current follow-up study is to evaluate the sleep pattern of the same swimmers after 2 years.
**Methods:** Using an open-label prospective approach, the study investigated swimmer's event time changes, total sleep time, daytime sleepiness, and other sleep measures after 2 years of the initial changes during the first study. 8 healthy swimmers on the Makos swim team filled follow-up questionnaires and participated in a 100-yard freestyle race. Descriptive statistics, frequency distributions, and correlation using SPSS 14.
**Results:** Eight (6F; 2M) of the initial nine seasonal teen swimmers participated (age 13-17). Four swimmers reported headaches and one reported sore throat in the morning. Three (37.5%) reported feeling sleepy during the day and 3 reported falling asleep when riding in a car. Two reported leg movements during the night. In two years after the initial study, 100-free race time significantly improved (65.01*5.38 vs 59.32*5.43 p=0.003), but the positive effect of ETST+WB on recorded sleep time was lost and returned to baseline. There was a clear trend, but no significant difference in total sleep time among the 3 groups: (initial 8:45 *0:32; after ETST+WB 9:17*0:32; after 2 years 8:08*0:30).
**Conclusion:** The improvement of total sleep time with weighted blankets and encouragement during the initial study correlated with improvement of 100 free race time in seasonal teen swimmers. This improvement in total sleep time was lost and returned back to baseline after 2 years follow up.
**Support (If Any):** The authors report no financial relationship with any company whose products are mentioned in this manuscript, or with companies of competing products. Participants will be able to keep SKY Grand activity trackers at the end of their participation.

## 0502

### HARMONY IN THE SLEEP LAB: A FOCUS ON RECOGNITION OF HYPOVENTILATION AND DIRECT FEEDBACK IMPROVES QUALITY OF PEDIATRIC TITRATIONS

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**Introduction:** Over 350 pediatric polysomnogram titrations (T-PSGs) are performed each year at the Sleep Laboratory at Children's Hospital of Philadelphia in three locations by 24 different polysomnography technologists (PSGTs) on a diverse patient population, typically performed as outpatient procedures and occasionally at the bedside as inpatients. PSGTs are responsible for titration of continuous or bilevel positive airway pressure based on flow, work of breathing, arousals, and/or gas exchange. PSGTs have varying degrees of experience; thus, maintaining quality of T-PSGs is challenging. We hypothesized that a quality improvement (QI) approach to reviewing T-PSGs with interdisciplinary education and regular feedback would improve T-PSGs. Our goal was to have >/= 80% of titrations of optimal quality.
**Methods:** Each T-PSG record was reviewed by a sleep physician for optimal quality, defined as appropriate signal integrity, titration, and documentation to permit definitive interpretation. Exclusion: RAM cannula use, illness, or external signal interference. Titration QI (T-QI) comments were reviewed by the sleep lab QI team bi-weekly to plan feedback. Improvement interventions for PSGTs included didactic education: lectures, presentations, and cases focusing on recognition of hypoventilation; direct feedback with teaching points by sleep physician and small group sessions with clinical supervisors to review areas for improvement; and communication of specific titration goals. Satisfaction surveys regarding recognition/titration for OSA/hypoventilation, transcutaneous CO2 signal integrity, and documentation were administered to sleep physicians.
**Results:** From September 2020-November 2021, PSGT education included: 1 synchronous and 2 asynchronous didactic presentations; 1:1 review of didactics with each night PSGT (n=24); T-QI feedback (2/week); and small group review sessions (4/week). 408 titrations were completed; 42 (10.3%, 2.8/month) were excluded; 366 (89.7%, 24.4/month) were reviewed for T-QI. 54.8% [50,71%] were deemed optimal during the first three months (pre-intervention) vs. 80.1% [63,96%] during the intervention period. QI satisfaction survey showed improvement in 3 of 4 domains.
**Conclusion:** Quality of T-PSG is enhanced by QI review of each titration, highlighting teaching points and areas for improvement via direct feedback and small group review. Education and communication among physicians, supervisors and technologists are important to support development which can result in better titrations and satisfaction.
**Support (If Any):** none

## 0503

### THE RELATIONSHIPS BETWEEN THE IMPACT OF COVID-19 PANDEMIC, PARENT INSOMNIA, INFANT TEMPERAMENT, AND INFANT SLEEP: A PATH ANALYSIS

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**Introduction:** Increased sleep problems in adults have been repeatedly reported during the COVID-19 pandemic. However, infant sleep was understudied. We aimed to examine the relationships between the impact of the COVID-19 pandemic, parent insomnia, infant temperament, and infant sleep during the COVID-19 pandemic.
**Methods:** Parents from the Phoenix metropolitan area with a full-term healthy infant (<1 year) were recruited through social media from 2/27/2021 to 8/7/2021. A sample of 70 parents (baby age 5.5±3.5mo; parental age: 31.7±5.0y) completed the COVID-19 Exposure and Family Impact Survey Part 2 (CEFIS-Part 2, range: 12-60), a measure of the impact of the COVID-19 pandemic on families with higher scores indicating greater negative impact/distress; the Brief Infant Sleep Questionnaire-Revised (BISQ-R, range: 0-100), with higher scores indicating better sleep quality, more positive sleep perception, and parent behaviors promoting healthy sleep; and the Insomnia Severity Index (ISI, range: 0-28, cutoff: 10). Infant temperament was assessed with the Infant Behavioral Questionnaire-Revised (IBQ-R), including the subscale Negative Affect. Path analyses were conducted based on the Transactional Model of Infant Sleep to identify the direct effect of CEFIS scores, and indirect effects of parent ISI scores and infant IBQ-R Negative Affect scores on BISQ-R scores, with z scores of all variables and infant age as a covariate.
**Results:** The parent sample was predominantly female (94.3%), identified as White (72.9%), had obtained a bachelor's degree or above (71.5%), was married or in a domestic partnership (98.6%), and had household incomes >

US$70,000 (57.1%). More than one third (35.7%) experienced insomnia symptoms. The means of CEFIS, ISI, IBQ-R subscale Negative Affect, and BISQ-R scores were 29.3±9.5, 8.7±5.2, 4.1±1.1, and 68.8±12.7, respectively. After adjusting for infant age, the COVID-19 related family impact was not directly associated with BISQ-R scores, whereas parent ISI scores (β=-0.11, 95%CI [-.25, -.01]) and infant IBQ-R Negative Affect scores (β=-0.10, 95%CI [-.25, -.002]) significantly mediated the relationship.

**Conclusion:** The study highlighted the indirect effects of parent insomnia symptom severity and infant negative affect on infant sleep from the family impact of the COVID-19 pandemic. Future research should investigate how best to support healthy sleep for families during global crises.

**Support (If Any):**

## 0504

### IDENTIFYING RISK FACTORS FOR DEVELOPING SLEEP DISORDERS

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**Introduction:** Sleep disorders in the pediatric clinical setting are often overlooked and under-screened. The study compared a set of clinical behavior questions and physiological risk factors with potential to increase the risk for sleep disorders within children.

**Methods:** A retrospective archive from electronic medical records was analyzed from 695 pediatric patients, 7-14 years old, that visited a pediatric clinic from March-November of 2019. Children or their parents reported on the presence of eight behavioral and physiological factors on the Kids Sleep Screener Questionnaire (KSSQ), which were used as potential risk factors for sleep disorders. The propensity of daytime sleepiness was measured using the Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD). Univariate analysis was performed to find frequencies to summarize the risk factors. Chi square test was used to test for associations between risk factors and ESS-CHAD. Multiple logistic regression (MLR) was used to predict different combinations of factors with ESS-CHAD. Odd ratios (ORs) and 95% CI were used to quantify the level of association. Receiver operating characteristic (ROC) with area under the curve analysis was used to compare three MLR models.

**Results:** The risk factors were positively ($p<0.05$) associated with ESS-CHAD. Excessive daytime sleepiness and increased sleep duration were risk factors with greater potential to predict sleep disorder. They presented 3 times greater ($p<0.05$) potential to predict sleep disorder than snoring, and 4 times than restless sleep and sleep onset latency. The two combined risk factors with greatest potential to predict sleep disorder are restless sleep with excessive daytime sleepiness, and sleep onset delay with excessive daytime sleepiness.Risk for potential sleep disorders is best assessed when considering the different risk factors with gender. Considering gender, the risk factors with greatest relationship to predict potential sleep disorders were sleep duration, excessive daytime sleepiness, night wakings and the previous discussed combinations (restless sleep with excessive daytime sleepiness, and sleep onset delay with excessive daytime sleepiness).

**Conclusion:** The Kids Sleep Screener Questionnaire is a potential tool to predict sleep disorder. Further studies are warranted to explore the behavior and physiological risk factors with potential to increase the risk for sleep disorders.

**Support (If Any):**

## 0505

### MAINTENANCE OF WAKEFULNESS TEST CHARACTERISTICS IN PEDIATRIC POPULATIONS WITH CENTRAL HYPERSOMNIA

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**Introduction:** Children with central hypersomnia often have residual daytime sleepiness despite treatment with medical therapies. The Maintenance of Wakefulness Test (MWT) is an objective measure used to assess daytime alertness and responsiveness to treatment in patients with hypersomnia. There are limited data on MWT characteristics among pediatric populations. The purpose of this study was to: (1.) Compare MWT characteristics and subjective assessment between patients who passed and failed the MWT; (2.) Determine clinical management changes following MWT.

**Methods:** A retrospective review was conducted of all children who underwent MWT at Cincinnati Children's Hospital Medical Center from September, 2008 to June, 2021. Pass and fail assessment designations were determined by the clinician as recorded in the medical record. Demographics, Epworth Sleepiness Scores (ESS), MWT characteristics, and pharmacological modifications were recorded. A majority of patients underwent MWT prior to driving. Descriptive statistics as well as Chi-square, Fisher's exact, and Wilcoxon rank-sum testing were utilized. All variables were reported as medians with interquartile ranges.

**Results:** 109 MWTs were performed on 79 children with a median age of 17.7 years [16.6, 18.6]. MWTs were indicated for 4 primary diagnoses: hypersomnia (n=5), idiopathic hypersomnia (n=11), narcolepsy type 1 (n=56), and narcolepsy type 2 (n=37). 55 (50.5%) were documented as pass (P) and 54 as fail (F). No differences in age (17.5 years) [16.2,18.5] (P) vs. (17.8) [16.9,18.9] (F) (p=NS) or other demographics existed between the two groups. As expected, mean sleep latency was significantly higher among those who passed (37.3 minutes) [31.2,40.0] (P) vs. (10.8) [7.9,16.6] (F) ($p<0.001$). However, no significant differences were observed in ESS 12.0 [8.0,17.0] (P) vs. 11.0 (6.0,14.0) (F) (p=NS). Pharmacologic adjustments were made in 42/54 (77.8%) (F) vs. 17/54 (31.5%) (P). Medications were not modified in 12/54 (22.2%) (F) assessments.

**Conclusion:** MWT provides useful objective assessment and often leads to management changes in adolescents with central hypersomnia. A subjective sleepiness assessment (ESS) does not correlate with objective MWT assessments. We speculate that an altered perception of sleepiness in children with hypersomnia may play a role in the inaccuracy of subjective assessments commonly utilized in clinical practice.

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