

Obstructive Sleep Apnea

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Declarations

- I have no Financial entanglements with any of the topics that are discussed today.

Objectives

- Define Obstructive sleep apnea (OSA)
- Treatment consideration for OSA
 - Positive airway Pressure
 - Oral Mandibular device
 - Inspire - hypoglossal nerve stimulator
 - Positional therapy
 - Weight loss
 - Surgery

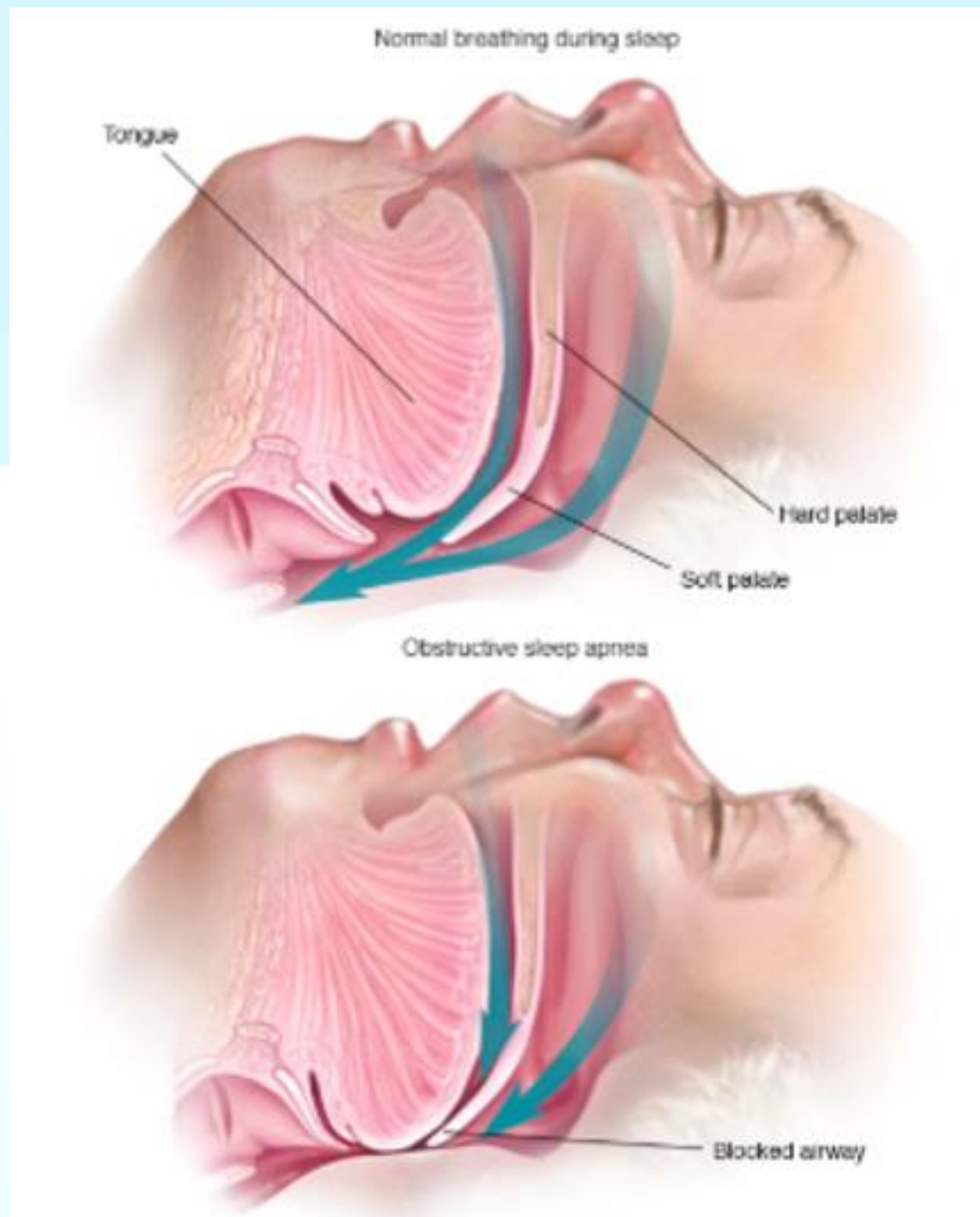
OSA

- Prevalence 15%
- Risk Factors
 - Obesity
 - Older age
 - Male
 - Post menopause females risk equal rate in men
 - Craniofacial differences and upper airway abnormalities

OSA definition

- A reduction of airflow (hypopnea) or cessation of airflow (apnea) while sleeping leading to an arousal of sleep and or a desaturation event
- OSA is diagnosed with a sleep study
 - Polysomnogram
 - Home sleep study
- These tests can determine the AHI (apnea-hypopnea index)
 - Mild 5-15
 - Moderate 15-30
 - Severe 30 or more

Anatomy of OSA



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Case Presentation

- 51 year old with daytime fatigue, non restorative sleep and who's wife states he snores and gasp for air occasional while sleeping
- Fortunately she has used her phone to make recording of her husband so he knows what he sounds like and gets it addressed
- No other complicating medical history
- Completes home sleep study
 - Moderate Sleep Apnea with an AHI 19

Treatment

Decision to treat

- OSA is associated with daytime fatigue, headaches, delayed mental acuity
 - Risk of increased accidents
 - Cardiovascular effects
 - Hypertension Peppard et al - Prospective study of the association between sleep-disordered breathing and hypertension. N Engl J Med. 2000;342(19):1378
 - CAD -Marin JM et al, Lancet. 2005;365(9464):1046.
 - Afib - next slide
 - Heart Failure CPAP increased LVEF 9% - Hla KM et al Sleep. 2015;38(5):677. Epub 2015 May 1.
 - Stroke Decrease risk of CVA in patient treated with PAP - Kim Y et al. PLoS ONE 2016
 - COPD Treatment with CPAP improved survival and decreased hospitalization. - Marin JM Am J Resp Crit Care Med 2010
 - Sudden Cardiac Death -N Engl J Med. 2005 Mar;352(12):1206-14.

OSA and Atrial Fibrillation

- Presence of OSA increased risk of A fib from 1% to 5%
- Prevalence in AHI > 10 is 58%
- AHI > 40 is 70%
- Mehra R et al: Association of nocturnal arrhythmias with sleep-disordered breathing: The Sleep Heart Health Study. *Am J Respir Crit Care Med*. 2006;173(8):910. Epub 2006 Jan 19.

OSA and Atrial Fibrillation

- Patient with A fib and untreated OSA are less likely to maintain sinus rhythm after cardioversion - Lavergne F et al. J Thorac Dis 2015
- CPAP may reduce the occurrence of paroxysmal A Fib and increase the success of the cardioversion - Abe H et al. Heart Vessels 2010
- Recurrence of A fib after cardioversion with CPAP 82% vs 42% - Kanagala R et al. Circulation 2003

OSA and Pulmonary Hypertension

- Pulmonary hypertension
 - OSA moderate to severe can develop Pulm HTN
 - Treatment can reduce pulmonary artery pressure up to 5 mmHg

Back to our case

- Treatment for OSA
- Positional Therapy
- Weight loss
- Oral mandibular device
- Nasal EPAP
- Surgery
- Hypoglossal nerve stimulator
- PAP

OSA

- Positional Therapy
 - Mild AHI: Device that prevents you from the supine position
- Weight loss
 - 10% reduction in weight associated with a 26% decrease in AHI
 - - Peppard PE et al. JAMA 2000
 - Tirzepatide - N Engl J Med 2024;391(13)1193
 - 50% reduction in the AHI vs placebo

OSA

Oral Mandibular Device

- Indicated in mild to Moderate OSA
- Needs referral to Dentist to make device
- Usually tolerated well, can develop TMJ pain
- Portable and quiet
- Usually costly upfront for the patient

OSA

Nasal EPAP

- Bongo brand name
 - <https://bongorx.com/>
-
- Indicated in mild to Moderated

Surgery

- Maxillomandibular Advancement
 - Rates of surgical success and cure 85% to 40%
- Multilevel upper airway surgery
 - Combined palatal and tongue surgery reduced AHI and sleepiness in severe OSA

Surgery

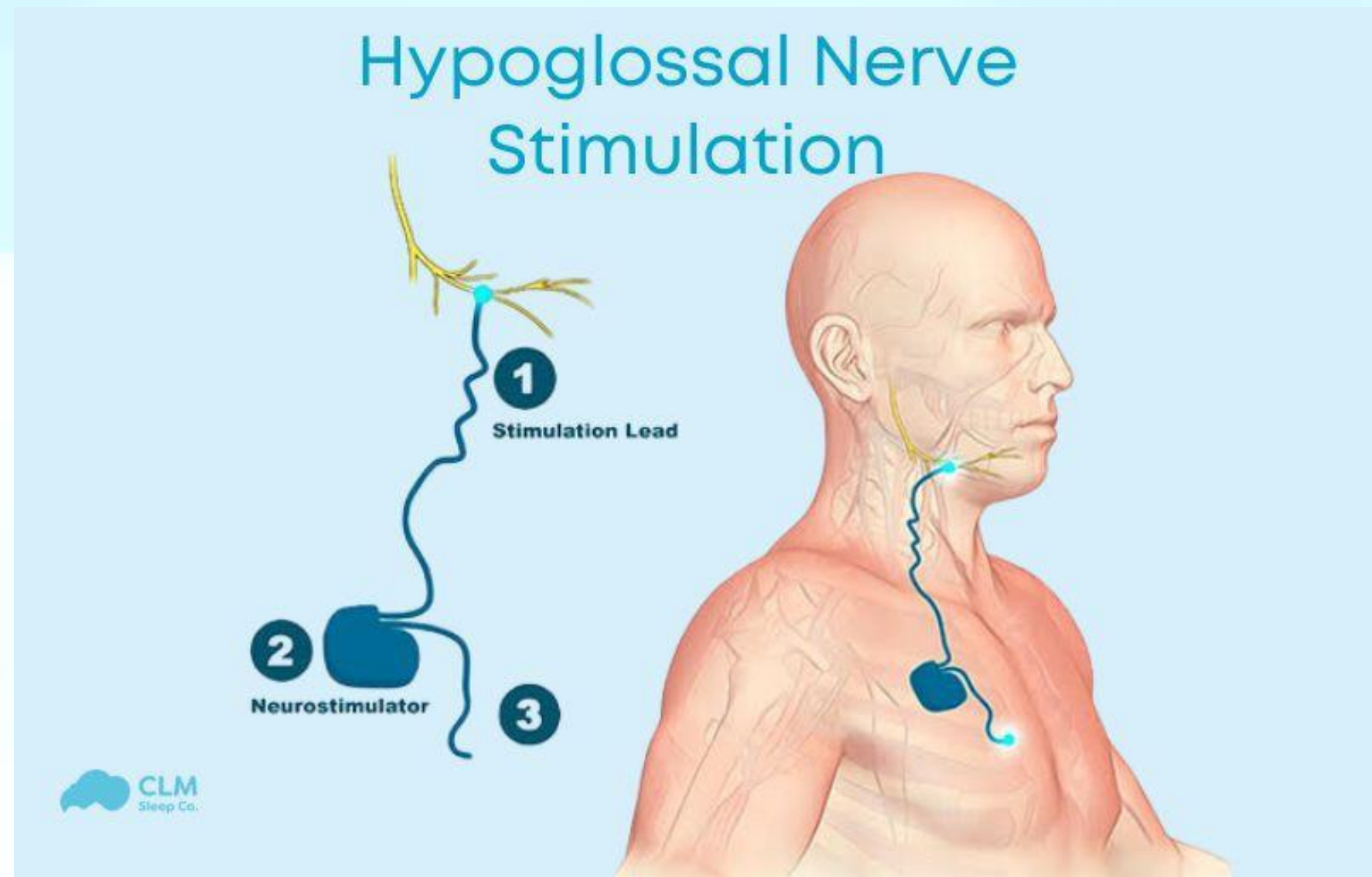
- Tracheostomy
 - Treat patients by bypassing the obstruction

Hypoglossal Nerve Stimulator

- An implantable pulse generator that allows synchronization of neurostimulation with the initiation of inspiration
- Indicated currently as a second line treatment for patient who fail PAP therapy
- BMI less than 40, insurance companies limit BMI less than 35
- Moderate to severe OSA AHI > 15

Hypoglossal Nerve stimulator

- <https://www.clmsleep.com/obstructive-sleep-apnea-treatment/>



Hypoglossal Nerve Stimulator

- STAR Trial - N Engl J Med. 2014;370(2):139
 - Moderate to Severe COPD
 - AHI decreased 29.3 to 9
 - 2/3 success defined by a 50% reduction in AHI to below 20

Positive airway pressure

- CPAP
 - Continuous Positive airway pressure
 - Generally set to a single pressure
 - Auto CPAP has a range of pressure that adjust from a range of pressure
 - Bilevel
 - IPAP and EPAP setting
- ASV

Positive airway pressure

- Goals of PAP
 - Decrease AHI
 - Get a download from the device
 - Improve symptoms of OSA
 - Daytime Fatigue
 - Improve outcomes in other conditions

Positive airway pressure

- Follow up:
 - 30-90 days after starting PAP
 - Download from the device
- Evaluate the course of treatment
 - Identify any barriers to treatment
 - Mask comfort/leak

Thank You

- Questions