

# The Dangers of Obstructive Sleep Apnea and Post-Surgical Care

A presentation by Justin Locke and Jared Burkholder

# Video Overview of Sleep Apnea



# **Perioperative Management: Meeting the Challenge of Identifying Patients with Obstructive Sleep Apnea at RMH**

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Some slides borrowed from David J. Leszczyszyn, M.D., PhD



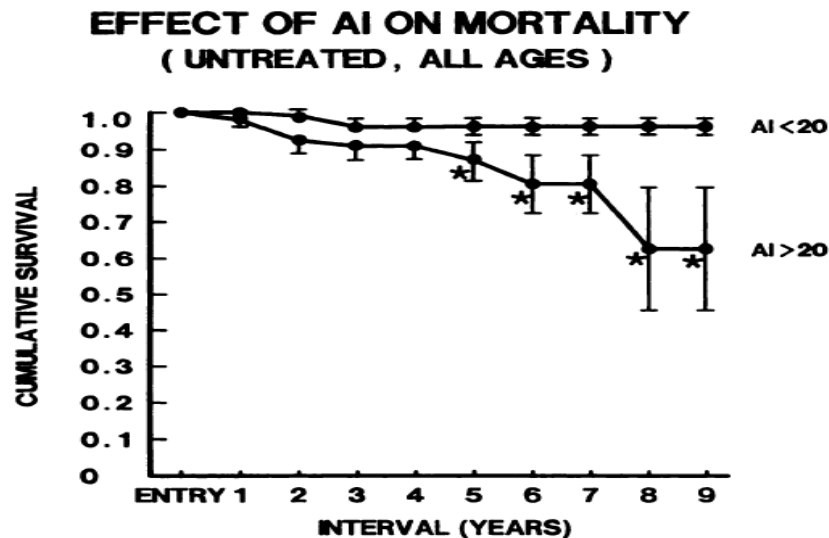
# OSA Facts

- **OSA is common – occurs in up to 9% of women, 24% of men, or approximately 18 million total in US population (National Sleep Foundation report on Sleep Apnea)**
- **Approximately 12-15% of the surgical population has OSA**
- **Clear relationship between OSA and other morbidities such as coronary artery disease, hypertension, and stroke.**
  - Michaelson, P., Allan, P. Chaney, J. Mair, E., 2006.
- **The medical community tends to under diagnose OSA**
  - Gupta, V., Reiter, E, 2004.

# Death

## (aka “The Ultimate Health Consequence”)

- 385 patients with OSA followed 8 years



- No deaths if treated with CPAP or trach.
  - He, J., Kryger, M., Zorick, F., et. al. (1988). Mortality and apnea index in obstructive sleep apnea. experience in 385 male patients. *Chest Journal*, 94(1), 9-14.

# OSA in the news...



- 2004- Just seven days after his 43<sup>rd</sup> birthday, NFL hall-of-famer Reggie White passed away. While the official cause was recorded as cardiac arrhythmia, sleep apnea is thought to have contributed to his death.
- 1997- Hawaiian singer “Iz” Israel Kamakawiwo’ole died at the age of 38 from complications of morbid obesity – press statement calling it “respiratory failure.” At 6’2”, he weighed 750 pounds.
- 2011- John Doe, 44, of Bridgewater, passed away peacefully on January 3<sup>rd</sup> at RMH, as a result of complications from sleep apnea.

# OSA Cost – Real World



- Over 100,000 MVAs annually are sleep-related
- Risk is 7 times higher in OSA patients than controls
- Disasters – Chernobyl, Three Mile Island, Challenger, Bhopal, Exxon Valdez, and Staten Island Ferry attributed to errors induced by sleepiness or fatigue
- Reduced work productivity
- Estimated cost of \$3 billion annually

# Why you need to care: Just the facts...

- Surgical patients with OSA have higher complication rates, mostly respiratory, including pulmonary edema, bronchospasm, pneumothorax, and hypercapnea.
- Increased need for reintubation, even hours after surgery.
- Anesthetic, sedative, and analgesic drugs all selectively impair upper airway activity. In patients with OSA, these drugs may further jeopardize upper airway patency, especially during sleep
  - Liao, P., Yegneswaran, B. et al, 2006;
  - Rennotte, M., Baele, P., Aubert, G., Rodenstein, D., 1995.



# Houston, we've had a problem...

- The problem has been under our nose, unrecognized
- Dawning of recognition
- Rude awakening as dramatic and unfortunate cases present



# When did it dawn on us as a community of practitioners?

- Case at World Congress of Sleep Medicine 2005, Montreal
- A woman in Wyoming National Park had orthopedic injury
- Invasive surgery
- Died of OSA's while unmonitored and given opiates

# Why does this matter to the medical community?

- \* Because it can **KILL** you
- \* Can potentially cost the hospital thousands of dollars in lawsuits
  - \* Massachusetts case
- \* Patient safety
  - \* RMH vision - “[offering] Exceptional quality and compassionate care for every person, every family, every day” ([www.rmhonline.com](http://www.rmhonline.com)).

# What is currently happening at RMH

- \* OSA is going undiagnosed too often
- \* Screening tool is not being used frequently enough or being used improperly
  - \* Cardiac and Pulmonary Rehab
- \* CPAP and anesthesia is not being used correctly during surgery
- \* Patients not being monitored carefully enough after surgery
  - \* Clinical team unaware of OSA and its dangers

# What should be happening?

- \* No respiratory complications or deaths attributed to OSA
- \* Entire clinical staff is aware of OSA and its dangers through our educational program
- \* Modified STOP-BANG tool is being used hospital-wide for **all** surgical patients
  - \* High-risk patients evaluated at Sleep Center
- \* Anesthesiologists using non-opiate based sedatives
- \* CPAP being used during surgery
- \* PACU tool being used properly

# What did we do?

- \* Partnered with Dr. William Cale, Medical Director of the RMH center for sleep medicine to create a 51 slide PowerPoint aimed at educating the clinical staff members.
- \* Goals:
  - \* Educate the necessary members of the clinical staff
  - \* Screen to identify high risk patients
  - \* Proper treatment and monitoring of OSA patients before and after surgery

# The process that we outlined

- \* Create awareness throughout the hospital about OSA and its dangers
- \* How to effectively use the STOP-BANG for identification
- \* Proper use of sedatives during surgery
- \* How the PACU tool was to be used during the monitoring process post-surgery

# STOP BANG Model

## 1. Snoring

Do you snore loudly (louder than talking or loud enough to be heard through closed doors) Do not select yes if snoring is not loud?

Yes No

## 2. Tired

Do you often feel *tired*, fatigued or sleepy during your **normal waking hours**? Do not select yes if the tiredness/sleepiness is not often.

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 greater than 35 (BMI = Pounds (lb) x 703 ÷ (Height in inches)<sup>2</sup>)?

Yes No

## 6. Age -

*age* over 50 years old?

Yes No

## 7. Neck Circumference

- *neck* circumference greater than 15.75 inches (measured around the base of neck)?

Yes No

## 8. Gender

- *gender*-male?

Yes No



# STOP BANG continued

High risk of OSA – ‘yes’ to four or more items or ‘yes’ to three items if one of those items are either numbers 1, 3, 5, or 7

Low risk of OSA – ‘yes’ to less than three items

*If you are at a high risk of having obstructive sleep apnea (OSA), it is important that you consider talking to your healthcare professional regarding the possibility of a sleep related breathing disorder. You may also self-refer to RMH Sleep Center to be evaluated by a board certified sleep physician at 540-437-8230.*

*If you would rather RMH Sleep Center call you regarding your self-referral, we would be happy to do so and we would be happy to answer any questions you may have regarding sleep disorder breathing. Please print your name and sign below, if you would like RMH Sleep Center to contact you.*

***The RMH solution that others have also modified.***



<b>Evaluation Period</b> (See criteria definition below)	<b>Initial Eval. Period</b> 30 min. after extubation or PACU admit (whichever occurs later)	<b>2<sup>nd</sup> Eval. Period</b> 30 min. after initial eval. (30 min after extubation or PACU admit)	<b>3<sup>rd</sup> Eval. Period</b> 30 min after 2 <sup>nd</sup> eval. (30 min after extubation or PACU admit)
Time of evaluation	___:___	___:___	___:___
<b>Hypoventilation</b> <8 respirations/minute (3 episodes needed for yes)	___ 0=No 1=Yes	___ 0=No 1=Yes	___ 0=No 1=Yes
<b>Apnea</b> ≥10 seconds (only 1 episode needed for yes)	___ 0=No 1=Yes	___ 0=No 1=Yes	___ 0=No 1=Yes
<b>Desaturations</b> Pulse Ox<30% with nasal cannula <b>**If unable to wean pt. to nasal            cannula counts as an event*</b> (3 episodes needed for yes)	___ 0=No 1=Yes	___ 0=No 1=Yes	___ 0=No 1=Yes
<b>Pain/ Sedation mismatch</b> RASS score -3 through -5 and Pain scale score >5 (only 1 episode needed for yes)	___ 0=No 1=Yes ___ RASS ___ Pain	___ 0=No 1=Yes ___ RASS ___ Pain	___ 0=No 1=Yes ___ RASS ___ Pain
Highest FiO <sub>2</sub> requirement each period	_____	_____	_____
PACU Instructions	If any of the above occur, inform anesthesiologist of possible need for monitored admission.	If any of the above occur, keep in PACU another 30 min. inform anesthesiology and ICU of possible admit.	If any of the above continue inform the anesthesiologist and ICU of monitored admission.

# Target Audience

- \* What we thought
  - \* Monitor techs
  - \* Surgeons
  - \* Anesthesiologists
  - \* Nurses
- \* Who was actually there
  - \* 20 people
    - \* Gender: 18 women, 2 men
    - \* Jobs: 18 nurses, 1 specialty clinic practice manager, 1 orthopedic surgeon
    - \* Age: Early 20's to about 60

# More About Target Audience

- \* What we thought
  - \* Little to no knowledge about OSA
  - \* Inexperienced
  - \* Uninterested in topic
- \* What they actually were
  - \* Extensive knowledge of OSA facts, dangers, and procedures
  - \* First hand experience with OSA patients
  - \* Very engaged throughout entire presentation

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Mean Scores
Before this presentation, I was aware of OSA and some of its dangers	8	9	1			4.4
This presentation added to my knowledge of OSA and its dangers	14	4				4.8
I knew how to properly manage OSA patients before this presentation	2	4	8	4		3.2
I understand the correct process for the management of OSA patients	3	10	4			3.9
This presentation was a valuable use of my time	13	5				4.7
The information was presented in a clear manner	15	3				4.8
The information was presented in a way that enhanced my learning	15	2	1			4.8
I was fully engaged throughout the entire presentation	14	4				4.8
I found the examples and information relevant to my position	13	4	1			4.7
I believe that I am capable of using the information that was presented	15	2	1			4.8
I feel as though I have gained a useful skill that can be used in my workplace setting	11	7				4.6

# Data Analysis

- \* Red difference – using unpaired t-test,  $p = 0.01$   
(significant difference)
- \* Green difference – using unpaired t-test  $p = 0.01$   
(significant difference)

# So what does this mean?

- \* Before the presentation, the audience was knowledgeable about OSA in general
- \* After the presentation, their knowledge was significantly increased
- \* Before the presentation, the audience had neutral feelings about how to manage OSA patients
- \* After the presentation, the audience had a much better understanding about the entire process

# How did it go?

- \* Dr. Cale was an excellent presenter
- \* Audience was fully engaged and told stories of personal experiences
- \* Stayed thirty minutes later than scheduled time
- \* Dr. Cale was impressed by professionalism of the presentation
  - \* Vocab was easy to understand for those outside of the general medical field
  - \* Slides not too “wordy”
  - \* Plenty of graphics



# How do we improve the presentation for next time?

- \* Fix few spelling mistakes
- \* Don't assume audience knows all acronyms and terminology specific to sleep medicine

# Recommendations for the future

- \* Increase educational campaign
  - \* Local
  - \* State
  - \* National
- \* Implement the process that we outlined
  - \* Screening
  - \* Sleep Center/CPAP
  - \* Anesthesia
  - \* PACU tool/monitoring

Questions?