Biomarqueurs digitaux et IA pour le diagnostic du SAOS et la stratification du risque



CHU Grenoble Alpes

UGA Université Grenoble Alpes

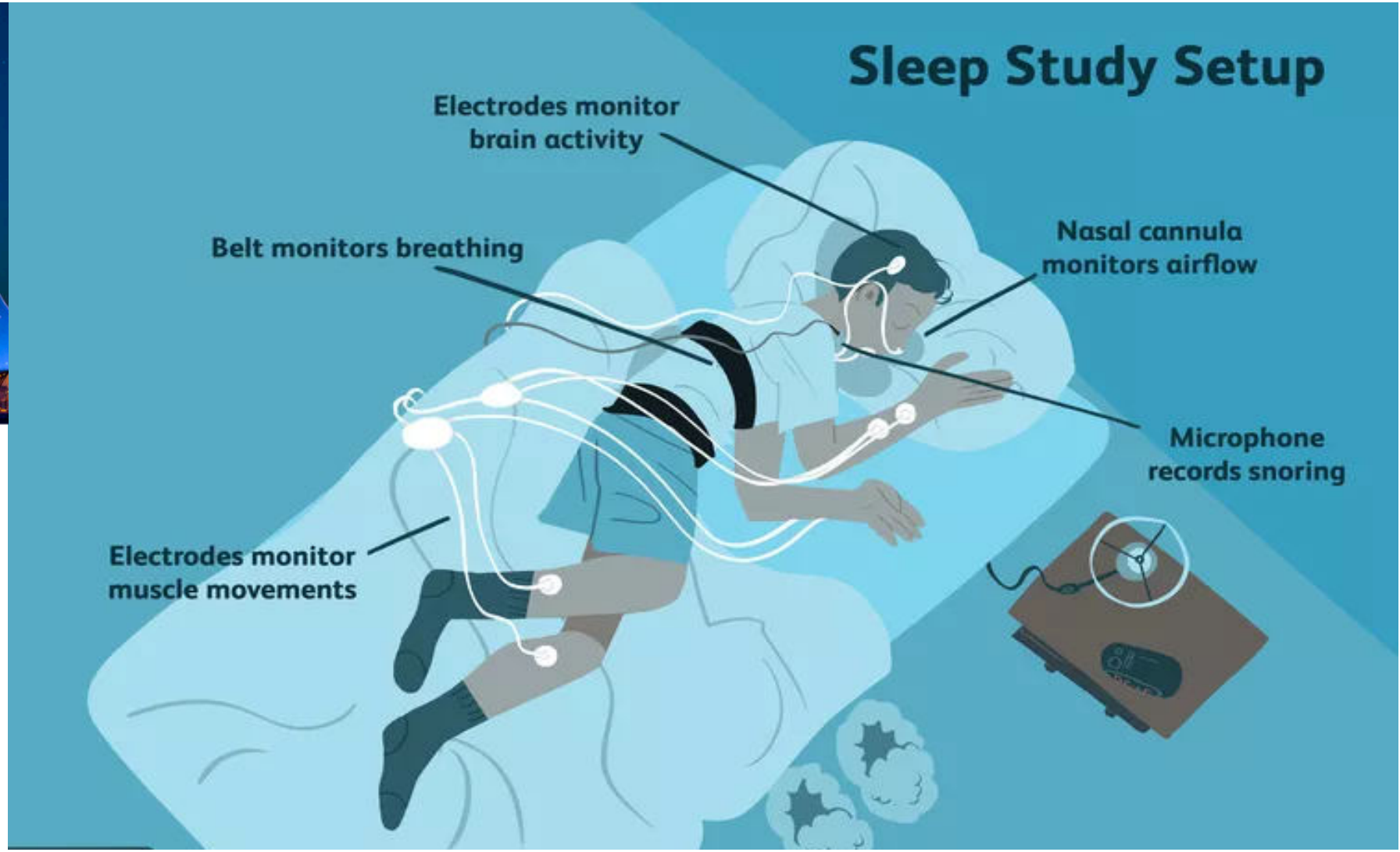
Instituts thématiques Inserm Institut national de la santé et de la recherche médicale

hp2 Laboratoire

e-santé Sleep and health trajectories

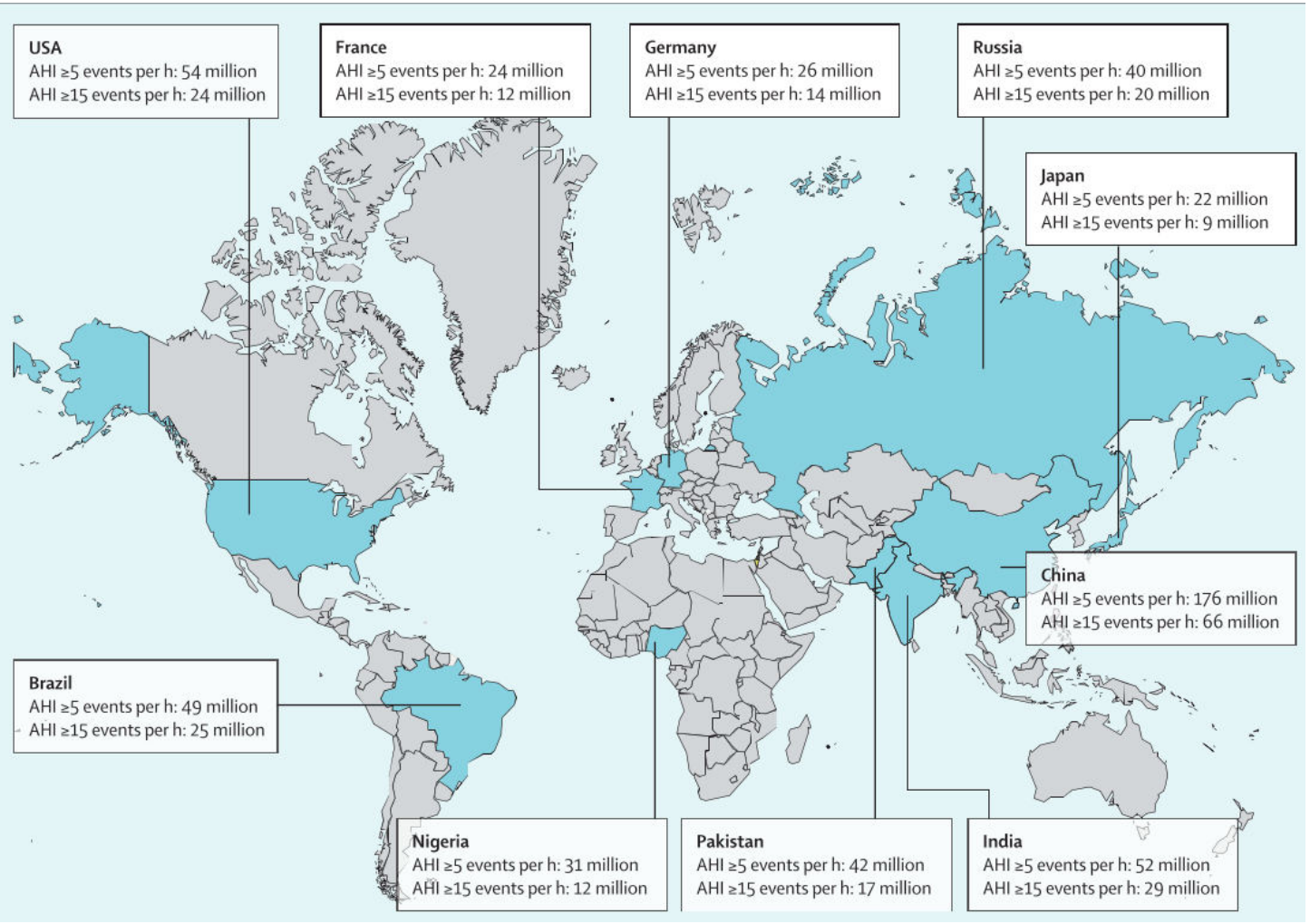
MIAI Cluster IA Multidisciplinary Institute In Artificial Intelligence

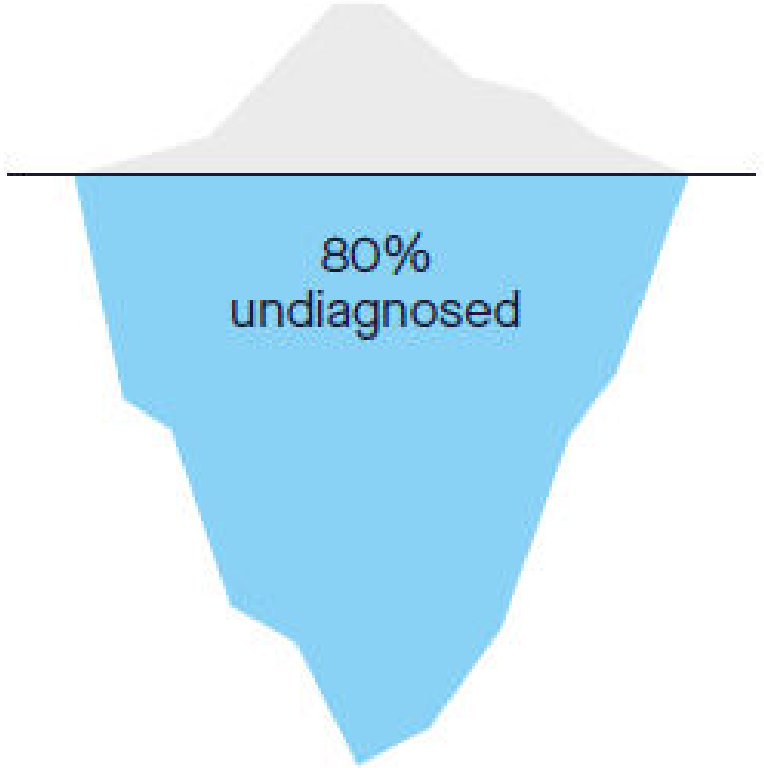
France 2030



Jean-Louis Pépin

Global prevalence and burden of obstructive sleep apnoea





Près d'un milliard de personnes dans le monde
> 30 millions de personnes non diagnostiquées en Europe

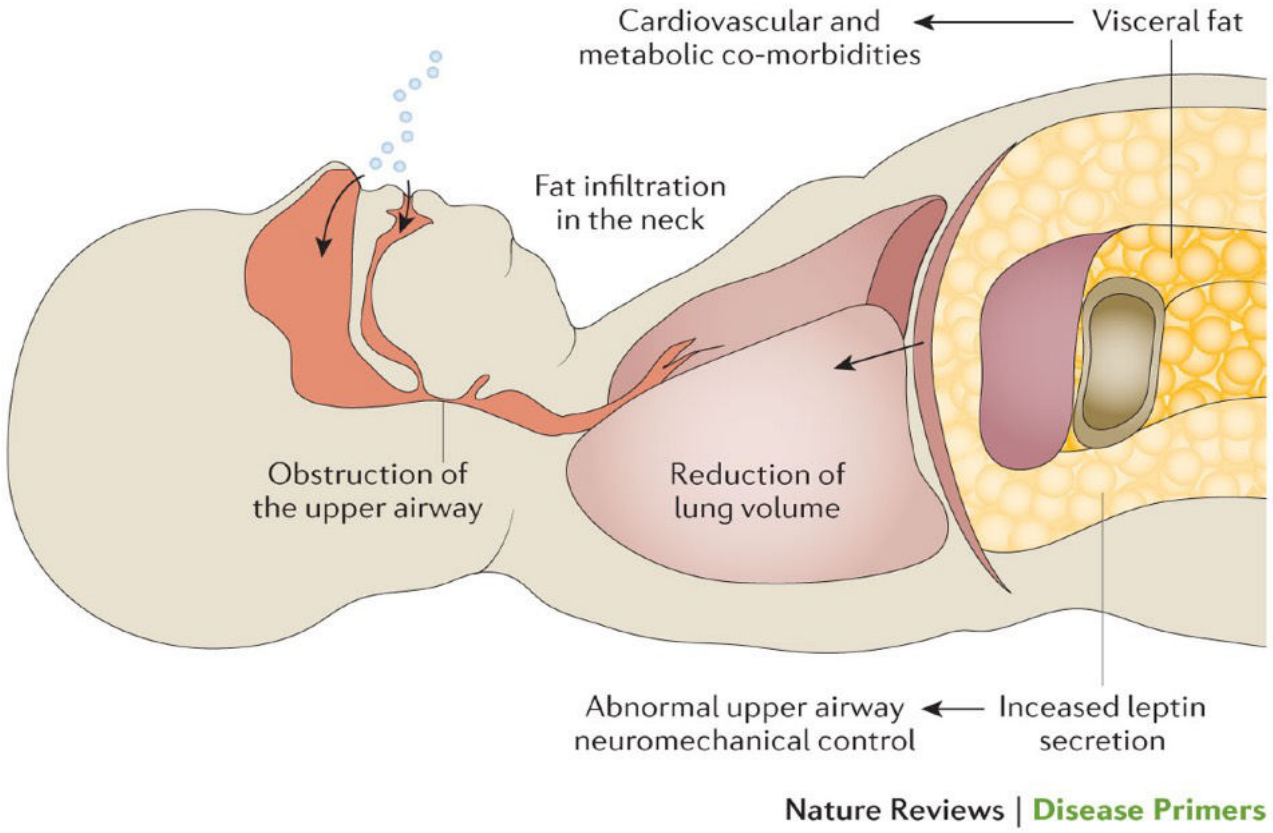
La prévalence va continuer à augmenter en raison des épidémies d'obésité et de diabète :

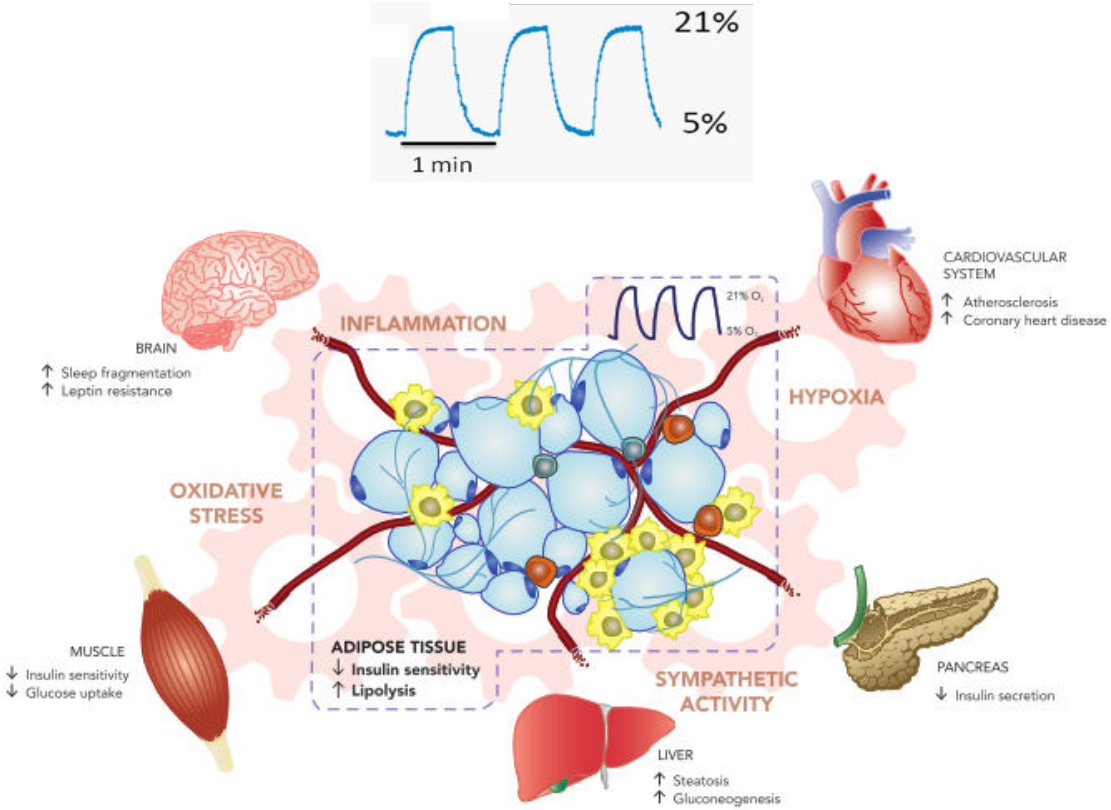
<u>outils diagnostiques non adaptés à l'ampleur du problème</u>

Benjafield A Lancet Respiratory Med 2019;7:687-698

Syndrome d'apnées du Sommeil : Est-il important de le diagnostiquer ?

Maladie chronique multi systémique associée à des comorbidités et une mortalité précoce





Ryan S and Pépin JL Eur Respir Rev 2019

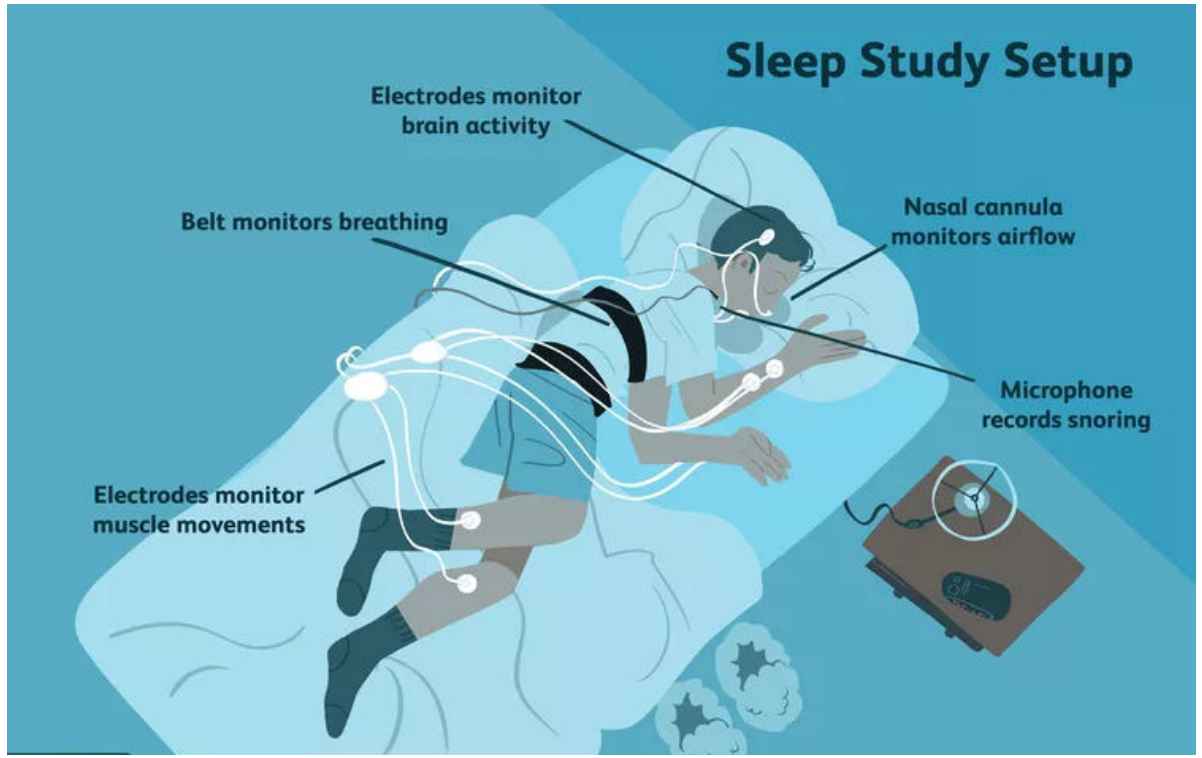
1 million d'enregistrements PSG/PG par an en France réalises par des spécialités médicales variées :

Est-ce bien raisonnable ?

Quel est le contrôle qualité ?

Lévy, P, Kohler M, McNicholas W, Barbé F, McEvoy D, Somers VK, Lavie L and Pépin JL Nat Rev Dis Primers 2015

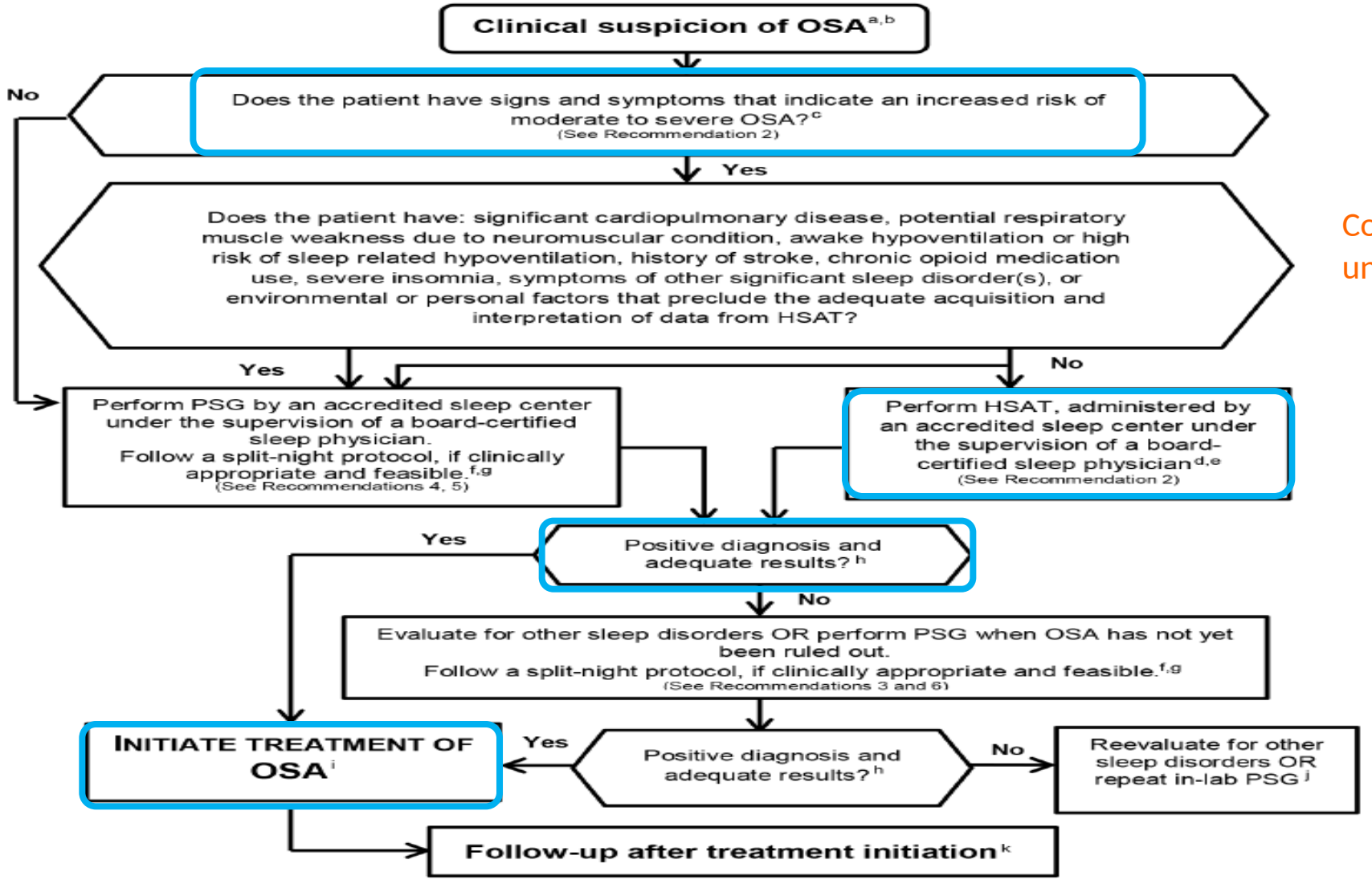
La PSG en laboratoire comme seul examen de diagnostic de référence est-elle périmée ?
Oui !



- Ne réponds pas à la demande épidémiologique
- Inégalités dans l'accès aux soins
- Non réalisée dans l'écosystème du patient
- Consommatrice de temps et d'expertise
- Ne prends pas en compte la variabilité inter nuits de la sévérité du SAHOS

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

Diagnostic du SAS à domicile : des indications bien définies et inclus dans recommandations



Probabilité pré-test élevée

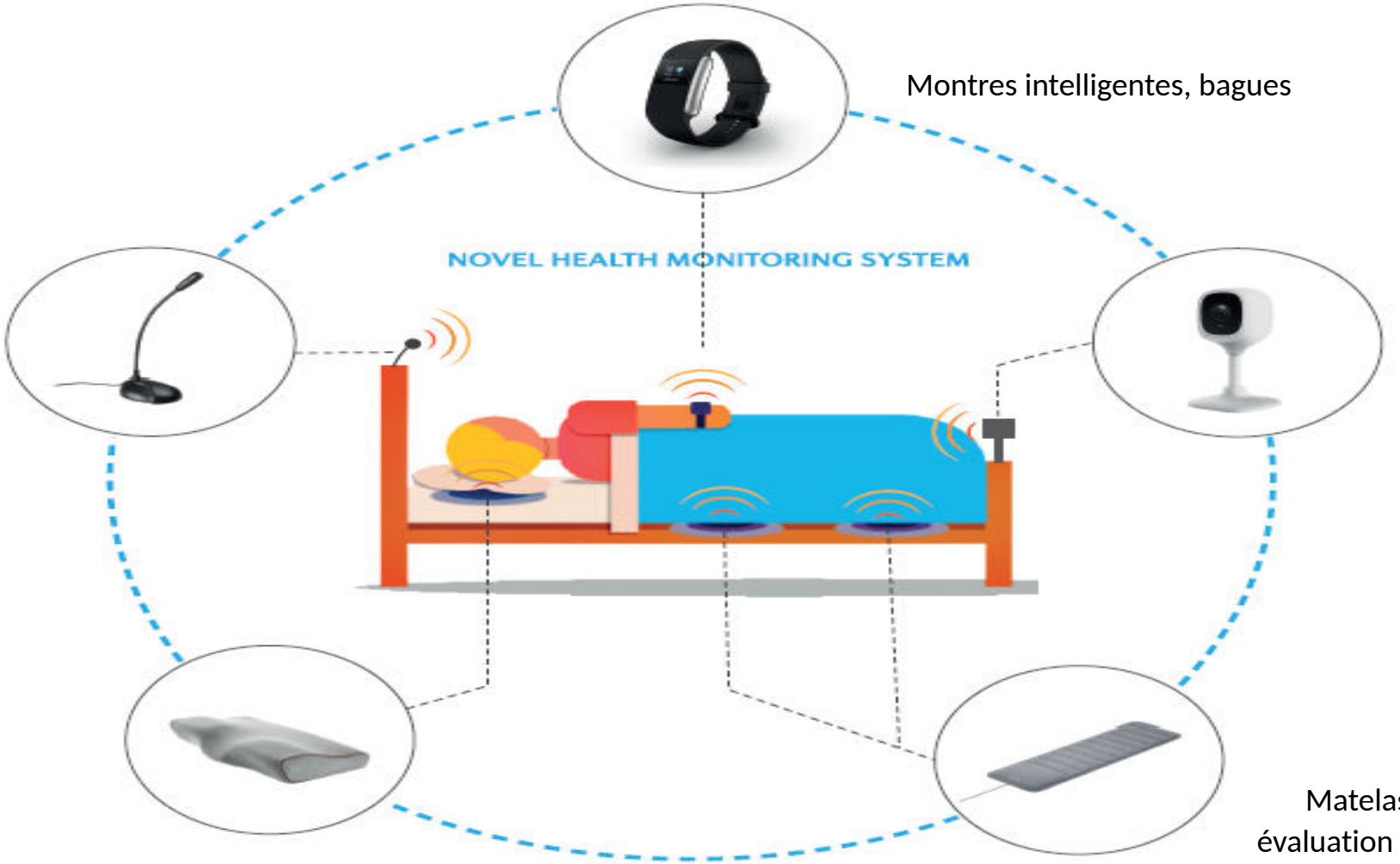
Comorbidités qui empêchent un diagnostic correct à domicile

Place aujourd'hui occupée par la polygraphie ventilatoire qui a des limites majeures : Surutilisée et dans de mauvaises indications

Kapur VK J Clin Sleep Med 2017:3;479-504

Une pléthore de technologies ont vu le jour pour explorer le sommeil et les troubles du sommeil à domicile

Une nécessité de validation scientifique pour permettre l'implémentation en clinique



Montres intelligentes, bagues

Vidéo infrarouge

Matelas instrumentés pour évaluation ballistocardiographique

Lechat B Front Neurosci 2021;15:751730

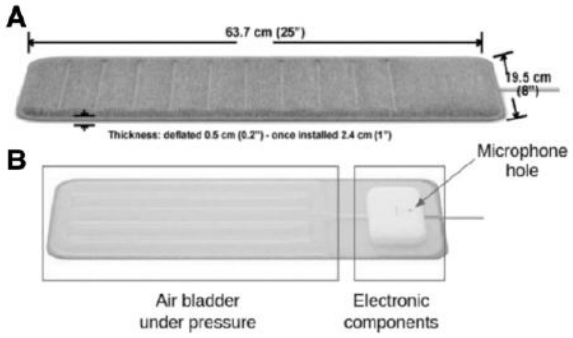
Améliorer les filières diagnostic du syndrome d'apnées du sommeil



De la polysomnographie à un nombre limité de capteurs et une analyse par intelligence artificielle explicable +++ par la physiologie





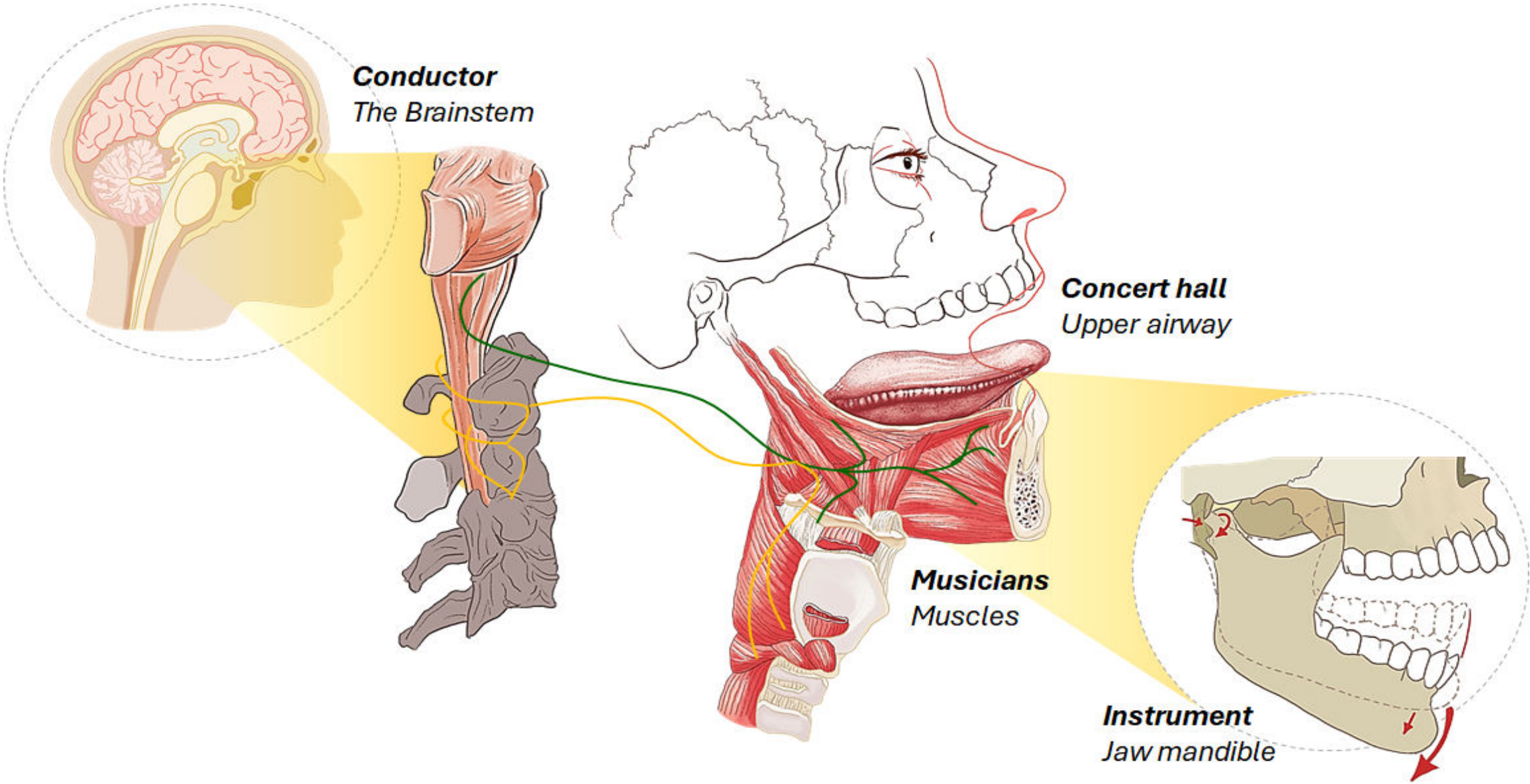


Facilite l'accès au diagnostic et la réduction des coûts

Intérêt majeur en période de pandémie

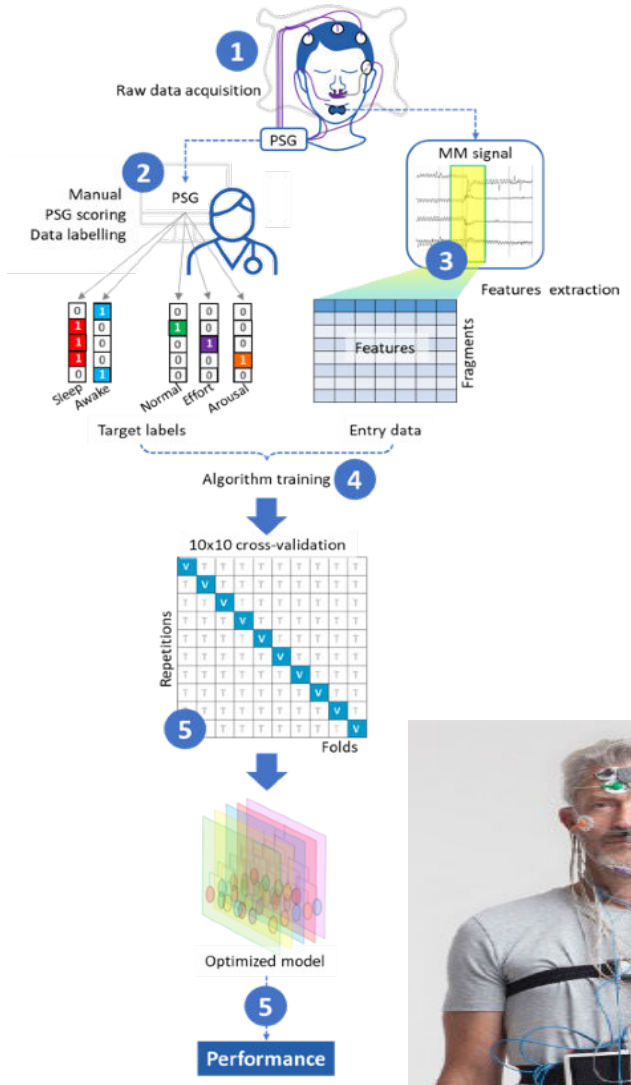
Mouvements mandibulaires et effort respiratoire

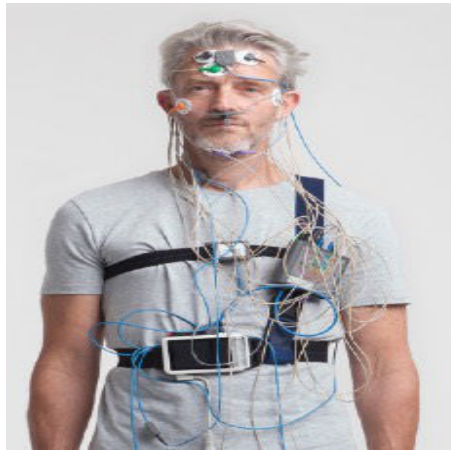
Le concept

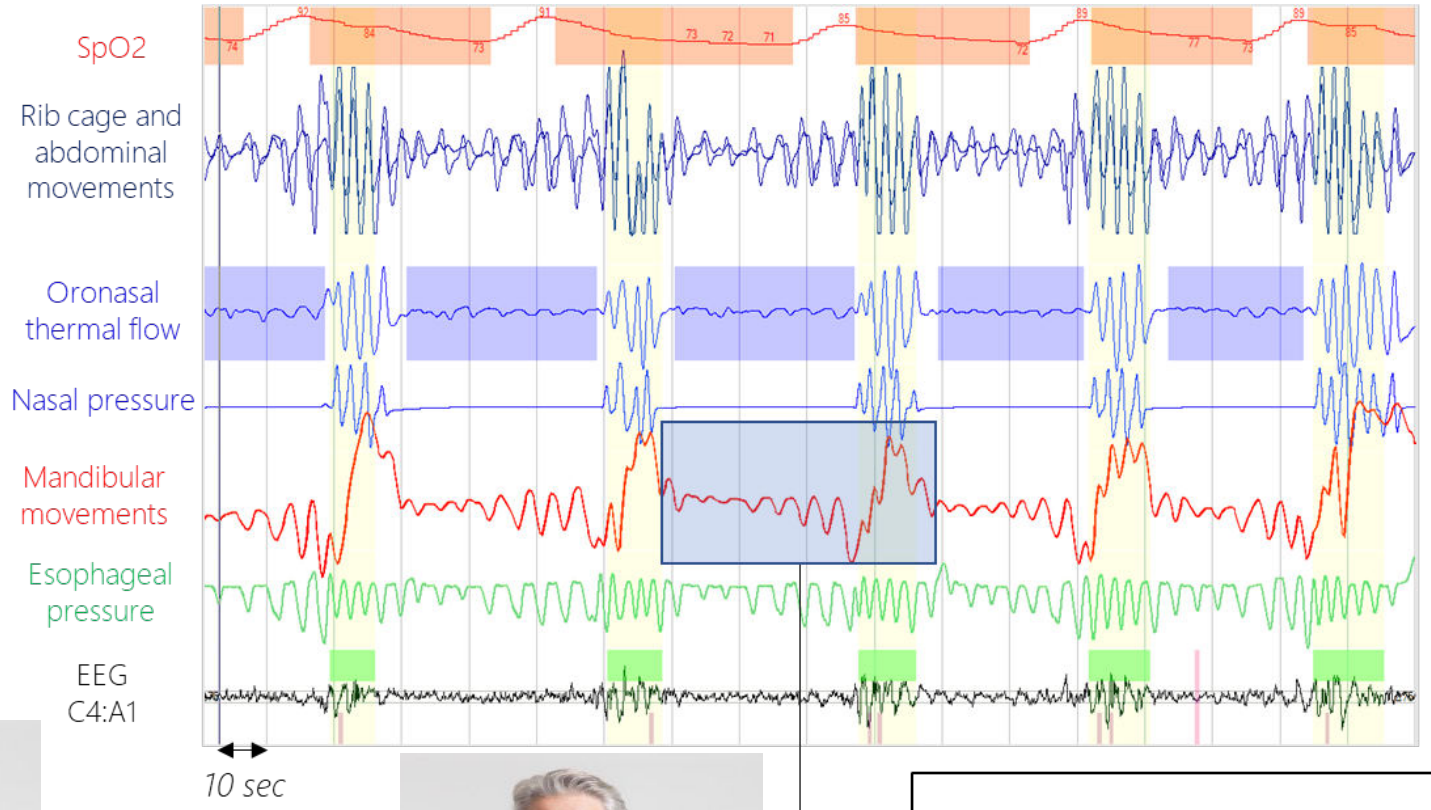


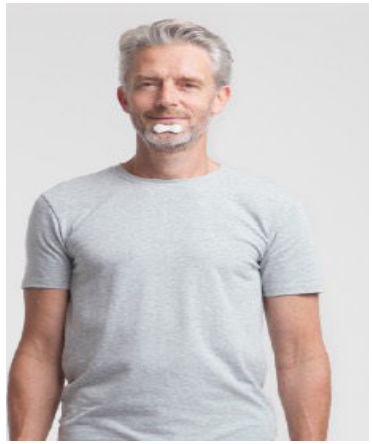
Analyse des mouvements mandibulaires

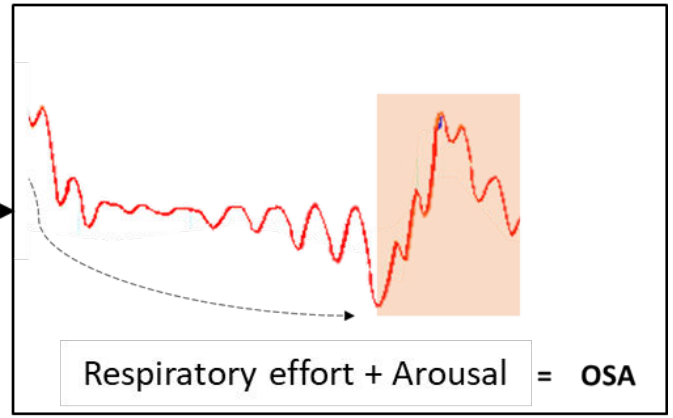
Développement d'un algorithme à partir d'annotation validées par des « experts métier »



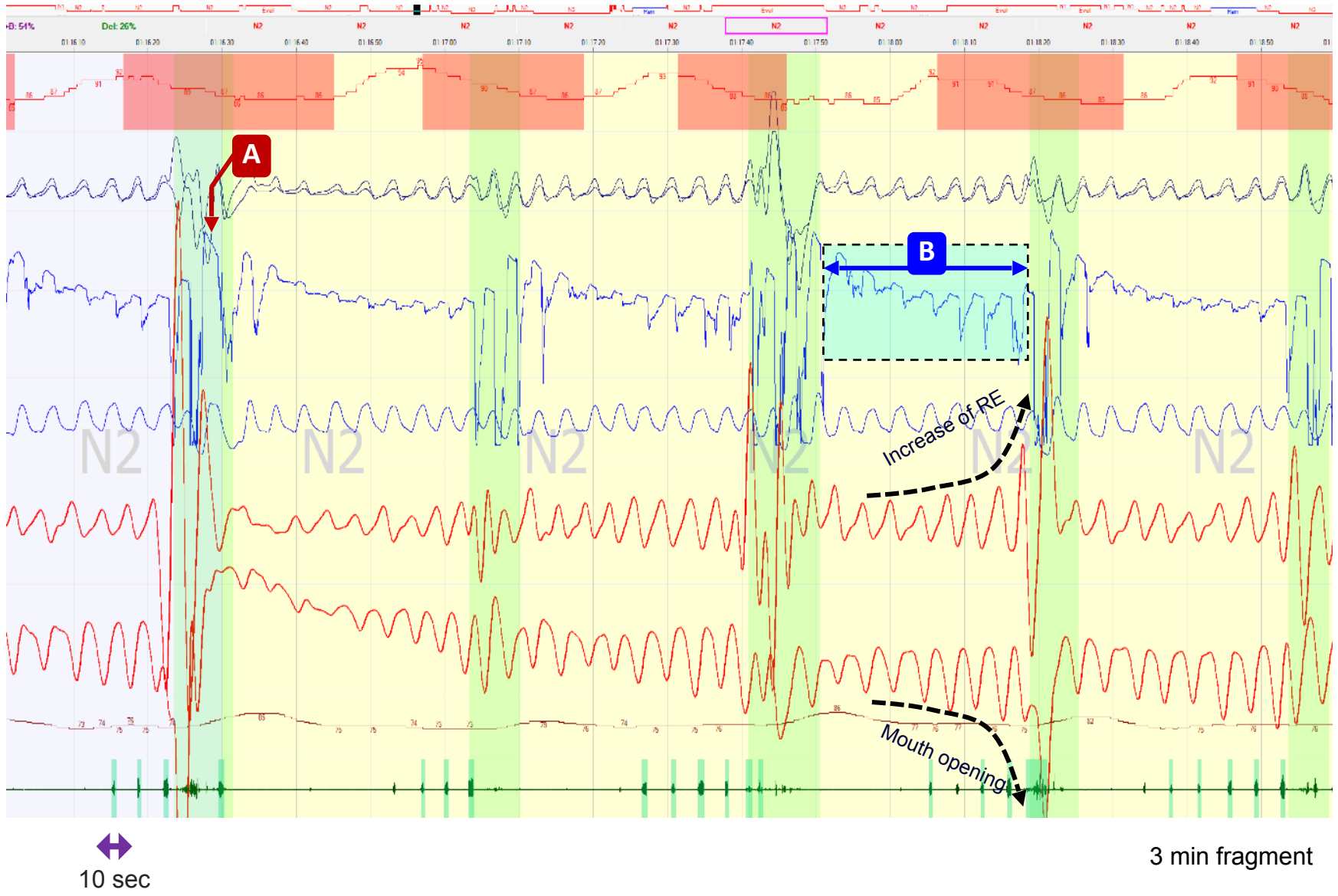








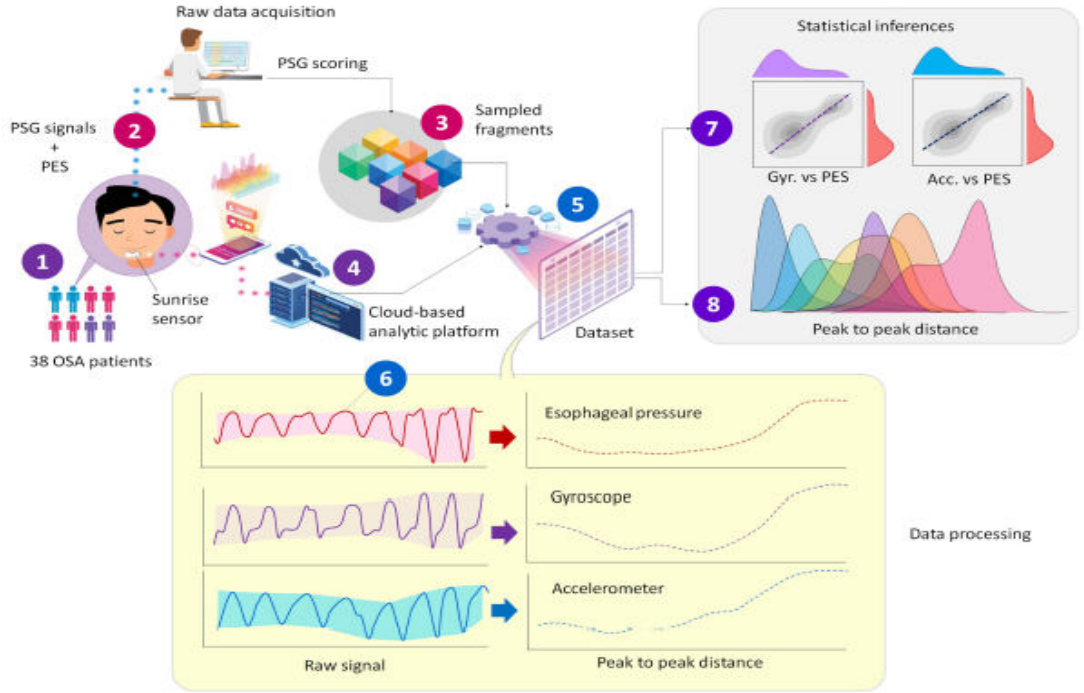
Mouvements mandibulaires et effort respiratoire

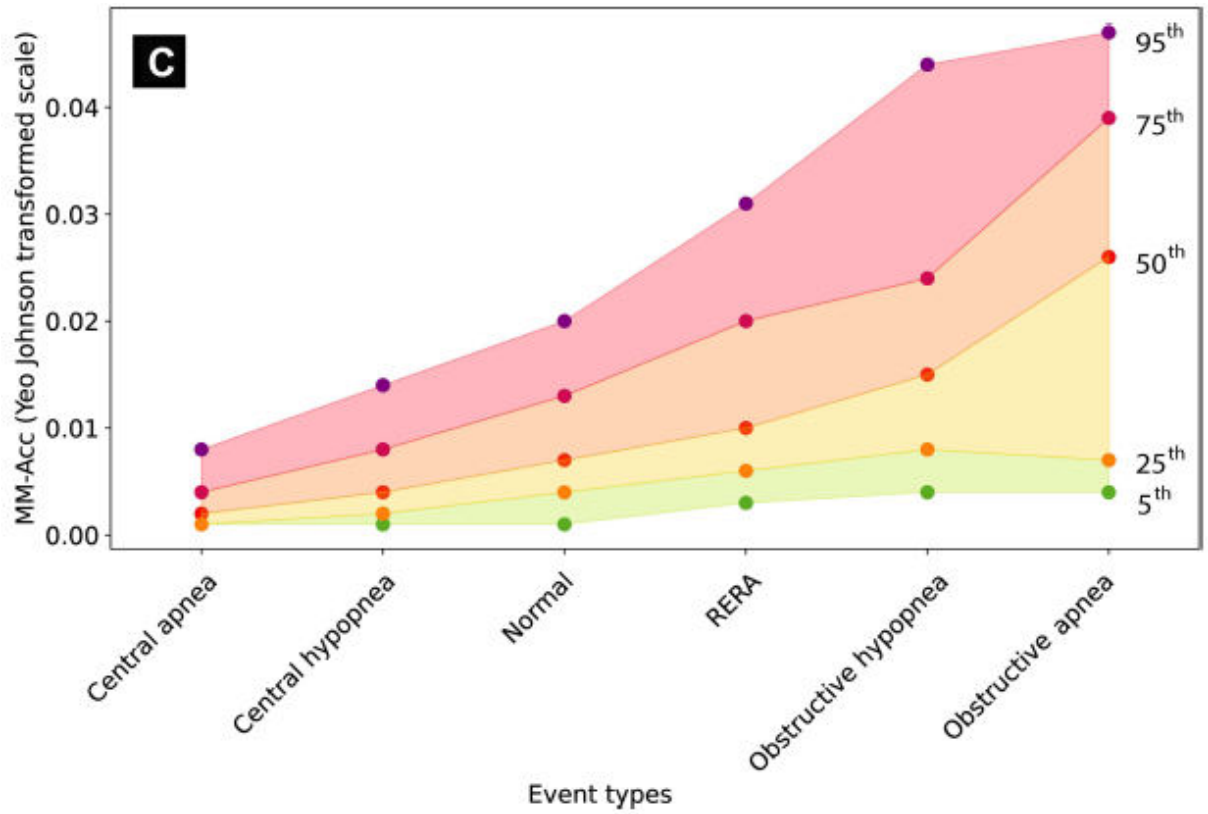


Martinot J-B and Pépin J-L Front Sleep 2023;2:1145620. doi: 10.3389/frsle.2023.1145620

Analyse des mouvements mandibulaires

Différenciation central versus obstructif (n=38) : comparaison avec la pression œsophagienne



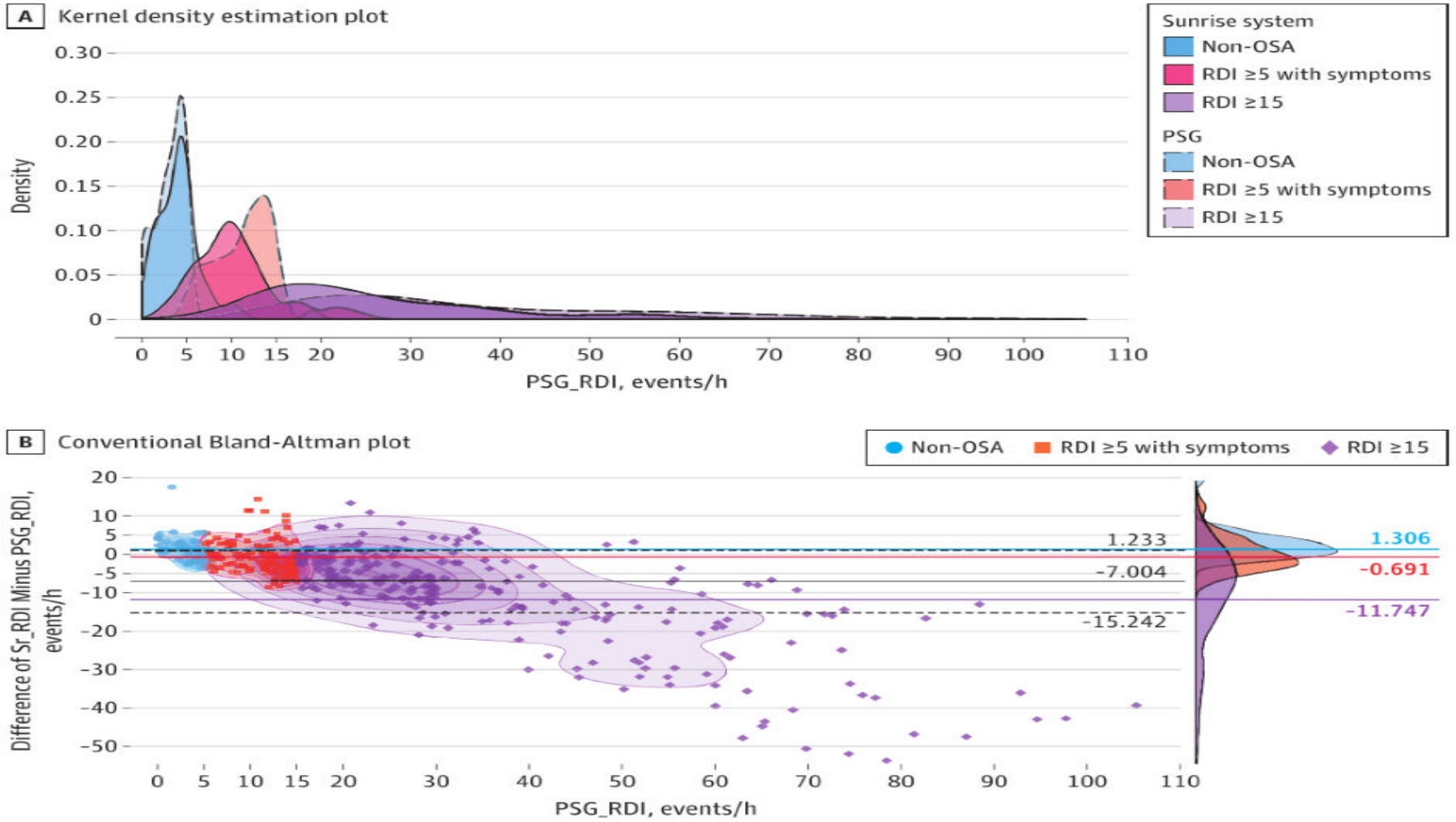


Pépin JL Nature and Science of Sleep 2022;14:635–644

Analyse des mouvements mandibulaires

Validation versus la polysomnographie au laboratoire (une nuit)

N=376



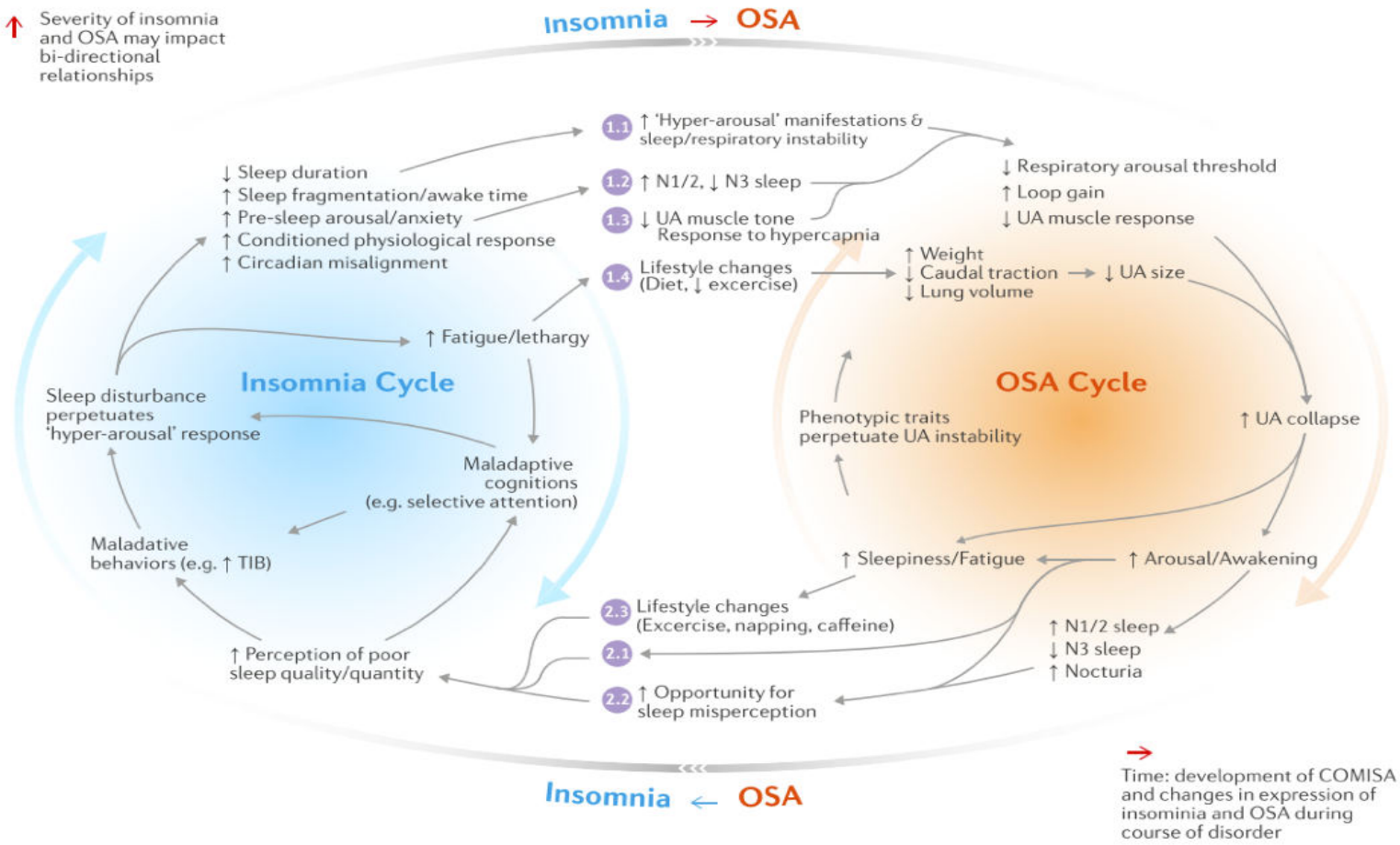
sun✳rise

Pépin JL JAMA Network open 2020;3:e1919657. doi:10.1001

hp2 LABORATOIRE

L'outil diagnostic ultime doit permettre le diagnostic des autres pathologies du sommeil ! Le COMISA par exemple

Ce besoin n'est absolument pas couvert par la polygraphie ventilatoire (300 000 nuits par an) et de nombreuses PSG programmées après une PG !!!

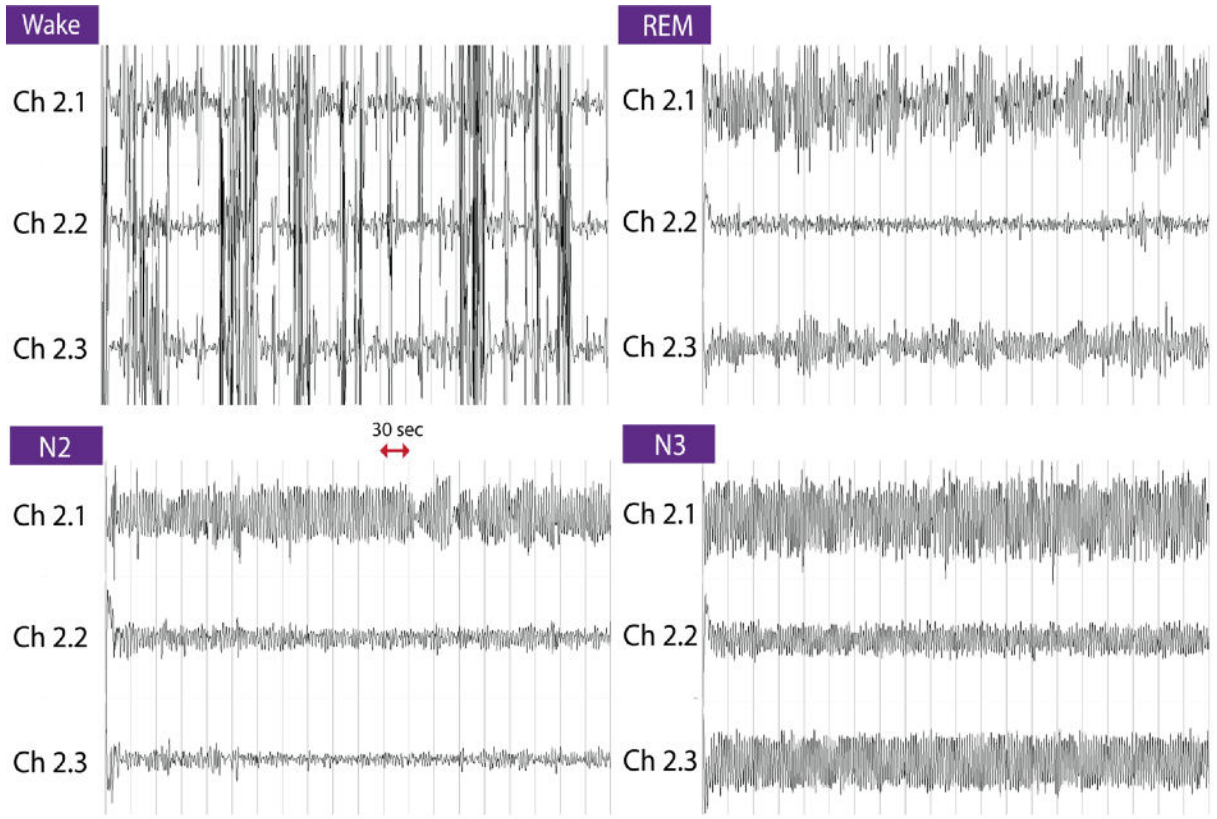


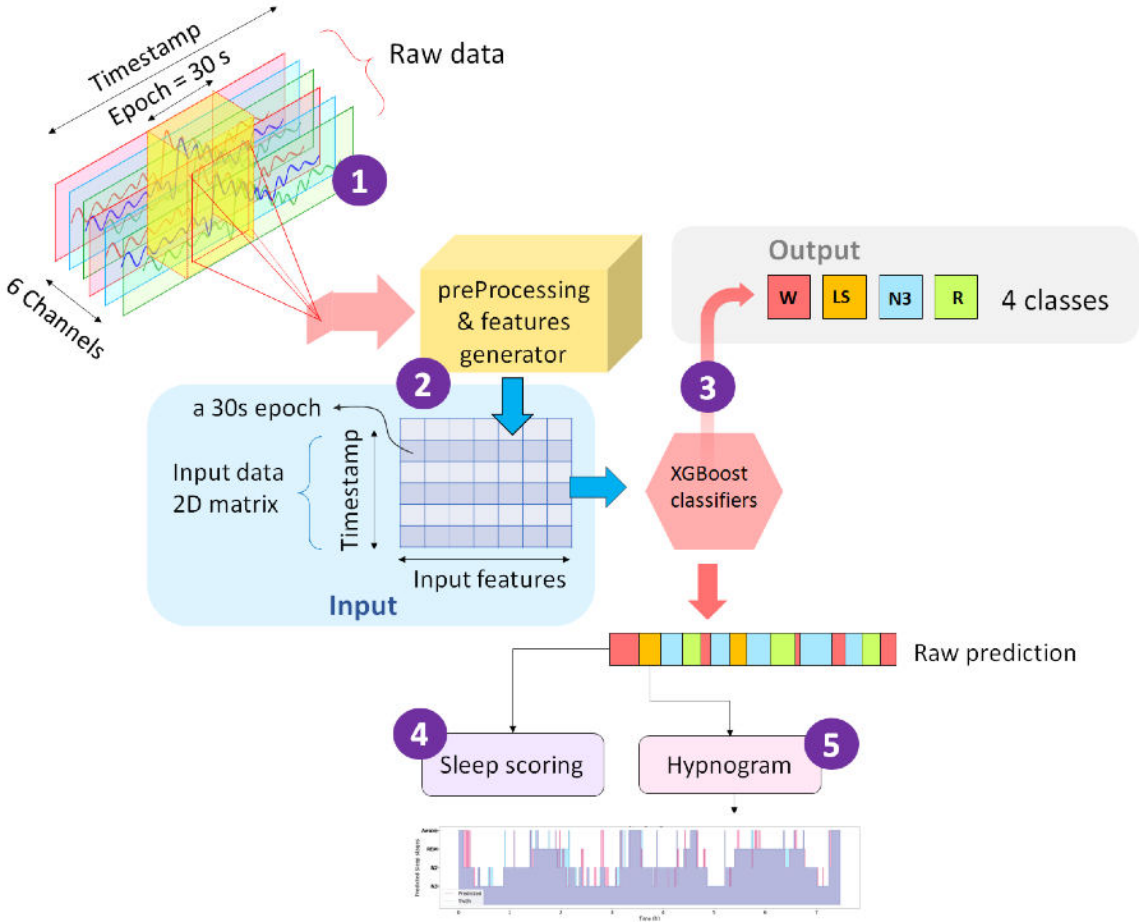
Sweetman A

Sleep Med Review 2021;60:101519. doi:10.1016/j.smrv.2021.101519

Analyse des mouvements mandibulaires

Validation de l'analyse des stades de sommeil



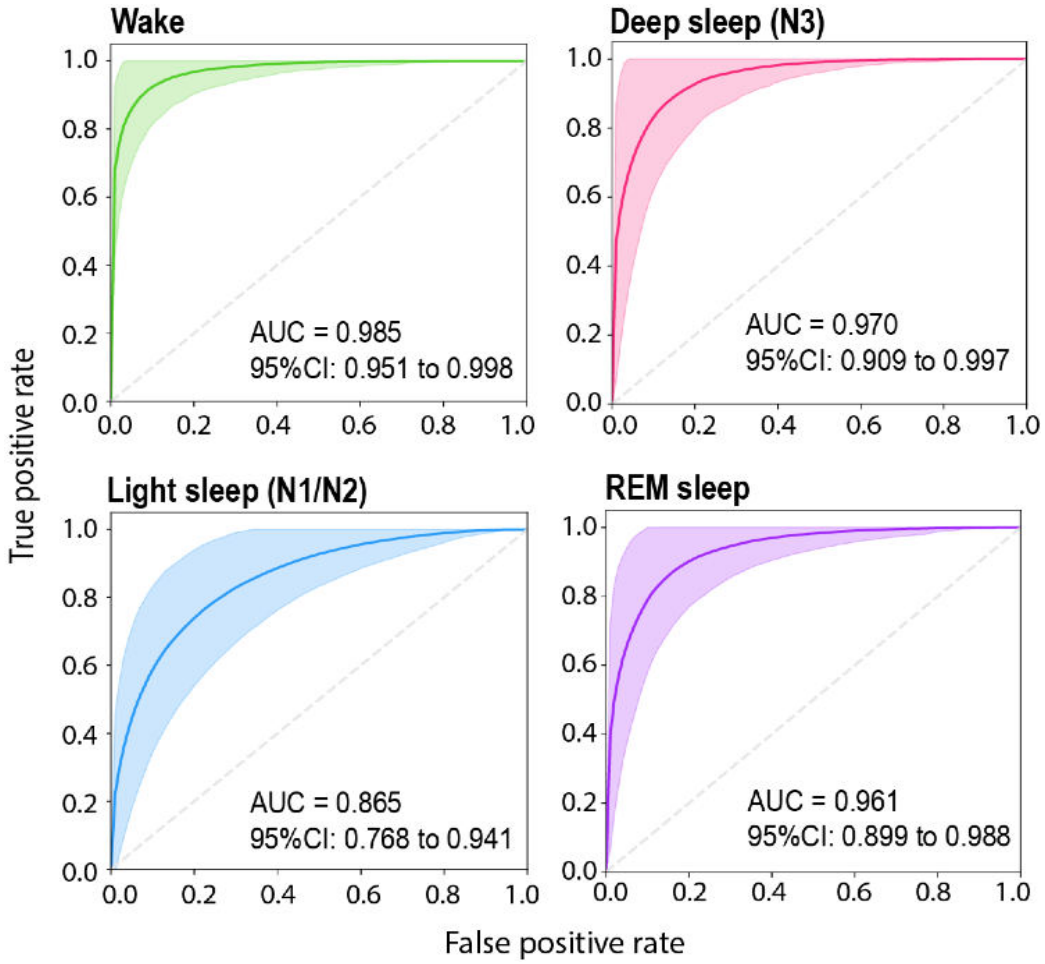


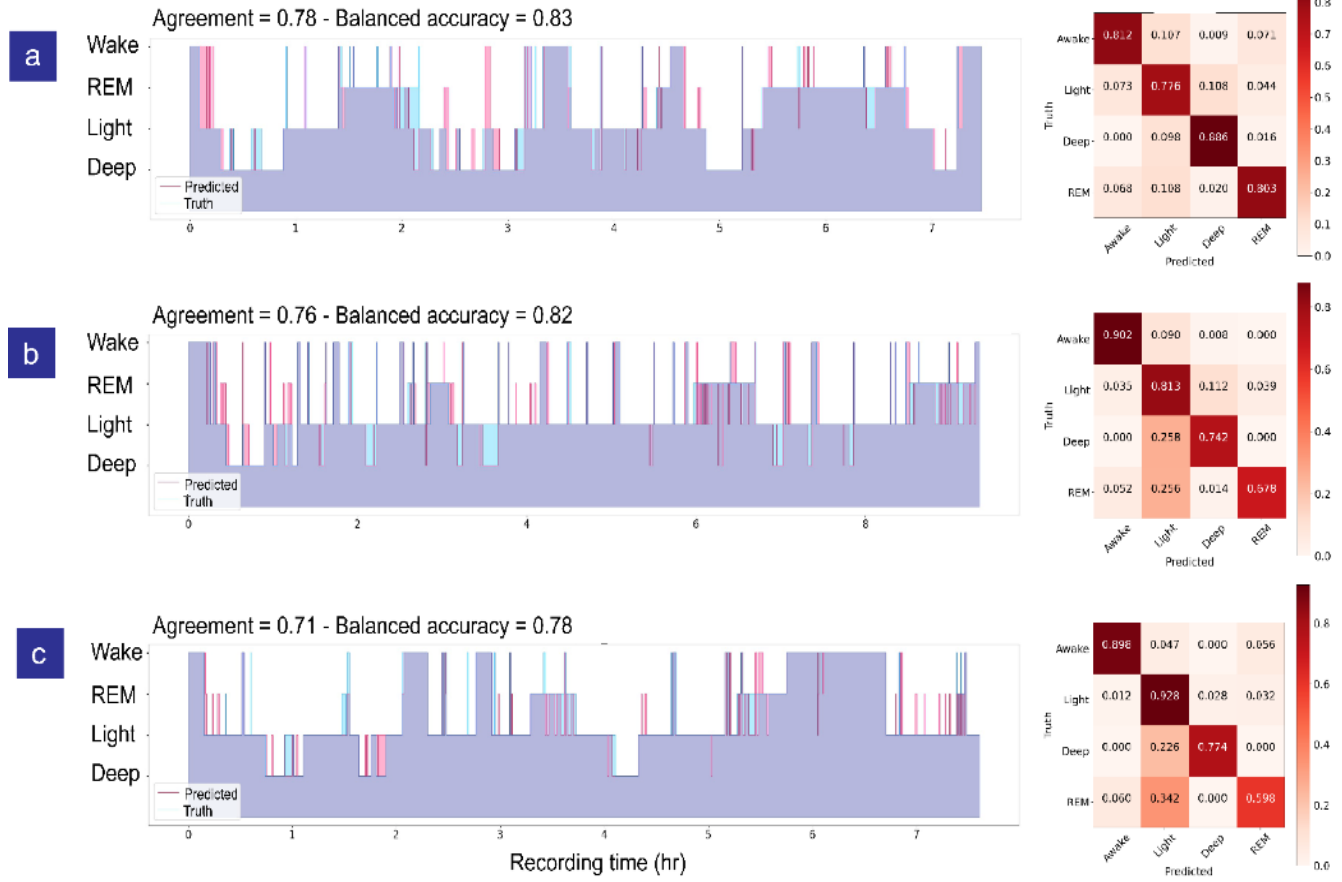
L'algorithme final a été entraîné à partir de 707 417 époques de sommeil de 30 secondes (800 sujets)

Le-Dong N AJRCCM 2021;204:1227-1231.

Analyse des mouvements mandibulaires

Validation de l'analyse des stades de sommeil



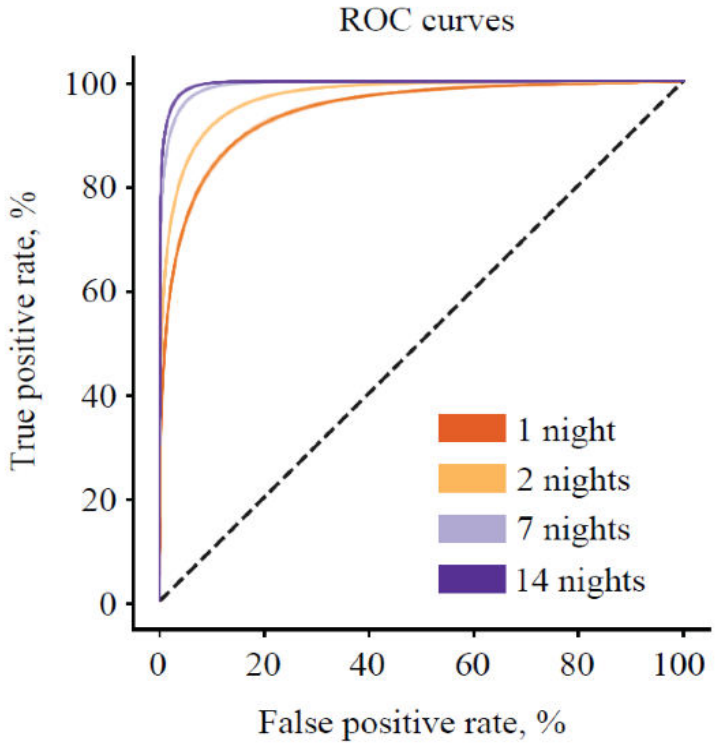


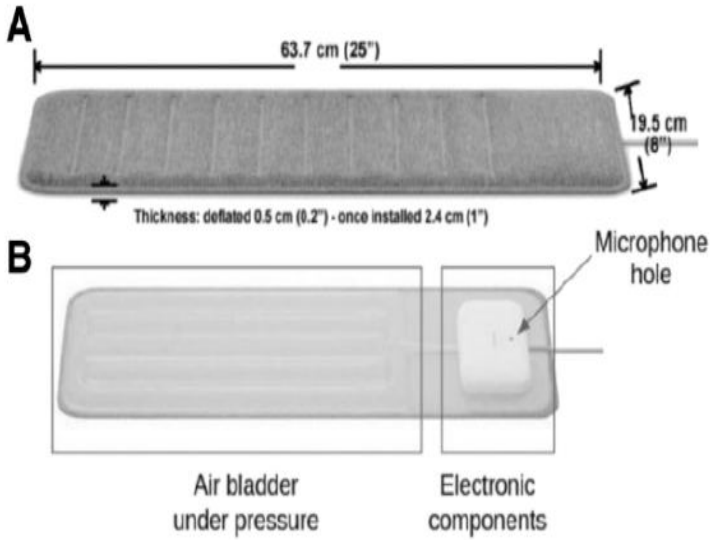
L'algorithme final a été entraîné à partir de 707 417 époques de sommeil de 30 secondes (800 sujets)

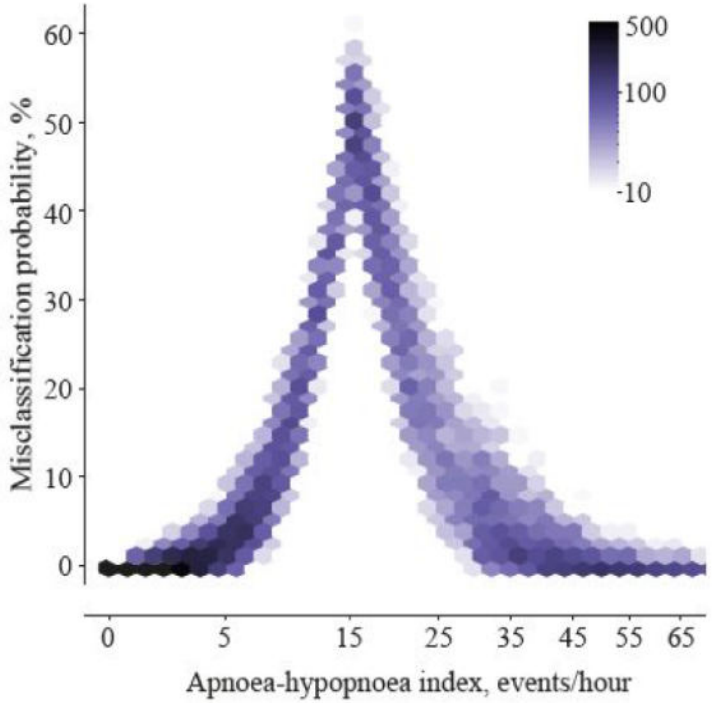
Le-Dong N AJRCCM 2021;204:1227-1231.

L'outil diagnostic ultime doit permettre du multi nuits à domicile à cout réduit ou constant !

Une seule nuit d'enregistrement peut entraîner une classification erronée de la gravité de la maladie étant donné la variabilité importante de l'IAH d'une nuit à l'autre





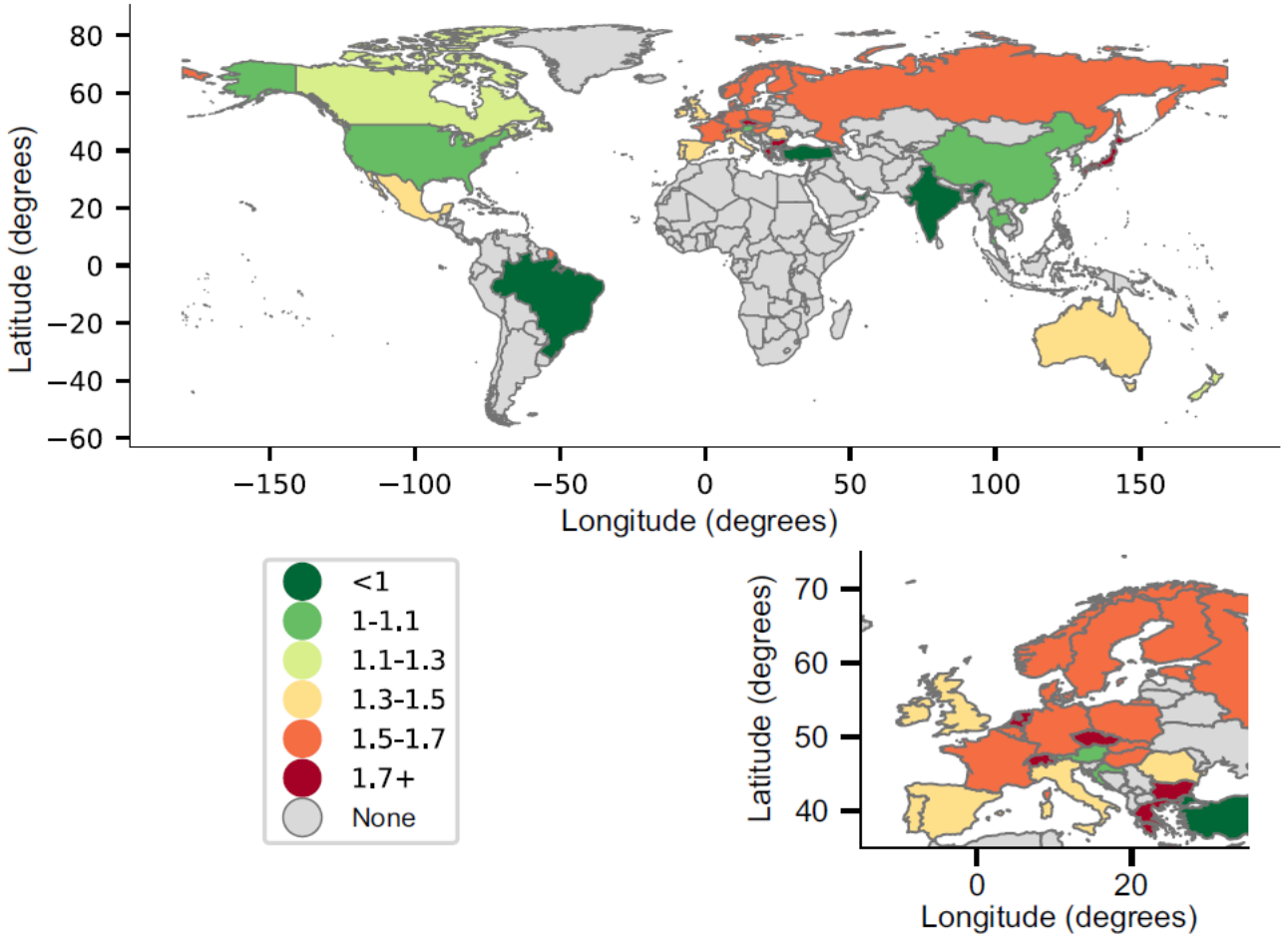


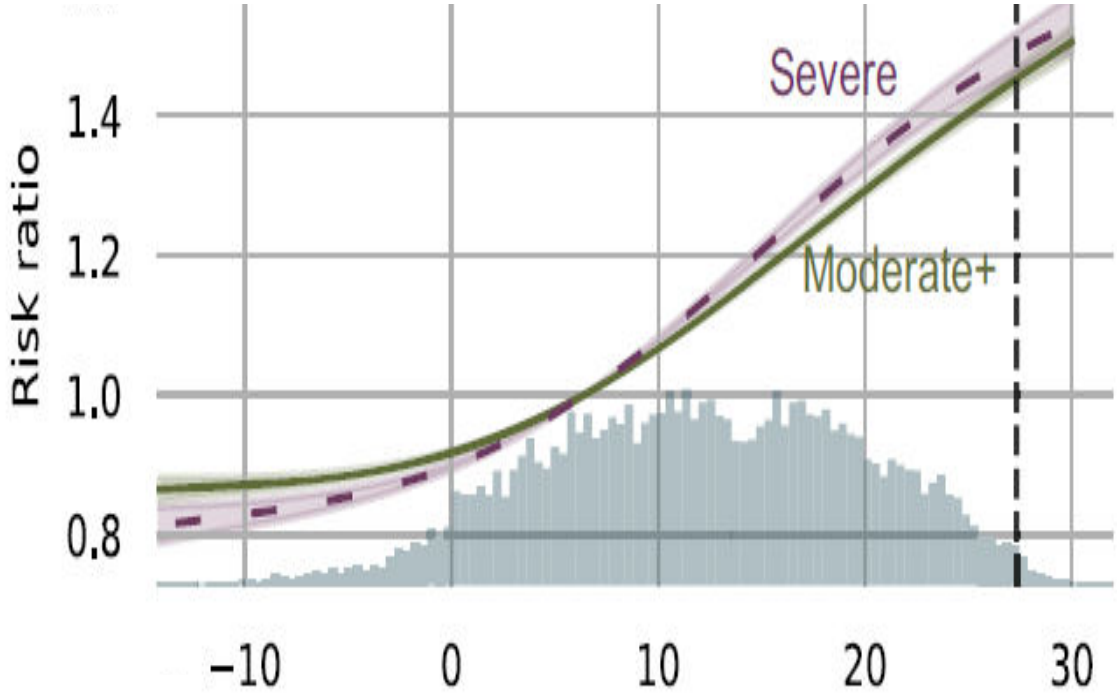
Probabilité d'un mauvais diagnostic chez les personnes atteintes de SAOS sur la base d'une seule nuit varie entre 20% et 50%

Taux d'erreur de diagnostic diminuent avec l'augmentation du nombre de nuits de surveillance et restent stables après 14 nuits

Lechat B AJRCCM 2022;205:563-569

Global warming may increase the burden of obstructive sleep apnea





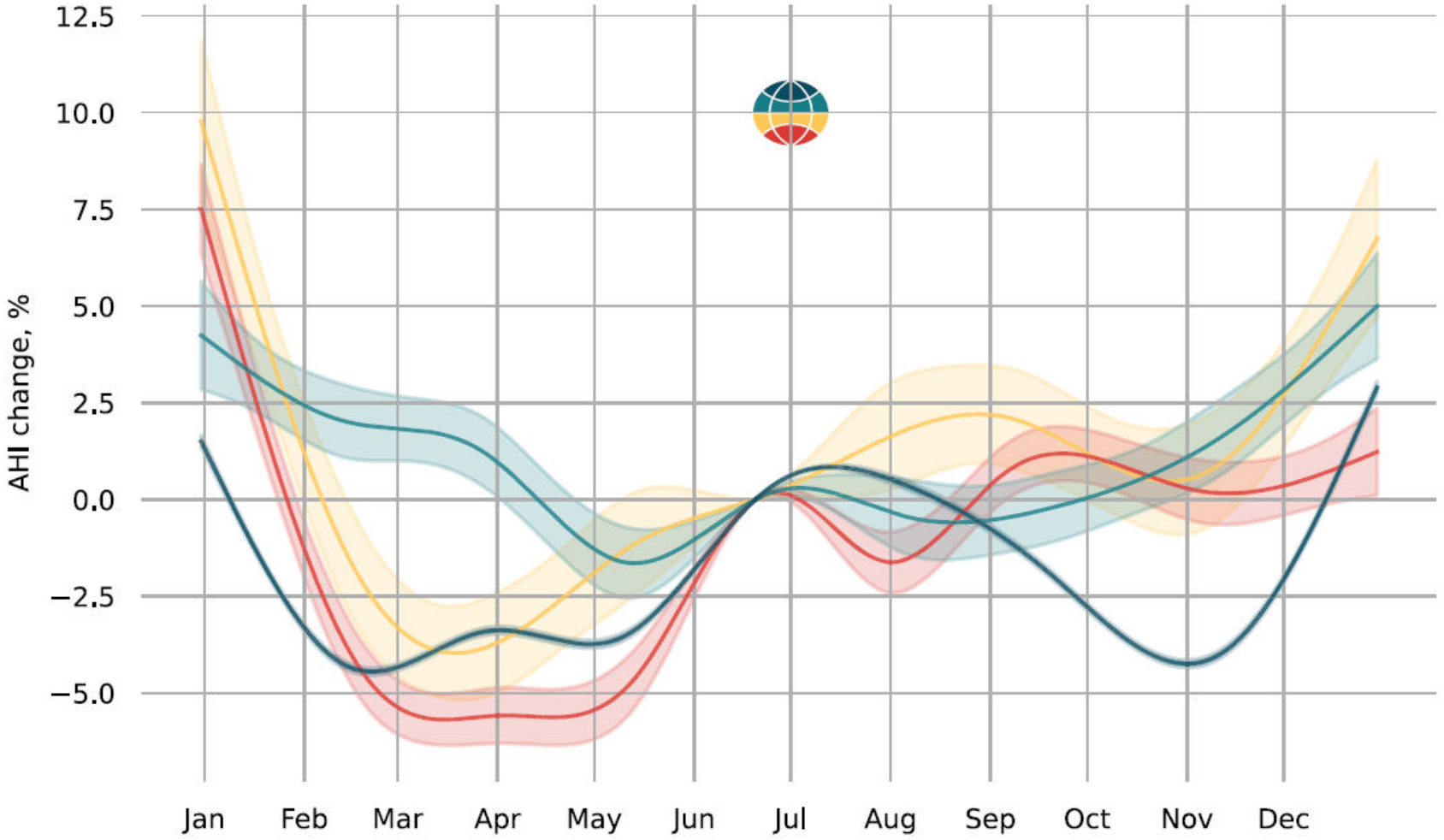
Higher temperatures (99th vs. 25th; 27.3 vs. 6.4 °C) were associated with a 45% higher probability of having OSA on a given night

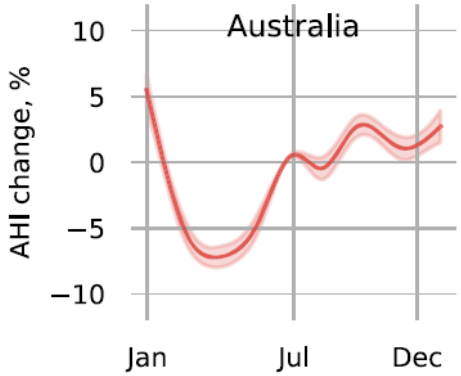
Affect diagnosis performance at individual level

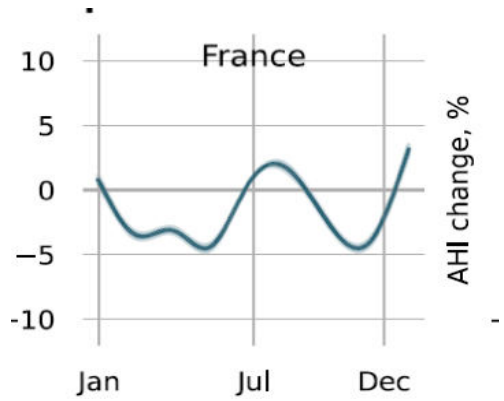
Major societal impact with further 1.2 to 3-fold increase in OSA burden by 2100

Lechat B Nat Commun 2025;16:5100

Obstructive sleep apnea severity varies by season and environmental influences such as ambient temperature







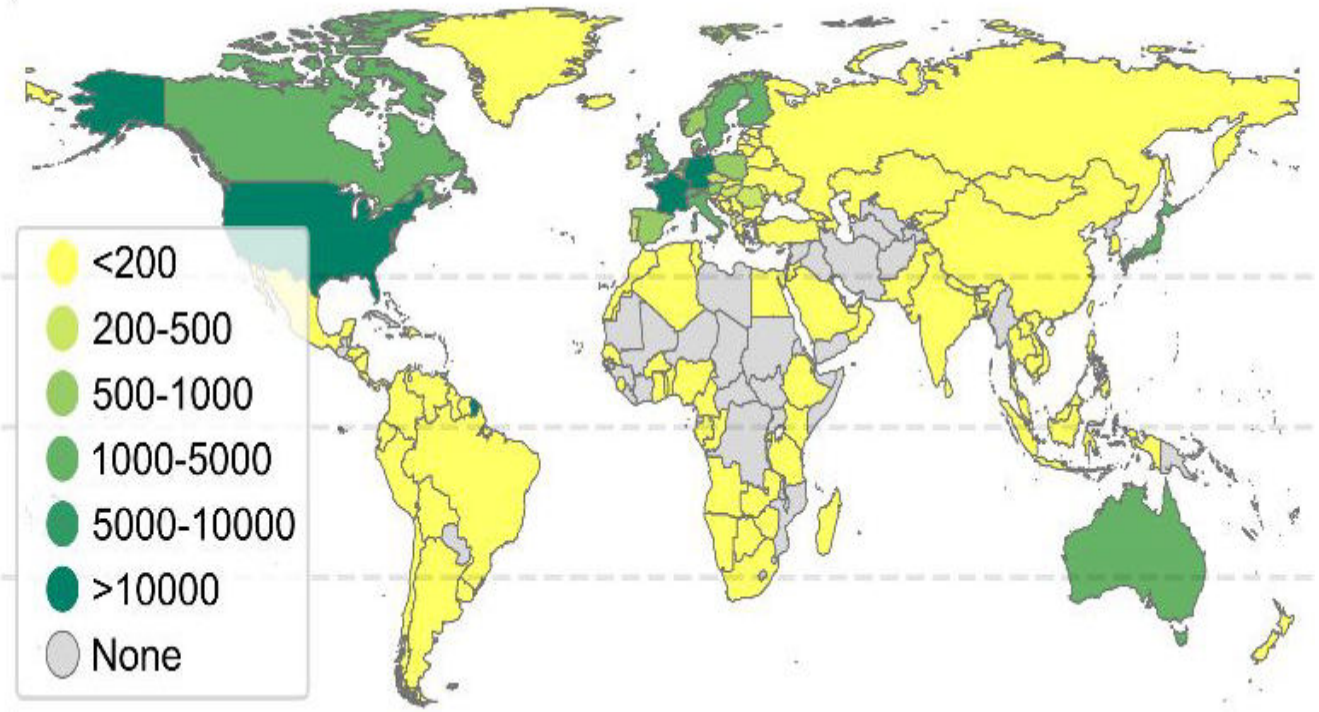
AHI is higher during summer/winter compared to spring/autumn in the northern hemisphere, and higher during summer compared to spring in the southern hemisphere

Partially explained by ambient temperature and seasonal variation in sleep duration

Lechat B Commun Med 2025;5:314

“Social Apnea”: Obstructive Sleep Apnea is Exacerbated on Weekends

Geographical distribution of the study sample: 70,052 participants





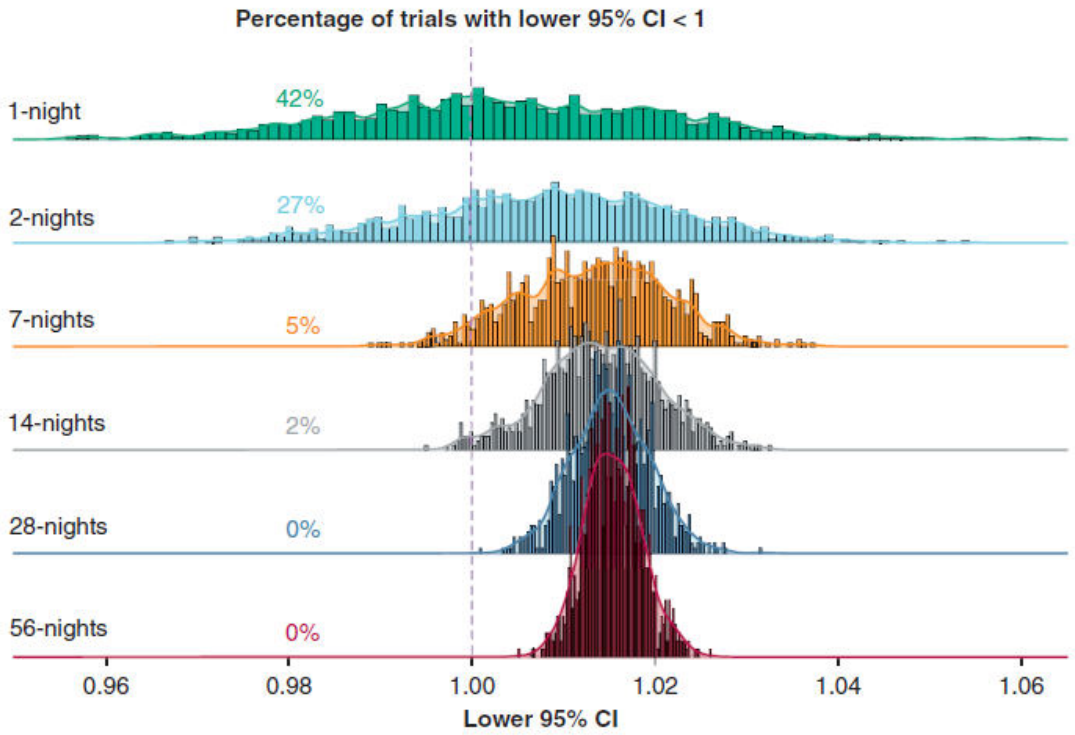
Odds of OSA (AHI ≥15 events/hr) were 18% higher on Saturdays compared to Wednesdays

Social apnea effect is particularly intensified in men and younger individuals, demographic subgroups with higher alcohol consumption and smoking behaviors

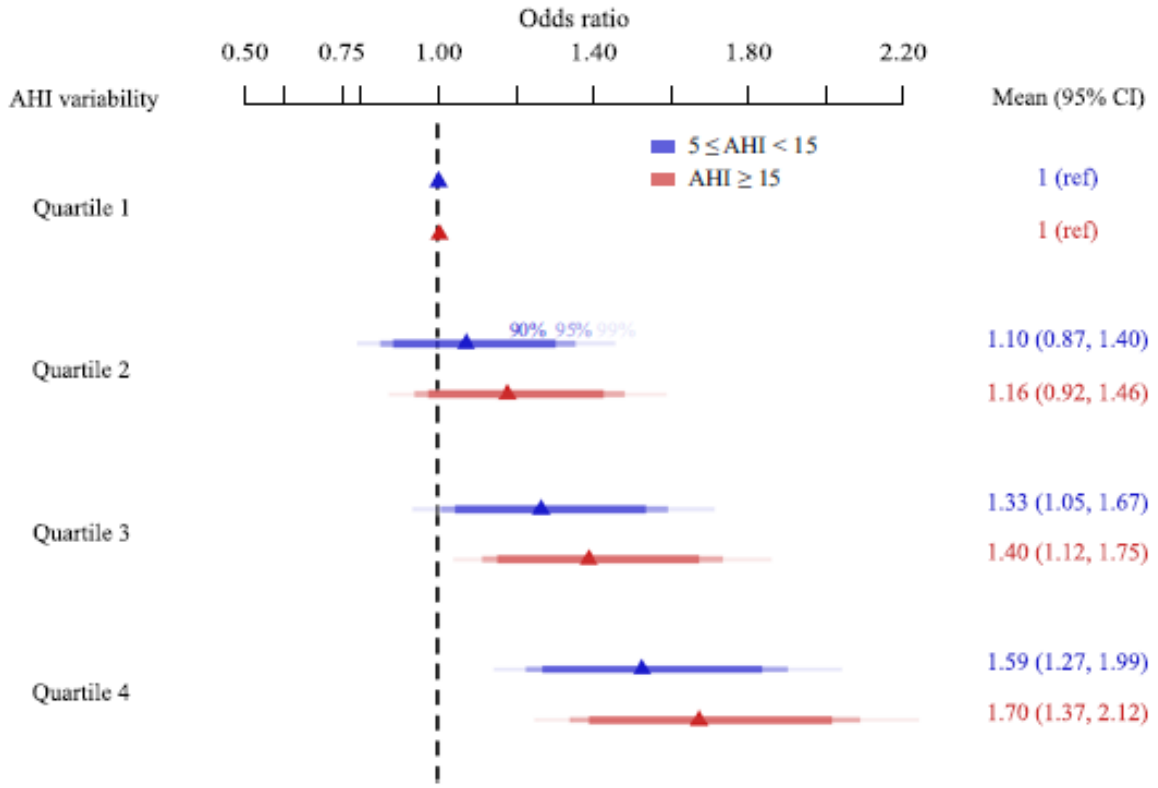
OSA is typically more severe during REM sleep, weekend catch-up sleep and social jetlag were related to higher OSA severity during WE

Pinilla L Am J Respir Crit Care Med 2025, in press

High night-to-night variability in sleep apnea severity is associated with uncontrolled hypertension



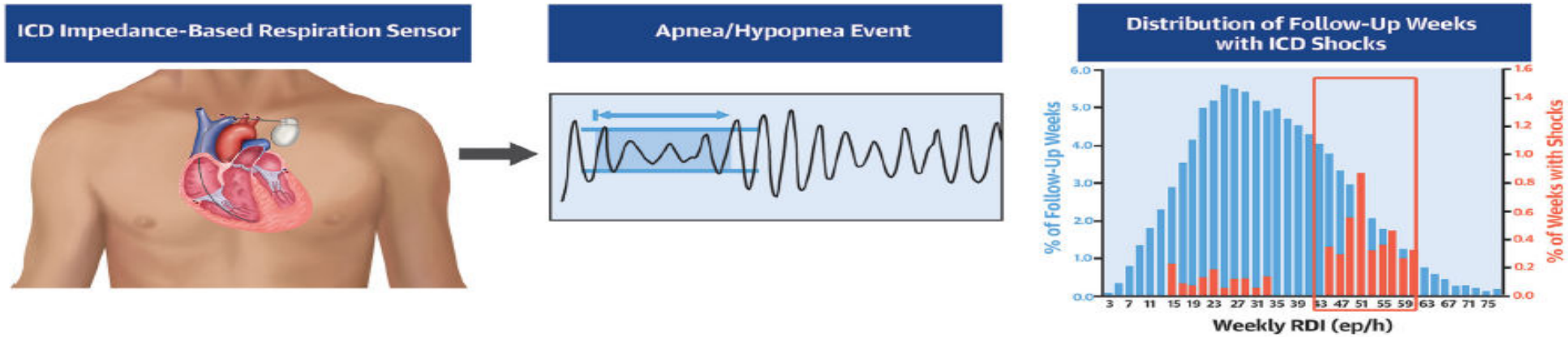
Lechat B Chest 2023; 164:231-240



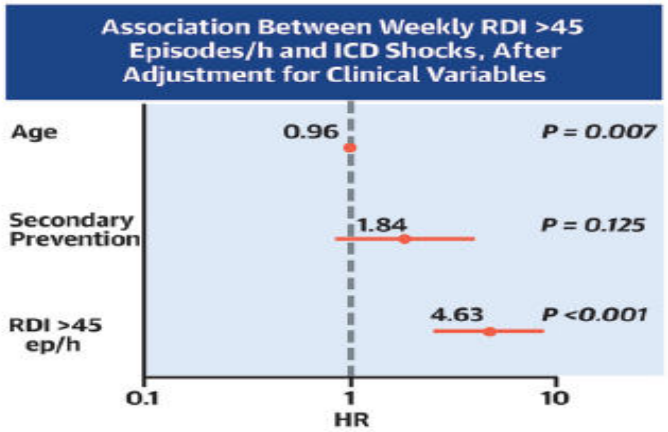
Association between nightly variation in obstructive sleep apnea severity with uncontrolled hypertension

Lechat NPJ Digital Medicine 2023;6:57

Troubles respiratoires du sommeil détectés par un défibrillateur implantable et chocs électriques appropriés



- The ICD-computed Respiratory Disturbance Index (RDI) accurately identifies severe sleep apnea
- The RDI shows considerable variability during follow-up
- The weeks during which the ICD delivers appropriate shocks are most frequently those in which the devices detects higher RDI values
- The continuously measured RDI identifies patients who are four/five-fold more likely to experience an ICD shock, after correction for baseline confounders



The continuous and automatic assessment of sleep apnea with ICDs allows physicians to identify patients with periods of significantly increased risk of ventricular tachyarrhythmias.

Les chocs appropriés ont plus de chances d'être administrés pendant les périodes où les patients présentent le plus d'anomalies respiratoires nocturnes

Mazza A J Am Coll Cardiol Elect 2022;8:1249–1256

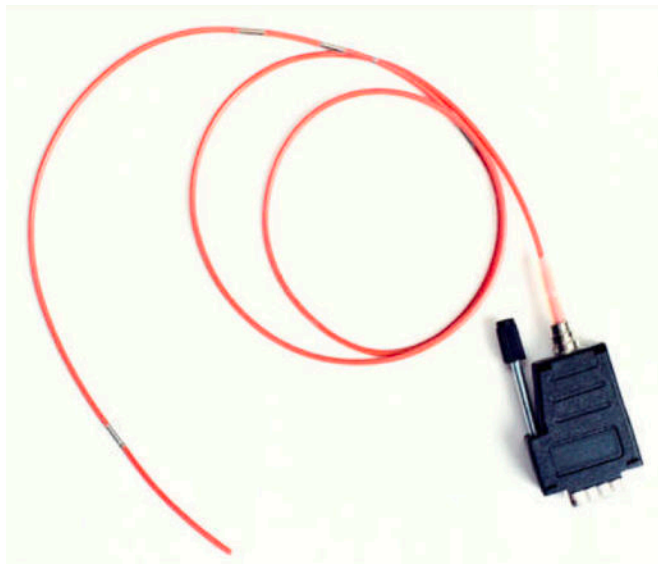
American Journal of Respiratory and Critical Care Medicine, 2026, 212(11), 2713–2714
https://doi.org/10.1093/ajrccm/aamag452
Published: September 4, 2026
Editorial

ATS American Thoracic Society
thoracic.org
OXFORD

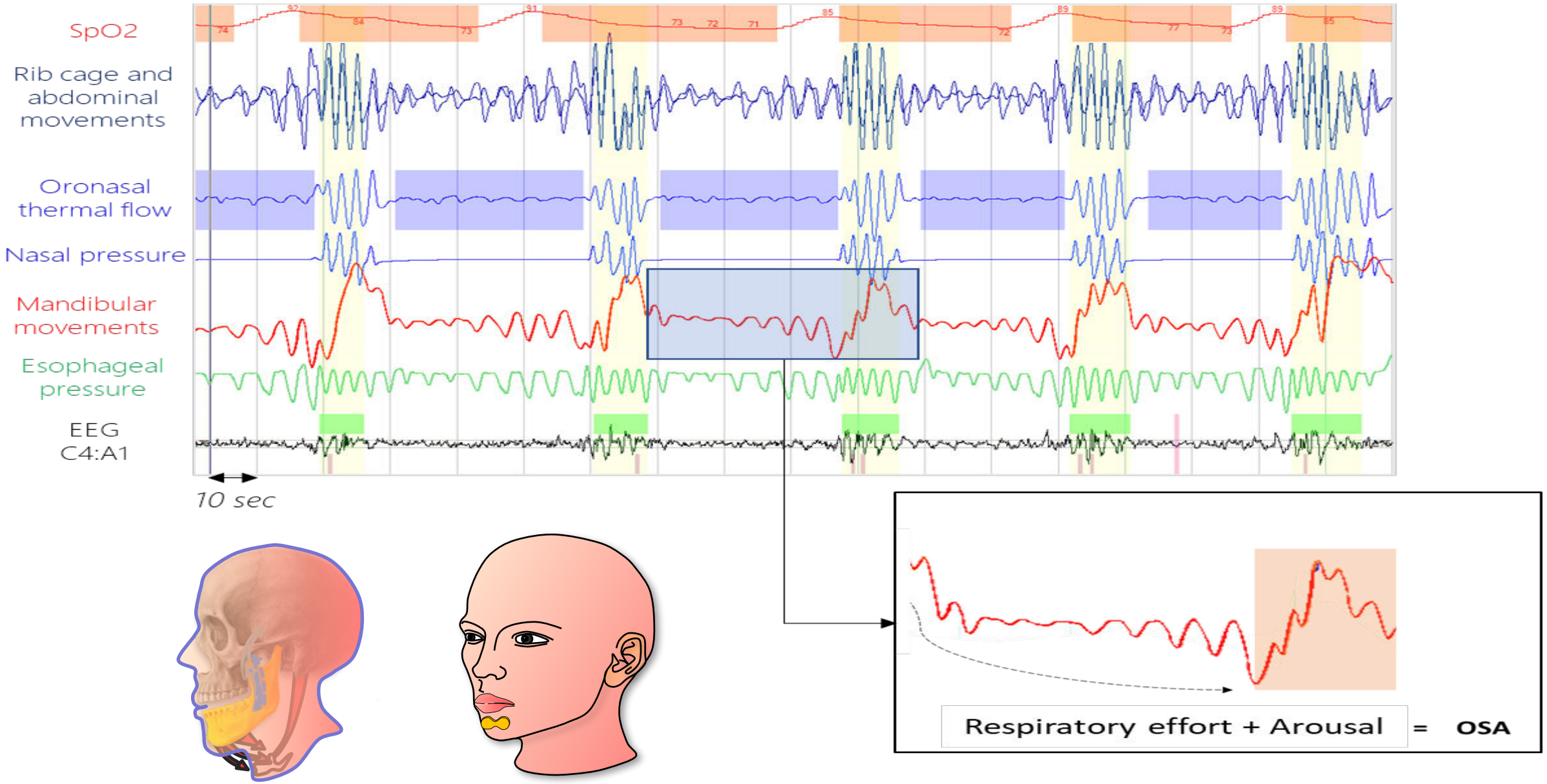
Beyond event frequency: respiratory effort reveals mortality risk in obstructive sleep apnea

Nasim Montazeri[1] **and Ankit Parekh**[2,3,*]

[1]Department of Electrical and Computer Engineering, Queens University, ON, Canada
[2]Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, United States
[3]Department of AI and Human Health, Icahn School of Medicine at Mount Sinai, New York, NY, United States
*Corresponding author: Ankit Parekh, Sleep and Circadian Analysis Group, Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Pl, New York, NY 10029, United States (Ankit.parekh@mssm.edu)

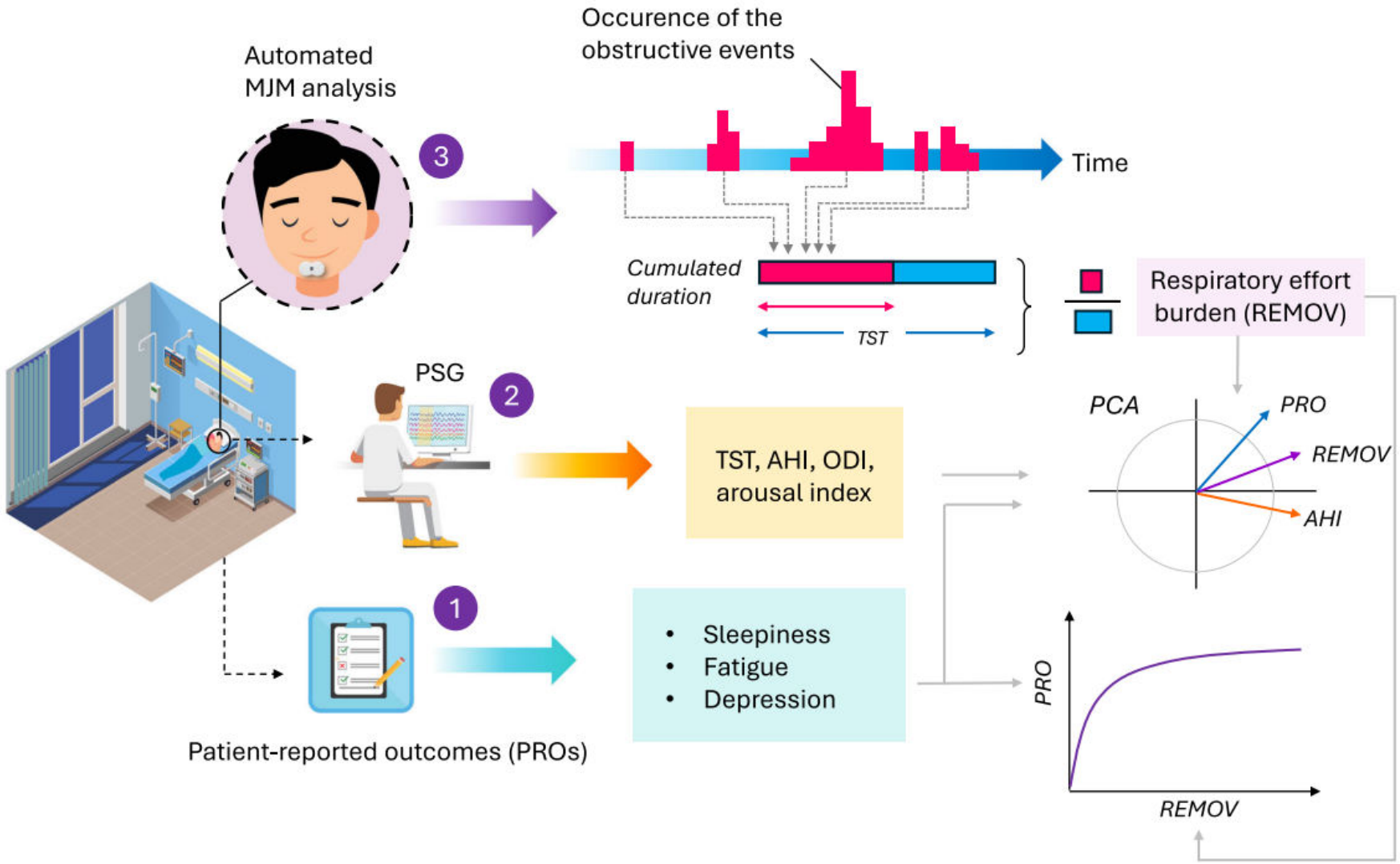





SpO2
Rib cage and abdominal movements
Oronasal thermal flow
Nasal pressure
Mandibular movements
Esophageal pressure
EEG C4:A1
10 sec
Respiratory effort + Arousal = OSA

Respiratory effort burden measured by mandibular jaw movements as a digital marker with clinical insights in obstructive sleep apnea

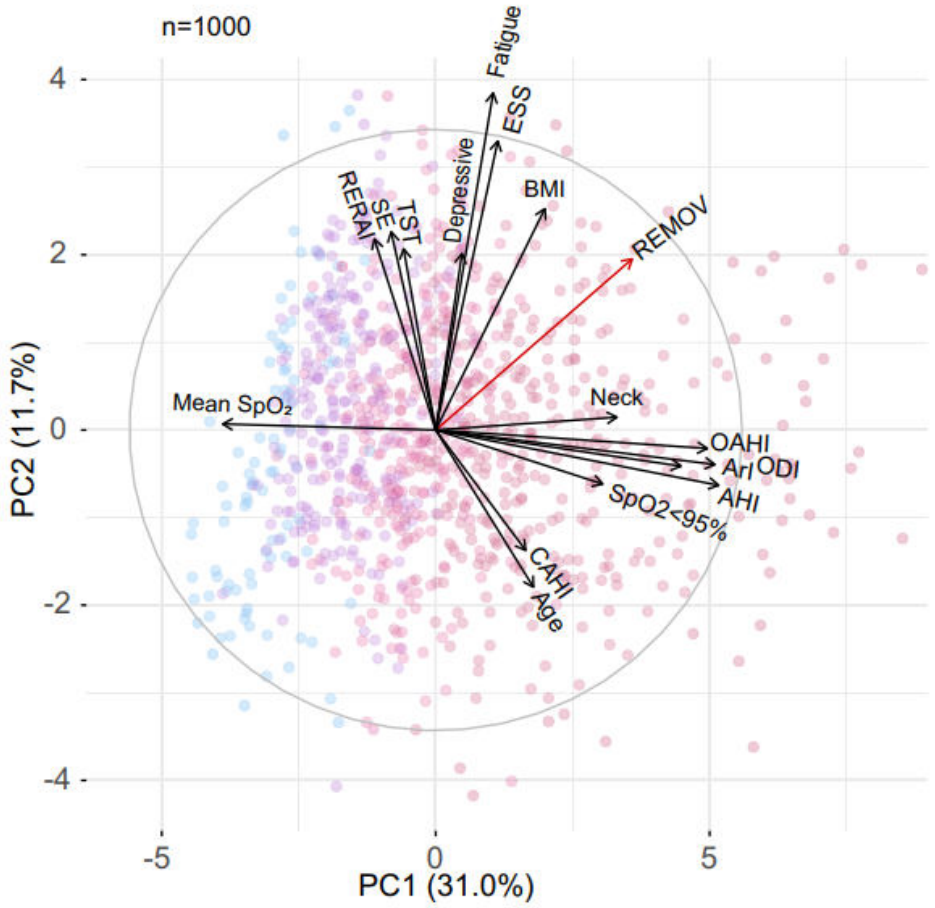
Integrated assessment workflow for OSA severity using PSG, MJM analysis, and patient-reported outcomes

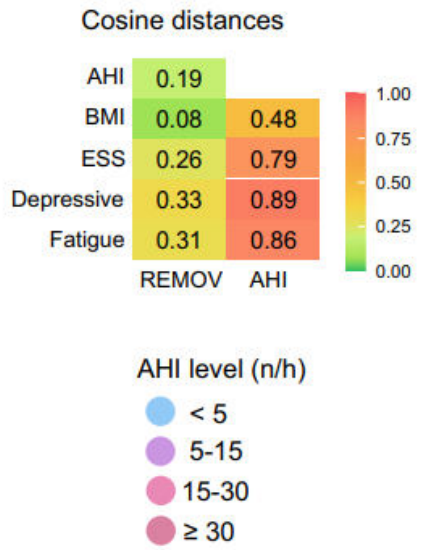


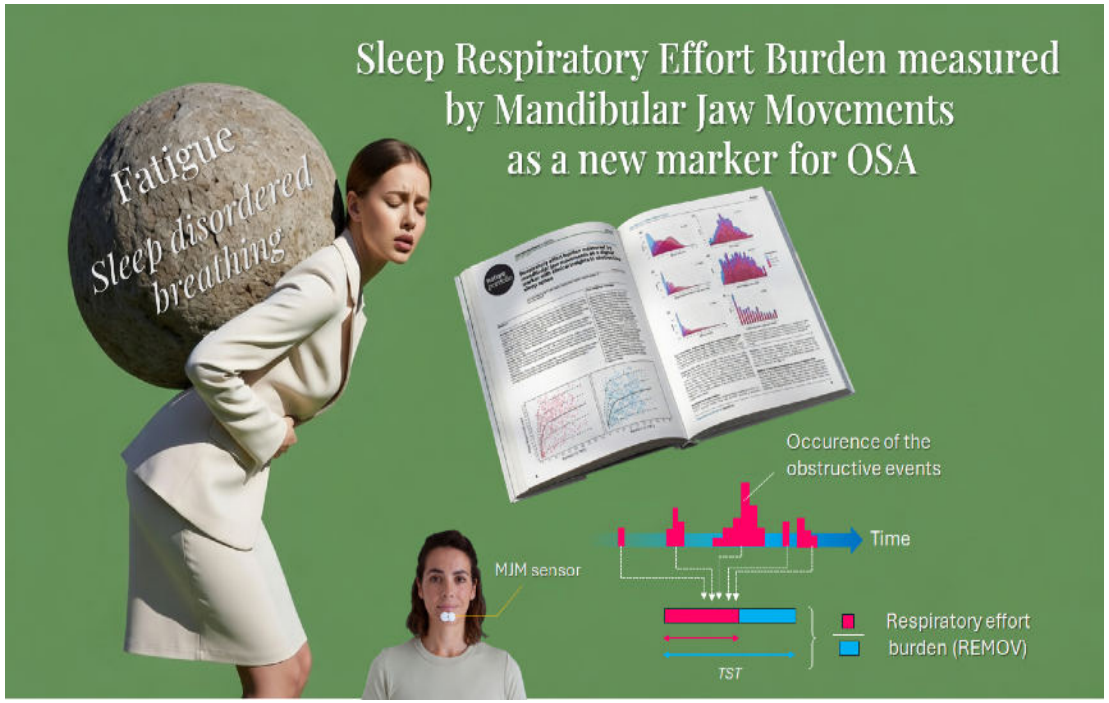
Martinot JB Commun Med 2026;6:112

Respiratory effort burden measured by mandibular jaw movements as a digital marker with clinical insights in obstructive sleep apnea

REMOV mieux associé aux symptômes qu'IAH

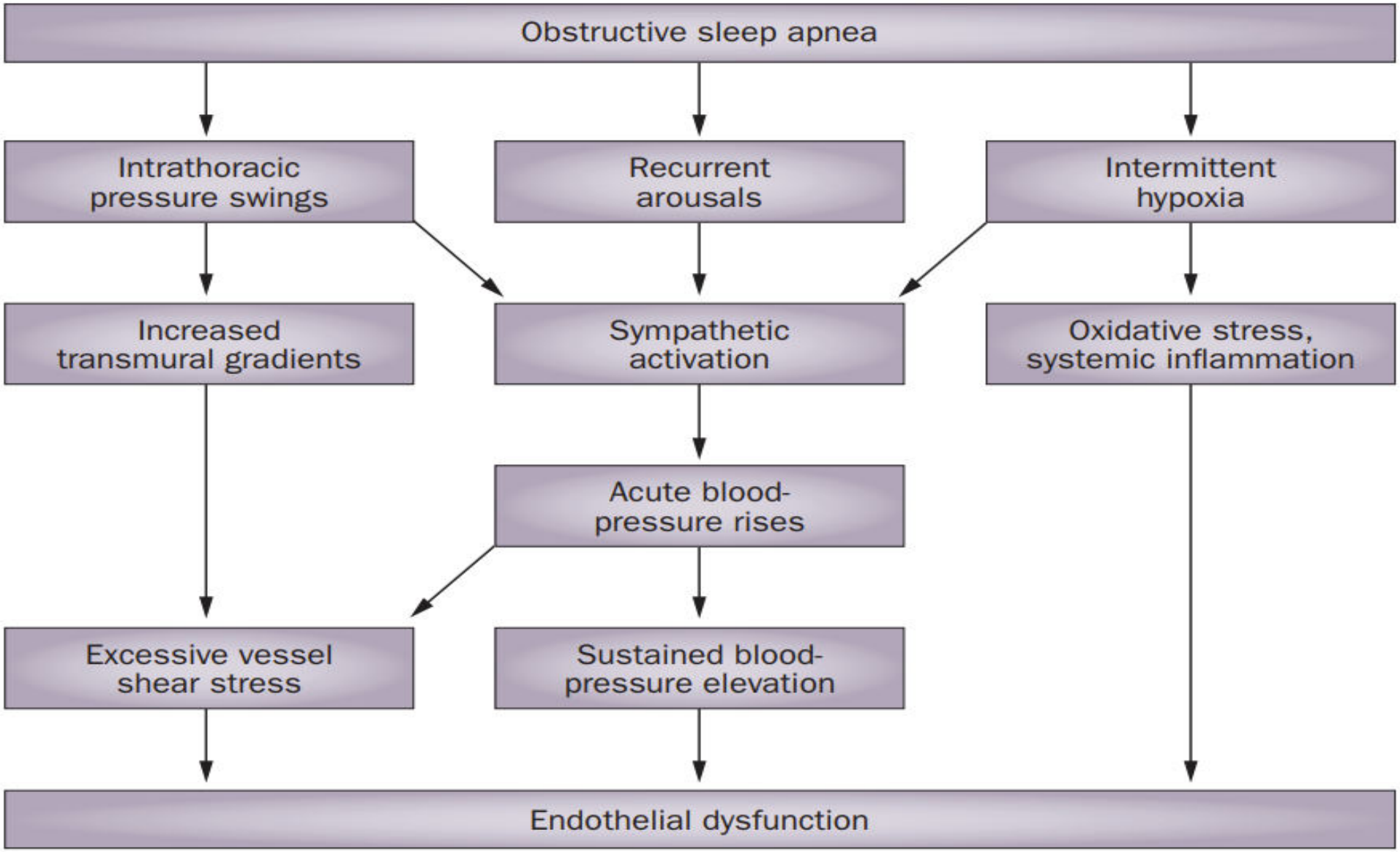






Martinot JB Commun Med 2026;6:112

Mechanisms of vascular damage in obstructive sleep apnea



Kohler, M & Stradling, JR Nat Rev Cardiol 2010;7:677-85

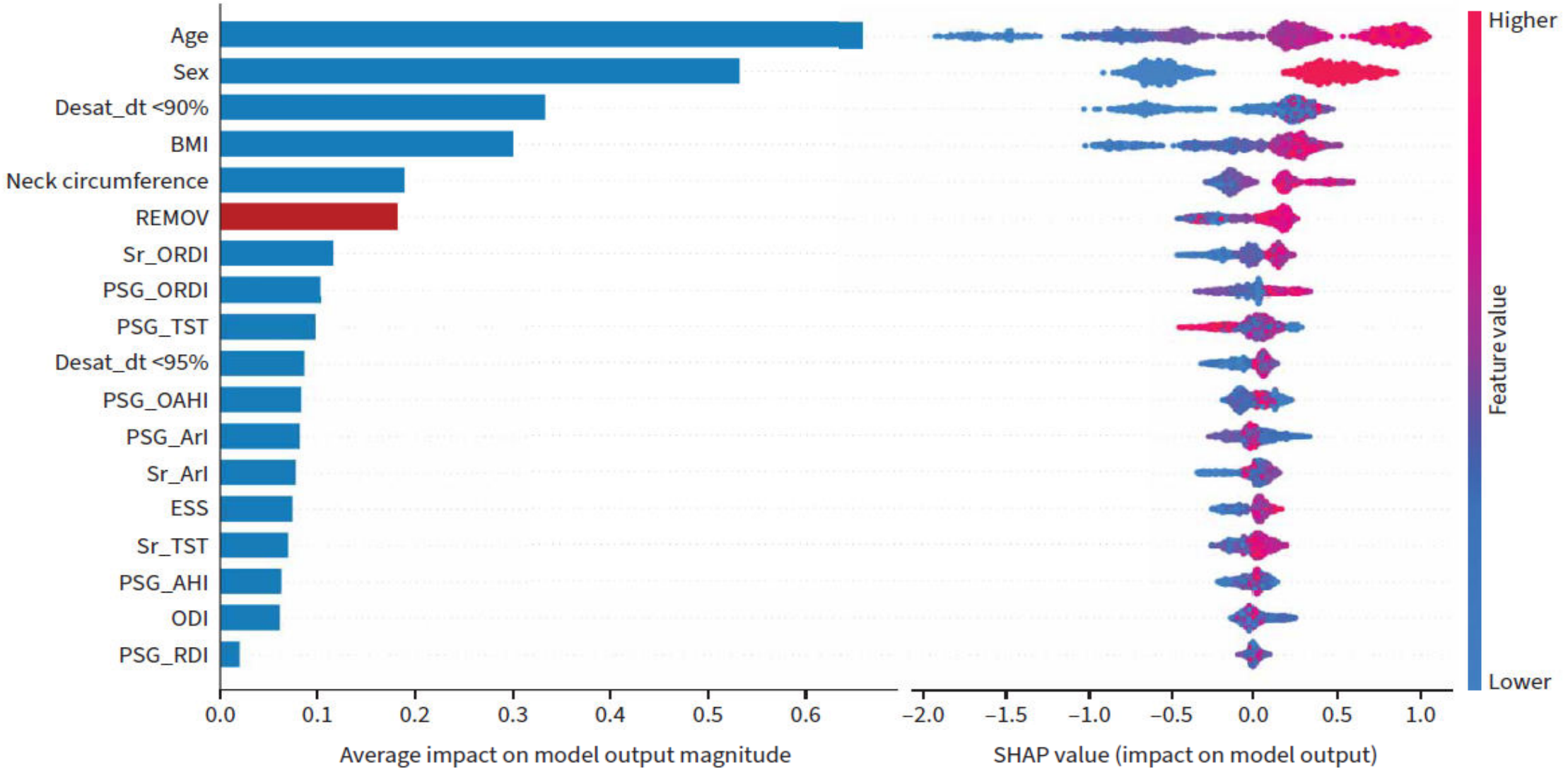
Respiratory effort during sleep and prevalent hypertension in obstructive sleep apnoea

	Training subset (n=901 (80%))		Test subset (n=226 (20%))	
	Hypertension (n=279 (31%))	Without hypertension (n=622 (69%))	Hypertension (n=68 (30%))	Without hypertension (n=158 (70%))
Male	129 (46.2)	265 (42.6)	35 (51.5)	80 (50.6)
Age, years	56.58±15.72	44.17±18.24	55.06±13.03	44.57±17.70
Neck circumference, cm	41.00±5.00	39.00±5.00	40.00±3.00	39.00±5.00
Blood pressure				
Systolic, mmHg	135.7±17.1	128.0±12.4	138.4±22.3	125.4±14.5
Diastolic, mmHg	82.1±13.6	78.2±11.9	80.9±17.2	75.9±11.1
BMI, $kg \cdot m^{-2}$	32.87±10.17	28.52±11.06	31.78±9.52	30.15±10.30
ESS score	11.00±8.00#	11.00±7.00	10.00±7.00#	11.00±6.00
OSA severity				
Non-OSA	19 (6.8)	104 (16.7)	4 (5.9)	27 (17.1)
Mild	49 (17.6)	223 (35.9)	13 (19.1)	57 (36.1)
Moderate	81 (29.0)	149 (24.0)	22 (32.4)	39 (24.7)
Severe	130 (46.6)	146 (23.5)	29 (42.6)	35 (22.2)
PSG indices				
TST, min	420.52±109.76#	437.27±98.12	415.76±76.13	430.75±89.87
ArI, events·h^{-1}	29.57±23.71	22.89±17.45	28.96±22.40	22.96±16.98
AHI, events·h^{-1}	27.32±29.12	14.00±22.31	26.52±27.90	14.04±19.64
OAHI, events·h^{-1}	19.44±27.99	9.87±19.23	19.18±26.45	9.26±16.71
RDI, events·h^{-1}	34.33±31.29	20.84±24.70	32.76±27.54	21.28±21.18
ORDI, events·h^{-1}	26.73±27.00	15.84±21.42	27.95±25.84	16.26±18.58
ODI, events·h^{-1}	24.86±35.26	10.73±23.01	23.87±32.97	9.54±20.94
Desat_dt <90%, %TST	3.43±12.90	0.28±3.06	4.35±9.73	0.36±3.79
Desat_dt <95%, %TST	19.45±22.40	7.63±16.03	17.88±21.80	7.38±15.35
Sunrise indices				
TST, min	439.00±81.25#	439.74±75.73	450.75±65.25	439.25±68.00
ORDI, events·h^{-1}	20.66±15.20	13.50±14.34	22.52±16.80	13.62±13.01
ArI, events·h^{-1}	21.97±16.16	17.79±13.55	23.35±21.42	17.24±13.69
REMOV, %TST	75.96±26.96	56.05±47.95	77.34±26.40	55.41±43.83
Antihypertensive medication				
β-blocker	127 (45.5)		54 (79.4)	
ACE inhibitor	79 (28.3)		38 (55.9)	
ARB	71 (25.4)		27 (39.7)	
CCB	87 (31.2)		14 (20.6)	
Diuretic	63 (22.6)		19 (27.9)	
Other	12 (4.3)		1 (1.5)	
Antihypertensives				
0		622 (100.0)		158 (100.0)
1	176 (63.1)		13 (19.1)	
2	52 (18.6)		31 (45.6)	
3	46 (16.5)		18 (26.5)	
4	4 (1.4)		6 (8.8)	
5	1 (0.4)			

Martinot JB Eur Respir J 2023;:61:2201486

Respiratory effort during sleep and prevalent hypertension in obstructive sleep apnoea

Contribution of the 18 input features to the classification output, evaluated by the Shapley additive explanation (SHAP) method.



Martinot JB Eur Respir J 2023;:61:2201486

Respiratory effort during sleep predicts mortality in patients with suspected obstructive sleep apnea

At a Glance Commentary

Scientific Knowledge on the Subject: Exaggerated negative intrathoracic pressure during obstructive events is a core mechanism of harm in obstructive sleep apnea (OSA). Even though esophageal pressure (PES) is the gold standard for estimating intrathoracic pressure and respiratory effort, it is invasive and rarely measured. Prior mortality studies therefore have characterized OSA almost entirely through the apnea-hypopnea index (AHI) and hypoxemia, and the long-term mortality impact of directly measured respiratory effort during sleep has been unknown.

What This Study Adds to the Field: In 16083 patients with suspected OSA followed for a median of 15 years, greater respiratory effort (measured by median PES through the night) independently predicted all-cause mortality after adjustment for age, sex, BMI, comorbidities, AHI, and mean nocturnal oxygen saturation. Both the depth and the duration of effort contributed in a dose-dependent manner, and the prognostic value was most evident in nonsevere OSA. Respiratory effort conveys prognostic information beyond AHI and hypoxemia, supporting a more comprehensive assessment of OSA severity.

Nahoui A AJRCCM 2026;212: 2803–2811

Respiratory effort during sleep predicts mortality in patients with suspected obstructive sleep apnea

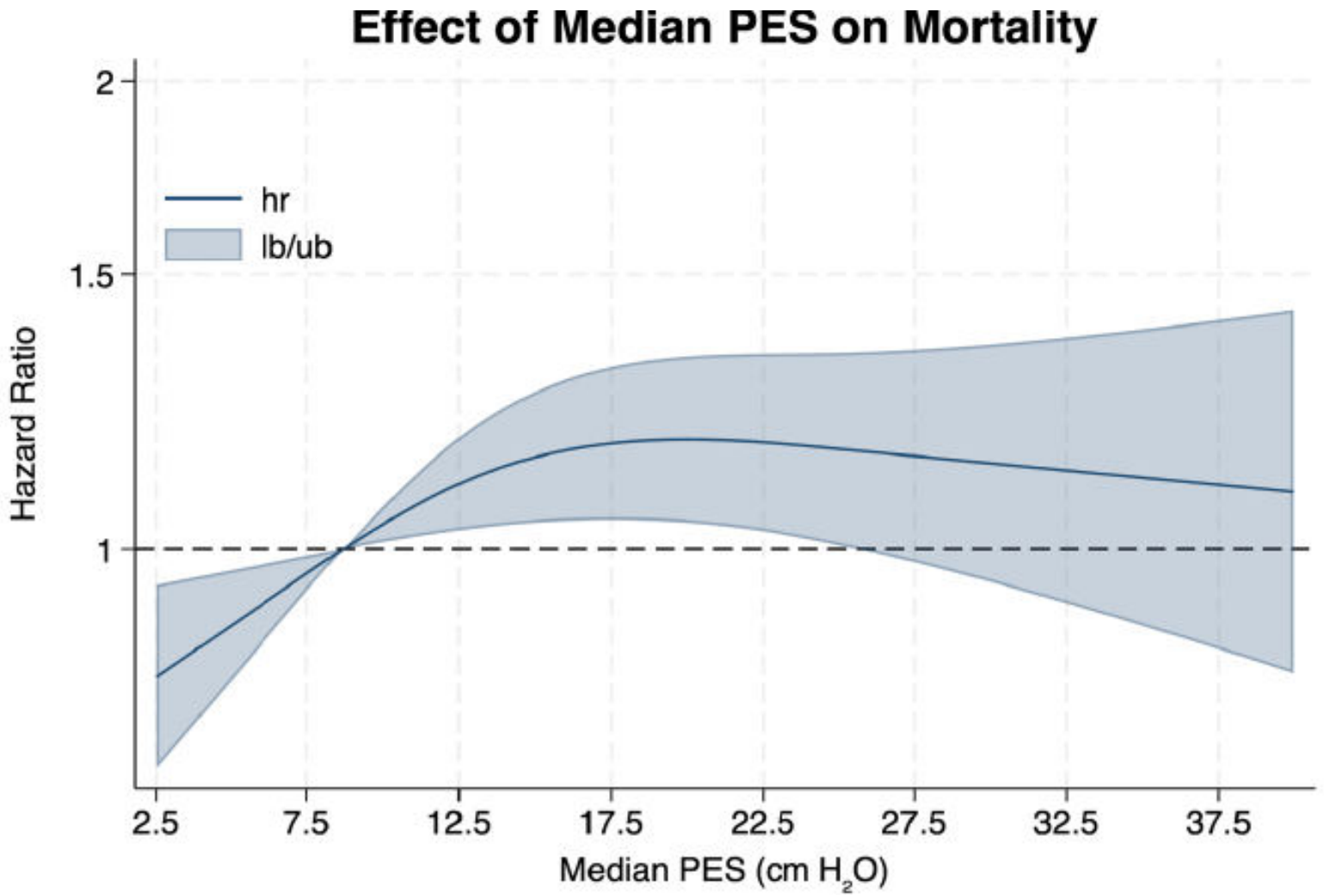
Baseline characteristics of the study cohort across quartiles of median intrathoracic pressure (PES) during sleep

	Q1 median PES (2.5-8.7 cmH_2O)	Q2 median PES (8.7-12.8 cmH_2O)	Q3 median PES (12.8-18.4 cmH_2O)	Q4 median PES (18.4-77.7 cmH_2O)	Total (n = 16083)	P value
Age, median (IQR)	45 (36-55)	48 (40-57)	50 (42-59)	50 (42-58)	48 (40-57)	<.001
BMI, median (IQR)	25.8 (23.9-28.1)	27.7 (25.5-30.1)	29.4 (27-32.4)	32.2 (29.1-36.1)	28.6 (25.7-32)	<.001
AHI, median (IQR)	4.8 (2.4-9.5)	7.5 (3.8-14.2)	11.5 (6-21)	25.2 (12.5-45.5)	10 (4.5-21.3)	<.001
Mean SpO_2, median (IQR)	95.1 (94.2-95.9)	94.6 (93.6-95.4)	94.1 (93-95)	93.3 (91.9-94.4)	94.3 (93.1-95.3)	<.001
Female, *n* (%)	970 (24.1)	1017 (25.3)	1082 (26.9)	1158 (28.8)	4227 (26.3)	<.001
Heart failure, *n* (%)	74 (1.8)	101 (2.5)	143 (3.6)	187 (4.7)	505 (3.1)	<.001
Atrial fibrillation, *n* (%)	46 (1.1)	52 (1.3)	59 (1.5)	55 (1.4)	212 (1.3)	.632
Myocardial infarction, *n* (%)	33 (0.8)	44 (1.1)	61 (1.5)	80 (2.0)	218 (1.4)	<.001
Ischemic heart disease, *n* (%)	90 (2.2)	118 (2.9)	166 (4.1)	181 (4.5)	555 (3.5)	<.001
Stroke, *n* (%)	49 (1.2)	50 (1.2)	66 (1.6)	55 (1.4)	220 (1.4)	.340
COPD, *n* (%)	26 (0.6)	35 (0.9)	36 (0.9)	50 (1.2)	147 (0.9)	.044
Chronic kidney disease, *n* (%)	16 (0.4)	12 (0.3)	33 (0.8)	31 (0.8)	92 (0.6)	.002
Hypertension, *n* (%)	136 (3.4)	175 (4.4)	272 (6.8)	324 (8.1)	907 (5.6)	<.001
Diabetes, *n* (%)	56 (1.4)	66 (1.6)	128 (3.2)	160 (4.0)	410 (2.5)	<.001
Anemia, *n* (%)	21 (0.5)	23 (0.6)	18 (0.4)	28 (0.7)	90 (0.6)	.499
Cancer, *n* (%)	50 (1.2)	52 (1.3)	60 (1.5)	63 (1.6)	225 (1.4)	.550
Dementia, *n* (%)	3 (0.1)	1 (0.0)	1 (0.0)	1 (0.0)	6 (0.0)	.572

Nahoui A AJRCCM 2026;212: 2803–2811

Respiratory effort during sleep predicts mortality in patients with suspected obstructive sleep apnea

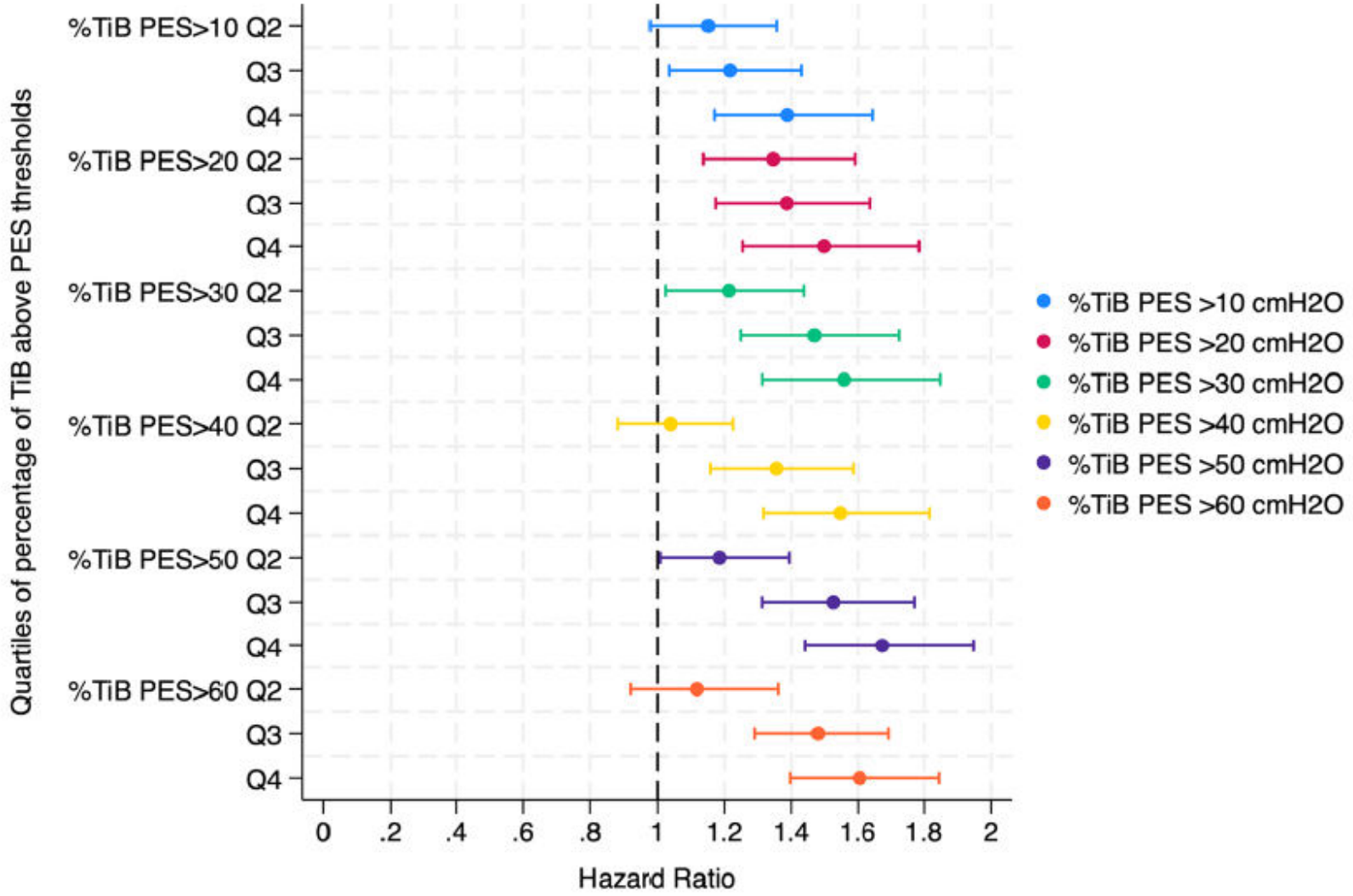
Association between median negative esophageal pressure (PES) and all-cause mortality using restricted cubic spline modeling



Nahoui A AJRCCM 2026;212: 2803–2811

Respiratory effort during sleep predicts mortality in patients with suspected obstructive sleep apnea

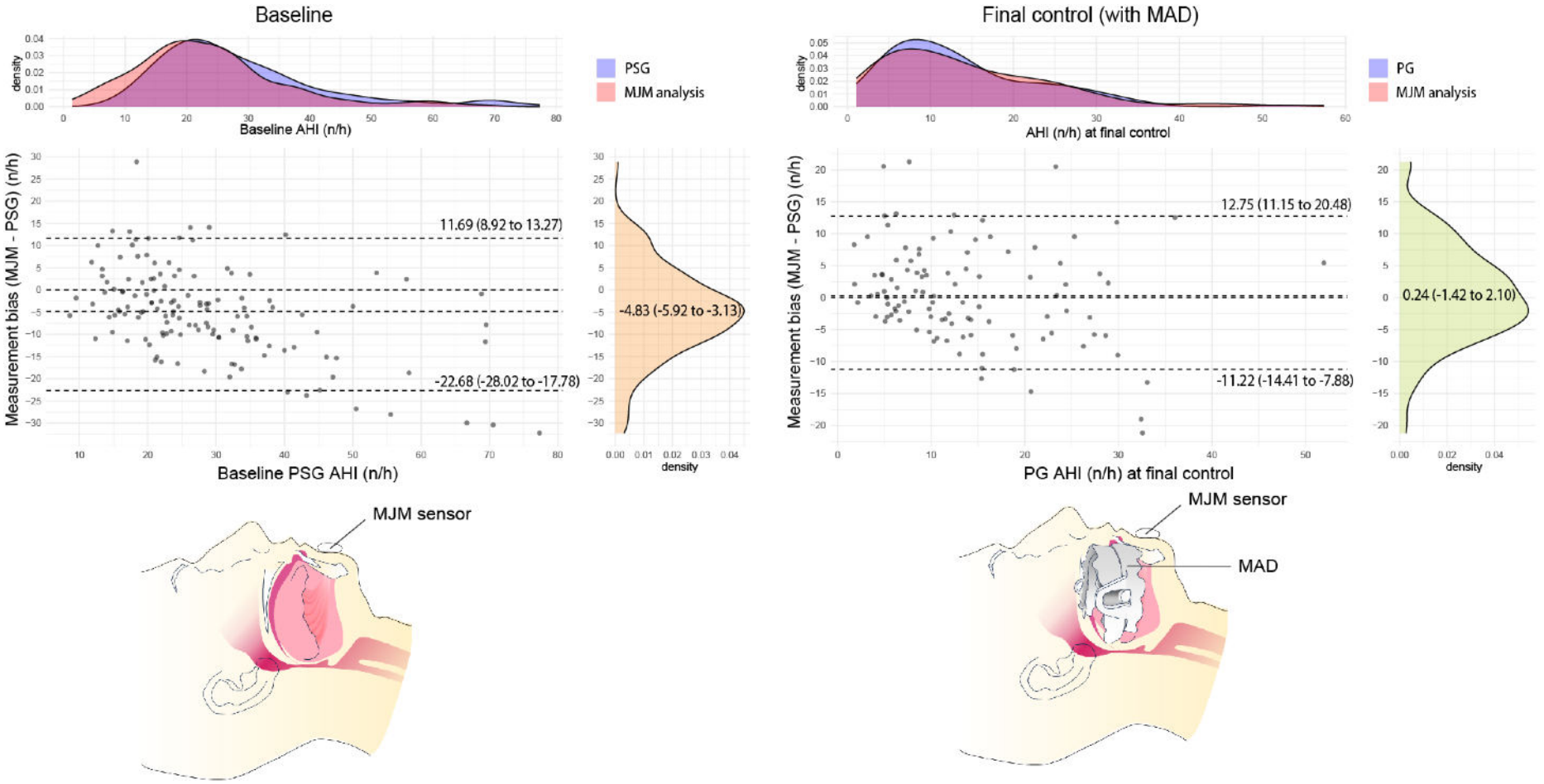
Association between quartiles of percentage of time in bed (%TiB) with negative intrathoracic pressure (PES) and all-cause mortality



Nahoui A AJRCCM 2026;212: 2803–2811

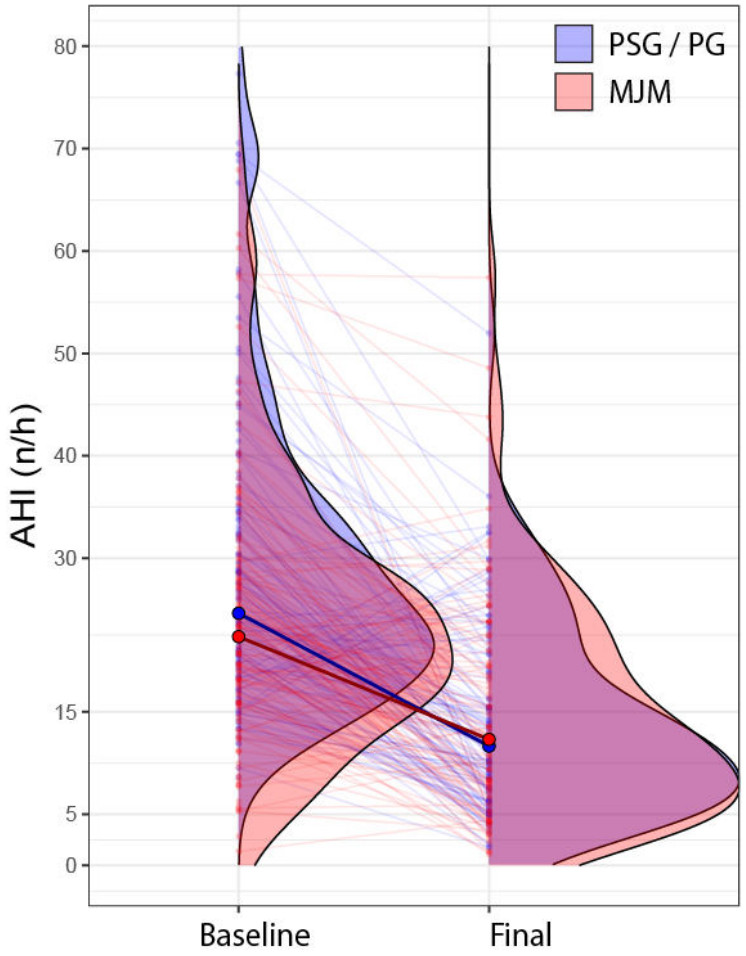
L'outil diagnostic ultime doit être utilisable et validé sur tout le parcours de soin et dans des populations ou le diagnostic est difficile (Pédiatrie) !

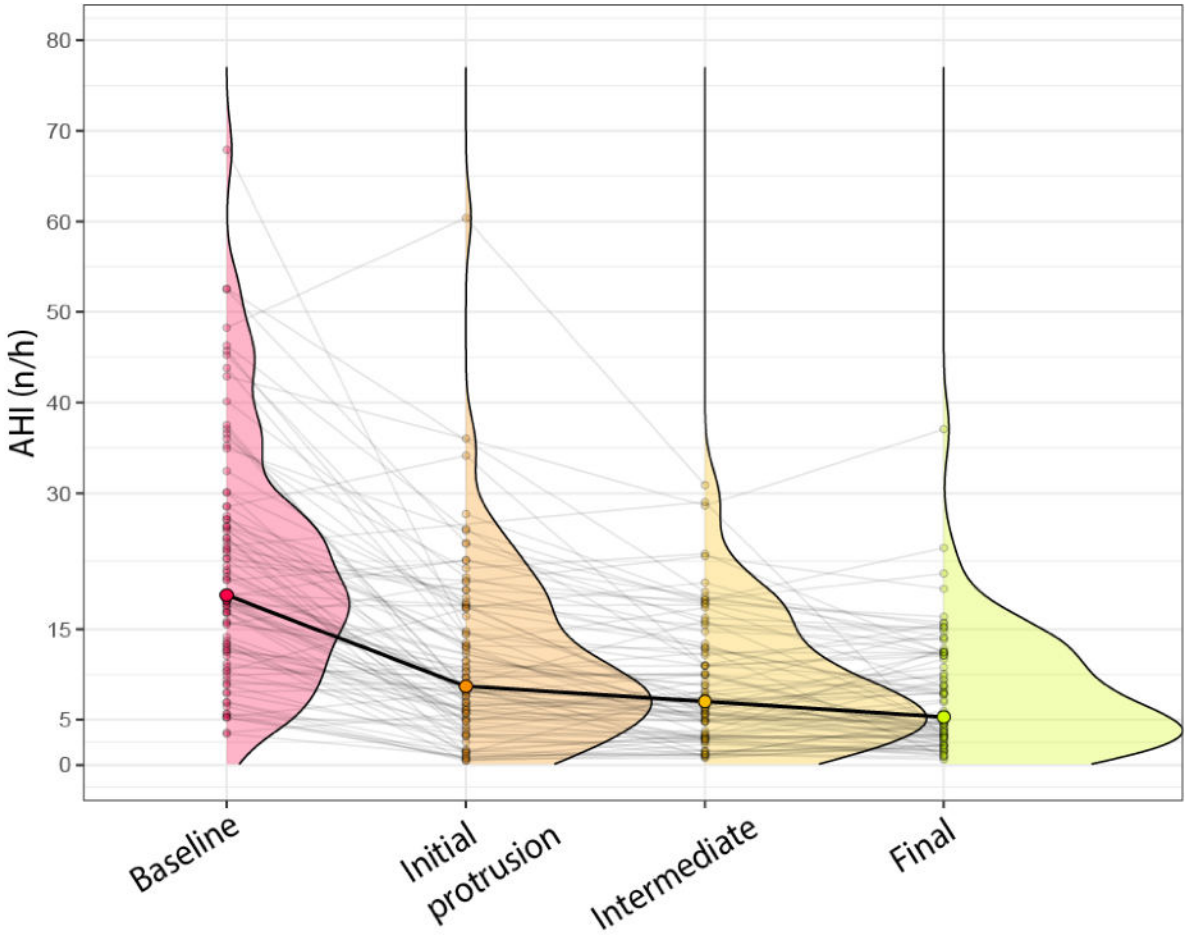
Contrôle d'efficacité sous orthèses, 150 000 nuits/an sous PPC !



Pépin, JL Ann Am Thorac Soc 2024;21:814-822

Mandibular jaw movement automated analysis for oral appliance monitoring in obstructive sleep apnea

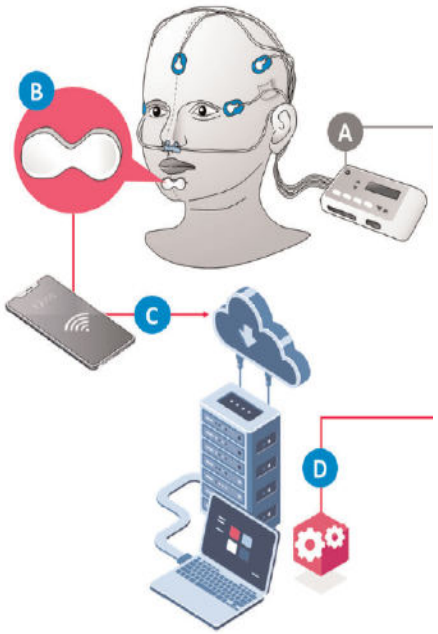


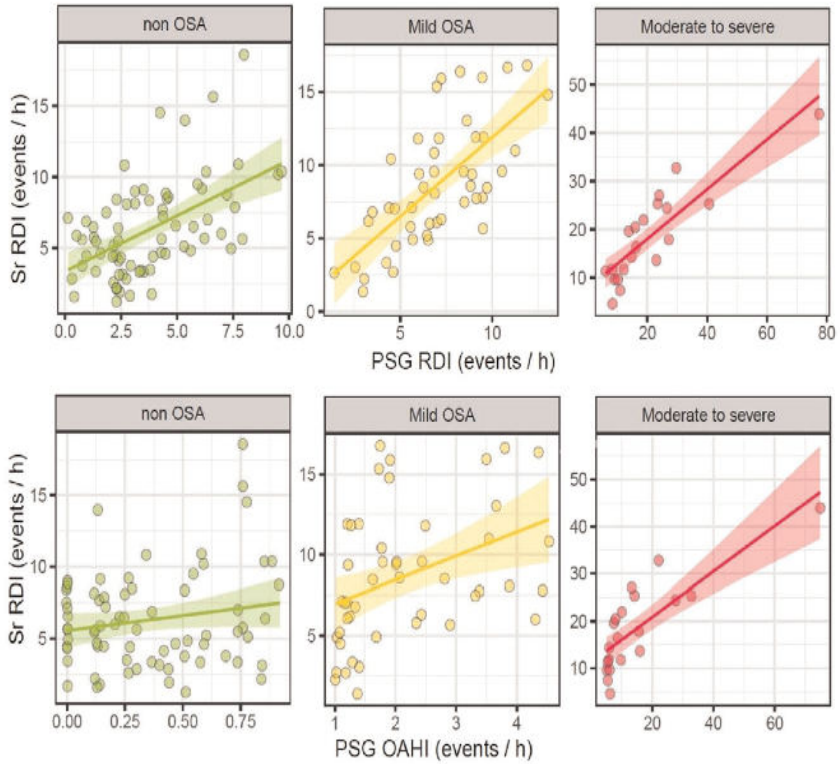


Pépin, JL Ann Am Thorac Soc 2024;21:814-822

Clinical validation of a mandibular movement signal-based system for the diagnosis of pediatric sleep apnea

Demographic Characteristics of the Pediatric Cohort n = 140 Sex ratio F/M: 77/63	Median	5th centile	95th centile	IQR
Age, years	6.90	3.159	15.841	5.6
Height, cm	121.5	94.9	171.0	36.75
Weight, kg	22.50	13.0	77.4	20
BMI, kg/m²	16.46	13.89	29.02	3.57
BMI Z_score	0.235	−1.883	2.921	1.84
Neck circumference, cm	17.00	13.29	32.33	5.57
Sleep parameters, PSG				
Total sleep time, h	7.60	4.63	9.00	1.59
OAHI, events/h	0.85	0.01	13.32	2.16
RDI, events/h	5.62	0.94	22.95	5.54
Arousal index, events/h	11.07	5.73	23.65	5.31
Symptoms, complaints and Friedman classification				
Presence of loud snoring	76 (54%)			
Reported breathing effort	56 (40%)			
Witnessed apneas	54 (39%)			
Observed mouth breathing	44 (31%)			
Night sweating	30 (21%)			
Nonrestorative sleep	48 (34%)			
Daytime sleepiness	47 (34%)			
Easily distracted	44 (31%)			
Restlessness	46 (33%)			
Friedman classification	2.28 (0.91)			

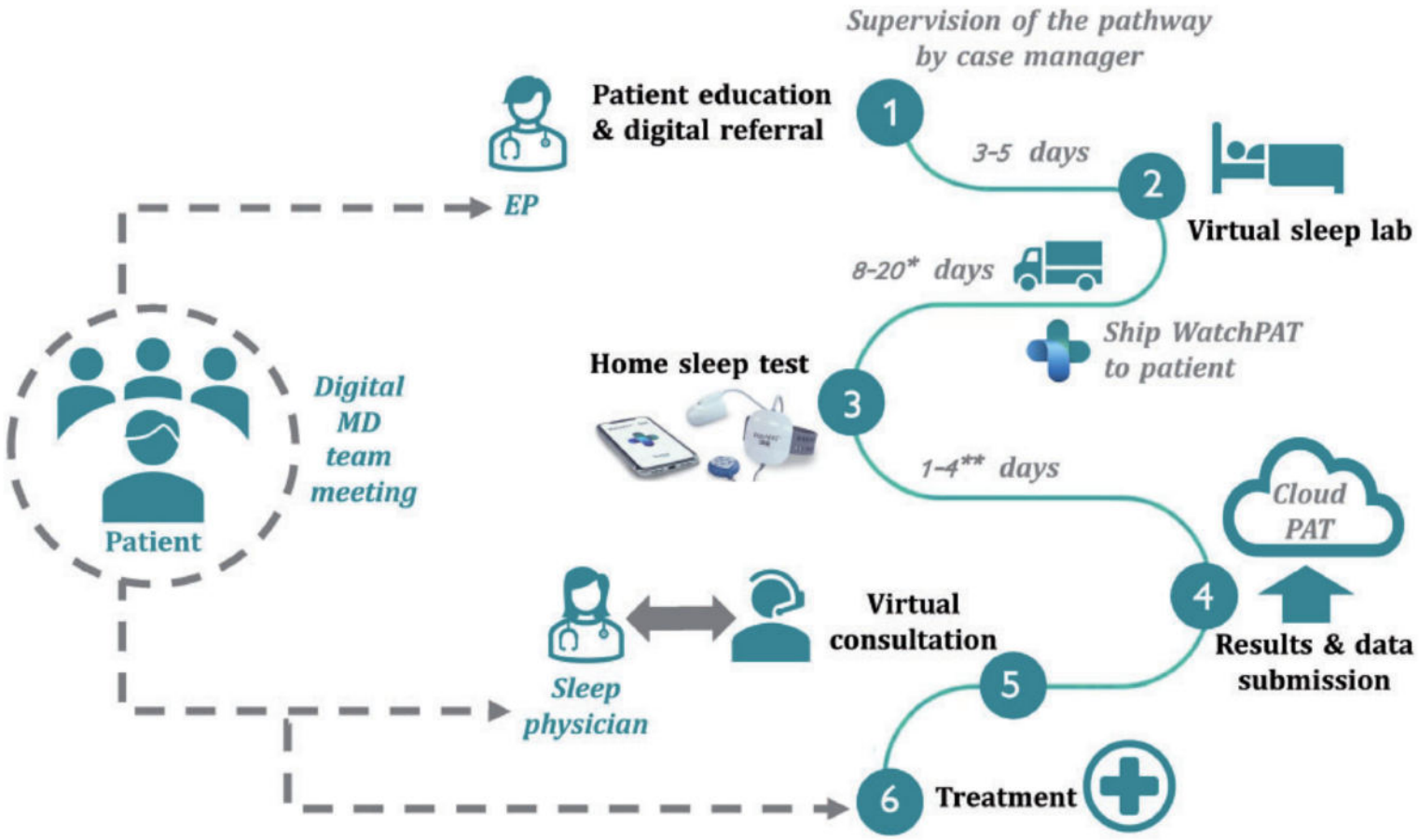


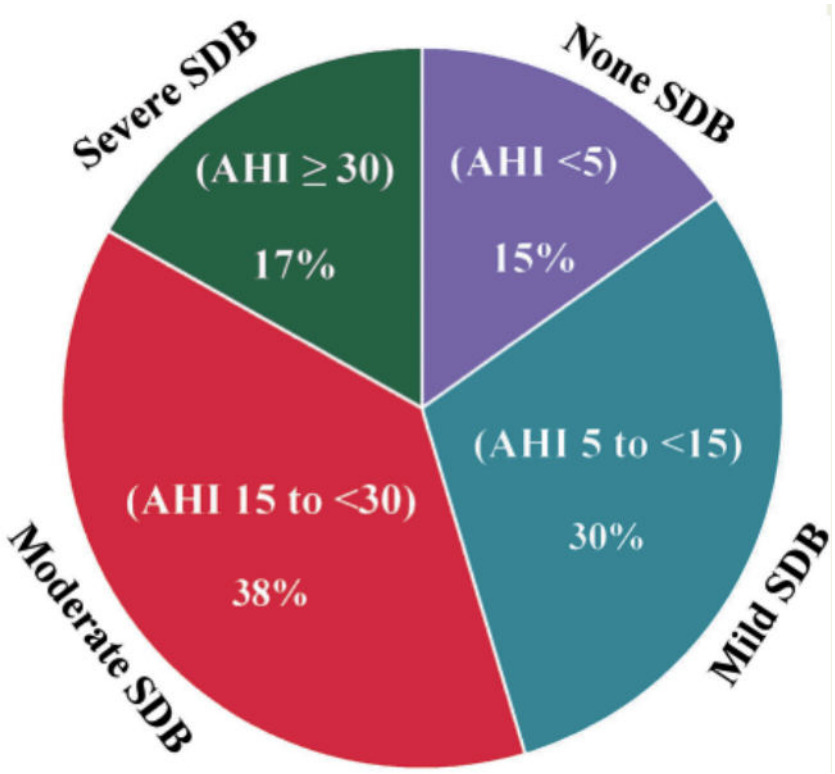


Martinot JB Pediatric Pulmonology 2021;1-10

L'outil diagnostic ultime doit être validé à l'échelle et dans le parcours de soin

Un parcours de soins VIRTUEL pour le diagnostic du SAS chez des patients souffrant de fibrillation auriculaire : Infrastructure numérique à distance





Le parcours virtuel de prise en charge de la FA a permis un délai de diagnostic court et une satisfaction élevée des patients

Verhaert V Europace 2022;24, 565–575

Forfait Innovation SUNSAS – 18 centres impliqués

Forfait Innovation

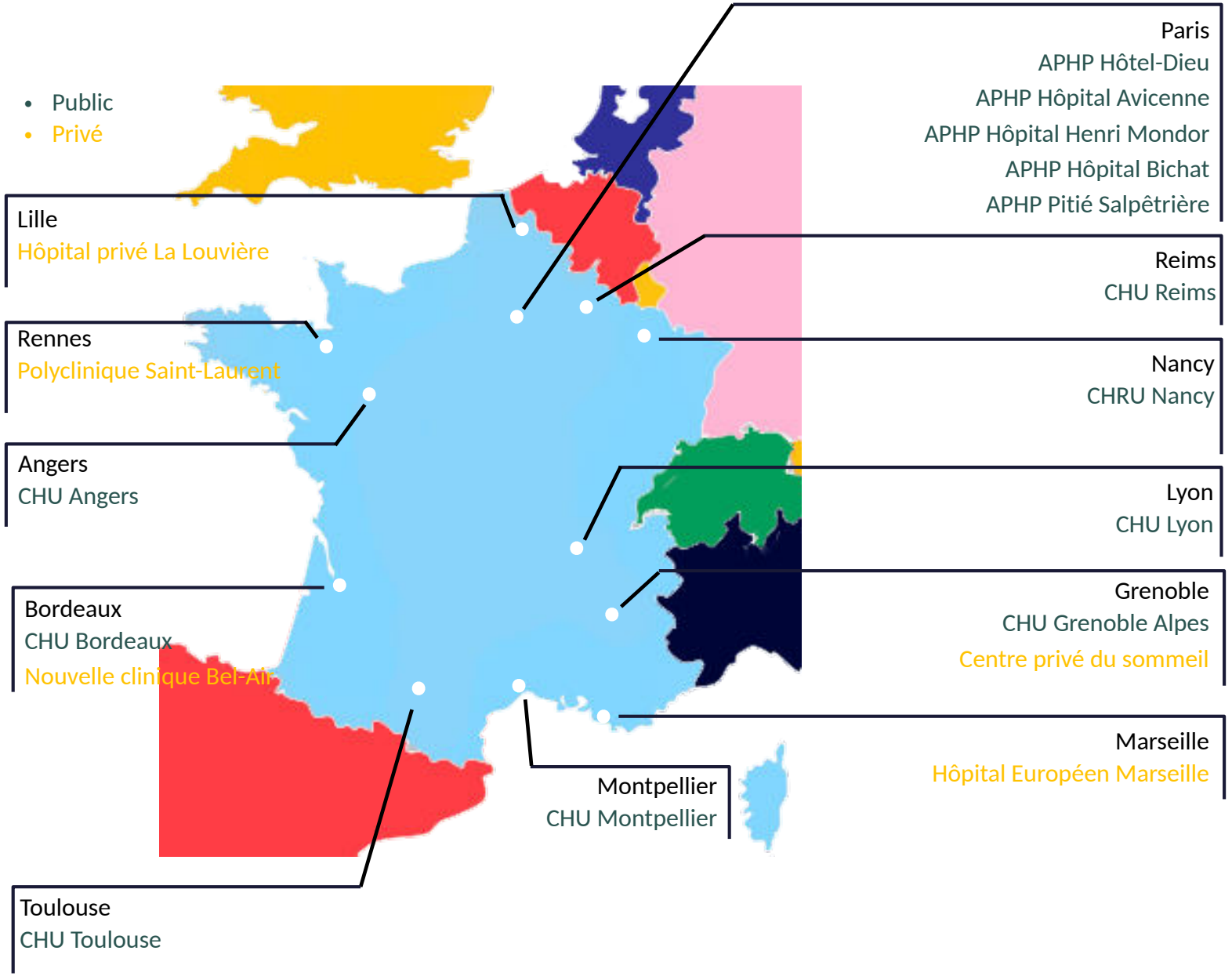
→ Consiste en une prise en charge dérogatoire et temporaire d'un dispositif médical ou acte innovant conditionnée à la réalisation d'une étude visant à fournir des données cliniques ou médico-économiques manquantes.

Essai Randomisé contrôlé: 848 patients

→ Approbation de la HAS obtenue le 22 décembre 2020
→ Publication au JO en juin 2021

Objectif

→ Raccourcissement des délais diagnostic et d'initiation du traitement
Remboursement de la solution diagnostique Sunrise en France



HAS
HAUTE AUTORITÉ DE SANTÉ

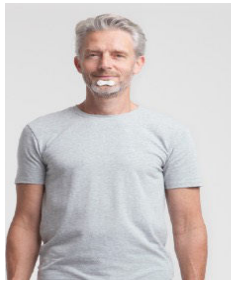
MINISTÈRE
DES SOLIDARITÉS
ET DE LA SANTÉ
Liberté
Égalité
Fraternité

Time to diagnosis and treatment of obstructive sleep apnoea using mandibular jaw movement monitoring versus polysomnography: an open-label, multicentre, randomised, controlled trial

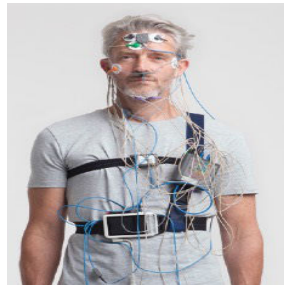
Characteristic	MJM (n = 426)	PSG (n = 423)	Overall (n = 849)
Age, years	50·0 (39·2; 60·0)	50·0 (39·0; 59·0)	50·0 (39·0; 60·0)
Female sex, n (%)	166 (39·0)	185 (43·7)	351 (41·3)
Body weight, kg	85·0 (74·0; 98·0)	83·0 (70·5; 98·0)	84·0 (72·0; 98·0)
Body mass index, kg/m^2	28·1 (24·9; 33·0)	27·5 (24·5; 32·5)	28·0 (24·7; 32·8)
Waist circumference, cm	106·0 (100·0; 115·0)	105·0 (98·0; 115·0)	106·0 (99·0; 115·0)
Neck circumference, cm	39·0 (37·0; 43·0)	39·0 (35·0; 42·0)	39·0 (36·0; 42·2)
Current smoker, n (%)	76 (17·8)	80 (18·9)	156 (18·4)
AHI on first night of recording, events/h	12·8 (6·7; 24·5)	17·0 (6·9; 31·0)	15·2 (6·8; 27·4)
ESS score	11·0 (7·0; 15·0)	11·0 (7·0; 15·0)	11·0 (7·0; 15·0)
Systolic blood pressure, mmHg	130·0 (120·0; 140·0)	126·0 (120·0; 138·0)	128·5 (120·0; 139·2)
Diastolic blood pressure, mmHg	80·0 (70·0; 88·5)	80·0 (72·0; 87·0)	80·0 (71·0; 88·0)
Hypertension, n (%)	87 (20·4)	89 (21·0)	176 (20·7)
Type 2 diabetes, n (%)	33 (7·7)	19 (4·5)	52 (6·1)
Depression, n (%)	35 (8·2)	27 (6·4)	62 (7·3)
COPD, n (%)	4 (0·9)	5 (1·1)	9 (1·0)
Stroke/transient ischaemic attack, n (%)	19 (4·5)	21 (5·0)	40 (4·7)
Cardiac failure, n (%)	1 (0·2)	3 (0·7)	4 (0·5)
Coronary heart disease, n (%)	9 (2·1)	14 (3·3)	23 (2·7)
Universal health coverage, n (%)	50 (12·3)	52 (12·6)	102 (12·4)
Use of hypnotic medications, n (%)	17 (4·0)	16 (3·8)	33 (3·9)

Pépin JL Lancet Regional Health 2026; 64:101637. doi: 10.1016/j.lanepe.2026.101637.

Time to diagnosis and treatment of obstructive sleep apnoea using mandibular jaw movement monitoring versus polysomnography: an open-label, multicentre, randomised, controlled trial

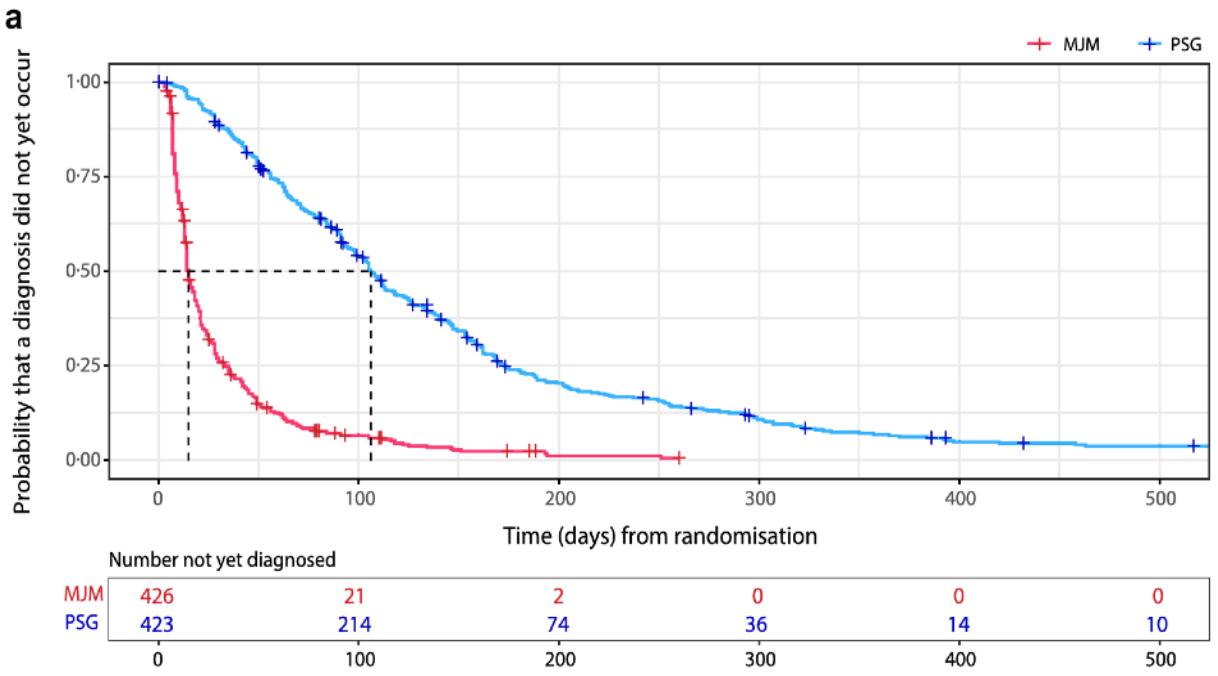


Décision de traitement prise sans polysomnographie



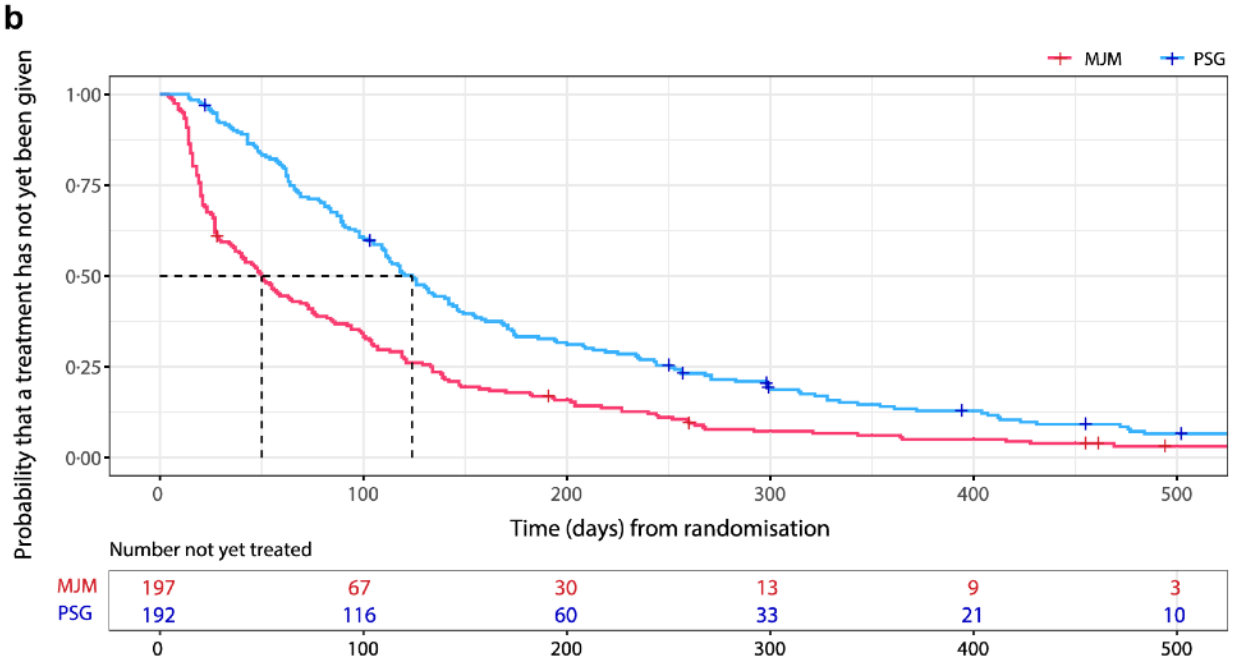
Pépin JL Lancet Regional Health 2026; 64:101637. doi: 10.1016/j.lanepe.2026.101637.

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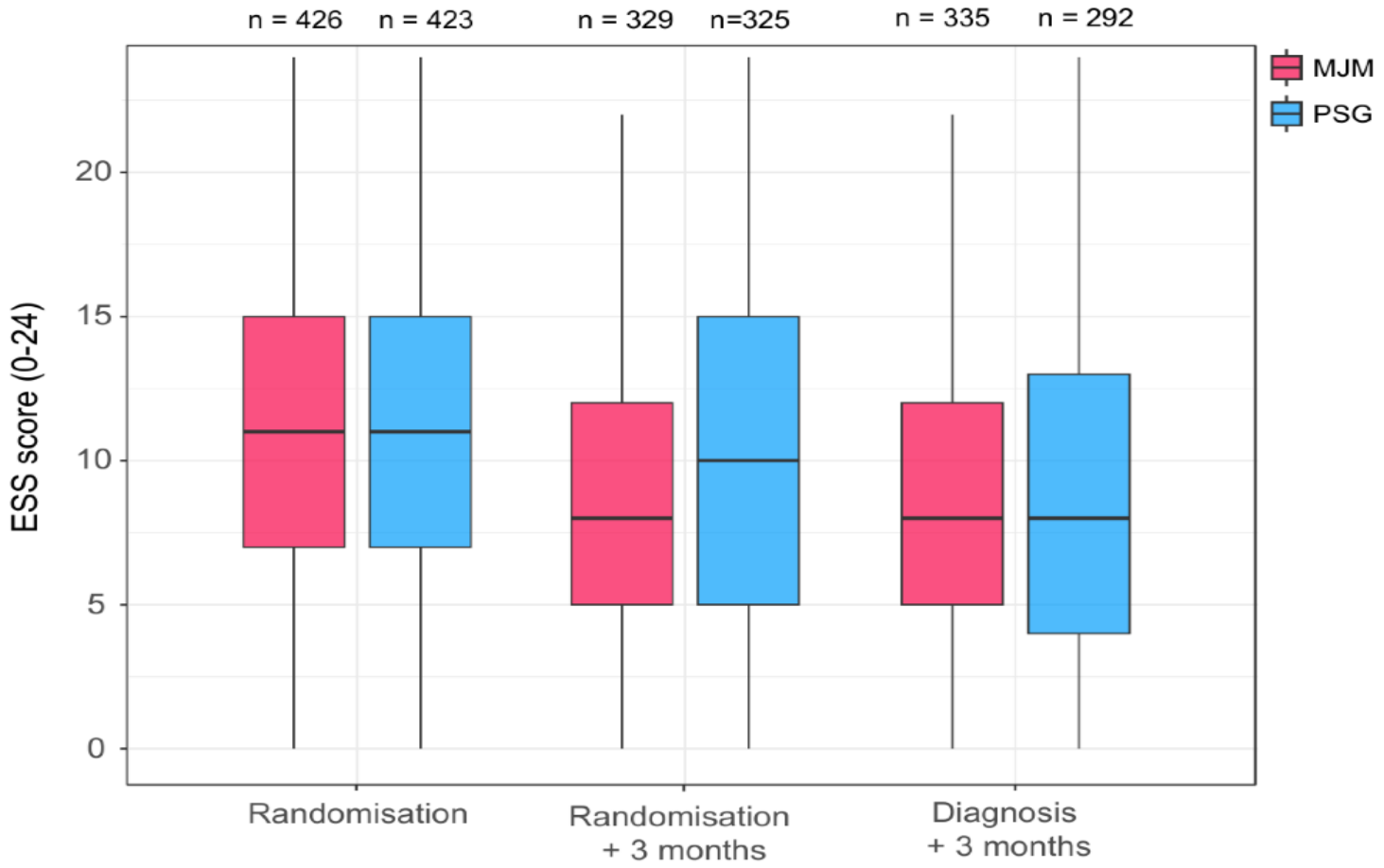
Délai médian d'accès au traitement a également été réduit de 124 jours à 50 jours

Délai médian jusqu'au diagnostic divisé par 7 :
Passe de 106 jours à 15 jours



Pépin JL Lancet Regional Health 2026; In press

Time to diagnosis and treatment of obstructive sleep apnoea using mandibular jaw movement monitoring versus polysomnography: an open-label, multicentre, randomised, controlled trial



Réduction plus rapide de la somnolence dans le bras Sunrise

Pépin JL Lancet Regional Health 2026; 64:101637. doi: 10.1016/j.lanepe.2026.101637.

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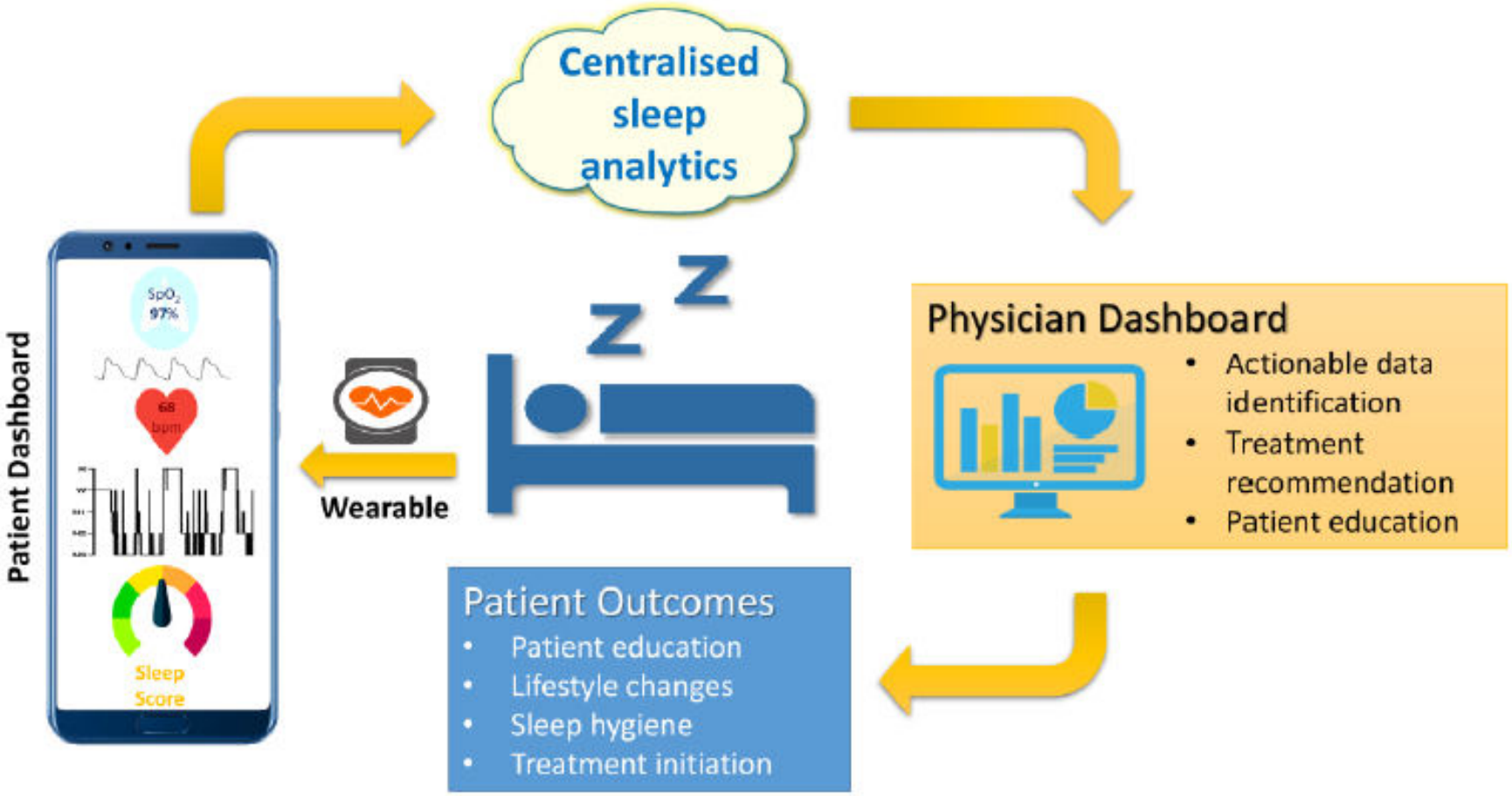
Variable	Baseline		Change from baseline		Between-group difference
	MJM	PSG	MJM	PSG	
QSQ domain scores[a]	N = 388	N = 382	N = 244	N = 260	
Daytime sleepiness	5·2 (4·0; 6·2)	5·3 (4·0; 6·2)	0·64 (0·48, 0·80)[b]	0·19 (0·06, 0·32)	0·41 (0·23, 0·59)
Diurnal symptoms	4·4 (3·2; 5·8)	4·5 (3·0; 6·0)	0·57 (0·41, 0·73)	0·26 (0·13, 0·38)	0·28 (0·09, 0·47)
Nocturnal symptoms	4·6 (3·6; 5·6)	4·9 (3·9; 5·7)	0·64 (0·49, 0·79)	0·29 (0·18, 0·41)	0·27 (0·10, 0·44)
Emotions	5·2 (4·2; 5·8)	5·2 (4·2; 6·0)	0·33 (0·20, 0·45)	0·16 (0·04, 0·27)	0·14 (−0·01, 0·29)
Social interactions	5·2 (4·4; 6·2)	5·5 (4·3; 6·2)	0·48 (0·33, 0·63)	0·29 (0·16, 0·41)	0·16 (−0·01, 0·33)
SF–36 domain scores[a]	N = 394	N = 387	N = 263	N = 274	
Physical functioning	90·0 (75·0; 95·0)	90·0 (75·0; 95·0)	0·00 (−1·58, 1·58)	−1·50 (−3·38, 0·39)	1·27 (−1·11, 3·65)
Role physical	75·0 (25·0; 100·0)[c]	75·0 (25·0; 100·0)	6·13 (1·91, 10·35)[d]	0·18 (−4·29, 4·66)	5·22 (−0·06, 10·51)
Role emotional	66·7 (33·3; 100·0)	66·7 (33·3; 100·0)	9·67 (4·78, 14·56)[c]	1·59 (−3·05, 6·22)[c]	5·59 (−0·22, 11·40)
Vitality	45·0 (30·0; 55·0)[c]	45·0 (25·0; 60·0)[c]	6·79 (4·80, 8·79)[c]	2·56 (0·84, 4·27)	3·78 (1·29, 6·28)
Emotional well-being	64·0 (48·0; 76·0)[c]	64·0 (48·0; 80·0)[c]	3·25 (1·38, 5·12)[c]	1·81 (0·08, 3·54)	1·17 (−1·22, 3·56)
Social functioning	62·5 (50·0; 87·5)[c]	62·5 (50·0; 87·5)[c]	5·22 (2·65, 7·79)[d]	−0·09 (−2·95, 2·76)	4·06 (0·56, 7·55)
Bodily pain	70·0 (45·0; 90·0)	77·5 (46·2; 90·0)	2·64 (0·15, 5·14)[c]	−1·61 (−3·84, 0·63)	3·69 (0·66, 6·71)
General health perceptions	55·0 (45·0; 70·0)[c]	60·0 (45·0; 73·8)[c]	2·12 (0·46, 3·78)[c]	−1·48 (−3·04, 0·08)	3·05 (0·88, 5·21)
WPAI questionnaire scores[b]	N = 384	N = 379	N = 244	N = 263	
Work time missed (absenteeism)[e]	0·0 (0·0; 0·0)	0·0 (0·0; 0·0)	−0·95 (−4·30, 2·41)	−0·69 (−3·59, 2·21)	0·26 (−3·00, 3·53)
Impairment while working (presenteeism)[e]	20·0 (0·0; 50·0)	20·0 (0·0; 57·5)	−10·08 (−15·19, −4·96)	−5·10 (−9·63, −0·57)	−5·65 (−11·00, −0·31)
Overall work impairment (productivity loss)[e]	20·0 (0·0; 50·0)	20·0 (0·0; 60·0)	−9·13 (−14·95, −3·31)	−4·64 (−9·31, 0·03)	−5·01 (−10·90, 0·89)
Impairment in regular activities (activity impairment)	20·0 (0·0; 50·0)	20·0 (0·0; 60·0)	−9·55 (−13·13, −5·97)	−4·26 (−7·66, −0·85)	−5·37 (−9·40, −1·34)

Amélioration plus rapide de la qualité de vie et productivité au travail dans le bras Sunrise

Pépin JL Lancet Regional Health 2026; 64:101637. doi: 10.1016/j.lanepe.2026.101637.

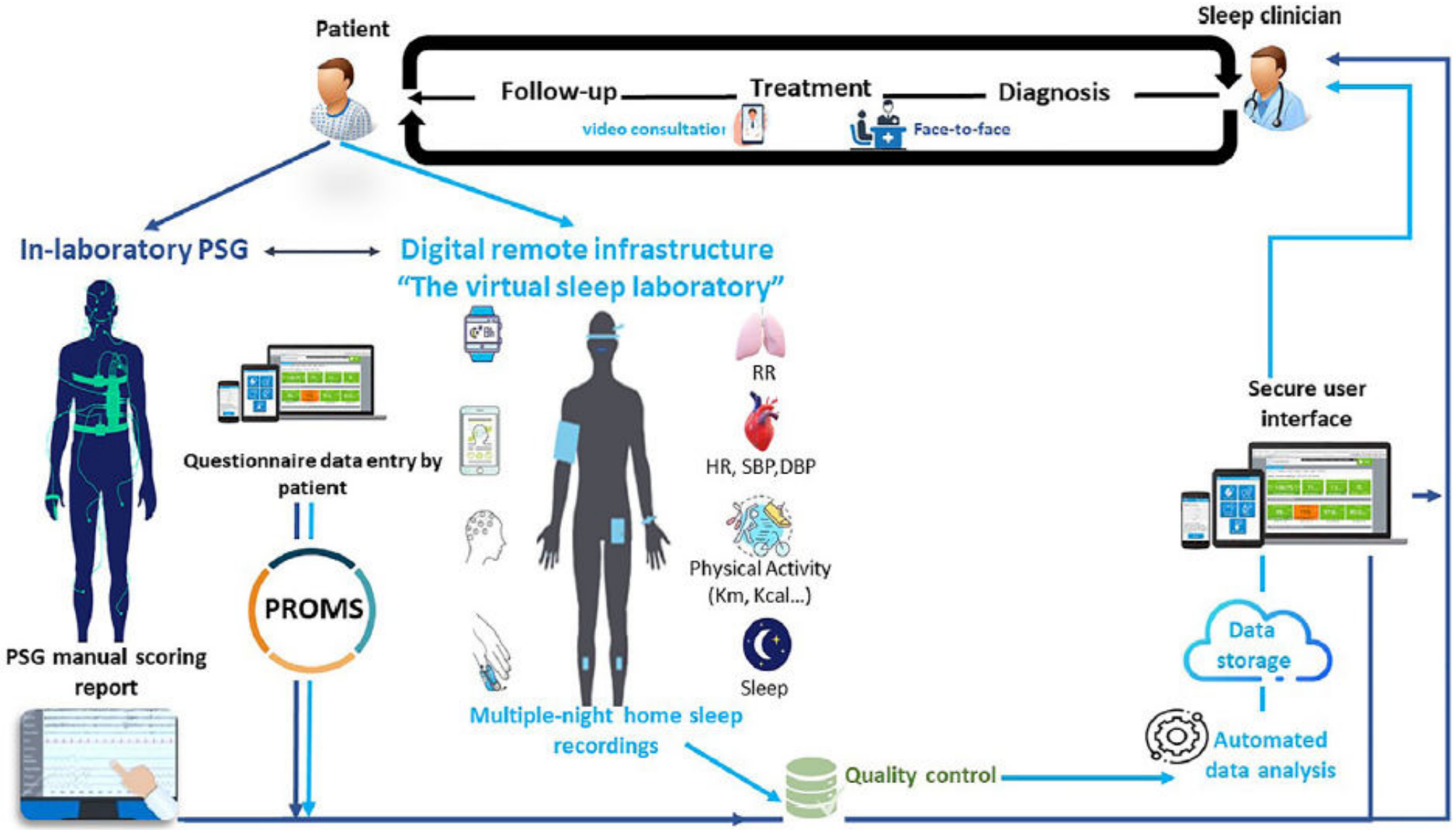
Caractérisation du sommeil à l'aide de dispositifs portables intelligents : Une nécessité de standardisation de la validation et de recommandations pour l'implémentation en clinique

Trouver des stratégies efficaces pour rendre ces données utiles dans la prise en charge clinique, permettre aux patients de participer à la collecte de données pour partager les décisions



Baumert M, Cowie MR, Redline S, Mehra R, Arzt M, Pépin JL, Linz D Sleep 2022;12:45:zsac183. doi: 10.1093/sleep/zsac183.

Creating an Optimal Approach for Diagnosing Sleep Apnea



Pépin JL Sleep Med Clin 2023;18:301-309