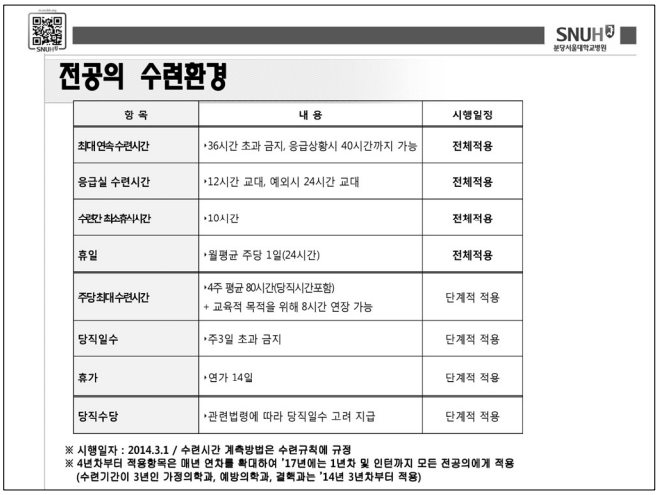
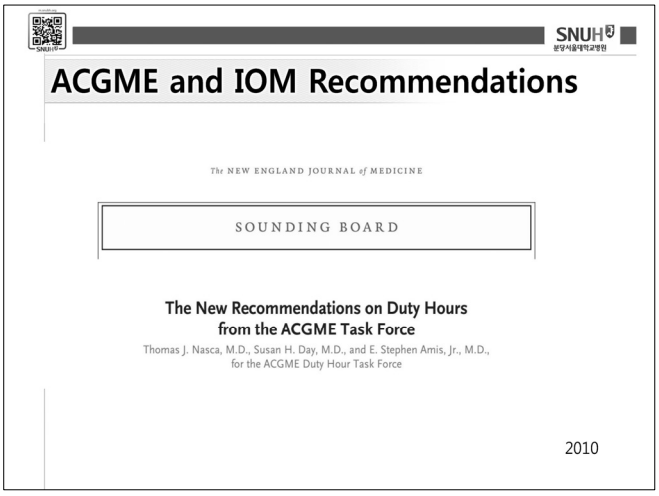

전공의가 알아야 할 수면질환
분당서울대병원
윤창호
SNUH
SEOUL NATIONAL UNIVERSITY
BUNDANG HOSPITAL


SNUH
분당서울대학교병원
전공의 수련환경
항 목
내 용
시행일정
최대연속수련시간
•36시간 초과 금지, 응급상황시 40시간까지 가능
전체적용
응급실 수련시간
•12시간 교대, 예외시 24시간 교대
전체적용
수련간 최소휴식시간
•10시간
전체적용
휴일
•월평균 주당 1일(24시간)
전체적용
주당최대수련시간
•4주 평균 80시간(당직시간포함)
+ 교육적 목적을 위해 8시간 연장 가능
단계적 적용
당직일수
•주3일 초과 금지
단계적 적용
휴가
•연가 14일
단계적 적용
당직수당
•관련법령에 따라 당직일수 고려 지급
단계적 적용
※ 시행일자 : 2014.3.1 / 수련시간 계측방법은 수련규칙에 규정
※ 4년차부터 적용항목은 매년 연차를 확대하여 '17년에는 1년차 및 인턴까지 모든 전공의에게 적용
(수련기간이 3년인 가정의학과, 예방의학과, 결핵과는 '14년 3년차부터 적용)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분당서울대학교병원
ACGME and IOM Recommendations
The NEW ENGLAND JOURNAL of MEDICINE
SOUNDING BOARD
The New Recommendations on Duty Hours
from the ACGME Task Force
Thomas J. Nasca, M.D., Susan H. Day, M.D., and E. Stephen Amis, Jr., M.D.,
for the ACGME Duty Hour Task Force
2010

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Evidence

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Effect of Reducing Interns' Work Hours on Serious Medical Errors in Intensive Care Units

Christopher P. Landrigan, M.D., M.P.H., Jeffrey M. Rothschild, M.D., M.P.H., John W. Cronin, M.D., Rainu Kaushal, M.D., M.P.H., Elisabeth Burdick, M.S., Joel T. Katz, M.D., Craig M. Lilly, M.D., Peter H. Stone, M.D., Steven W. Lockley, Ph.D., David W. Bates, M.D., and Charles A. Czeisler, Ph.D., M.D., for the Harvard Work Hours, Health and Safety Group

2004

Evidence

The NEW ENGLAND JOURNAL of MEDICINE

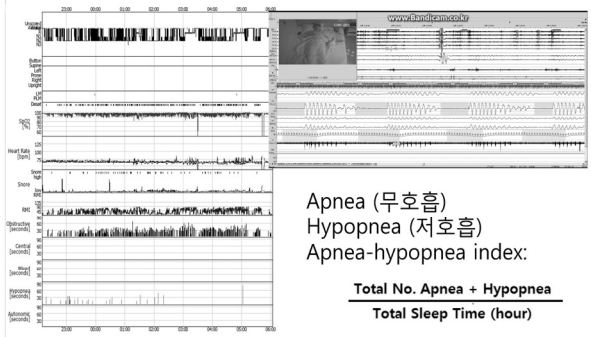
ESTABLISHED IN 1812 OCTOBER 28, 2004 VOL. 351 NO. 18

Effect of Reducing Interns' Weekly Work Hours on Sleep and Attentional Failures

Steven W. Lockley, Ph.D., John W. Cronin, M.D., Erin E. Evans, B.S., R.P.S.G.T., Brian E. Cade, M.S., Clark J. Lee, A.B., Christopher P. Landrigan, M.D., M.P.H., Jeffrey M. Rothschild, M.D., M.P.H., Joel T. Katz, M.D., Craig M. Lilly, M.D., Peter H. Stone, M.D., Daniel Aeschbach, Ph.D., and Charles A. Czeisler, Ph.D., M.D., for the Harvard Work Hours, Health and Safety Group

2004

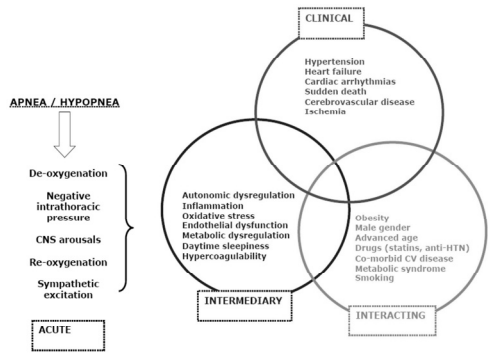
Clinical Significance



Apnea (무호흡)
Hypopnea (저호흡)
Apnea-hypopnea index:

$$\frac{\text{Total No. Apnea + Hypopnea}}{\text{Total Sleep Time (hour)}}$$

OSA Leads to STROKE



Caples, 2007

Does Sleep Apnea Increase Stroke Risk?

- N = 1022 (697 OSAS, 68%)
- Prospective observational cohort study
- Group: OSA vs. Non-OSA
- Outcome: stroke or death

- Unadjusted HR: 2.24 (1.30 – 3.86, p=0.004)
- Adjusted HR: 1.97 (1.12 – 3.48, p=0.01)
  (Age, sex, race, smoking, alcohol, BMI, DM, hyperlipidemia, atrial fibrillation, HT)

Yaggi HK, NEJM 2005

Significance of OSA

- Common condition
  - General population: 3-6%
  - Acute stroke patient: 40 – 75%
- Indicator of poor treatment outcome and high recurrence risk

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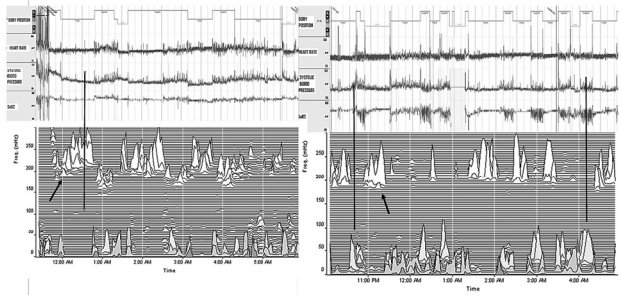
BP Surge Related to OSA



Cerebral Hemodynamic Changes in Stroke During OSA

- Bilateral NIRS

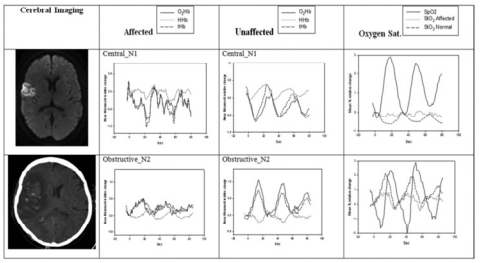


Figure. Cerebral imaging (first column), mean NIRS parameters of the affected (second column) and unaffected (third column) hemispheres, peripheral and cerebral oxygen saturation (fourth column) changes during central (first line), and obstructive (second line) apneas. NIRS indicates near-infrared spectroscopy.

Pizza F, Stroke 2012

Acute Stroke Care에서 주치의가 할일

- OSA screening as a part of vascular risk evaluation (HT, DM, HLP, OSA, smoking, heart disease, FHx, etc)
- **Clinical indicator of OSA**
  - Habitual snoring
  - Obesity (BMI > 25.0 kg/m^2)

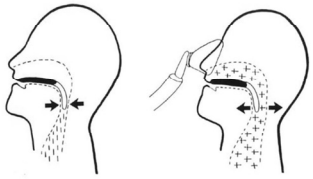
Diagnosis

- Overnight polysomnography

Parameters of Interests	Recording parameters	
	Polysomnography (PSG)	Portable devices
Features	Standard, attended, in-lab	Alternative, unattended, home
Sleep	**EEG** (electroencephalography) **EOG** (electro-oculography) **Chin EMG** (electromyography)	Portable PSG Portable devices • SaO_2 • + airflow • + respiratory effort • + ECG • + actigraphy (motion sensor) • + peripheral arterial tonometry (state marker, autonomic arousal)
Airflow	**Airflow sensor** • Nasal pressure transducer • Oronasal thermistor	
Results	**Sleep quality** (EEG, EOG, chin EMG) **Impaired gas homeostasis** • SaO_2 • End-tidal or pecutaneous CO_2 **Cardiac monitoring** • EKG	
Qualitative marker of sleep apnea	**Respiratory effort** • Chest/abdomen belt • Intercostal/diaphgram EMG	

Treatment

- Continuous positive airway pressure therapy (CPAP)



- **Pressured air as a drug**

요약

- Obstructive sleep apnea
- Stroke risk factor
- Screening
  - Habitual snoring and BMI
- Polysomnography
- CPAP

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하지불안증후군

- Restless legs syndrome (RLS)
= Willis-Ekbom disease (WED)
- 특징
  - Sensorimotor disorder with circadian tendency
  - An urge or a need to move the limbs to stop unpleasant sensations in the evening or while at rest
- Periodic limb movement during sleep (~80%)

Wijemanne 2015

진단기준

- The urge to move the legs, usually but not always accompanied by or felt to be caused by uncomfortable and unpleasant sensations in the legs
- The urge to move the legs and any accompanying unpleasant sensations begin or worsen during periods of rest or inactivity such as lying down or sitting

IRLSSG 2003, 2012

진단기준

- The urge to move and any accompanying unpleasant sensations are partially or totally relieved by movement, such as walking or stretching, at least as long as the activity continues
- The urge to move and any accompanying unpleasant sensations during rest or inactivity only occur or are worse in the evening or night than during the day

IRLSSG 2003, 2012

진단기준

- The above features are not solely accounted for by other medical or behavioral conditions, such as myalgias, venous stasis, leg edema, arthritis, leg cramps, positional discomfort, habitual foot tapping, other nocturnal sensory-motor symptoms

IRLSSG 2003, 2012

Treatment: Dopamine Agonist

Medication	Data	Dosing	Short-term	Long-term	Augmentation
Rotigotine	2 short-term & 2 long-term studies w/ Class I:	*0.5mg~4mg daily	Effective for short-term treatment of primary RLS [Level A]	Effective for long-term treatment of primary RLS [Level A]	Overall 5-yr incidence of clinical significant augmentation = 13.2% (39/295) - 5.1%: 1~3mg/day
Ropinirole	3 short-term & 1 long-term w/ class I: no change to previous recommendation	0.4~3.6mg daily	Effective for short-term treatment of primary RLS at mean dose of 2.1~3.1mg/day [Level A]	Possibly effective for long-term treatment of primary RLS at mean dose of 2.1~3.1mg/day [Level C]	6 mo study: 4% augmentation rate with 3% being clinical significant (vs. <1% placebo) + 6 mo OL study: 3% augmentation rate with 2% clinical significant
Pramipexole	8 short-term & 2 long-term studies w/ class I: change to previous recommendation	0.25~0.75 mg daily	**Effective** for short-term treatment of primary RLS at dose 0.25~0.75 mg/day [Level A]	Possibly effective for long-term treatment of primary RLS at dose 0.25~0.75 mg/day [Level C]	6 mo study: 9.2% augmentation rate (vs. 6% placebo) 46 wk OL study: 4.3% augmentation rate Mean 30.5 mo R study: 22.4% augmentation rate

Garcia-Borreguero D et al., Eur J Neurol. 2012 Nov;19(11):1385-96

Restless Legs Syndrome

- Sensorimotor disorder
  - Discomfort in leg with urge to move
  - Night/resting
  - Temporary improvement by movement
- Treatment: dopamine agonist

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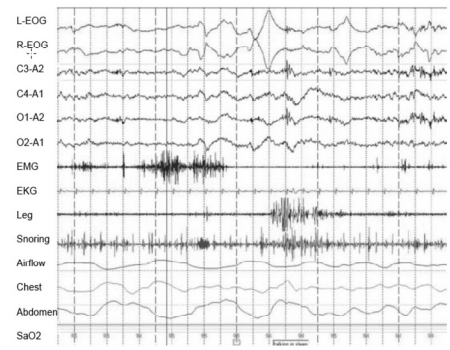
REM Sleep Behavior Disorder (RBD)

- Old age (older than 50 years old)
- Male preponderance
- Dream enactment
  - Violent
  - Vivid dream
  - 2nd half of night
- Progress into neurodegenerative diseases: Parkinsonism, dementia
- Treatment
  - Clonazepam
  - Melatonin
  - Donepezil
  - Pramiopexole



Take Home Message

- Obstructive sleep apnea와 stroke
- Restless legs syndrome
- REM sleep behavior disorder