

Obstructive sleep apnea

Its effect on hypertension

Disclaimer

- The author declare no conflict of interest to introduce this article.

Introduced by

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Obstructive sleep apnea syndrome

OSAS

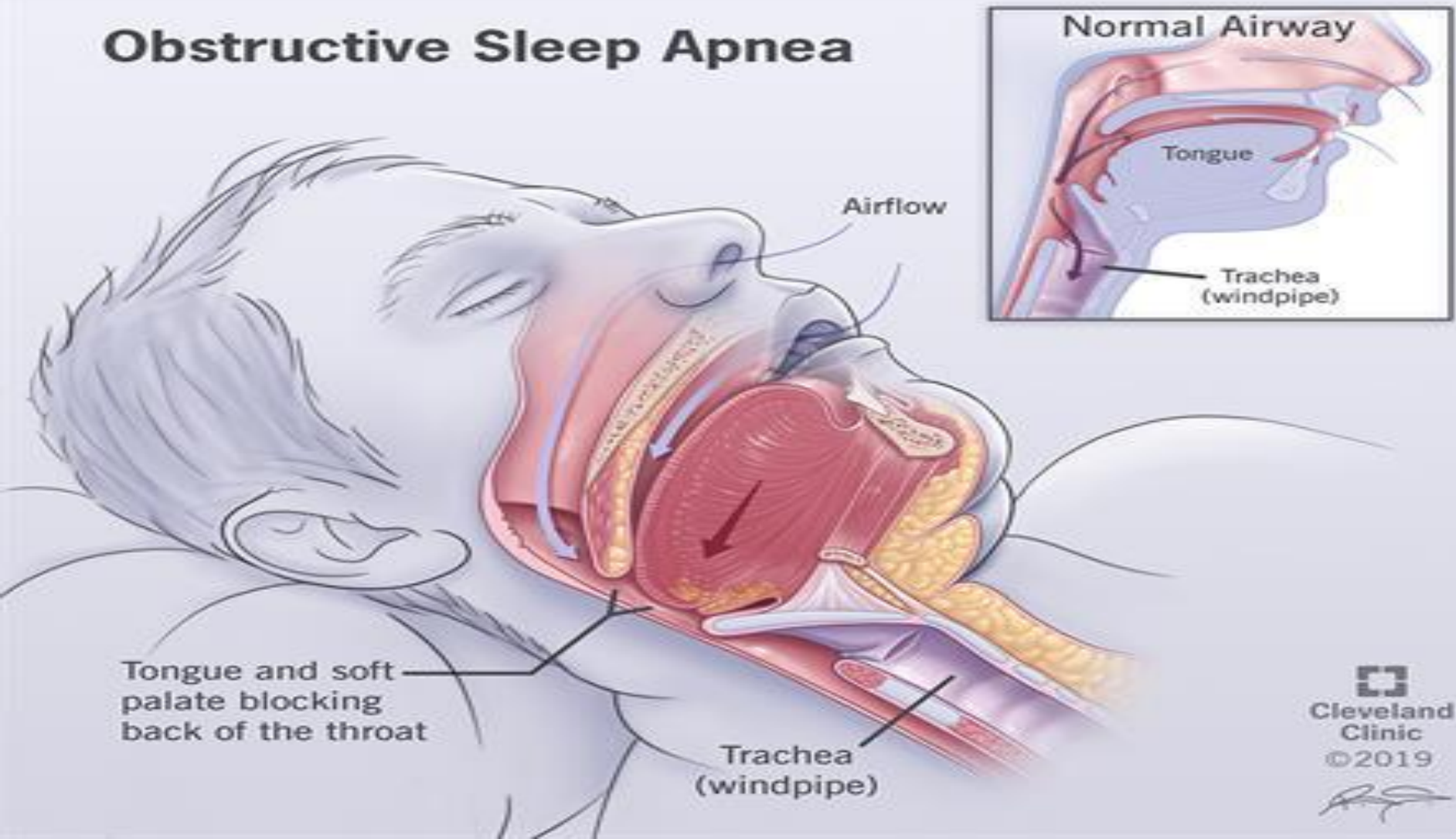
- The most common type of apnea is obstructive sleep apnea
- The most common sleep-related breathing disorder
- It causes repeatedly stop and start breathing while in sleep.
- It has many systemic complications including cardiovascular system.

How it occur

- occurs in 25% of men and nearly 10% of women
- can affect people of all ages particularly people over the age of 50 and those who are overweight
- large neck and structural abnormalities reducing the diameter of the upper airway, such as nasal obstruction, a low-hanging soft palate, enlarged tonsils or a small jaw with an overbite
- soft tissue in the rear of the throat collapses during sleep.

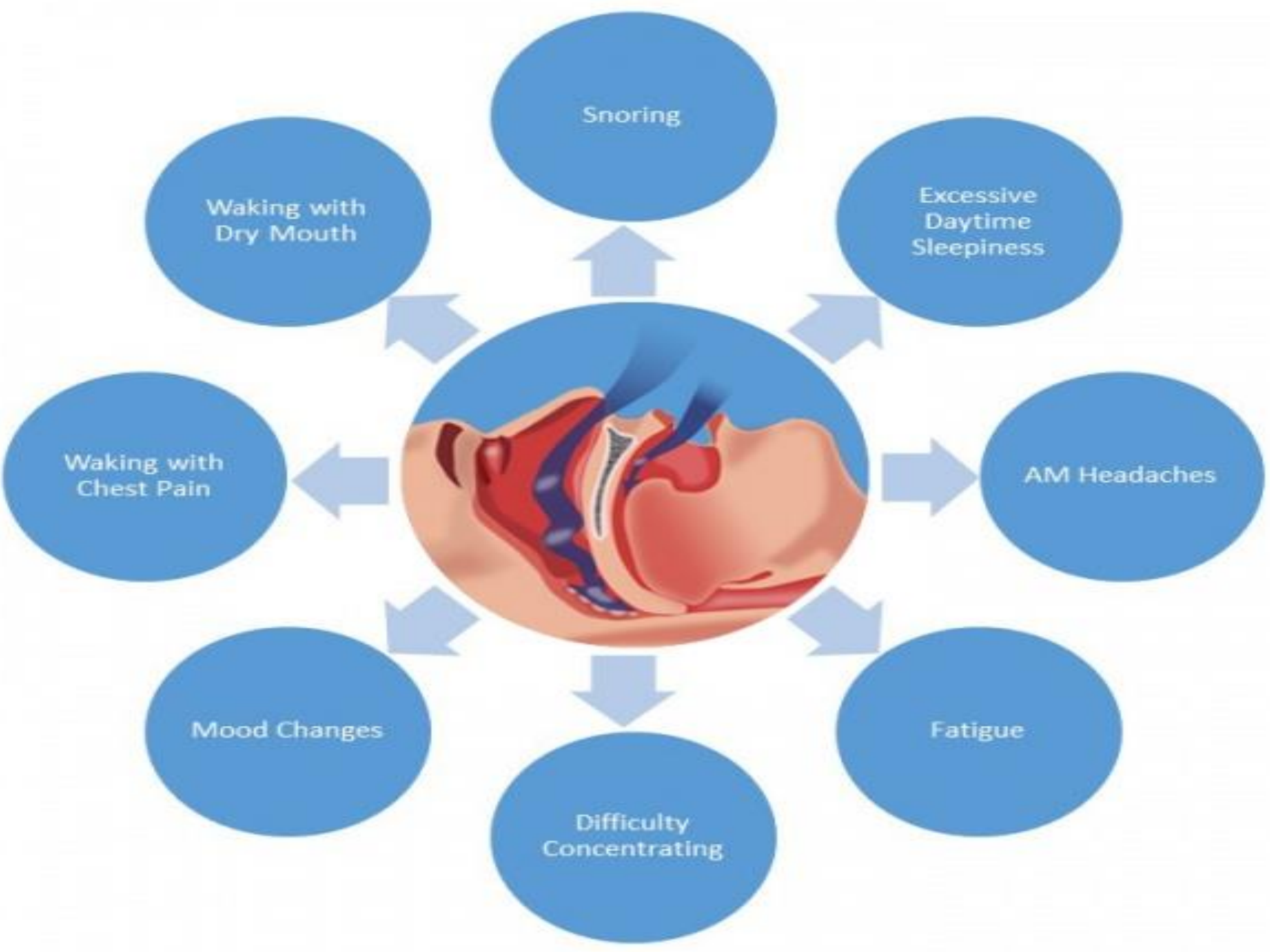
Patho-physiology

Obstructive Sleep Apnea



Clinical features of OSAS

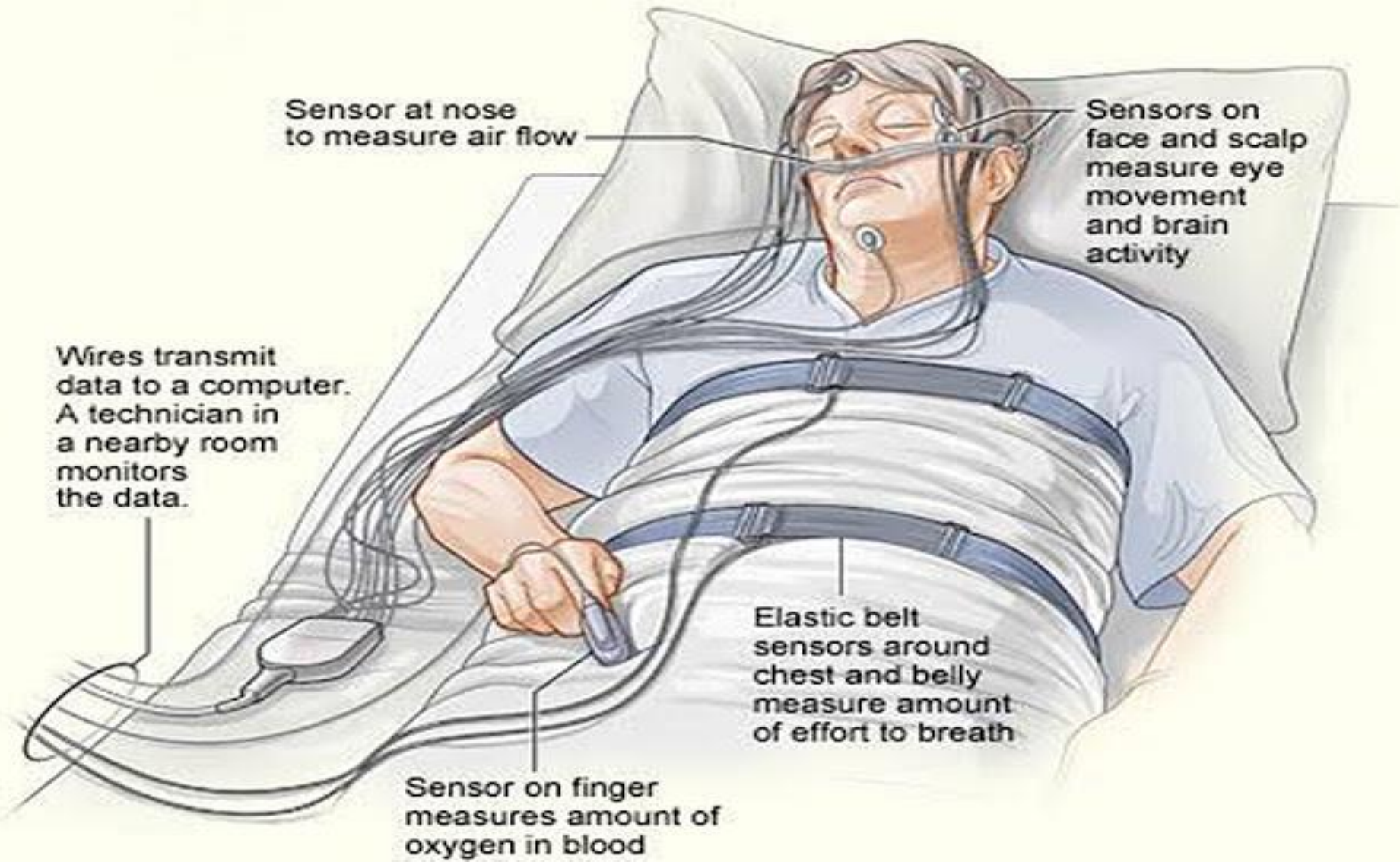
- Snoring
- Restlessness during sleep, frequent nighttime Sudden awakenings with a sensation of gasping or choking
- Daytime sleepiness or fatigue
- Cognitive impairment, such as trouble concentrating, forgetfulness or irritability
- sleeping positions, such as sleeping on the hands and knees, or with the neck hyper-extended
- Excessive sweating at night.



Diagnosis of OSAS

- Sleep evaluation by sleep specialist
- Testing includes an overnight sleep study called a polysomnogram (PSG)
- Home Sleep Test (HST)
- It's not used for patients with significant medical problems (such as heart failure, moderate to severe cardiac disease, neuromuscular disease or moderate to severe pulmonary disease)

polysomnogram (PSG)



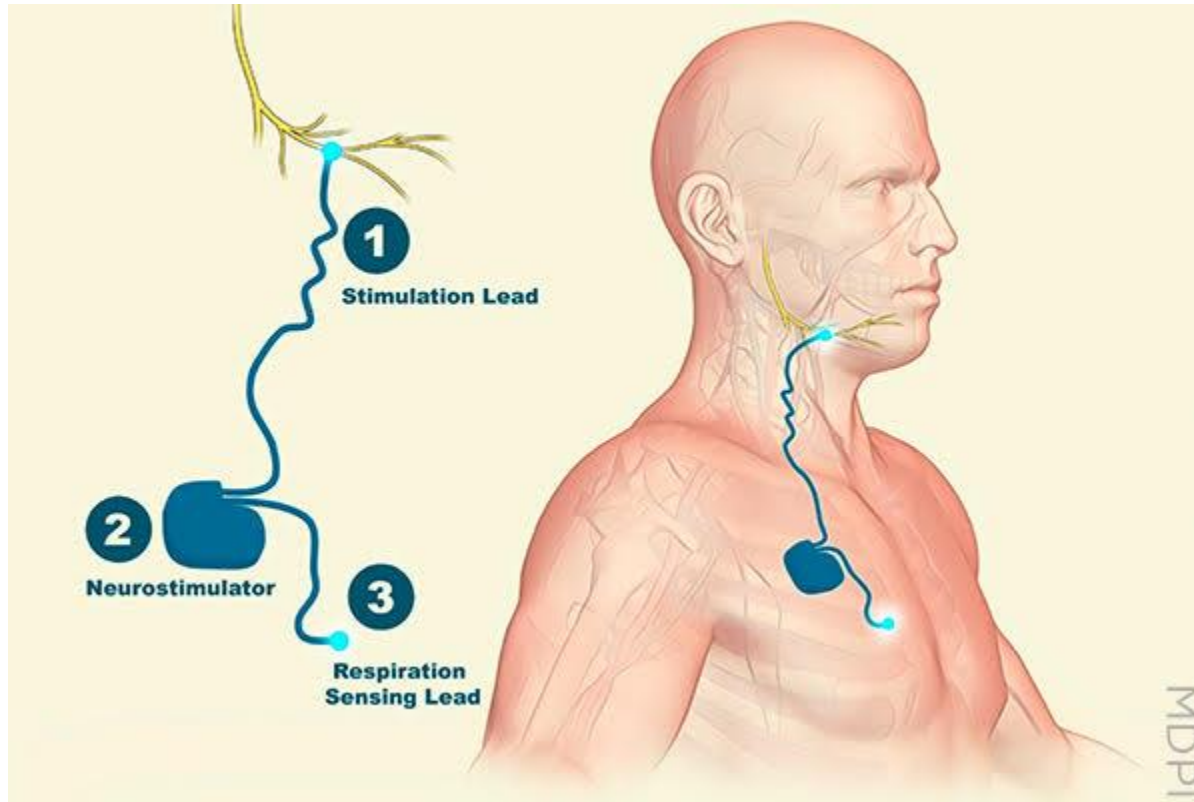
Treatment

- Conservative treatment by: Weight reduction, avoid alcohol and sleeping pills, treatment of sinuses and nasal congestion, avoid sleep on back and avoid sleep deprivation
- Mechanical therapy by CPAP, Bi PAP

Mandibular Advancement Devices



Hypoglossal nerve stimulator



Surgery

- **Somnoplasty**
- **Tonsillectomy**
- **Uvulopalatopharyngoplasty (UPPP)**
- **Mandibular/maxillary advancement surgery**
- **Nasal surgery.**

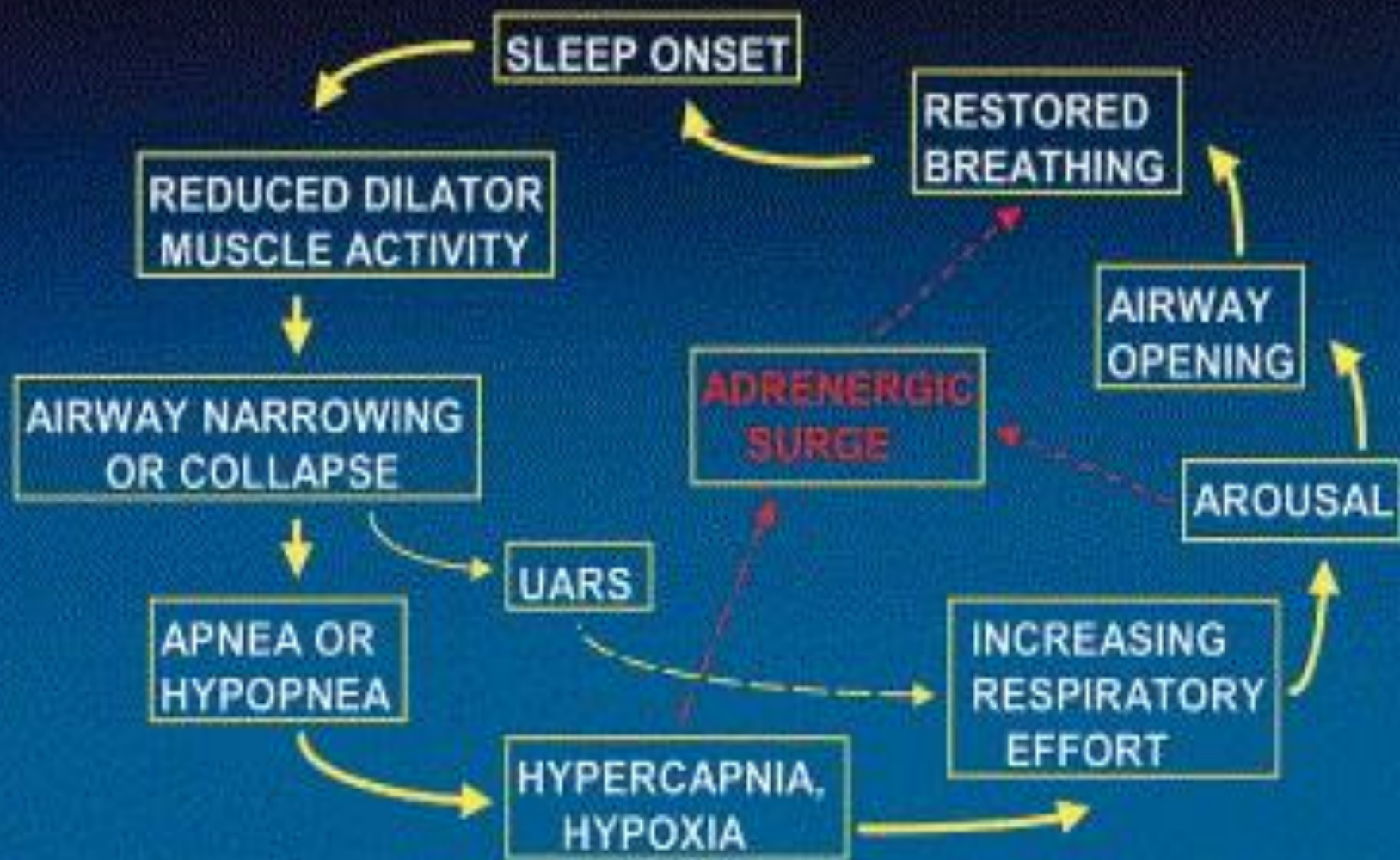
OSAS and Hypertension

- OSAS increases both daytime and night-time ambulatory blood pressures through the activation of various neurohumoral factors including the sympathetic nervous system and the renin-angiotensin-aldosterone system.
- Sudden drops in blood oxygen levels that occur during sleep apnea increase blood pressure and strain the cardiovascular system.

Pathophysiology

- Repetitive apnoeas expose the cardiovascular system to cycles of hypoxia, exaggerated negative intrathoracic pressure, and arousals. These noxious stimuli can, in turn, depress myocardial contractility, activate the sympathetic nervous system, raise blood pressure, heart rate, and myocardial wall stress, depress parasympathetic activity, provoke oxidative stress and systemic inflammation, activate platelets, and impair vascular endothelial function.

OSA: PATHOPHYSIOLOGIC CYCLE



Interdependence Between OSA and Hypertension

- Half of all patients with sleep apnea may have underlying hypertension
- Resistant hypertension, may have OSA.
- Interaction between OSA severity and resistance to antihypertensive medications
- Elevated nocturnal blood pressure “dipping” during sleep also suggest a higher likelihood of underlying sleep apnea.

Systolic and Diastolic Hypertension

- high prevalence of isolated diastolic hypertension
- Significant association between the incidence of combined systolic and diastolic hypertension and OSAS in younger patients (<60 years of age) but not in older patients
- No significant association was seen between isolated systolic hypertension and sleep apnea in either age group.

Hypertension, OSA, and Changes in Cardiac Structure and Function

- Sleep apnea has also been associated with impaired right ventricular systolic and diastolic function independent of hypertension
- The effect of OSA on left ventricular systolic function and right ventricular myocardial performance index, systolic function, and free wall diameter have also been shown to improve with continuous positive airway pressure

Management

- The first-line treatment for OSA-induced hypertension is treatment of OSA and antihypertensive medications as indicated.

Thank you

