RT/Sleep Crossover
Disease States and Technology

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- Respiratory Associates, 2024

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Conflicts of Interest

- Sleep Lab Management Consulting, LLC
- Accreditation Site Surveyor

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RT/Sleep Crossover Origins?

- Majority of Sleep Lab Medical Directors
  - Pulmonologists
- Majority of Sleep Lab Department Directors
  - RT Department Directors
- Both oversee critical care and sleep disorder centers.

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Respiratory/Sleep Crossover

Adult Acute Care *
Continuing Care/Rehab *
Diagnostics *
Education *
Home Care *
Long Term Care *
Management *
Neonatal/Pediatrics *
Perioperative Settings
Surface and Air Transport *

* **OSA Patients are EVERYWHERE, Everywhere, EVERYWHERE !!!**

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RT Audience/Attendees Today

- Hospital RTs? ER, OR, Peds, ICU, PICU, Floors?
- RPSGTs, SDS, CCSH, RST?
- Home Care RTs? LTACC?
- Sleep lab managers, night staff/day staff?
- Hospital RT Department Directors?

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Goals for Today

To review the different clinical settings and technology overlap within those settings, between respiratory care and sleep disorder medicine. RT Opportunities!!!

Obstructive Sleep Apnea(OSA). OSA Focused.
OSA Patients are Everywhere in Health Care

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Three Learning Objectives

1. RT attendee will be better able to identify and advocate for sleep disorders patients who present in all settings.
2. RT attendee will better understand pharmacology, symptoms and technology that a sleep disorders patient brings to their floor, ICU, PACU, OR, ER.
3. RT attendee will better understand how to mitigate risk/liability/escalation of care, re-admissions while improving patient outcomes and hospital revenues

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The OSA Patient DX

- Clinical examination(history and physical examination) carries a diagnostic sensitivity and specificity of only 50 to 60% even when performed by experienced sleep physicians
- Clinics of Chest Med **1998**; 19:1-19
- If it walks like, talks like, looks like a ….
- **It's OSA**

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The Technology for This Lecture

- CPAP>>>>>>Home/Sleep Lab to Hospital
- Bi-Level>>>>>>Sleep Lab to Hospital/Home
- Auto CPAP, Auto Bi-Level>Sleep Lab>Home>Hospital

- HST>>>Home to Hospital Floors to Sleep Labs.

- Inspire/Zoll/Nyoaxh Implants – Nerve Stimulation
- Interfaces for NIV/PAP and **more**….>>>>>

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CPAP/Crossover

- Continuous Positive Air Pressure
- Spontaneous Triggered by Patient
- Affects Upper Airway like a Splint

- Room Air initially, O_2 optional, PSG can sometimes eliminate O_2
- Delivered w Humidification
- 4cm/h_20 to 25cm/h_20

Hospital protocols in place for PAP brought from home??

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REACTHEALTH

Luna TravelPAP

In the box:
- Luna TravelPAP
- 2 Extra Air Filters
- User Manual
- AC Power Adapter
- Storage Bag
- 15 MM Tube
- Quick Start Guide

To enhance experience even further, we are pleased to offer additional items for purchase.
- TravelPAP Carry bag
- DC Power Adapter

Complimentary LightTrip (US) App

React Health offers the LightTrip (US) App, which is available for download in both the Apple App Store and the Google Play Store. This app serves as a valuable tool for managing the device, setting comfort features, and reviewing therapy sessions. It's designed to make the patient's experience more user-friendly and tailored to their preferences

Key features:
- Any mask can be used except for other travel PAP masks.
- < 30 dBA
- Bluetooth connectivity – LightTrip App
- Modes: CPAP / Auto

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Bi-Level Technology Crossover

- In Home/Hospital
- IPAP of 8 In the ER 20/4
- EPAP of 4
- Easier to exhale, improves compliance at high pressures.
- Current technology came over from the sleep side
- Found a home in the ER and on hospital floors

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Hospital Floors/Respiratory Care

- Bi-Level equipment common now
- Ventilators have adapted CPAP/Bi-Level Modes
- Used for weaning patients off ventilators.
- Respiratory Distress
- COPD/Pulmonary and CHF/Cardiology Patients/Stroke

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Auto CPAP, Auto Bi-Level

- ResMed 1st Developed
- Evidence Based Validation 2010
- Validated in Sleep Disorders Centers
- Used in Homes
- Used in Hospitals
- Other major manufacturers soon followed.

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Home Sleep Study/Crossover

- **Since 1988 to Now!!**
- **Politics of Money and Medicine**

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Nox Medical Wireless PSG

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Sleep Image, Thumb Ring

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COMPUMEDICS

'Defining *Life's* Signals'

The Somfit Technolo

Somfit

Somfit®

Document Number: AK038-01

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Itamar

Disposable HSTs got COVID Boost

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Inspire Implant for OSA

- Inspire therapy is a new and innovative Obstructive Sleep Apnea treatment option for people unable or unwilling to use or get consistent benefit from CPAP. The fully implanted system delivers mild stimulation to the tongue which keeps the airway open during sleep. Inspire therapy is controlled with a small, handheld remote—no mask or hose needed. Simply turn the therapy on before bed and off when you wake up. Currently Pacemaker size?? Chip Size???>>>>>>MORE
- Discuss Hospital, RT and Sleep Tech Titration aspects.

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Inspire Therapy STAR Trial

- STAR Trial
- • Stimulation Therapy for Apnea Reduction
- (STAR)
- – 22 leading medical centers across the US and Europe
- – 126 patients
- – Results published in the *New England Journal of*
- *Medicine, January 9, 2014*
- Upper-airway Stimulation for Obstructive Sleep Apnea
- Strollo PJ Jr, Soose RJ, Maurer JT et al.
- *N Eng J Med. 2014;370(2):139-149.*

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Implants

- **ZOLL-CSA Subclavicular**
- **Inspire-OSA Subclavicular**
- **Nyxoah-OSA Submental**
- **Phrenaide???-CSA Neck Patch**

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Pharma Treatment for OSA

- "An Introduction to Obstructive Sleep Apnea (1 of 3) Development of Potential Pharmaceutical Treatment Options"
- By Luigi Taranto Montemurro, MD, CSO of Apnimed and David P. White, MD, SVP Medical Affairs, Apnimed
- Trials all over the world.
- Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, Brigham & Women's Hospital and Harvard Medical School, Boston, Massachusetts

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Apnimed

- Stage 3, trials at this time/FDA FastTrack
- 2023 Cantor Fitzgerald Global Healthcare Conference, New York/September 28th
- Baird Global Healthcare, New York
- Citi 18th Annual BioPharma Conference, Boston
- Apnimed presenting at these three September 2023 events
- To Date Apnimed has raised $207 Million in Funding for Research and Development>>>Shionogi Partnership 150 Million more..

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Interfaces for NIV/PAP Therapy Nasal

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Full Face Nose and Mouth

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Very Full Face Nose Mouth Eyes Chin

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Pressure Points/Skin Breakdown

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Nasal Pillows w Gel

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Cotton Barrier Concept

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Cloth Masks and Cloth Covers

- Circadiance/ DreamWeaver
- Comfort Cover/ Elastic Cloth Cover

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PAP Goal>>Getting to Compliance

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Clinical Settings/Locations/Cross-Over

- Sleep Disorders Center/RTs involved
- Home DME>>>RTs
- Emergency Department NIV-Vent-NIV
- Perioperative, Pre and Post Op OSA Risk
- Hospital Floors>>>RTs
- ReHab/SNF>>>RTs
- LTACC and Independent Living Centers

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RTs in Sleep Centers and Hospitals

- Mostly CPAP to Bi-Level Lab modes used
- ASV for Central Apneas and Cheyne Stokes
- Interface Experts along w DME Providers
- Diagnostics to Treatment Direction>>
- Home Sleep Study Patient Set-Ups
- Ability to Adapt/Change>> through Education
  - AI is now used for interface fittings!!!
    - USE AI for fittings…..Drop the Ego..

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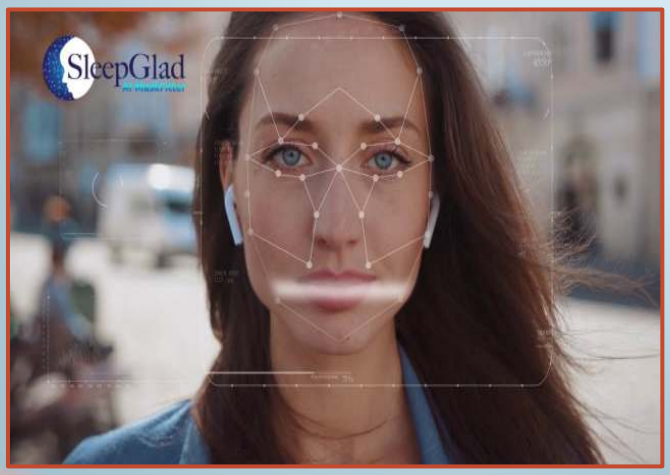
AI Mask Fitting Laser Data Points



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Our Solution - aerSleep®

aerSleep is a new way of treating sleep apnea which provides many advantages

- Cordless neck collar which opens the airway from the outside with gentle vacuum
- Integrated, silent vacuum pump
- Comfortable, easy to use and very portable
- Preferred by user and bed partner
- Monitoring capabilities

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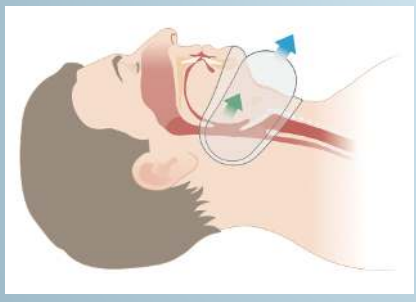
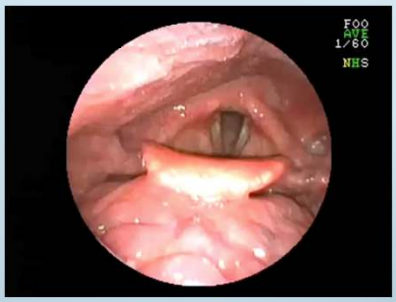
Here's How aerSleep Works

External view



Internal view



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Negative Pressure Cuff Note

- **Currently approved in Canada for both acute care and obstructive sleep apnea.**
- **Approved in the US for Acute Care only at this time.**
  - **Sommetrics**

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Home RT/Sleep Crossover

- DMEs
- Compliance is Key
- Tracked now thru WIFI
- Interface and Skin Expertise
- Telemedicine Aspects Growing>>>
- Remote Patient Monitoring(RPM)>>>

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Evidence Based Medicine!!!

- Manufacturer's Product White Papers
- Peer Review Journal Articles
- Critical for Health Care Innovation Presentations
- Sleep RTs=Revenue and saved Revenue!!

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AASM Telemedicine Position Paper

- American Academy of Sleep Medicine
  - (AASM)
  - Telemedicine Position Paper Released
  - October 14th 2015

American Academy of Sleep Medicine(AASM) Position Paper for the Use of Telemedicine for the Diagnosis and Treatment of Sleep Disorders

http://dx.doi.org/10.5664/jcsm.5098

Telemedicine Implementation Task Force

Journal of Clinical Sleep Medicine, Vol. 11, No. 10, 2015

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TeleRespiratory Care

American Association for Respiratory Care
(AARC)
Position Statement
Telehealth and Respiratory Therapy

Summary

The American Association for Respiratory Care supports efforts to provide patients access to respiratory care services via Telehealth. Furthermore the AARC supports the recognition of respiratory therapists as providers of telehealth services under Medicare, Medicaid, commercial and other health insurance programs.

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AARC Contact for Telemedicine

Cheryl.west@aarc.org
Director of Government Affairs

http://capwiz.com/aarc/issues/?style=D

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Remote Patient Monitoring
RPM

- **A new revenue source for physician practices that also improves patient outcomes**

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New Business Model based on RPM Billing Codes (2024 CMS national coverage amount)

First Month/Patient	Monthly/Patient		
99453	**99454**	**99457**	**99458**
Practice Expense: Initial Enrollment	Practice Expense: Device	Care Management (20 min)	Care Management (additional 20 min increments)
A one-time practice expense reimbursing for the setup and patient education on RPM equipment. This code covers the initial setup of device, training and education on the use of monitoring equipment, and any services needed to enroll the patient on-site.	The supply and provisioning of device used for RPM program. The code is billable only once in a 30-day billing period, if at least 16 daily data sets are available. Specifically, this code covers the costs associated with the device provided to the patient.	A direct monthly expense for the remote monitoring of physiologic data as part of the patient's treatment management services. To receive reimbursement, the physician, qualified health professional, or other clinical staff must provide RPM treatment management services for at least 20 minutes per month, which includes "interactive communication" with the patient, as well as time engaged in non-face-to-face care management services.	An add-on code for CPT Code 99457 and cannot be billed as a stand-alone code. This code can be utilized for each additional 20 minutes of remote monitoring and treatment management services provided (up to 2x).
$19.65	$46.50/month	$48.13/month	$38.64/month

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Emergency Department Crossover

- BI-Level used here
- Patients who might have been intubated in the past now may have the option of NIV.
- Criteria varies from hospital to hospital.
- Patients in respiratory distress, Oxygen>NIV>Vent>NIV
- Interfaces and Skin Breakdown
- Acute Care Setting for Negative Pressure Cuff

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Perioperative, Pre and Post Op

- How often do you see respiratory emergencies in the hospital?
- How many could OSA have been factor?
- Unexpected Deaths in the PACU
- Unexpected Deaths 24 hrs after Surgery
- Within one week of Surgery? Post Op Pain Meds?

- **More to come>>>>**

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Rehab/SNF/Hospice-Crossover

- LTACC, Assisted Living, Nursing and Rehabilitation
- PAP used for respiratory distress patient
- PAP used for the OSA patient
- PAP used for the hospital vent step down patient
- PAP used for Palliative Care, End of Life concerns
- DME involvement here

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LTACC

- Kindred
- Select Specialty Care
- Exceptional Care(Pediatric)
- Wean off Vent to PAP

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Patient/Family RT Education = Compliance

- Primary Care
- Surgeons/Anesthesiologists
- Hospital Respiratory and Allied Health
- Sleep Physician/PAs/CRNPs/Discharge Planners
- RT/RPSGT/CCSH Sleep Educators/Sleep Navigators
- RT/RPSGT Sleep Technologists
- Effects of HST and AutoPAP on Patient Education

- Allied Health Educational Crossover

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American Society of Anesthesiologists

- 2006 Commissioned a Task Force that Identified the Importance of Pre-Screening surgery patients for the presence of Obstructive Sleep Apnea (OSA).
- Purpose: Prevent Post-Surgical Respiratory Events
- Anesthesiology 2006; 104:1081-93

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2008 National Patient Safety Goals

- Proposed Goal 17 from Task Force
- Reduce Risk of Post-Operative Complications for Patients with Obstructive Sleep Apnea
- Organization screens potential OSA patients prior to surgical procedures involving centrally acting anesthetic and/or analgesic agents.

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Anesthesia Concerns with OSA

- OSA patients are more susceptible to airway collapse without anesthesia.
- OSA can affect all three phases of perioperative period.
- Anesthesiologists role in identification of the at risk OSA patient.
- Upper airway dilator muscles impaired.
- Effect may last for hours
- Eikermann, et. Al., AmJRespirCritCareMed 2007 175:9-15

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Anesthesia

- Impairs airway patency
- Increases difficulty of intubation
- Brain response less effective
- Narcotics decrease sensitivity to CO_2
- Respiratory drive/rate depressed

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Preoperative screening for OSA

- Stop Bang Questionnaire with H&P
- Preoperative diagnosis
- Referral to sleep disorder center
- Preoperative treatment if possible
- PAP Treatment prior to surgery
- PAP Treatment documented prior to surgery
- Post Op PAP

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Stop-Bang Stop-Bang Stop-Bang

- 1. Do you **Snore** loudly?
- 2. Do you often feel **Tired** during the daytime?
- 3. Has anyone **Observed** you stop breathing during your sleep?
- 4. Do you have or are you being treated for high blood **Pressure**?

Stop

- 5. **BMI** more than 35 kg/m ?
- 6. **Age** over 50?
- 7. **Neck** circumference greater than 40cm?
- 8. **Gender** male?

Bang

- High Risk of OSA=Yes to 3 or more items
- Low Risk of OSA= Yes to less than 3 items

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American Society of Anesthesiology

Recommendations :

- Anesthesiologists working with Surgeons and Sleep Labs
- Develop Protocols
- Get suspected OSA patients diagnosed and treated prior to surgery whenever possible
- If diagnosis of OSA is made on the day of the surgery, then patient and family needs to be informed of the potential implications of OSA on the perioperative course.

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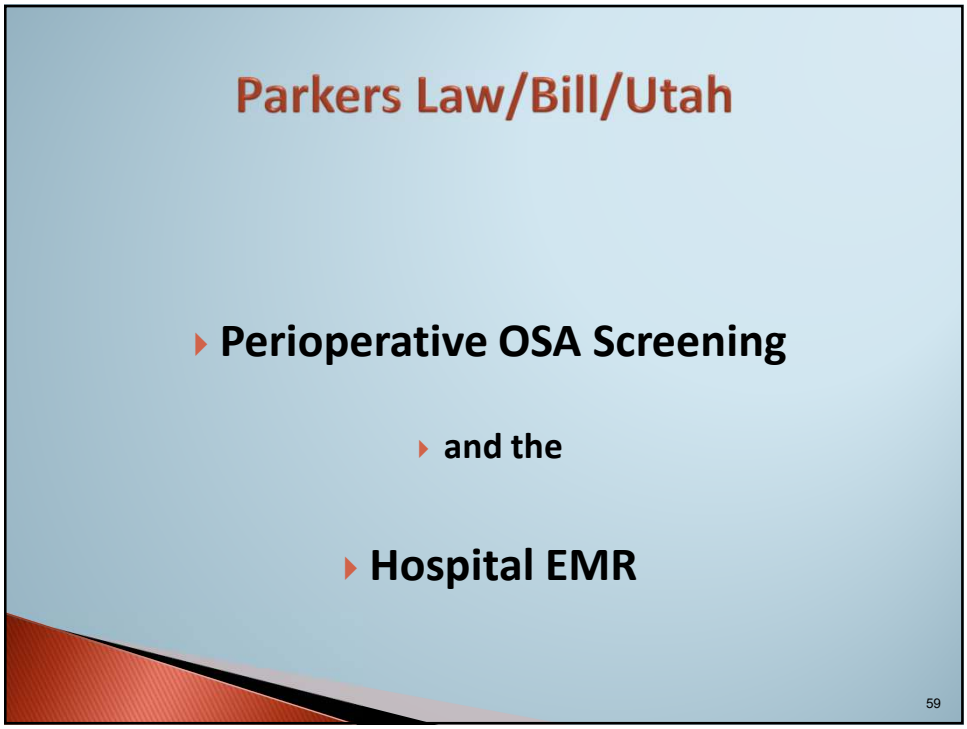

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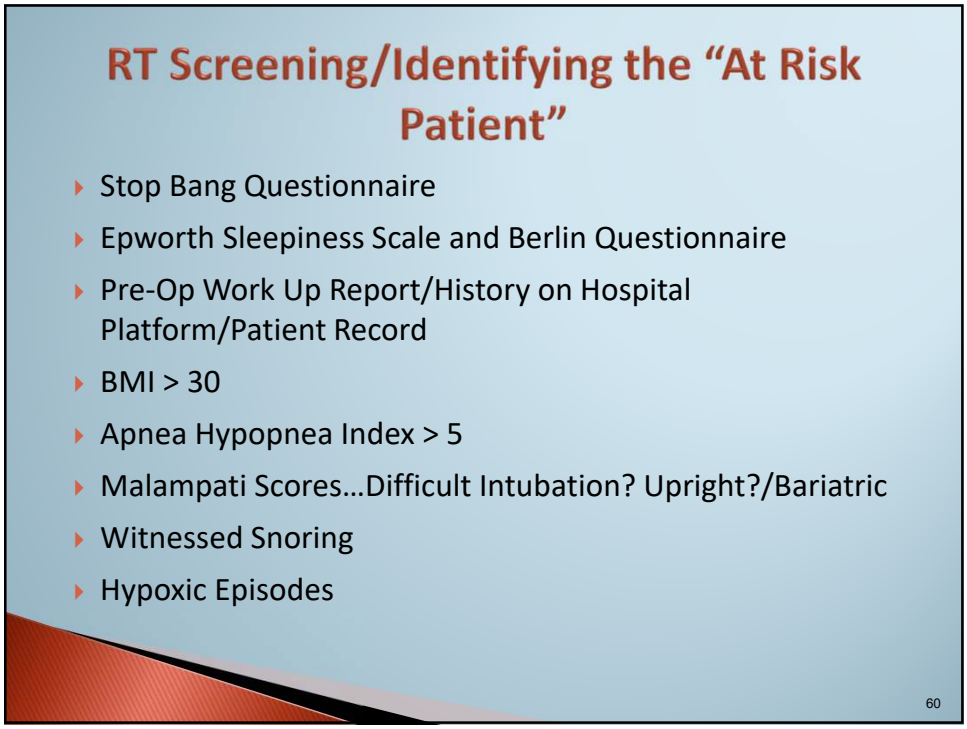

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Protocol Inclusion Criteria/EMR

BOX 1: High Risk Indicators

- STOPBANG ≥ 5 (no previous sleep study, or no home use of CPAP, bi-level, or auto-titrate)
- Previous diagnosis of OSA; however patient is non-compliant with CPAP or bi-level ordered therapy; or not yet ordered on PAP therapy
- Patient requiring CPAP, bi-level or auto-titrate in PACU or on a patient care floor who were not using at home prior to procedure
- Recurrent Respiratory Event (***Non-stimulated patient – defined as ≥ 2 events during Phase 2 recovery***):
  - Repeated occurrence of oxygen saturation < 90%
  - Bradypnea < 8 breaths/minute
  - Apnea > 10 seconds
- Pain mismatch (high pain and sedation scores concurrently)
- Patient requiring supplemental oxygen but did not pre-procedure/pre-hospital admission
- Extended PACU recovery (≥ 90 minutes)
- Consider transfer to higher level of care or hospital admission if PACU recovery time ≥ 120 minutes

Intermountain Healthcare

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Statistics, Cost/Case, Numbers & Regulations…

Human Cost…

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Intermountain Healthcare

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Best Practices Contact

- **Kim Bennion MsHS, RRT, CHC**
  - Intermountain Healthcare
  - System Administrative Director
    - Respiratory Care
    - 801-507-8072 Office
    - 801-347-1269 Cell
    - Kim.Bennion@imail.org

Intermountain Healthcare

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Administrative Hot Buttons

Your OSA RT/Sleep Crossover Peri-Op Program

Reduces Liability
Reduces Readmissions
Decreases Post-Op Complications
Improves Patient Safety
Improves Patient Satisfaction
Increases Outpatient Volume and Revenue
Get Your Champion

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Working Together

- Primary Care Physicians
- Surgeons, Hospitalists
- Anesthesiologists Prescreening
- Allied Health, Nursing, Respiratory Care
- Sleep Disorder Centers, Sleep Navigators
- Home Care Companies
- Hospital Administration/Physician Liaisons
- LTACC, Rehab, SNF
  - **Find Your Champion!**

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Helpful Organizations

- American Society of Anesthesiology - **ASA**
- Society of Anesthesia & Sleep Medicine - **SASM**
- American College of Chest Physicians - **ACCP**
- American Academy of Sleep Medicine - **AASM**
- American Association for Respiratory Care – **AARC**
  - **NBRC, BRPT, AAST**

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Hospital Respiratory and Allied Health

- Need to work closer with their Sleep Labs
- Need to Identify OSA Patients and Refer to Labs
- Respiratory Therapists
- CRNPs
- Discharge Planners
- Case Managers
- Hospitalists
- Physician Assistants
- Critical Care Pulmonary/Sleep Physicians

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HST >> AutoPAP = Patient Education????

- Creates Different Opportunities
- For
- RT Sleep Technologists
- Sleep Navigator Role

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Sleep Educators/Navigators-New

- Emerging Role Developing
- Sleep Educators-CSE, CCSH, RPSGT, RST, SDS
- Certified Sleep Educators
- Focus moving from Diagnostics to Treatment
  - **Fast Track Split Sleep Studies?????**
  - **Education Education Education**

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Allied Health Education Crossover

- Collaboration and Education
- Get Out of Your Comfort Zone to Grow
- Take on New Challenges/Opportunities
- Identifying Crossover for Professional Growth
- No Progress Without Conflict/**Find Champion!**

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Summary and Conclusions

- Allied Health, hospitals, specialized medical facilities, home care medical equipment suppliers and sleep disorders centers will increase collaboration, regarding the OSA patient.
- The results, will be continued technological and educational improvements, that will both support and improve outcomes for the OSA patient.
- OSA Allied Health Providers, RTs, Who Embrace /Adapt to Change, will grow professionally while improving outcomes for their patients.
- **Most Important to Remember:**
- **Hospital Sleep Lab is a <u>Revenue Center!!!!!!!!</u>**

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Michael Smith, RRT, 2015 January 12th

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Thanks to Respiratory Associates

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