For **Handouts** and other cool stuff go to [KiwiLive.com](http://kiwilive.com) Keyword = Spencer@Sleep

**Jamison R. Spencer, DMD, MS**

Dental Sleep Medicine: Getting Started Saving Lives
• Scary video by WatchPAT
Sleep Disordered Breathing and Mortality: Eighteen-Year Follow-up of the Wisconsin Sleep Cohort: SLEEP, Vol. 31, No. 8, 2008
Today we will cover

- This morning
  - Normal sleep
  - Snoring
  - Sleep apnea in adults and children
  - Diagnosis of sleep apnea
  - Oral appliance therapy
  - Avoiding side effects

- This afternoon (Hands on students)
  - From screening to final follow up
  - Hands on bite registrations
  - Deeper dive into appliance selection
  - Hands on morning repositioners
Sleep Apnea Definitions

- Apnea = Cessation of ventilation for 10 seconds or more.
- Hypopnea = 30-50% reduction in airflow for 10 seconds or more.
- Apnea-Hypopnea Index (AHI) = Average number of apneas plus hypopneas per hour of sleep.
Apnea Hypopnea Index (AHI)

• Normal: less than 5 events per hour
Apnea Hypopnea Index (AHI)

- Mild: 5-15 events per hour
- Normal: less than 5 events per hour
Apnea Hypopnea Index (AHI)

- Moderate: 16-30 events per hour
- Mild: 5-15 events per hour
- Normal: less than 5 events per hour
Apnea Hypopnea Index (AHI)

- Severe: over 30 events per hour
- Moderate: 16-30 events per hour
- Mild: 5-15 events per hour
- Normal: less than 5 events per hour
Oxygen Saturation

• Normally, the blood oxygen level should be above 90%. With obstructions, you can have varying degrees of desaturations.
• Mild problem: 85-90%
• Moderate problem: 80-84%
• Severe problem: below 80%
Sleep Stages

- Non-REM
- N1
- N2
- N3
- REM
Brain Waves

N1 (Stage 1)

- “Light Sleep”
- 4-5% of total sleep time is considered normal
- increases to 15% by age 70
N2 (Stage 2)

- “Restful Sleep”
- 45-50% of normal sleep time
N3 (Stage 3)

- “Deep Sleep”
- Delta or slow wave sleep
- Range of total sleep: 10-20%
- Percentage decreases with age
- Above 40-50% in children
- May be completely absence by age 40-60
- Usually appears only in the first 1/3 of the sleep episode
- Growth hormone usually released during N3 sleep
SimplyNoise App

Jamison Spencer
• Rapid eye movement sleep
• Observed eye movements
• 20-25% total sleep time
• Body paralysis – atonia
• Mind very active
• Very vivid hallucinatory imagery or dreaming
• Do problem solving
Sleep Cycle

Normal sleep histogram of healthy young adult.
For **Handouts** and other cool stuff go to KiwiLive.com

**Keyword = Spencer@Sleep**
Let’s Talk About Hygiene
Let's Talk About Sleep Hygiene

Sleepy time
Sleep environment
Exercise
Priority
Let’s Talk About Sleep Hygiene

Sleepy time: Try to have a regular bedtime…and give yourself enough time for sleep.
Let’s Talk About

Sleep Hygiene

Light: Limit exposure to bright light, including computer/ipad screens, the last hour or so before bed.

Tip: www.justgetflux.com
Let’s Talk About Sleep Hygiene

Exercise: Daily exercise will help you sleep deeply and is good for you on a bunch of other levels too. Tip: www.simplynoise.com
Let’s Talk About

Sleep Hygiene

Priority: Make sleep a priority!
Let’s Talk About

Sleep Hygiene

Sleepy time

Light

Environment

Exercise

Priority
Anatomy of Snoring and Sleep Apnea
Pharyngeal Patency
Normal vs Obstructed
Snoring

Jamison Spencer
Does Snoring and Sleep Apnea affect the Bed Partner’s Sleep?
The effect of snoring and obstructive sleep apnea on the sleep quality of bed partners.

- MATERIALS AND METHODS: We studied 10 married couples in which 1 member was undergoing polysomnography to evaluate suspected OSA. The patients and their spouses underwent simultaneous polysomnography. Midway through the 1-night study, the patients received nasal continuous positive airway pressure (CPAP) with the pressure adjusted to eliminate snoring and obstructive breathing events.

The effect of snoring and obstructive sleep apnea on the sleep quality of bed partners.

• RESULTS: The patients (all male) demonstrated a median (range) apnea-hypopnea index of 26 (3-75) that decreased to 7 (0-34) during the trial of nasal CPAP therapy (P < .05).

• During the CPAP trial, the median (range) arousal index of the spouses decreased from 21 (14-34) to 12 (4-27) (P < .01), and the spouses' median (range) sleep efficiency increased from 74% (56%-80%) to 87% (64%-95%) (P < .01).

The effect of snoring and obstructive sleep apnea on the sleep quality of bed partners.

• CONCLUSION: The elimination of snoring and OSA in these patients was associated with an improvement in the quality of their bed partners' sleep, as indicated by improved sleep efficiency and continuity, even when the spouses had been habitually exposed to snoring and OSA. Assuming that 480 minutes were spent in bed for sleep, a 13% improvement in sleep efficiency (i.e., from 74% to 87%) translates to an additional 62 minutes of sleep per night for the spouses of snorers with OSA.

Second hand Smoke!
If you don't care about your health, at least let me care about mine.

Jamison Spencer
Second Hand Sleep Apnea
Not so benign snoring

Heavy Snoring as a Cause of Carotid Artery Atherosclerosis (Sleep, 2008)

An epidemiologic study of snoring and all-cause mortality (Oto Head Neck Surg, 2011)
Everyone who snores will eventually have sleep apnea

James O’Brien, M.D.
Snoring Recording Apps

SnoreLab
The Snoring Management App

- Record, measure and track your snoring with the No.1 snoring management app for iPhone and iPad:
  - Generates charts of your night's snoring
  - Records snoring sound samples
  - Measures snoring intensity (Snore Score)
  - Tests the effectiveness of snoring remedies
  - Tracks the impact of lifestyle factors

SnoreLab has helped change lives for the better. If snoring impacts your life: download it today!

Download on the App Store
Sleep Apnea
OBSTRUCTIVE vs. CENTRAL APNEA

Wake
Sleep
Airflow
Chest Wall Movement

Obstructive
Central

Time

Seconds
Sleep Apnea Increases Risk of

- High blood pressure
- Heart failure
- Heart rhythm disturbances
- Atherosclerotic heart disease
- Pulmonary hypertension
- Insulin resistance
- Sudden death
- Memory problems
- Depression
- Anxiety
- Gastroesophageal reflux disease (GERD)
Heart Disease in the US

- 610,000 die per year (more than 1 PER MINUTE!!)
- 325,000 sudden cardiac death
- 735,000 heart attacks per year
Sleep Apnea in an Adult

Nighttime Symptoms

- Snoring: intermittent with pauses
- Snorting, gasping
- Awakening with gasping or choking
- Apnea, pauses in breathing
- Frequent awakening
- Sweating
- Fragmented, non-refreshing, light sleep
- Thrashing in bed
- Insomnia
- BRUXISM

Daytime Symptoms

- Excessive Daytime Sleepiness (EDS)
- Non-restorative sleep
- Poor memory, clouded intellect
- Poor concentration and performance
- Fatigue
- Morning headache
- Decreased sex drive, impotence
- Depression, irritability
- Gastro-esophageal reflux (GERD)
GERD or OSA?
Depression or OSA?

- Chronic Fatigue Syndrome?
- Fibromyalgia?
- TMJ?
Bruxism or OSA?
Parafunction... or Protective Function?
Parafunction

• Physical behavior that is without functional purpose and may be potentially harmful.
What might parafunction lead to?
Damage to the Teeth (and restorations)
TMJ Disorders & Muscle Pain
Capsulitis

Posterior temporal attachment or “superior lamina”

Posterior mandibular attachment or “inferior lamina”
Dr. Per-Lennart Westesson and Dr. Lars Eriksson
University of Lund, Sweden.

Internal Derangements

DJD
Myofascial Pain Dysfunction
But what if it isn’t parafunction?

A new Paradigm regarding the Etiology of many TMJ Disorders and Craniofacial Pain Problems
Protective Function?

Physical behavior that is intended, whether conscious or subconscious, to improve survival
Nocturnal Bruxism
Sleep bruxism muscle activity is associated with a rise in respiration within arousal.

A significant increase in breathing amplitude precedes sleep bruxism. Khoury S, Rouleau GA, Rompré PH, Mayer P, Montplaisir JY, Lavigne GJ.

Sleep bruxism episodes during sleep are under the influences of brief and transient activity of the brainstem arousal-reticular ascending system.

• there is an association between obstructive sleep apnea and parafunctional activity, [and] sleep position affects the incidence of both sleep disordered breathing and parafunctional activity.

Effect of sleep position on sleep apnea and parafunctional activity.
Phillips BA, Okeson J, Paesani D, Gilmore R.

• 74% of rhythmic masticatory muscle activity were scored in the supine position compared to 23% in the lateral decubitus position.

Association between sleep bruxism, swallowing-related laryngeal movement, and sleep positions.
Why do people clench and grind their teeth?
Bruxism and Sleep Apnea in Children
A significant and independent association was found between poor school performance and hyperactivity, nocturnal enuresis, tooth grinding and habitual snoring in primary school children: prevalence and association with sleep-related disorders and school performance. All of the children diagnosed with severe OSAHS also presented snoring and bruxism.


Symptoms of obstructive sleep apnea-hypopnea syndrome in children Gregório PB, Athanazio RA, Bitencourt AG, Neves FB, Terse R, Hora F.
This study suggests that there is a positive correlation between sleep-disordered breathing and bruxism. There was an important improvement of bruxism after T & A surgery.


This study suggests that adenotonsillectomy could improve bruxism significantly in children who have obstructive symptoms due to adenotonsillar hypertrophy.

Treatment of Nocturnal Bruxism
Continuous Positive Airway Pressure (CPAP)
During the CPAP titration night most breathing abnormalities were eliminated and a complete eradication of the tooth grinding events was observed. The results of this study suggest that when sleep bruxism is related to apnea/hypopneas, the successful treatment of these breathing abnormalities may eliminate bruxism during sleep.

Sleep bruxism related to obstructive sleep apnea: the effect of continuous positive airway pressure. Oksenberg A, Arons E.
Treatment of Nocturnal Bruxism?
Stress Reduction

Bang Head Here

Directions:
1. Place on FIRM surface.
2. Follow directions in circle.
3. Repeat step 2 as necessary, or until unconscious.
4. If unconscious, cease stress reduction activity.
• RESULTS: No statistically significant difference in AHI was noted between baseline and splint nights.

• However, four patients experienced an aggravation in apnea diagnosis category on the night they used the splint. The AHI was increased by more than 50% in 5 of the 10 patients. The RDI showed a 30% increase from baseline to splint nights. The percentage of sleeping time with snoring also increased by 40% with the splint.

Aggravation of respiratory disturbances by the use of an occlusal splint in apneic patients: a pilot study.
Gagnon Y, Mayer P, Morisson F, Rompré PH, Lavigne GJ.
Faculty of Dental Medicine, University of Montreal, Canada.
CONCLUSION: This open study suggested that the use of an occlusal splint is associated with a risk of aggravation of respiratory disturbances. It may therefore be relevant for clinicians to question patients about snoring and sleep apnea when recommending an occlusal splint.
Treatment of Nocturnal Bruxism?

CPAP Treatment

OA Treatment
Figure 2-5. Head-tilt/chin-lift technique of opening airway.
Cone Beam CT showing pre treatment and with TAP II in place
Twelve subjects

5 nights in a sleep laboratory. After habituation and baseline nights, 3 more nights were spent with an MAA in either a slight (25%) or pronounced (75%) mandibular protrusion position or with an MOS (control).

CONCLUSION: Short-term use of an MAA is associated with a significant reduction in SB motor activity without any appliance breakage. A reinforced MAA design may be an alternative for patients with concomitant tooth grinding and snoring or apnea during sleep.
Thirteen intense and frequent bruxors

The MOS was used as the active control condition and the MAD was used as the experimental treatment condition.

Designed to temporarily manage snoring and sleep apnea, the MAD was used in 3 different configurations.

CONCLUSIONS: Short-term use of a temporary custom-fit MAD is associated with a remarkable reduction in sleep bruxism motor activity.

Reduction of sleep bruxism using a mandibular advancement device: an experimental controlled study.
Landry ML, Rompré PH, Manzini C, Guitard F, de Grandmont P, Lavigne GJ.
Sleep Apnea in Children

- Snoring
- Hyperactivity (ADHD)
- Developmental delay
- Poor concentration
- Enuresis
- Nightmares
- Night terrors
- Headaches
- Restless sleep
- Obesity
- Large tonsils
- Noisy breathers
- Chronic runny noses
- Frequent upper airway infections
- Earaches
- BRUXISM
Sleep apnea in Children
Sleep Apnea in Children

“Girls with adenoids”
From Walter Moore’s
People’s Health,
New-York McMillan, 1913
Hypertrophy (enlargement) of the tonsils and adenoids is the most common cause of obstructive sleep apnea in children.


Tonsil removal may improve school performance.


A rapid maxillary expander is an effective appliance for treating children with OSAS.

Sleep Med. 2007 January 17.
Attention Deficit Hyperactivity Disorder

- Snoring is associated with higher levels of inattention and hyperactivity.
- 81% of snoring children with ADHD (25%) could have their ADHD eliminated if their habitual snoring were effectively treated. Sleep 20(12): 1185-1192.
- Children with ADHD are 2-½ times more likely to be bed wetters.

Enuresis

Surgical removal of upper airway obstruction led to a significant decrease in or complete cure of nocturnal enuresis in 76% of children studied.


Nocturnal enuresis ceased within a few months in the 10 cases studied by using rapid maxillary expansion to reduce nasal constriction.

OSA Prevalance
OSA Prevalance

Data previously published in the American Journal of Epidemiology show that the estimated prevalence rates of obstructive sleep apnea have increased substantially over the last two decades, most likely due to the obesity epidemic. It is now estimated that 26 percent of adults between the ages of 30 and 70 years have sleep apnea.

American Academy of Sleep Medicine, 2014
Obstructive sleep apnea in non-obese patients: age, gender and severity
Teimur Yeligulashvili, PhD

• Results confirmed that OSA in non-obese patients is most prevalent in middle-aged men with larger neck sizes. Fifty-four percent (2,906) of 5,426 non-obese patients were OSA positive, and most of them were middle age (57 percent). An equal number of patients had mild OSA (50.4%) or moderate to severe OSA (49.6%). Male prevalence and neck size were significantly higher in the group with moderate to severe OSA.

Abstract presented at SLEEP 2009
Sleep apnoea is a common occurrence in females
Karl A. Franklin et. al.

- We investigated 400 females from a population-based random sample of 10,000 females aged 20–70 years. They answered a questionnaire and performed overnight polysomnography.

European Respiratory Journal, August 2012
Sleep apnoea is a common occurrence in females
Karl A. Franklin et. al.

• Obstructive sleep apnoea (apnoea-hypopnoea index ≥ 5) was found in 50% (95% CI 45–55%) of females aged 20–70 years. Sleep apnoea was related to age, obesity and hypertension but not to daytime sleepiness. Severe sleep apnoea (apnoea-hypopnoea index ≥ 30) was scored in 14% (95% CI 8.1–21%) of females aged 55–70 years and in 31% (95% CI 12–50%) of obese females with a body-mass index of >30 kg·m$^{-2}$ aged 50–70 years.

European Respiratory Journal, August 2012
Results: The majority of the Far-East Asian men were found to be nonobese (mean BMI, 26.7 +/- 3.8) but had severe OSAS (mean RDI, 55.1 +/- 35.1). When controlled for age, RDI, and LSAT, the white men were substantially more obese (mean BMI, 29.7 +/- 5.8, P = .0055). When controlled for age and BMI, the white men had less severe illness (RDI, 34.1 +/- 17.9, P = .0001). Although the posterior airway space and the distance from the mandibular plane to hyoid bone were less abnormal in the Far-East Asian men, the cranial base dimensions were significantly decreased.

Diagnosis of Sleep Apnea
You can NOT rule out sleep apnea with a home test
Non-Surgical Treatment of OSA
Continuous Positive Airway Pressure (CPAP)

- Gold standard in treatment of OSA
- Those that benefit from it should stay on it
- Different models and features
  - Pressure changing/self titrating
  - Humidifiers
  - Different masks/cushions/pillows
  - Compact/quieter
- There are complications and side effects
  - Including tooth movement
The Dentist’s Role in the Management of Snoring and Obstructive Sleep Apnea
Dentistry’s Role

- Obstructive Sleep Apnea (OSA) is a life-threatening medical disorder.
- Dentists are not medically qualified nor legally permitted to diagnose sleep disorders. 
- Diagnosis must be made by a physician.
Dentistry’s Role

- Screening and referral
- Provide and monitor oral appliance therapy as part of treatment team with physician
- Monitor and treat potential side effects of oral appliance therapy
- Follow-up

Recommendations:

1. We recommend that sleep physicians prescribe oral appliances, rather than no therapy, for adult patients who request treatment of primary snoring (without obstructive sleep apnea). (STANDARD)

2. When oral appliance therapy is prescribed by a sleep physician for an adult patient with obstructive sleep apnea, we suggest that a qualified dentist use a custom, titratable appliance over non-custom oral devices. (GUIDELINE)

3. We recommend that sleep physicians consider prescription of oral appliances, rather than no treatment, for adult patients with obstructive sleep apnea who are intolerant of CPAP therapy or prefer alternate therapy. (STANDARD)

4. We suggest that qualified dentists provide oversight—rather than no follow-up—of oral appliance therapy in adult patients with obstructive sleep apnea, to survey for dental-related side effects or occlusal changes and reduce their incidence. (GUIDELINE)

5. We suggest that sleep physicians conduct follow-up sleep testing to improve or confirm treatment efficacy, rather than conduct follow-up without sleep testing, for patients fitted with oral appliances. (GUIDELINE)

6. We suggest that sleep physicians and qualified dentists instruct adult patients treated with oral appliances for obstructive sleep apnea to return for periodic office visits—as opposed to no follow-up—with a qualified dentist and a sleep physician. (GUIDELINE)
Screening Your Patients
How do we best screen for OSA?

• **History**
  • Snoring
  • Witnessed apneas
  • Non-restorative sleep
  • Excessive Daytime Sleepiness / Fatigue

• **Co morbidities**
  • Hypertension
  • GERD
  • Headaches
  • BRUXISM
OSA Risk Factors

- BMI > 30
- Neck circumference > 17 inches
- High arched palate
- Micro/retrognathia
- Mallampati class III / IV airway
Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations? Use the following scale to choose the most appropriate number for each situation:

0 = would never doze  1 = slight chance of dozing  2 = moderate chance of dozing  3 = high chance of dozing

Sitting and reading

Watching TV

Sitting, inactive in a public place (theater, meeting)

As a passenger in a car for an hour without a break

Lying down to rest in the afternoon when circumstances permit

Sitting and talking to someone

Sitting quietly after a lunch without alcohol

In a car, while stopped for a few minutes in traffic

Total
# STOP BANG

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you snore loudly? (Louder than talking or loud enough to be heard behind a closed door?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Do you often feel tired, fatigued or sleepy during daytime?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Has anyone observed you stop breathing during your sleep?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Do you have or are you being treated for high blood pressure?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Is your body mass index greater than 28?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Are you 50 years old or older?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Are you a male with a neck circumference greater than 17 inches, or a female with a neck circumference greater than 16 inches?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Are you a male?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8199 Ustick Rd. Boise, ID 83704 • (208) 376-3600 • Fax (208) 376-3616 • www.cpcidaho.com • www.sleepidaho.com
STOP
# Sleep Screening Questionnaire

Please answer the questions below to help us assess the possibility of a sleep disorder which may be related to your dental and overall health. There is often a correlation between grinding of the teeth, TMJ disorders, breakdown of the teeth and sleep disorders. These sleep issues may also increase your risk for many different health conditions including heart attack and stroke. If you are here with your child (under 18), please fill out the lower portion marked “for children only” for your child.

### Name: [ ] Weight: [ ]

### Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations, in contrast to just feeling tired?

- 0 = I would never doze
- 1 = I have a slight chance of dozing
- 2 = I have a moderate chance of dozing
- 3 = I have a high chance of dozing

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of Dozing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sitting and reading</td>
<td>[ ]</td>
</tr>
<tr>
<td>2. Watching TV</td>
<td>[ ]</td>
</tr>
<tr>
<td>3. Sitting inactive in a public place (e.g., a theater or a meeting)</td>
<td>[ ]</td>
</tr>
<tr>
<td>4. As a passenger in a car for an hour without a break</td>
<td>[ ]</td>
</tr>
<tr>
<td>5. Lying down to rest in the afternoon when circumstances permit</td>
<td>[ ]</td>
</tr>
<tr>
<td>6. Sitting and talking to someone</td>
<td>[ ]</td>
</tr>
<tr>
<td>7. Sitting quietly after lunch without alcohol</td>
<td>[ ]</td>
</tr>
<tr>
<td>8. In a car while stopped for a few minutes in traffic</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

### Total Score: [ ]

### Have you ever been diagnosed with:

1. Impaired Cognition (i.e., difficulty concentrating or thinking) [ ]
2. Mood Disorders/Depression [ ]
3. Insomnia [ ]
4. Hypertension (high blood pressure) [ ]
5. Ischemic Heart Disease (Coronary artery disease / atherosclerosis) [ ]
6. History of Stroke [ ]
7. Sleep Apnea [ ]
   - if yes: Did you try using CPAP [ ]
8. TMJ problems significant enough to require treatment [ ]
9. Gastric reflux (GERD) or heartburn [ ]

### Are you aware of (or have you been told):

1. Snoring on a regular basis [ ]
2. Feeling tired or fatigued on a regular basis [ ]
3. Grinding or clenching your teeth (bruxism) [ ]
4. Having frequent headaches [ ]
5. Your neck size being >17 inches (male) or >16 inches (female) [ ]
6. Anyone in your family having sleep apnea [ ]
7. Snoring/hissing while sleeping [ ]

### For children only (filled out by parent or guardian):

### Are you aware of your child:

1. Snoring/noisy breathing while sleeping [ ]
2. Grinding his/her teeth [ ]
3. Waking the bed [ ]
4. Having difficulty in school/learning [ ]
5. Being treated for ADD or ADHD [ ]
6. Breathing primarily through their mouth [ ]
7. Having frequent nightmares [ ]
8. Having frequent earaches [ ]

### Dental Exam Findings:

- [ ] Evidence of Bruxism
- [ ] Tori or Bone lumps
- [ ] Anterior wear
- [ ] Crowded/squashed
- [ ] Overbite/Class II
The association between periodontitis and obstructive sleep apnea: a preliminary study.

MATERIAL AND METHODS:
• 687 participants (460 men and 227 women)
• 47-77 years of age
• standard polysomnography
• clinical periodontal examination
• Periodontitis was defined as clinical attachment level (CAL) ≥ 6 mm and probing pocket depth ≥ 4 mm.

RESULTS: The results showed that 17.5% of the participants had periodontitis, 46.6% had OSA and 60.0% who were diagnosed with periodontitis had OSA.

CONCLUSION: There is a significant association between OSA and periodontal disease. Further research is needed to clarify the causal relationship between the two conditions.
1.2mm Airway!!!
CPAP Treatment

OA Treatment
Functional Classification of Oral Appliances

• Tongue Retaining Devices (TRD)
• Mandibular Repositioning Appliances / Mandibular Advancement Devices (MRA or MAD)
Tongue Retaining Device (TRD)
Indications for Tongue Retaining Devices

- Lack of tooth support or edentulous
- Non-apneic snorers or mild OSA
- Patients with Down’s Syndrome
A simple, effective treatment for snoring.

aveoTSD

- A brilliantly simple, low-cost treatment for problem snoring
- aveoTSD suction onto the tongue, preventing it from falling back into the throat. It is indicated for anyone – even patients with TMJ or who are edentulous.
- Requires no impressions or adjustments. Delivered on the same day the patient agrees to treatment and greatly improve their quality of life.

$139 each

Ask for your free patient education materials

How aveoTSD works

**BLOCKED airway**

TONGUE

In this MRI image, the tongue falls into the back of the airway to a person's sleep. This blocks the airway leading to snoring.

*Magnetic Resonance Imaging GE Sigma Profile EXE/T/27

 aveoTSD

TONGUE

This MRI image shows the aveoTSD holding the tongue gently forward, preventing it from falling back and obstructing the airway. Note how the airway is now open and clear. This stops or greatly reduces snoring.

800-334-1979
getaveo.com

glidewell.com

GLIDEWELL LABORATORIES

"The Standard of Care"
Mandibular Repositioners
Like most veterinary students, Doreen breezes through chapter 9
Appliance Selection

• Things to consider
  • Lateral bruxer
    • Desire to keep their mouth closed
    • Desire the ability to open their mouth
    • Retention issues (too little or too much)
  • Missing teeth
    • Restorations and future restorative
    • Distance the patient has to travel
    • Ability to return for follow up
    • Manual dexterity and vision
  • Metal allergies/sensitivity
    • Prior experience with oral appliance therapy
    • Current or history of TMJ problems
Types of Adjustable Appliances

- Anterior pull/push (TAP, Silencer, MDSA, etc.)
- Bilateral Push (Herbst, SUAD, etc.)
- Bilateral Pull (EMA, Silent Night, Narval, etc.)
- Interlocking (Somnomed, Dorsal, Respire, etc.)
- Mono block (Moses, PM Positioner, Klearway, etc.)
- Temporary/Trial (Boil and Bites, Silent Sleep, etc.)
Anterior Pull/Push
Bilateral Push
Bilateral Pull
Interlocking
Mono Block
Temporary/Trial
Appliance Selection Simplified

- Lateral Bruxer

- Limited Retention
“Dr. Spencer’s Starting 4 + 1”
“Combination Therapy”
The Best Combination Therapy?

Whatever oral appliance you feel is the best choice for the patient +

Whatever CPAP mask works best for the patient
Oral Appliance Therapy as an Adjunct to CPAP

• For use during travel
• For use when electricity is not readily available (camping/hunting)
Conclusion: Current literature demonstrates that myofunctional therapy decreases apnea-hypopnea index by approximately 50% in adults and 62% in children. Lowest oxygen saturations, snoring, and sleepiness outcomes improve in adults. Myofunctional therapy could serve as an adjunct to other obstructive sleep apnea treatments.
Possible Side Effects

“Jaw Pain”
Tooth Movement
Bite Changes
“Jaw Pain”

- Have the patient point with 1 finger to where the pain is.
- Determine if the pain is more likely in the TMJ (joint pain) or in the masseter or temporalis (muscle pain).
“Jaw Pain”
Rules of Thumb

• If the patient has muscle pain, reduce the vertical or add posterior support if there wasn’t any.
• If the patient has TM joint pain, check the protrusion and/or check to see if the midline is being shifted.
Non-Intuitive Exception to the Rules of Thumb

- If the patient’s airway is not being kept patent by the oral appliance, they may “fight” the appliance (the brain trying to maintain an airway) and as such may have muscle and/or TMJ pain.
- Ask the patient:
  - Are you still snoring?
  - How do you feel you are sleeping?
- If the patient is still snoring or not sleeping well (unless they aren’t sleeping well due to pain), consider taking the appliance farther forward, or adding vertical, in an attempt to open the airway.
- If you do this, ask the patient to set their alarm for 3 or so hours after they go to bed so they can wake up and make sure that their pain isn’t worse.
- Also, remember that snoring may be nasal.
Predict the Problems
BEFORE
They Occur
Normal | RDD | NRDD
--- | --- | ---

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Internal Derangements

DJD
Avoiding Problems

• Patients with a reducing disc displacement
  • Jaw may desire to stay more anterior
• Patients with a non-reducing disc displacement
  • Added stress may result in previously asymptomatic problem becoming symptomatic…and/or they may start clicking
• These patients still need to be treated—just inform them!!
Avoiding Problems

• Patient Instructions for Avoiding Common Side Effects of OAT
  • Tooth Movement
    • “World’s Greatest Flosser”
  • Jaw Position Changes/Bite Changes
    • Morning repositioner
    • Check your bite every night when you brush
Avoiding Problems

- Consent, Educate and Consent Some More!!
  - Explain to the patient that side effects will most likely occur
  - Explain that if the patient pays attention to side effects and communicates with you that serious side effects can be avoided
- Reinforce this at each follow up appointment
“Nothing is Free”

• There are side effects with almost every treatment

• There are “side effects” with no treatment (for example, dying)

• Which side effects are the patient willing to live with?
Oral Appliance Therapy Protocol

- Screen and refer patient to MD for evaluation
- MD refers patient for sleep study (in lab or home study)
- Referral from physician for oral appliance therapy
- Initial exam
- Records (study models, bite registrations, imaging, other)
- Fitting of appliance
- Follow up visits for comfort and efficacy
- Referral back to physician for follow up PSG with titration of the appliance in the sleep lab (or HST confirmation of effective treatment)
- Alteration of the appliance for long term success
- Long term follow up with regular maintenance and replacement of the appliance every 3 to 5 years

Jamison Spencer