Out of Center Sleep Testing and Auto-titrating CPAP: Gizmos and Gadgets

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I receive support from Respironics and ResMed, but have no conflicts of interest related to this talk.
Objectives

- To review the influence of payer policy on today’s use of HST
- To recognize the benefits and limitations of HST
- To recognize the potential of HST and APAP in program efficiency and in improving access to sleep care
Who’s using HST?

A. HST is a part of my practice
B. I’m not using HST yet, but I plan to
C. I’ll never convert
D. HST…is that *Hashish Self Therapy*?
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Types of Sleep Testing

- **Type I**: in-lab attended polysomnography
- **Type II**: polysomnography, unattended
- **Type III**: cardiorespiratory monitoring (no sleep staging or recording) of four physiologic variables
  - Usually 4-7 channels
- **Type IV**: 1-2 channels, usually including oximetry

Out of Center Sleep Testing = Home Sleep Testing = Portable Monitoring
HST Data

Limited reporting

- Total recording time
- Apnea-Hypopnea index (AHI)
- Oxygen desaturation index (ODI)
- Min sat, T<90%, T<88%

Events are largely based on flow and desaturation

May have decreased sensitivity/high FN results in thin healthy people
Types of Data Output
Types of Data Output
Importance of Reviewing Data
Importance of Reviewing Data
Importance of Reviewing Data
Can you score these?   A. Yes   B. No   C. What events?
Role of OCST

- High pretest probability of moderate to severe OSA
- Not for asymptomatic populations
- Not for patients with other sleep disorders
- Not for patients with moderate to severe pulmonary disease, CHF, or neuromuscular disease
Which one is a HST?

A. 

B. 

C. 

D.
Which one is a HST?

A. Picture A
B. Picture B
C. Picture C
D. Picture D

The correct answer is C. Picture C.
Changing Climate of Sleep Medicine

Sleep RTs  Sleep Docs

Tech Companies  Insurance/Payers

Hey! You pull up and I'll push down and we'll see what happens!

Okay!
History of HST Coverage

1995: Safety and effectiveness of HST to diagnose sleep disorders unproven

2003: AASM/ATS/ACCP comprehensive review

2005: Insufficient evidence for HST as a basis for prescribing CPAP

2007: CMS reconsiders HST reimbursement for NCD

2008: NCD covering CPAP for OSA diagnosed by HST
HST....

- Reimbursable
- Diverse selection of devices
- Increased access to testing

But...

- Much lower reimbursement rate (28% PSG)
- Lack of evidence on outcomes
- Perception of better data from PSG
Impact of 2008 NCD

Sleep Docs

HST

Most don't know what a HST is, so why should they care about it?

Thomas Hesse, Sony BMG

(artist's impression)
Payer Driven Change

- Prior authorizations
- Fewer PSGs, more HSTs
- Fewer in-lab Titrations, more home APAP
- Centralized testing services
- Staffing changes
- Administrative burden
- Lab closures
Technology Driven Changes
### HST Variability

<table>
<thead>
<tr>
<th>Signals</th>
<th>Output</th>
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<tbody>
<tr>
<td>Flow</td>
<td>Raw Data</td>
</tr>
<tr>
<td>EtCO2</td>
<td>“Black box”</td>
</tr>
<tr>
<td>Acoustic signaling</td>
<td></td>
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<tr>
<td>Respiratory effort</td>
<td></td>
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<td>EEG</td>
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<td>HR vs. ECG</td>
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What device to choose? What will it measure?
Innovative Devices
APAP

- Increase pressure to maintain airway patency, decrease pressure when no events are detected
- Algorithms to adjust: snoring, apneas, hypopneas, airflow limitation, impedance
Why APAP?

- Treatment of OSA
- Determination of optimal fixed pressure
- Pressure requirements fluctuate depending on position and stage of sleep
- Patient characteristics may change over time: BMI, rhinitis
- Facilitates ambulatory evaluation
Payer Influence on use of APAP

- **90d Rule**
  - Compliance: 4+ hours of PAP use per night, >70% of nights in a 30 consecutive day period
  - Face-to-face assessment documenting symptomatic improvement in daytime sleepiness or fatigue, observed apneas/choking/gasping during sleep, morning headaches

- **Cost**
  - In lab vs. home
  - No reimbursement for home titration
Which patient should avoid APAP?

A. 75y/o male with predominantly mixed apneas, AHI 30/h
B. 28y/o male with depression and PTSD, AHI 17/h
C. 55y/o non-snoring male, AHI 23/h
D. 46y/o male s/p UPPP, AHI 68/h
E. None of the above. They may all do just fine.
Which patient should avoid APAP?

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Era of Limited Resources

Resources
- Docs
- Equipment

Demand
- Awareness
- Aging Population
- Obesity
Do the Math

Prevalence: 24% men (152M), 9% women (157M)

80-90% are undiagnosed

44 Million

(giddy up)
Paradigm Shift in Sleep Care

• Access to Care
  • What can HST do for you?
  • Can APAP simplify treatment?

• Sleep as a chronic disease
  • Improving compliance with OSA treatments
  • Long term management

• Redefining outcomes in sleep research
Ambulatory Models of Care

• HST + APAP titration vs. attended PSG + CPAP titration (or split) (Berry, 2008)
  • 106 pts: No difference in CPAP adherence, ESS, FOSQ, CPAP satisfaction score at 6wks

• HST + APAP titration vs. attended split night or PSG + home APAP titration (Kuna, 2011)
  • 296 pts: CPAP adherence and improvement in daytime function in home group was not clinically inferior to in-lab group at 3mo

• HomePAP: PM + APAP titration vs. PSG+ CPAP titration (Rosen, 2012)
  • 373 pts: CPAP use and adherence were higher in home group
Rethinking the Role of OCST

- High pretest probability of moderate to severe OSA
- Pretest probability...moderate or low?
- Not for asymptomatic populations
- Asymptomatic with comorbidities?
- Not for patients with other sleep disorders
- Middle insomnia? Central sleep apnea?
- Not for patients with moderate to severe pulmonary disease, CHF, or neuromuscular disease
- If equipment can detect CSR, CSA, PB, why not?

Who’s left after all of the above are excluded?...
In-processing

1. VA I.D.
2. CPAP
Sleep as a Chronic Disease

- Patient Centric Treatment plans
- Long-term goals: weight loss, sleep hygiene
- Shift of care back to primary care without compromising the role of sleep specialists
- Use technology to increase sleep awareness and engage pts!
Summary/Future Directions

- Money really does drive change
- HST is wonderful (even with limitations)
- Implementing HST/APAP can increase access to care and program efficiency.
- Role of HST/APAP in reducing readmission rates?
I was given LOTS of advice about today’s talk. The best advice is:

A. Drink the night before…if you have a hangover it takes the edge off

B. Do a shot of whiskey first

C. Eat breakfast
A. Drink the night before...if you have a hangover it takes the edge off
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23%  57%  20%