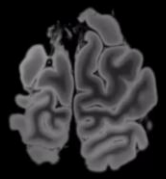

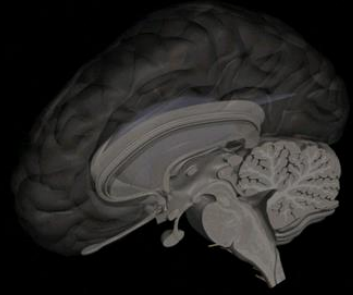

IMPORTANCIA DEL SUEÑO EN LA INFANCIA

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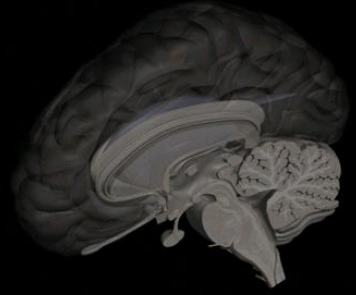


SUEÑO EN LA INFANCIA: OBJETIVOS A DOMINAR POR LOS ALUMNOS

-CONOCER LAS IMPLICANCIAS DEL SUEÑO EN EL NEURODESARROLLO

-CONOCER LAS REPERCUSIONES DE UN SUEÑO INADECUADO EN LA INFANCIA

-CONOCER LOS PRINCIPALES TRASTORNOS DEL SUEÑO EN LOS NIÑOS Y ADOLESCENTES

-SER CAPAZ DE ORGANIZAR UNA ADECUADA “HIGIENE DEL SUEÑO” A LA FAMILIA

-CONOCER LOS RANGOS NORMALES DE HORAS DE SUEÑO EN DISTINTAS ETAPAS DE LA VIDA

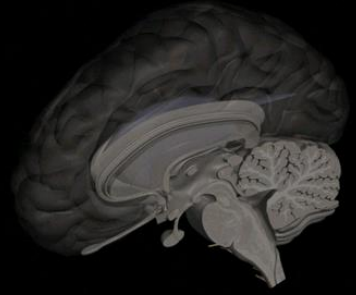
-SER CAPAZ DE IDENTIFICAR LOS TRASTORNOS DEL SUEÑO COMO DIAGNÓSTICO DIFERENCIAL DE DISTINTAS PATOLOGÍAS DE LA INFANCIA

-CONOCER LOS DISTINTOS FACTORES AMBIENTALES QUE ALTERAN LA CALIDAD Y CANTIDAD DE SUEÑO

Original Investigation

Later Emotional and Behavioral Problems Associated With Sleep Problems in Toddlers
A Longitudinal Study

Børge Sivertsen, PhD; Allison G. Harvey, PhD; Ted Reichborn-Kjennerud, PhD, MD; Leila Torgersen, PhD; Eivind Ystrom, PhD; Mari Hysing, PhD



IMPORTANCE Childhood sleep problems have been linked to a range of adverse health outcomes, but there is limited knowledge as to the temporal association between sleep problems and subsequent emotional and behavioral problems in young children.

OBJECTIVE To examine whether sleep problems in toddlers aged 18 months are related to both concurrent and subsequent emotional and behavioral problems in preschool children aged 5 years.

DESIGN, SETTING, AND PARTICIPANTS A large population-based longitudinal study was conducted in September 2014 using data from the Norwegian Mother and Child Cohort Study conducted at the Norwegian Institute of Public Health from June 1, 1999, to December 31, 2008. A total of 32 662 children or pregnancies were included.

EXPOSURES Sleep was assessed by mother-reported child sleep duration and nocturnal awakenings.

MAIN OUTCOMES AND MEASURES Emotional and behavioral problems were measured with items from the Child Behavior Checklist and operationalized according to recommended clinical cutoffs, corresponding to T scores of greater than 65 (93rd percentile). Risk ratios (RRs) were calculated using negative binomial regression, controlling for emotional and behavioral problems at 18 months and other relevant covariates.

RESULTS Short sleep duration (≤10 hours) in 556 children (1.7%) and frequent nocturnal awakenings (≥3 times) in 1033 children (3.2%) at 18 months significantly predicted both concurrent and later incidence of emotional and behavioral problems at 5 years. The longitudinal RRs were generally larger for internalizing problems, with adjusted RRs of 1.59 (95% CI, 1.23-2.08) for both short sleep duration and 1.57 (95% CI, 1.28-1.93) for nocturnal awakenings; RRs for externalizing problems were 1.77 (95% CI, 1.37-2.30) and 1.25 (95% CI, 1.00-1.58), respectively. Additional adjustment for emotional and behavioral problems at 18 months slightly reduced the strength of these associations, and all RRs remained significant in the fully adjusted models.

CONCLUSIONS AND RELEVANCE Early sleep problems predict later development of emotional and behavioral problems. Intervention studies are needed to examine whether sleep programs targeting early childhood may avert the onset of later adverse outcomes.

Editorial

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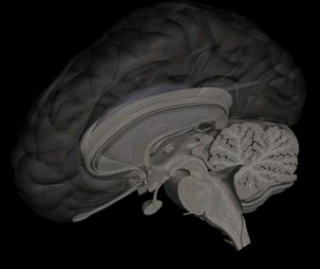


Changes in Bedtime Schedules and Behavioral Difficulties in 7 Year Old Children

WHAT'S KNOWN ON THIS SUBJECT: Links between clinically diagnosed sleep problems and adverse behavioral outcomes are well documented. However, in nonclinical populations, causal links between disrupted sleep and the development of behavioral difficulties are far from clear.

WHAT THIS STUDY ADDS: Seven-year-old children with nonregular bedtimes had more behavioral difficulties than children who had regular bedtimes. There were clear dose–response relationships, and the effects of not having regular bedtimes appeared to be reversible.

AUTHORS: Yvonne Kelly, PhD, John Kelly, BEng, and Amanda Sacker, PhD

Department of Epidemiology and Public Health, University College London, England

KEY WORDS

child behavior, sleep, Millennium Cohort Study, International Centre for Lifecourse Studies in Society and Health

ABBREVIATIONS

A/AS—advanced/advanced supplementary
CI—confidence interval
GCSE—General Certificate of Secondary Education
MCS—The Millennium Cohort Study
SDQ—Strengths and Difficulties Questionnaire

Prof Kelly conceptualized and designed the study and drafted the initial manuscript; Mr Kelly provided input on analytical strategy, carried out the initial analyses, and reviewed and revised the manuscript; Prof Sacker provided analytical support and reviewed and revised the manuscript; and all authors approved the final manuscript as submitted.

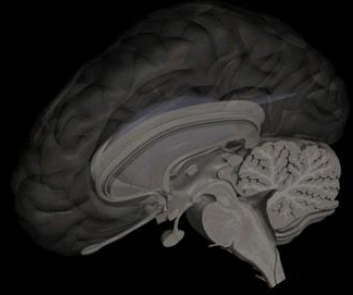
www.pediatrics.org/cgi/doi/10.1542/peds.2013-1906

doi:10.1542/peds.2013-1906

abstract

OBJECTIVES: Causal links between disrupted sleep and behavioral problems in nonclinical populations are far from clear. Research questions were as follows: Are bedtime schedules associated with behav-

SUEÑO EN LA INFANCIA



-ROL FUNDAMENTAL EN DESARROLLO NORMAL SNC

-LACTANTES (50% VIDA DURMIENDO), ADULTOS (1/3 VIDA DURMIENDO)

-RELACIÓN CON PROCESOS DE REPARACIÓN NEURONAL Y SINAPTOGÉNESIS

-ALTA RELACIÓN CON CONSOLIDACIÓN DE MEMORIA

-ALTERACIONES DEL SUEÑO: CORRELACIÓN CON ALTERACIONES DEL DESARROLLO (TEMPERAMENTO DIFÍCIL, TRASTORNOS CONDUCTA, TDAH, TEA)

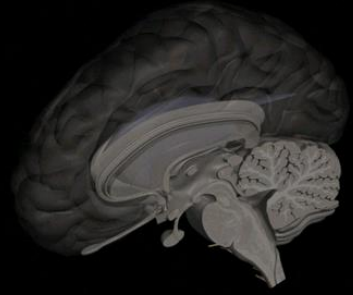
Tabla 1. Horas de Sueño Según Edad

Edad	Horas de Sueño	Nº de Siestas Día	Nº Horas Siesta
RN a 3 meses	16 a 20 h		
3 a 5 meses	14 a 17 h	3 a 4	4 a 6
5 meses	Se consolida sueño nocturno (ritmo circadiano)		
6 a 11 meses	12 a 15 h	2 a 3	2,5 a 4
1 a 2 años	11 a 14 h	1 o 2	2 a 3
3 a 4 años	10 a 13 h	1	0,5 a 2
5 a 13 años	9 a 11 h		
14 a 17 años	8 a 10 h		

American Academy of Sleep Medicine. International classification of sleep disorders (ICSD). 3rd ed; 2014. Available in: http://www.aasmnet.org/library/default.aspx?id=9.

-PROBLEMAS MÁS FRECUENTES: DIFICULTADES CALIDAD Y CANTIDAD DE SUEÑO
TRASTORNOS PAROXÍSTICOS DEL SUEÑO
SOMNOLENCIA DIURNA

SUEÑO EN LA INFANCIA RECOMENDACIONES



-ESCOLARES PEQUEÑOS: 11 HORAS

-ESCOLARES GRANDES: 10 HORAS

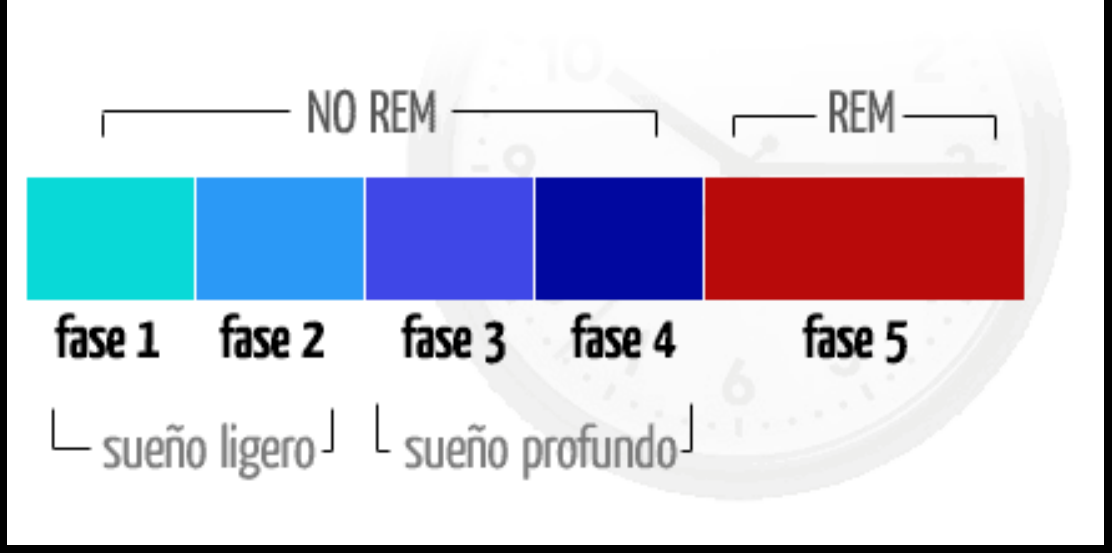
-ADOLESCENTES: 9 HORAS

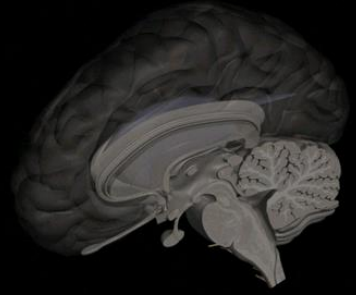
-IMPORTANCIA DE DORMIR TEMPRANO AUNQUE SEA LA MISMA CANTIDAD DE HORAS-CONSTANCIA DE HORARIOS

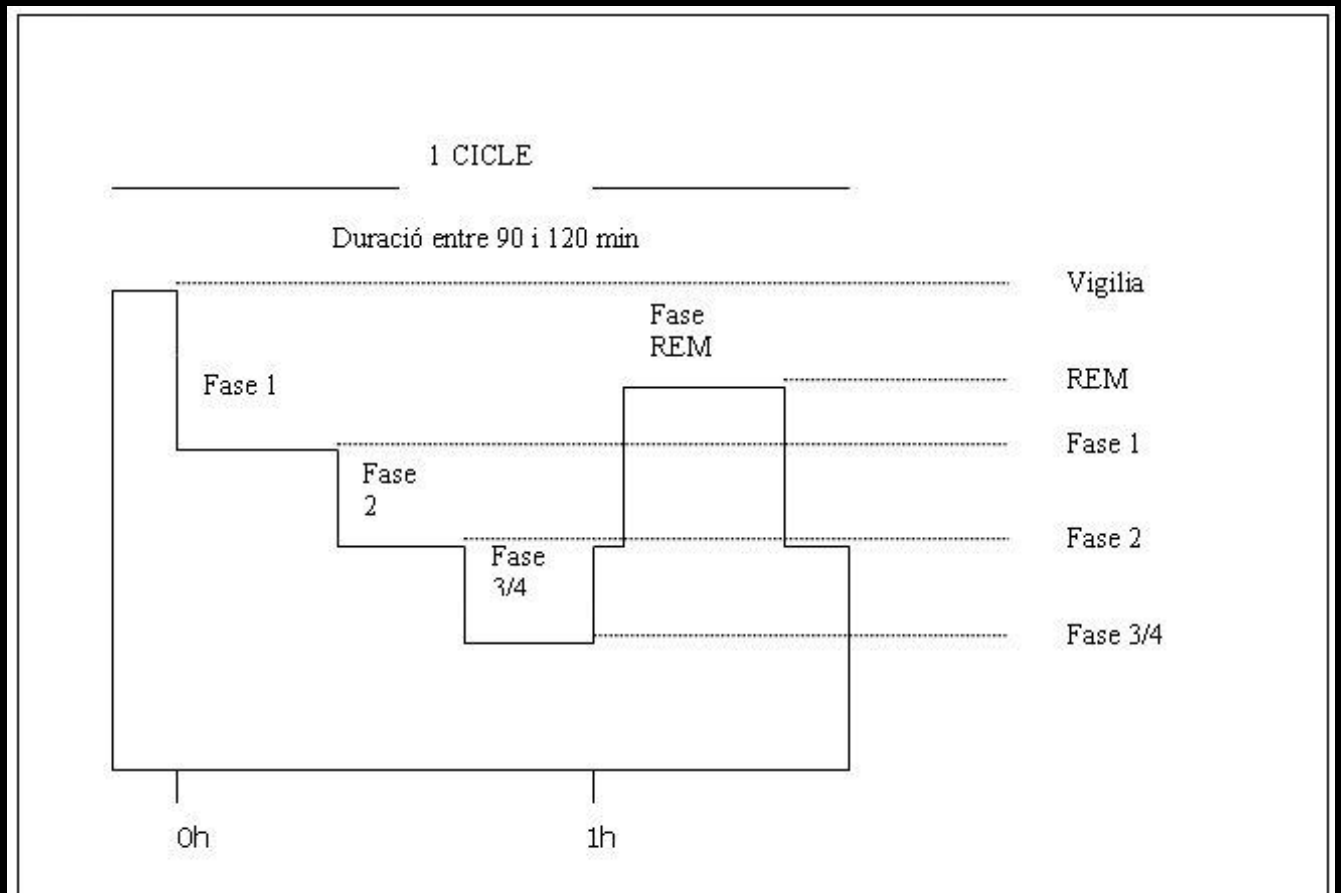
-“HIGIENE DEL SUEÑO”: EVITAR TV-PC-PANTALLAS 2 HRS ANTES DE DORMIR
EVITAR COMER MUY TARDE
FAVORECER LUCES BAJAS Y SILENCIO AMBIENTAL
BAJA TEMPERATURA
EVITAR LEDS-CELULARES EN HABITACIÓN
NIÑOS NO DEBEN TENER TV EN EL DORMITORIO
NO DORMIR CON AUDÍFONOS O MÚSICA

-EL SUEÑO ES UN HÁBITO

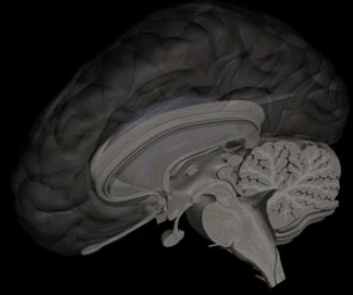
-REPERCUSIÓN A LARGO PLAZO


NO REM
REM
fase 1
fase 2
fase 3
fase 4
fase 5
sueño ligero
sueño profundo




1 CICLE
Duració entre 90 i 120 min
Vigilia
Fase
REM
Fase 1
REM
Fase 1
Fase
2
Fase 2
Fase
3/4
Fase 3/4
0h
1h

INSOMNIO EN LA INFANCIA



-AFECTA 25% POBLACIÓN PEDIATRICA ENTRE 6 MESES Y 5 AÑOS DE EDAD

-ASOCIADO A FACTORES BIOLÓGICOS Y/O PSICOSOCIALES EN EL NIÑO Y/O FAMILIA

-REPERCUSIÓN DINÁMICA FAMILIAR, TANTO EN EL NIÑO COMO EN CUIDADORES

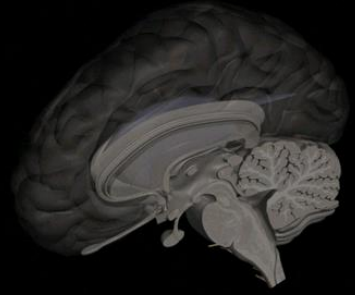
-INSOMNIO ES LA DIFICULTAD PARA INICIAR (INSOMNIO DE CONCILIACIÓN) Y/O MANTENER (INSOMNIO DE MANTENCIÓN) O COMPLETAR EL HORARIO ESPERADO (INSOMNIO DEL DESPERTAR)

-LATENCIA DEL SUEÑO MAYOR A 30´Y/0 DESPERTARES DE MÁS DE 2`SE ASOCIAN A MALESTAR CLÍNICAMENTE SIGNIFICATIVO Y/O DETERIORO SOCIAL, FAMILIAR, ACADÉMICO

TRASTORNO DE ASOCIÓN DEL INICIO DEL SUEÑO
(PROPIA DEL LACTANTE: TOMADO DE LA MANO, CON LUZ PRENDIDA, COLECHO, ETC)

INSOMNIO POR FALTA DE FIJACIÓN DE LÍMITE
(PROPIA DEL PREESCOLAR-ESCOLAR: DIFICULTAD DE PADRES EN ESTABLECER HORARIOS)

FASE DE SUEÑO RETRASADA-INSOMNIO PSICOFISIOLÓGICO
(PROPIA DEL ADOLESCENTE)



INSOMNIO EN LA INFANCIA

ANTE NIÑO CON INSOMNIO SIEMPRE PLANTEARSE DIAGNÓSTICOS DIFERENCIALES

-BASE ORGÁNICA

-DEPRESIÓN

-TDAH

-TEA

ENFOQUE TERAPÉUTICO

-HIGIENE DEL SUEÑO
-TERAPIA COGNITIVO-CONDUCTUAL
-TRATAMIENTO FARMACOLÓGICO
  -MELATONINA
  -TRIPTOFANO
  -ANTIHISTAMÍNICOS
  -BZD

PARASOMNIAS

-GRUPO DE TRASTORNOS DEL SUEÑO CARACTERIZADOS POR LA PRESENCIA DE EVENTOS MOTORES, VERBALES O CONDUCTUALES ANORMALES Y DESAGRADABLES QUE OCURREN DURANTE LA TRANSICIÓN DEL SUEÑO A LA VIGILIA O DE LA VIGILIA AL SUEÑO.

-FACILITADAS POR DOLOR, SAHOS, FALTA DE SUEÑO, OH, FIEBRE, SEDANTES, GENÉTICA, ESTRÉS EMOCIONAL, MALA HIGIENE DEL SUEÑO

-PARASOMNIAS DEL SUEÑO NO REM: (AMNESIA)	DESPERTARES CONFUSIONALES SONAMBULISMO (ATENTO A FÁRMACOS) TERRORES NOCTURNOS DESÓRDENES ALIMENTARIOS RELAC. AL SUEÑO
-PARASOMNIAS DEL SUEÑO REM:	PESADILLAS TRASTORNO DE CONDUCTA RELAC. AL SUEÑO REM PARÁLISIS DEL SUEÑO
-OTRAS PARASOMNIAS:	SÍNDROME DE CABEZA EXPLOSIVA ALUCINACIONES RELACIONADAS AL SUEÑO (HIPNAGÓGICAS-HIPNOPÓMPICAS) ENURESIS NOCTURNA SOMNILOQUIA

-DIAGNÓSTICO DIFERENCIAL CRÍTICO: EPILEPSIA DEL LÓBULO FRONTAL

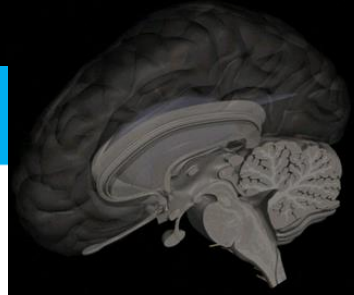


Tabla I. Trastornos del sueño más frecuentes en el niño (según Clasificación Internacional de los Trastornos del Sueño Revisada)

1 DISOMNIAS

1.a. Intrínsecas

Narcolepsia

Síndrome de apneas obstructivas del sueño

Movimientos periódicas de las piernas

1.b. Extrínsecas

Trastorno ambiental

T. del establecimiento de límites

T. de las asociaciones al inicio del sueño

1.c. Trastornos del ritmo circadiano

Retraso de fase de inicio del sueño

2 PARASOMNIAS

2.a. Del despertar

Despertares confusionales

Sonambulismo

Terrores nocturnos

2.b. De la transición sueño-vigilia

Movimientos rítmicos del sueño

Somniloquia

Mioclonías del sueño

2.c Asociadas al sueño REM

Pesadillas

Otras

Bruxismo

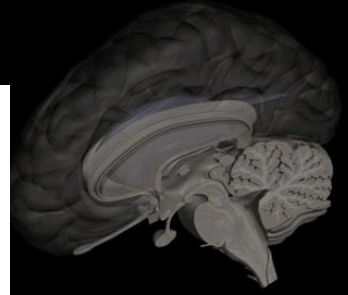
Enuresis

Ronquido primario

Muerte súbita de lactante

Apneas del lactante

Mioclonías neonatales benignas



Kleine Levin syndrome (periodic hypersomnia, recurrent hypersomnia)

This disorder occurs in adolescents with a male predominance of 4:1. Patients develop 10–14 days of hypersomnolence during which they may sleep 18 to 20 hours per day in association with feelings of depersonalization, mood disturbance, compulsive hyperphagia, and hypersexual behavior. There are intervening 2 to 4 months of normal alertness and behavior [15]. The binge eating observed during sleepy periods may be associated with a 2- to 5-kg increase in body weight. Atypical forms of the syndrome have also been recognized in which there might be anorexia and no hypersexual behavior. Nocturnal polysomnography during the sleepy periods exhibits decreased sleep efficiency, shortened latency to rapid eye movement sleep, and decreased percentage of time spent in N3 sleep. The multiple sleep latency test reveals moderately shortened mean sleep latency in the 5- to 10-minute range, but not the 2 or more sleep onset REM periods that are typical for narcolepsy. The episodes of sleepiness gradually diminish over time, resolving over 5 to 7 years or evolving into classic depression, which brings up the issue of whether the disorder might be a variant of depression. A disturbance of hypothalamic function has been hypothesized but not established. The occasional precipitation after systemic infections and its relapsing and remitting nature are suspicious for an autoimmune etiology [16]. While the retrospective, multi-center study [16] suggested an association with HLA DQB1*0602, this was not confirmed in the more recent prospective study [15].

There is no satisfactory treatment, though some medications have been used in an empiric manner. Lithium carbonate and lamotrigine have been reported to be effective in preventing recurrence of symptoms in a case report [17, 18]. Modafinil may reduce the severity and duration of the symptomatic episodes [19].

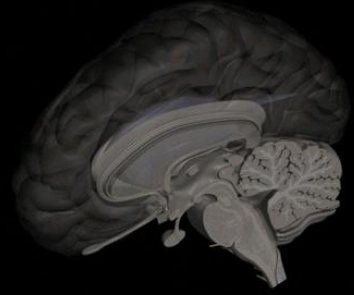
Tabla VI. Medidas de "higiene" del sueño

Medidas ambientales:

1. Empleo de asociaciones adecuadas y familia res al niño para iniciar el sueño
2. Uso de cama confortable
3. Ambiente de baja intensidad lumínica
4. Temperatura adecuada
5. Ambiente poco estimulante
6. Evitar asociación de la cama con situación de castigo
7. Evitar el consumo de bebidas con cafeína después del mediodía

Medidas que animan o facilitan al niño irse a la cama:

1. Realización de rutinas predecibles para acostarse
2. Acostar y levantar a los niños a la misma hora habitualmente
3. Promover la capacidad de dormirse sin la presencia de los padres
4. Llevarlos a la cama cuando están cansados y evitarlo si están demasiado activos
5. Realizar actividades relajantes y no realizar actividad intensa antes de acostarse
6. Resolver problemas o hacer planes antes de acostarse y no en ese momento



Increased sensitivity of the circadian system to light in early/mid puberty

Stephanie J. Crowley, Ph.D,[1], Sean W. Cain, Ph.D,[2], Angus C. Burns[2], Christine Acebo, Ph.D,[3,4], Mary A. Carskadon, Ph.D[3,4,5]

[1]Biological Rhythms Research Laboratory, Department of Behavioral Sciences, Rush University Medical Center, Chicago IL USA; [2]School of Psychological Sciences, Monash University, Clayton, Australia; [3]E.P. Bradley Hospital Sleep and Chronobiology Research Laboratory, Providence RI USA; [4]Department of Psychiatry and Human Behavior, The Warren Alpert Medical School of Brown University, Providence RI USA; [5]Centre for Sleep Research, University of S Australia, Adelaide, Australia

Context: Late adolescence is marked by a delay in sleep timing, which is partly driven by a delay shift of the circadian timing system. This study examined whether the sensitivity of the circadian system to light – the primary entraining stimulus to the circadian system – differs between pre- to mid-pubertal and late- to post-pubertal adolescents.

Objective: To determine the influence of puberty on the sensitivity of the circadian system to light in humans.

Methods: Melatonin suppression to low and moderate light levels was assessed in 38 pre- to mid-pubertal (9.1–14.7 years) and 29 late- to post-pubertal (11.5–15.9 years) adolescents. They received 1 hour of 4 light levels on consecutive nights: ~0.1 (near-dark baseline condition), 15, 150, and 500 lux. One group received evening light beginning at 2300 (n=39); a second group received morning light beginning at 0300 (n=28). Salivary melatonin was sampled every 30 minutes. Melatonin suppression for 15, 150 and 500 lux was calculated relative to unsuppressed baseline levels in the ~0.1 lux setting, within individuals.

Results: The pre- to mid-pubertal group showed significantly greater melatonin suppression to 15 lux (9.2 ± 20.5%), 150 lux (26.0 ± 17.7%), and 500 lux (36.9 ± 11.4%) during evening light exposure compared to the late- to post-pubertal group (-5.3 ± 17.7%, 12.5 ± 17.3%, and 23.9 ± 21.7%, respectively; $p < .05$). No significant differences were seen between developmental groups in morning melatonin suppression.

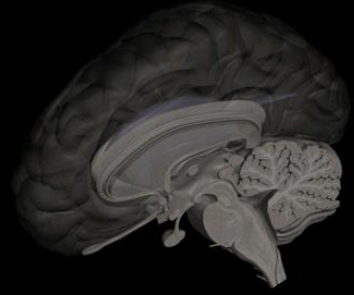
Conclusion: These results indicate support for a greater sensitivity to evening light in early pubertal children. The increased sensitivity to light in younger adolescents suggests that exposure to evening light could be particularly disruptive to sleep regulation for this group.

JCEM THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

LEASE:

Sleep Duration, Restfulness, and Screens in the Sleep Environment

Jennifer Falbe, ScD, MPH[a], Kirsten K. Davison, PhD[b,c], Rebecca L. Franckle, MPH[b,c], Claudia Ganter, MPH[b,d], Steven L. Gortmaker, PhD[d,e], Lauren Smith, MD, MPH[f], Thomas Land, PhD[g], Elsie M. Taveras, MD, MPH[b,h]



abstract

BACKGROUND AND OBJECTIVE: Associations of inadequate sleep with numerous health outcomes among youth necessitate identifying its modifiable determinants. Television (TV) has been associated with sleep curtailment, but little is known about small screens (eg, smartphones), which can be used in bed and emit notifications. Therefore, we examined associations of different screens in sleep environments with sleep duration and perceived insufficient rest or sleep.

METHODS: Participants included 2048 fourth- and seventh-graders participating in the Massachusetts Childhood Obesity Research Demonstration Study in 2012 to 2013. Using linear and log binomial regression, we examined cross-sectional associations of small screens and TVs in sleep environments and screen time with weekday sleep duration and perceived insufficient rest or sleep in the past week.

RESULTS: Children who slept near a small screen (compared with never) reported 20.6 fewer minutes of sleep (95% confidence interval [CI], −29.7 to −11.4) and had a higher prevalence of perceived insufficient rest or sleep (prevalence ratio, 1.39; 95% CI, 1.21 to 1.60). Children who slept in a room with a TV (compared with no TV) reported 18.0 fewer minutes of sleep (95% CI, −27.9 to −8.1). TV or DVD viewing and video or computer game playing were associated with both sleep outcomes ($P < .01$). Some associations were stronger among Hispanic, non-Hispanic black, and older children ($P < .05$ for heterogeneity).

CONCLUSIONS: Sleeping near a small screen, sleeping with a TV in the room, and more screen time were associated with shorter sleep durations. Presence of a small screen, but not a TV, in the sleep environment and screen time were associated with perceived insufficient rest or sleep. These findings caution against unrestricted screen access in children's bedrooms.

[a]Division of Community Health and Human Development, School of Public Health, University of California Berkeley, Berkeley, California; Departments of [b]Nutrition and [c]Social and Behavioral Sciences, and [d]Prevention Research Center, Harvard School of Public Health, Boston, Massachusetts; [e]Technische Universität Berlin, Berlin, Germany; [f]National Institute for Children's Health Quality, Boston, Massachusetts; [g]Bureau of Community Health and Prevention, Massachusetts Department of Public Health, Boston, Massachusetts; and [h]Division of General Academic Pediatrics, Department of Pediatrics, Massachusetts General Hospital for Children, Boston, Massachusetts

Dr Falbe designed, conceptualized, and carried out the analysis, interpreted the data, and drafted and revised the manuscript; Dr Davison, Ms Franckle, and Drs Gortmaker, Smith, and Land contributed to the analysis and interpretation and reviewed and revised the manuscript; Ms Gehre contributed to acquisition of data and reviewed and revised the manuscript; Dr Taveras contributed to the design, concept, analysis, and interpretation and reviewed and revised the manuscript; and all authors approved the final manuscript as submitted.

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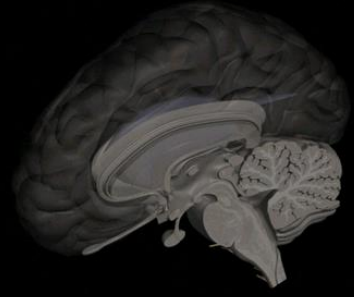
Accepted for publication Nov 10, 2014

WHAT'S KNOWN ON THIS SUBJECT: Inadequate sleep has been identified as a risk factor for obesity and other outcomes. Screen time and the presence of a television in the bedroom have been associated with inadequate sleep, but little is known about small screens (eg, smartphones).

WHAT THIS STUDY ADDS: Among 2048 fourth- and seventh-graders, children who slept near a small screen reported shorter sleep durations and perceived insufficient rest or sleep. Presence of a television in the bedroom and more screen time were also associated with poorer sleep.



Behaviorally Assessed Sleep and Susceptibility to the Common Cold

Aric A. Prather, PhD[1]; Denise Janicki-Deverts, PhD[2]; Martica H. Hall, PhD[3]; Sheldon Cohen, PhD[2]

[1]Department of Psychiatry, University of California, San Francisco, CA; [2]Department of Psychology, Carnegie Mellon University, Pittsburgh, PA; [3]Department of Psychiatry, University of Pittsburgh Medical Center, Pittsburgh, PA

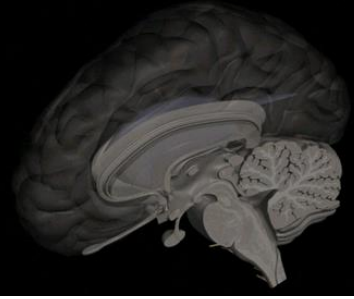
Study Objectives: Short sleep duration and poor sleep continuity have been implicated in the susceptibility to infectious illness. However, prior research has relied on subjective measures of sleep, which are subject to recall bias. The aim of this study was to determine whether sleep, measured behaviorally using wrist actigraphy, predicted cold incidence following experimental viral exposure.

Design, Measurements, and Results: A total of 164 healthy men and women (age range, 18 to 55 y) volunteered for this study. Wrist actigraphy and sleep diaries assessed sleep duration and sleep continuity over 7 consecutive days. Participants were then quarantined and administered nasal drops containing the rhinovirus, and monitored over 5 days for the development of a clinical cold (defined by infection in the presence of objective signs of illness). Logistic regression analysis revealed that actigraphy- assessed shorter sleep duration was associated with an increased likelihood of development of a clinical cold. Specifically, those sleeping < 5 h (odds ratio [OR] = 4.50, 95% confidence interval [CI], 1.08–18.69) or sleeping between 5 to 6 h (OR = 4.24, 95% CI, 1.08–16.71) were at greater risk of developing the cold compared to those sleeping > 7 h per night; those sleeping 6.01 to 7 h were at no greater risk (OR = 1.66; 95% CI 0.40–6.95). This association was independent of prechallenge antibody levels, demographics, season of the year, body mass index, psychological variables, and health practices. Sleep fragmentation was unrelated to cold susceptibility. Other sleep variables obtained using diary and actigraphy were not strong predictors of cold susceptibility.

Conclusions: Shorter sleep duration, measured behaviorally using actigraphy prior to viral exposure, was associated with increased susceptibility to the common cold.

Keywords: common cold, immunity, rhinovirus, sleep continuity, sleep duration

Citation: Prather AA, Janicki-Deverts D, Hall MH, Cohen S. Behaviorally assessed sleep and susceptibility to the common cold. *SLEEP* 2015;38(9):1353–1359.



Sleep Duration and Adolescent Obesity

WHAT'S KNOWN ON THIS SUBJECT: Short sleep may be an adolescent obesity risk factor, but most evidence is from cross-sectional studies. Three longitudinal studies have investigated the association between sleep duration and adolescent obesity, finding mixed results.

WHAT THIS STUDY ADDS: Shorter sleep was associated with increases in BMI from age 14 to 18, especially at the upper tail of the BMI distribution. Increasing daily sleep to 10 hours per day could help to prevent adolescent obesity.

AUTHORS: Jonathan A. Mitchell, PhD,[a] Daniel Rodriguez, PhD,[b] Kathryn H. Schmitz, PhD,[a] and Janet Audrain-McGovern, PhD[b]

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KEY WORDS
adolescence, longitudinal study, obesity, sleep

ABBREVIATIONS
CI—confidence interval
MVPA—moderate-to-vigorous physical activity

Dr Mitchell conceived and designed the study, analyzed the data, drafted the manuscript, and approved the final manuscript as submitted; Dr Rodriguez manages and maintains the data set that was used in the current study, revised the manuscript, interpreted the data, and approved the final manuscript as submitted; Dr Schmitz reviewed and revised the manuscript, interpreted the data, and approved the final manuscript as submitted; and Dr Audrain-McGovern acquired the data, reviewed and revised the manuscript, interpreted the data, and approved the final submitted manuscript.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute or the National Institutes of Health.

www.pediatrics.org/cgi/doi/10.1542/peds.2012-2368

abstract

OBJECTIVES: Short sleep has been associated with adolescent obesity. Most studies used a cross-sectional design and modeled BMI categories. We sought to determine if sleep duration was associated with BMI distribution changes from age 14 to 18.

METHODS: Adolescents were recruited from suburban high schools in Philadelphia when entering ninth grade (n = 1390) and were followed-

Sleep Medicine

journal homepage: www.elsevier.com/locate/sleep

Original Article

The history of sleep apnea is associated with shorter leukocyte telomere length: the Helsinki Birth Cohort Study

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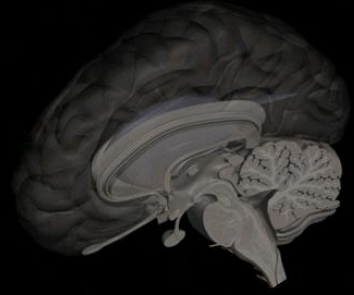
Oxidative stress
Sleep disorder

ABSTRACT

Objectives: Sleep apnea poses an elevated risk for chronic age-related diseases. Leukocyte telomere length (LTL), a biomarker and factor associated with accelerated cellular aging processes, may serve as a novel mechanism underlying these disease risks. We investigated if a history of clinician-diagnosed sleep apnea or primary snoring was associated with LTL in later adulthood.
Methods: Data on sleep apnea, primary snoring and LTL, were available for 1948 participants from the Helsinki Birth Cohort Study. Patients with sleep apnea ($n = 44$) and primary snoring ($n = 29$) severe enough to be recorded as an inpatient diagnosis for hospitalization were identified by their case records through the Finnish Hospital Discharge Register. The LTL was measured by using the realtime quantitative polymerase chain reaction (PCR) method at a mean age of 61.5 years (standard deviation [SD], 2.9).
Results: A history of sleep apnea was associated with shorter LTL ($P = .010$). Adjustment for a number of covariates did not alter the association.
Conclusions: Accelerated cellular aging reflected in shorter LTL in patients with a history of sleep apnea may partly explain their higher risk for age-related diseases. Future studies elucidating the impacts of long-term or successful treatment history of sleep apnea on the maintenance of LTL are warranted.



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Sleep Drives Metabolite Clearance from the Adult Brain

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The conservation of sleep across all animal species suggests that sleep serves a vital function. We here report that sleep has a critical function in ensuring metabolic homeostasis. Using real-time assessments of tetramethylammonium diffusion and two-photon imaging in live mice, we show that natural sleep or anesthesia are associated with a 60% increase in the interstitial space, resulting in a striking increase in convective exchange of cerebrospinal fluid with interstitial fluid. In turn, convective fluxes of interstitial fluid increased the rate of β-amyloid clearance during sleep. Thus, the restorative function of sleep may be a consequence of the enhanced removal of potentially neurotoxic waste products that accumulate in the awake central nervous system.

mice, $P < 0.05$, paired t test) (Fig. 1D). To investigate whether the state of brain activity indeed controlled CSF influx, we repeated the experiments in a new cohort of mice in which all experiments were performed when the animals were awake (8 to 10 p.m.). Because mice normally do not sleep at this time of day, we first evaluated CSF tracer influx in the awake state by means of intracisternal infusion of FITC-dextran. CSF tracer influx into the brain was largely absent and only slowly gained access to the superficial cortical layers (Fig. 1, E and F, and fig. S2). After 30 min imaging of CSF tracer in the awake state, the animals were anesthetized with intraperitoneal administration of ketamine/xylazine (KX). Texas red-dextran was administered 15 min later, when a stable increase in slow wave activity was noted (Fig. 1, E and F). Texas red-dextran rapidly flushed in along periarterial spaces and entered the brain parenchyma at a rate comparable with that

OPEN ACCESS

Time for bed: associations with cognitive performance in 7-year-old children: a longitudinal population-based study

Yvonne Kelly, John Kelly, Amanda Sacker

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/jech-2012-202024).

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ABSTRACT

Background Little is known about the links between the time that young children go to bed and their cognitive development. In this paper we seek to examine whether bedtimes in early childhood are related to cognitive test scores in 7-year-olds.

Methods We examined data on bedtimes and cognitive test (z-scores) for reading, maths and spatial abilities for 11 178 7-year-old children from the UK Millennium Cohort Study.

Results At age 7, not having a regular bedtime was related to lower cognitive test scores in girls: reading (β: −0.22), maths (β: −0.26) and spatial (β: −0.15), but not for boys. Non-regular bedtimes at age 3 were independently associated, in girls and boys, with lower reading (β: −0.10, −0.20), maths (β: −0.16, −0.11) and spatial (β: −0.13, −0.16) scores. Cumulative relationships were apparent. Girls who never had regular bedtimes at ages 3, 5 and 7 had significantly lower reading (β: −0.36), maths (β: −0.51) and spatial (β: −0.40) scores, while for boys this was the case for those having non-regular bedtimes at any two ages (3, 5 or 7 years): reading (β: −0.28), maths (β: −0.22) and spatial (β: −0.26) scores. In boys having non-regular bedtimes at all three ages (3, 5 and 7 years) were non-significantly related to lower reading, maths and spatial scores.

Conclusions The consistent nature of bedtimes during early childhood is related to cognitive performance. Given the importance of early child development, there may be knock on effects for health throughout life.

with their children, and it might be that bedtimes get pushed back or are not routinely in place. This could have important ramifications as when sleep is restricted or disrupted symptoms that reflect a reduced capacity for plastic change and/or disrupted circadian rhythms follow, including cognitive impairment and lack of concentration.[9 10] Early child development has profound influences on health and well-being across the lifecourse.[11] Therefore, reduced or disrupted sleep, especially if it occurs at key times in development, could have important impacts on health throughout life.

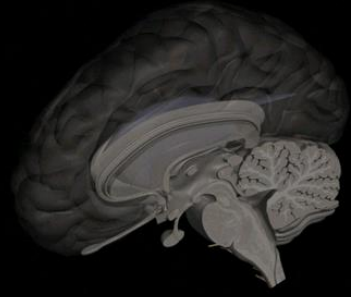
Most prior work on sleep and cognitive function has been conducted on adults and adolescents, and recent reviews point to the need for population-based studies, set in early childhood[12–15] that examine markers of sleep in relation to multiple measures of cognitive performance. Few prior studies[16–18] have considered these associations longitudinally. In this paper, we examine data from a large nationally representative prospective population-based cohort study to see whether and how reported bedtimes through early childhood relate to markers of cognitive performance at 7 years of age.

First, we look cross-sectionally to assess whether the time children go to bed and the consistency of bedtimes are related to cognitive test scores. Second, we look longitudinally to consider whether there are sensitive period or cumulative effects of markers of bedtimes through early childhood.

6. Music and sleep

Surprisingly, the effect of music on the sleep of children and adolescents has rarely been studied, despite the fact that electronic transmission of music has followed a similar developmental timeline to that of television. FM radio transmission began in the 1960s, with audio cassettes and compact discs developed in the 1980s, followed later by portable MP3 players in the late 1990s [23].

A recent study found that 42% of American adolescents reported listening to music on an MP3 player after 9 pm [20], and the National Sleep Foundation reported that 90% of adolescents have a music player in their bedroom [13]. But only two studies have explored the effectiveness of music as a sleep aid among school-aged children and adolescents. In a cross-sectional correlational study use of music as a sleep aid was related to later bedtime on weekdays, less sleep on weekdays, and increased tiredness among adolescents aged 12–17 years [37]. But it was not significantly related to bedtime or total sleep time on weekend days [37]. In an experimental study with participants in the 5th grade, participants were randomly allocated to either receive sedative classical music at naptime and bedtime for three weeks or not to receive music during this time [52]. The researcher found that children in the experimental group had better subjective global sleep quality over time than those in the control group [52]. They also experienced improvements in subjective sleep efficiency and subjective sleep duration, and there was a significant decrease over time in the percentage of children who were considered "poor sleepers" [52]. The intervention received by the experimental group, however, also involved a component of relaxation training, as the children in this group were instructed to monitor their breathing and relax their muscles as they listened to the music. Therefore, it cannot be concluded that the effects on sleep were purely a result of listening to music. Considering the widespread use of music players in the evening, more research is needed to ascertain the effects of different types of music on sleep.



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journal homepage: www.elsevier.com/locate/sleep

Review Article

Electronic media use and sleep in school-aged children and adolescents: A review

Neralie Cain, Michael Gradisar *

School of Psychology, Flinders University, Adelaide, SA, Australia

Sleep spindles in midday naps enhance learning in preschool children

Laura Kurdziel[a], Kasey Duclos[b,c], and Rebecca M. C. Spencer[a,b,1]

[a]Neuroscience and Behavior Program, [b]Department of Psychology, and [c]Commonwealth Honors College, University of Massachusetts Amherst, Amherst, MA 01002

Edited by Terrence J. Sejnowski, Salk Institute for Biological Studies, La Jolla, CA, and approved August 19, 2013 (received for review April 5, 2013)

Despite the fact that midday naps are characteristic of early childhood, very little is understood about the structure and function of these sleep bouts. Given that sleep benefits memory in young adults, it is possible that naps serve a similar function for young children. However, children transition from biphasic to monophasic sleep patterns in early childhood, eliminating the nap from their daily sleep schedule. As such, naps may contain mostly light sleep stages and serve little function for learning and memory during this transitional age. Lacking scientific understanding of the function of naps in early childhood, policy makers may eliminate preschool classroom nap opportunities due to increasing curriculum demands. Here we show evidence that classroom naps support learning in preschool children by enhancing memories acquired earlier in the day compared with equivalent intervals spent awake. This nap benefit is greatest for children who nap habitually, regardless of age. Performance losses when nap-deprived are not recovered during subsequent overnight sleep. Physiological recordings of naps support a role of sleep spindles in memory performance. These results suggest that distributed sleep is critical in early learning; when short-term memory stores are limited, memory consolidation must take place frequently.

formation in the prefrontal cortex occur around the preschool age (15). Lam et al. (16) suggest that the elimination of the midday nap may be a marker of this brain maturation. Specifically, they found a negative correlation between the number of times a preschool child napped during a week and performance on a battery of cognitive assessments.

However, whether individual sleep bouts contribute to recent memories in early childhood is unknown. Counter to what is observed in young adults, performance on a procedural memory task was not improved by overnight sleep in young (6–8 y; ref. 17) or older children (7–13 y; refs. 18 and 19). Wilhelm et al. (20) suggest that the absence of procedural memory consolidation in children may be due to insufficient initial encoding; children with extended training did exhibit sleep-dependent improvements in motor skill.

Nap-dependent consolidation of declarative memories in children has not been examined. Naps are sufficient for declarative memory consolidation in young adults (21). Moreover, declarative memories have been shown to benefit from nocturnal sleep in children 6–13 y of age (17, 19, 22). Thus, naps may function to consolidate declarative memories throughout early life. However, given the transitional nature of naps during early childhood

ARTICLE

Impact of Delaying School Start Time on Adolescent Sleep, Mood, and Behavior

Judith A. Owens, MD, MPH; Katherine Belon, BA; Patricia Moss, PhD

Objective: To examine the impact of a 30-minute delay in school start time on adolescents' sleep, mood, and behavior.

Design: Participants completed the online retrospective Sleep Habits Survey before and after a change in school start time.

Setting: An independent high school in Rhode Island.

Participants: Students (n=201) in grades 9 through 12.

Intervention: Institution of a delay in school start time from 8 to 8:30 AM.

Main Outcome Measures: Sleep patterns and behavior, daytime sleepiness, mood, data from the Health Center, and absences/tardies.

Results: After the start time delay, mean school night sleep duration increased by 45 minutes, and average bedtime advanced by 18 minutes (95% confidence interval, 7-29 minutes [t_{423}=3.36; $P<.001$]); the percentage of students getting less than 7 hours of sleep decreased by 79.4%, and those reporting at least 8 hours of sleep increased from 16.4% to 54.7%. Students reported significantly more satisfaction with sleep and experienced improved motivation. Daytime sleepiness, fatigue, and depressed mood were all reduced. Most health-related variables, including Health Center visits for fatigue-related complaints, and class attendance also improved.

Conclusions: A modest delay in school start time was associated with significant improvements in measures of adolescent alertness, mood, and health. The results of this study support the potential benefits of adjusting school schedules to adolescents' sleep needs, circadian rhythm, and developmental stage.

Arch Pediatr Adolesc Med. 2010;164(7):608-614

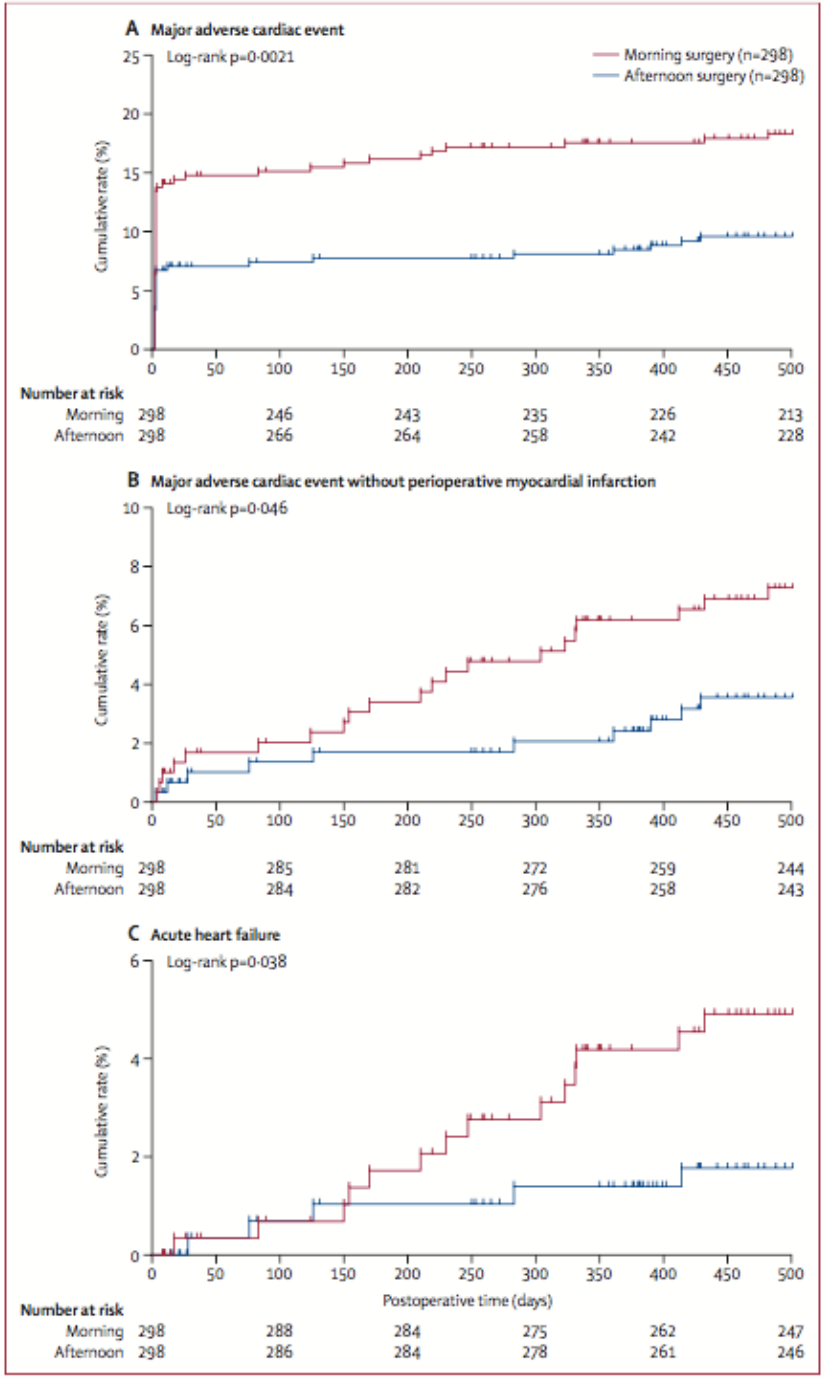

Figure 1: Cardiovascular events after aortic valve replacement surgery according to time of the day of surgery in the matched cohort population

Daytime variation of perioperative myocardial injury in cardiac surgery and its prevention by Rev-Erbα antagonism: a single-centre propensity-matched cohort study and a randomised study

David Montaigne, Xavier Marechal, Thomas Modine, Augustin Coisne, Stéphanie Mouton, Georges Fayad, Sandro Ninni, Cédric Klein, Staniel Ortmans, Claire Seunes, Charlotte Potelle, Alexandre Berthier, Celine Gheeraert, Catherine Piveteau, Rebecca Deprez, Jérome Eeckhoute, Hélène Duez, Dominique Lacroix, Benoit Deprez, Bruno Jegou, Mohamed Koussa, Jean-Louis Edme, Philippe Lefebvre, Bart Staels

Summary

Background On-pump cardiac surgery provokes a predictable perioperative myocardial ischaemia–reperfusion injury which is associated with poor clinical outcomes. We determined the occurrence of time-of-the-day variation in perioperative myocardial injury in patients undergoing aortic valve replacement and its molecular mechanisms.

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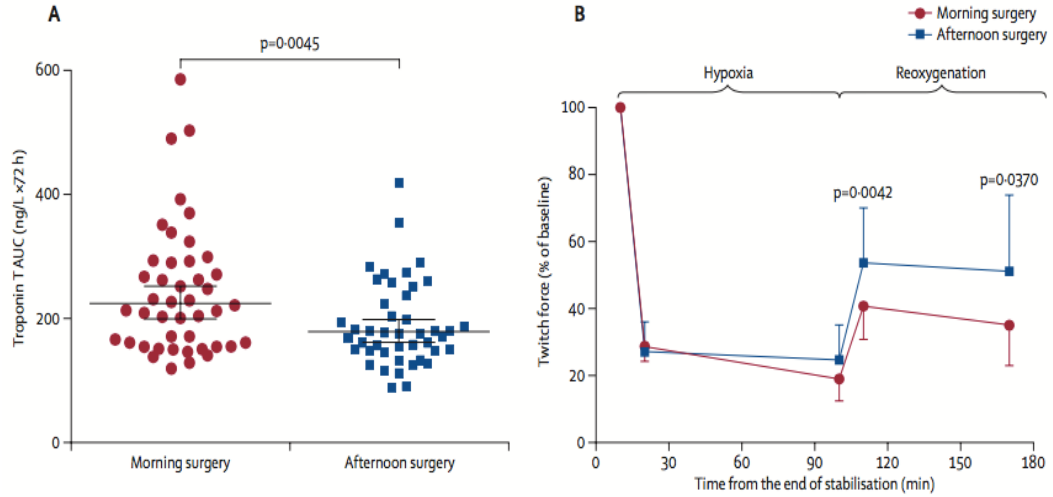
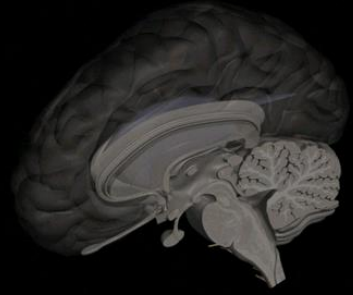


CUADROS EN LOS CUALES LOS TRASTORNOS DEL SUEÑO DEBEN PLANTEARSE COMO DIAGNÓSTICO DIFERENCIAL O CONTRIBUYENTES A LA CLÍNICA DEL PACIENTE:



-EPILEPSIA

-TRASTORNOS DEL ÁNIMO

-DETERIORO ACADÉMICO-TRASTORNOS DEL APRENDIZAJE

-TRASTORNOS DE CONDUCTA

-TRASTORNOS DE LA ALIMENTACIÓN

-FALLA DE INCREMENTO PONDO-ESTATURAL

-CUADROS PSIQUIÁTRICOS

-ALTERACIONES DE LA MEMORIA

-COMPROMISO DE CONCIENCIA (SÍNCOPE-LIPOTIMIA)

-CEFALEA

Reaction Time

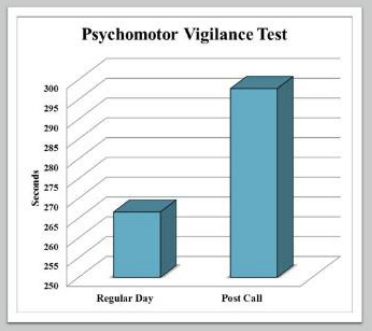
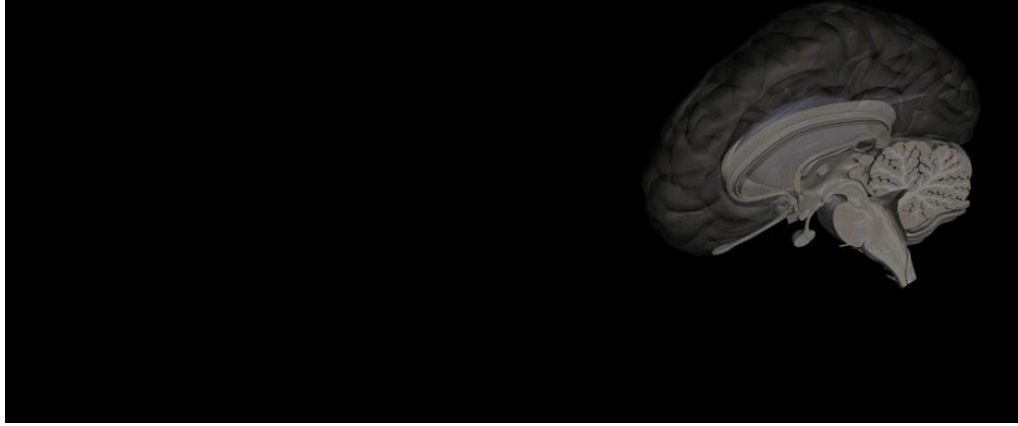


Figure. Reaction time.



Respiration and Sleep Medicine

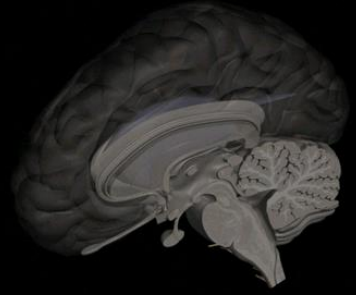
SPECIAL ARTICLE

Effect of Inadequate Sleep on Clinician Performance

CME

Haleh Saadat, MD

The negative impacts of sleep deprivation and fatigue have long been recognized. Numerous studies have documented the ill effects of impaired alertness associated with the disruption of the sleep-wake cycle; these include an increased incidence of human error–related accidents, increased morbidity and mortality, and an overall decrement in social, financial, and human productivity. While there are multiple studies on the impact of sleep deprivation and fatigue in resident physicians, far fewer have examined the effects on attending physicians, and only a handful addresses the accumulated effects of chronic sleep disturbances on acute sleep loss during a night call-shift. Moreover, the rapid and unprecedented spread of coronavirus disease 2019 (COVID-19) pandemic significantly increased the level of anxiety and stress on the physical, psychological, and the economic well-being of the entire world, with heightened effect on frontline clinicians. Additional studies are necessary to evaluate the emotional and physical toll of the pandemic in clinicians, and its impact on sleep health, general well-being, and performance. (Anesth Analg 2021;132:1338–43)



SUEÑO EN LA INFANCIA: OBJETIVOS A DOMINAR POR LOS ALUMNOS

-CONOCER LAS IMPLICANCIAS DEL SUEÑO EN EL NEURODESARROLLO

-CONOCER LAS REPERCUSIONES DE UN SUEÑO INADECUADO EN LA INFANCIA

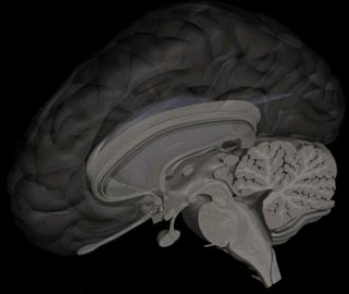
-CONOCER LOS PRINCIPALES TRASTORNOS DEL SUEÑO EN LOS NIÑOS Y ADOLESCENTES

-SER CAPAZ DE ORGANIZAR UNA ADECUADA “HIGIENE DEL SUEÑO” A LA FAMILIA

-CONOCER LOS RANGOS NORMALES DE HORAS DE SUEÑO EN DISTINTAS ETAPAS DE LA VIDA

-SER CAPAZ DE IDENTIFICAR LOS TRASTORNOS DEL SUEÑO COMO DIAGNÓSTICO DIFERENCIAL DE DISTINTAS PATOLOGÍAS DE LA INFANCIA

-CONOCER LOS DISTINTOS FACTORES AMBIENTALES QUE ALTERAN LA CALIDAD Y CANTIDAD DE SUEÑO



INSOMNIA