

Don't Ignore the Score: An Obstructive Sleep Apnea Screening Protocol



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Objectives

- The learner will understand the:
 - need for a surgical obstructive sleep apnea screening tool.
 - process of implementing an evidence-based practice sleep apnea guideline in a shared leadership environment.
 - Iowa Model of Evidence-Based Practice process.



Introduction

- Personal Interest and focus
 - Passion nursing excellence
- PACU Nurse assessment process
 - Self discovery vulnerable sleep apnea patient
 - How can we be sure patients are safely cared for?
- Capstone project: Doctorate Nursing Practice
- Goal: promote best practice for nurses to screen patients for obstructive sleep apnea



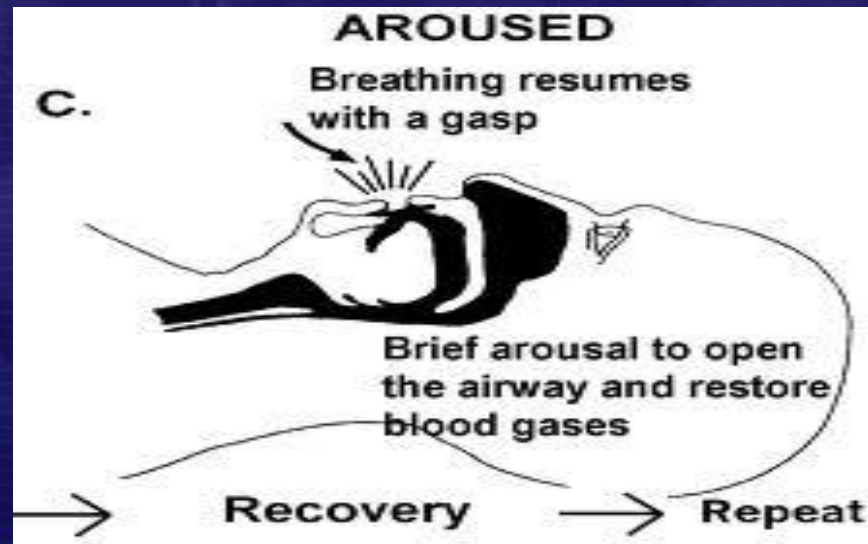
Patient Population

- **Obstructive** sleep apnea (OSA): common condition caused by decrease in upper airway size and patency during sleep
- Apnea: cessation of airflow ≥ 10 seconds
- Hypopnea: \downarrow airflow > 10 seconds + 30% \downarrow airflow + at least 4% oxygen desaturation
- Polysomnography: Apnea Hypopnea Index (AHI)
 - AHI 5-14/hr. mild
 - AHI 15-30/hr. moderate
 - AHI > 30 /hr. severe



OSA Cycle: Path to Comorbidities

- Individuals with OSA are aroused repeatedly from deep sleep by hypoxemia and hypercapnia
- Cycle: Permits breathing to resume



Flow Diagram Pathophysiology of OSA / Sedation

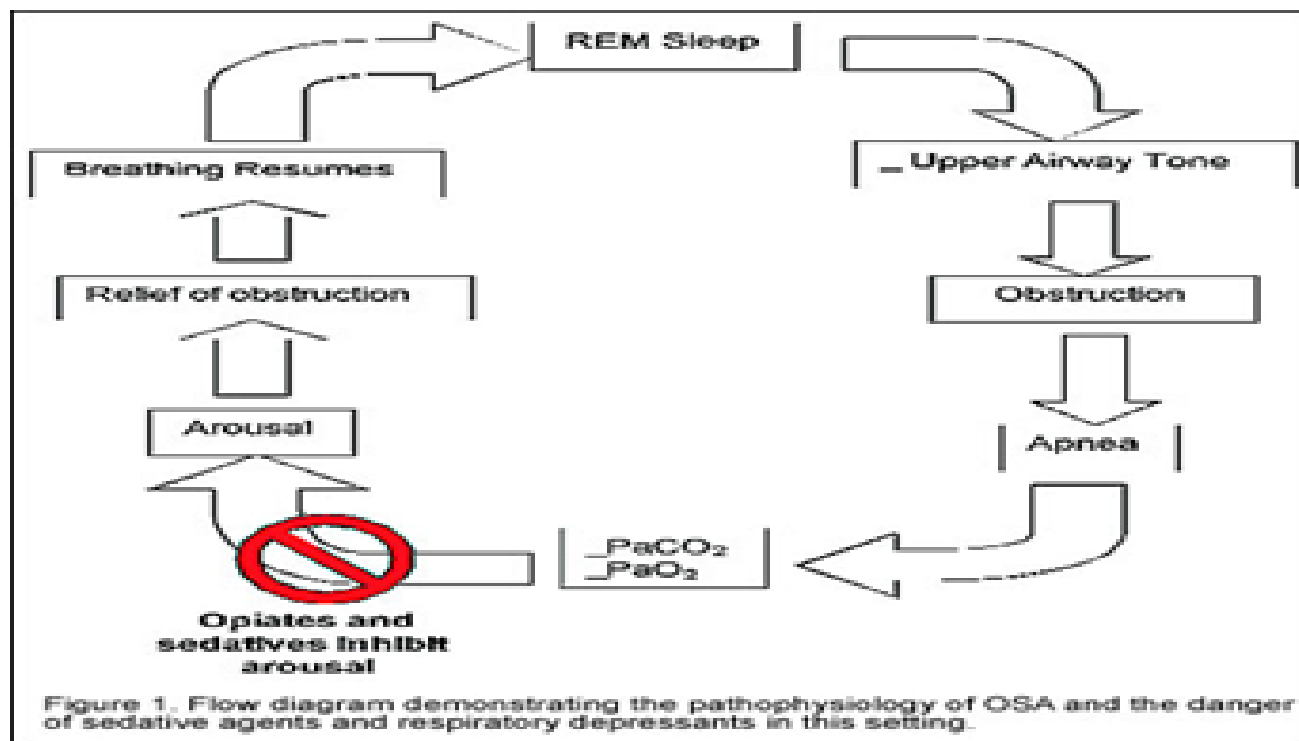


Figure 1: Respiratory pattern is inhibited with opiates and sedatives (Finkel, Saager, Becker, & Tymkew, 2006).



Why a Screening Tool



- **PA Safety Advisory Board:** >250 cases poor patient outcomes
- **The Joint Commission:** Direct Impact Issue: Safety initiative anesthesia and sedation
- **National Clearinghouse:** safer outcomes with implementation of guidelines
- **ASA Task Force:** meta analysis: guidelines for care of perioperative OSA patient



Preoperative Assessment

- Focus: patient's heart and lung history
 - Little emphasis on sleep disorders
 - Patients with unremarkable medical history developed unexpected postoperative respiratory complications
 - 2-26% U.S. adult population: OSA
 - 80-90% unaware of having OSA



PICO Prevention Question



- For patients in the perioperative area receiving anesthesia, sedation, or intravenous opioids, does the use of a screening tool to identify patients with obstructive sleep apnea, (OSA) reduce the risk of complications of OSA compared with those OSA patients who did not have a screening tool?



PICO Format

- **Population of Interest:** Perioperative patients receiving anesthesia, sedation or intravenous opioids.
- **Intervention:** Develop screening tool and guidelines for perioperative nurses to safely monitor patients with obstructive sleep apnea (OSA).
- **Comparison:** Evidence-based practice (EBP) nurse assessment screening tool for OSA *versus* current method which is no definitive screening tool.
- **Outcome:** An EBP screening tool for assessment of OSA will be used throughout the perioperative area.



Berlin Questionnaire

Questions

Answers

Scoring

Category 1

1. Do you snore? Yes(1), no(0) don't know(0)
2. *If yes, how loud is it?*
3. How often do you snore?
4. Has snoring bothered others?
5. Has anyone noticed that you quit breathing during sleep?

Items 1,4,8,10:

Item 2:

- Slight louder than breathing (0)
 As loud as talking (0)
 louder than talking (1)
 very loud heard in adjacent rooms (1)

category 1: positive: Sum ≤ 2
category 2: positive: Sum ≤ 2
category 3: positive item 10 is yes or if BMI > 30kg/m²

High risk of OSA: 2 or more categories scored as positive

Category 2

6. How often do you feel tired Or fatigued after sleep?
7. During your waking time, do you feel tired, fatigued, or not up to par?
8. Have you ever nodded off or fallen asleep while driving?
9. *If yes, How often does this occur?*

Items 5,6,7,9:

- nearly every day (1)
 3-4 times a week (1)
 1-2 times a week (0)
 1-2 times a month (0)
 never or nearly never (0)

Category 3

10. Do you have high blood pressure?

Abrishami, A., Chung, F. (2010)



The American Society of Anesthesiologists' Checklist

Questions

Answers

Scoring

Category 1: Predisposing Physical Characteristics

all items: yes/no

If \leq items in category
1 are positive, category
1 is positive.

1. BMI \leq 35kg/m²
2. Neck circumference > 43cm/17 inches (men) or
40 cm/ 16 inches (women)
3. Craniofacial abnormalities affecting the airway
4. Anatomical nasal obstruction
5. Tonsils nearly touching or touching the midline

If \leq items in Category 2
are positive, category 2
is positive.

Category 2: History of Apparent Airway

1. Snoring (loud enough to be heard through closed
door)
2. Frequent snoring
3. Observed pauses in breathing during sleep
4. Awakens from sleep with choking sensation
5. Frequent arousals from sleep

If \leq +items in category
3 are positive,
category 3 is positive.

High risk of OSA: 2
more Categories
scored as positive.

Low risk of OSA: 1
or no categories **Category 3:**
scored as positive.

Somnolence

1. Frequent somnolence or fatigue despite adequate
"sleep"
2. Falls asleep easily in a nonstimulating environment
3. Parent or teacher comments child appears sleepy
during the day, is easily distracted, is overly
aggressive, or has difficulty concentrating*
4. Child often difficult to arouse at usual awakening
time*

* Refers to pediatric patients

Gross et al. (2006)



American Sleep Apnea Association Snore Score

Are you a loud and/or a regular snorer?	Yes	No
Have you ever been observed to gasp or stop breathing during your sleep?	Yes	No
Do you feel tired or groggy upon awakening, or do you awaken with a headache?	Yes	No
Are you often tired or fatigued during the wake time hours?	Yes	No
Do you fall asleep sitting, reading, watching TV, or driving?	Yes	No
Do you often have problems with memory or concentration?	Yes	No

www.sleepapnea.org (2008)



The Epworth Sleepiness Scale

Use the scale to choose the most appropriate number for each situation:

0 = would *never* doze or sleep

1 = *slight* chance of dozing or sleeping

2 = *moderate* chance of dozing or sleeping

3 = *high* chance if dozing or sleeping

Situation

or Sleeping

Sitting and reading

Watching TV

Sitting inactive in a public place

Being a passenger in a motor vehicle

for an hour or more

Sitting and talking to someone

Sitting quietly after lunch (no alcohol)

Stopped for a few minutes in traffic

while driving

Total score (add up the scores)

Chance of Dozing



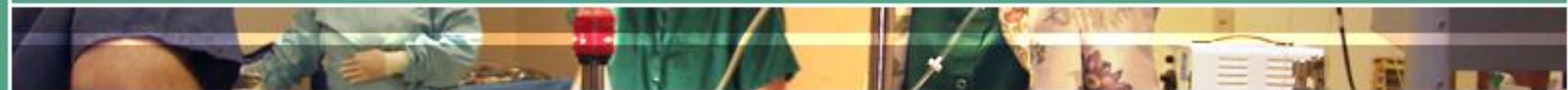
STOP-Bang OSA Scoring Model

- Answer Yes or No to each question and place an “X” in the corresponding column.

Questions	Yes	No
1. Snoring: Do you snore loudly (louder than talking or loud enough to be heard through closed doors?)	_____	_____
2. Tired: Do you often feel tired, fatigued, or sleepy during the daytime?	_____	_____
3. Observed: Has anyone observed you stop breathing during your sleep?	_____	_____
4. Blood Pressure: Do you have or are you being treated for high blood pressure?	_____	_____
5. Height: _____ft. _____in. Weight: _____lbs. BMI Calculator _____ BMI > 35?	_____	_____
6. Age: > 50 yr. Old?	_____	_____
7. Neck Circumference: > 17 in. or 40 cm.?	_____	_____
8. Gender: Male gender	_____	_____
	_____	_____
Total for Yes:	_____	_____

- The patient is at high risk for OSA if they answered **yes to three or more** items.
- The patient is at low risk for OSA if they answered **yes to less than three** items.

Chung et al. (2008)



Iowa Model Algorithm for OSA Screening Tool

- **Trigger for EBP:** Need to improve current care of OSA patients.
- **Organizational Priority:** Promote excellence in patient safety outcomes.
- **Team Formation:** Linda Lakdawala: PACU RN, Quality Director, Chief Anesthesiologist, Informatics Nurse, Critical Care Advanced Practice Nurse.
- **Evidence Gathered:** Highest level literature review.
- **Research Base Critiqued and Analyzed.**



Iowa Model Process

- **Sufficient Evidence Gathered:** ASA Task Force (2006) Systematic Review
- **Pilot Change:** STOP-Bang Screening Tool (Chung et al, 2008) One month pilot for orthopedic patients
- **Decision:** Incorporate Tool as preoperative assessment and postoperative physician order set.
- **Widespread Implementation with Monitoring of Outcomes:** Educational competency for perioperative nurses and anesthesiologists. Comparative evaluation of critical events prior OSA tool and post implementation.
- **Dissemination of Results:** Three month comparative data before and after STOP-Bang Tool.



Communication Process

- Preoperative Nurse: conducts STOP-Bang assessment
- Phone interview
- If needed: complete neck circumference & BMI (DOS).
- Inform Anesthesiologist if high risk
- Anesthesiologist determines validation
- High risk: OSA Physician order set completed
- OSA green label on front of patient chart



Organizational Assessment/ Readiness for Change

UPMC Shadyside: Shared Leadership Councils



Promote Quality and Practice Change with EBP

Communicate Results of Need for EBP Practice Change

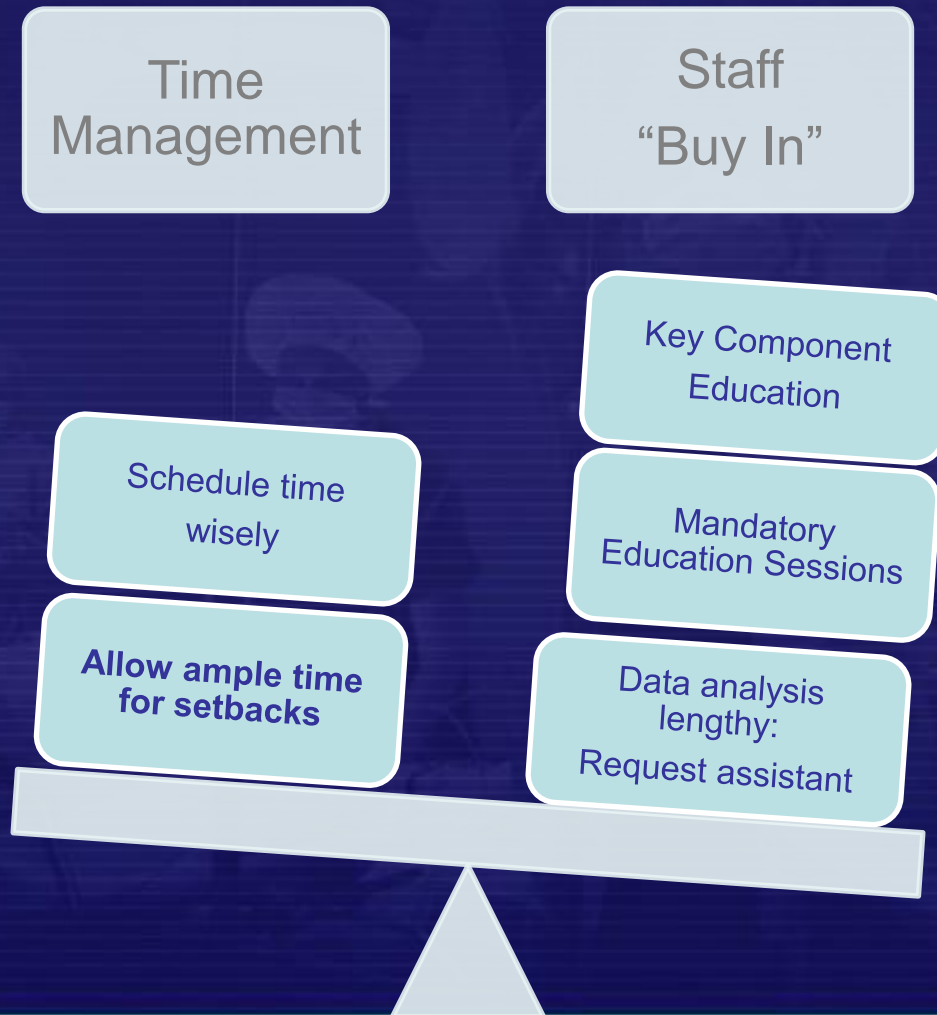
Clear and Concise Education Sessions for Staff Preparation

End Result: Staff Understands and Accepts the EBP Change

Enhanced Patient Outcomes and Satisfaction



Barriers/Challenges for OSA Project



OSA Project Outcomes & Evaluation

STOP-Bang Scoring Model

Electronic Health Record
Print on Demand

Postoperative Physician Order Set

Evaluation

Compare improvements in quality of care
prior to and post OSA screening

Staff competency

Nursing Staff Questionnaire

Evaluation process

Assess for process improvement



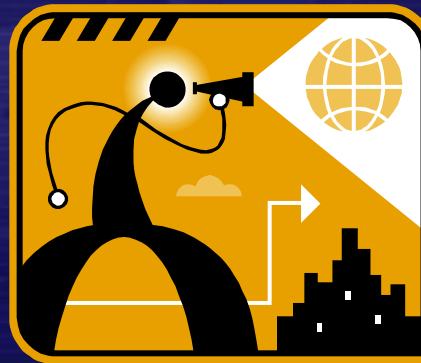
Set Backs/ Adversity of OSA Project

- Time issues:
- Chart review for evaluation Of QI project.
- Request for assistance with Chart review is limited.
- Collaboration of team members to complete tasks: Staff work load minimal mandates time for additional projects.
- **Solution: Time Management:** Be Patient but persistent and allow for additional time for project.



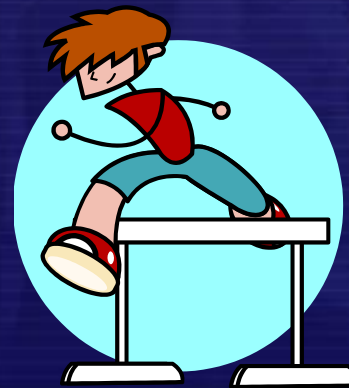
Components of Organizational Change

- **Clear communication of vision and plan:**
- All department directors of Shadyside Hospital acknowledge need for OSA screening tool.
- Timeline for OSA project approved.
- OSA Policy and Procedure development for adherence to standards of revised practice.



Strategies to Overcome Barriers

- Foster respect amongst team members.
- Understand need for time delays as result of added work load due to economy.
- Professional relationships among team members: prove effective with encouragement and understanding of need for practice change.



Resources: Human & Financial

- Expert Staff utilized for critique of Literature Review: Chief Anesthesiologist, QI Director, Electronic Health Record staff, Advanced Practice Nurse.
- **QI IRB Exempt:** permission to review patient records to compile data for comparison evaluation.
- **Financial:** No financial assistance has been required to date.



STOP-Bang Scoring Model

The STOP-Bang OSA Screening Tool Assessment/Follow-up with Anesthesia

Answer Yes or No to each question and place an "X" in the corresponding

Questions:

	Yes	No
1. Snoring: Do you snore loudly (louder than talking or loud enough to be heard through closed doors?)		
2. Tired: Do you often feel tired, fatigued, or sleepy during the daytime?		
3. Observed: Has anyone observed you stop breathing during your sleep?		
4. Blood Pressure: Do you have or are you being treated for high blood pressure?		
5. Height: ____ft. ____in. Weight: _____lbs. BMI Calculator____ BMI > 35?		
6. Age: > 50 yr. Old?		
7. Neck Circumference: > 17 in. or 40 cm.?		
8. Gender: Male gender		
Total for Yes:		

The patient is at high risk for OSA if they answered **yes to three or more** items.

The patient is at low risk for OSA if they answered **yes to less than three** items.

Alert Anesthesia if patient is at high risk: Yes: | **No:** |

Anesthesiologist will determine proper postoperative guidelines.

Anesthesiologist Signature: _____

Chung et al, (2008)



Postoperative Plan

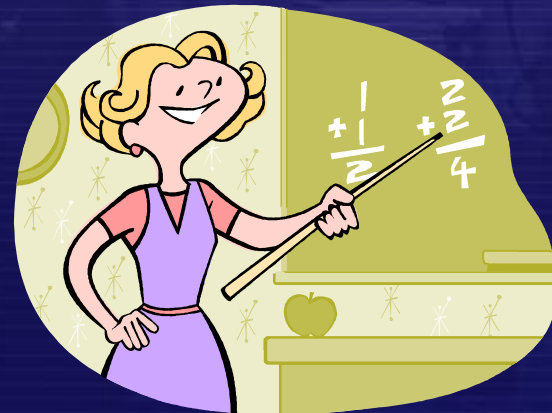
Postoperative Physician Order Set:

- Consult respiratory therapy postoperative oxygen requirements: maintain oxygen saturation >90%. Consider CPAP, BIPAP.
- Notify physician if unable to maintain $saO_2 >90\%$.
- Consult medical physician regarding follow-up for formal sleep study.
- Postoperative nurse OSA discharge education protocol: OSA patient education channel, instruct need for formal sleep study as prescribed.
- Continuous pulse oximeter and cardiac monitor for 24 hours postoperative or until intravenous opioids are discontinued.
- The OSA order is located in the PACU postoperative order set in the Electronic Health Record.**

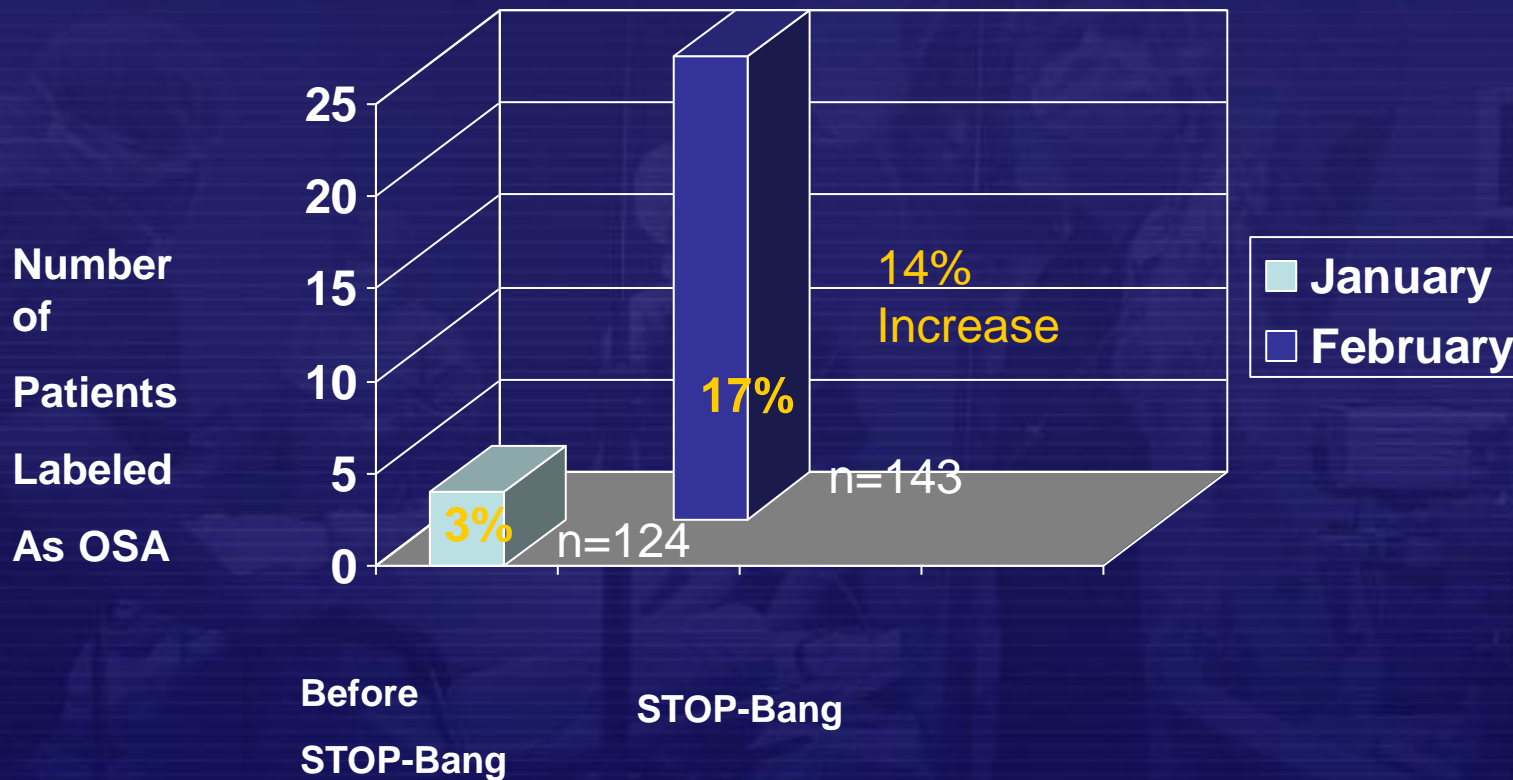


Teaching Methods for Perioperative Staff

- 20 minute lecture with power point presentation.
- Return demonstration: staff will partner-up and perform STOP-Bang Screening Tool.
- Review postoperative physician order set for OSA.
- Complete competency: ensure staff understanding of OSA program.
- Total program: 1 hour



Comparison of Obstructive Sleep Apnea Patients Before and After STOP-Bang Scoring Model



Orthopedic Unit: Postoperative Review

	January N=124	February N=143
Naloxone	0	0
Condition C	3	0
Condition A	0	0
Total	3	0



Postoperative OSA Patient Care

- PACU nurse monitors closely
- Outpatient: monitored 4 hours (PACU+DAS)= 4hrs
- High risk OSA: continuous pulse oximeter & LLM for 24 hours or until iv opioids are d/c.



Discovery >>>>>

Planning >>>>>

Implementation >>>>>

Evaluation >



8/08 – 10/09

3/09 – 3/11

6/30/11

Futuristic

- ✓ Literature review
- ✓ Expert approval Anesthesiologist QI Director
- ✓ QI IRB exempt

- ✓ STOP-Bang Print on Demand template 3/09
- ✓ Physician order set 11/09
- ✓ Education process 1/10
- ✓ Repeat 3/11
- ✓ STOP-Bang pilot 1/10-2/10

- ✓ OSA Awareness Day
- ✓ Quality award
- ✓ STOP-Bang surgical scoring model
- 9/15/11
- ✓ Inaugural OSA System wide meeting

- ✓ Comparison analysis 3 months pre & post STOP/Bang
- ✓ Staff evaluation 5/1/11



Moving Forward

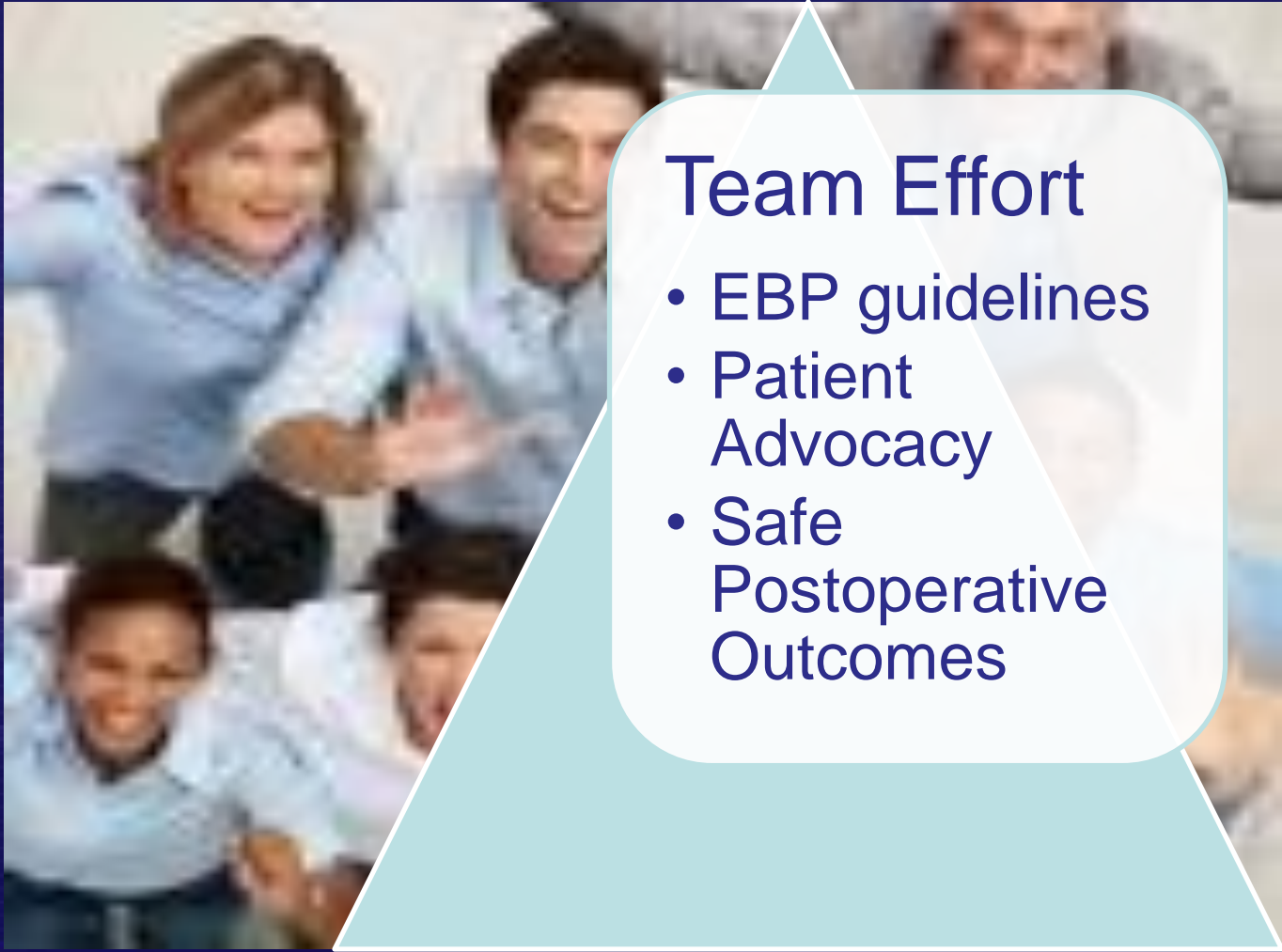
Hot Topic: My focus has received much attention

Collaboration with Sleep Director and UPMC home equipment OSA home sleep monitor testing

Nursing education: focus vigilant respiratory assessment for vulnerable OSA patient



Conclusion



Team Effort

- EBP guidelines
- Patient Advocacy
- Safe Postoperative Outcomes



Take Home Message

- If you have a burning question, a desire, or even a thought...
- Don't put it on the back burner.
- Live it and breathe it.
- In a shared leadership environment,
 - Great Things Happen!
 - Thank You.



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