BUILDING A SUCCESSFUL HOME SLEEP APNEA TESTING PROGRAM

ALEXANDER VILLAREAL, MD
WISCONSIN SLEEP SOCIETY
9/14/2018
DISCLOSURES

- I am not receiving any financial compensation for this talk
- Names used will be generic when possible
- All recommendations will be based on scientific evidence.
EDUCATIONAL OBJECTIVES

• To describe three different types of home sleep apnea testing units.

• To select a home sleep apnea testing system based on a cost effectiveness analysis

• To name current business models of home sleep apnea testing deployment
WHAT IS POLYSOMNOGRAPHY AND HOW IS IT CLASSIFIED?
POLYSOMNOGRAPHY

- Simultaneous recordings of multiple physiologic signals during sleep, including:
  - Electroencephalogram (central, occipital, frontal)
  - Electromyogram (chin, tibialis)
  - Electrooculogram (right, left)
  - Electrocardiogram
  - Snoring microphone
  - Nasal/Oral Airflow (thermistor, pressure)
  - Thoracic Effort
  - Abdominal Effort
  - SaO2
  - Body Position / video
BRIEF HISTORY OF POLYSOMNOGRAPHY

1937 – Davis, Loomis, Harvey, Hobart - different stages of sleep were reflected in changes of the EEG
1953 – Asereinsky & Kleitman - Identification of Rapid Eye Movements during Sleep
1957 – Dement & Kleitman - Relationship between eye movements, body motility, and dreaming
1968 – Rechtschaffen and Kales (R&K) - standard sleep scoring technique
2007 – American Academy of Sleep Medicine - Manual for the Scoring of Sleep and Associated Events
CLASSIFICATION

Type 1 – In sleep center, attended, overnight polysomnogram
Type 2 – Record same variables as type 1, unattended
Type 3 – Evaluate four physiologic parameters – not sleep
  • respiratory movement and airflow
  • heart rate
  • arterial oxygen saturations
  • (snoring), (position)
Type 4 – evaluate one or two parameters (saturation and airflow)
UNATTENDED HOME SLEEP APNEA TEST (HSAT) TYPE III

• Abbreviated physiological variables
  • Nasal/Oral Airflow (thermistor, pressure)
  • Thoracic / Abdominal Effort
  • SaO2
  • Pulse rate
  • Snoring microphone*
  • Position*

• Rule in moderate to severe OSA with high pre-test probability
• Cannot rule out OSA with a negative test (↓ NPPV)
• Not used for other sleep disorders
IS HOME SLEEP TESTING A NEW CONCEPT?
Comparisons of Home Sleep Recordings and Polysomnograms in Older Adults with Sleep Disorders

Sonia Ancoli-Israel, Daniel F. Kripke, William Mason, and Sam Messin

*Department of Psychiatry, University of California, San Diego, and San Diego Veterans Administration Medical Center, San Diego, California*
Verification of Sleep Apnea Using a Portable Sleep Apnea Screening Device

HELENE A. EMSELLEM, MD, Washington, DC; WILFRED A. CORSON, MD, Minneapolis, Minn;
BOB A. RAPPAPORT, MD, Washington, DC; STEVE HACKETT, CRTT, Edina, Minn;
LEONARD G. SMITH, and JEFFREY N. HAUSFELD, MD, Washington, DC

ABSTRACT: Sixty-seven patients referred to a sleep laboratory with a tentative diagnosis of obstructive sleep apnea were examined with a device designed for home use as an apnea screening system. Direct comparison was made between data obtained by the portable device and by data acquired simultaneously with standard polysomnographic techniques. The portable recorder measured nasal/oral airflow, chest wall movement, cardiac rhythm, and blood oxygen saturation. There was no significant difference in the number of disordered breathing events (apneas and hypopneas) recorded by the two systems. The portable device was found to have a sensitivity of 95% and a specificity of 96%. Indications and limitations for use of the portable home apnea screening test are reviewed and guidelines for normalcy suggested.
Management of Obstructive Sleep Apnea Syndrome in the Home*

The Role of Portable Sleep Apnea Recording

Michael P. Coppola, M.D., F.C.C.P.;† and Michael Lawee, B.S., R.R.T.

Unattended four-channel sleep apnea recording has been shown to be an accurate tool in the diagnosis of moderate to severe obstructive sleep apnea. We selected 11 patients with severe obstructive sleep apnea who had an apnea-hypopnea index (AHI) determined by unattended sleep apnea recording. The mean AHI was 41 (SD, 17.5). We began nasal continuous positive airway pressure (NCPAP) at home empirically with 5 cm to 7.5 cm of pressure for several nights. We then adjusted the level of NCPAP after telephone interview with the patients and their significant others. The level of NCPAP was increased by 2.5-cm increments until the patients reported cessation of snoring and symptom improvement. The mean NCPAP was 8.0 cm (SD, 1.4). We repeated the overnight sleep apnea recording while on NCPAP in all patients at home to determine their response to therapy. All 11 patients had documented return of their AHI to normal (mean AHI, 2.4; SD, 1.6). Statistically significant improvement was noted in the number of obstructive apneas, hypopneas, total respiratory events, and the AHI. Follow-up data confirmed that patients had improvement in their symptoms and remained compliant with therapy (mean follow-up = 18 months; SD, 10.2). No serious complications were encountered when NCPAP was introduced in an unattended setting. We were able to diagnose and treat these patients in an entirely outpatient setting.

(Chest 1993; 104:19-25)

AHII = apnea-hypopnea index; OSAS = obstructive sleep apnea syndrome; NCPAP = nasal continuous positive airway pressure; RDI = respiratory disturbance index; REM = rapid eye movement
ASDA Standards of Practice

Practice Parameters for the Use of Portable Recording in the Assessment of Obstructive Sleep Apnea

Standards of Practice Committee of the American Sleep Disorders Association
Clinical Guidelines for the Use of Unattended Portable Monitors in the Diagnosis of Obstructive Sleep Apnea in Adult Patients

Portable Monitoring Task Force of the American Academy of Sleep Medicine

Task Force Members: Nancy A. Collop, M.D.1 (Chair); W. McDowell Anderson, M.D.2; Brian Boehlecke, M.D., M.S.P.H.3; David Claman, M.D.4; Rochelle Goldberg, M.D.5; Daniel J. Gottlieb, M.D., M.P.H.6; David Hudgel, M.D.7; Michael Sateia, M.D.8; Richard Schwab, M.D.9

JCSM Journal of Clinical Sleep Medicine, Vol. 3, No. 7, 2007
Clinical Practice Guideline for Diagnostic Testing for Adult Obstructive Sleep Apnea: An American Academy of Sleep Medicine Clinical Practice Guideline

Vishesh K. Kapur, MD, MPH; Dennis H. Auckley, MD; Susmita Chowdhuri, MD; David C. Kuhlmann, MD; Reena Mehra, MD, MS; Kannan Ramar, MBBS, MD; Christopher G. Harrod, MS

Journal of Clinical Sleep Medicine, Vol. 13, No. 3, 2017
WHAT DO THE LATEST GUIDELINES SAY?
ADULT PERSON WITH SUSPECTED OSA

1. Does the patient have signs and symptoms that indicate an increased risk of moderate to severe OSA?

2. Does the patient have: significant cardiopulmonary disease, potential respiratory muscle weakness due to neuromuscular condition, awake hypoventilation or high risk of sleep related hypoventilation, history of stroke, chronic opioid medication use, severe insomnia, symptoms of other significant sleep disorder(s), or environmental or personal factors that preclude the adequate acquisition and interpretation of data from HSAT?

IF NO SIGNIFICANT COMORBIDITIES THEN…

3. Perform HSAT, administered by an accredited sleep center under the supervision of a board certified sleep physician

4. Positive diagnosis and adequate results?
   a) **NO** - Evaluate for other sleep disorders OR perform PSG when OSA has not yet been ruled out. Follow a split-night protocol, if clinically appropriate and feasible.
   b) **YES** - Initiate treatment of OSA

5. Follow-up after treatment initiation

WHAT IS THE REIMBURSEMENT FOR HSAT?
## SLEEP SERVICES CMS REIMBURSEMENT

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
<th>2017 Payment</th>
<th>2018 Payment</th>
<th>Change ($)</th>
</tr>
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<tbody>
<tr>
<td>95782</td>
<td>PSG &lt;6yrs 4/&gt;par</td>
<td>$1,035.39</td>
<td>$935.63</td>
<td>-$99.76</td>
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<tr>
<td>95783</td>
<td>PSG &lt;6yrs PAP</td>
<td>$1,176.79</td>
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<tr>
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<td>$92.23</td>
<td>$92.52</td>
<td>$0.29</td>
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<tr>
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<td>$171.91</td>
<td>$173.52</td>
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<tr>
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<tr>
<td>95811</td>
<td>PSG &gt;6yrs PAP</td>
<td>$663.22</td>
<td>$671.03</td>
<td>$7.81</td>
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</tbody>
</table>
WHY ARE WE USING HOME SLEEP TESTING IF IT IS LESS PRECISE AND HAS LOWER REIMBURSEMENT?
HST IN SUSPECTED SIMPLE OSA

- Patient comfort / convenience (Consumerism)
- Lower cost for the patient
  - High coinsurance payments
  - Increasing deductibles
- Patient outcomes appear not to be worsened*
  - Good program in appropriate patients
  - PAP adherence
  - Epworth, Quality Of Life (QOL)
- Mandated by health insurance companies
WHY ARE THE GOVERNMENT AND HEALTH INSURANCE COMPANIES PUSHING FOR HSAT?
NATIONAL DEBT CONTINUES TO GROW
MAJOR ENTITLEMENTS 52%

28% Medicare, Medicaid, Other Health Care
24% Social Security
17% Income Security
15% National Defense
9% All Other
7% Net Interest
TOTAL U.S. HEALTHCARE EXPENDITURES BY SERVICE 2008 – 2024

- 32% Hospital Care
- 26% Professional Services
- 13% Retail Medical Products
- 8% Residential and Personal Care
- 7% Private Health Insurance Administration
- 5% Nursing Care Facilities and Continuing Care Retirement Communities
- 2.7% Home Healthcare
- 2.5% Government Public Health Activities
- 1.3% Government Administration
- 1.4% Research
Medicare Adding to Federal Deficits Faster than Other Government Spending Programs

Entitlement spending is the main cause of long-term runaway federal deficits. Medicare is the fastest-growing program due to retiring baby boomers, the effects of an aging population, and rising healthcare costs.

Source: Congressional Budget Office (Alternative Fiscal Scenario).
Increasing OSA diagnostic tests & their cost

Source: CMS Claims Data (2009); # Diagnostic Tests if 25% of Patients are Medicare
### HIGH COST OF HEALTH CARE FRAUD

**2011 FBI DATA:**
- $1.2 billion in restitutions
- $1 billion in civil settlements
- $1 billion in fines
- $96 million in seizures
- $320 million in civil restitution

#### NATIONAL HEALTH CARE FRAUD TAKEDOWNS

<table>
<thead>
<tr>
<th>Date</th>
<th># of People Charged</th>
<th>Amount of Loss</th>
</tr>
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<tr>
<td>July 2010</td>
<td>94</td>
<td>$251 million</td>
</tr>
<tr>
<td>February 2011</td>
<td>111</td>
<td>$225 million</td>
</tr>
<tr>
<td>September 2011</td>
<td>91</td>
<td>$295 million</td>
</tr>
<tr>
<td>May 2012</td>
<td>107</td>
<td>$452 million</td>
</tr>
<tr>
<td>October 2012</td>
<td>91</td>
<td>$430 million</td>
</tr>
<tr>
<td>May 2013</td>
<td>89</td>
<td>$223 million</td>
</tr>
<tr>
<td>May 2014</td>
<td>90</td>
<td>$260 million</td>
</tr>
<tr>
<td>June 2015</td>
<td>243</td>
<td>$712 million</td>
</tr>
<tr>
<td>June 2016</td>
<td>~275</td>
<td>~$800 million</td>
</tr>
<tr>
<td>Total</td>
<td>App. 1,200</td>
<td>Over $3.5 billion</td>
</tr>
</tbody>
</table>
ALSO AFFECTING SLEEP MEDICINE

- Multiple lawsuits against sleep clinics accused of knowingly using unlicensed or unqualified personnel to conduct tests or dispense medical devices:
  - 2011 whistleblower lawsuit against Florida-based SomnoMedics LLC
  - 2011 settlement of allegations against Alpha Sleep Diagnostic Centers in Colorado
  - 2013 settlement for $15.3 million against American Sleep Medicine to resolve whistleblower and government allegations
  - 2014 settlement of a whistleblower action against central Florida’s VMG Pulmonary and Sleep Institute and its physician/owner
  - 2014 settlement of whistleblower and government accusations against North Atlantic Medical Services Inc. (NAMS) in Massachusetts (respiratory therapy services including devices)

- A 2010 federal indictment in Sacramento, California, for a wide-ranging health care fraud scheme including billing Medicare for sleep studies never performed and falsifying related records

- A 2014 settlement of alleged multiple fraudulent practices by Florida’s Sleep Medicine Center and two physicians, including billing for services that were not medically necessary or never performed, using unlicensed personnel, and failing properly to supervise a center

- A 2015 DOJ lawsuit against California’s Qualium Corporation dba Bay Area Sleep Clinics alleging over 14,000 false claims to Medicare due to alleged billing for tests and devices provided at non-Medicare-approved locations, using unlicensed personnel, and violating rules prohibiting sleep-test providers from providing related medical devices and from co-locating a sleep-clinic with a medical equipment business. A related whistleblower complaint additionally alleges unlawful kickbacks and accusations against a third party billing company.
DOES HSAT ADVERSELY AFFECT OSA OUTCOMES?
HOME VERSUS LABORATORY DIAGNOSIS AND TREATMENT OF OSA

A Multisite Randomized Trial of Portable Sleep Studies and Positive Airway Pressure Autotitration Versus Laboratory-Based Polysomnography for the Diagnosis and Treatment of Obstructive Sleep Apnea: The HomePAP Study

Carol L. Rosen, MD\textsuperscript{1}; Dennis Auckley, MD\textsuperscript{2}; Ruth Benca, MD\textsuperscript{3}; Nancy Foldvary-Schaefer, DO\textsuperscript{4}; Conrad Iber, MD\textsuperscript{5}; Vishesh Kapur, MD\textsuperscript{6}; Michael Rueschman, MPH\textsuperscript{7}; Phyllis Zee, MD\textsuperscript{8}; Susan Redline, MD\textsuperscript{9}

\textsuperscript{1}University Hospitals-Case Medical Center, Case Western Reserve University School of Medicine, Cleveland, OH; \textsuperscript{2}MetroHealth Medical Center, Case Western Reserve University School of Medicine, Cleveland, OH; \textsuperscript{3}University of Wisconsin, Madison, WI; \textsuperscript{4}Cleveland Clinic, Case Western Reserve University, Cleveland, OH; \textsuperscript{5}Hennepin County Medical Center, University of Minnesota, Minneapolis, MN; \textsuperscript{6}Harborview Medical Center, University of Washington, Seattle, WA; \textsuperscript{7}Brigham and Women's Hospital, Boston, MA; \textsuperscript{8}Northwestern University, Feinberg School of Medicine, Chicago, IL; \textsuperscript{9}Brigham and Women's Hospital and Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA
RESULTS

• At 3 mo, PAP usage (nightly time at pressure)
  • 4.7 ± 2.1 hr (HOME) vs. 3.7 ± 2.4 hr (LAB).

• Adherence (percentage of night used ≥ 4 hr)
  • 62.8 ± 29.2% (HOME) vs. 49.4 ± 36.1% (LAB)

• Acceptance of PAP therapy, titration pressures, effective titrations, time to treatment, and ESS score change did not differ between arms.

• Cost: $139,148.48 (HOME) vs. $186,109.50 (LAB)
Noninferiority of Functional Outcome in Ambulatory Management of Obstructive Sleep Apnea

Samuel T. Kuna¹,², Indira Gurubhagavatula¹,², Greg Maislin³, Sakhena Hin¹, Kathryn C. Hartwig⁴, Sue McCloskey¹, Robert Hachadoorian³, Sharon Hurley³, Rajesh Gupta¹, Bethany Staley², and Charles W. Atwood⁴,⁵

¹Department of Medicine, Philadelphia Veterans Affairs Medical Center, Philadelphia; ²Department of Medicine, University of Pennsylvania, Philadelphia; ³Biomedical Statistical Consulting, Wynnewood; ⁴Department of Medicine, Veterans Affairs Pittsburgh Healthcare System, Pittsburgh; and ⁵Department of Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania

Originally Published in Press as DOI: 10.1164/rcm.201011-1770OC on January 21, 2011
Internet address: www.atsjournals.org
CONCLUSIONS

- Functional outcome and treatment adherence in patients evaluated according to a home testing algorithm is not clinically inferior to that in patients receiving standard in-laboratory polysomnography.
OTHER SIMILAR STUDIES EXIST


WHAT IS THE ECONOMICAL JUSTIFICATION FOR A HOME SLEEP APNEA TESTING PROGRAM?
PREVALENCE OF SDB IN THE GENERAL POPULATION IS INCREASING

- U.S Adult Population: 245.2 M
  - Prevalence OSA (AHI>5): 29.4 M
    - Undiagnosed: 23.5 M (80%)
    - Diagnosed: 5.9 M (20%)

- CPAP: 5 M (85%)
- Oral Appliances: 0.6 M (10%)
- Surgery: 0.3 M (5%)
- Lifestyle: 5.9 M (100%)

Hidden Health Crisis Costing America Billions. AASM 2016
OBESE ADULTS – BMI > 30
PREVALENCE\textsuperscript{1} OF SELF-REPORTED OBESITY AMONG U.S. ADULTS BY STATE AND TERRITORY, BRFSS, 2016

\textsuperscript{1} Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.

*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) \( \geq 30\% \).
OSA WORSENS WITH AGE

Smoothed plot (5-year moving average) of the prevalence of an AHI≥15 by age

Population Aged 65 and Over: 1900 to 2050

For information on confidentiality protection, nonsampling error, and definitions, see

# Economic Impact of Untreated OSA

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th># People in U.S. with Undiagnosed OSA and Comorbidity (Mil)</th>
<th>Costs ($US Bil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>14.1</td>
<td>$5.4</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>3.1</td>
<td>$6.7</td>
</tr>
<tr>
<td>Diabetes</td>
<td>5.6</td>
<td>$6.4</td>
</tr>
<tr>
<td>Asthma and Other Breathing Disorders</td>
<td>5.9</td>
<td>$2.6</td>
</tr>
<tr>
<td>Insomnia</td>
<td>6.8</td>
<td>$2.1</td>
</tr>
<tr>
<td>Depression, Anxiety and Other Mental Health Problems</td>
<td>8.7</td>
<td>$7.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td><strong>$30.0</strong></td>
</tr>
</tbody>
</table>

*Costs include medication and healthcare utilization.*

Hidden Health Crisis Costing America Billions. AASM 2016
## TREATING OSA IS COST EFFECTIVE

<table>
<thead>
<tr>
<th>Undiagnosed</th>
<th>Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td># People with OSA</td>
<td>23,500,000</td>
</tr>
<tr>
<td></td>
<td>5,900,000</td>
</tr>
<tr>
<td>Cost of Undiagnosed OSA ($US Bil)</td>
<td>Diagnosis, Testing and Follow-up</td>
</tr>
<tr>
<td>Comorbidities &amp; Mental Health</td>
<td>Cost of Diagnosed OSA ($US Bil)</td>
</tr>
<tr>
<td>$30.0</td>
<td>$0.8</td>
</tr>
<tr>
<td>Motor Vehicle Accidents</td>
<td>Diagnosis, Testing and Follow-up</td>
</tr>
<tr>
<td>$26.2</td>
<td>Non-surgical Treatment (PAP and Oral Appliances)</td>
</tr>
<tr>
<td>Workplace Accidents</td>
<td>$6.2</td>
</tr>
<tr>
<td>$6.5</td>
<td>Surgical Treatment</td>
</tr>
<tr>
<td>Lost Productivity</td>
<td>$5.4</td>
</tr>
<tr>
<td>$86.9</td>
<td>$5.4</td>
</tr>
<tr>
<td><strong>Total Costs ($US Bil)</strong></td>
<td><strong>$149.6</strong></td>
</tr>
<tr>
<td>$149.6</td>
<td><strong>$12.4</strong></td>
</tr>
<tr>
<td>Cost per Person</td>
<td>$6,366</td>
</tr>
<tr>
<td></td>
<td>$2,105</td>
</tr>
</tbody>
</table>
HOW TO SCREEN FOR OSA CLINICALLY?
PRACTICAL OSA SCREENING

STOP BANG Questionnaire

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 daytime?

3. **Observed**
   Has anyone observe you stopping breathing during your sleep?

4. **Blood Pressure**
   Do you have or are you being treated for high blood pressure?

5. **BMI**
   BMI more than 35kg/m²?

6. **Age**
   Age over 50 years old?

7. **Neck circumference**
   Neck circumference greater than 40 cm (15.75’’)?

8. **Gender**
   Male gender?

High risk of OSA – ‘yes’ to three or more items

Chung. Anesthesiology. 2008
OTHER PATIENTS AT HIGH RISK FOR OSA

- Obesity (BMI > 35)
- Congestive heart failure
- Atrial fibrillation
- Refractory hypertension
- Diabetes Type 2
- Stroke

- Nocturnal dysrhythmias
- Pulmonary HTN
- High-risk driving populations (CDL)
- Preoperative for bariatric surgery
WHAT ARE THE CONTRAINDICATIONS FOR A HSAT?
<table>
<thead>
<tr>
<th>HST CONTRAINDICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Severe pulm disease</td>
</tr>
<tr>
<td>• BMI &gt; 40</td>
</tr>
<tr>
<td>• Narcotic analgesic use</td>
</tr>
<tr>
<td>• Raynaud's</td>
</tr>
<tr>
<td>• Neuromuscular disease</td>
</tr>
<tr>
<td>• Stroke</td>
</tr>
<tr>
<td>• CHF</td>
</tr>
<tr>
<td>• Lack of dexterity</td>
</tr>
<tr>
<td>• Asymptomatic patients</td>
</tr>
<tr>
<td>• Individuals suspected of having other sleep disorders</td>
</tr>
<tr>
<td>• Identification of individuals working in safety-critical occupations</td>
</tr>
<tr>
<td>• Pediatric populations</td>
</tr>
<tr>
<td>• Inability to cooperate</td>
</tr>
</tbody>
</table>
WHAT ABOUT AUTO TITRATION POSITIVE AIRWAY PRESSURE (APAP)?
APAP AS GOOD AS A CPAP TITRATION IN SIMPLE OSA

• APAP was equivalent to CPAP in efficacy, adherence, and functional outcomes after 3 or 6 months
  • Kushida, Sleep. 2011

• APAP was more cost effective and offered similar outcomes among patients with moderate-severe OSA without serious co-morbidities.
  • McArdle. Thorax. 2010

• Quality, algorithms and reports vary amongst vendors.

• APAP cost is the same or less* than for fixed pressure CPAP
APAP CONTRAINDICATIONS

- To diagnose OSA (instead of a PSG)
- Congestive heart failure
- Significant lung disease; (i.e. COPD)
- Obesity hypoventilation syndrome
- Patients who do not snore (naturally or s/p palate surgery)
- Central sleep apnea syndromes
DO YOU KNOW YOUR COMPETITION?
Find a Sleep Facility Near You

Use the fields below to find your nearest sleep center. The search may include your full address, your city and state, or your zip code. You can change the search radius by increasing or decreasing the number of miles in the appropriate field.

I'm not a robot

Please prove you're not a robot before hitting Search.

53072 within 25 miles

Search
OTHER COMPETITORS

• Non-accredited sleep centers
• Otolaryngology practices
• Pulmonary practices
• Neurology practices
• Primary care physicians

• Dental practices
• Independent home sleep apnea testing companies
• Health Insurance carriers
• Durable Medical Equipment Companies
• Internet based testing
NOT ALL COMPETITORS ARE EQUAL

AASM SLEEP PROGRAMS
• Accredited sleep center
• Scored by a technologist
• Boarded Sleep Physician reviewed epoch by epoch
• Single night, > 6 hours
• Technical quality standards

DISLOYAL COMPETITION
• Report signed by a licensed physician*
• Automatic generated report
• Lower out of pocket cost
• Multiple studies / nights
• Free screening tests
Home Sleep Apnea Test Device Kit

ApneaLink Plus is an at home sleep testing device used for diagnosis of sleep apnea. This device itself is not for sale but rather the service of diagnostic testing and test result interpretation.

Your cart is empty.

Manufacturer: 1800CPAP.COM
MPN: 22328
In Stock: 4

Quantity: 1
Add To Cart

Shipping Rates & Delivery Times
Choose the right solution for your needs.
Do you have a physician that you see regularly?

If Yes,  
**Home Sleep Test**  
Our Price: $299.99

[Add to Cart]

Convenient - Utilizes two in-person physician consultations  
Fast - As little as 1 week with expedited shipping  
Accurate - High accuracy level - equivalent in effectiveness to facility-based testing  
Affordable - Only $299 vs. thousands of dollars for a facility-based sleep test

If No,  
**Easy Sleep Apnea Test**  
Our Price: $399.99

[Add to Cart]

Convenient - Utilizes two remote physician consultations  
Fast - As little as 1 week with expedited shipping  
Accurate - High accuracy level - equivalent in effectiveness to facility-based testing  
Affordable - Only $399 vs. thousands of dollars for a facility-based sleep test
WHAT IS YOUR COMPETITIVE ADVANTAGE?

HOSPITAL BASED
• Higher unbundled reimbursement
• Greater capital investment
• Captive referral base

IDTF
• Lower cost out of pocket for patients
• Greater flexibility
• Sales and marketing
WHAT IS YOUR PATIENT FLOW LIKE?

- Who is allowed to order an HAST? – Sleep center providers vs. others
- Any insurance restrictions?
- Who does the prior-authorization work?
- Who and how is the patient educated on HSAT?
- How is the unit delivered to the person being tested? Pick up vs. mail
- How are damaged or lost units managed? Contracts?
- Patient follow up and treatment
- This model works only with adequate patient evaluation & follow up
WHERE TO START FINDING HOME SLEEP APNEA TESTING UNITS?

- Ask your network
- Sleep Review Magazine
- Every October
- http://www.sleepreviewmag.com/

HOME SLEEP TESTING (HST) DEVICES

<table>
<thead>
<tr>
<th>Company</th>
<th>Advanced Sleep Monitoring Inc</th>
<th>BRAHSON Medical</th>
<th>Compumedics USA Inc</th>
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<tbody>
<tr>
<td>Product</td>
<td>SleepProfiler &amp; PSG2</td>
<td>Multalite Jr</td>
<td>Exponential</td>
</tr>
<tr>
<td>Cost to Buy</td>
<td>Starting at $2,500</td>
<td>$2,450</td>
<td>$3,500</td>
</tr>
<tr>
<td>Cost to Rent</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Owner’s Warranty (years)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cost of Calibration per Study</td>
<td>$175 (includes calibration or portal software)</td>
<td>&gt;$90</td>
<td>&gt;$90</td>
</tr>
<tr>
<td>Type</td>
<td>Type II (8,12,19,44)</td>
<td>Type III</td>
<td>Type III</td>
</tr>
<tr>
<td>Channels</td>
<td>Up to 13 channels: Sleep Profiler includes EEG, LOCUS, EOG, IMPI, EMG, CEMI, expiratory pulse, snooze, snore, level measured, and weight; PSG additionally includes waveform triggers, HP, and pulse, total sleep, airflow, and onset and offset of events, followed by PSG events, and RDI.</td>
<td>Type III</td>
<td>Type III</td>
</tr>
<tr>
<td>Dimensions</td>
<td>2 x 4.5 x 1.75</td>
<td>6.35 x 3.72 x 1.91</td>
<td>7.62 x 6.00 x 1.28</td>
</tr>
<tr>
<td>Product Weight</td>
<td>3 lbs</td>
<td>9 lbs</td>
<td>5 lbs</td>
</tr>
<tr>
<td>Recalibrations</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>
WHAT IS YOUR COST OF DOING BUSINESS?

- Rent, utilities, and phones
- Office equipment and supplies
- Benefits, continuing education, or training
- Other Insurance
- Labor: RT vs. RPSGT
- Advertising, marketing, and promotion
- Fees, dues, and subscriptions
EXAMPLE

• Home sleep apnea equipment rental fee: $50 per month
  • $6.25 per study (if unit used 8 times a month)

• Disposables: $10 per study

• Sleep technologist time: $24
  • Assumes Wisconsin median per salary.com – September 2018
  • 60 minutes - Programing, educating, downloading, scoring, archiving and cleaning.

• Physician time: $25
  • 15 minutes for epoch by epoch review, report generation, billing

• Grand Total: $65.25
## HOME SLEEP APNEA TEST COMPARISON

<table>
<thead>
<tr>
<th></th>
<th>95800</th>
<th>95806 – Unit 1</th>
<th>95806 – Unit 2</th>
<th>95806 – Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>24/7 Customer Service for patients</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Warranty / insurance lost broken units</strong></td>
<td>Yes up to 50% per year</td>
<td>no</td>
<td>no</td>
<td>Yes. Third party assumes full risk</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td>Easiest</td>
<td>Easy</td>
<td>Very Easy</td>
<td>Easy</td>
</tr>
<tr>
<td><strong>Autoscoring</strong></td>
<td>Yes</td>
<td>No</td>
<td>Partial</td>
<td>Yes for a fee</td>
</tr>
<tr>
<td><strong>Day Tech time</strong></td>
<td>20 minutes ($8)</td>
<td>60 minutes ($24)</td>
<td>60 minutes ($24)</td>
<td>30 minutes ($12)</td>
</tr>
<tr>
<td><strong>Physician Time</strong></td>
<td>10 minutes ($16.66)</td>
<td>15 minutes ($25)</td>
<td>15 minutes ($25)</td>
<td>15 minutes ($25)</td>
</tr>
<tr>
<td><strong>Cost lease unit per study (8 studies per month)</strong></td>
<td>$12.5 ($100 a month)</td>
<td>$5 ($40 a month)</td>
<td>$8.75 ($70 a month)</td>
<td>$150</td>
</tr>
<tr>
<td><strong>Cost Disposables per study</strong></td>
<td>$40</td>
<td>$10</td>
<td>$10</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>$77.16</td>
<td>$64</td>
<td>$67.75</td>
<td>$187</td>
</tr>
<tr>
<td><strong>Medicare Reimbursement 2018 (AASM)</strong></td>
<td>Cpt code 95800 (RVU 5.02) $180.72</td>
<td>CPT code 95806 (RVU 4.75) $173.52</td>
<td>CPT code 95806 (RVU 4.75) $173.52</td>
<td>CPT code 95806 (RVU 4.75) $173.52</td>
</tr>
<tr>
<td><strong>Net Cash Flow Per Study</strong></td>
<td>$103.56</td>
<td>$109.52</td>
<td>$105.77</td>
<td>$-13.48</td>
</tr>
</tbody>
</table>
WHAT TO DO WITH THE EXISTING INFRASTRUCTURE (BEDROOMS)?
IN LABORATORY POLYSOMNOGRAPHY

NON-SLEEP DISORDERED BREATHING

- Parasomnias (RBD)
- Nocturnal Seizures
- Narcolepsy
- Other Hypersomnias
- Research

SLEEP DISORDERED BREATHING

- Central sleep apnea
- Hypoventilation – CO2
- OSA
  - Pediatric
  - Lack of dexterity / behavioral
  - Overlap syndrome (+ COPD)
  - At risk for Complex Sleep Apnea
FINAL REMARKS
SUMMARY – THE UGLY

• HSAT & APAP will become more prevalent as health insurance companies and government attempt to contain costs

• Prior authorizations for in laboratory sleep studies will become more onerous and routine

• Reimbursement for in laboratory polysomnography will likely continue to drop

• Sleep centers and people working in them will be affected
SUMMARY – THE GOOD

- Expect more OSA patients as the population grows older & heavier
- HST will open the door to patients who would otherwise not be tested.
- Higher volume of more complex patients (card, neuro, pulm, pain, peds)
- An initial sleep consultation with defensive documentation will support the appropriateness of an in laboratory sleep study.
- Good patient care and low costs will be rewarded. (value based medicine)
THANK YOU