

# CMEO BriefCase

## More Than Just Sleepiness: Impact of EDS in Patients with OSA

*Supported by an educational grant from Axsome*

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# Learning Objective

Identify the QoL impact of persistent EDS in patients with OSA including those who are CPAP adherent.

# Virtual Visit

Meet Hector



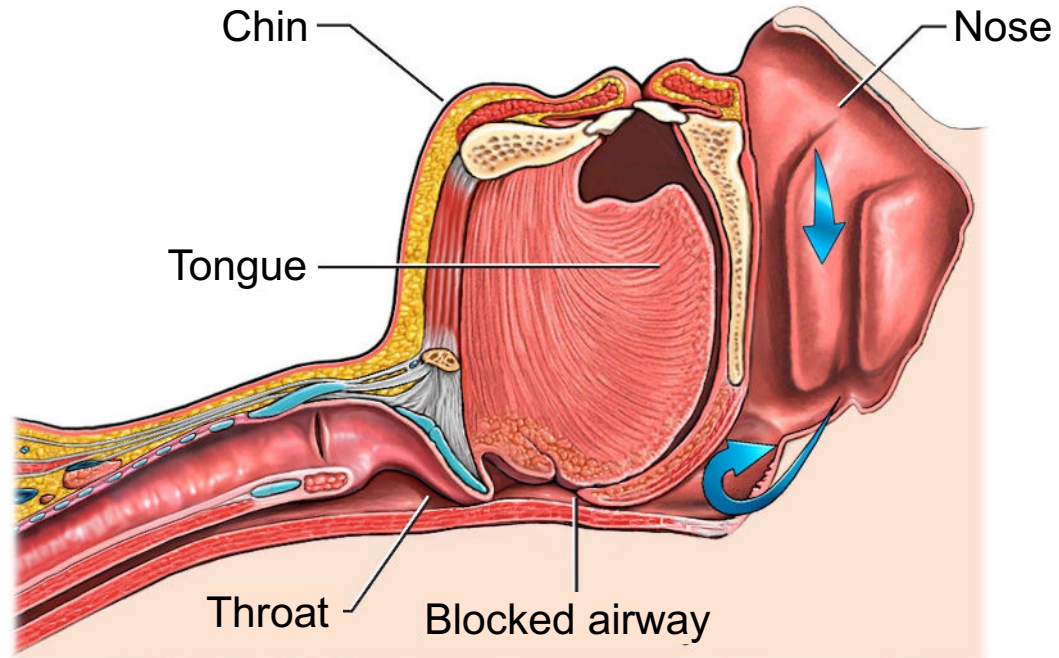
# Patient Case: Hector

- 51-year-old Black male with severe OSA initiated on CPAP 5 months ago
- Has caused damage to the workplace while operating heavy machinery at his work
- At baseline experienced heavy snoring, awakening 4-5 times a night with shortness of breath, cognitive impairment during the day that has worsened over the years
- Patient has experienced some relief with CPAP, improved focus at work, but still complains of sleepiness during the day
- Past medical history: obesity, HTN, GERD, T2DM
- Baseline AHI = 41 episodes/hour, current AHI = 6 episodes/hour, BMI = 33, ESS = 13, FOSQ = 14, BP = 138/86

AHI = Apnea-Hypopnea Index; BMI = body mass index; BP = blood pressure; CPAP = continuous positive airway pressure; ESS = Epworth Sleepiness Scale; FOSQ = Functional Outcomes of Sleep Questionnaire; GERD = gastroesophageal reflux disease; HTN = hypertension; OSA = obstructive sleep apnea

# Obstructive Sleep Apnea

- Episodes of complete (apnea) or partial collapse (hypopnea) of the upper airway
- Characteristics
  - Intermittent hypoxia
  - Loud snoring, choking, gasping during sleep
  - Fragmented, nonrestorative sleep
  - EDS



EDS = excessive daytime sleepiness

Slowik JM, et al. Obstructive sleep apnea. In: *StatPearls*. 2023. <https://www.ncbi.nlm.nih.gov/books/NBK459252/>. Image: Nucleus Medical Media. Nucleus Catalog Website. 2023. <https://catalog.nucleusmedicalmedia.com/obstructive-sleep-apnea-blocked-upper-airway/view-item?ItemID=3840>.

# Prevalence and Demographics of OSA

- 25%-30% of men
- 9%-17% of women
- Higher in Hispanic, Black, and Asian populations
- By age 50, women as likely as men to have OSA
- Obesity is common in OSA patients, but 30% are not



# Audience Response

**Which of the following is accurate regarding the pathophysiology of Hector's OSA-related EDS?**

- A.** Implementing naps into a patient schedule can decrease oxidative stress in patients with OSA-related EDS
- B.** Intermittent hypoxia and not sleep fragmentation leads to neuronal damage associated with OSA-related EDS
- C.** OSA-related EDS is a cause of chronic sleep fragmentation and not associated with brain injury
- D.** The primary driver of OSA-related EDS is neuronal damage in wake-promoting areas of the brain
- E.** I don't know

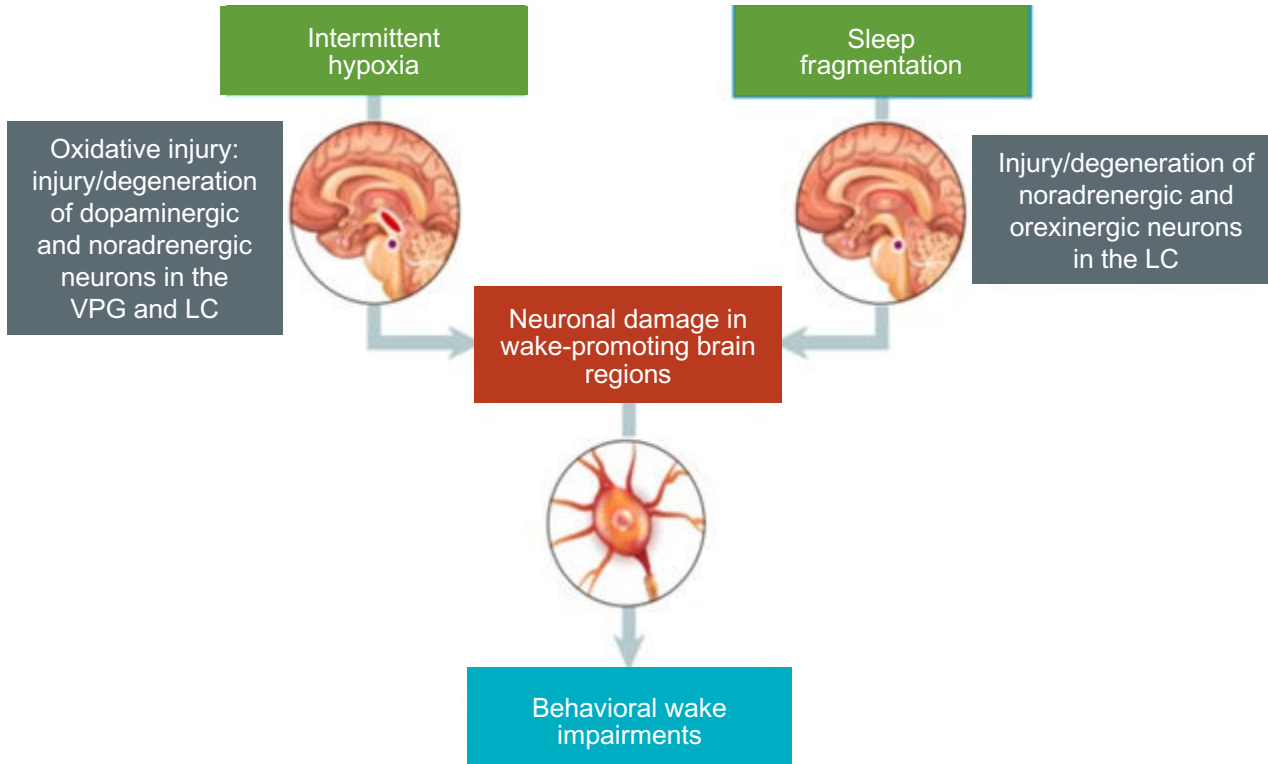


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# Pathophysiology of EDS in Sleep Apnea



- Mechanism of hypoxia
  - Upper airway obstruction: negative collapsing pressure during inspiration
  - Progressive expiratory narrowing in the retropalatal area
- Hypoxia during sleep causes injury to wake-promoting regions of the brain
- CPAP may reverse some of this damage over time

# Personal Impact of EDS

Depression and anxiety



Increased motor vehicle and occupational accidents



Attention and memory impairments



Impaired higher-order executive functioning



# Audience Response



**Which of the following is true regarding Hector's CPAP use?**

- A.** He is in the 5% of patients who experience EDS while stable on CPAP
- B.** Men experience EDS at a higher rate than women despite adherence to CPAP
- C.** Roughly 25% of patients such as Hector still have EDS after 5 months of CPAP use
- D.** If Hector is experiencing OSA-related EDS, it is most likely due to poor adherence or improper use of equipment
- E.** I don't know

# Audience Response



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# EDS and OSA

## CPAP is the gold standard for OSA

- 33%-50% of patients fail CPAP, continue struggle with OSA and EDS

CPAP unmet needs



- Over 25% of patients succeeding on CPAP by 5-month follow-up have residual EDS

CPAP success



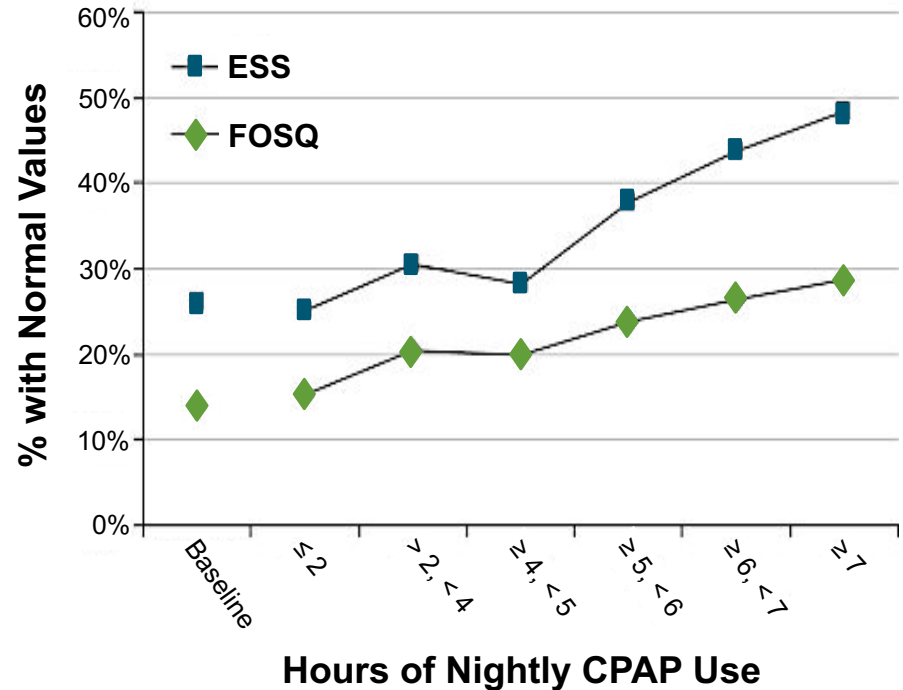
- Oral appliances (second-line therapy) are not associated with improvement in EDS

Oral appliances



# EDS Compared to CPAP Adherence

- CPAP use associated with decreased EDS
  - N = 95, 3-month study period
  - EDS defined as ESS  $\geq 10$
- Notable findings
  - 75% of patients using < 2 hours per night had EDS
  - 52% of patients using  $\geq 7$  hours per night had EDS



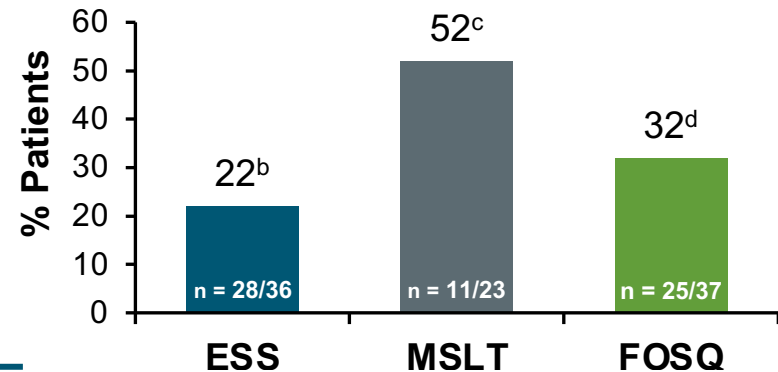
# Excessive Sleepiness May Persist Despite $\geq 6$ Hours CPAP Use per Night

- Despite adequate treatment with CPAP, patients with OSA still have residual EDS
- In a multicenter trial (n = 128 patients with AHI  $\geq 15$ ), patients with OSA were treated with CPAP for 3 months and assessed for sleepiness before and after airway treatment using:
  - Self-reported ESS and FOSQ
  - Clinically-derived MSLT



For patients reporting  $\geq 6$  hours of CPAP use per night, **based on MSLT (n = 23), more than half of participants** continued to experience EDS

Percent Patients Failing to Achieve a Normal Score With  $\geq 6$  Hours CPAP Use per Night for 3 Months<sup>a</sup>



<sup>a</sup>Evaluated in patients with pre- and post-treatment assessments who had abnormal pretreatment values

<sup>b</sup>Subjective EDS defined as ESS ( $> 10$ )

<sup>c</sup>Objective EDS according to MSLT sleep latency  $< 7.5$  min

<sup>d</sup>Functional impairment defined as FOSQ  $< 17.9$

MSLT = Multiple Sleep Latency Test

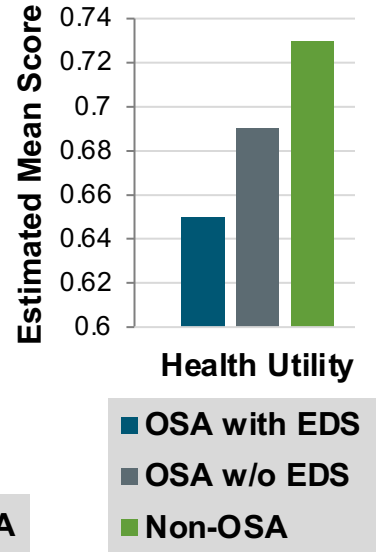
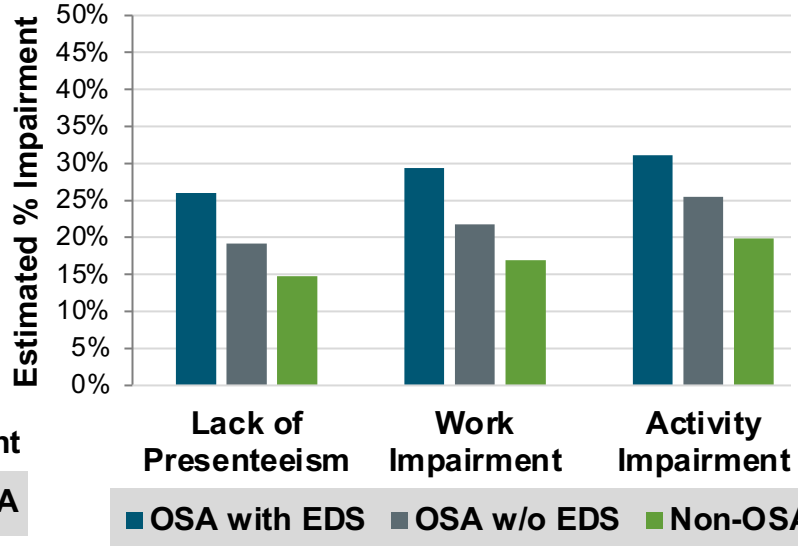
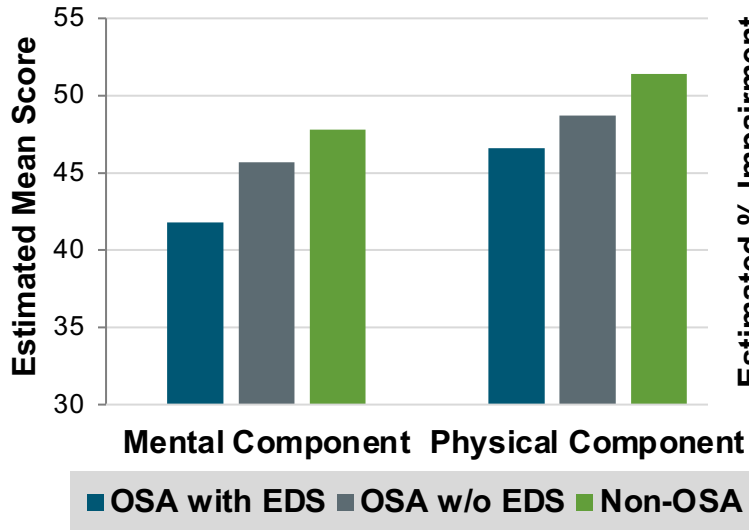
Foster SN, et al. *Sleep Breath.* 2020;24(1):143-150. Weaver TE, et al. *Sleep.* 2007;30(6):711-719.



# Health-Related Quality of Life (HRQoL) of Patients with OSA and EDS

## U.S. National Health and Wellness Survey

OSA with EDS (n = 731)    OSA without EDS (n = 1,452)    Non-OSA controls (n = 86,961)  
 HRQoL Outcomes (all  $p < .01$ )

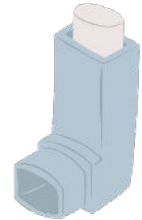
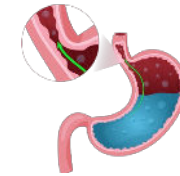


w/o = without

Stepnowsky C, et al. *J Clin Sleep Med.* 2019;15(2):235-243.

# Comorbidities in Patients with OSA-associated EDS

- U.S. National Health and Wellness Survey Revisited\*
  - **Depression:** 62.4% vs. 48.0%
  - **GERD:** 39.0% vs. 29.4%
  - **Asthma:** 26.3% vs. 20.7%
  - **Angina:** 7.8% vs. 6.7%



\*OSA with EDS group compared to the OSA without EDS group ( $p < .05$ )  
Stepnowsky C, et al. *J Clin Sleep Med.* 2019;15(2):235-243.

# Common Comorbidities in OSA



## Multimorbidity and overall comorbidity of sleep apnea: a Finnish nationwide study (n = 3,223,399)

- 63% of patients with OSA had multimorbidity vs. 38% of general population
- 34% of patients with OSA had 4 or more comorbidities vs. 14% of general population

T2DM = type 2 diabetes mellitus

Palomäki M, et al. *ERJ Open Res.* 2022;8(2):00646-2021.

# Patient Case: Hector

- 51-year-old Black male with severe OSA initiated on CPAP 5 months ago

How can we positively  
impact Hector's  
QoL?



Which comorbidities are  
concerning regarding  
Hector?



How do we approach  
Hector's EDS?



What are our  
next steps?



# SMART Goals

Specific, Measurable, Attainable, Relevant, Timely

- Acknowledge that EDS may persist despite adherence to CPAP in patients with OSA
- Develop a heightened awareness of the impact of EDS on HRQoL, encompassing its consequences on professional performance, psychological and social well-being, and cognitive functioning
- Distinguish comorbidities in patients that are associated with OSA-related EDS and their significance in relation to a patient's long-term health

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2

Treatment Factors:  
What Should Be Driving  
My Treatment Decisions?

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3

Tailoring Therapy to Fit  
the Whole Patient with  
OSA-associated EDS

[www.cmeoutfitters.com/sleep-disorders-hub/](http://www.cmeoutfitters.com/sleep-disorders-hub/)

# Sleep Disorders Hub

Free resources and education to educate health care professionals and patients on sleep disorders

<https://www.cmeoutfitters.com/sleep-disorders-hub/>

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