Bridging the Healthcare Gap to Save Lives

Addressing Sleep Apnea in Dental Practice

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Course Objectives

1. Learn how to look beyond your patients medical history.

2. How to incorporate appropriate screening into your dental practice to reduce sudden cardiac death and heart disease.

3. Bridging the gap between medicine and dentistry.

OSA…*True Silent Killer*

- 1 billion worldwide
- 70% of heart attack patients have OSA
- 43% of patients with mild OSA have hypertension/ 69% for severe
- 86% of obese type 2 diabetic patients have OSA
- 48% of type 2 diabetics have sleep apnea
- 4x more at risk of stroke
- 1 out of 5 adults have mild OSA
- 1 out of 15 have moderate to severe OSA
- 75% of severe cases remain undiagnosed
- 40-50% with A-fib have OSA
- 50-75% patients with sleep apnea have GERD

OSA…*True Silent Killer*

<u>Patients who have OSA often have a co-diagnosis</u>

Hypertension Arrhythmias A-FIB Stroke Diabetes

Congestive Heart Failure

The Centers for Disease Control and Prevention (CDC) estimates that one person dies every 36 seconds in the United States from cardiovascular disease. That's about 25% of America's mortality rate. Heart disease costs the United States about $363 billion each year from 2016 to 2017 – almost $1 billion per day.

OSA...*True Silent Killer*

Atrial Fibrillation (A-Fib)

- Most common arrhythmia
  - 2.4 million Americans
  - 3.3 million in 2020, 5.6 million in 2050
- Thromboembolic complications, and tachycardia-mediated cardiomyopathy
  - 5-fold increased of stroke
- Prevalence increases with age; 10% (80s).
  - Increased mortality

America Heart Association Summary Statement 2017

OSA…*True Silent Killer*

Sudden Cardiac Death/Arrest is so often linked with coronary artery disease, the same factors that put you at risk of coronary artery disease may also put you at risk of sudden cardiac arrest. These include:

- A family history of coronary artery disease
- Smoking
- High blood pressure
- High blood cholesterol
- Obesity
- Diabetes
- Drinking too much alcohol (more than two drinks a day)
- Sleep Apnea (obstructive/central/mixed)

OSA…*True Silent Killer*

90 million people in North America have breathing & sleep problems:

Prevalence Stats:

Insomnia: 12% of adults diagnosed
Snoring: 25% of adults snore regularly
Sleep Apnea: 38M+ adults affected

Snoring by Age 50+:

Men: 60%+ snore
Women: 40%+ snore

Sources: AASM.org, AMA.org,

OSA…*True Silent Killer*

About 40-50 million Americans suffer from sleep disorders

About 85% are undiagnosed/underdiagnosed/untreated

Cost of Non-Compliance

Untreated Obstructive Sleep Apnea Results in Higher Costs, Healthcare Utilization

Older adult US Medicare beneficiaries with untreated obstructive sleep apnea are heavier users of health care than matched control patients.

Emerson M. Wickwire, PhD, Sarah E. Tom, PhD, Aparna Vadlamani, MS, Montserrat Diaz-Abad, MD, Liesl M. Cooper, PhD, MBA, Abree M. Johnson, MS, MBA, Steven M. Scharf, MD, PhD, Jennifer S. Albrecht, PhD Published Online:January 15, 2020https://doi.org/10.5664/jcsm.8128Cited by:52 Journal of Clinical Sleep Medicine

Researchers evaluated HCU and costs over the course of 12 months leading up to treatment initiation. This data was compared between beneficiaries with OSA and matched control patients without the condition.

"Medicare beneficiaries with obstructive sleep apnea cost taxpayers an additional $19,566 per year and utilized more outpatient, emergency, inpatient, prescription, and overall health care services."

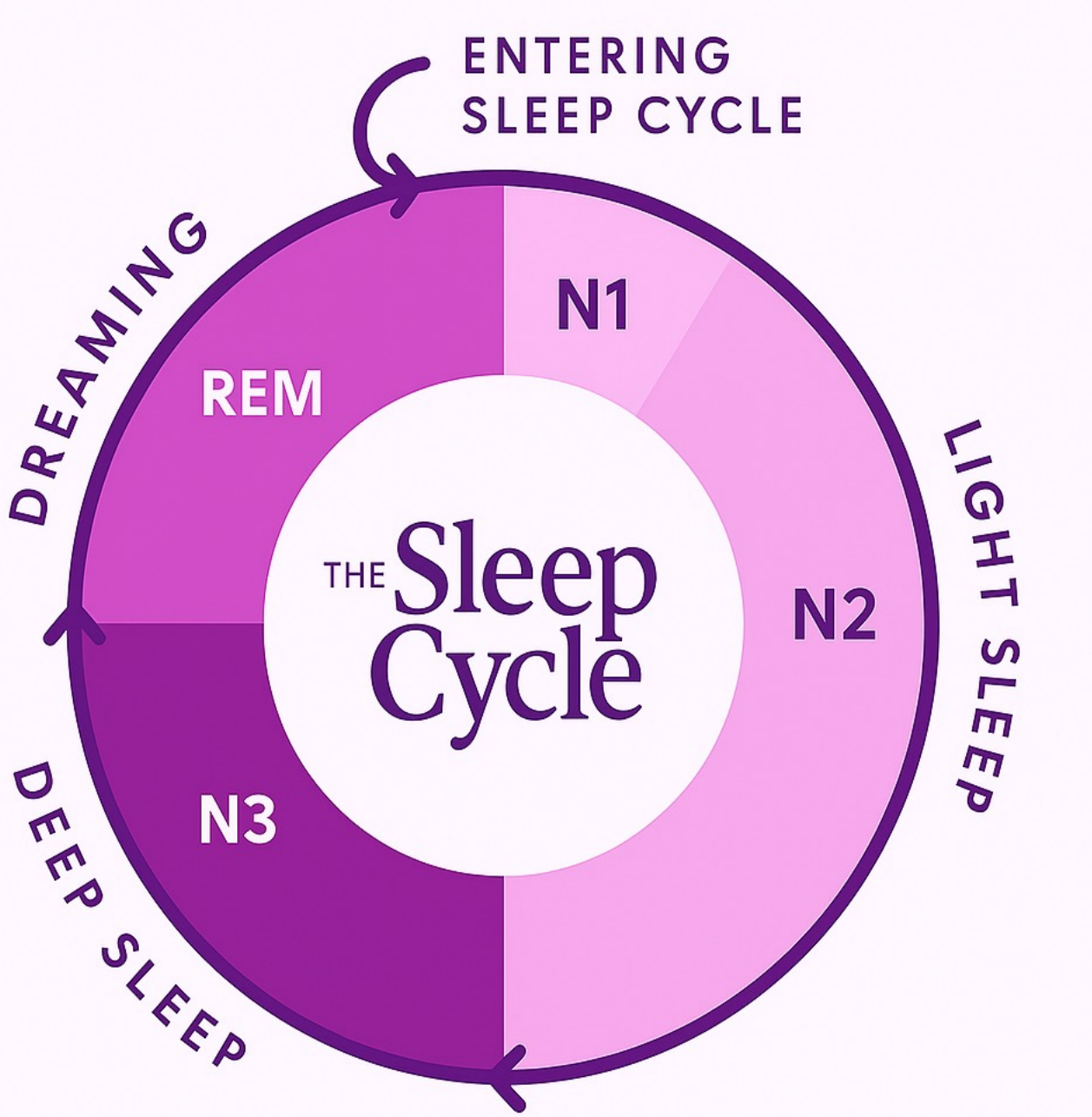
Results also demonstrated an increase in annual costs across all individual points of service. Researchers reported that inpatient care was associated with the highest incremental costs when compared to control patients

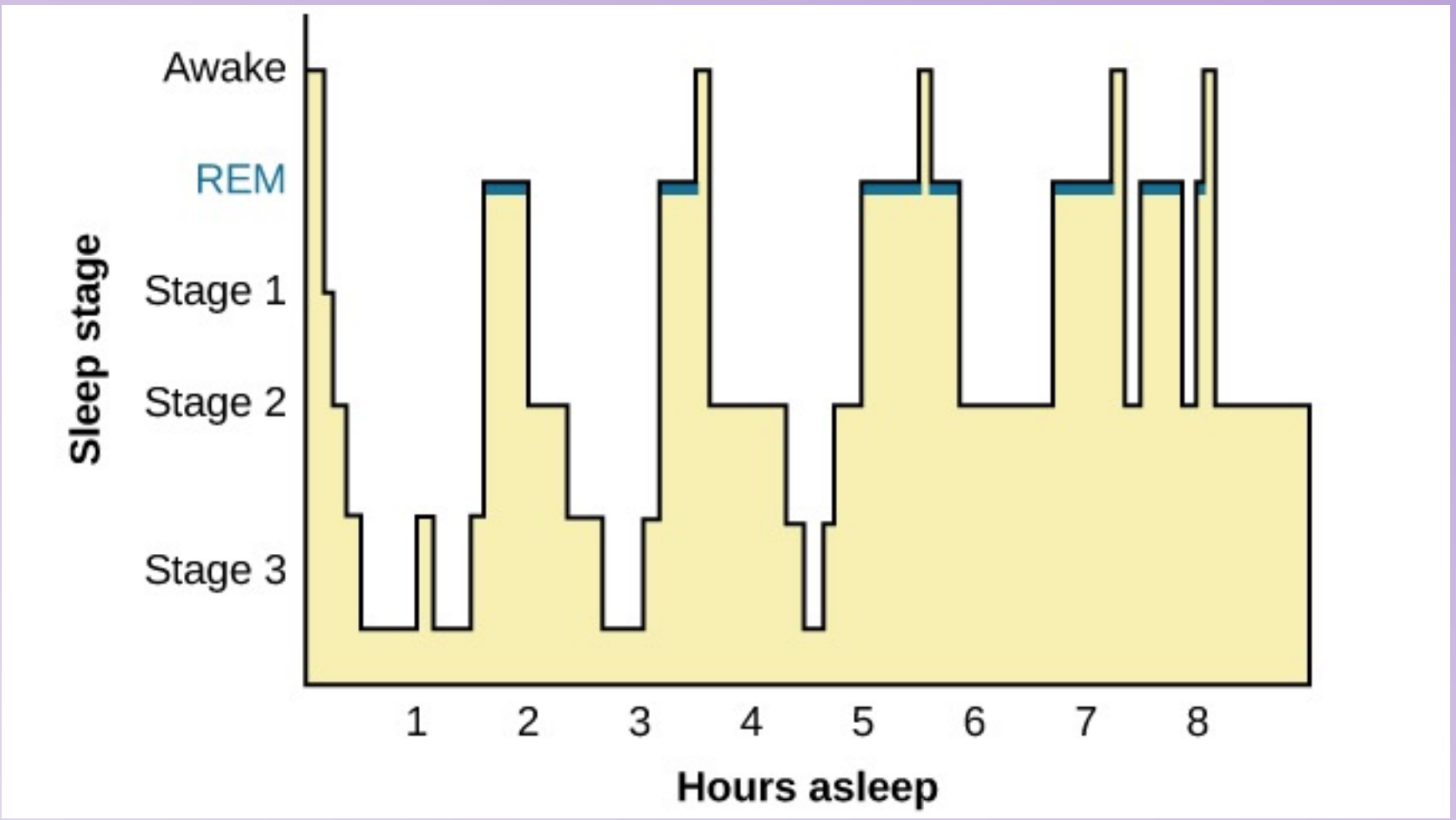
Purpose of Sleep

Sleep: A Vital Biological Process, Not Passive Downtime

- evolutionarily preserved process essential for brain and body health.
- actively supports learning, memory, immune regulation, and tissue repair.
- sleep deprivation leads to reduced cognitive performance, impaired decision-making, heightened seizure risk, slowed reaction time.
- Severe deprivation can be fatal


4 minutes
without AIR
3 days
without WATER
11 days
without SLEEP
2 months
without FOOD

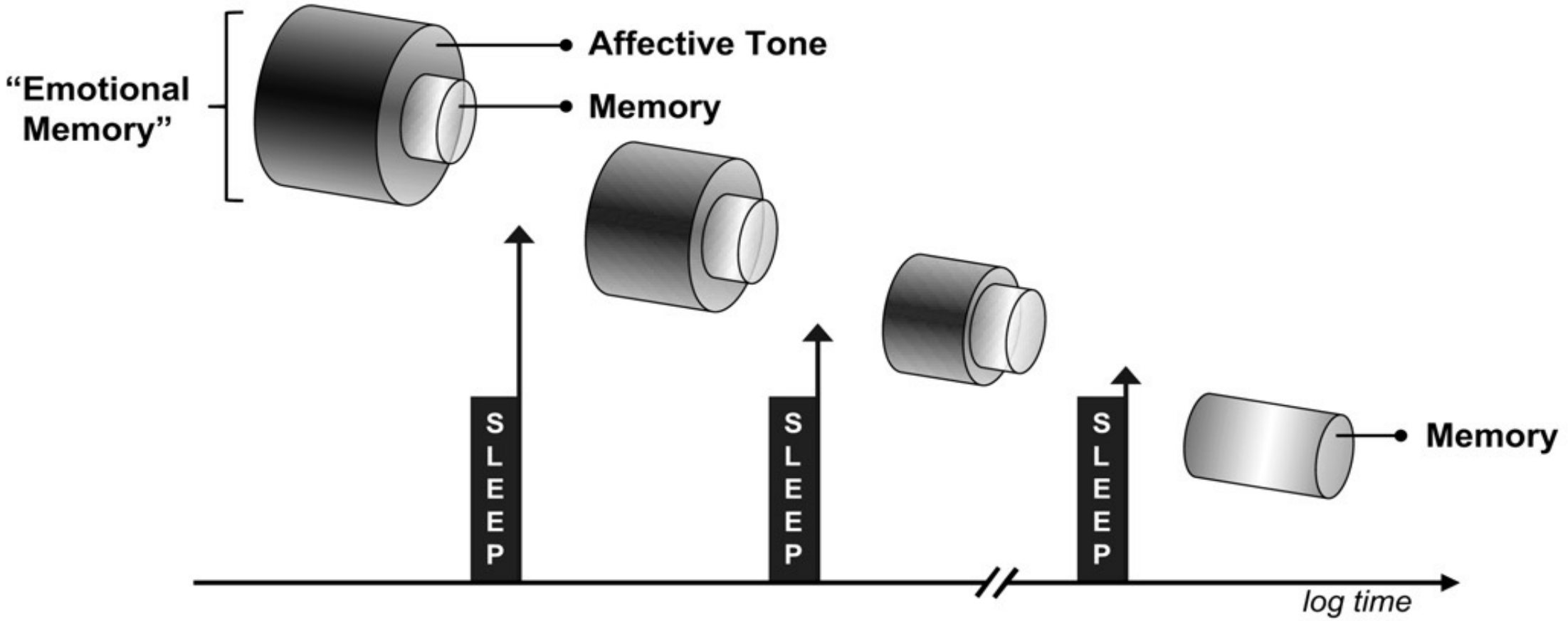

ENTERING
SLEEP CYCLE
N1
N2
N3
REM
THE Sleep Cycle
LIGHT SLEEP
DEEP SLEEP
DREAMING


Awake
REM
Stage 1
Stage 2
Stage 3
Sleep stage
1
2
3
4
5
6
7
8
Hours asleep

Purpose of Sleep

- **REM Sleep: Emotion Regulation and Memory Encoding**
    - REM sleep consolidates emotional memories
    - Reduces their emotional impact
    - Helps regulate mood and prevent chronic anxiety.

Purpose of Sleep-REM



Purpose of Sleep

Detox at Night: Sleep and Brain Waste Clearance

In Deep Sleep:

The **blood-brain barrier (BBB) becomes more permeable** and the brain clears out toxins like β-amyloid and tau proteins from the brain.

Glymphatic system activity increases — this is the brain's "waste clearance" system. **Cerebrospinal fluid (CSF)** flows more freely through the brain tissue.

This flushes out **metabolic waste**, including **beta-amyloid** and **tau proteins**, which are linked to **Alzheimer's disease**.

Blood-brain barrier permeability is believed to increase during this stage, allowing better exchange and detoxification.

Neurohormones produced during sleep: Growth hormone (tissue repair) ADH (fluid balance) Oxytocin & Prolactin (mood, immunity, dreams)

Obstructive Sleep Apnea

APNEA

Cessation of breathing for 10 seconds or more

HYPOPNEA

Oxygen desaturation 4% or more

Obstructive Sleep Apnea

During sleep:

- **Muscles that hold airway open relax**
- **Excess fat decreases tonicity in muscles**
- **Airway collapses causing a full or a partial obstruction**
- **Air forced through narrow opening or there is no airflow at all**

Obstructive Sleep Apnea

Tongue completely blocks the airway

Patient stops breathing several times per hour for 10 sec or more

Patient has arousals

Patient wakes themselves up, gasping for breath

Obstructive Sleep Apnea

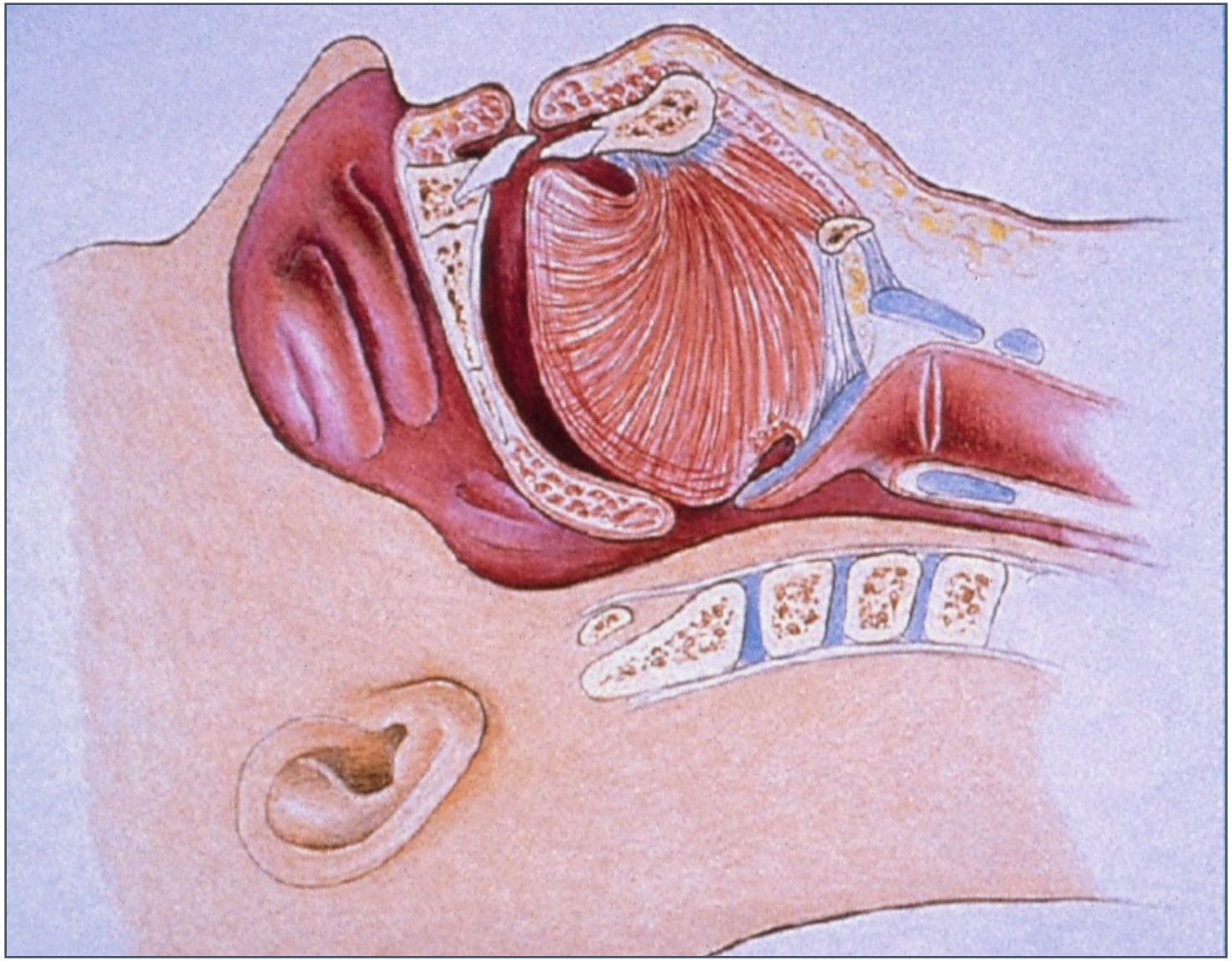
Snoring occurs when tongue partially blocks the airway

Tissues at the back of throat vibrate (uvula & soft tissue palate)

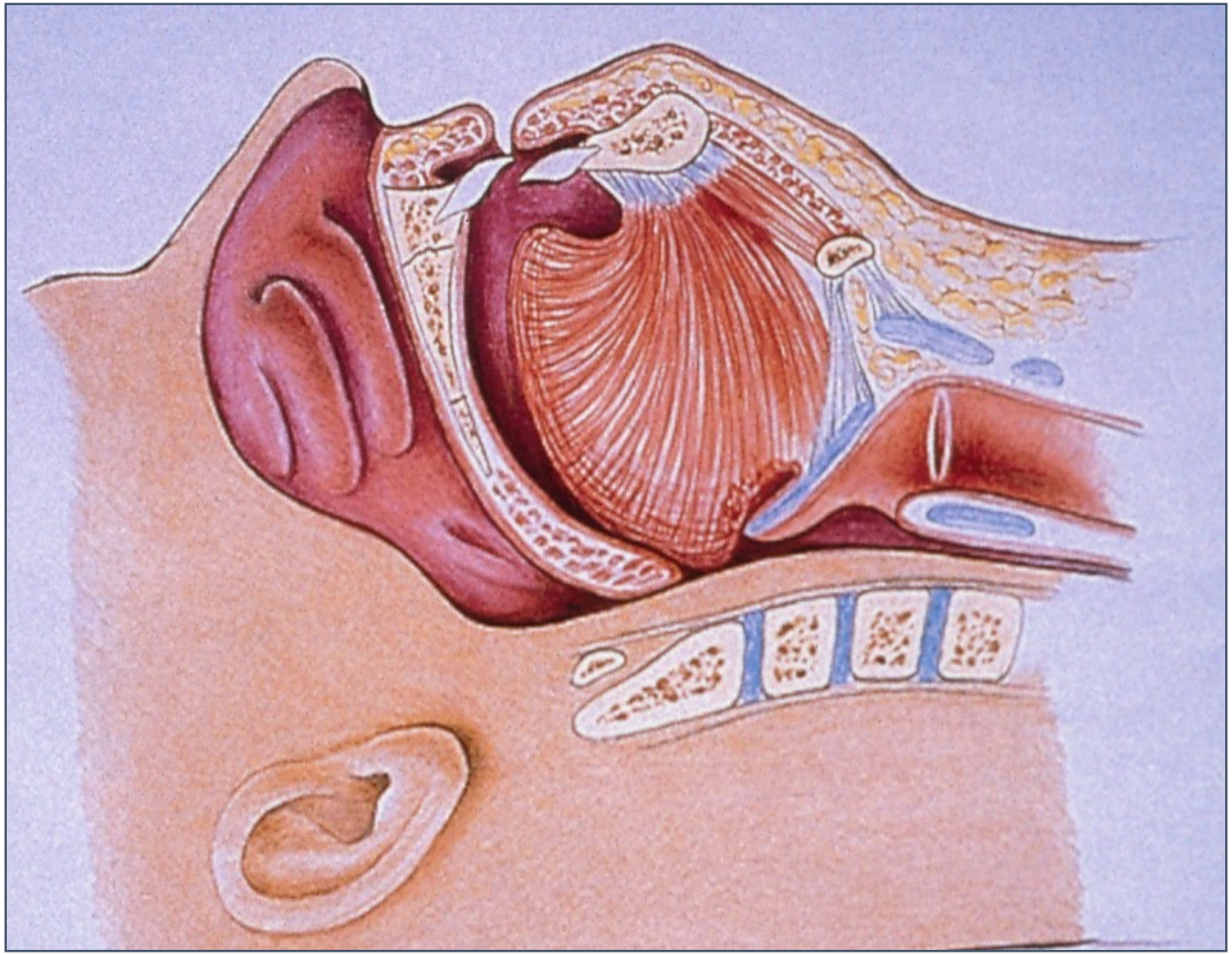
Patients usually sleeping on back

Snoring is like thunder

SNORING
Tongue Partially Blocks Airway



SLEEP APNEA
Tongue Completely Blocks Airway



Obstructive Sleep Apnea

Patient gasps for breath

Chest muscles heave

Patient wakes up

Oxygen goes to lungs

Patient falls back to sleep

Patient not aware they woke up

Obstructive Sleep Apnea

Could happen hundreds of times each night

Patient extremely tired during the day

#1 Sign of Underlying OSA daytime fatigue

AHI (Apnea-Hypopnea Index)

APNEA	Cessation of breathing for 10 seconds or more
HYPOPNEA	Oxygen desaturation 4% or more

AHI: Number of apneic +hypopnic events / number of sleep hours

Mild OSA	5 – 15 events per hour
Moderate OSA	16-30 events per hour
Severe OSA	Over 30 events per hour

Dentistry's Role in Treating OSA

Dentists can be instrumental in screening for OSA and those who are trained in the field of dental sleep medicine can be a resource for providing FDA approved treatment as an alternative to CPAP or surgery. In some cases, combination therapy is recommended.

Screening Questionnaires:
STOP BANG
Epworth
Thornton
Heart SAFE

Extraoral and Intraoral Exam

Nasal Obstructions

- Deviated Septum
- Enlarged turbinates
- Nasal polyps
- Allergies (Swollen Nasal Mucosa)
- Ridge Supported: No collapse
- Examine each nostril individually
- Breathing: Nose Mouth Both

Intraoral

- Enlarged adenoids
- Enlarged tonsils
- Excessive soft palate
- Large uvula
- Large tongue (scalloped edges)
- Narrow high palate
- Soft palate collapses against posterior pharyngeal wall

CAUSES OF SNORING

Snoring is the sound of air making its way past an obstruction.

Enlarged tonsils

Enlarged adenoids

Large tongue

Low soft tissue palate

Excess fat in throat area

Large tongue

Underdeveloped Jaw

TONGUE LEVEL

THROAT OBSTRUCTION

- Underdeveloped lower jaw
- Forces tongue posteriorly against posterior pharyngeal wall
- Blocks airway

What's Next?

Patient needs to be tested.

Refer patient or order *(dependent on local regulations)* a sleep test

May need a sleep consult by a specialist

Main goal: Get the patient diagnosed!

Current Recommendations

Per American College of Cardiology (ACC) and American Association of Sleep Medicine (AASM) *guidelines, a mandibular advancement device can be used as the first line therapy for mild OSA and as an alternate treatment option for mod-severe OSA in patients who are adverse or intolerant of CPAP.*

Dentistry's Role in Treating OSA

Mandibular Advancement Appliances

Move lower jaw forward

Open the vertical

Helps opens airway

Helps reduce/stop snoring

Small, Comfortable

Increased compliance

Option to add a compliance monitor

Why *Multidisciplinary* Approach to treating OSA

We can collectively reduce hospital readmissions to promote patient safety and improve health status outcomes!!!

We can collectively reduce the incidence of the BIG 3: Heart Attack, Stroke, Sudden Cardiac Death

We can significantly improve Quality of Life

Sudden Cardiac-death Awareness Research Foundation
S.C.A.R.F.

Our mission is to eradicate the deadliest health-care epidemic which is sudden cardiac death by empowering communities and health care providers with knowledge and greater access to automated external defibrillators.

www.scarfnow.org