ΣΑΥ: Κλινική διαγνωστική προσέγγιση
Clinical Practice Guideline

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Σύνδρομο Αποφρακτικής Υπνικής Άπνοιας-Υπόπνοιας (ΣΑΥ)

- Πιο συχνή από διαταραχές αναπνοής στον ύπνο
- Συχνότητα της νόσου:5-15% άντρες, 2-7% γυναίκες του γενικού πληθυσμού
- Τόσο οι ασθενείς , όσο και οι σύντροφοί τους, υποφέρουν από την κατάσταση τη νύχτα , αλλά και την ημέρα

Κλινική προσέγγιση-διάγνωση

- Ιστορικό (συμπτώματα, παράγοντες κινδύνου, καταστάσεις που επιδεινώνουν ΣΑΥ)
- Κλινική εξέταση
- Καταγραφή κατά τη διάρκεια του ύπνου

ΙΣΤΟΡΙΚΟ

Συμπτώματα του ΣΑΥ	
Κατά τη διάρκεια του ύπνου	**Κατά την εγρήγορση**
Ροχαλητό	Υπνηλία
Μη αποικοδομητικός ύπνος	Έλλειψη συγκέντρωσης
Ανήσυχος ύπνος	Χρόνια κόπωση
Άπνοιες που διαπιστώνονται από σύντροφο	Γνωσιακές διαταραχές
Αφυπνίσεις με αίσθημα πνιγμονής	Πρωινή κεφαλαλγία
Εφιάλτες	Πρωινή ξηροστομία
Αϋπνία εξαιτίας συχνών αφυπνίσεων	Σεξουαλικά προβλήματα
Γαστροοισοφαγική παλινδρόμηση	
Νυκτουρία	
Εφίδρωση	
Νυχτερινή στηθάγχη	

Ιστορικό-Καταστάσεις που επιδεινώνουν το ΣΑΥ

- **Αλκοόλ**: ελαττώνει τη δράση των μυών που διατείνουν το φάρυγγα
- **Κατασταλτικά- υπνωτικά** : ελαττώνουν τη δράση των μυών που διατείνουν το φάρυγγα και πιθανώς καταστέλλουν το κέντρο της αναπνοής
- **Κάπνισμα:** οίδημα-φλεγμονή βλεννογόνου, αύξηση αντιστάσεων
- **Ύπτια στάση** κατά τον ύπνο:πτώση γλώσσας προς τα πίσω, μείωση της FRC

Συχνότερες αιτίες υπνηλίας

- **Ανεπαρκής διάρκεια ύπνου**
- **Σύνδρομο αποφρακτικών απνοιών**
- Κατάχρηση φαρμάκων/ ουσιών
- Εργασία σε βάρδιες (Shift-work sleep disorder)
- Διαταραχές κιρκάδιου ρυθμού
- Ναρκοληψία
- Σύνδρομο ανήσυχων ποδιών

"This is the man we hired to 'dream up' ideas."

Διαφορετική κλινική εικόνα άντρες – γυναίκες….

- Συχνότερο στους άρρενες (3:1)

Ροχαλητό, άπνοιες και υπνηλία πιο συχνά σε άρρενες

- Κατάθλιψη και κεφαλαλγία συχνότερα σε γυναίκες- πρώτη διάγνωση κατάθλιψη ή ΧΑΠ
- Γυναίκες με ΣΑΥ πιο παχύσαρκες από άρρενες
- Εμμηνόπαυση, πολυκυστικές ωοθήκες
- Εγκυμοσύνη

Table 4—OSA Symptoms that Should Be Evaluated during a Comprehensive Sleep Evaluation

Witnessed apneas
Snoring
Gasping/choking at night
Excessive sleepiness not explained by other factors
Nonrefreshing sleep
Total sleep amount
Sleep fragmentation/maintenance insomnia
Nocturia
Morning headaches
Decreased concentration
Memory loss
Decreased libido
Irritability

Table 2—Patients at High Risk for OSA Who Should Be Evaluated for OSA Symptoms

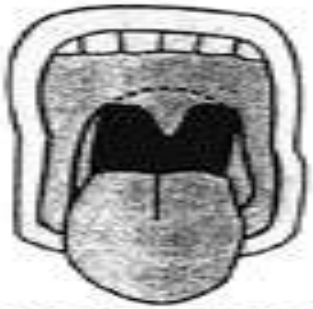
Obesity (BMI > 35)
Congestive heart failure
Atrial fibrillation
Treatment refractory hypertension
Type 2 diabetes
Nocturnal dysrhythmias
Stroke
Pulmonary hypertension
High-risk driving populations
Preoperative for bariatric surgery

- **Acquired disorders**
  - **Acromegaly**
  - **Hypothyroidism**

- **Congenital disorders**
  - **Down syndrome**
  - **Marfan's syndrome**
  - **Pierre-Robin syndrome/Stickler syndrome**
  - **Achondroplasia**

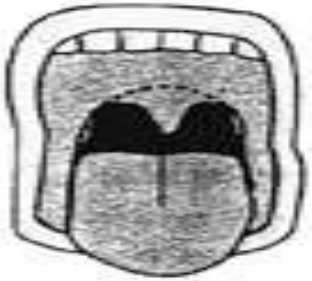
Κλινική εξέταση

Mallampati Signs as Indicators of Difficult Intubation



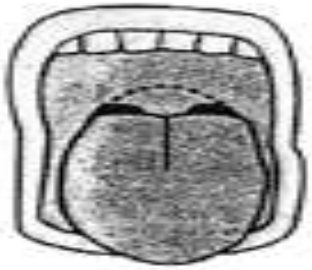
Class I: soft palate, uvula, fauces, pillars visible

No difficulty



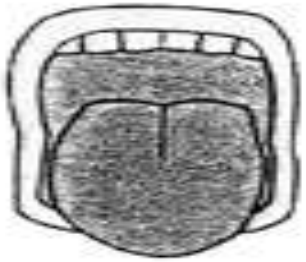
Class II: soft palate, uvula, fauces visible

No difficulty



Class III: soft palate, base of uvula visible

Moderate difficulty



Class IV: hard palate only visible

Severe difficulty

Ερωτηματολόγια!!

- Όσο αυξάνεται η παχυσαρκία , το ποσοστό του ΣΑΥ θα αυξάνεται….
- Υπάρχει τρόπος να προβλέψουμε ή να κάνουμε διαλογή περιστατικών με υψηλότερο κίνδυνο, ώστε να κάνουμε οικονομία χρόνου και χρήματος???

Table 1. Test Characteristics of Questionnaires Predicting the Diagnosis of Obstructive Sleep Apnea

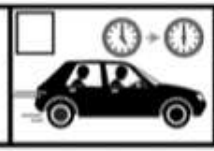
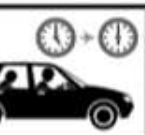
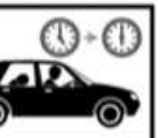
Study	Prevalence of OSA	AHI Threshold	Study n	Sensitivity (95% CI)	Specificity (95% CI)	LR^+ (95% CI)	LR^- (95% CI)
ASA checklist; Chung *et al.*,[38] 2008	0.696	5	177	0.721 (0.633–0.799)	0.382 (0.254–0.523)	1.167 (0.922–1.476)	0.730 (0.470–1.135)
Berlin questionnaire; Ahmadi *et al.*,[39] 2008	0.262	5	130	0.676 (0.495–0.826)	0.490 (0.386–0.594)	1.325 (0.978–1.796)	0.661 (0.390–1.120)
Berlin questionnaire; Ahmadi *et al.*,[39] 2008	0.262	10	130	0.618 (0.436–0.778)	0.427 (0.327–0.532)	1.078 (0.786–1.479)	0.895 (0.551–1.456)
Berlin questionnaire; Sharma *et al.*,[40] 2006	0.596	5	104	0.855 (0.742–0.931)	0.952 (0.838–0.994)	17.952 (4.624–69.691)	0.152 (0.083–0.280)
Berlin questionnaire; Sharma *et al.*,[40] 2006	0.596	10	104	0.855 (0.742–0.931)	0.857 (0.715–0.946)	5.984 (2.833–12.641)	0.169 (0.091–0.314)
Berlin questionnaire; Chung *et al.*,[38] 2008	0.696	5	177	0.689 (0.598–0.769)	0.545 (0.406–0.680)	1.515 (1.108–2.072)	0.571 (0.399–0.816)
Epworth Sleepiness Scale; Osman *et al.*,[41] 1999	0.457	5	46	0.286 (0.113–0.522)	0.520 (0.313–0.722)	0.595 (0.270–1.311)	1.374 (0.864–2.184)
Sleep questionnaire; Haraldsson *et al.*,[42] 1992	0.429	10	42	0.778 (0.524–0.936)	0.792 (0.578–0.929)	3.733 (1.647–8.460)	0.281 (0.115–0.682)
SDQ females; Weatherwax *et al.*,[43] 2003	0.552	5	55	0.800 (0.593–0.932)	0.667 (0.472–0.827)	2.400 (1.395–4.130)	0.300 (0.132–0.684)
SDQ males; Weatherwax *et al.*,[43] 2003	0.552	5	70	0.750 (0.597–0.868)	0.654 (0.443–0.828)	2.167 (1.244–3.775)	0.382 (0.213–0.685)
Snoring questionnaire; Bliwise *et al.*,[13] 1991	0.423	10	1,409	0.304 (0.267–0.342)	0.988 (0.977–0.994)	24.690 (13.178–46.259)	0.705 (0.668–0.744)
STOP questionnaire; Chung *et al.*,[31] 2008	0.696	5	177	0.656 (0.564–0.739)	0.600 (0.459–0.730)	1.639 (1.157–2.322)	0.574 (0.414–0.795)
Symptoms; Gurubhagavatula *et al.*,[44] 2004	0.28	5	406	0.518 (0.422–0.612)	0.685 (0.628–0.738)	1.643 (1.286–2.099)	0.704 (0.574–0.865)
Pooled estimates	0.28–0.696			0.520 (0.493–0.546)	0.800 (0.779–0.819)	2.468 (2.210–2.757)	0.642 (0.608–0.678)

Ramachandran et al Anesthesiology 2009; 110:928–39

Name: _____ Date: ___/___/___ Hospital No: _____ Date of Birth: ___/___/___

In contrast to just feeling tired, how likely are you to doze off or fall asleep in the following situations? Even if you have not done some of these things recently, try to work out how they would affect you.

Use the following scale to choose the most appropriate number for each situation.

Situation (✓ Please tick box)	0 No chance of dozing	1 Slight chance	2 Moderate chance	3 Definitely would doze
Sitting and reading				
Watching TV				
Sitting inactive in a public place (e.g. Theatre or a meeting)				
As a passenger in a car for an hour without a break				
Lying down to rest in the afternoon when circumstances permit				
Sitting and talking to someone				
Sitting quietly after lunch without alcohol				
In a car, while stopped for a few minutes in traffic				

orth

Ενταση επιθυμίας για ύπνο
0 = καμιά πιθανότητα να κοιμηθώ
1 = Μικρή πιθανότητα να κοιμηθώ
2 = Μέτρια πιθανότητα να κοιμηθώ
3 = Μεγάλη πιθανότητα να κοιμηθώ.

ESS < 11	Normal
ESS 11-14	Mild Sleepiness
ESS 15-18	Moderate Sleepiness
ESS>18	Severe Sleepiness

Johns M. Sleep. 1991;14:540-5
Csara V,et al Sleep Breath. 2004;8(2):91

STOP

S (snore)	Have you been told that you snore?	YES / NO
T (tired)	Are you often tired during the day?	YES / NO
O (obstruction)	Do you know if you stop breathing or has anyone witnessed you stop breathing while you are asleep?	YES / NO
P (pressure)	Do you have high blood pressure or on medication to	

Αυξημένος κίνδυνος ΣΑΥ –«ΝΑΙ» σε περισσότερες από 3 ερωτήσεις
Χαμηλός κίνδυνος ΣΑΥ–«ΝΑΙ σε λιγότερες από 3 ερωτήσεις

B (BMI)	Is your body mass index greater than 28?	YES / NO
A (age)	Are you 50 years old or older?	YES / NO
N (neck)	Are you a male with a neck circumference greater than 17 inches, or a female with a neck circumference greater than 16 inches.	YES / NO
G (gender)	Are you a male?	YES / NO

Chung F et al. Anesthesiology 2008; 108:812–21

STOP Questionnaire

A Tool to Screen Patients for Obstructive Sleep Apnea

Frances Chung, F.R.C.P.C.,* Balaji Yegneswaran, M.B.B.S.,† Pu Liao, M.D.,‡ Sharon A. Chung, Ph.D.,§ Santhira Vairavanathan, M.B.B.S.,‖ Sazzadul Islam, M.Sc.,‖ Ali Khajehdehi, M.D.,† Colin M. Shapiro, F.R.C.P.C.#

Table 6. Predictive Parameters for STOP Questionnaire (n = 177)

AHI >5	
Sensitivity, %	65.6 (56.4–73.9)
Specificity, %	60.0 (45.9–73.0)
PPV, %	78.4 (69.2–86.0)
NPV, %	44.0 (32.6–56.0)
Likelihood ratio	1.639 (1.172–2.385)
Odds ratio	2.857 (1.482–5.507)
Area under ROC curve	0.703
AHI >15	
Sensitivity, %	74.3 (62.4–84.0)
Specificity, %	53.3 (43.4–63.0)
PPV, %	51.0 (41.3–60.7)
NPV, %	76.0 (64.8–85.1)
Likelihood ratio	1.590 (1.280–2.057)
Odds ratio	3.293 (1.707–6.352)
Area under ROC curve	0.722
AHI >30	
Sensitivity, %	79.5 (63.5–90.7)
Specificity, %	48.6 (40.0–63.0)
PPV, %	30.4 (21.7–40.3)
NPV, %	89.3 (80.1–95.3)
Likelihood ratio	1.545 (1.261–2.010)
Odds ratio	3.656 (1.636–9.054)
Area under ROC curve	0.769

Table 7. Predictive Parameters for STOP-Bang (n = 177)

AHI >5	
Sensitivity, %	83.6 (75.8–89.7)
Specificity, %	56.4 (42.3–69.7)
PPV, %	81.0 (73.0–87.4)
NPV, %	60.8 (46.1–74.2)
Likelihood ratio	1.9160 (1.416–2.666)
Odds ratio	6.587 (3.217–13.489)
Area under ROC curve	0.806
AHI >15	
Sensitivity, %	92.9 (84.1–97.6)
Specificity, %	43.0 (33.5–52.9)
PPV, %	51.6 (42.5–60.6)
NPV, %	90.2 (78.6–96.7)
Likelihood ratio	1.629 (1.401–1.966)
Odds ratio	9.803 (3.654–26.300)
Area under ROC curve	0.782
AHI >30	
Sensitivity, %	100 (91.0–100.0)
Specificity, %	37.0 (28.9–45.6)
PPV, %	31.0 (23.0–39.8)
NPV, %	100 (93.0–100.0)
Likelihood ratio	1.586 (1.426–1.838)
Odds ratio	>999.999
Area under ROC curve	0.822

Chung F et al. Anesthesiology 2008; 108:812–21

Validation of the stop bang questionnaire in ***a sleep clinic*** in Greece for the prediction of obstructive sleep apnea
Pataka A, et al. 23rd ERS Annual Congress,Barcelona, Spain. P4052 (submitted)

Table 2. STOP predictive values for different cut-offs of AHI

	STOP		
	AHI≥5	**AHI≥15**	**AHI≥30**
Sensitivity	95%	96%	97%
Specificity	15.7%	13%	11%
PPV	84%	71%	52.3%
NPV	40.5%	58%	78.4%
LR(+)/LR(-)	1.13/0.3	1.1/0.34	1.1/0.3
AUC (95%CI)	0.65 (0.6-0.7)	0.67 (0.6-0.7)	0.63 (0.6-0.66)
OR (95%CI)	3.5 (2.4-5.3)	3.3 (2.2-4.8)	4 (2.5-6.3)

ESS: Epworth Sleepiness Scale, OSAHS: Obstructive Sleep Apnea Hypopnea Syndrome, AHI: Apnea Hypopnea Index, PPV: Positive Predictive Value, NPV: Negative Predictive Value, LR: Likelihood ratio, AUC: area under the ROC curve, OR: odds ratio

Table 3. STOP-BANG predictive values for different cut-offs of AHI

	STOP-BANG		
	AHI≥5	**AHI≥15**	**AHI≥30**
Sensitivity	96.2%	97.6%	98.7%
Specificity	14%	12.7%	9.9%
PPV	83.3%	70.6%	52.7%
NPV	45%	71%	88.4%
LR(+)/LR(-)	1.2/0.3	1.1/0.2	1.1/0.13
AUC (95%CI)	0.74 (0.7-0.8)	0.73 (0.7-0.76)	0.72 (0.7-0.75)
OR (95%CI)	4.1 (2.6-6.45)	5.9 (3.6-9.5)	8.5 (4.4-16.5)

ESS: Epworth Sleepiness Scale, OSAHS: Obstructive Sleep Apnea Hypopnea Syndrome, AHI: Apnea Hypopnea Index, PPV: Positive Predictive Value, NPV: Negative Predictive Value, LR: Likelihood ratio, AUC: area under the ROC curve, OR: odds ratio

Berlin questionnaire

Name _____
Address _____
_____

SLEEP EVALUATION

1 **Complete the following:**
height _____ age _____
weight _____ male/female ____

CATEGORY 1

2 **Do you snore?**
- ☐ yes
- ☐ no
- ☐ don't know

If you snore:

3 **Your snoring is?**
- ☐ slightly louder than breathing
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ never or nearly never

5 **Has your snoring ever bothered other people?**
- ☐ yes
- ☐ no

6 **Has anyone noticed that you quit breathing during your sleep?**
- ☐ nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ never or nearly never

CATEGORY 2

7 **How often do you feel tired or fatigued after your sleep?**
- ☐ nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ never or nearly never

8 **During your wake time, do you feel tired, fatigued or not wake up to par?**
- ☐ nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week

If yes, how often does it occur?
- ☐ nearly every day
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-2 times a month
- ☐ never or nearly never

CATEGORY 3

10 **Do you have high blood pressure?**
- ☐ yes
- ☐ no
- ☐ don't know

BMI =

High Risk: if there are 2 or more Categories where the score is positive

Low Risk: if there is only 1 or no Categories where the score is positive

Netzer, et al.,
Ann Intern Med. 1999;131(7):485-91

Translation and validation of Berlin questionnaire in primary health care in Greece

Table 4 Predictive parameters for BQ

	AHI ≥ 5 – <15 (95% CI)	AHI ≥ 15 – ≤ 30 (95% CI)	AHI > 30 (95% CI)
Sensitivity, %	76 (67–73)	84 (76–91)	79 (69–86)
Specificity, %	40 (12–74)	61 (41–79)	39 (22–58)
PPV, %	94 (86–96)	86 (80–94)	80(71–87)
NPV, %	12 (3.5–28.2)	52 (34–69)	36 (20–55)
Positive LR	1.26 (0.6–27)	2.14 (1.6–2.9)	1.28 (0.8–2.0)
Negative LR	0.61 (0.3–1.1)	0.26 (0.1–0.5)	0.55 (0.3–0.9)
Odds ratio	2.069 (0.54–7.8)	8.21 (3.2–20.8)	2.31 (0.97–5.5)
AUC	0.578 (0.488–0.665)	0.724 (0.639–0.799)*	0.586 (0.496–0.672)

AHI: apnoea/hypopnoea index; *AUC*: area under the curve; *BQ*: Berlin Questionnaire; *LR*: likelihood ratio; *NPV*: negative predictive value; *PPV*: positive predictive value.

Conclusions: In conclusion, the Greek Version of the BQ is a useful instrument for identifying patients at risk for OSAS in primary health care in Greece. The findings of our study confirm that such screening tools should be used by primary care clinicians for OSAS prediction.

Bouloukaki *et al. BMC Pulmonary Medicine* 2013, **13**:6

Evaluation of five different questionnaires for assessing sleep apnea syndrome in a sleep clinic

OSAHS severity	ESS	Berlin	STOP	STOPBang	4-Variable	
					⩾11	⩾14
Mild (AHI 5–14)						
Sensitivity	33.3%	71.8%	91.7%	90%	73.6%	30%
Specificity	50.6%	17.2%	6.4%	4.9%	13%	52%
PPV	9.1%	11.5%	12.8%	12.2%	12.7%	8%
NPV	83.6%	80.2%	84%	76.8%	86.6%	83%
LR(+)/LR(−)	0.6/1.3	0.86/1.6	0.98/1.3	0.9/2	1/1	0.6/1.3
AUC (95% CI)	0.42 (0.4–0.46)	0.45 (0.4–0.5)	0.49 (0.45–0.5)	0.48 (0.4–0.5)	0.5 (0.4–0.55)	0.4 (0.36–0.45)
OR (95% CI)	0.5 (0.4–0.7)	0.53 (0.4–0.75)	0.76 (0.44–1.3)	0.46 (0.27–0.8)	0.94 (0.6–1.4)	0.45 (0.3–0.66)
Moderate (AHI 15–29)						
Sensitivity	44.5%	78%	92.7%	94.8%	77.5%	38.5%
Specificity	52.1%	18%	6.6%	5.5%	25.6%	53.4%
PPV	17%	16.5%	17.3%	17%	18.6%	16%
NPV	81%	80.4%	72%	84%	81.5%	79%
LR(+)/LR(−)	0.9/1	0.96/1.2	1/1.1	1/0.9	1/1	0.8/1.1
AUC (95% CI)	0.48 (0.45–0.5)	0.48 (0.44–0.5)	0.5 (0.46–0.5)	0.52 (0.46–0.54)	0.5 (0.45–0.55)	0.46 (0.4–0.5)
OR (95% CI)	0.875 (0.7–1.1)	0.8 (0.6–1.1)	0.9 (0.54–1.5)	1.1 (0.6–2)	1 (0.7–1.44)	0.72 (0.5–1)
Severe (AHI ⩾30)						
Sensitivity	57%	90%	97%	98.7%	81%	61%
Specificity	62.4%	28.5%	11%	9.9%	32%	69.3%
PPV	59%	56%	52.3%	52.7%	52%	64.4%
NPV	60%	74%	78.4%	88.4%	64.8%	66.2%
LR(+)/LR(−)	1.5/0.7	1.3/0.35	1.1/0.3	1.1/0.13	1.2/0.6	2/0.56
AUC (95% CI)	0.6 (0.57–0.6)	0.6 (0.56–0.6)	0.63 (0.6–0.66)	0.72 (0.7–0.75)	0.56 (0.53–0.6)	0.66 (0.63–0.7)
OR (95% CI)	2.2 (1.8–2.67)	3.6 (2.7–4.75)	4 (2.5–6.3)	8.5 (4.4–16.5)	2 (1.5–2.6)	3.5 (2.7–4.6)

Conclusions: SB had the highest sensitivity, OR, and AUC, but rather low specificity, and 4-V the highest specificity. The combination of different questionnaires did not improve their predictive value.

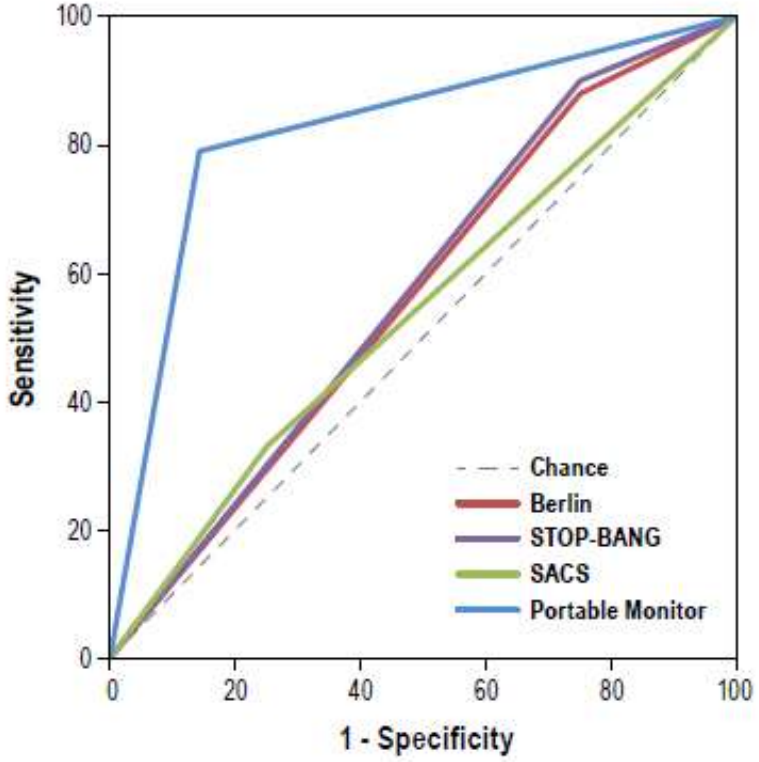
Pataka A et al. Sleep Medicine 15 (2014) 776–781

Diagnosis of Obstructive Sleep Apnea in Adults Using Clinical Tools, Questionnaires and Prediction Algorithms

Μπορούμε να κάνουμε διάγνωση ή να εφαρμόσουμε θεραπεία μόνο με ερωτηματολόγια ή κλινικά κριτήρια??

Comparing a Combination of Validated Questionnaires and Level III Portable Monitor with Polysomnography to Diagnose and Exclude Sleep Apnea

Figure 5—Receiver operating characteristic (ROC) curves for each of the three questionnaires and the PM at a PSG AHI cutoff of 10 events/h



Area under the curve (AUC): Berlin = 0.565; SACS = 0.540; STOP-Bang = 0.575; PM = 0.824.

Can CPAP be indicated in adult patients with suspected obstructive sleep apnea only on the basis of clinical data?

Table 1 Criteria based on polysomnography and clinical history to indicate CPAP in patients with obstructive sleep apnea (observer 2)

1. Based on guidelines of the Sociedad Española de Neumonología y Cirugía Torácica (SEPAR)

Reference method (A)

1. RDI≥30 or
2. RDI≥5 and <30 plus one of the following
   (a) Frequent tiredness after sleeping (≥3–4 times a week)
   (b) Freque
   (c) Excess
   (d) Hypert
   (e) Corona
   (f) Ischem
   (g) Diabet
   (h) Cardia

2. Based o
   Medicin

Reference

1. RDI≥1
2. RDI≥5 [illegible]
   (a) Frequent tiredness after sleeping (≥3–4 times a week)
   (b) Frequent tiredness during waking time (≥3–4 times a week)
   (c) Excessive daytime sleepiness (Epworth>11)
   (d) Hypertension
   (e) Coronary heart disease
   (f) Ischemic or hemorrhagic stroke
   (g) Diabetes type II
   (h) Cardiac arrhythmias

Table 5 Clinical criteria used to diagnose obstructive sleep apnea and indicate CPAP (observer 1)

Snorers with overweight (BMI>25 kg/m^2) who reported the presence of frequent apnea (≥3–4 times a week) associated with any of the [illegible]

Clinical criteria	AUC-ROC (SE)	Sensitivity (95 % CI)	Specificity (95 % CI)	LR+	LR−
CC vs. RM A	0.65 (0.014)	33 (28.3–38)	97.8 (83.7–99.5)	15.1 (4.9–46.5)	0.69 (0.6–0.7)
CC vs. RM B	0.64 (0.014)	31 (26.3–35.4)	97.2 (92.2–99.4)	11.1 (3.6–34.4	0.71 (0.7–0.8)

CC clinical criteria, *RM A or B* reference method A and B, *AUC-ROC* area under the ROC curve, *SE* standard error, positive and negative likelihood ratio, *95 % CI* 95 % confidence interval

Nigro C et al Sleep Breath (2016) 20:175

Combination of oximetry and sleep questionnaires as screening tools for CPAP initiation in patients with obstructive sleep apnea

A. Pataka[a,*], G. Kalamaras[a], E. Vlachogianni[b], P. Argyropoulou[a]

Table 3. Sensitivities and specificities of the combination* of different questionnaires for the patients that received CPAP treatment

	Sensitivity %	Specificity %
SB- ESS	51.6	71.4
ESS-BQ	46.9	79.4
SB-BQ	87.2	42.4
ESS-SB- BQ	45.9	81.6

CPAP: Continuous Positive Airway Pressure, SB: Stop- Bang,ESS:Epworth Sleepiness Scale, BQ: Berlin Questionnaire

*combination positive if all tests are positive and negative if at least one test is negative

for patients treated with

ODIox
89.3
83.5
87
86.4
5.4/0.13
42.2 (18.7-95)
0.86 (0.8-0.92)

y, CPAP: Continuous Predictive Value, LR: Likelihood ratio, AUC: area under the ROC curve, OR : Odds Ratio, CI: confidential interval

Pulmonol. 2018.
https://doi.org/10.1016/j.pulmoe.2018.10.004

Καταγραφή ύπνου

Table 1. **Types of Monitors for Diagnosis of Obstructive Sleep Apnea***

Type	Portability	Channels, *n*	Signals	≥2 Airflow/Effort Channels	Identifies Sleep and Awake States	Measures AHI
I	Facility-based	14–16	EEG, EOG, EMG, ECG/HR, airflow, effort SaO_2	Yes	Yes	Yes
II	Portable	≥7	EEG, EOG, EMG, ECG/HR, airflow, effort SaO_2	Yes	Yes	Yes
III	Portable	≥4	Airflow and/or effort, ECG/HR, SaO_2	Yes	No	No, but estimates AHI†
IV	Portable	1–3‡	All monitors that do not fit into type III classification	No	No§	No, but estimates AHI†

AHI = apnea–hypopnea index; ECG = electrocardiography; EEG = electroencephalography; EMG = electromyography; EOG = electro-oculography; HR = heart rate.
* Adapted from reference 28.
† Both type III and type IV monitors estimate the AHI by measuring the total number of episodes of apnea and hypopnea divided by the number of recording hours/time (as opposed to number of hours of sleep determined by EEG). Some type IV devices estimate sleep and awake states by peripheral arterial tone and estimate the AHI from the estimated sleep time.
‡ May have >3 channels provided that criteria for type III monitors are not met.
§ May include monitors that measure signals that are, in principle, able to identify arousals from sleep.

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[1]; Dennis H. Auckley, MD[2]; Susmita Chowdhuri, MD[3]; David C. Kuhlmann, MD[4]; Reena Mehra, MD, MS[5]; Kannan Ramar, MBBS, MD[6]; Christopher G. Harrod, MS[7]

Home Sleep Apnea Testing for the Diagnosis of Obstructive Sleep Apnea in Adults

Recommendation 2
raphy, or home sle
adequate device, be
complicated adult pa
toms that indicate a
OSA. (STRONG)

Recommendation 3:
sleep apnea test is n
adequate, polysomn
sis of OSA. (STRON

An uncomplicated patient is defined by the absence of:

1. *Conditions that place the patient at increased risk of non-obstructive sleep-disordered breathing (e.g., central sleep apnea, hypoventilation and sleep related hypoxemia). Examples of these conditions include significant cardiopulmonary disease, potential respiratory muscle weakness due to neuromuscular conditions, history of stroke and chronic opiate medication use.*
2. *Concern for significant non-respiratory sleep disorder(s) that require evaluation (e.g., disorders of central hypersomnolence, parasomnias, sleep related movement disorders) or interfere with accuracy of HSAT (e.g., severe insomnia).*
3. *Environmental or personal factors that preclude the adequate acquisition and interpretation of data from HSAT.*

J Clin Sleep Med. 2017;13(3):479–504.

A technically adequate HSAT device incorporates a minimum of the following sensors: nasal pressure, chest and abdominal respiratory inductance plethysmography, and oximetry; or else PAT with oximetry and actigraphy. For additional information regarding HSAT sensor requirements, refer to The AASM Manual for the Scoring of Sleep and Associated Events.[24]

A technically adequate diagnostic test includes a minimum of 4 hours of technically adequate oximetry and flow data, obtained during a recording attempt that encompasses the habitual sleep period.

J Clin Sleep Med. 2017;13(3):479–504.

Diagnosis of Obstructive Sleep Apnea in Adults with Comorbid Conditions

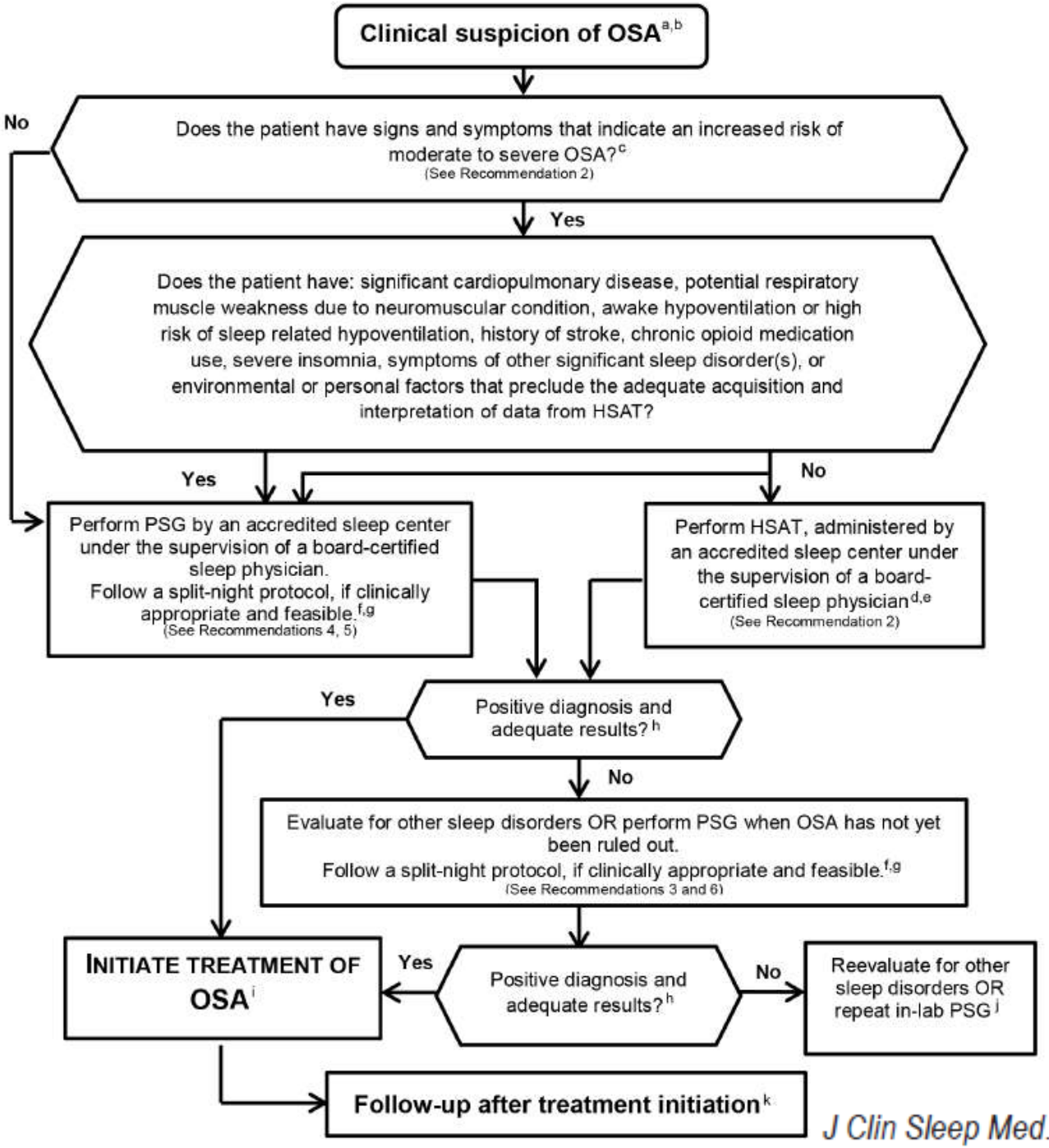
Recommendation 4: We recommend that polysomnography, rather than home sleep apnea testing, be used for the diagnosis of OSA in patients with significant cardiorespiratory disease, potential respiratory muscle weakness due to neuromuscular condition, awake hypoventilation or suspicion of sleep-related hypoventilation, chronic opioid medication use, history of stroke or severe insomnia. (STRONG)

Diagnosis of Obstructive Sleep Apnea in Adults Using a Split-Night versus a Full-Night Polysomnography Protocol

Recommendation 5: We suggest that, if clinically appropriate, a split-night diagnostic protocol, rather than a full-night diagnostic protocol for polysomnography be used in the diagnosis of OSA. (WEAK)

This recommendation is based on a split-night protocol that initiates CPAP titration only when the following criteria are met: (1) a moderate to severe degree of OSA is observed during a minimum of 2 hours of recording time on the diagnostic PSG, AND (2) at least 3 hours are available for CPAP titration.

J Clin Sleep Med. 2017;13(3):479–504.



J Clin Sleep Med. 2017;13(3):479–504.

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[1]; Dennis H. Auckley, MD[2]; Susmita Chowdhuri, MD[3]; David C. Kuhlmann, MD[4]; Reena Mehra, MD, MS[5]; Kannan Ramar, MBBS, MD[6]; Christopher G. Harrod, MS[7]

Recommendation Statement	Strength of Recommendation	Evidence Quality	Benefits versus Harms	Patient Values and Preferences
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
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
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	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

JAMA Clinical Guidelines Synopsis

Diagnostic Testing for Obstructive Sleep Apnea in Adults

Babak Mokhlesi, MD, MSc; Adam S. Cifu, MD

JAMA November 28, 2017 Volume 318, Number 20

MAJOR RECOMMENDATIONS

- Screening questionnaires and prediction algorithms should not be used to diagnose OSA in the absence of polysomnography or home sleep apnea testing (HSAT) (moderate evidence; strong recommendation).
- Facility-based polysomnography or HSAT with a technically adequate device should be used for diagnosis of OSA in uncomplicated adult cases with suspected moderate to severe OSA (moderate evidence; strong recommendation).
- Facility-based polysomnography, rather than HSAT, should be used for diagnosis of OSA in complicated cases (those with significant cardiorespiratory disease, potential respiratory muscle weakness due to neuromuscular condition, awake hypoventilation or suspected sleep-related hypoventilation, chronic opioid medication use, history of stroke, or severe insomnia) (very weak evidence; strong recommendation).
- When facility-based polysomnography is used, a split-night (rather than full-night) diagnostic protocol should be used for diagnosis of OSA (low evidence; weak recommendation).

Ευχαριστώ!!!!