Indiana Patient Safety Center
of the Indiana Hospital Association

# 1 Opioid & Sedation Management

ADE Failure to Rescue Delirium Falls Airway Safety VTE VAE

W A K E - U P

Ignore the Snore No More: Obstructive Sleep Apnea & STOP BANG

February 20, 2018

IHAconnect.org/Quality-Patient-Safety
Indiana’s Bold Aim

To make Indiana the safest place to receive health care in the United States...

*if not the world*
**WAKE UP** promotes opioid and sedation management to reduce unnecessary sleepiness and sedation.

- Informational State Survey
- Educational Webinars
- Online Resources
  - Webinar recordings, resource sheet, webinar information sheet and pre-written WAKE UP social media are available here on the IHAconnect.org website: [https://www.ihaconnect.org/patientsafety/Initiatives/Pages/UP-Campaign.aspx](https://www.ihaconnect.org/patientsafety/Initiatives/Pages/UP-Campaign.aspx)
Wake Up Webinars

State of the State: State & National Opioid Stats and Emergency Department Point Program
- January 23, 3-4pm ET: Kaitlyn Boller, MHA & Krista Brucker, MD
- Audience: Emergency Dept personnel, LCSW, pharmacy, discharge planners, care coordinators, quality, educators

Obstructive Sleep Apnea & STOP BANG Assessment
- February 20, 3-4pm ET: Abhinav Singh, MD
- Audience: Medical Surgical Staff, Respiratory, Educators

Sedation Management and Opioid Practices to Minimize Harm
- March 6, 3-4pm ET: Opioid & Sedation Management Best Practices & ABCDEF Bundle
- Maryanne Whitney, Cynosure Health & Jennifer Hittle, IU Health Arnette
- Audience: ICU/Medical/Surgical/Procedural Staff & Managers, Pharmacy, Respiratory, Educators

Delirium Assessment, Prevention, & Treatment
- March 20, 3-4pm ET: Malaz Boustani, MD
- Audience: Quality, ICU/Medical/Surgical Staff & Managers, Pharmacy, Educators

Use the following to join each installment in the series:

Dial in number: (888) 390-3967  
Participant link: https://join.onstreammedia.com

IHAconnect.org/Quality-Patient-Safety
Wake-Up Resources

- **Social Media**
- **Resource Sheet**
- **Webinar Information**
  - (click hyperlink above to access—also accessible on IHA website-Patient Safety Up Campaign)
- **Patient Safety Awareness Week Toolkit and**
  - [IPSCresources.com](http://IPSCresources.com)
2018 Patient Safety Awareness Week

March 11-17, 2018
Patient Safety Awareness Week

Daily Topics

• Opioid Awareness
• Wake Up: Know Your Meds
• Get Up: Prevention of Falls
• Soap Up: Hand Hygiene
• Safe Antibiotic Usage
• Could it be Sepsis?
• Safe Infant Sleep Practices
Objectives

Following this webinar,

1. Identify signs, symptoms & pathophysiology of Obstructive Sleep Apnea (OSA)
2. Identify potential complications of OSA
3. Describe STOP BANG assessment for OSA
4. Describe Pre-acute, Acute Care & Post-Acute process improvements to reduce respiratory depression from OSA
5. Describe relationship of STOP BANG OSA Assessments in HIIN Wake-Up Campaign
Wake UP Overview

1. Is my patient awake enough to get up or is there a change in sedation level?

At risk medicines:
- Opioids & Sedatives
- Antihistamines/anticholinergics
- Antipsychotics
- Some antidepressants
- Anti-emetics
- Muscle relaxants

HIIN Script Up 1/30/18:

American Geriatric Society Beers Criteria Meds to watch in ≥ 65 yo
Beers Criteria Medications

- **Anticholinergics**: Benadryl®, Phenergan®, Vistaril®
- **Antispasmodic agents**: Donnatal®, Bentyl®, Librax®, Probanthine®
- **Sleep aids**: Ambien®, Luminal®, Dalmane®, Nembutal®
- **Benzodiazepines**: Ativan®, Valium®, Xanax®, Librium®, Klonopin®
- **NSAIDS**: Advil®, Motrin®, Aleve®
- **Cardiac drugs**: Digoxin > 0.125mg/day, Procardia®, Catapres®
Hospital Resources

ADDRESSING SUBSTANCE ABUSE

Designed to help staff provide support to all patients with special attention to substance abuse, this toolkit provides access to articles, policies, management techniques, assessment tools and more. Our Addressing Substance Abuse Checklist should be printed and shared.

Prescribing and Treatment

ED Prescribing Guidelines
- Indiana Guidelines for Opioid Prescribing in the Emergency Department

Chronic Pain Rules
- Indiana Pain Management Prescribing Requirements Final Rule
- Summary | Indiana Pain Management Prescribing Final Rule | ISMA
- Comparison of CDC Guidelines to Indiana Prescribing Rule | ISMA

Acute Pain Prescribing Guidelines
- Indiana Guidelines for Managing Acute Pain

https://www.ihaconnect.org/member/resources/Pages/Checklist.aspx
Wake Up Checklist

WAKE UP

To reduce: ADE, airway safety events, delirium, falls, VAE and VTE

☐ Are the dangers of over sedation known?
☐ Is there a strong desire to keep sedation to a minimum?
☐ Have you selected evidence-based assessment tools such as:
  ☐ STOP BANG (identifies patients at risk for obstructive sleep apnea)
  ☐ PASERO OPIOID-INDUCED SEDATION SCALE (POSS)
  ☐ RICHMOND AGITATION SEDATION SCALE (RASS)
☐ Have staff been educated on the use of the selected assessment tool(s) and performance expectations?
☐ Is there a place to document the results of the assessment(s)?
☐ Are assessment targets established for each patient?
☐ Are the results from assessment(s) used to modify sedation levels?
☐ Is there a protocol in place to adjust sedation levels?

http://www.hret-hiin.org/engage/up-campaign.shtml
Wake UP Processes

- **Patient & family awareness** of dangers of opioids
- **Use of non-opioid and non-pharmacologic pain management**
- **Safe order sets** preventing high opioid doses to opioid naïve patients and prevent layering of benzos on opioids
- **Routine nursing assessments** that **pair pain & sedation tools** (e.g. Pasero Opioid Sedation Scale or Michigan Opioid Sedation Scale)

**WARN YOURSELF:** This is high risk.

**ASSESS:** Use tools (STOP BANG, POSS, RASS, PA-PSA).

**KNOW:** Your drugs, your patient.

**ENGAGE:** Patients and families to set realistic pain expectations, use of non-sedating analgesics, risks of opioids.

**UTILIZE:** Dose limits, layering limits, soft and hard stops.

**PROTECT:** The patient...our ultimate job.
Polling Question #1

What is your primary role within your organization?

- Infection Prevention
- Nursing Professional
- Laboratory Professional
- Medical Staff
- Environment Services / Housekeeping
- Social Worker
- Mental Health Professional
STOP BANG Use: 28%

### ANSWER CHOICES

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasero Opioid-Induced Sedation Scale (POSS) prior to an after opioid administration</td>
<td>66.67% 12</td>
</tr>
<tr>
<td>Offer multi-modal pain management - both pharmacologic and non-pharmacologic modalities</td>
<td>50.00% 9</td>
</tr>
<tr>
<td>Setting realistic pain management expectations prior to admission</td>
<td>44.44% 8</td>
</tr>
<tr>
<td>Asking about comfort level in addition to pain score</td>
<td>55.56% 10</td>
</tr>
<tr>
<td>Using teach-back methods with patients and families to enhance their knowledge and assist in setting pain management expectations</td>
<td>66.67% 12</td>
</tr>
<tr>
<td>STOP BANG for identifying Obstructive Sleep Apnea</td>
<td>27.78% 5</td>
</tr>
<tr>
<td>Richmond Agitation Sedation Scale (RASS)</td>
<td>72.22% 13</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>Responses 22.22% 4</td>
</tr>
</tbody>
</table>

Total Respondents: 18

If yes, do you use or complete the following? (Check all that apply)

- Pasero Opioid-induced Sedation Scale (POSS) prior to an after opioid administration
- Offer multi-modal pain management - both pharmacologic and non-pharmacologic modalities
- Setting realistic pain management expectations prior to admission
- Asking about comfort level in addition to pain score
- Using teach-back methods with patients and families to enhance their knowledge and assist in setting pain management expectations
- STOP BANG for identifying Obstructive Sleep Apnea
- Richmond Agitation Sedation Scale (RASS)
- Other (please specify)

Answered: 16  Skipped: 2
Ignore the Snore...
No More!!

SLEEP APNEA IN THE SURGICAL PATIENT

ABHINAV SINGH  MD, MPH, DABIM-SM [ SLEEP MEDICINE ]
DEBBY HENTZ, RN, MSN, CS, CPHQ [QUALITY COORDINATOR]
JULI WHITE, MSN, APRN, FNP, NE-BC [ SLEEP MEDICINE ]

FEBRUARY 20, 2018  3.00 PM
What's the connexion?

Spuyten - Duyvil Metro North Bronx, 2013

Challenger 1986

Three Mile Island 1979

AIR FRANCE 447 2009

FACES of SLEEP DISORDERS
Road Map!

- **Introduction and Timeline.**
- Epidemiology. [Overall vs Surgical pts]
- Definition, Diagnosis and Treatment.
- Screening Tools.
- Risks of Untreated OSA in the perioperative Population.
- Perioperative Protocols & Challenges.
- Future Direction.
Why Sleep?

(NREM) 75%
- Stage 1
- Stage 2
- Stage 3
- Stage 4

Body's rest, recovery & metabolic restoration, regulation, immunity

(REM) 25%
- Phasic eye movements
- Loss of muscle tone
- EEG neutral

Active state of brain → learning, memory

Time Ticks Away

1837
- 1837 – Pickwick Papers, Charles Dickens
- 1918 – Osler Coins Pickwickian
- 1929 – EEG discovery

1950
- 1952 Discovery of REM sleep - University of Chicago

1970
- 1970s - Obstructive Sleep Apnea
- Only Cure - Tracheostomy

1980
- 1981 – Invention of CPAP, Australia
- 1990-2000 – Development of Bi Level PAP, ENT Surgery ; UPPP

2000
- 1990-2000 – CPAP, Bi Level PAP, Oral Appliances,
- 2000-2010 – Auto PAP, Humidity, Adaptive Servo Ventilation, Masks

NOW
- CPAP, Bi-level PAP with adaptive breathing, Portable Ventilators, Povent, Hypoglossal Nerve stimulator, More interfaces
Road Map!

- Introduction and timeline
- Epidemiology. (Overall vs Surgical pts)
- Pathophysiology, Definition, Diagnosis & Rx
- Risks of Untreated OSA (Overall vs Surgical Pts)
- Screening tools
- Perioperative Protocols and Challenges.
- Future Direction
Epidemiology Of OSA

- Snoring → 40% of men & 20% of women. ? Habitual Snoring

- ~ 9% of the adult population has OSA. [NEJM 1993; 328: 1230-35, WI Cohort]

- Recent studies ~ OSA rates as high as 26% of adults between 30-70 yrs of the U.S. population. 2013.

- Untreated OSA Cost: Medical, Mental Health, Work Productivity loss, Motor Vehicle Accidents > $150 billion / yr.
  
  *Frost and Sullivan 2014*
Epidemiology


© American Academy of Sleep Medicine 2016
OSA - Surgical Population Prevalence

- **General Surgery (~25%)**

- **Bariatric Surgery (~70%)**
  - Frey et al Obes Surg 2004;14:23-6

- **Elective Surgery (41%)**

- **Epilepsy Surgery (33%)**

**Bottom Line – Surgical population prevalence HIGHER!**

80% pts unaware prior to undergoing surgery
Road Map!

- Introduction and timeline.
- Epidemiology. (Overall vs Surgical pts)
- Pathophysiology, Definition, Diagnosis & Rx.
- Risks of Untreated OSA (Overall vs Surgical Pts)
- Screening tools
- Perioperative Protocols and Challenges
- Future Direction
Patho-Fizz!

Normal Breathing
- Airway is open
- Air flows freely to lungs

Obstructive Sleep Apnea
- Airway collapses
- Blocked air flow to lungs

http://www.toptenz.net/top-10-bizarre-sleep-disorders.php
OSA – playing the odds!
Visual Cues

Mallampati Score

Why do men have more OSA?

Pear vs Apple
Diagnosis

Polysomnography – In lab

Home Sleep Apnea Test
Snoring – Posterior airway vibration (60-70 db)

- Whisper 20 db, Conversation 30 db, Vacuum Cleaner 70db

Mild OSA $\rightarrow$ AHI = 5-15/hr. of Sleep.
Moderate OSA $\rightarrow$ AHI = 15-30/hr. of Sleep.
Severe OSA $\rightarrow$ AHI = 30/hr of Sleep.

RDI > 20/hr > 40/hr (Apnea + Hypopnea + RERA)

REI Respiratory Event Index
Treatments
Bypass Surgery, Stents, Pacemakers

Mild – Moderate OSA
- CPAP
- Auto – PAP
- Bi level – PAP
- Oral Appliance
- Postural therapy
- Weight loss

Moderate – Severe OSA
- CPAP (Gold standard)
- Auto - PAP
- Bi Level PAP
- Surgical ( ENT, UPPP, DNS )
- Surgical ( Mandibular advancement)
- Hypoglossal nerve stimulator
- Tracheostomy ( rarely done)

PAP therapy - Mainstay
Treatment of OSA

- 100 interfaces
- Downloadable
- Auto PAP /Humidity
- 35 yrs since invention
Road Map!

- Introduction and timeline.
- Epidemiology. [Overall vs Surgical pts]
- Pathophysiology, Definition, Diagnosis & Rx.
- Risks of Untreated OSA (Overall vs Surgical Pts)
- Screening tools.
- Perioperative Protocols and Challenges.
- Future Direction.
Untreated OSA- *more than meets the eye*

Shamsuzzaman et al JAMA 2003
Bad Company!!

Diseases Associated with OSA

- **Hypertension**: 35%
- **Atrial Fibrillation**: 49%
- **Pacemakers**: 59%
- **Diabetes**: 72%
- **Congestive Heart Failure**: 76%
- **Obesity**: 77%
- **Drug Resistant Hypertension**: 83%
- **Night Tme Heart Attacks**: 91%

- 85% or 30-40 million patients are undiagnosed.
- Comorbidities make treatment a must.
Surgical Pt. + Untreated OSA = Perfect Storm

- **Perioperative medications** (eg, **sedatives**, general anesthetic agents, opioids, neuromuscular blocking agents) may
  - Reduce upper airway dilator tone
  - Inhibit **protective** airway reflexes
  - **Inhibit** Central ventilatory drive, & **blunt protective arousal mechanisms**
  - **Inhibit** peripheral chemo-responsiveness to hypoxic & hypercapneic stimuli
  - Exacerbate repetitive upper airway collapse in **pts with OSA**.
Nightmare continued..

- Surgical patients are at risk for fluid and salt retention. (Rostral fluid shifts legs to neck) (Peri Op IVFs)

- Supine posture

- Perioperative discontinuation of continuous positive airway pressure (CPAP) - More Fuel to the fire!
REM Sleep Rebound

- **NORMAL REM physiology** - 25% of the night, increased instability of heart rate, respiration, and blood pressure
  - In OSA pts → REM related hypoxic episodes 2-3 times increased
  - Pharyngeal tone is further diminished; with hypoxic sympathetic tone increased

- Surgical trauma **releases inflammatory cytokines**
  - (TNF-α), interleukin 1 (IL-1), & IL-6. = REM SUPPRESSION

- REM sleep frequently absent on 1-3 post-op days, then **REM rebound occurs**.

- REM sleep is also associated with **increased sympathetic discharge** leading to tachycardia, hemodynamic instability, and myocardial ischemia.
Post – Op Morbidity

- Majority of unexpected & unexplained postoperative deaths occur **at night** and within **7 days of surgery**.
- In MI survivors, **OSA** found in **36%** vs **3.8%** of matched controls.
- After correcting for known risk factors, OSA with AHI>5.3 was independently predictive of MI with an odds ratio of 23.3 (p<0.001)

*Chest 2006;129:198-205*

**Tough? Unethical** to do a study; Sham CPAP group to prove increased morbidity.
Difficult to replicate perioperative scenario in Animal models. Unique OSA
<table>
<thead>
<tr>
<th>Author</th>
<th>Type of Study</th>
<th># of Patients</th>
<th>Dx of OSA</th>
<th>Type of Surgeries</th>
<th>Complications</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gupta et al.98</td>
<td>Case control study</td>
<td>101 Pts. with OSA &amp; 101 matched controls</td>
<td>PSG</td>
<td>Orthopedic (hip or knee replacement)</td>
<td>Reintubation, hypoxemia, acute hypercapnia, MI, arrhythmia, delirium, &amp; ICU transfer</td>
<td>Pts with OSA had higher rate of postoperative complications (39% vs 18%). These pts also had increased hospital length of stay.</td>
</tr>
<tr>
<td>Auckley et al.105</td>
<td>Historical cohort study</td>
<td>81 pts with completed Berlin Q</td>
<td>Berlin Q</td>
<td>Elective surgery (type of surgeries is not included in the abstract)</td>
<td>Hypoxemia, hypercapnia, reintubation, atelectasis, pneumonia, arrhythmia, thromboembolism</td>
<td>Pts. with high-risk of sleep apnea based on the Berlin Q had a higher rate of postoperative complications (20% vs 4.5%).</td>
</tr>
<tr>
<td>Kaw et al.100</td>
<td>Case control study</td>
<td>37 pts with OSA &amp; 185 matched controls</td>
<td>PSG</td>
<td>Cardiac</td>
<td>Encephalopathy, postoperative infections, and ICU length of stay</td>
<td>Pts. with OSA had higher rate of encephalopathy, postoperative infections (mediastinitis), &amp; increased ICU length of stay.</td>
</tr>
<tr>
<td>Hwang et al.102</td>
<td>Historical cohort study</td>
<td>172 Pts underwe nt NOSS</td>
<td>Home NOSS</td>
<td>Abdominal, ENT, Thoracic, Vascular, Gyn, Neurosurgical, Urologic, Cardiothoracic, and Orthopedic</td>
<td>Arrhythmia, hypoxemia, atelectasis, GI bleed, pneumonia, PE,</td>
<td>Pts with ODI 4% ≥ 5/h had a higher rate of postop complications than those with ODI4% &lt; 5/h (15.3% vs 2.7%).</td>
</tr>
<tr>
<td>Author et al.</td>
<td>Study Design</td>
<td>Number of Participants</td>
<td>Matched Controls</td>
<td>Primary Diagnosis</td>
<td>Incidence of Postoperative Complications</td>
<td></td>
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<td>--------------</td>
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</tr>
<tr>
<td>Liao et al. 99</td>
<td>Retrospective matched cohort study</td>
<td>240 Pts with OSA &amp; 240 matched controls</td>
<td>(ICD-9) codes</td>
<td>Cardiac, ENT, Orthopedic, Spine, Urologic, General, Gyn, &amp; Plastic</td>
<td>Hypoxemia, pulmonary edema, bronchospasm, arrhythmia, confusion</td>
<td></td>
</tr>
<tr>
<td>Vasu et al. 16</td>
<td>Historical cohort study</td>
<td>135 pts. completed STOP BANG Q</td>
<td>STOP BANG Q</td>
<td>Orthopedic Abdominal Head &amp; Neck, ENT, Gyn, Vascular, Cardiothoracic</td>
<td>Hypoxemia, pneumonia, PE, atelectasis, hypotension, A-Fib</td>
<td></td>
</tr>
<tr>
<td>Memtsoudis et al. 101</td>
<td>Case control study</td>
<td>58358 orthopedic pts with OSA &amp; 45547 G Surg pts with OSA were matched for controls in 1:3 manner</td>
<td>(ICD-9) codes</td>
<td>Orthopedic &amp; G surgery</td>
<td>Aspiration pneumonia, pulmonary embolism, need for intubation and mechanical ventilation, ARDS</td>
<td></td>
</tr>
<tr>
<td>Kaw et al. 103</td>
<td>Cohort study</td>
<td>471 pts who underwent non-cardiac surgery within 3 yrs of PSG</td>
<td>Pts with an (AHI) ≥ 5/h = OSA, and &lt;5/hr Controls</td>
<td>Non-cardiac surgery</td>
<td>A Fib, respiratory failure, hypoxemia, delirium, transfer to ICU, CHF, MI, hospital length of stay</td>
<td>Pts with OSA had a higher rate of postop hypoxemia (12.4% vs 2.1%), transfer to ICU (6.7% vs 1.6%), any complication (14.2% vs 2.6%), &amp; hospital length of stay.</td>
</tr>
</tbody>
</table>
Respiratory Complications

- Profound oxyhemoglobin desaturation
- Aspiration pneumonia & ARDS
- Post-obstructive pulmonary edema (from breathing against an obstructed upper airway)
- Emergent non Invasive Ventilation. Bi Level PAP. ICU tx
- Acute respiratory Failure, Arrest & Re intubation
Cardiovascular Complications

- Large BP fluctuations.
- Myocardial ischemia.
- Cardiac arrhythmias. (Watch me fib watch me ne ne)
- Increased Length of Stay.
- Sudden Cardiac death.
- Post op delirium. (X 6 fold in Cardiac Surgeries)
- Elective Hips & Knee Sx – X 2 fold hospital death.
Road Map!

- Introduction and timeline.
- Epidemiology. [Overall vs Surgical pts]
- Pathophysiology, Definition, Diagnosis & Rx.
- Risks of Untreated OSA (Overall vs Surgical Pts)
- Screening tools.
- Perioperative Protocols and Challenges.
- Take Home points & Future Direction.
Screening Tools

- STOP BANG (8 point simple questionnaire)
- PSG. (polysomnography i.e. Sleep study)
- Home Sleep Apnea Testing. (Portable, at home)
- BERLIN Questionnaire
- ASA Check list

- Established OSA – Compliant
- Established OSA - Non Compliant
# STOP - BANG

## STOP

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you <strong>SNORE</strong> loudly (louder than talking or loud enough to be heard through closed doors)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you often feel <strong>TIRED</strong>, fatigued, or sleepy during daytime?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has anyone <strong>OBSERVED</strong> you stop breathing during your sleep?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have or are you being treated for high blood <strong>PRESSURE</strong>?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## BANG

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong> more than 35kg/m2?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AGE</strong> over 50 years old?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NECK</strong> circumference &gt; 16 inches (40cm)?</td>
<td></td>
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</tr>
<tr>
<td><strong>GENDER</strong>: Male?</td>
<td></td>
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</tr>
</tbody>
</table>

High risk of OSA: Yes 5 - 8
Intermediate risk of OSA: Yes 3 - 4
Low risk of OSA: Yes 0 - 2

*Chung F et al. Anesthesiology 2008; 108: 812-821,*
+ STOP-BANG score ≥ 3 (any 3 positive items),

- **Sensitivity** for identifying moderate-severe OSA was 87%
- **Specificity** for identifying moderate-severe OSA was 31%

- **Ideal screening tool** with high sensitivity.

**Specificity:** (for identifying moderate-severe OSA)

- 2 positive items from the 4 STOP questions + BMI > 35 kg/m², = 85%,
- 2 positive items from the 4 STOP questions + male gender, = 77%,
- 2 positive items from the 4 STOP questions + neck circumference > 40 cm = 79%,

**What about NOSS?** oxygen desaturation index by nocturnal oximetry had a sensitivity of 75-95% and a specificity of 67-97% as compared to AHI. (Apnea Hypopnea Index) NOSS → No CPAP!
Screening

- Who to screen? (Every one presenting for a surgery or being discharged from the hospital)

- When to screen?
  - At the initial appointment using STOP BANG.
  - If 3-5 – heightened Vigilance, monitoring, Empiric PAP therapy.
  - If 6-8 - Consider deferring Sx - OSA diagnostics & Rx
## American Society of Anesthesiologists Checklist

High risk of OSA if 2 or more categories scored as positive.
Low risk of OSA if 1 or no categories scored as positive

<table>
<thead>
<tr>
<th>Category 1: Predisposing physical characteristics</th>
<th>Category result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. BMI $\geq$ 35</td>
<td>If 2 or more items in this category are present, then this category is positive</td>
</tr>
<tr>
<td>b. Neck circumference $&gt; 45$ cm/17 cm (men) or 40 cm/16 cm (women)</td>
<td></td>
</tr>
<tr>
<td>c. Craniofacial abnormalities affecting the airway</td>
<td></td>
</tr>
<tr>
<td>d. Anatomical nasal obstruction</td>
<td></td>
</tr>
<tr>
<td>e. Tonsils nearly touching or touching the midline</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category 2: History of apparent airway obstruction during sleep</th>
<th>Category result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Snoring loud enough to be heard through closed doors</td>
<td>If 2 or more items are present (or 1 item if patient lives alone), then this category is positive</td>
</tr>
<tr>
<td>b. Frequent snoring</td>
<td></td>
</tr>
<tr>
<td>c. Observed pauses in breathing during sleep</td>
<td></td>
</tr>
<tr>
<td>d. Awakens from sleep with a choking sensation</td>
<td></td>
</tr>
<tr>
<td>e. Frequent arousals from sleep</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category 3: Somnolence</th>
<th>Category result</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Frequent somnolence or fatigue despite adequate “sleep”</td>
<td>If 1 or more items in this category are present, then this category is positive</td>
</tr>
<tr>
<td>b. Falls asleep easily in a nonstimulating environment (eg, watching TV, reading, riding in or driving a car) despite adequate sleep</td>
<td></td>
</tr>
<tr>
<td>c. Parent or teacher comments that child appears sleepy during the day, is easily distracted, is overly aggressive or has difficulty concentrating</td>
<td></td>
</tr>
<tr>
<td>d. Child often difficult to arouse at usual awakening time</td>
<td></td>
</tr>
</tbody>
</table>
Road Map!

- Introduction and timeline
- Epidemiology (Overall vs Surgical pts)
- Pathophysiology, Definition, Diagnosis & Rx
- Risks of Untreated OSA (Overall vs Surgical Pts)
- Screening tools
- **Perioperative Protocols and Challenges**
- Take Home points & Future Direction
Peri-Operative Day -1 to Day 0

- Anticipate the difficult airway.

- Most pts may be obese & appropriate care should be taken to prevent desaturation.

- Short-acting anesthetics, less soluble inhalational agents, titrate opioids, & minimize sedation.

- Awake extubation may be needed ;( 30° to 45°) head-up position or lateral

- Modifications of anesthetic technique, e.g. avoidance of general anesthesia in favor of a central neuraxial or a peripheral nerve block.
Immediate Post OP – PACU

- HOB, Extubate to PAP, Minimize sedatives, multimodal analgesia

PACU → Home (counsel, PAP compliance, testing, minimize narcotics & muscle relaxers)

PACU → Ward (End-tidals, O2, HOB elevation, Witnessed apneas, Empiric PAP)

Ward → Home (counsel, PAP compliance, Encourage testing, minimize narcotics & muscle relaxers)
Franciscan Health-Central Indiana

Indianapolis

Mooresville

Carmel
PERI-OPERATIVE TOOL KIT

Preoperative Considerations

- **Perioperative Evaluation**
  - Patient with Known OSA
  - Patient with Presumptive Diagnosis of OSA

- **Optimized Co-morbid Conditions**
  - Non-optimized Co-morbid Conditions
  - Postoperative pain can be managed predominantly by using non-opioid analgesic techniques

- **Optimized Co-morbid Conditions AND able to use CPAP after discharge**

Intraoperative Considerations

- **Proceed with Surgery**
- **Not Suitable for Surgery, may benefit from diagnosis and treatment**

Postoperative Considerations

- **Appropriate disposition (home or admit)**
- **Encourage follow-up sleep consultation**
- **OSA education for patient/family**

Outpatient Surgery (ASD) to Home

- **Follow-up phone call**
  - To include CPAP compliance while sleeping day or night at the time of discharge follow-up phone call
  - Patients encouraged to follow-up with their primary care physician
  - Reinforce follow-up sleep consultation and patient/family education during hospitalization and at discharge

Outpatient Surgery (ASD) Recovery

- **Place patients in a semi-upright position**
- **Observe patients for oxygen desaturation**
  - Patients to have ETCO₂ monitoring

- **If oxygen desaturation occurs, will use CPAP or Bi Level PAP**
  - Minimize/limit systemic opioids, if possible
  - Patients who are noted to easily obstruct their airway when drowsy should receive extra vigilance with longer Phase III recovery time, as needed
  - Use CPAP while sleeping even during the daytime
  - Reinforce patient and family education
  - Contact anesthesiologist if problems are new or reoccur

PACU Phase

- **In addition to the routine PACU discharge criteria of the Aldrete score, Patients with a suspected diagnosis of OSA are monitored for**
  - Apnea ≥ 10 seconds
  - Desaturation on 4 liters on O₂
  - Inability to wean from nasal cannula O₂
  - Bradypnea ≤ 8 respiratory rate/minute
  - Pain sedation score mismatch
  - Place patients in a semi-upright position
  - Observe patients for oxygen desaturation and/or apneic episodes patients to have ETCO₂ monitoring

Challenges & Opportunities

- Sleep testing & follow up delays
- PAP device delivery delays
- Pt education and awareness
- PAP acclimation / Compliance
- Insurance Authorizations

Sleep Medicine Providers
Easier Screening.
Hospital based DME
Experienced Personnel
T- Rex! (Take Home Reccs)

- OSA prevalent (25%) in Surgical Population as obesity grows.
- Frequently not identified before surgery.
- Identify, treat & reduce perioperative risk. Simple screening tools
- If pt. remains untreated, document additional risk & notify family.
- Minimize opioids / muscle relaxers, alternative analgesic modalities.
- Non Supine positions. Increased vigilance and Monitoring.
- 360 degrees of awareness. (All involved)

A stitch in time saves nine as well as ninety nine! (both short & long term gains)
Team Effort! – 360 Degrees

- Surgical Colleagues.
- Anesthesia Team.
- Educating Patients and Families
- PACU / Nursing Team.
- Sleep Medicine Team.
- Pulmonary Critical Care Team.
- Respiratory Therapy Team
- Home Medical Equipment Companies
- Hospital Administration.
Risk Stratify. Screen Early

Sleepy vs Not sleepy Phenotypes?

Could we do salivary genetic metabolic tests to choose & dose medications better?

Programs can be implemented cost effectively to improve patient safety & **surgical outcomes** as well as improve **Long term pt outcomes**

- Death & Near Miss Registry.
- Sleep Medicine Telemedicine Service.
- IN SLEEP WE TRUST!
Thank you for your Wakefulness

Q & A

Fix the Snore, improve yo $core!

Elective Surgery delayed surgery survived!

Ignore the snore no more!

Avoid the Perfect SnORM!

I DON'T SNORE
I DREAM I'M A MOTORCYCLE
Objectives

Following this webinar,

1. Identify signs, symptoms & pathophysiology of Obstructive Sleep Apnea (OSA)
2. Identify potential complications of OSA
3. Describe STOP BANG assessment for OSA
4. Describe Pre-acute, Acute Care & Post-Acute process improvements to reduce respiratory depression from OSA
Have you implemented the ABCDEF Bundle in your ICU?*

*excludes response of not applicable
Grant me the serenity to prioritize the things I cannot delegate, the courage to say no when I need to, and the wisdom to know when to go home....

- Anonymous
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