachers of Universidade Federal do Rio Grande do Norte

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**Introduction:** Epidemiological evidence indicates that occupational stress affects 90% of the world's population and imposes a habitual disturbance of the circadian system, such as social jetlag that is strongly related to the development of cardiometabolic diseases. Studies have shown that the teacher is always subjected to different degrees of stress that can compromise physical, mental health and sleep quality. **Aim:** This research is an epidemiological study that aimed to estimate the prevalence of cardiometabolic risk related to social jetlag in professors of the Federal University of Rio Grande do Norte (UFRN) **Methods:** Data were acquired by completing validated online forms and physical assessment for anthropometric data collection, blood pressure

measurement and laboratory data analysis. The project was approved by CEP / UFRN under number 2,401,132. For the analysis of the variables we used the Pearson correlation test. **Results:** Information was obtained from 92 teachers, of which 40% were men and 60% women, with a mean age of  $44.9 \pm 1.1$  years and teaching time of  $12.7 \pm 1.1$  years. Among the survey participants, 57 teachers answered the questionnaires. As a result it was found an average of  $6.97 \pm 1.0$  total hours of sleep, among which 65.5% of the teachers had social jetlag  $\leq 1$  h and 34.5%  $> 1$ h, representing an average of social jetlag of  $0,9 \pm 0.0$  hours of the total sample. It was also found that 44% of teachers had good sleep quality, 45% and 11% had poor sleep quality and sleep disorder, respectively. There was a positive correlation between stress level, anxiety, sleep quality and sleep duration, also evidencing metabolic alterations, such as elevated triglyceride levels, fasting LDL cholesterol and fasting glucose with age, longer contribution time to the institution and increased systolic pressure over commuting time to university. **Conclusions:** Therefore, our results suggest that sleep time misalignment is associated with cardiometabolic risk factors such as stress and anxiety. In this context, it is important to develop actions and strategies to improve the sleep quality of the teaching population and promote health benefits, since the changes compromise the quality of life and occupational profile of those involved.

**ID: 948**

### Basic Research

#### Evaluation of sleep quality and associated factors in community-dwelling elderly in a central western Brazil

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**Introduction:** The rapid advance of the aging process associated with demographic and epidemiological transition implies consequences for the elderly, leading to the emergence of new health demands, especially "epidemic of chronic diseases and functional disabilities". Thus, changes in sleep quality stand out, being a deleterious factor for the impairment of the physical, mental health and well-being of older people, resulting in greater and more prolonged use of Health Services at the Primary Health Care level. justifying the social relevance of this research. **Aim:** To evaluate sleep quality and its relationship with associated factors in the elderly of a community in

the Midwest region **Methods:** Cross-sectional study with elderly people from the Basic Health Unit of Granja do Torto, being considered chosen according to medical appointments made at this unit during 2017. For data collection, sociodemographic and health characteristics were evaluated, and sleep quality was assessed using the Pittsburgh Sleep Quality Index. The scores of these components produce an overall score ranging from 0 to 21 points, so that 0-4 points indicate good sleep quality and  $\geq 5$  indicate poor sleep quality. The project was approved by the Research Ethics Committee (Opinion 1,861,003) and the participants signed an informed consent form. In the data analysis, the normality of the groups was verified using the Shapiro-Wilk test, followed by the chi-square test, adopting  $p \leq 0.05$ . **Results:** Sample of 70 elderly, with a predominance of females (72.9%). The prevalence of poor sleep quality in females and males, respectively, 54.3% and 17.1%. Age ranged from 60 to 90 years ( $M = 71.90$ ;  $SD = 7.07$ ). Among the elderly aged 70-79 years, 38.6% have poor sleep quality. 37.1% who have poor sleep quality are married. No significant differences were found between sociodemographic variables, sleep quality index (SQI), but 34.3% of the elderly with poor sleep use polypharmacy. The variables dyslipidemia ( $p = 0.007$ ) and Regular Physical Activity ( $p = 0.01$ ) showed significant differences when compared to the IQS. **Conclusions:** It is of great magnitude to be aware of the aspects related to sleep in Primary Health Care, seeking strategies such as studies using pharmacological and mainly non-pharmacological strategies, enabling greater integration of the Primary Health Care team with the elderly, family members and caregivers

**ID: 951**

### Basic Research

#### Effects of sleep deprivation during pregnancy on maternal behavior – a systematic review and meta-analysis of preclinical data

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**Introduction:** Previous studies have hypothesized that sleep deprivation during pregnancy might lead to impairment into mother-infant relationship and postpartum depression. Multiples studies have been conducted in preclinical models of sleep deprivation and maternal behavior, as a way to evaluate the mechanisms behind this relationship. However, the data raised so far

in animal studies are internally inconsistent. **Aim:** Based on that, we aimed at conducting a preclinical systematic review and meta-analysis of studies evaluating the effects of experimental sleep deprivation during pregnancy on maternal behavior in animals. **Methods:** A bibliographic search was conducted in five databases: Pubmed, Scopus, Web of Science, Psychinfo and Lilacs. Search strategy encompassed three domains: sleep deprivation during pregnancy (as intervention), maternal behavior (as outcomes) and animals (as population). Studies were selected in a two steps process, first based on titles and abstracts, followed by full text analysis and data extraction. Individual effect size for each articles was calculated using standardized mean difference and meta-analysis was conducted using a random effects model. **Results:** After bibliographic search, 144 non-duplicated articles were included in our initial data screening. Sample was reduced to six records after screening and analyses. A meta-analysis was performed, including data from either the pup retrieval test (latency to retrieve the last pup) and ethogram-derived maternal variables (maternal score or licking and grooming frequency), including 115 animals. No effect was observed regarding the impact of sleep deprivation during pregnancy on maternal behavior ( $-0.14$  [ $-0.52$ ;  $0.23$ ],  $p = 0.57$ ). **Conclusions:** Despite clinical data point to an increased likelihood of postpartum depression and impaired mother-infant relationship, preclinical data failed to replicate this effect, demonstrating that gestational impaired sleep does not change maternal behavior. This might reinforce the importance of social and cultural factors into the sleep deprived-dependent postpartum depression in human beings, since these factors are absent in rodents. When not affected by these additional factors, maternal behavior seem to be maintained even in face of environmental stress. This behavioral maintenance might be part of an adaptive behavior, assuring maternal behavior to be properly displayed even in adverse conditions, assuring the viability and survival of the offspring.

**ID: 952**

### Clinical Studies

#### Screening Questionnaires for Obstructive Sleep Apnea in patients evaluated for Bariatric Surgery

Silva, E V L, Rocha, M F L, Fernandes, L G G, Lima, P V, Rocha, V C, Coelho, J A P M, Mota, B R, Gitai, L L G

**Introduction:** Obstructive Sleep Apnea (OSA) affects nearly 1 billion people worldwide and obesity is its main reversible risk factor. Bariatric surgery is the most effective and long-lasting treatment for morbid obesity. As

untreated OSA increases the frequency of perioperative complications, screening for OSA prior to bariatric surgery has been recommended. Polysomnography is the gold standard method for diagnosis and, although there are OSA clinical screening assessment tools, a key knowledge gap is identifying which tools are most clinically relevant to use in clinical practice models. **Aim:** The aim of this study is to evaluate three standardized screening questionnaires to identify high-risk patients for OSA among patients undergoing bariatric surgery. **Methods:** Consecutive obese patients evaluated for bariatric surgery from August 2018 to August 2019 underwent clinical screening with STOP-BANG, NoSAS and Epworth Sleepiness Scale (ESS) and a standard overnight polysomnography (PSG) at a sleep study center. Evaluation and interpretation of the PSG followed the American Society of Sleep Medicine criteria (2.5). Inclusion criteria included age > 18 years and a body mass index (BMI) > 30 kg/m<sup>2</sup>. Exclusion criteria included a previous diagnosis of OSA and incomplete data. **Results:** 112 subjects were analyzed. The mean age was 36.1 ± 9.4 (range = 18–63) and 83% were female. The prevalence of OSA and moderate to severe OSA were 77.7 and 40.2%, respectively. The frequency of subjects who were classified as high risk by the NoSAS was 41.1% and by the STOP-BANG was 52.7%. The NoSAS score identified individuals at risk of moderate to severe OSA, with an area under the curve (AUC) of 0.67 (95% CI 0.56–0.77; p=0.003). Stop-BANG questionnaire identified individuals at risk of clinically significant OSA, with an AUC of 0.71 (95% CI 0.61–0.81; p<0.001). ESS score was not predictive of moderate to severe OSA, with an area under the curve (AUC) of 0.54 (95% CI 0.43–0.65; p=0.4). The sensitivity and specificity values of the NoSAS score to predict moderate to severe OSA were 53.3 and 67.2%, respectively. The sensitivity and specificity values of STOP-BANG to predict moderate to severe OSA were 71.1 and 59.7%, respectively. **Conclusions:** In obese patients evaluated for bariatric surgery, STOP-BANG questionnaire performed better than NoSAS score and ESS to identify patients with moderate to severe OSA, although neither screening tool seemed able to replace the need for polysomnography.

**ID: 954**

### Clinical Studies

#### Poor sleep quality among high students is associated with impaired quality of life

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**Introduction:** Quality of life and sleep quality have a bidirectional relationship. Contemporary society presents a wide variety of challenges to teenagers' quality of life and sleep quality. **Aim:** The purpose of the present study was to assess reported sleep duration, sleepiness, quality of life and sleep quality among high school students. **Methods:** High school students from a private school in Sao Paulo were invited to participate. Subjects answered three questionnaires: World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). In addition, students were asked about average sleep duration. **Results:** Out of 220 students, 152 (42% men) accepted to participate. Mean reported sleep duration was 7:36 ± 0:53 hours. Most students (53.4%) had excessive daytime sleepiness (defined as an ESS > 10). In addition, most students (73.8%) reported poor sleep quality (defined as a PSQI > 4). There was a negative correlation between sleep quality and the different domains of WHOQOL-BREF: Physical (r= -0.636; p < 0.001); Psychological (r = - 0.548; p < 0.001); Social (r = - 0.219; p = 0.011); Environment (r = - 0.327; p < 0.001). Daytime sleepiness was associated with physical, psychological and environment WHOQOL-BREF domains (r ranging from -0.260 to -0.343; p < 0.01) and sleep quality (r = 0.311; p < 0.001). **Conclusions:** High school students report poor sleep quality and daytime sleepiness, which affects quality of life. Interventions to improve sleep quality and quality of life among high school students are warranted.

**ID: 955**

### Basic Research

#### Sleep Quality and Insomnia in Adolescents Athletes Before Competitions

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**Introduction:** Adolescents who participate in competitions experience high levels of stress, which can alter sleep quality, promotes insomnia and affect the performance. **Aim:** We assessed the subjective sleep quality and insomnia of adolescents athletes during a competitive period. **Methods:** One hundred and nineteen Brazilian adolescents athletes (69 boys and 50 girls) of individual and team sports participated in this study (swimming, soccer and volleyball). The sleep quality was evaluated by Pittsburgh Questionnaire and insomnia was assessed by Insomnia Severity Index. Both questionnaires were performed up to 60 minutes before national sports

competitions began. Spearman Coefficient was employed to evaluate the relationship between sleep quality (SQ score) and insomnia. Wilcoxon-Mann-Whitney test was used to analyze the sleep quality (bad and good sleepers) and Insomnia (with and without indicative). Was considered as level of statistical significance  $p < 0.05$ . **Results:** Sixty and fifty – nine adolescent athletes were considered bad and good sleepers ( $3.4 \pm 1.5$  and  $8.2 \pm 2.2$ , respectively;  $p < 0.001$ ), 56 had presence of insomnia and 63 without insomnia ( $4.2 \pm 2$  and  $12.1 \pm 3.8$ , respectively;  $p < 0.001$ ). Overall, we observed a significant relationship between sleep efficiency and duration ( $r = 0.538$ ;  $p < 0.001$ ), SQ score with sleep efficiency ( $r = 0.371$ ;  $p < 0.001$ ), duration ( $r = -0.664$ ;  $p < 0.001$ ) and sleep latency ( $r = 0.452$ ;  $p < 0.001$ ) and, sleep latency with duration ( $r = -0.252$ ;  $p = 0.006$ ). **Conclusions:** Most of the adolescents athletes showed bad sleep quality and 47% had presence of insomnia before competition. To evaluate the sleep of adolescent athletes before competitions could be an interesting monitoring strategy for coaching staffs that may impact upon their performance.

**ID: 956**

### Clinical Studies

#### The use of the Brief Version of the Social Rhythm Metric in individuals with and without depression

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**Introduction:** Social Rhythm refers to the manifestation of regular daily activities, determined by social relations. People with depression have less stability in social rhythms and are generally more susceptible to the cognitive and somatic effects caused by breaking the rhythm. The Brief Version of Social Rhythm Metric (SRM) has been validated for the assessment of Social Rhythm in healthy adults. It consists of a self-administered questionnaire, which evaluates the performance of 6 daily activities (getting out of bed, talking to someone for the first time, starting work, having lunch, dinner and going to bed) and at what time they occurred. **Aim:** To evaluate the use of

the SRM in participants with and without depression. **Methods:** This was a cross-sectional study with a sample of 36 patients (94.4% female), 36 controls (63.9% female), with a mean age of  $45.14 \pm 15.75$  and  $45.61 \pm 15.27$ , respectively. The interviews took place in person at the Hospital de Clínicas de Porto Alegre (HCPA) and at the Hospital Materno Infantil Presidente Vargas (HMIPV), obtaining approval from the Ethics Committee of the two hospitals (HCPA n°GPPG: #2018-0437; HMIPV n°CAE: 57352416.0.0000.5329). Volunteers invited to participate in the study signed an informed consent form. The following questionnaires were applied: Sociodemographic Questionnaire, Beck Depression Inventory (BDI) and SRM. The last scale was completed for 15 days. **Results:** The preliminary results indicated that BDI score was  $22.94 \pm 14.38$  for patients and  $5.78 \pm 3.96$  for control group. In the patient group, only 61.1% of participants completed the scale correctly during 15 days, 19.4% partially completed and 19.4% did not complete the scale. For the control group, only 54.3% of participants completed the scale correctly, 11.1% partially completed, and 33.3% did not complete the scale. **Conclusions:** The SRM proved to be a difficult scale to fill for both depressed and non-depressed individuals. Further studies are suggested to improve the definition and constructs of the Social Rhythm as well as its evaluation.

**ID: 957**

### Clinical Studies

#### Inspiratory flow limitation in normal and UARS patients in a general population sample

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**Introduction:** Inspiratory flow limitation (IFL) is defined as a “flattened shape” of inspiratory airflow contour detected by nasal cannula pressure during sleep and can indicate increased upper airway resistance especially in mild Sleep Related Breathing Disorders (SRBD). It is commonly caused by narrowing of a hypotonic upper airway in response to the negative intrathoracic pressure developed during inspiration. However IFL cut-off value for SRBD is not established yet. **Aim:** The objective of the study was to determine the cut-off value of IFL in potential Upper Airway Resistance Syndrome (UARS) subjects considering clinical outcomes in a general population sample. **Methods:** The baseline sample was derived from a prospective population-based study designed to assess the prevalence of sleep disorders in Sao Paulo, Brazil. A total of 1,042 subjects completed all the study assessments in 2007 and, from July 2015 to April 2016, 712 from these

participants were reassessed and underwent a second examination. Full night polysomnography (PSG) at both baseline and follow-up was performed. IFL was scored based on nasal cannula recording if there were at least four consecutive breaths with flattening of the airflow curve in a 30 second epoch. We manually scored each participant and calculated their total sleep time (TST) spent in IFL during sleep. Clinical outcomes (excessive daytime sleepiness, fatigue, mood and quality of sleep) of no OSAS subjects (normal individuals and potential UARS patients) were analyzed at baseline and after 8 years. **Results:** From the 712 participants evaluated, 242 subjects without OSAS (normal individuals and potential UARS patients) were clinically evaluated at baseline and after 8 years. When an IFL cut-off value of equal to or greater than 5% of TST was considered for UARS diagnosis, there was not any statistical significant difference in clinical outcomes though 8 years. Otherwise, when an IFL cut-off value of equal to or greater than 15% of TST was considered for UARS diagnosis, normal subjects in 2007 that had potential UARS in 2016 and patients with potential UARS in 2007 that maintain their diagnosis in 2016 had more severity of depressive symptoms than normal subjects in 2007/2016. **Conclusions:** In a general population sample, we suggest a cut-off value of IFL in normal subjects and in potential UARS patients of equal or greater than 15% of TST when clinical outcomes are considered.

**ID: 959**

## Clinical Studies

### Oral treatment with cannabinoids microdosing improves sleep in Parkinson Diseases - Preliminary Findings

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**Introduction:** Sleep disorders (SD) are very common and can occur before the beginning of motor symptoms in Parkinson's disease (PD) patients. Current therapies to treat SD in PD patients are very ineffective. On the other hand, several studies have shown the potential of Cannabis sativa (CS) and cannabinoids to treat SD in many kind of patients. Then, our hypothesis is that CS treatment could improve the SD in PD patients. **Aim:** To evaluate the effect of a CS extract with cannabinoids low doses on SD in PD patients. **Methods:** Four patient diagnosed with PD for at least 10 years were selected. The project was approved by

the Human Ethics Committee. 3 patients underwent an oral oil containing 1mg THC and 112µg CBD daily while 1 patient received the oil containing 250µg THC and 28µg CBD, daily. The treatment lasted for 60 days. During this period, patients used an actimeter on non-dominant wrist to monitor the following parameters: bed time, wake up time, time in bed, sleep duration, sleep efficiency, number of awakenings and WASO. A total of 33 days of actigraphy per subject was considered for this exploratory analysis, resulting in 132 nights evaluated in three times (T1=48 nights, T2=48 nights, and T3=36 nights). Due the small sample size, the nights were considered as independent measures and means were compared using factorial ANOVA, with dose time of evaluation as between factors. Values are presented as means±SE. **Results:** Patient aged from 49-65 years old. ANOVA did not identified effects of dose, or time of treatment for Bedtime (1mg 21:42±00:07; 250 21:52±00:12, p>0.05), time in bed (1mg 08:05±0:08; 250 07:45±00:14; p>0.05). However, there was significant effect of dose and time of treatment for the waking up time at with earlier waking up for the 250 g at the T3 (1mg 5:38±0:13; 250 4:32±0:23; p<0.05). The lower dose of treatment also was associated with shorter sleep duration, with ANOVA detecting effect of dose (1mg 6:51±0:07; 250 6:00±0:12; p<0.05). Dose was associated with increasing sleep efficiency for the 250 condition, from 75.75%±2.36 at T1 to 82.237%±2.73 at T3, as a consequence of reduced WASO from T1 to T3 (115.91±10.5min to 77.22±12.54min p<0.05). **Conclusions:** Our preliminary findings suggest that cannabinoids microdosing have potential as a pharmacological tool to treat SD with significant benefits in sleep characteristics. Notwithstanding, further studies with larger sample sizes are needed

**ID: 960**

## Case Reports

### Sleep Hygiene in Children - A Case Report

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**Introduction:** Sleep disorders are prevalent in pediatrics, affecting about 1 in 4 children after the first years of life. Can impact on attention and memory which are the functions of importance for child development, can being involved in increased hyperactivity, mood disorders and aggression. They may be of organic or behavioral etiology. Behavioral insomnia is based on sleep hygiene and treatment and precautionary measures, which uses a range of changes in habits of children and families, as well as environmental changes, providing to the patient with conditions suitable for a quality sleep. **Aim:** Report

a case **Methods:** Descriptive **Results:** CR, male, 1 year and 7 months comes to outpatient clinic accompanied by his mother, complaining of nocturnal awakening and irritability. He had been using risperidone for 2 months as indicated by the neuropsychiatrist due to the difficulty in maintaining sleep and agitated and aggressive behavior during the day, without showing improvement in the period. He sleeps from 9pm to 7am, with awakening between 2 and 3am, when he has narrowed eyes, confused, not obeying the commands of parents. Denies snoring or stereotyped movements. He takes a nap about 1:30 after lunch, when he is awakened “to not affect night sleep”. He does not have a well-established bedtime routine. We suggest letting him sleep for free in the afternoon nap to assess the actual need for sleep and the mother was advised about new routine. After 14 days, there was a significant improvement in daytime and sleep behavior. A consistent routine has been adopted with the child: after coming home from school, receives dinner, takes a shower and goes to the dimly lit room, where the mother tells stories until the child sleeps. The patient remained consistent at bedtime 21h and woke up at 6am, without awakening. He increased spontaneously about an hour in the afternoon nap (total 2h30). After one week of sleep hygiene, the mother reports having finished risperidone and chose not to give the medication again, considering the improvement of the child's overall behavior. **Conclusions:** Sleep deprivation has consequences on child health, such as metabolic disorders, memory deficit, reduced cognitive performance and behavioral impairment. Recent studies show the negative effect on their ability to regulate behavior. Therefore, it is essential to adopt adequate sleep hygiene measures before drug interventions for children with insomnia and behavioral alterations that do not delay neurological development.

**ID: 963**

### Clinical Studies

#### Mandibular advancement device (MAD) treatment for moderate to severe obstructive sleep apnea (OSA)

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**Introduction:** Obstructive sleep apnea (OSA) is a highly prevalent sleep-related breathing disorder characterized by periods of recurrent cessation of breathing caused by partial or complete collapse of the upper airway. Mandibular advancement device (MAD) represents a well-tolerated treatment for selected patients with OSA. MAD reduces

upper airway collapsibility, often in a dose-dependent manner, by increasing the pharyngeal dimensions upon protrusion of the lower jaw. The apnea hypopnea index (AHI) has been found to be a weaker predictor to identify MAD treatment responders and patients with moderate to severe OSA might also have a good outcome. **Aim:** To describe three cases of moderate to severe OSA treated with MAD presenting improvement of clinical complaints and AHI. **Methods:** We describe three patients being followed-up in the Otolaryngology or Neurophysiology Laboratory, complaining excessive daytime sleepiness, snoring, fatigue and other clinical symptoms, diagnosed with OSA, as follow: Case 1: 42-year-old male patient, presenting in 2012 an apnea hypopnea index (AHI) 57.5 events/hour, submitted to otolaryngology surgeries with no improvement of symptoms and AHI 53.3 events/hour. Case 2: 45-year-old male patient, presenting in 2010 an AHI 18.4 events/hour, after two otolaryngology surgeries (2010 and 2011) presented an AHI 23.7 events/hour. Case 3: 55-year-old male patient, presenting AHI 25 events/hour had no adherence to CPAP treatment due to limited economic condition. All patients were referred to Dentistry Division of the Hospital for MAD treatment for OSA and submitted to clinical and radiological evaluation. The installed model was one-piece, allowing 70% retrusion and protrusion and its efficiency were determined with a new polysomnography. **Results:** All patients reported improvement in clinical complaints after MAD use and there was a significant improvement in AHI observed in subsequent polysomnography. Case 1: AHI 1.1 event/hour, case 2: AHI 7,3 events/hour and case 3: AHI 11.8 events/hour. **Conclusions:** Advanced ways to interpret sleep apnea recordings will allow the identification of various phenotypes of sleep apnea patients and provide a more promising way forward to find patients who respond to OSA treatment in different ways. MAD therapy alone is sufficient in a quarter of severe OSA patients.

**ID: 965**

### Basic Research

#### Effects of female sexual hormones on sleep – a bibliometric review of preclinical data

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**Introduction:** Previous clinical and preclinical data have

raised the possibility that female sexual hormones may influence sleep physiology, being used as an alternative to hypnotics. Due to the diversity of formulations and other methodological factors have impaired to draw definitive conclusions on this topic, especially in preclinical studies. Up to now, no comprehensive reassessment have been performed. **Aim:** The current study intended to perform a bibliometric review of studies evaluating the effects of sexual hormones interventions on sleep, focusing on preclinical animals models. It aimed at understand the publication trends on this field, including the most used hormonal interventions and animal species. This is a previous step to a systematic review, which aim at explored the available data and research trends, as well as to evaluate which interventions, outcomes and species are more likely to result in a meta-analysis. **Methods:** An initial bibliographic search was conducted in Pubmed, aiming at retrieving studies evaluating the effects of female sexual hormones on objectively assessed sleep in preclinical animal models. Search strategy encompassed three domains: female sexual hormones (as intervention), sleep evaluate by polysomnography or related recordings (as outcomes) and experimentation animals (as intervention). Studies were screened by two independent reviewers. A bibliometric analysis was made, in order to understand the publication trends on this field. **Results:** After bibliographic search, 288 records were retrieved. Among these, 38 were considered eligible for this systematic review. Concordance rate between reviewers were of 97.92%. Publication record seems to be in decline on this field, as most studies were published during the 90's (12 – 31%), while 13 were published from 2000 to date. Most commonly used species were rats (20 studies) followed by mice (2 studies). All other species were used in an only one study (including marmoset, rabbit, sheep, canary, cat and guinea pig). Regarding the interventions, 10 studies evaluated the effects of estradiol, seven were related to progesterone. **Conclusions:** Heterogeneity is observed on hormonal interventions and animal species, reducing the likelihood of performing a robust meta-analysis on the field. The reduction on the number of articles might reflect an understanding that hormonal-derived interventions have no clinical value as a possible therapeutic strategy for sleep disorders.

**ID: 966**

### Case Reports

**Narcolepsy type 1 and rem sleep without atonia (RSWA): what is the relationship to rem sleep behavior disorder (RBD) and obstructive sleep apnea ?:** case report

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**Introduction:** Narcolepsy type 1 is a sleep disorder characterized by excessive daytime sleepiness, cataplexy, sleep paralysis and it is usually associated with other sleep conditions. We report a case of a patient with narcolepsy type 1, who presented with REM Sleep Behavior Disorder (RBD) features and obstructive sleep apnea (OSA) in sleep studies. **Aim:** The purpose of this case report is to highlight the importance of evaluating other sleep conditions associated with Narcolepsy. **Methods:** A 34-year-old man with a history of excessive daytime sleepiness since he was 15 years old, associated to loss of muscle tone often triggered by pleasant emotions. He had been hospitalized at age 17 for hypnagogic and hypnopompic hallucinations, being medicated with benzodiazepines, antidepressants and antipsychotics, leading to deterioration of its clinical condition, over the years. The consequences were weight gain, learning disability and irritability; frequente he was fired from his jobs. At 32 years old, he was diagnosed with Narcolepsy, and treatment with Modafinil and Nortriptyline lead to partial symptom improvement. **Results:** Due to residual symptoms of excessive daytime sleepiness, cataplexy and hypnagogic and hypnopompic hallucinations, as well as his wife's report of abnormal behaviors during sleep and a 10 kg weight gain in the last year, with increased snoring intensity, polysomnography, actigraphy and multiple sleep latency test were requested. Polysomnography showed severe obstructive sleep apnea, and motor behaviors compatible with diagnosis of RDB. The multiple sleep latency test revealed a mean sleep latency of less than 8 min with 5 episodes of REM sleep, confirming diagnostic of Narcolepsy. Actigraphy pattern indicated sleep fragmentation. In narcolepsy, RBD and RSWA are associated conditions, probably related to the role of hypocretin in REM tone loss. In narcoleptic patients, the RDB age onset is earlier than usual, the movements during the episode are less complex and less violent. Isolated obstructive sleep apnea may cause abnormal behaviors during sleep, but it is usually less severe, due to maintainance of tone in this situations. **Conclusions:** Given Narcolepsy with difficulty in controlling symptoms, it is important to investigate other sleep disorders, like RBD and OSA. Asking about dream enactment or symptoms of sleep apnea, may help to better define the differential diagnosis.