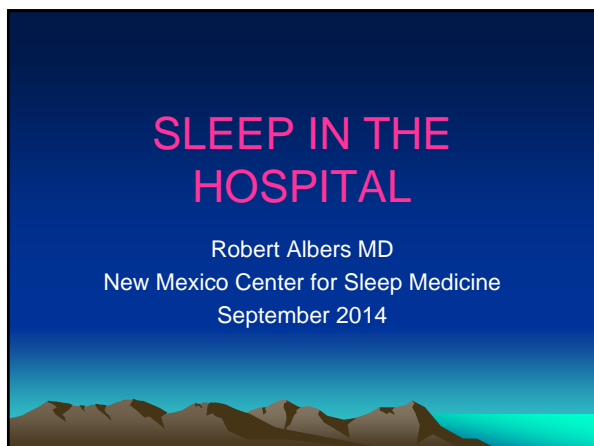


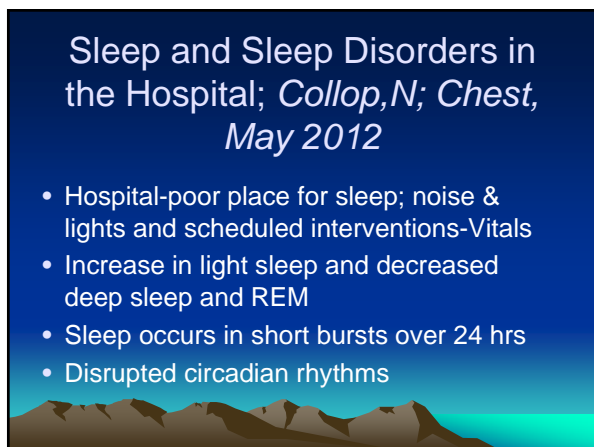
SLEEP IN THE HOSPITAL

Robert Albers MD
New Mexico Center for Sleep Medicine
September 2014



Sleep and Sleep Disorders in the Hospital; *Collop, N; Chest, May 2012*

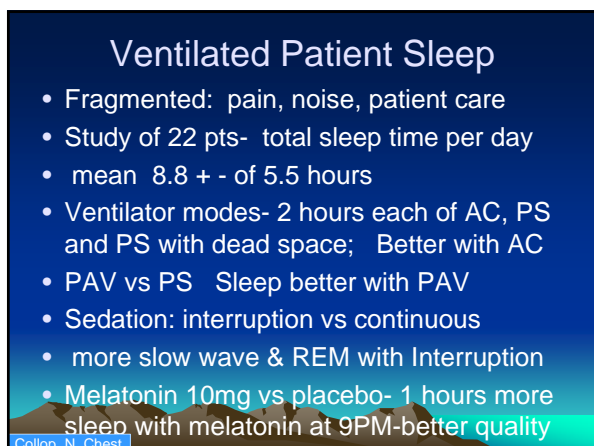
- Hospital-poor place for sleep; noise & lights and scheduled interventions-Vitals
- Increase in light sleep and decreased deep sleep and REM
- Sleep occurs in short bursts over 24 hrs
- Disrupted circadian rhythms



Ventilated Patient Sleep

- Fragmented: pain, noise, patient care
- Study of 22 pts- total sleep time per day
 - mean 8.8 + - of 5.5 hours
- Ventilator modes- 2 hours each of AC, PS and PS with dead space; Better with AC
- PAV vs PS Sleep better with PAV
- Sedation: interruption vs continuous
 - more slow wave & REM with Interruption
- Melatonin 10mg vs placebo- 1 hours more sleep with melatonin at 9PM-better quality

Collop, N. Chest



My First Case of Insomnia

- 1975-1st 24 hour call as a medical student
- 45yoF- severe fatigue,HTN,DMII,edema, DOE, nonsmoker. Difficulty sleeping in chair, never in bed.
- ABG- low O2 and high CO2, worse at night. HTN and DM worse at night.
- Mild obesity, postmenopausal, no asthma
- Snored in chair, occasion choking in sleep
- Awake-no difficulty breathing or swallowing

Insomnia Patient

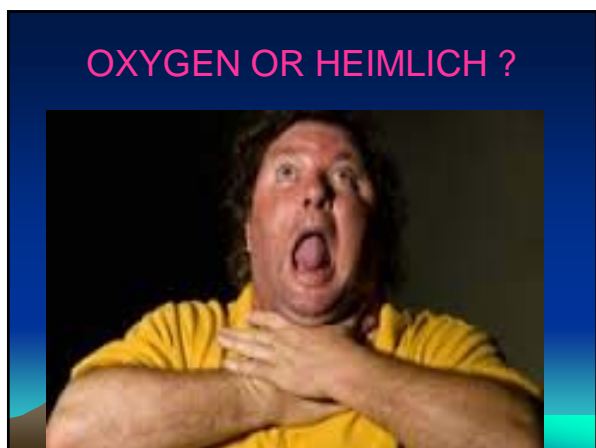
- CXR- heart prominent, no infiltrates or edema
- No oximetry or 2-D echo (stone age)
Work-up started, looking for Zebras
- She died 2 nights later, in her chair
- 1977 – Dement and Guilleminault report case of insomnia with apneas

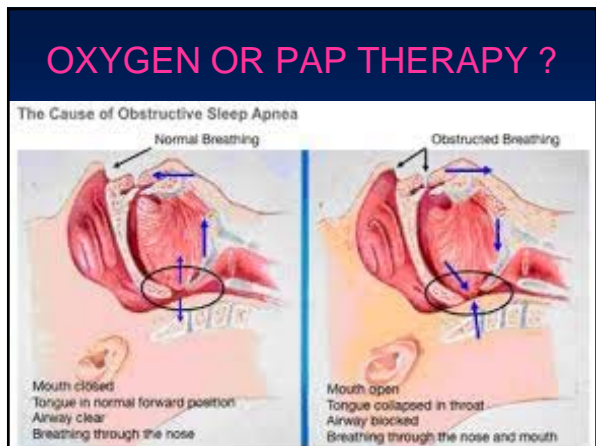
Insomnia with Sleep Apnea

- Stanford Grand Rounds presentation
- Chief of Pulmonary Medicine-walked out
- What would two psychiatrist know about breathing and snoring?
- Their advantage: they watched people sleep.









Obstructive Sleep Apnea

- 5% of the US population
- Sleep apnea – Stroke pts- 60-90%
- risk of early death-OSA with Stroke
- Acute MI- undiagnosed OSA in 60%
- Decompensated HF- 75%- AHI of 15 or G
- Internal Med Service- BMI greater 35kg/M2 Hypoventilation in 31%
- CPAP underused in hospital - one study showed only 6% diagnosed with sleep apnea provided with CPAP therapy

Zollop, N. Chest

OSA Patients with Pneumonia

- Retro- 250,907 patients- 347Hospitals
- 2007 to 2010, 66%CAP-6.2% had OSA
- Inv-Vent(18%vs9%), Noninv(29%vs7%)
- More likely **men,obese,young,COPD,HF**
- More likely to deteriorate clinically
- More use of resources

Lindernauer-Chest-May 2014;1032-1038

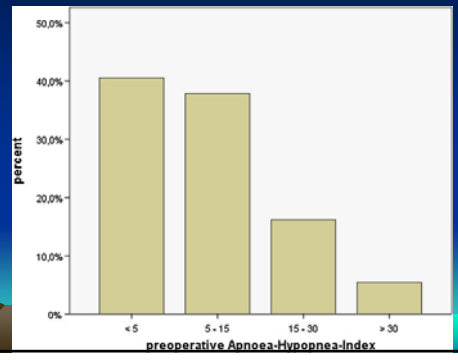
CPAP vs Oxygen in patients with HTN

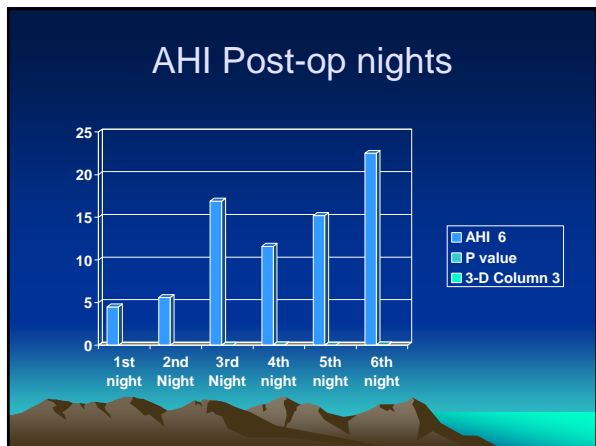
- 281 randomized to O2 or CPAP
- AHI of 15 to 50/hr
- 12 weeks of therapy
- 24 hours - mean arterial pressure
- Significantly lower with CPAP than O2 alone or control group
- O2 use=4.8hrs, CPAP use=3.5hrs
- CPAP ? Prevent post-apnea BP surge
- *S Redline, et al NEJM, 370:24 6-12-2014*

Perioperative SDB Roggernbach, J et al; Patient Safety in Surgery, 3-13-2014

- Prospective- Major Abdominal Surgery
- No previous Dx of SDB
- Study -4 channel- No "EEG"
- presurgery & post-op - 37 patients
- 40% prostate – fluid load post-op common
- Increased SDB common after 2nd night

Preop - 4 Channel Screening





OSA & Severe Maternal-Infant Morbidity/Mortality in USA 1998-2009

Louis, J et al SLEEP, vol37, No5, 2014

- OSA-0.7/10,000 1998 to 7.3/10,000 2009
- Ave. ann. increase of OSA Dx---24%/year
- If OSA Dx -OR for preeclampsia 2.5
- eclampsia 5.4
- cardiomyopathy 9.0
- pulmonary embolism 4.5
- In hospital mortality 5.0

Stop-Bang Sleep Apnea Questionnaire

1. Snoring Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?	Yes No
2. Tired Do you often feel tired, fatigued, or sleepy during daytime?	Yes No
3. Observed Has anyone observed you stop breathing during your sleep?	Yes No
4. Blood pressure Do you have or are you being treated for high blood pressure?	Yes No
5. BMI BMI more than 35 kg/m2? (obese)	Yes No
6. Age Age over 50 yr old?	Yes No
7. Neck circumference Neck circumference greater than 40 cm?	Yes No
8. Gender Gender male?	Yes No

High risk of OSA: answering yes to three or more items
Low risk of OSA: answering yes to less than three items

*sensitivity varied from 76% to 96%, and the specificity ranged from 13% to 54%.“ – ie. – will pick it up but lots other things can cause those problems like restless legs

Anesthesiology 2008; 108:812-21 STOP Questionnaire: A Tool to Screen Patients for Obstructive Sleep Apnea. Frances Chung et al

+ STOP-BANG and Preeclampsia
Goldfarb, I et al; Obstet Gynecol;
May 2014; 123 Suppl 1:53S

- OSA Dx with PSG associated with pre-eclampsia and intrauterine growth restriction in previous studies

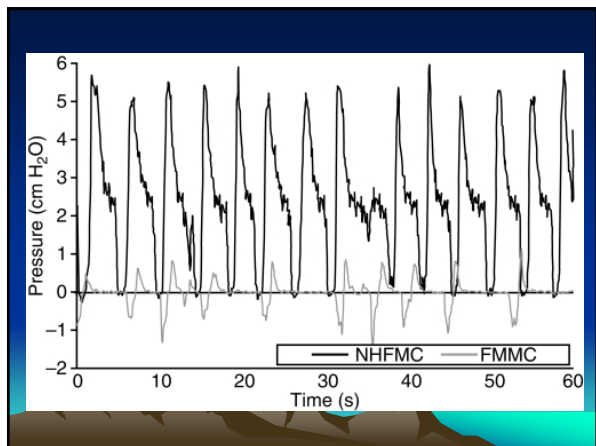
103 pregnancies screened with STOP BANG-
19 "+" (18%)
42% of screen positive –preeclampsia
13% of screen negative – preclampsia
No association with IUGR
53% of total would accept formal PSG if recommended by their health care provider

Treatment of OSA with CPAP

- Very Challenging in the hospital
- Staff bias against OSA and CPAP therapy
- PSG blows up DRG reimbursement
- Education of patient to use CPAP takes a lot of time and TLC
- CPAP mask selection is usually minimal
- Mask comfort and humidity are number 1 challenges

Nasal High Flow Oxygen





Nasal High-Flow vs Venturi Mask Oxygen Therapy-Post extubation
Maggiore, SM; AJRCCM, 8-1-2014,

- 105 ventilated for ARF for at least 48hrs
- Randomized to NHF or Venturi
- same FiO₂ post extubation
- NHF-4 respiratory failure(2NIV,2 Intubate)
- Venturi-18 RF(7NIV, 11 intubated)

• **NHF is really low pressure CPAP/PEEP with enhanced humidity**

1977- Sleep Apnea

- Chief of Pulmonary Disadvantage:
- He only observed people awake
- He assumed snoring was normal and pauses in breathing common without impact on health

• 40 years later, most physicians have the same disadvantage

2014

- The advantage goes to the night shift worker
- You need to repeatedly present your observations of a patient with sleep apnea
- Even when daytime clinicians, repeatedly walk away
