Sleep Disorders

MOA

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Conflict of Interests

- I acknowledge I have no conflicts of interest with the presentation and subject matter presented

Agenda and Objectives

- What are sleep disorders other than Obstructive Sleep Apnea?
- What is the objective of treating a sleep disorder?
- If not treated, what are the possible consequences of a lack of treatment?
- What tools can be used when you are suspicious of a sleep disorder?
- Can Obstructive sleep apnea be diagnosed only with a questionnaire?
- If a home sleep apnea test is ordered, what are you able to diagnose?
- How do you determine the compliance of the use of the equipment?
- Is your medical record including your suspicion? And why?

Variety of sleep disorders

1. Insomnia
2. Sleep Apnea
3. Restless leg syndrome
4. Narcolepsy
5. Parasomnias

Insomnia

Sleeplessness –difficulty falling asleep or staying asleep for a desired amount of time

Restless legs syndrome

1. Willos-Ekbom syndrome is a neurological syndrome which does not allow the legs to rest while sleeping. Periodic limb movements occur when awake, involving the legs or arms, with voluntary jerking. This is not restless leg syndrome. Underlying health conditions contributing to this are iron deficiency anemia or kidney disease. Neurologist believe the symptoms of restless leg syndrome may be due to how the body handles Dopamine.

Narcolepsy

1. A chronic neurological disorder that doesn't regulate sleep, mainly affects REM sleep. REM sleep is Rapid Eye Movement accompanied by low muscle tone throughout the body and with the propensity of the sleeper to dream vividly. The core body temperature increase s and skin temperature decreases to lowest values. For the first 90 minutes in humans, REM sleep alternates with non-REM sleep, with marked physical changes beginning with electrical bursts called "ponto-geniculo-occipital waves, originating in the brain stem, occurring 4 times in a 7 hour sleep duration. During this time, central homeostasis is suspended allowing fluctuations in respiration, thermoregulation and circulation which do not occur in any other modes of sleep or waking.

Parasomnias

1. Involve abnormal movements, behaviors, emotions, perceptions, and dreams that occur while falling asleep, sleeping between sleep stages or during arousal from sleep. These dissociated sleep states are partial arousals during the transitions between wakefulness, NREM sleep and REM sleep and their combinations.
2. Henri Roger 1932 (French researcher)

Parasomnia

This nomenclature derived from the Greek word ‘para’ meaning beside Latin term ‘somnus’ sleep.

Parasomnia	Adults lifetime prevalence in %	Children prevalence in % (under 15 years of age)
NREM		
Sleepwalking	22.4	17.0
Confusional arousal	18.5	17.3
Sleep terror	10.4	6.5
Sleep-related eating disorder	4.5	
Sexual act during sleep/sexsomnia	7.1	
REM		
REM behavior disorder	15.0	
Sleep-related groaning/Catathrenia	31.3	
Nightmare	66.2	10-50

Treatment

Psychotherapy can be helpful in most NREM parasomnias. Benzodiazepines are the mainstay of management for most persisting parasomnia. Clonazepam is highly effective in the dose of 0.25 to 1 mg in preventing arousals and REM sleep dissociations. For RBDs, clonazepam and melatonin are found to be highly effective. Imipramine, levodopa, carbamazepine and pramipexole have been tried in the past but with limited success in the management [30].

Clinical assessment

- As clinicians, it is crucial to understand the characteristics of various parasomnias and address them with detailed sleep history and essential diagnostic approach for proper evaluation.
- It is also important to rule out other possible differentials such as nocturnal seizure disorder, psychiatric disorders like post-traumatic stress disorder (PTSD), panic attack and psychogenic spells that can mimic parasomnias.


Cureus. 2018 Dec 31;10(12):e3807. doi: 10.7759/cureus.3807

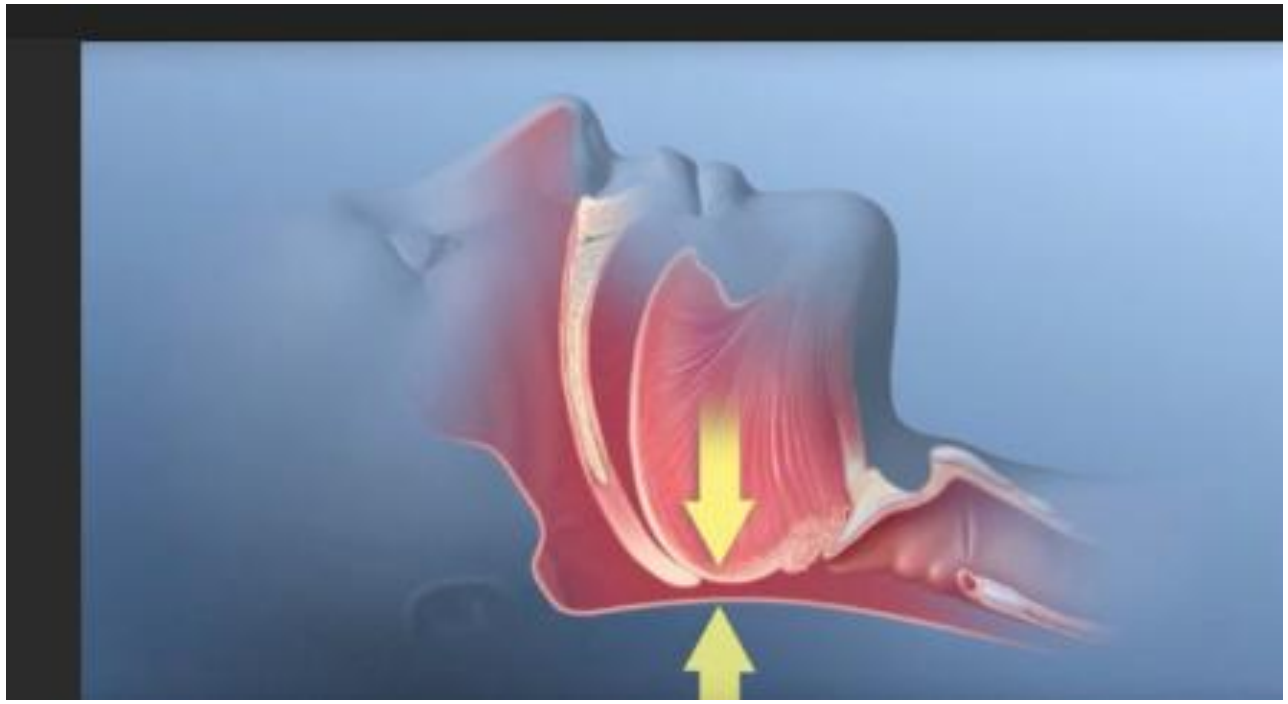
Parasomnias: A Comprehensive Review

Shantanu Singh [1], Harleen Kaur [2,✉], Shivank Singh [3], Imran Khawaja [1]

Sleep Apnea

1. Two types: Central and Obstructive
2. Central occurs when the brain fails to send signals to the proper muscles that control breathing
3. Estimated that 10 % of adults suffer from sleep apnea
4. Obstructive sleep apnea occurs when the muscles in the back of the throat relax and obstruct the airway. This does not only include obesity, but also non-obesity, women and men, but also in women, who are menopausal. As a result of this obstruction, oxygen level s will drop. Your brain senses that and you can't breathe, which may awaken you, but you don't recall the event.

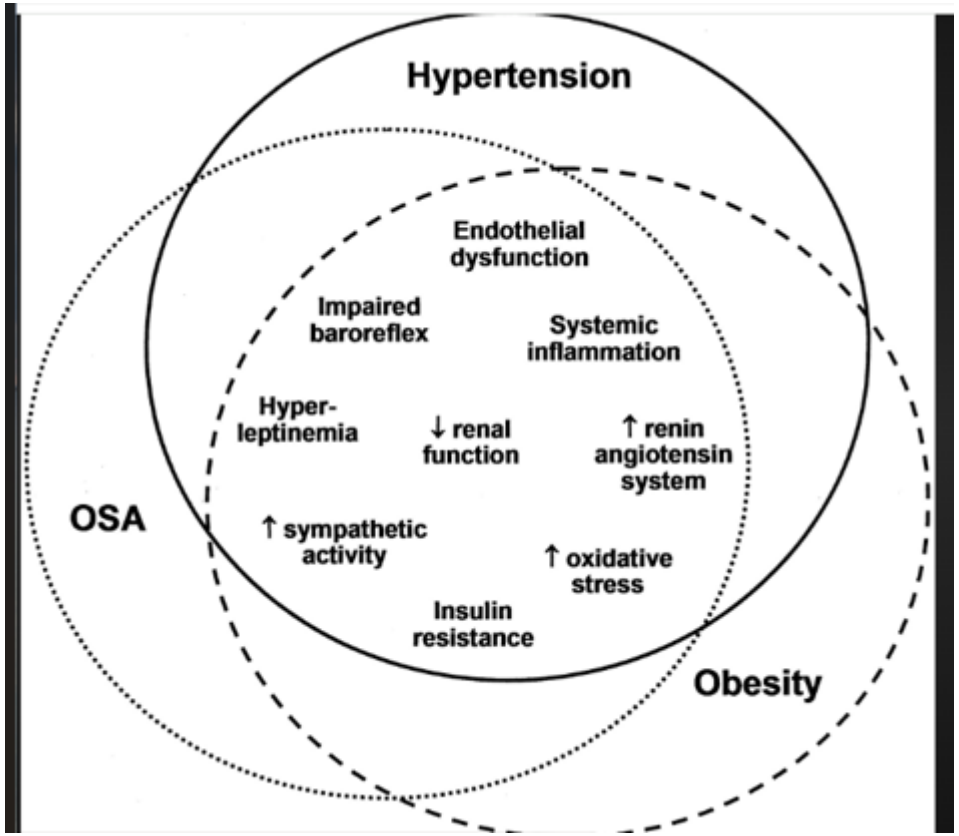
OSA



Why do we treat this diagnosis?

1. Comorbidities and consequences

How are these related?



Relationships

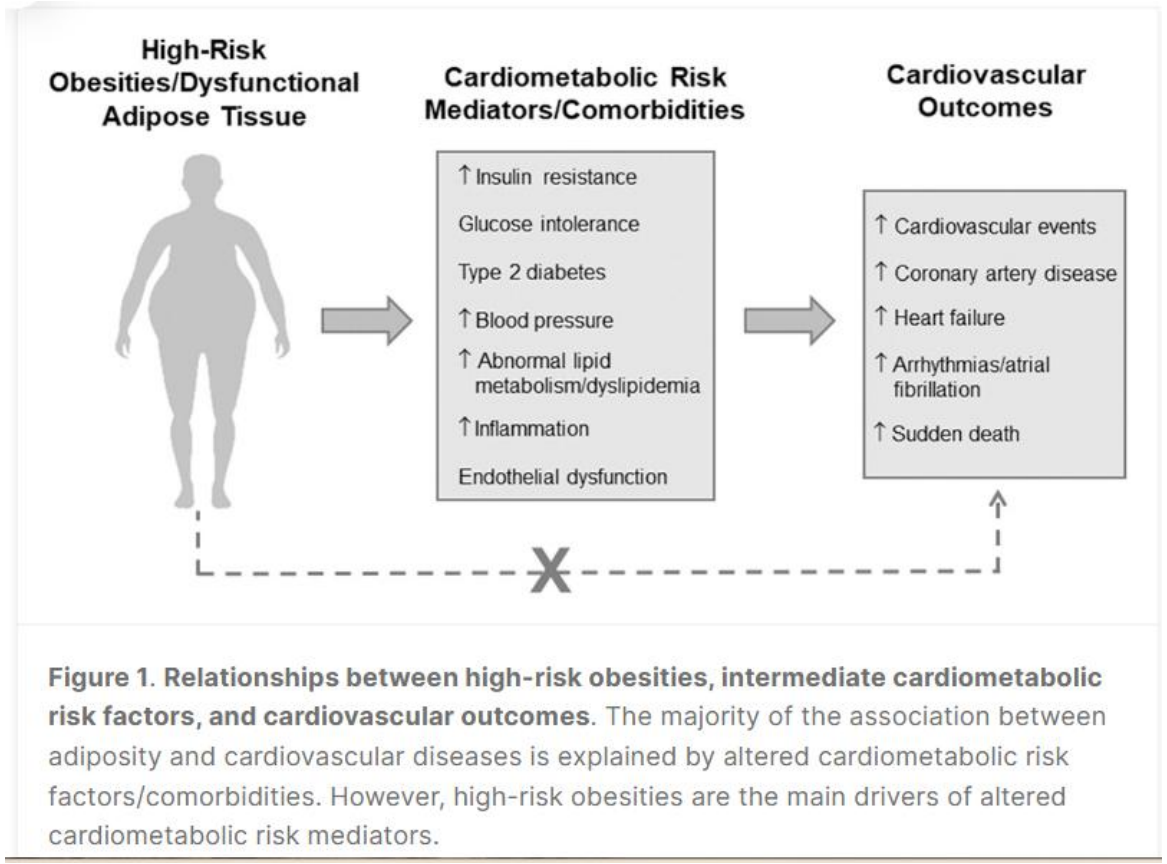
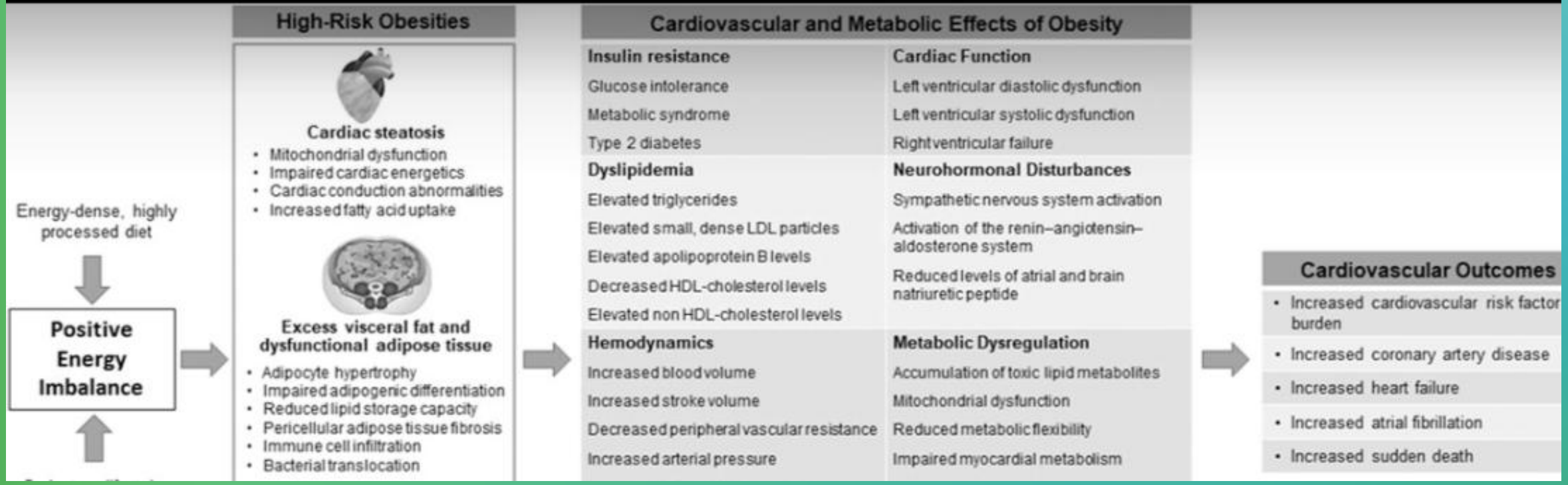


Figure 1. Relationships between high-risk obesities, intermediate cardiometabolic risk factors, and cardiovascular outcomes. The majority of the association between adiposity and cardiovascular diseases is explained by altered cardiometabolic risk factors/comorbidities. However, high-risk obesities are the main drivers of altered cardiometabolic risk mediators.

CK TO ARTICLE

Figure 5. Cardiovascular and metabolic consequences of high-risk obesities. The inherited inability of some low-risk adipose depots to store excess triglycerides is an important driver of excessive adipose tissu...



Obesity Phenotypes, Diabetes, and Cardiovascular Diseases

Marie-Eve Piché, André Tchernof, and Jean-Pierre Després | AUTHOR INFO & AFFILIATIONS

Circulation Research • Volume 126, Number 11 • https://doi.org/10.1161/CIRCRESAHA.120.316101

OTC

Small Clinical Trial: Nutroslim Pep19 Reduces Visceral Fat, Improves Sleep

Sep 29, 2025 | Over-the-Counter Treatments | 0 | ☆☆☆☆☆

•Physiological Effect

•Hypoxia: Repeated episodes of reduced oxygen levels during sleep can lead to systemic inflammation and oxidative stress.

•Sympathetic Activation: Obstructive sleep apnea triggers increased sympathetic nervous system activity, contributing to elevated blood pressure and heart rate.

•Research indicates that greater severity of obstructive sleep apnea correlates with a diminished GLP-1 response to glucose tolerance. These results suggest a potential mechanism by which obstructive sleep apnea, and consequently sleep deprivation, impacts glucose metabolism. Further research is warranted.

Obstructive sleep Apnea

1. Obstructive sleep apnea (OSA) is a highly prevalent sleep disorder, characterized by recurrent upper airway obstruction during sleep, resulting in intermittent hypoxia, increased sympathetic activation, and sleep deficiency.

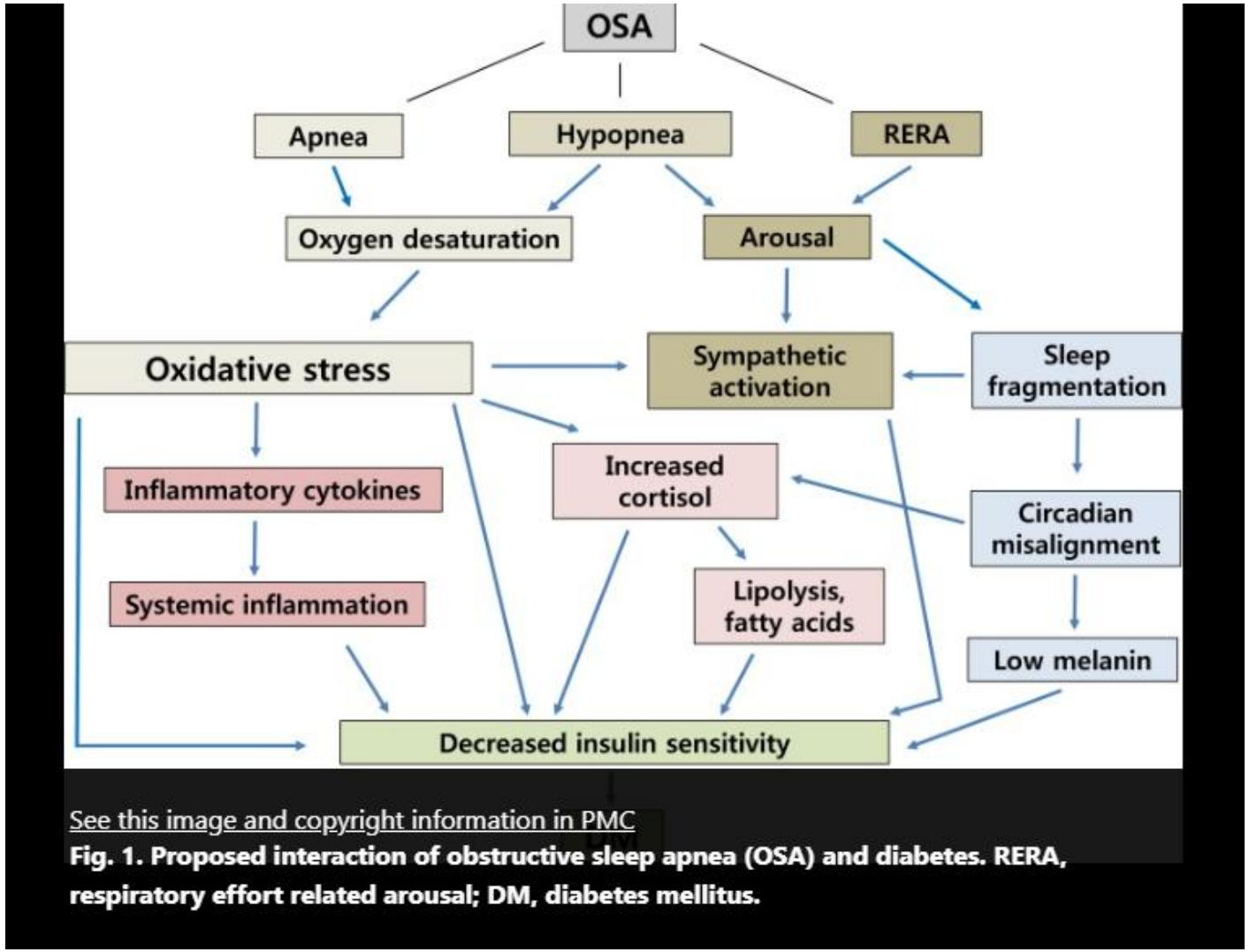


Fig. 1. Proposed interaction of obstructive sleep apnea (OSA) and diabetes. RERA, respiratory effort related arousal; DM, diabetes mellitus.

1. Observational studies indicate that OSA is a strong risk factor for the development of hypertension and diabetes. Moreover, clinical and experimental studies support a causal role of OSA in hypertension and impairments in glucose metabolism, beyond excess weight.

1. There are many evidence of reports that OSA is associated with diabetes with a bidirectional correlation. A possible causal mechanism of OSA to diabetes is intermittent hypoxemia and diabetes to OSA is microvascular complication. However, OSA and diabetes have a high prevalence rate in public and shares the common overlap characteristic and risk factors such as age, obesity, and metabolic syndrome that make it difficult to establish the exact pathophysiologic mechanism between them.

1. Metabolic Consequences of Obstructive Sleep Apnea Especially Pertaining to Diabetes Mellitus ad Insulin Sensitivity. Diabetes Metabolism J. 2019 Apr;43(2):144-155

Clinical Suspicion

Excessive daytime fatigue, unrestfull sleep, snoring and gasping for air, nocturnal wakening

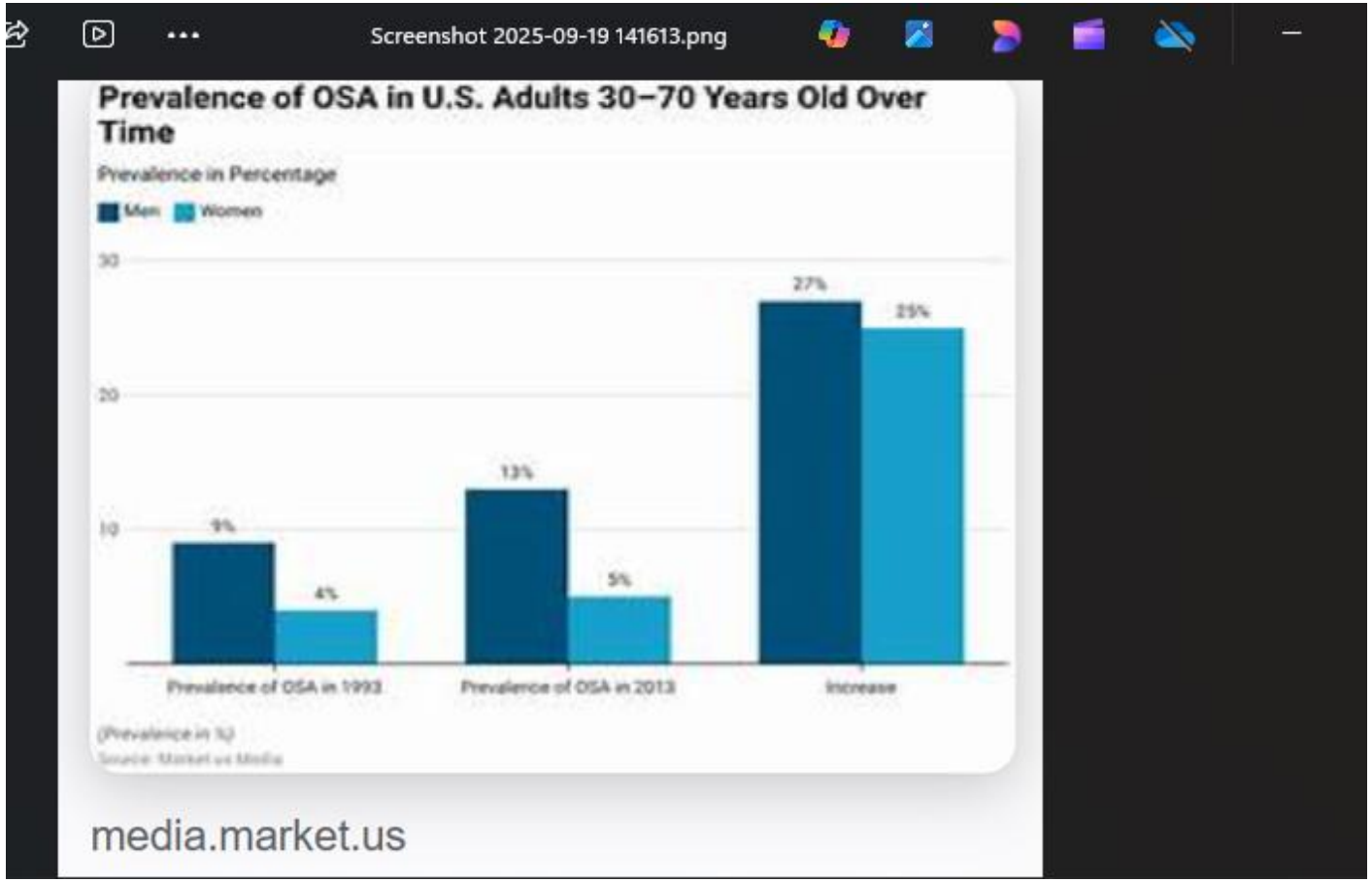
Screening Questions attached- American Academy of sleep Medicine

Central Sleep Apnea

If suspected an in lab polysomnogram is indicated. The home sleep test is only indicated for moderate to high suspicion of Obstructive sleep apnea.

Treatment may include a PAP machine, oxygen therapy, phrenic nerve stimulation, or medication. Treatment of the medical condition contributing to the central sleep apnea may include treatment of CHF, or a higher altitude.

What is happening?



Prevalence

1. Total of 80.6 million individuals were estimated to be living with OSA in the US in 2024, of whom 47,623,848 (59%) were males and 32,967,117 (41%) females. This translates to 32.2% overall prevalence in the US among adults aged 20 years and older, with 39% males and 25.8% females, adjusting for obesity. The AHI severity distribution was estimated to be 61% mild, 24% moderate, and 15% severe.

2. Conclusion

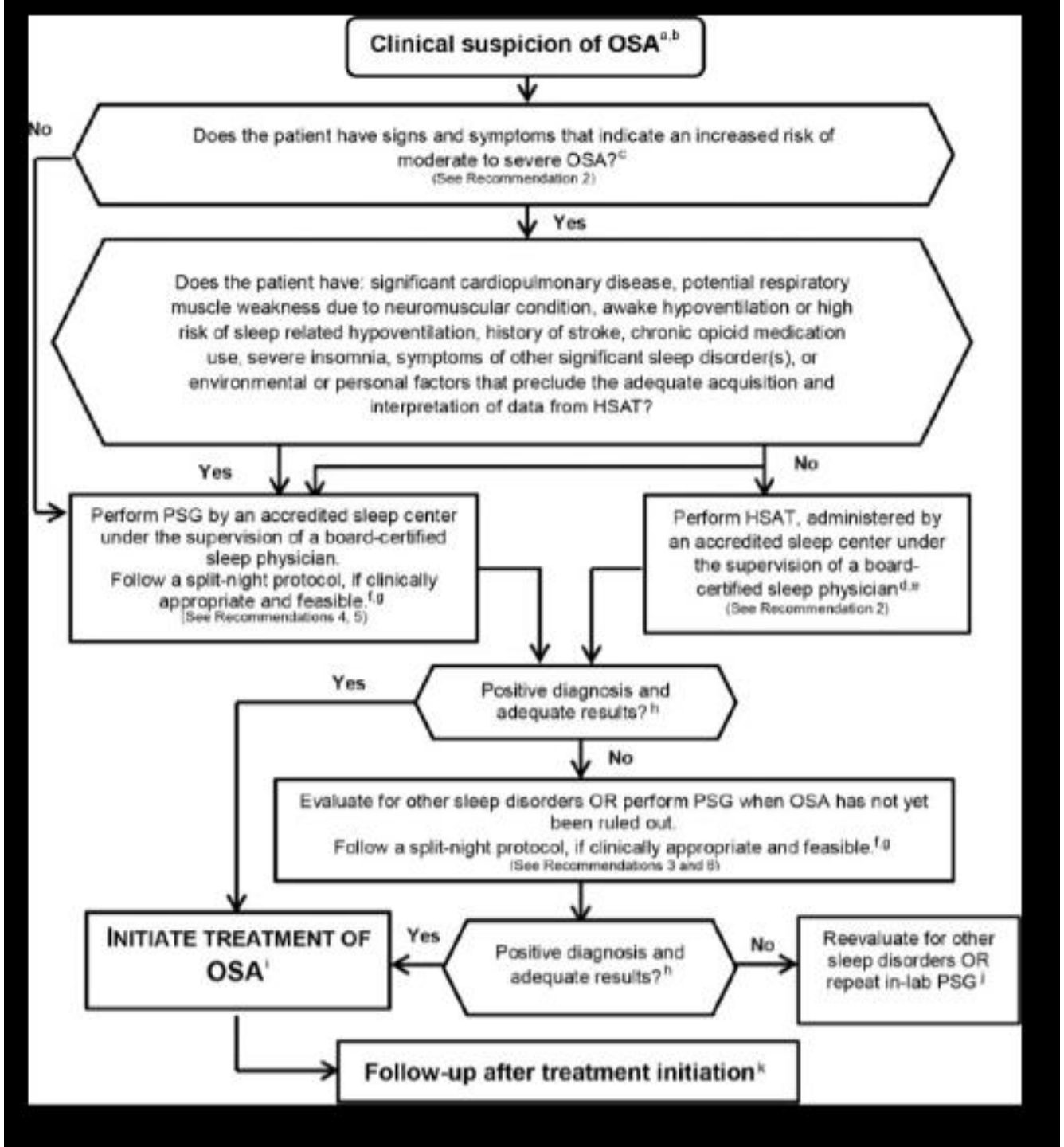
3. Our findings indicate that OSA is highly prevalent among US adults. Despite its substantial prevalence, OSA remains largely undiagnosed, highlighting the urgent need for improved screening and diagnosis as well as greater awareness about the chronic and serious complications of untreated OSA.

4. *Reference: Sleep*, Volume 48, Issue Supplement_1, May 2025, Pages A277–A278, https://doi.org/10.1093/sleep/zsaf090.0635
Published: 19 May 2025

- **A 65% relative increase in OSA prevalence among women, reaching 30.4 million by 2050**: The sharp rise, attributed to factors like an aging population and underdiagnosis, underscores the need for greater awareness of how OSA presents differently in women to support earlier screening, diagnosis, and targeted treatment.
- **A 19% relative increase in OSA prevalence among men, reaching 45.9 million cases by 2050**: This continued rise reflects ongoing risk in aging male populations, highlighting the need for scalable diagnostic pathways and long-term treatment strategies.

Risks Factors

1. Although nonobese individuals may suffer from OSA, obesity is the main epidemiologic risk factor. Indeed, increases in body mass index, central accumulation of adipose tissue, and neck circumference are strong predictors of disease (4). Further, the prevalence of OSA is two to three times greater in men than in women (3, 5, 6) and in older individuals (≥65 yr) compared with middle-aged individuals (30–64 yr) (7).
2. Proc Am Thorac Soc. 2008 Feb 15;5(2):144-153.doi:10.1513/pats.200207-114MG



VK Kapur, DH Auckley, S Chowdhuri, et al. Clinical Practice Guideline: Diagnostic Testing OSA

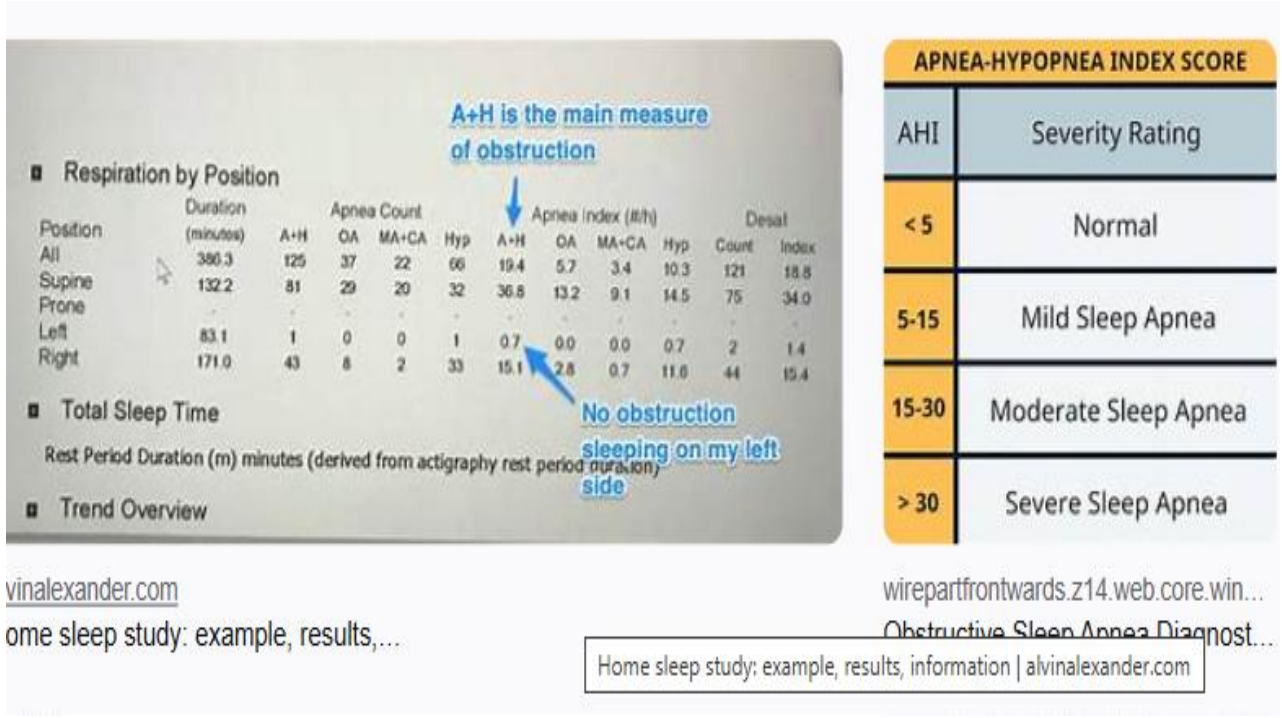
Why do we treat it?

1. Consequences of untreated OSA can increase the risk of cardiometabolic disease which can include myocardial infarctions, strokes, atrial fibrillation, heart failure, diabetes, uncontrolled hypertension, and sudden cardiac death . The economic cost of the results of untreated OSA actually increases the cost of healthcare overall.
2. The quality of life for poor sleep quality is daytime sleepiness, depression, irritability, impatience, automobile accidents from the drowsiness and decrease alertness.

Diagnosis

1. American Academy of Sleep Medicine has specific guidelines strongly recommended that a diagnosis of OSA should not be made only with questionnaires, but with an accompanying HSAT (home sleep apnea test) or a polysomnogram.
2. Contraindications to a HSAT are a diagnosis of heart disease, dysrhythmia, COPD on or off oxygen, use of narcotics, movement disorder or restless leg syndrome, seizures even if controlled, neurological disorder and inability to operate or manage the home testing device.
3. Apnea-Hypopnea Index results: <5 is normal
    - 5-15 Moderate
    - >30 Severe
    - Oxygen Desaturation (3%) change

Apnea – Hypopnea Index



Gold Standard Treatment

1. CPAP, APAP, BiPAP (All patient should be offered CPAP device initially)
2. CPAP compliance : CPAP compliance is generally defined as using a CPAP machine at least four hours a night during at least five nights in a week. Unfortunately, nearly half of people prescribed a CPAP machine use their device less than four hours each night. Even in those who previously had good CPAP compliance, symptoms of OSA can return after just one or two nights of insufficient use.
3. www.sleepfoundation.orgTrusted

Alternative treatments

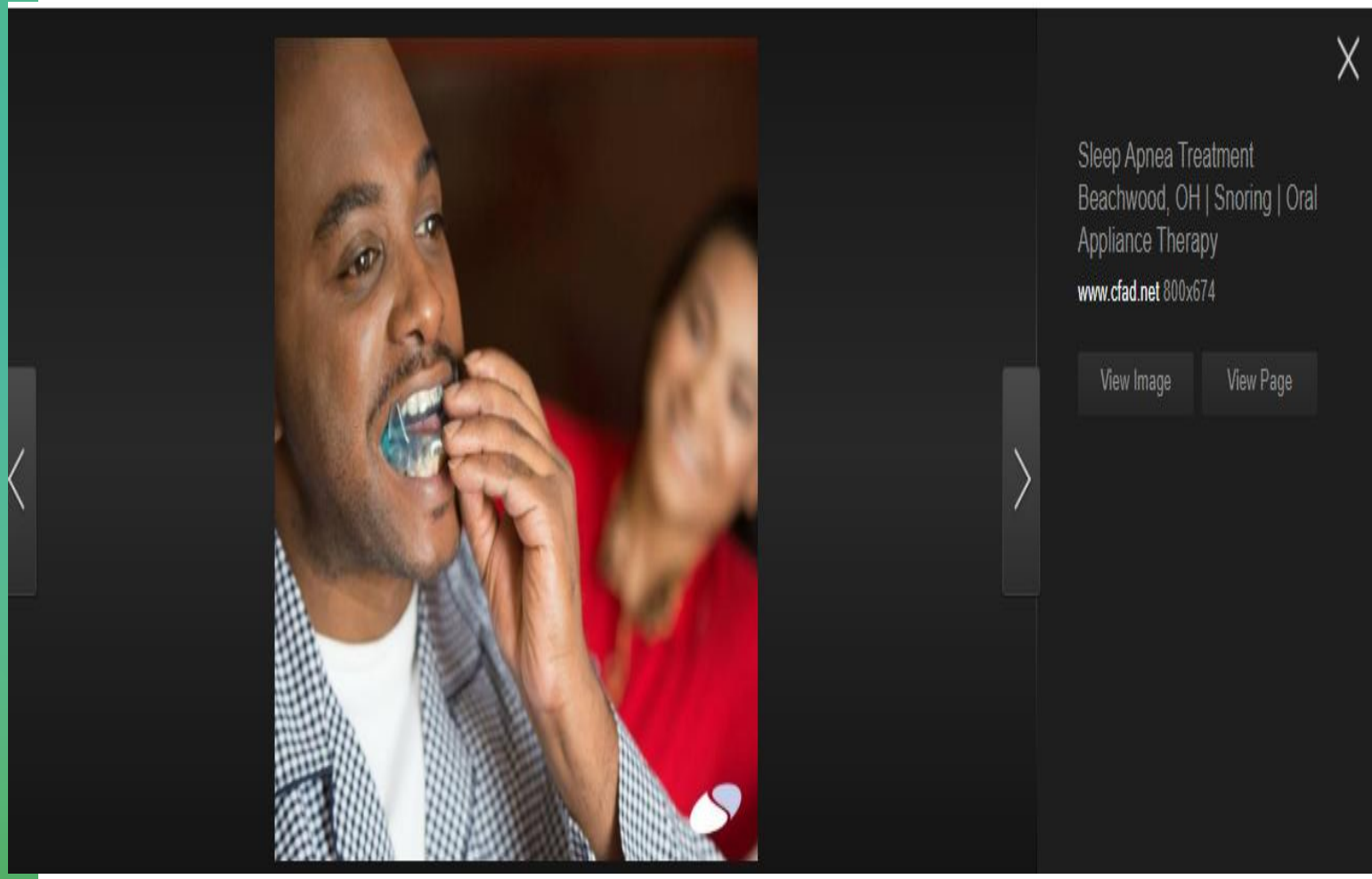
1. Surgical and non surgical treatments
2. Patient should be informed that surgical procedures are not always effective, if they have moderate to severe obstructive apnea.
3. If obesity is present, weight loss is recommended. The pharmacotherapy with Tirzepetide has been FDA approved but the mechanism is still weight loss. There are some employers who have chosen to exclude treatment with Tirzepetide for OSA. Currently there is one study which supports this. Nova Nordisk may be developing a broader range for treatment by it's SGLP agonist Wegovy for other related conditions.

Alternatives continued

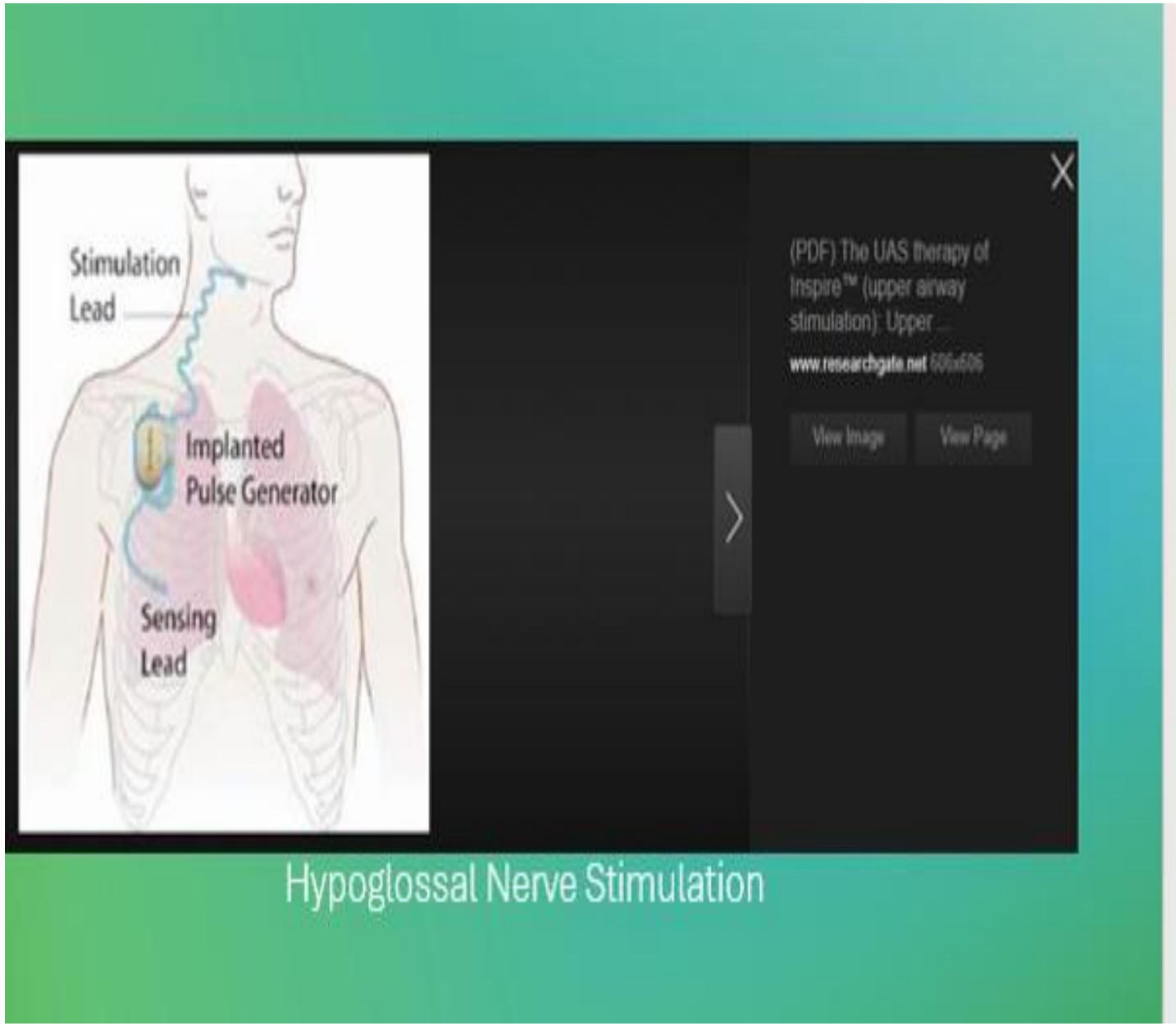
1. Oral appliances are recommended only for mild OSA. They should not be considered for severe OSA.
2. Inspire, require a 90 minute surgery with an implant which is activated remotely by the patient . It works by activating the hypoglossal nerve that moves your tongue. It pushes your tongue forward so it's out of your airway when you breathe. The FDA had approved this now for up to a BMI of 40. AHI up to 100(nerve stimulation device)
3. Alternative treatments for sleep apnea include lifestyle changes, such as weight loss and positional therapy, as well as surgical options like uvulopalatopharyngoplasty (UPPP) and maxillomandibular advancement (MMA).

4. Reference: Inspiresleep.com; FDA.gov

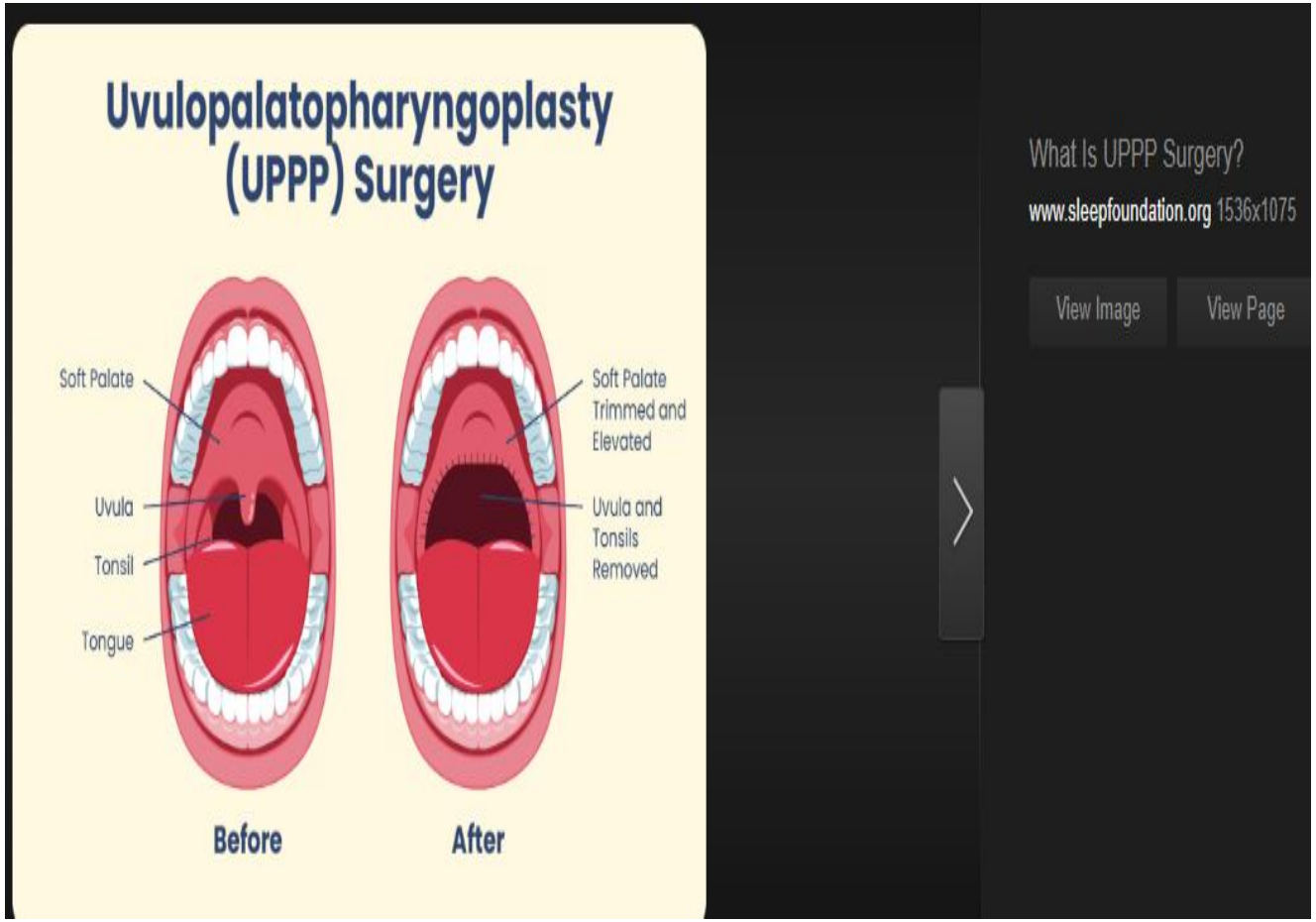
Oral dental appliance (advancement of the mandible)



Hypoglyossal Nerve Stimulation Procedure



UPPP surgery



My question

1. How Effective is UPPP Surgery for Sleep Apnea?
2. Although **uvulopalatopharyngoplasty** is effective for snoring (76-90% success rate), according to the American Academy of Sleep Medicine, the efficacy of UPPP surgery for sleep apnea is much lower.
3. In *Surgical Management of Sleep Apnea and Snoring* book, the author mentions that surgical UPPP success is claimed if your apnea hypopnea index AHI drops by 50% after the surgery.
4. So, if your **AHI is now 20** - which means you have moderate sleep apnea - a surgical success would leave you with an **AHI of 10**, which equates to mild sleep apnea and you still need a treatment afterwards (CPAP).
5. The problem with these *success rates* is that they are usually determined by a sleep study many weeks post surgery (3 to 6 months). If your sleep apnea is not completely treated, it will deteriorate from the mild form (right after surgery) to moderate (from 3 months to 5 years).

Take home points

1. Moderate and Severe OSA requires treatment to reduce risk of cardiometabolic disease
2. Weight gain can drive the development of OSA, but not always
3. CPAP is the gold standard treatment and should be attempted in moderate to severe OSA
4. When intolerant of CPAP surgical and non surgical alternatives can be considered
5. CPAP intolerant patients may require multimodality and multiple disciplinary care to ensure adequate treatment
6. Check with your insurer for coverage prior to procedures

Any questions