Home Sleep Apnea Testing

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Disclosures

- I wish I could make big bucks giving lectures and promoting sleep products, but sadly, nobody has asked me to do this.
- I have nothing to disclose.

Historical Prospective

- Like most of us in the sleep field, I was diametrically opposed to using home units for the diagnosis of sleep apnea.
- 2011
  - Our center was doing about 1200-1300 studies (PSG, CPAP, MSLT) yearly
  - I learned at sleep meetings and during AASM site visits that some insurers were going to require precertification for sleep studies and that polysomnography would be disallowed for certain uncomplicated patient populations.
  - Our center acquired HSAT devices (Stardust II) and we compared them with diagnostic PSGs and found that the devices ere reasonably accurate, but tended to under estimate the severity of respiratory events.
- 2012 only ~800 in lab studies done!!!
- Fortunately, we were ready to use HSAT devices when the changes came.

Why perform a Home Sleep Apnea Test?

“High Pre Test Clinical Probability of Significant Sleep Apnea”

The HSAT is not the appropriate test for…..

- "I can't sleep"
- "sleep at the wrong times"
- "I am very dangerously sleepy"
- "I do peculiar things during my sleep and sometimes don't know it"
- "I move a lot at night"
- "I have lots of other bad medical problems"

We do this every day!
We know this!

- Sometimes the person at the insurance company doesn't, or perhaps has a different agenda.
- Sometimes, now that HSAT has become mainstream, our patients think they can all have their "sleep" test at home
- Sometimes the primary care providers tell patients "They will let you do your test at home"

It is our job to do the most appropriate test for our patient. The test that gives us information we need to properly treat the patient promptly and inexpensively.

What do the smart people recommend?

Clinical Practice Guideline for Diagnostic Testing for Adult Obstructive Sleep Apnea: An American Academy of Sleep Medicine Clinical Practice Guideline

1. We recommend that clinical tools, questionnaires or prediction algorithms not be used to diagnose OSA in adults, in the absence of PSG or HSAT.	Strong	Moderate	High certainty that harms outweigh benefits	Vast majority of well-informed patients would most likely not choose clinical tools, questionnaires or prediction algorithms for diagnosis
2. We recommend that PSG, or HSAT with a technically adequate device, be used for the diagnosis of OSA in uncomplicated adult patients presenting with signs and symptoms that indicate an increased risk of moderate to severe OSA.	Strong	Moderate	High certainty that benefits outweigh harms	Vast majority of well-informed patients would want PSG or HSAT

Vishesh K. Kapur, MD, MPH[1]; Dennis H. Auckley, MD[2]; Susmita Chowdhuri, MD[3]; David C. Kuhlmann, MD[4]; Reena Mehra, MD,
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3. We recommend that if a single HSAT is negative, inconclusive or technically inadequate, PSG be performed for the diagnosis of OSA.	Strong	Low	High certainty that benefits outweigh harms	Vast majority of well-informed patients would want PSG performed if the initial HSAT is negative, inconclusive, or technically inadequate
4. We recommend that PSG, rather than HSAT, be used for the diagnosis of OSA in patients with significant cardiorespiratory disease, potential respiratory muscle weakness due to neuromuscular condition, awake hypoventilation or suspicion of sleep related hypoventilation, chronic opioid medication use, history of stroke or severe insomnia.	Strong	Very Low	High certainty that benefits outweigh harms	Vast majority of well-informed patients would most likely choose PSG to diagnose suspected OSA

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5. We suggest that, if clinically appropriate, a split-night diagnostic protocol, rather than a full-night diagnostic protocol for PSG be used for the diagnosis of OSA.	Weak	Low	Low certainty that benefits outweigh harms	Majority of well-informed patients would most likely choose a split-night diagnostic protocol to diagnose suspected OSA
6. We suggest that when the initial PSG is negative, and there is still clinical suspicion for OSA, a second PSG be considered for the diagnosis of OSA.	Weak	Very low	Low certainty that benefits outweigh harms	Majority of well-informed patients would most likely choose a second PSG to diagnose suspected OSA when the initial PSG is negative and there is still a suspicion that OSA is present

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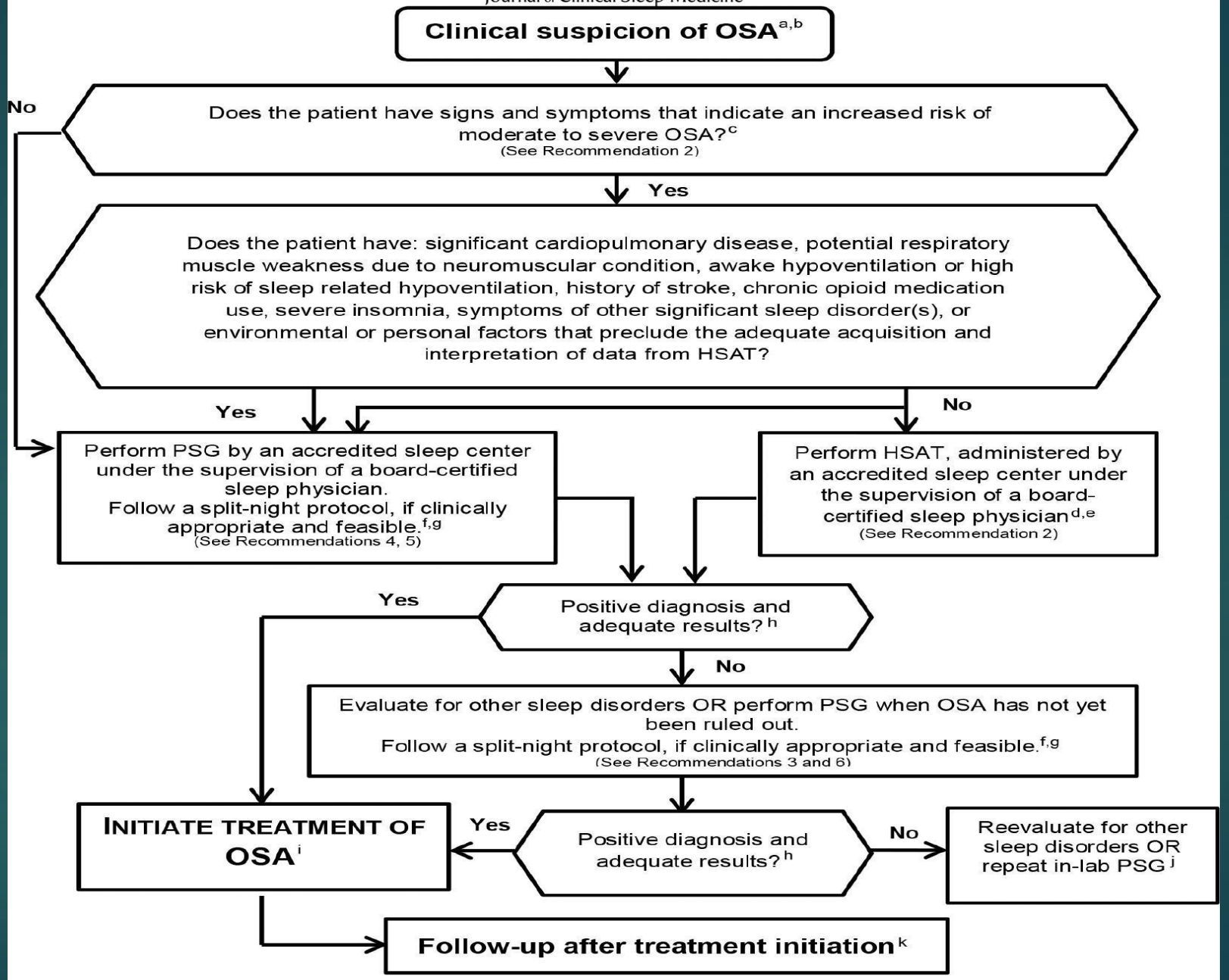


Kapur VK, Auckley DH, Chowdhuri S, Kuhlmann DC, Mehra R, Ramar K, Harrod CG. Clinical practice guideline for diagnostic testing for adult obstructive sleep apnea: an American Academy of Sleep Medicine clinical practice guideline. J Clin Sleep Med. 2017;13 (3):479–504.

Which Device?

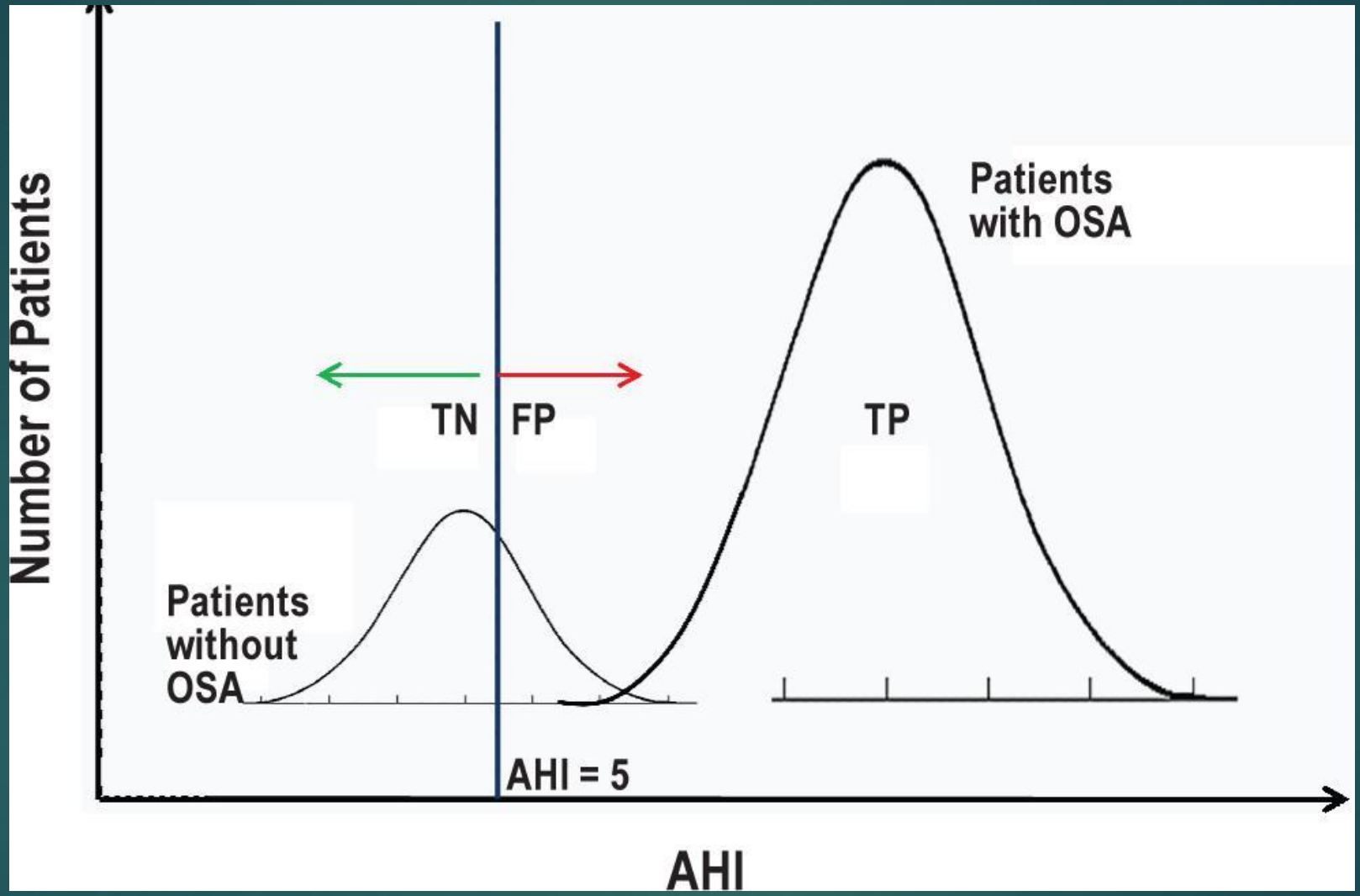
- Many centers have already made this decision
- For those that have not please consider:
  - What sensors are you familiar with?
    - Easy for the patient to apply?
    - Reliable recording?
  - Easy to score
  - User friendly reporting?
  - Does the device allow for review of raw data?
  - Buy or Rent?
  - Durability?
  - Cost per test?
- Rent/lease v buy, these devices take a lot of abuse.

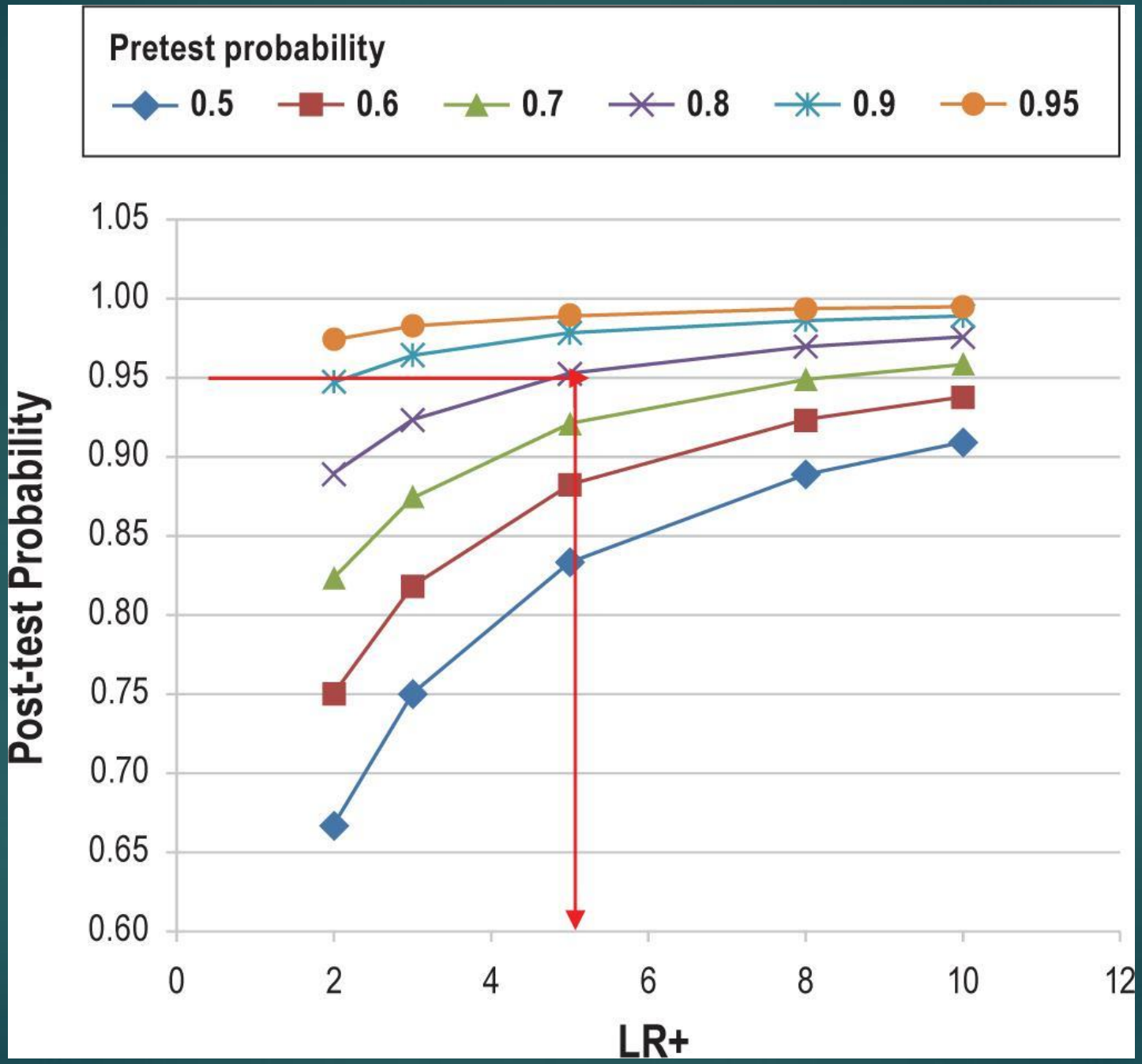
What Do You Want this Device to Do?

"Rule IN OSA"

The HSAT device should be used to increase the pretest probability to a sufficiently high post-test probability that one is very certain that the patient has OSA.
We will recommend that to be considered as having OSA, the post-test probability should be ≥ 95%

Nancy A. Collop, M.D.[1]; Sharon L. Tracy, Ph.D.[2]; Vishesh Kapur, M.D.[3]; Reena Mehra, M.D., M.S.[4]; David Kuhlmann, M.D.[5]; Sam A. Fleishman, M.D.[6]; Joseph M. Ojile, M.D.[7] *J Clin Sleep Med* 2011;7(5):531-548.


Number of Patients
Patients with OSA
TN
FP
TP
Patients without OSA
AHI = 5
AHI


Pretest probability
0.5
0.6
0.7
0.8
0.9
0.95
Post-test Probability
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0
2
4
6
8
10
12
LR+

Obstructive Sleep Apnea Devices for Out-Of-Center (OOC) Testing: Technology Evaluation

Table 1—SCOPER Categorization System

Sleep	Cardiovascular	Oximetry	Position	Effort	Respiratory
S_1 – Sleep by 3 EEG channels+ with EOG and chin EMG	C_1 – more than 1 ECG lead – can derive events	O_1 – Oximetry (finger or ear) with recommended sampling	P_1 – Video or visual position measurement	E_1 – 2 RIP belts	R_1 – Nasal pressure and thermal device
S_2 – Sleep by less than 3 EEG+ with or without EOG or chin EMG	C_2 – Peripheral arterial tonometry	O_{1x} – Oximetry (finger or ear) without recommended sampling (per Scoring Manual) or not described	P_2 – Non-visual position measurement	E_2 – 1 RIP belt	R_2 – Nasal pressure
S_3 – Sleep surrogate: e.g. actigraphy	C_3 – Standard ECG measure (1 lead)	O_2 – Oximetry with alternative site (e.g. forehead)		E_3 – Derived effort (e.g. forehead versus pressure, FVP)	R_3 – Thermal device
S_4 – Other sleep measure	C_4 – Derived pulse (typically from oximetry)	O_3 – Other oximetry		E_4 – Other effort measure (including piezo belts)	R_4 – End-Tidal CO_2 ($ETCO_2$)
	C_5 – Other cardiac measure				R_5 – Other respiratory measure

Proper oximetry sampling is defined as 3 s averaging and a minimum of 10 Hz sampling rate (25 Hz desirable).[1] +3 EEG channels defined as frontal, central and occipital. EEG, electroencephalography; EOG, electrooculography; EMG, electromyography; ECG, electrocardiography; RIP, respiratory inductance plethysmography.

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Obstructive Sleep Apnea Devices for Out-Of-Center (OOC) Testing: Technology Evaluation

$$AHI^{s} = \frac{[\text{apneas (10 sec without flow)} + \text{hypopneas (reduced flow with 4\% desat)}]}{\text{Total sleep time (h)}}$$

$$AHI^{as} = \frac{[\text{all PSG determined respiratory events (apneas, hypopneas using other definitions, RERAs)}]}{\text{Total sleep time (h)}}$$

$$REI = \frac{[\text{apneas} + \text{hypopneas}]}{\text{Total sleep or recording time (h)}}$$

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Obstructive Sleep Apnea Devices for Out-Of-Center (OOC) Testing: Technology Evaluation

Table 2—Devices by SCOPER Categorization

Device Name	Sleep	Cardiac	Oximetry	Position	Effort	Respiratory
ApneaLink (Ng 2009)	0	4	1x	0	0	2
Apnoescreen I (Golpe 2002)	3	4	1x	2	0	3
Apnoescreen II (Garcia-Diaz 2007)	3	3	1x	2	4	3
ARES (Westbrook 2005)	3	4	2	2	0	5
ARES (Ayappa 2008, To 2009)	3	4	2	2	3	2
Compumedics PS-2 (Iber 2004)	2	3	1x	0	1	3
Embletta PDS (Ng 2010)	0	4	1x	2	1	2
Embletta (Dingli 2003)	0	0	1x	2	4	2
Morpheux Hx software with standard hospital signals (Amir 2010)	4	3	1x	0	4	4
Northeast Monitoring Holter-oximeter (Heneghan 2008)	0	3	1x	0	0	0
Novasom QSG/Bedbugg/Silent Night (Reichert 2003)	0	4	1x	0	x	5
Novasom QSG/Bedbugg/Silent Night (Claman 2001)	0	4	1x	0	4	5
Remmers/SnoreSat (Jobin 2007)	0	0	1x	2	0	5
Siesta (Campbell 2010)	2	3	1x	2	4	1
SNAP (Michaelson 2006)	0	4	1x	0	0	5
SNAP (Su 2004)	0	4	1x	0	x	5
Somté/Morpheus (Takama 2010)	0	4	1x	0	x	3
Stardust II (Yin 2006, Santos-Silva 2009)	0	4	1x	2	4	2
WatchPAT (Bar 2003)	0	2	1x	2	0	0
WatchPAT (Ayas 2003, Pittman 2004, Pittman 2006, Zou 2006, Pang 2007, Choi 2010)	3	2	1x	2	0	0

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Table 6—Devices using nasal pressure (R_2) plus effort

SCOPER/Device/Author (year)	Evidence Level	Setting	LR+	LR-	Sensitivity
$O_{1x}P_2E_4R_2$/Embletta/Dingli et al. (2003) **[2 Piezo belts]**	Ia	H/L*	∞*	0.395	0.60*
$C_4O_{1x}P_2E_1R_2$/Embletta PDS/ Ng et al. (2010) **[2 RIP belts]**	Ib	L/L	6.5 at REI/AHI_{ns} ≥ 5	0.089 at REI/AHI_{ns} ≥ 5	0.92 at REI/AHI_{ns} ≥ 5
$C_4O_{1x}P_2E_4R_2$/Stardust II/ Santos-Silva et al. (2009) **[1 piezo belt]**	Ia	L/L	2.6 at REI/AHI_s ≥ 5	0.03 at REI/AHI_s ≥ 5	0.98 at REI/AHI_s ≥ 5
		H/L	2.5 at REI/AHI_s ≥ 5	0.08 at REI/AHI_s ≥ 5	0.95 at REI/AHI_s ≥ 5
$C_4O_{1x}P_2E_4R_2$/Stardust II/ Yin et al. (2006) **[1 piezo belt]**	IVa	H/L	1.0 at REI/AHI_s ≥ 5	N/A	1.00 at REI/AHI_s ≥ 5

*Calculated from reported data; at AHI_{ns} ≥ 15 and Embletta REI ≥ 20 defined as OSA+; L/L portion of study used to construct diagnostic cutoffs.

Devices are judged on whether or not they can produce an LR+ of at least 5 and a sensitivity of at least 0.825 at an in-lab AHI of at least 5.

Table 5—Devices using only nasal pressure as a measurement of respiration (R_2)

SCOPER/Device/ Author (year)	Evidence Level	Setting	LR+	LR-	Sensitivity
$C_4O_{1x}R_2$/ApneaLink/ Ng et al. (2009)	Ia	L/L	∞ for all REI/AHI_{ns} (5-20)	0 for all REI/AHI_{ns} (5-20)	1.0 at $REI/AHI_{ns} \geq 5$
$S_3C_4O_2P_2E_3R_2$/ARES/ Ayappa et al. (2008)	Ia	L/L	6.0* at $REI/AHI_s \geq 5$	0.02 at $REI/AHI_s \geq 5$	0.98 at $REI/AHI_s \geq 5$
	Ia	H/L	4.4* at $REI/AHI_s \geq 5$	0.12 at $REI/AHI_s \geq 5$	0.90 at $REI/AHI_s \geq 5$
$S_3C_4O_2P_2E_3R_2$/ARES/ To et al. (2009)	IIa	L/L	∞ at $REI/AHI_{ns} \geq 5$	0.11 at $REI/AHI_{ns} \geq 5$	0.89 at $REI/AHI_{ns} \geq 5$

*Defined as OSA+

Devices are judged on whether or not they can produce an LR+ of at least 5 and a sensitivity of at least 0.825 at an in-lab AHI of at least 5.

Table 8—Devices using PAT signal (Watch PAT)

SCOPER/Device/Author (year)	Evidence Level	Setting	LR+	LR-	Sensitivity
$C_2O_{1x}P_2$/Bar et al. (2003)	Ia	L/L	7 at $REI/AHI_{ns} \geq 10$*	0.33 at $REI/AHI_{ns} \geq 10$*	0.7 at $REI/AHI_{ns} \geq 10$*
$S_3C_2O_{1x}P_2$/Zou et al. (2006)	Ia	H/H	9 at $REI/AHI_{ns} \geq 10$*	0.11 at $REI/AHI_{ns} \geq 10$*	0.9 at $REI/AHI_{ns} \geq 10$*
$S_3C_2O_{1x}P_2$/Pang et al. (2007)	Ia	L/L	4.7 at $REI/AHI_{ns} \geq 5$	0.075 at $REI/AHI_{ns} \geq 5$	0.94 at $REI/AHI_{ns} \geq 5$
$S_3C_2O_{1x}P_2$/Pittman et al. (2004)	IIa	L/L	13.0 at $REI/AHI_s \geq 5$	0 at $REI/AHI_s \geq 5$	0.92 at $REI/AHI_s \geq 5$
	IIa	H/L	∞ at $REI/AHI_s \geq 5$	0 at $REI/AHI_s \geq 5$	1.00 at $REI/AHI_s \geq 5$
$S_3C_2O_{1x}P_2$/Pittman et al. (2006)	IIa	L/L	1.6 at $REI/AHI_{ns} > 5$†	0.29 at $REI/AHI_{ns} > 5$†	0.86 at $REI/AHI_{ns} > 5$†
$S_3C_2O_{1x}P_2$/Ayas et al. (2003)	IIa	L/L	2.9 at $REI/AHI_{ns} \geq 10$‡	0.24 at $REI/AHI_{ns} \geq 10$‡	0.83 at $REI/AHI_{ns} \geq 10$‡
$S_3C_2O_{1x}P_2$/Choi et al. (2010)	IIb	L/Hospital	5.9 at $REI/AHI_s \geq 5$	0 at $REI/AHI_s \geq 5$	1 at $REI/AHI_s \geq 5$

*Calculated from original figure in paper at $AHI_{PSG} \geq 10$ and $REI_{WatchPAT}$ scored according to Chicago criteria. †Scored according to Chicago criteria; if "converted" to standard criteria (see Section 1.0), at REI > 15 the LR+ is 8, which is adequate. ‡Scored according to Chicago criteria; if "converted" to standard criteria (see Section 1.0), at AHI ≥ 15 the LR+ is 3.5, which is also inadequate.

Devices are judged on whether or not they can produce an LR+ of at least 5 and a sensitivity of at least 0.825 at an in-lab AHI of at least 5.

Are you Confident that the HSAT Device You Use Allows You to Rule In OSA?

- The easiest way to find out is to review the published literature for your device, comparing it to PSG.
- If your center is contemplating the use of a new device, make sure to compare the data between old and new systems

HSAT Implementation in Clinical Practice

Things have changed!!

- OSA may be as prevalent as 20-30 % of males and 10-15 % of females.
- With more stringent definitions 15% of men and 5 % of women have OSA that qualifies for CPAP or other advanced alternative therapies
- The obesity epidemic has contributed to rising prevalence rates

KP Strohl, UpToDate, July 2018

HSAT Provides the Opportunity to Serve Large Numbers of Patients Efficiently and Inexpensively

- How can we identify the population at risk?
- How can we encourage our PCPs to initiate the discussion regarding OSA with their patients?

Consider Quality Improvement Measures that Incorporate HSAT

Owensboro Regional Hospital

Owensboro Health Mission Statement

OWENSBORO HEALTH EXISTS TO HEAL THE SICK AND TO IMPROVE THE HEALTH OF THE COMMUNITIES WE SERVE

Core Commitments

- **Excellence** – Providing high-quality, compassionate care.
- **Innovation** – Utilizing the most advanced treatments and technology.
- **Integrity** – Making the right decisions for the right reasons.
- **Respect** – Treating every person equally.
- **Service** – Focusing on our patients' needs.
- **Teamwork** – Working together toward a common goal.

OHRH Sleep Medicine Goals

- **Excellence** –Patients are seen, studied and treated promptly
- **Innovation** – HSAT, Apps and Modems, Telemedicine
- **Integrity** – Easy, Inexpensive, Effective Therapy
- **Respect** – Treating every person equally, Always.
- **Service** – Bring Sleep Medicine to patients
- **Teamwork-**
  - work with local DME providers to insure patients get the right equipment
  - Engage ENT, Pediatrics, Neurology, Bariatric Surgery, Dental and Psychiatry in Sleep

Excellence

Patients are seen, studied and treated promptly

- Time from initial contact to first visit
- Time from consultation to study
  - ? Precertification delays?
    - How long does it take your office to get authorization for the HSAT?
  - Study Date Availability
- Result review-<24 hours
- Patient/Provider treatment plan development-face to face
- Time to Initiation of therapy
  - Ordered on day of interpretation
  - Delays on DME side?
- Follow up visit 30, 90, 365 day visits

Innovation

HSAT, Apps and Modems, Telemedicine

- Home studies facilitate adequate diagnosis in appropriate patient population
  - Find a way to get HSAT Instruction, application and recovery locally
  - Get 3rd party payors to forgo prior authorization of HSAT
  - Consider asking your hospital or health care organization to take a stand. HSAT testing is inexpensive. Why require prior authorization????
- Utilization of technology to engage patients in therapy adherence.
- Telemedicine for rural locations
  - Result Review and therapeutic decisions
  - Review of CPAP compliance (data download and alteration of therapy)

Integrity
Easy, Inexpensive, Effective Therapy

- Patients obtain HSATs in remote clinic locations
  - Studies can be scored at the sleep center
  - Providers/telemedicine instruction for use.
- Reduce drive times for results/follow up visits
  - On site ARNP or
  - Telemedicine interviews
- Monitor new CPAP set ups via cloud database
  - Early intervention for patients that are failing
  - Offer alternative therapies earlier to prevent patient dropout

Clinical Use of a Home Sleep Apnea Test: An American Academy of Sleep Medicine Position Statement

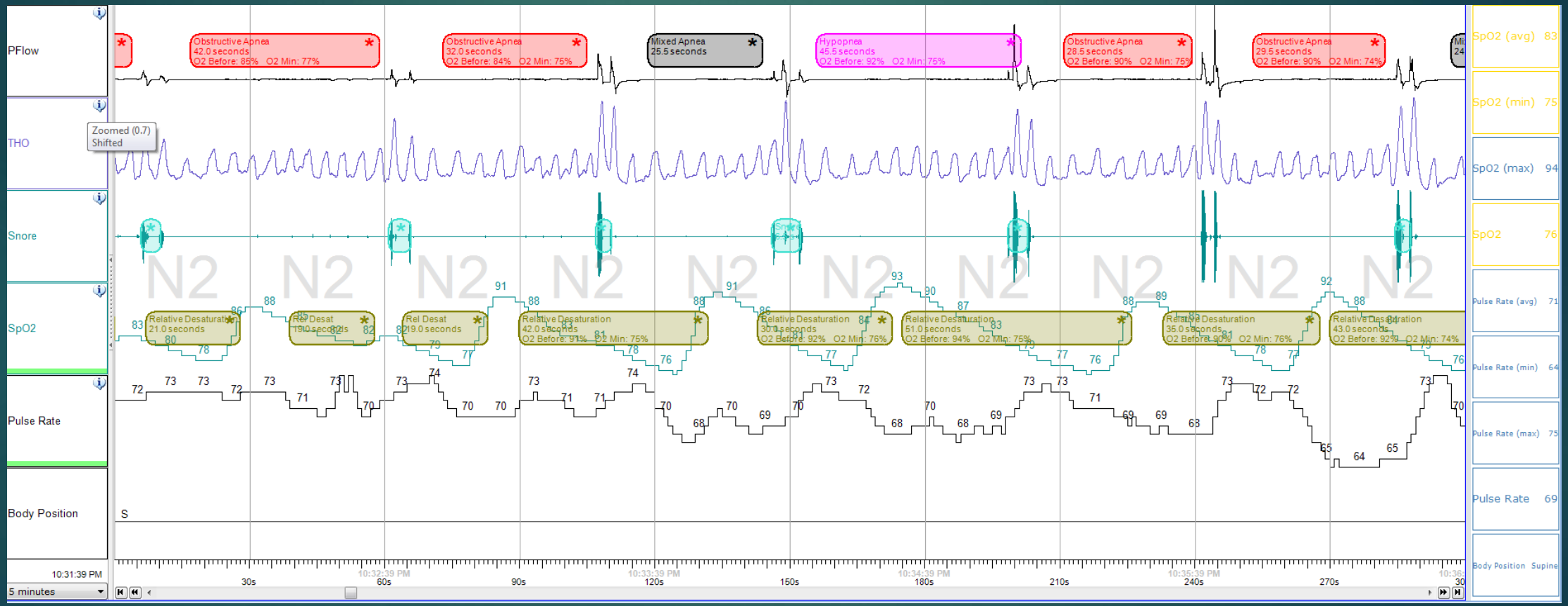
- Only a physician can diagnose medical conditions such as OSA and primary snoring.
- The need for, and appropriateness of, an HSAT must be based on the patient's medical history and a face-to-face examination by a physician, **either in person or via telemedicine.**
- An HSAT is a medical assessment that must be ordered by a physician to diagnose OSA or evaluate treatment efficacy.
- An HSAT should not be used for general screening of asymptomatic populations.
- **Diagnosis, assessment of treatment efficacy, and treatment decisions must not be based solely on automatically scored HSAT data, which could lead to sub-optimal care that jeopardizes patient health and safety.**
- **The raw data from the HSAT device must be reviewed and interpreted by a physician who is either board-certified in sleep medicine or overseen by a board-certified sleep medicine physician.**

Ilene M. Rosen, MD, MS[1]; Douglas B. Kirsch, MD[2]; Ronald D. Chervin, MD, MS[3]; Kelly A. Carden, MD[4]; Kannan Ramar, MD[5]; R, *J Clin Sleep Med*. 2017;13(10):1205–1207.

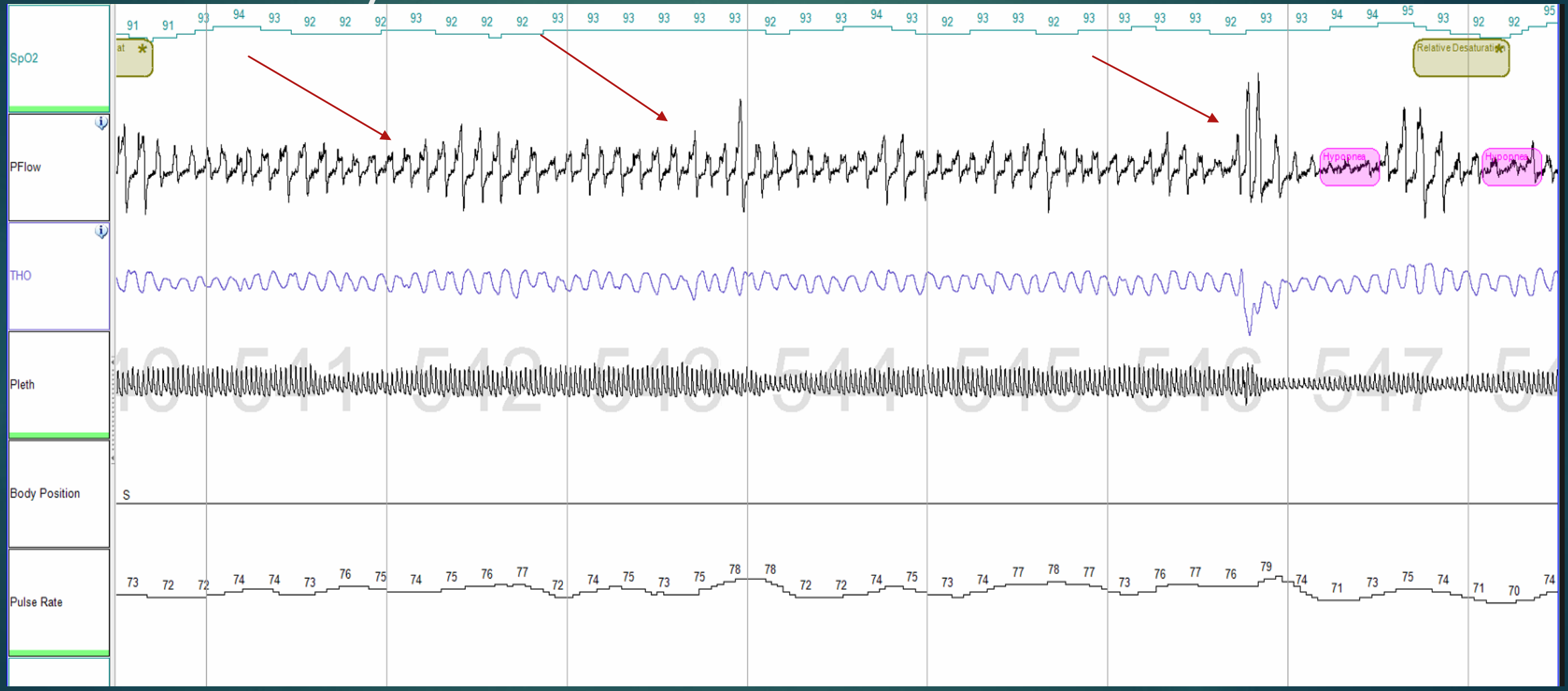
Home Sleep Apnea Testing

- NOT a Sleep Test
- Most devices are "home breathing recorders"
- Measure:
  - respiratory effort
  - Nasal air flow
  - Pulse ox saturation
  - Derive Heart Rate from pulse ox sat device
  - Monitor body position

Identification via Auto Scoring will facilitate rapid results, But….



Raw Data Review
What do you do with These?



Limitations of HSAT

- The frequency of breathing disturbances given is known as the in reports as the Respiratory Event Index or REI
  - This determines the number of disturbances per hour of **RECORDING** not per hour of **SLEEP**
  - This needs to be differentiated from the AHI derived on polysomnogram
- Underestimation of frequency of events per hour of sleep
- Polysomnogram demonstrates events per hour of sleep and most all medical literature is based on these values.
- Fails to identify respiratory events that cause arousal, but not significant O2 desaturation (seen in younger patients, especially women)

Question?

- Does your center discard data when the recording is incomplete?
  - E.G. the NPT, belt or pulse ox sat drops out
- Do you differentiate between recording time and monitoring time?
  - Discarding "failed" epochs may change significantly the denominator to the equation
    - Events/recording time v. events/monitoring time
- What constitutes a failed study?
  - What is the minimum time required to consider the study valid?
  - Do you make allowances if the study is particularly severe?
  - When do you repeat a study automatically?

Contraindications to Home Sleep Apnea Testing-Careful Documentation a must

- **Comorbid medical conditions**
  - significant respiratory disease
    - chronic obstructive pulmonary disease (COPD; GOLD stage II or higher)
  - class III or IV heart failure (because they are predisposed to Cheyne-Stokes breathing)
  - patients with hypoventilation syndromes (eg, obesity hypoventilation, central sleep apnea syndromes)
  - Patients that cannot be expected to use the device properly (dementia)
- **Comorbid sleep disorders**
  - Narcolepsy or other hypersomnia disorders
  - Insomnia
  - Parasomnias
  - Periodic limb movement disorder

Contraindications to Home Sleep Apnea Testing

- **Mission-critical employment**
  - CDL holders
  - Airline Pilots
  - Air Traffic Controllers
  - Current technologies do not certify that the data are generated from that specific individual; this creates the potential for fraud.
- How do you satisfy the need to document that the patient (AND NOT HIS DAUGHTER OR HIS DOG) used the HSAT device?
- One solution is to have the patient use the HSAT device in your center and have the technician document chain of custody.

Predictors of Obstructive Sleep Apnea on Polysomnography after a Technically Inadequate or Normal Home Sleep Test

- Technically Adequate HSAT
  - N=127 normal HST
  - 76% had a normal PSG
  - 24% had OSA (23 mild, 6 moderate, 1 severe)
- Technically Inadequate HSAT
  - N=111
  - 71% had OSA (43 mild, 19 moderate, 17 severe)
- Individuals younger than 50 years old with a normal HST were more likely to have a normal PSG
- Older age predicted diagnosis of OSA on PSG among individuals with an inadequate HST.

J Clin Sleep Med. 2015;11(11):1313

Potential Underestimation of Sleep Apnea Severity by At-Home Kits: Rescoring In-Laboratory Polysomnography Without Sleep Staging

- Retrospective analysis of n = 838 diagnostic polysomnography (PSG) nights
  - n = 444 with OSA (4% rule, apnea/hypopnea index (AHI) ≥ 5)
  - n = 394 with AHI < 5.
- Recalculated the AHI using time in bed (TIB) instead of TST, to assess the predicted underestimation risk of OSA severity.
- 26.4% would be reclassified as having less severe or no OSA after recalculating the AHI using TIB rather than TST.
- Misclassification
  - n = 275 with mild OSA, 18.5% would be reclassified as not having OSA.
  - n = 119 moderate OSA cases, 40.3% would be reclassified as mild
  - n = 50 severe OSA cases, 36.0% would be reclassified as moderate
  - Age strongly correlated with the degree of underestimation of the AHI, because age was significantly correlated with time awake during PSG.

J Clin Sleep Med. 2017;13(4):551–555.

AASM Site Visit Standards HSAT

- **Standard**
- **E-6—HSAT Equipment Procedures**
- Specific instructions must exist for HSAT device and sensor packing, shipping and storage.
- Facilities must have a policy in place that documents the procedure(s) used to delete all PHI and physiologic data from HSAT equipment following each use of the device.

AASM Site Visit Standards HSAT

- **F-3—HSAT Reports and Recommendations**
- Reports of HSAT must include all the "RECOMMENDED" and/or "ACCEPTED" parameters from chapter IX. Home Sleep Apnea Testing (HSAT) Rules for Adults in the current version of the AASM Scoring Manual. Any recommendations for next management steps (based upon test results and clinical information), if provided, must be consistent with applicable AASM Standards of Practice, AASM Practice Guidelines, and AASM Best Practice papers.

AASM Site Visit Standards HSAT

- **F-9—Subcontracting HSAT**
- Accredited facilities may subcontract home sleep apnea testing. The subcontract may not include diagnosis of a medical condition; this must remain the responsibility of the facility's appropriately licensed physician or APRN, as appropriate. The facility must have a written agreement with the subcontractor to this effect that clearly identifies the specific expectations of the subcontractor and requiring the subcontractor to meet all applicable AASM HSAT Standards. The facility is responsible for assessing the performance of the subcontractor in meeting contractual obligations on an annual basis.

AASM Site Visit Standards HSAT

- **I-2—HSAT Emergency Procedure**
- The facility must instruct the patient to call emergency services (911) in the event of an emergency during a HSAT

AASM Quality Assurance Standards HSAT

- **J-2—HSAT Quality Assurance Program**
- The facility must have a QA program for HSAT that addresses two process measures and one outcome measure. These measures may be chosen from the AASM Quality Measures

http://www.aasmnet.org/QualityMeasures.aspx

A Final Observation

- After a tough 2012 our Center re-invented itself.
- Our focus became serving the growing population of patients that clinically had significant OSA in a prompt, efficient, low cost manner through use of HSAT, auto CPAP and telemedicine.
- Our experience has been rewarding
  - Dramatic increase in number of patients served
  - Improved patient satisfaction
  - Therapy often initiated same day as diagnosis
  - Estimation of performing 1800+ studies in 2018, 60% HSAT