Simple and unbiased OSA prescreening: Introduction of a new morphologic OSA prediction score

Supplementary Data

Supplementary Table 1 Test variables and their formula.

Test Accuracy	Sensitivity (true positive rate)	Specificity (true negative rate)	Positive Predictive Value	Negative Predictive Value	Positive Likelihood Ratio	Negative Likelihood Ratio
ACU	SEN	SPE	PPV	NPV	LR+	LR-
$\frac{TP+TN}{TP+FP+TN+FN}$	$\frac{TP}{TP+FN}$	$\frac{TN}{TN+FP}$	$\frac{TP}{TP+FP}$	$\frac{TN}{TN+FN}$	$\frac{SEN}{1-SPE}$	$\frac{1-SEN}{SPE}$

Abbreviations: ACU, test accuracy; SEN, sensitivity; SPE, specificity; PPV, positive predictive value; NPV, negative predictive value; LR+, positive likelihood ratio; LR-, negative likelihood ratio; TP, true positives; TN, true negatives; FP, false positives; FN=false negatives.

Supplementary Table 2 Test Cohort – Two-by-two outcome table for predicting severity of obstructive sleep apnea.

	Total (n=150)		Score Prediction	
	Total Positives	Total Negatives	Total Positives (TP + FP)	Total Negatives (TN + FN)
Severe OSA **(Score ≥8)**	34	116	49 (28 + 21)	101 (95 + 6)
Exclusion of OSA* **(Score ≤4)**	39	111	47 (28 + 19)	103 (92 + 11)
Mild to Moderate OSA **(4< Score < 8)**	77	73	54 (38 + 16)	96 (57 + 39)

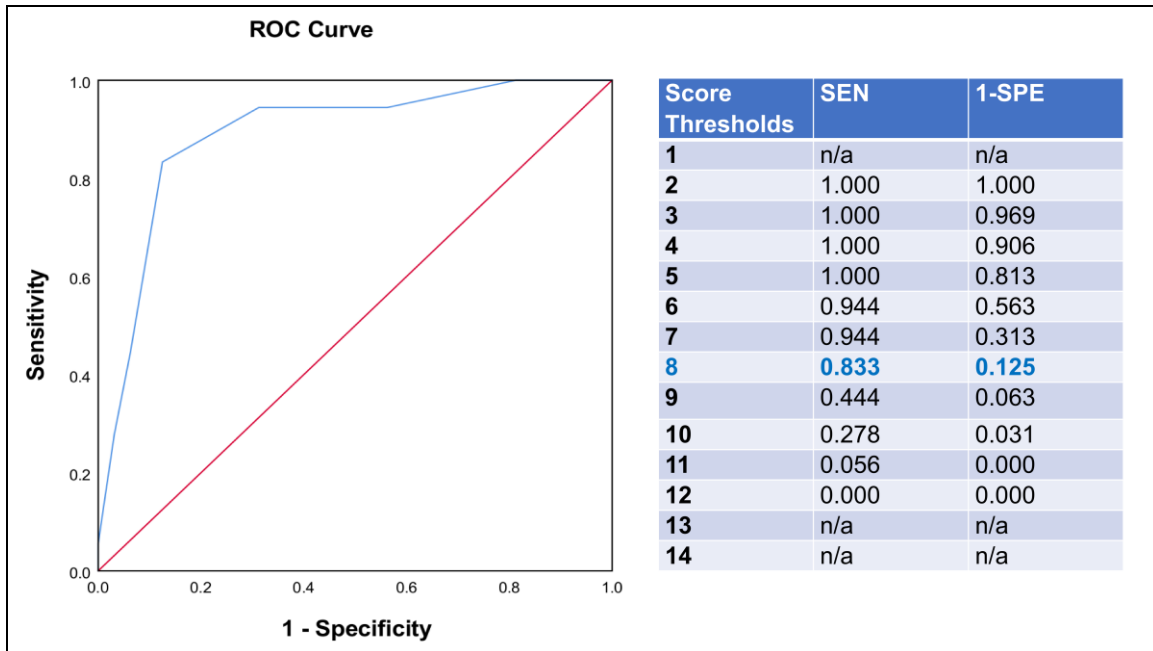**Notes:** * Here, positive means the exclusion of OSA (not having the disease)

Abbreviations: OSA, obstructive sleep apnea; TP, true positives; FP, false positives; TN, true negatives; FN, false negatives.

Supplementary Table 3 Validation Cohort – Two-by-two outcome table for predicting severity of obstructive sleep apnea.

	Total (n=50)		Score Prediction	
	Total Positives	Total Negatives	Total Positives (TP + FP)	Total Negatives (TN + FN)
Severe OSA (Score ≥8)	18	32	19 (15 + 4)	31 (28 + 3)
Exclusion of OSA* (Score ≤4)	5	45	15 (5 + 10)	35 (35 + 0)
Mild to Moderate OSA (4< Score < 8)	27	23	16 (14 + 2)	34 (21 + 13)

Notes: * Here, positive means the exclusion of OSA (not having the disease)
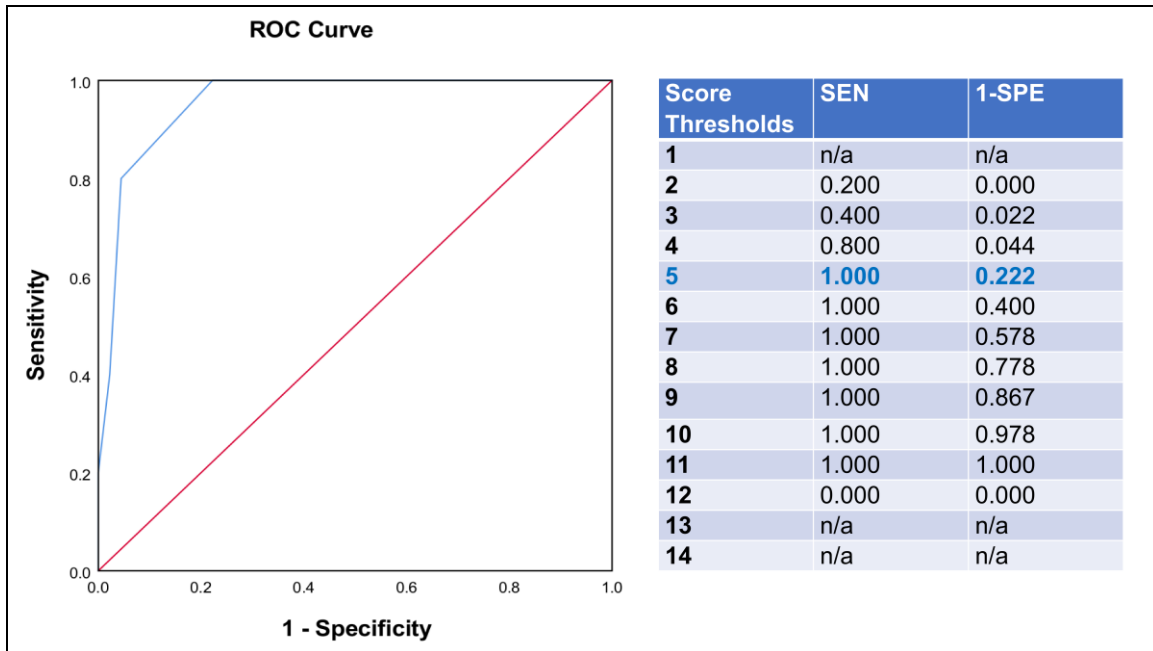
Abbreviations: OSA, obstructive sleep apnea; TP, true positives; FP, false positives; TN, true negatives; FN, false negatives.

Score Thresholds	SEN	1-SPE
1	n/a	n/a
2	1.000	1.000
3	1.000	0.969
4	1.000	0.906
5	1.000	0.813
6	0.944	0.563
7	0.944	0.313
8	**0.833**	**0.125**
9	0.444	0.063
10	0.278	0.031
11	0.056	0.000
12	0.000	0.000
13	n/a	n/a
14	n/a	n/a

Supplementary Figure 1 Validation Cohort - Receiver-operating curve and score thresholds for predicting severe obstructive sleep apnea (apnea-hypopnea index ≥30).

Notes: Left: ROC curve for score prediction of severe obstructive sleep apnea (apnea-hypopnea index ≥30) within the test cohort. The curve is defined by sensitivity (true positive rate) on the y-axe and 1-specificity (false positive rate) on the x-axe. Points above the diagonal of the plot represent good results, better than random. Right: Sensitivity and 1-specificity for different score thresholds. Highlighted (blue, bold): A score of 8 or above presents the best predictive values.
Abbreviations: ROC, receiver-operating characteristics; SEN, sensitivity; SPE, specificity; n/a, score not available in this cohort.

ROC Curve

Score Thresholds	SEN	1-SPE
1	n/a	n/a
2	0.200	0.000
3	0.400	0.022
4	0.800	0.044
5	**1.000**	**0.222**
6	1.000	0.400
7	1.000	0.578
8	1.000	0.778
9	1.000	0.867
10	1.000	0.978
11	1.000	1.000
12	0.000	0.000
13	n/a	n/a
14	n/a	n/a

Supplementary Figure 2: Validation Cohort - Receiver-operating curve and score thresholds for predicting exclusion of obstructive sleep apnea (apnea-hypopnea index<5).

Notes: Left: ROC curve for score prediction of exclusion of obstructive sleep apnea (apnea-hypopnea index <5) within the test cohort. The curve is defined by sensitivity (true positive rate) on the y-axe and 1-specificity (false positive rate) on the x-axe. Points above the diagonal of the plot represent good results, better than random. Right: Sensitivity) and 1-specificity for the different score thresholds. Highlighted (blue, bold): A score of 5 or below presents the best predictive values.

Abbreviations: ROC, receiver-operating characteristics; SEN, sensitivity; SPE, specificity; n/a, score not available in this cohort.