

Syndrome d'Apnées du Sommeil chez la personne âgée What to do Dr Watson?

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Définition SAOS

Pathologie caractérisée par des apnées obstructives, hypopnées, et/ou respiratory effort-related arousals (RERA) provoquées par un collapsus répétitif des voies aériennes supérieures durant le sommeil.

Mécanisme

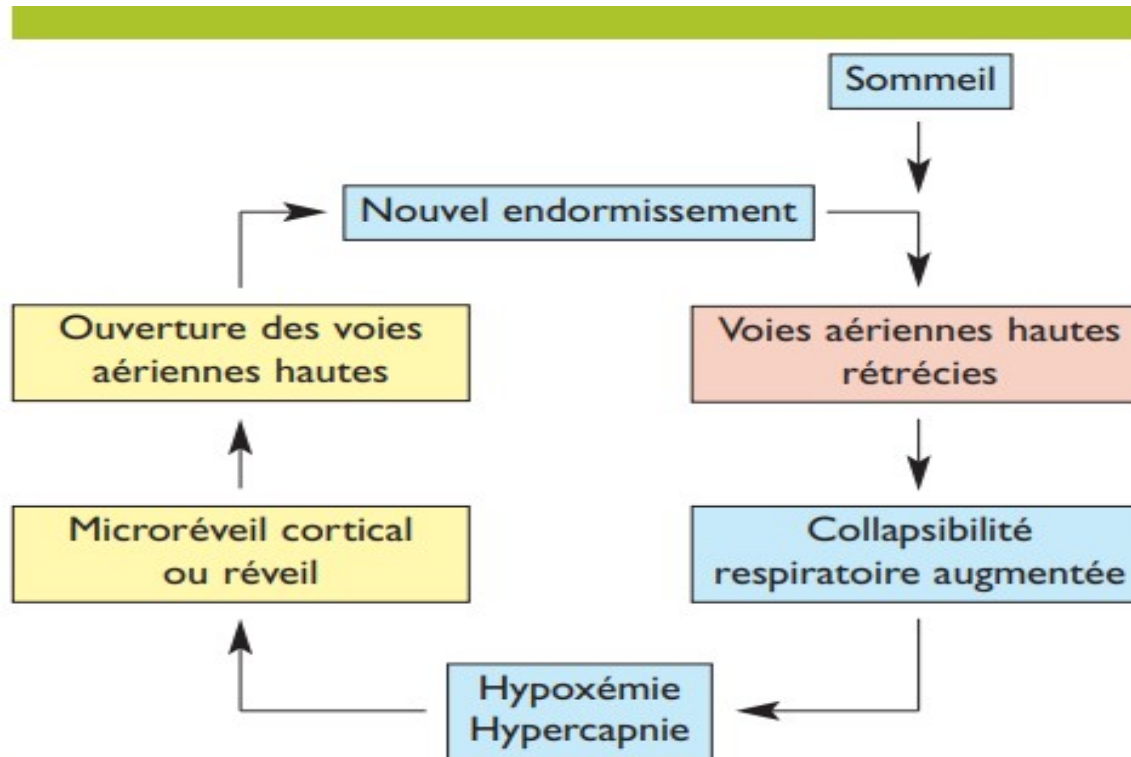


Figure 4. Physiopathologie des apnées du sommeil en cas de syndrome d'apnées du sommeil, expliquant les désaturations en oxygène et les microréveils répétitifs

Il se crée un véritable cercle vicieux.

Mécanisme

TABLE 1 Factors associated with greater pharyngeal collapsibility in the elderly

Airway resistance during sleep [33, 173]	Increased
Deposition of parapharyngeal fat [174]	Increased or decreased
Pharyngeal musculature activity [30]	Decreased
Lung elastic recoil (affects lung volume and tracheal traction) [32]	Decreased
Upper airway dimensions (fat deposition, structure changes, loss of teeth, etc.) [174]	Decreased
Sleep fragmentation [34]	Increased
Alterations of the pharynx muscular dilatory reflexes [175]	Increased
Respiratory instability during sleep (central events) [176]	Increased

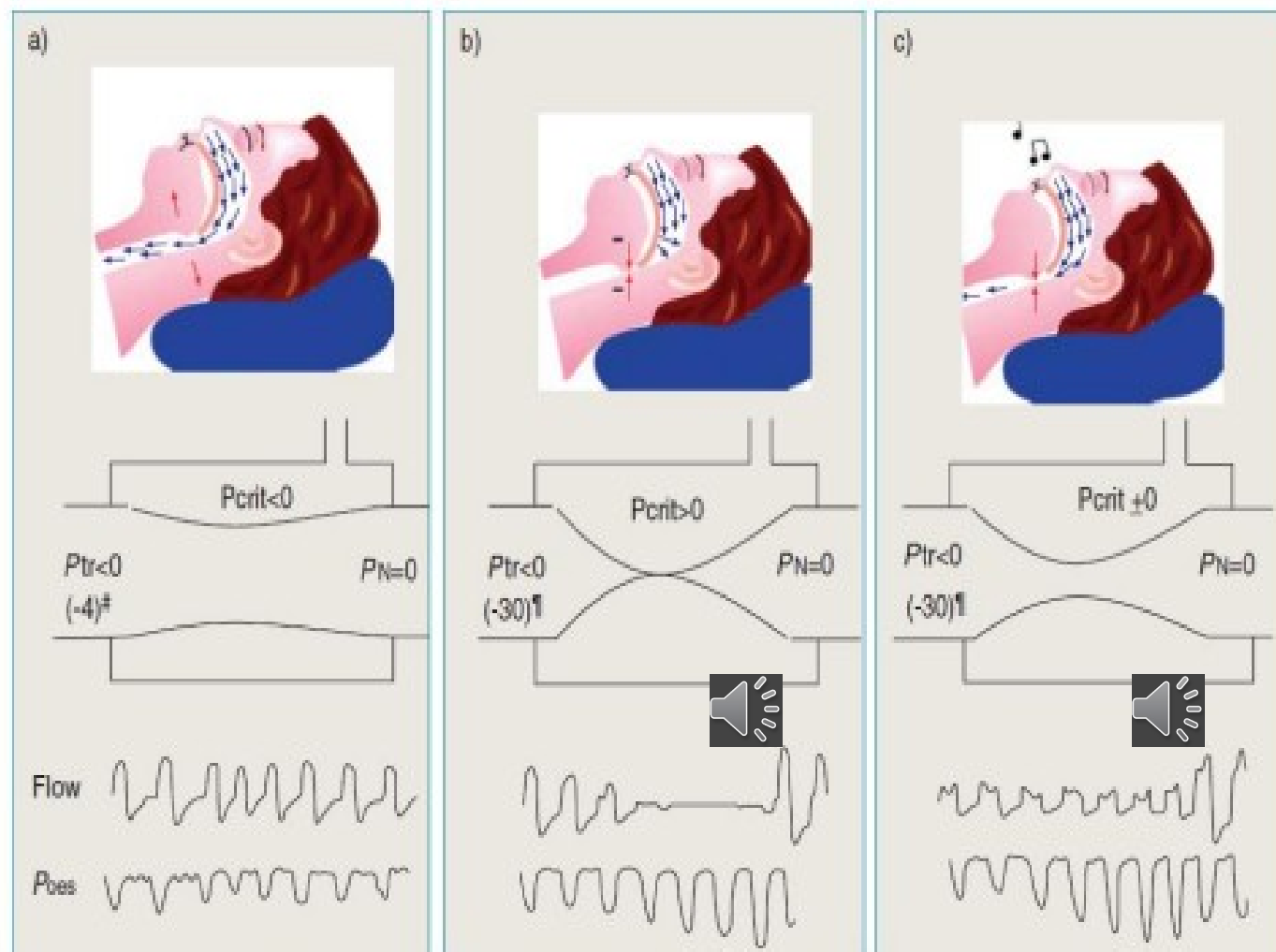
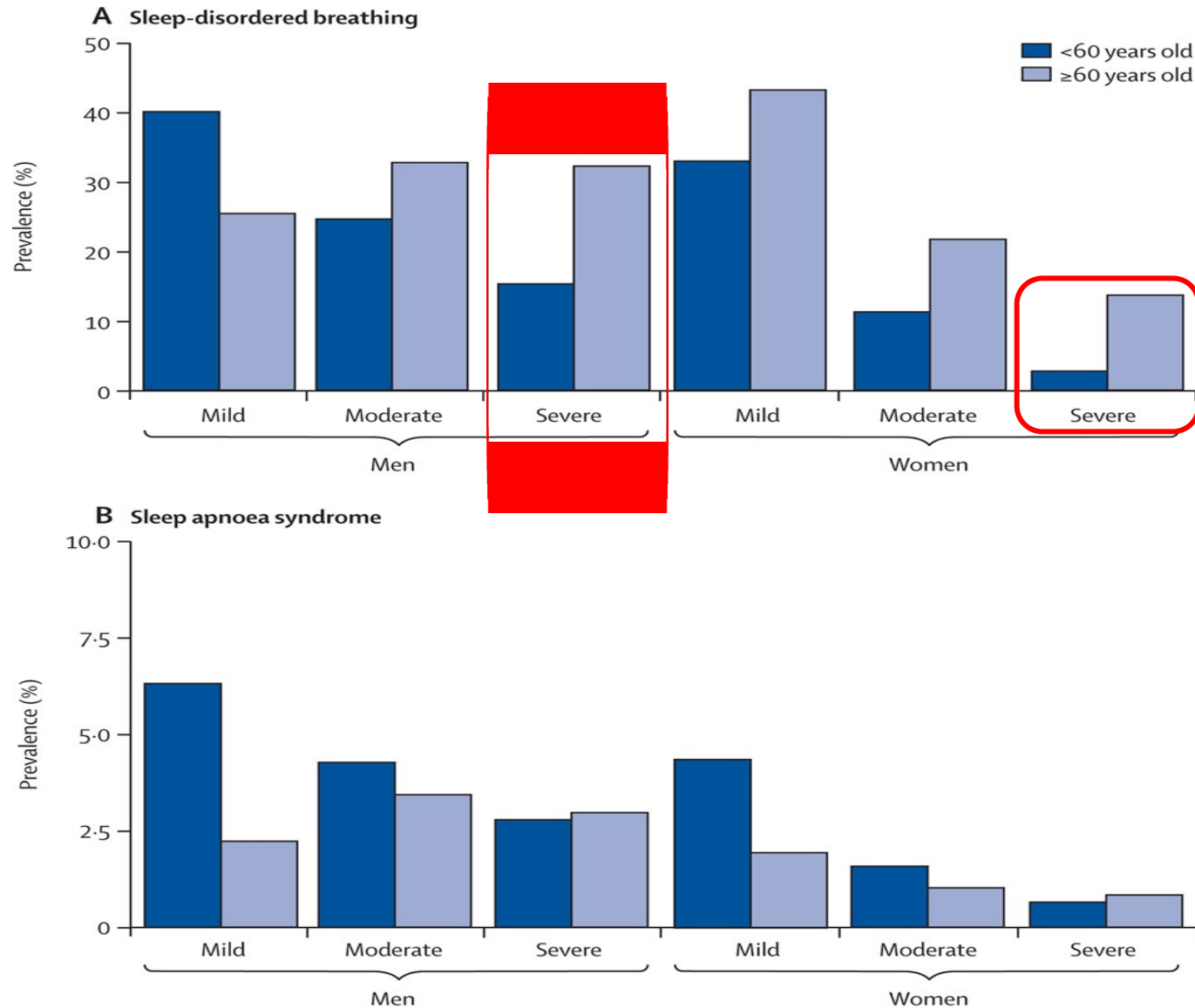


Figure 1. Respiratory model based on a Starling resistor for the collapsible upper airway. a) When critical pressure (P_{crit}) is lower than zero there is no airway collapse and the breathing pattern is normal, as shown in the normal flow and oesophageal pressure (P_{oes}). b) When P_{crit} is positive this results in an airway closure, apnoea, inducing a progressive decrease in intratracheal pressure (P_{tr}) as the patient tries to breathe against a collapsed airway. c) When P_{crit} is slightly negative the upper airway partially collapses and a hypopnoea occurs as the P_{tr} progressively decreases along with inspiration. P_{tr} : upstream (nasal) pressure. $^{\#}$: $-4 \text{ cmH}_2\text{O}$; ‡ : $-30 \text{ cmH}_2\text{O}$.

Critères diagnostiques du SAOS

- Patient **symptomatique** ou ayant une **comorbidité** (HTA, CAD, AVC, CHF, FA, trouble de la thymie (dépression), diabète, etc.)
ET 5 à 15 évènements respiratoires par heure sur une PSG/PG
OU
- >15 évènements respiratoires par heure sans aucun symptôme ou comorbidités.

Prévalence en Suisse



Quand y penser? - Facteurs de risque

- Sexe masculin (2:1 ratio hommes:femmes).
- Âge > 60 ans.
- Comorbidités Cardiovasculaires, Démence, Maladie Parkinson.
- Obésité.
- Anamnèse familiale.

Formulaire Somnologique

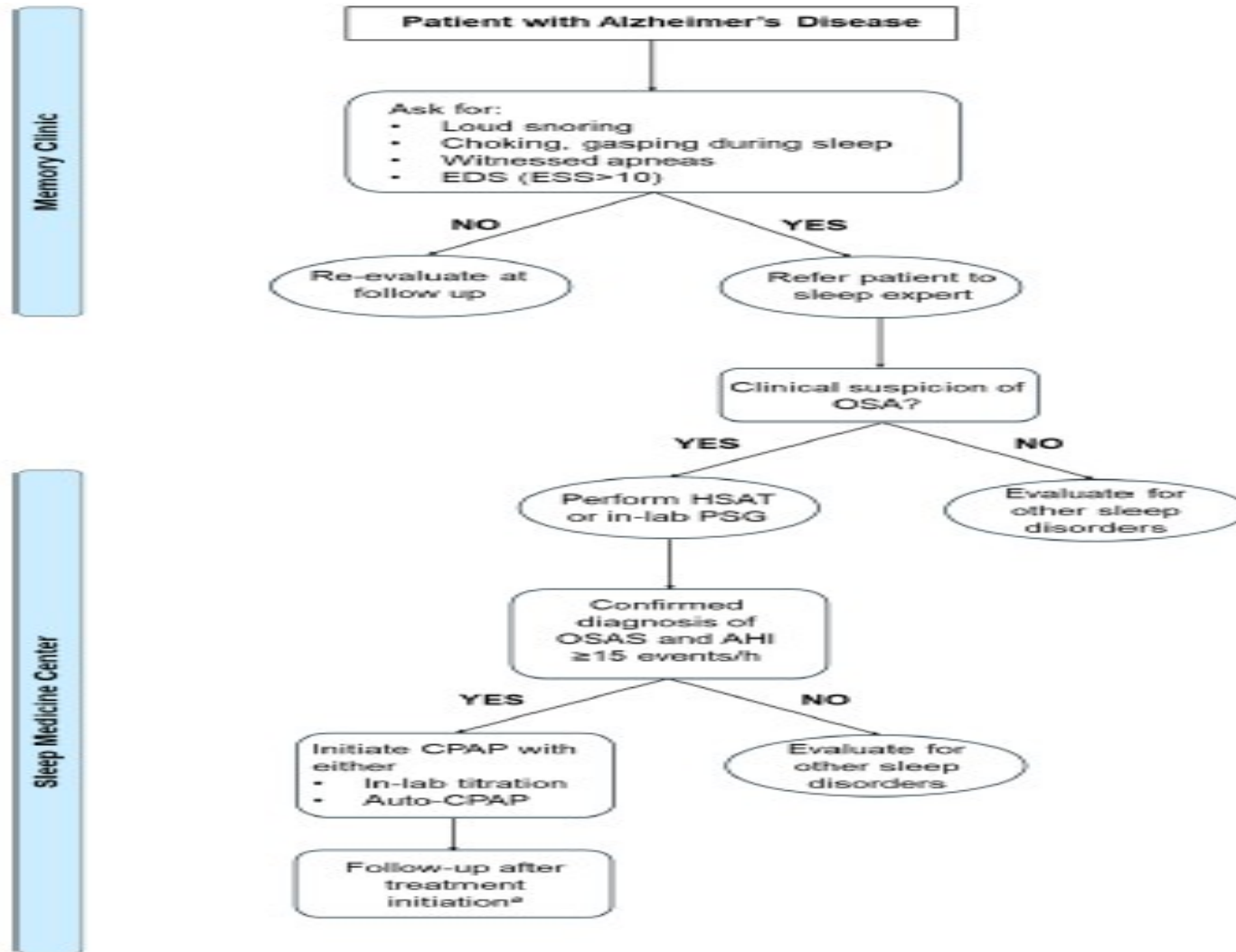
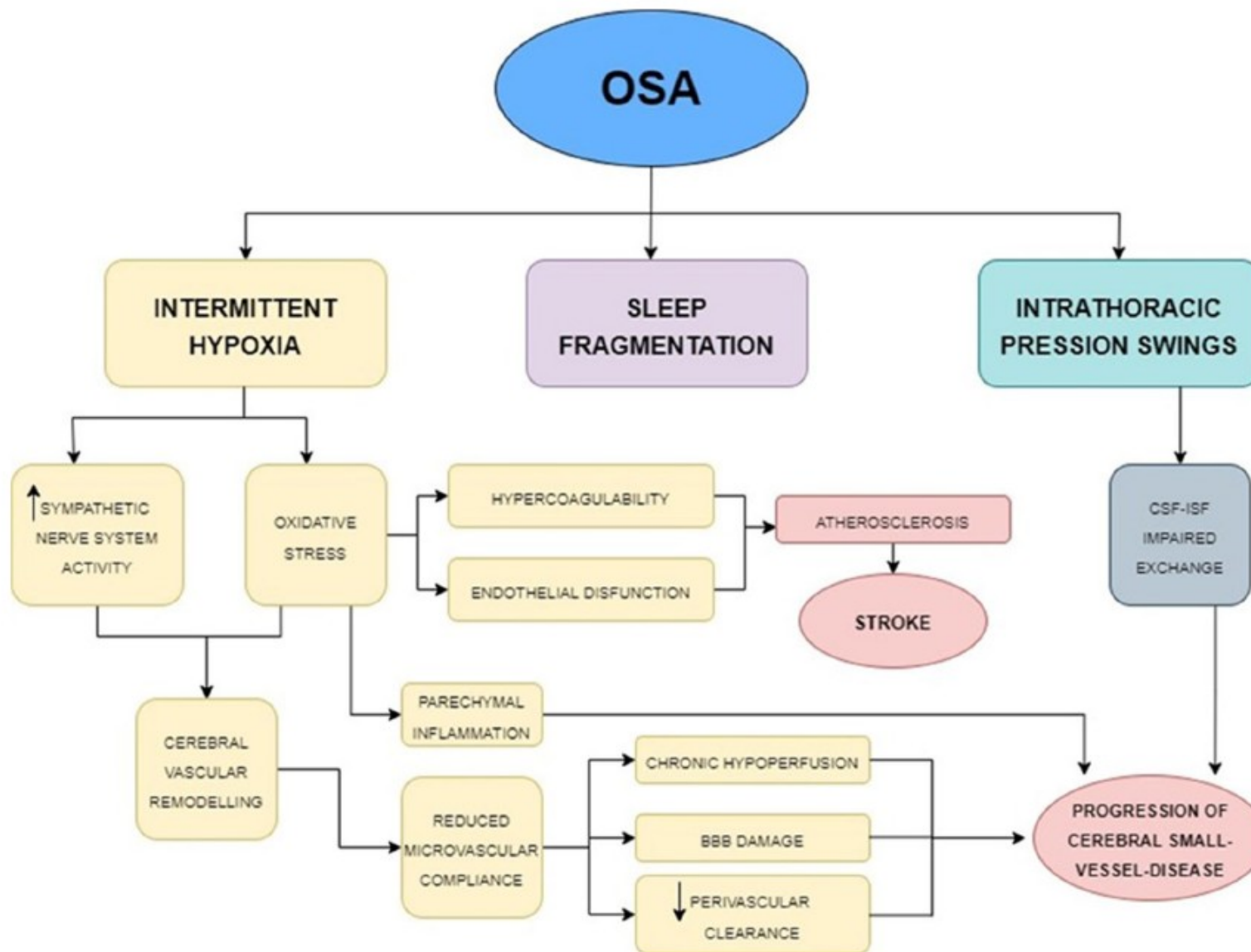


Fig. 2 Management of OSA in patients with MCI or dementia due to AD. ^a= follow-up evaluation should include adherence to treatment, residual AHI, residual EDS. Abbreviations: AHI=Apnea Hypopnea Index; CPAP=Continuous Positive Airway Pressure; EDS=Excessive Daytime Sleepiness; ESS=Epworth Sleepiness Scale; HSAT=Home Sleep Apnea Test; OSA=Obstructive Sleep Apnea; OSAS=Obstructive Sleep Apnea Syndrome; PSG=Polysomnography

Comorbidités aux EMS Genève

GeroScience (2024) 46:99–111

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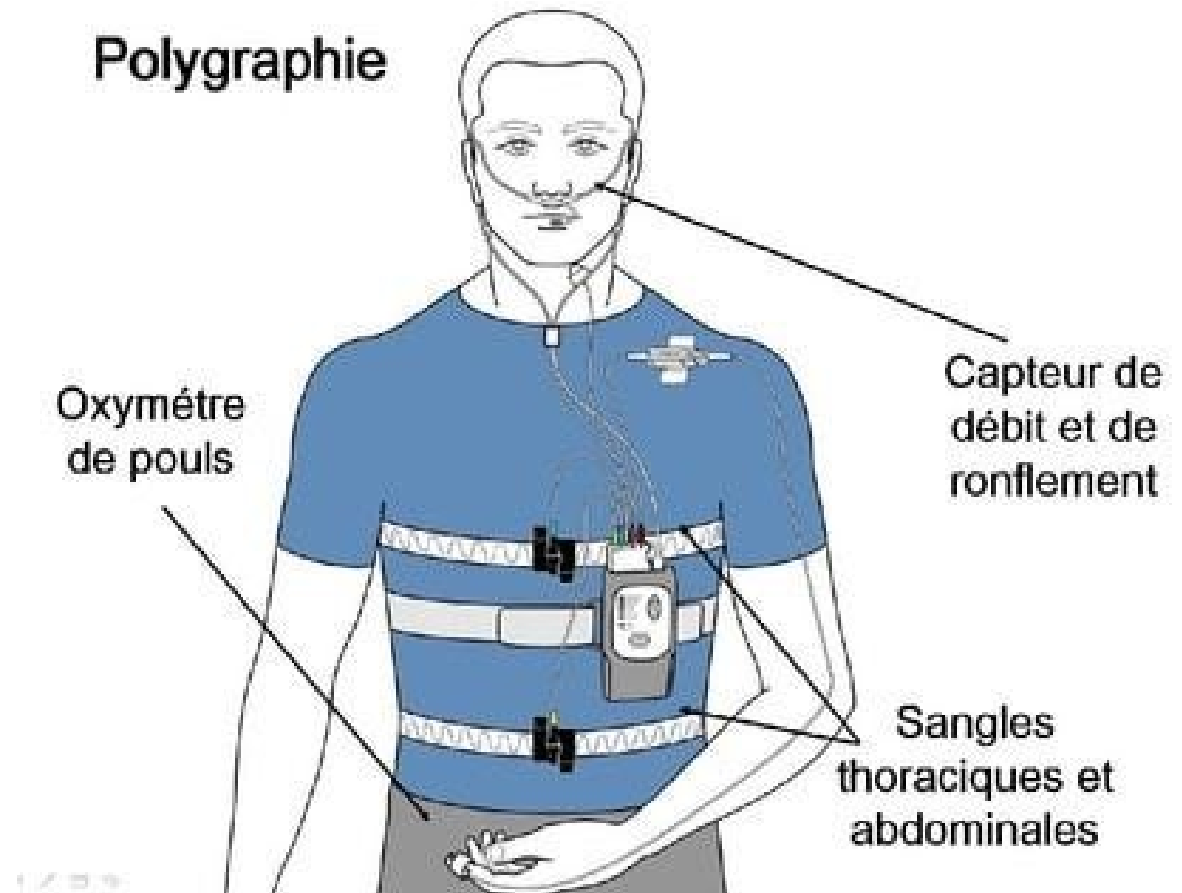
Comment diagnostiquer un SAOS : PSG vs PG



"OK, Mrs. Tully. We want you to relax, get a good night's sleep, and we'll evaluate any sleep issues that you have."

Polygraphie (PG)

- Ambulatoire
- Chez le spécialiste
- Min 4 heures de sommeil



Traitement positionnel



Figure 1. Stratégies positionnelles diverses

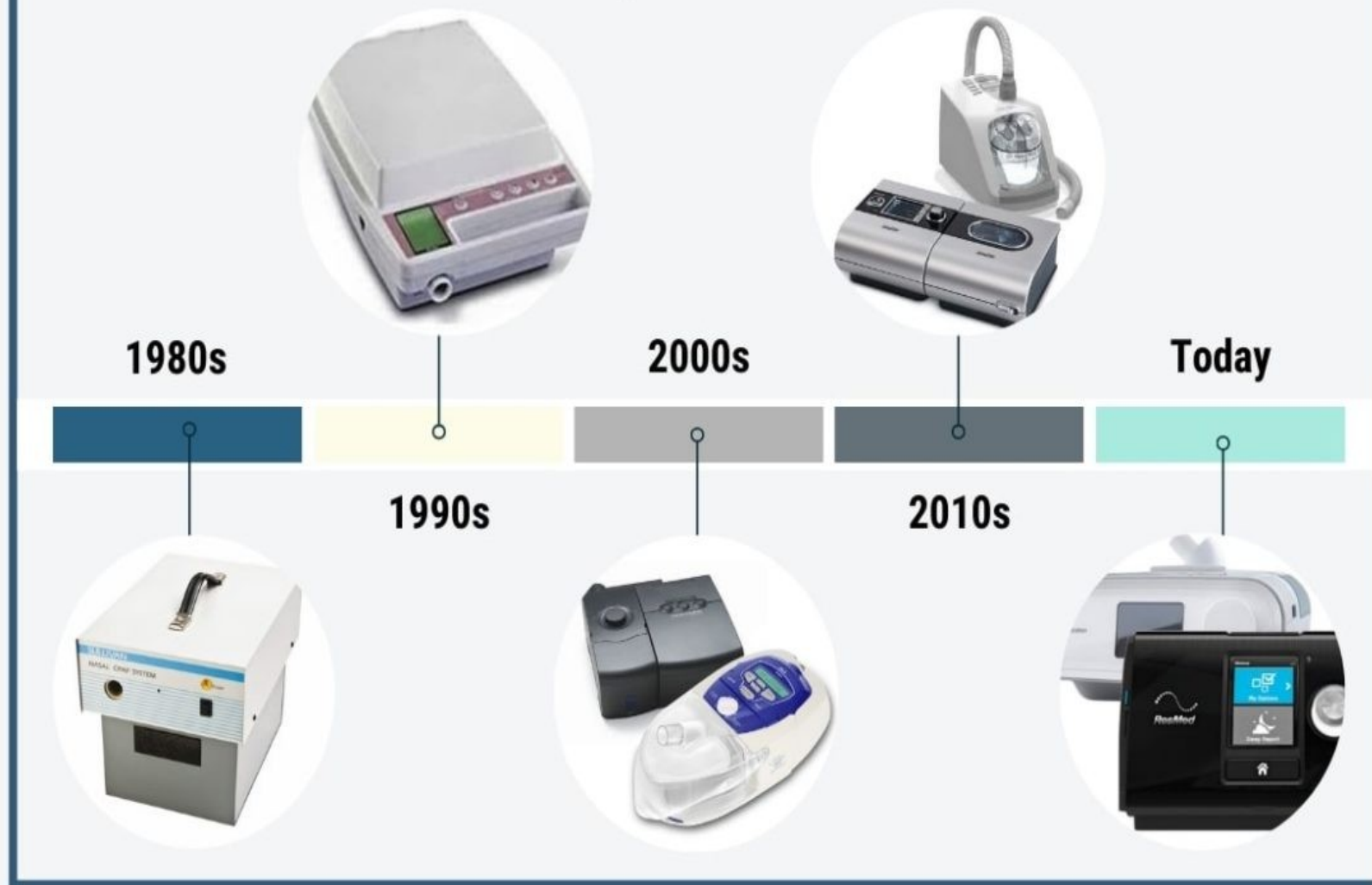
- A.** Type 1 : stratégie positionnelle inconfort en position dorsale.
- B.** Type 2 : stratégie positionnelle jouant sur l'effet de volume.
- C.** Type 3 : Systèmes de vibrations en position dorsale (cou ou thorax).

Orthèse d'avancement mandibulaire



Continuous positive airways pressure (CPAP)

History of CPAP



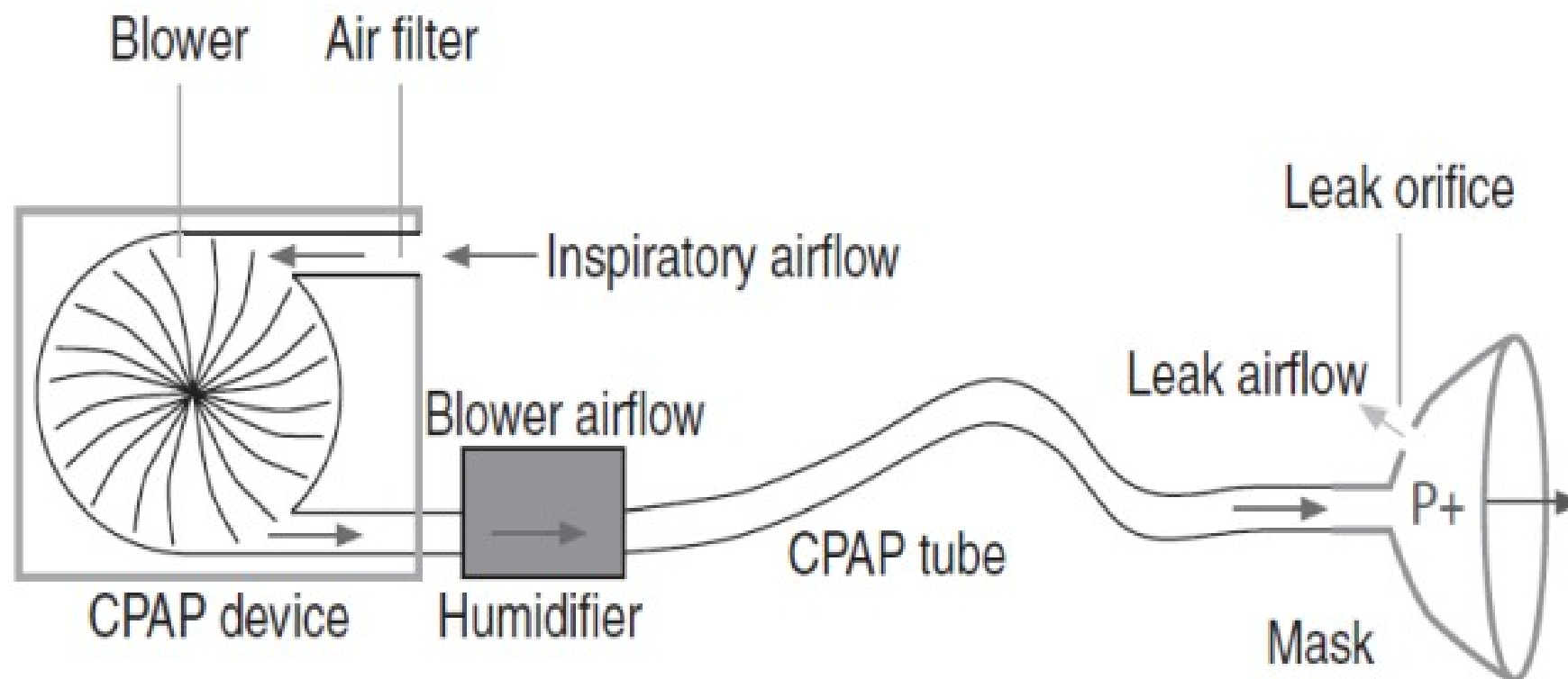


Figure 3. Diagram of nasal continuous positive airway pressure (CPAP) system used to treat patients with obstructive sleep apnoea. P+: mask pressure.

Evolution de l'interface du masque



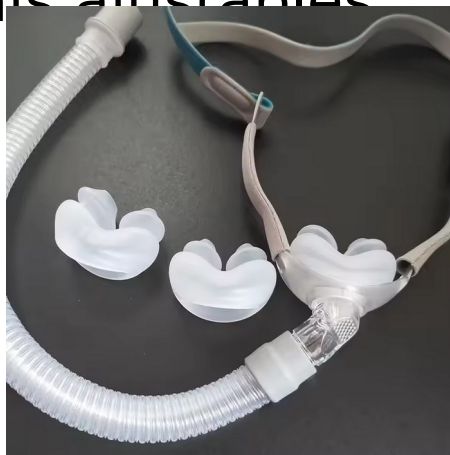
Évolution des Masques CPAP – 1980s à 2000s

Années 1980 : Masques rigides, inconfortables, fuites fréquentes. Masques nasaux uniquement.

Années 1990 : Silicone, meilleur confort et étanchéité. Apparition des masques faciaux complets.



Années 2000 : Masques plus légers et minimalistes. Coussins nasaux et harnais ajustables.



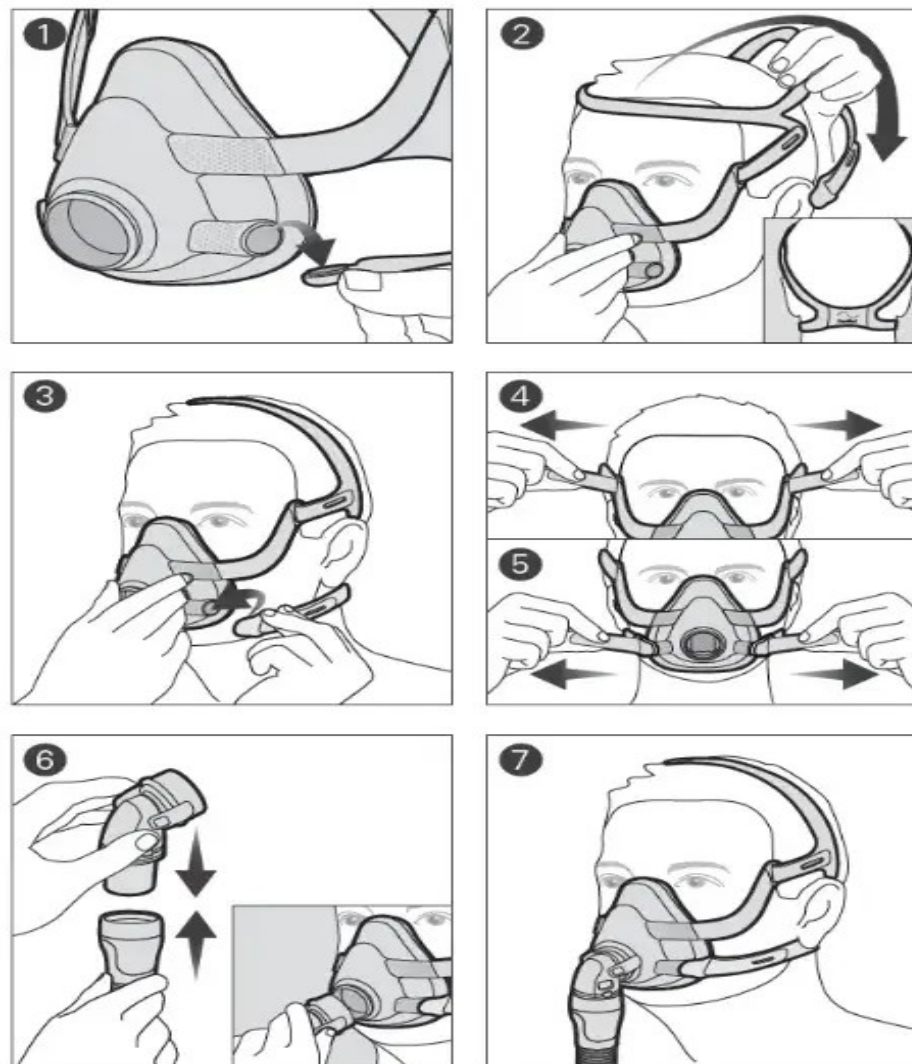
Évolution des Masques CPAP – 2010s à 2020s

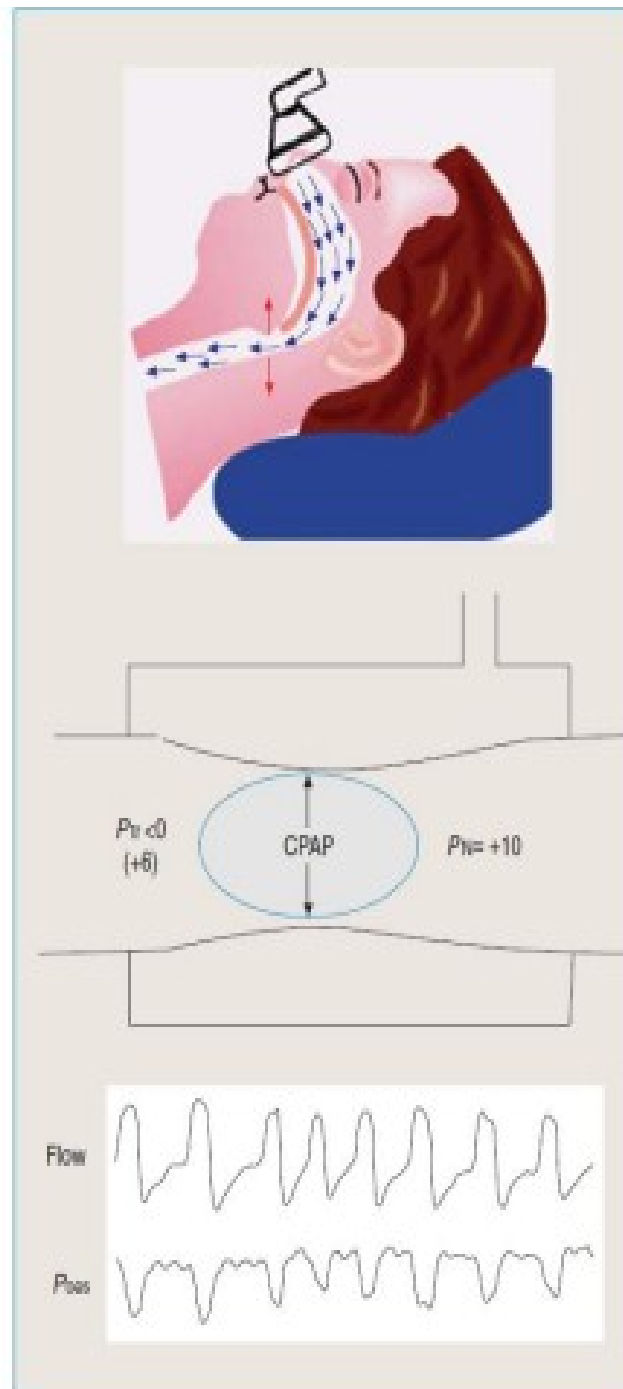
- Années 2010 : clips magnétiques, masques plus silencieux
- Années 2020 : matériaux confort "air-touch", Masques : imprimante 3D le futur ?



Positionnement du masque

- **Positionnement du harnais :** Tirez le harnais par-dessus votre tête. Les sangles latérales doivent être sur les côtés de la tête et la sangle arrière à la base du crâne.
- **Fixation :** Attachez les clips ou crochets inférieurs du harnais au masque, généralement sous les oreilles.
- **Ajustement initial :** Ajustez les sangles supérieures puis inférieures de manière égale, en utilisant les bandes velcro. Le masque doit être ajusté pour être confortable, pas excessivement serré. Un serrage excessif peut causer des fuites et des points de pression.





Pourquoi traiter le SAOS ?

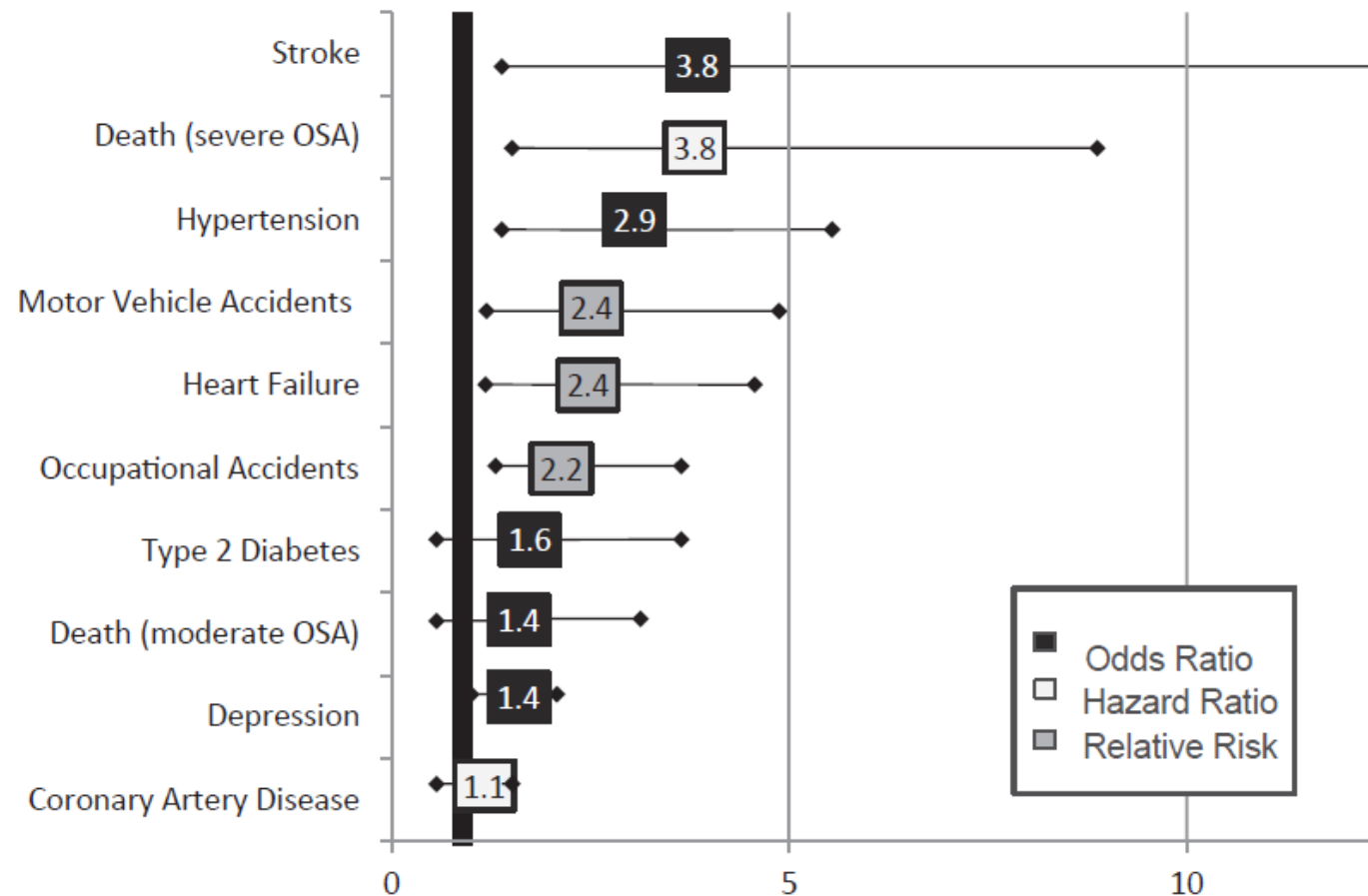


Fig. 1 Increased risk in obstructive sleep apnea syndrome.

Pourquoi traiter le SAOS ?

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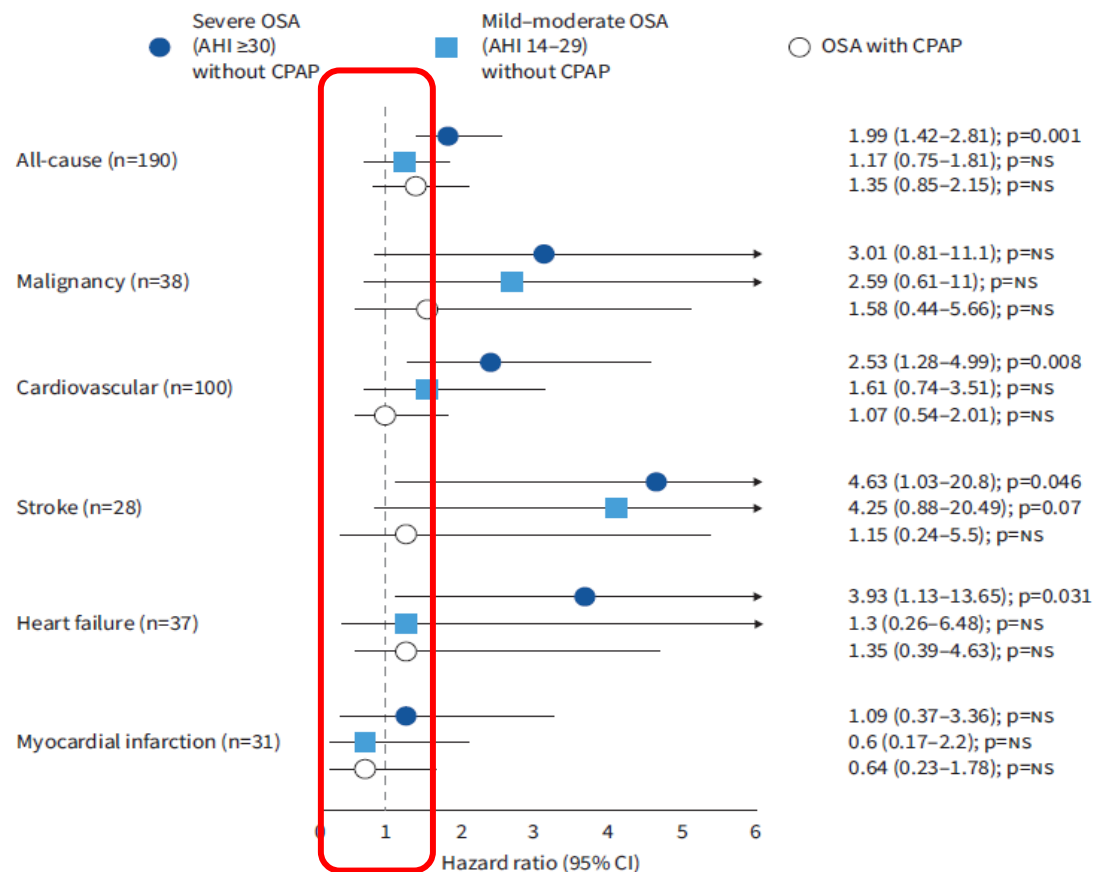


FIGURE 1 Risk of general mortality, cardiovascular mortality, and types of cardiovascular and noncardiovascular events studied with respect to the control group without obstructive sleep apnoea (OSA) in 939 elderly patients with OSA without continuous positive airway pressure (CPAP), with mild-moderate OSA without CPAP and with OSA with (good adherence to) CPAP. AHI: apnoea-hypopnoea index ($\text{events} \cdot \text{h}^{-1}$); ns: nonsignificant. Reproduced from [87] with permission.

Pourquoi traiter le SAOS ?

Bénéfices cognitifs et fonctionnels du traitement.

- Traitement par CPAP améliore ou préserve les fonctions cognitives (mémoire et fonctions exécutives)

ETUDE PROOF 2015.RCT au Canada 2025.

- Amélioration significative des scores cognitifs (MMSE , MoCA) et de l'humeur (GDS).

Etude Italienne 2023. Review 2024 (Alzheimer).

Réduction de la somnolence diurne et amélioration de la qualité de vie.

- Traitement par CPAP réduit la somnolence diurne (score ESS) et améliore la qualité de vie.

Etude Espagnole 2023.

Pourquoi traiter le SAOS ?



SOS
OXYGÈNE

Graphical Abstract

Cognition and obstructive sleep apnea in Parkinson's disease: randomized controlled trial of positive airway pressure (COPE-PAP trial)

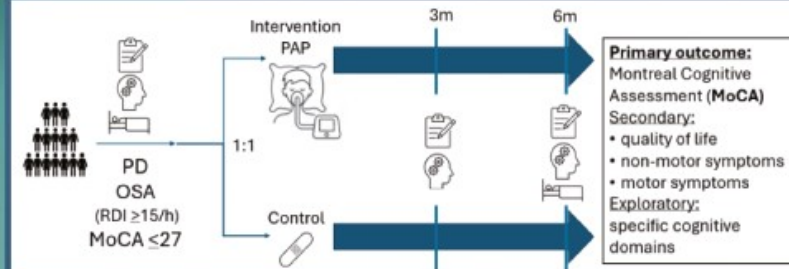
OSA is frequent in PD and associated with motor and non-motor symptom severity, including cognitive decline. Interventions are limited to improve cognition in PD. OSA might be a *modifiable* risk factor in this context.

This RCT aimed to determine if treating OSA can improve global cognition in individuals with PD.

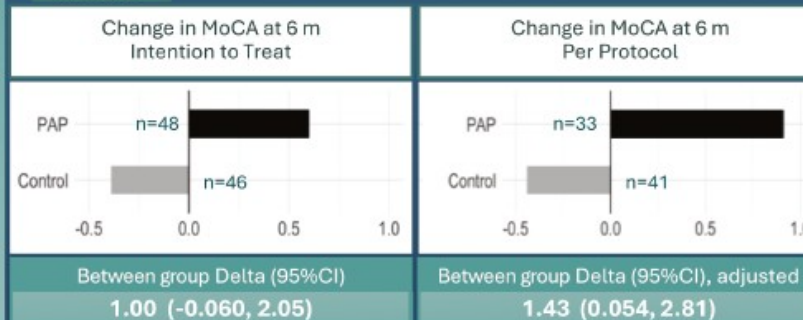


Cognition and Obstructive Sleep Apnea in Parkinson's Disease, Effect of Positive Airway Pressure Therapy Trial

Methods



Results



Conclusion

PD patients with OSA able to adhere to PAP therapy have improved cognition over 6 months. They also benefit regarding sleep quality, depressive and global non-motor symptoms, and motor function. We propose that integrated PD care should include screening for and treatment of OSA as tolerated, particularly among those with declining cognition, to reduce symptom burden.



PAP adherence at 6 months

35 participants still using :
• use on 69% (SD 25) of days,
• 6h13min per night (SD 1h54min) on days used.

Causal Average Complier Effect (CACE) on MOCA

• 1.37, 95%CI (0.063, 2.94) for any PAP use
• 3.19, 95%CI (0.11, 8.18) for use >3h /night

Improved in PAP group only:

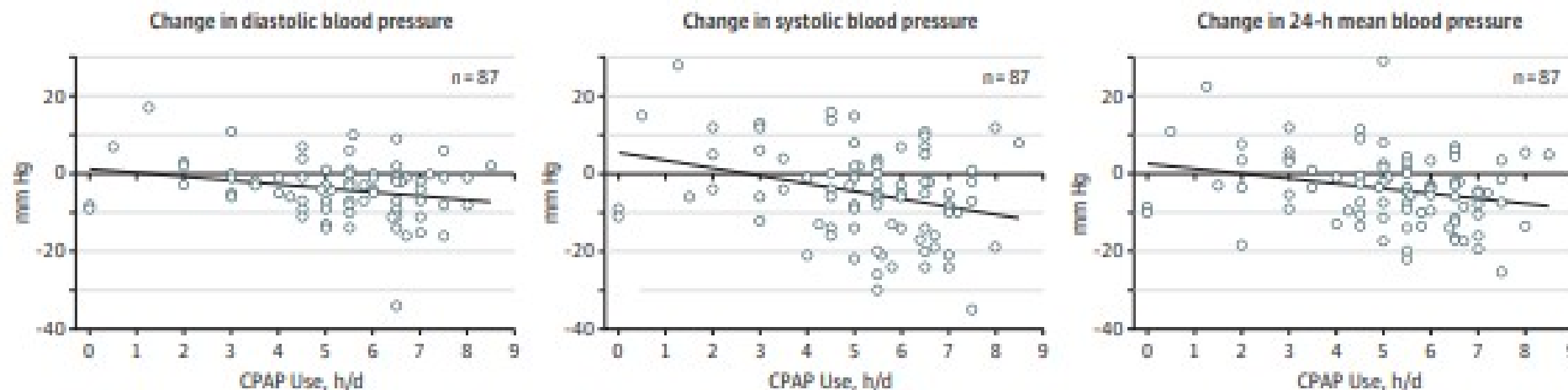
→ Global non-motor symptoms (UPDRS 1)
→ Depression (BDI-II)
→ Sleep (PDSS)
→ Executive function
→ Complex motor task
Improved between groups (PP):
→ Motor function (UPDRS 3)

Statement of Significance

This is the largest and longest randomized controlled trial (RCT) of treatment for obstructive sleep apnea (OSA) in a neurodegenerative condition, namely Parkinson's disease (PD). PD is the fastest growing neurodegenerative disorder of aging, while sleep and sleep disorders have come into focus as important determinants of brain health. OSA is common in the general population, including older adults, and in PD. Observational data are accumulating that treating OSA can improve cognitive outcomes in aging, and in PD. However, this is the first RCT of positive airway pressure (PAP) therapy over a 6-month period, which shows this therapy is feasible in PD, and suggests benefit with respect to cognition and other outcomes. This has important implications for further research and clinical care of individuals with PD.

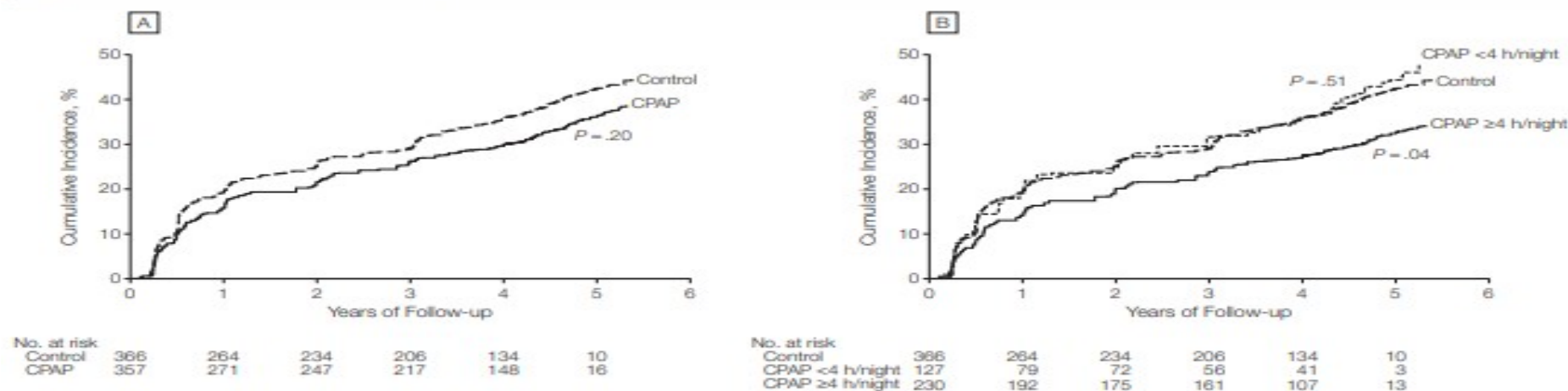
Pourquoi traiter le SAOS ?

Figure 2. Correlation Between Changes in 24-Hour Mean, Systolic, and Diastolic Blood Pressure and Number of Hours of Continuous Positive Airway Pressure Use



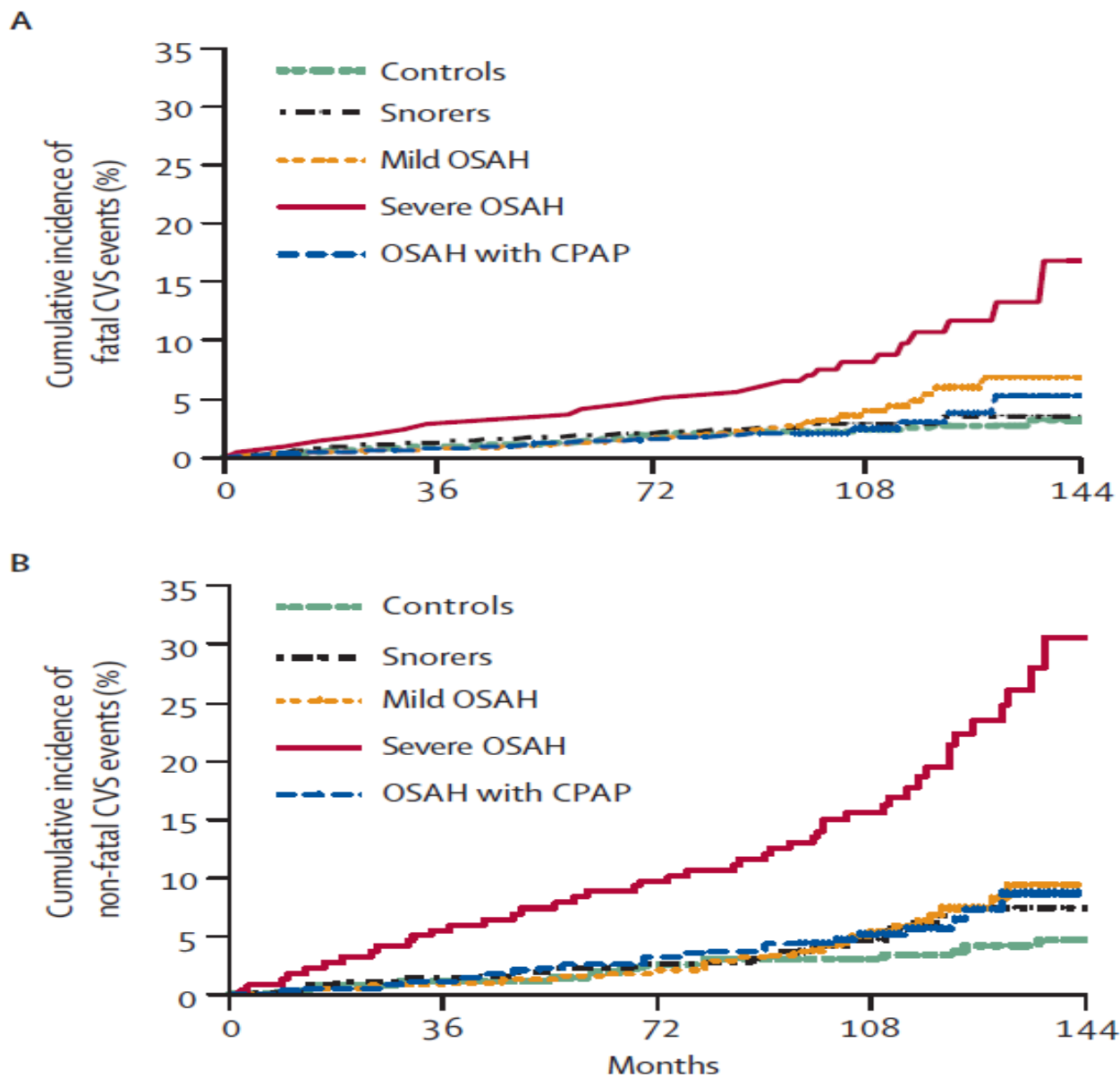
Correlation between continuous positive airway pressure (CPAP) use and change in blood pressure in the patients of the CPAP group who finished the follow-up.

Figure 2. Cumulative Incidence of Hypertension or Cardiovascular Events During Follow-up



A, Cumulative incidence of hypertension or cardiovascular events for the intervention groups during follow-up and the P value for the incidence density ratio of continuous positive airway pressure (CPAP) vs control (Wald test). B, Panel A with CPAP group stratified according to adherence (<4 vs ≥4 h/night) and the P values for their incidence density ratios in reference to the control group.

Pourquoi traiter le SAOS ?



Pourquoi traiter le SAOS ?

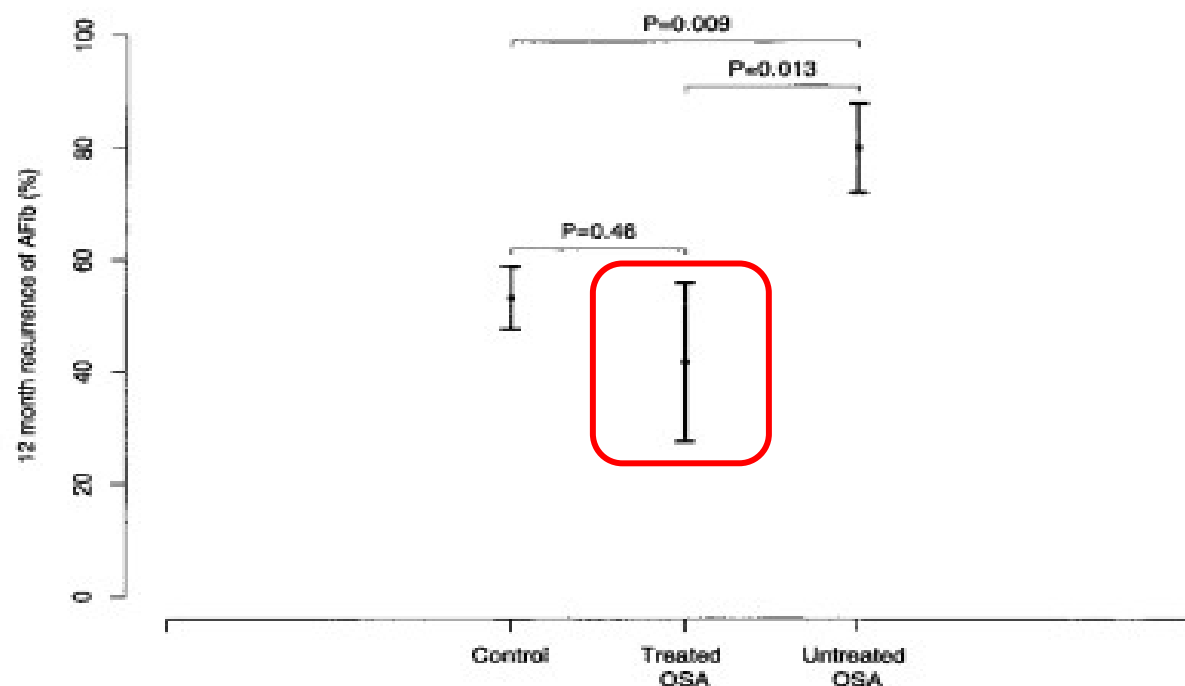


Figure 1. Recurrence of AF at 12 months comparing patients who did not have sleep studies (controls) with treated OSA patients and with untreated (including noncompliant) OSA patients (mean $\pm$ SD).

Take Home Messages

- Penser à un SAOS chez vos patients avec HTA/FA/synd métabolique, dépression, etc.
- Dépister par questionnaire et diagnostiquer par PG /PSG.

TABLE 7 Some take-home messages with clinical implications about obstructive sleep apnoea (OSA) and continuous positive airway pressure (CPAP) treatment in the elderly

- OSA prevalence increases with age
- Since it is not known what the cut-offs are in the apnoea–hypopnoea index and Epworth Sleepiness Scale that should be considered as pathological, these should be used as in younger individuals
- A clinical history that includes findings specific to elderly people must always be undertaken
- Sleepiness must not be considered a physiological situation in the elderly; however, it is not to be assumed that it must be associated with OSA
- The clinical picture of OSA in the elderly is different to that seen in younger patients; neurocognitive symptoms are especially prevalent
- Full polysomnography is the gold standard in the diagnosis of OSA in the elderly; however, simplified tests can be used in patients without important comorbidities
- Randomised clinical trials have demonstrated that CPAP is effective in symptomatic moderate-to-severe OSA patients
- It is not known what happens in extreme old age (≥ 80 years old) when compliance to CPAP is very low; therefore, a less aggressive approach may be appropriate when recommending treatment with CPAP

**I DON'T ALWAYS USE THE FORCE,
BUT WHEN I DO**



**I MAKE SURE MY CPAP IS
PLUGGED IN...**

memegenerator.net

Références

- R. Simon et Al Rev Med Suisse 2005; 1 :1556-60.
- J-P Rieder et Al Rev Med Suisse 2009; 1 :1660-9379.
- S. Vat et Al Rev Med Suisse 2013; 9 :2150-4.
- Geering S et Al Rev Med Suisse 2018; 14 :1751-4.
- Richard J Schwab et Al An official ATS statement :CPAP adherence tracking systems the Optimal Monitoring Strategies and outcome AJRCM 188 (5) :613-20.
- Eur Respir Mon 2010 ;50 :244-246.
- R.Heinzer et Al Prevalence of sleep-disorder breathing in the general population HypnoLaus study Lancet Resp Apr;3(4):310-8.
- Myers KA et Al JAMA 2013 ; 310:731.Daytime sleepiness,snoring,and SAS, Johns MW et Al Chest 1993;103:30Does this patient have SAS?:The rational Clinical Examination systematic review.
- Kapur et Al Clinical Practice Guideline for Diagnostic Testing for Adult Obstructive Sleep Apnea AASM Guidelines 2017.
- Multi-night Prevalence ,Variability, and Diagnostic Misclassification of Ostructive Sleep Apnea Bastien L.et Al Am J Resp Crit Care 2021.
- The Importance of Mask Selection on CPAP outcomes for OSA Ann Amer. Thoracic Soc Vol 17, No 10, oct 2020 ATS.
- Jean-Luis Pépin et Al CPAP Therapy termination Rates by OSA phenotype : A French Nationwide Database Analysis J.Clin. Med 2021,10, 936.
- B.Fleury et Al Traitement du SAHOS par OAM Rev Mal Respir 2010 ; 27 : S146-S156.
- Hypnolaus study Heinzer 2011 & Mador MJ, Prevalence of positional sleep apnea in patients undergoing PSG Chest 2005.
- Rev Med Suisse 2013; 9 :2150-4.
- Efficacy of the New Generation of Devices for Positional Therapy for Patients with Positional SAOS: A systematic Review of the Literature and Meta-Analysis Madeline J.L et Al J Clin Sleep Med 2017 Jun 15;13(6)813-824.
- M.Knauert et Al Clinical consequences and economic costs of untreated obstructive sleep apnea syndrome. World Journal of ENT (2015) 1, 17-27.
- Shein AS et Al CPAP reduces blood pressures in patients with OSA J Hypertens 2014;32:1762-1773. 31
- Calkins H et Al 2012 Heart Rhythm Society Task force on Catheter and Surgical Ablation of atrial fibrillation 2012 6 622-66