Functions of Sleep

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue reversal</td>
<td>Restoration</td>
</tr>
<tr>
<td>Biochemical refreshment</td>
<td>Function</td>
</tr>
<tr>
<td>Immune function</td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>Psychologic well-being</td>
</tr>
</tbody>
</table>

How much sleep do you really need?

<table>
<thead>
<tr>
<th>Age</th>
<th>Sleep Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborns (0-2 months)</td>
<td>12-18 hours</td>
</tr>
<tr>
<td>Infants (3-11 months)</td>
<td>14-15 hours</td>
</tr>
<tr>
<td>Toddlers (1-3 years)</td>
<td>12-14 hours</td>
</tr>
<tr>
<td>Preschoolers (4-6 years)</td>
<td>10-13 hours</td>
</tr>
<tr>
<td>School-age children (7-11 years)</td>
<td>10-11 hours (nine and around 6 p.m. old)</td>
</tr>
<tr>
<td>Teenagers (12-17)</td>
<td>8.5-8.75 hours</td>
</tr>
<tr>
<td>Adults</td>
<td>7-8 hours</td>
</tr>
</tbody>
</table>

Right Amount of Sleep?

Study of 1.1 million men and women from 30-102 years old

Best survival was 7 hours of sleep

Increased mortality with >8 hours and <6 hours of sleep (15%)

7.7
Normal Sleep Architecture

called a hypnogram

Biologic Functions of NREM Sleep

Mainly for BODY restoration
Neuronal rest and repair
Release of essential hormones for growth and recovery

Biologic Functions of REM Sleep

Mainly for BRAIN restoration
The body is paralyzed
Mood

Memory
Learning
20%

Stage 1 (N1)

5% of sleep cycle
“Drowsy” stage
Heart rate begins to slow

Transitional stage-1-7 minutes duration
Easy to awake from

Stage 2 (N2)

Deeper stage of sleep with reduction in HR and BP, but still light
45-55% of total sleep time
Most body movements, including bruxing

Stage 3 (N3)

Deep sleep or Delta sleep
Restorative- growth and rejuvenation

Hormones and blood sugars regulate
20%
REM Sleep

- Increase in heart rate, respiration, blood flow, BP
- Apnea and hypopnea can increase
- Dominates last third of night’s sleep
- Sympathetic nerves 2x more active as when awake
- WHY??
  - 20%

Insomnia

- Repeated difficulty with sleep initiation, duration, consolidation, or quality
- More common in women
- Finding the cause is usually needed to cure it
- Mayo Clinic finding: High correlation between insomnia patients failing pharmaceuticals and undiagnosed OSA
- 10 types

- Caused by fear, stress, anxiety, medications, poor sleep habits, herbs, caffeine
- 20%

- More common in women
- Finding the cause is usually needed to cure it
- 10 types

- Insomnia
  - Repeated difficulty with sleep initiation, duration, consolidation, or quality
  - Mayo Clinic finding: High correlation between insomnia patients failing pharmaceuticals and undiagnosed OSA

Sleep-Related Breathing Disorders

- Disordered respiration during sleep
  - Primary Snoring
    - Upper Airway Resistance Syndrome (UARS)
  - Obstructive Sleep Apnea
    - Central Sleep Apnea
    - Cheyne-Stokes Respiration

Primary Snoring

- 40% of the population snores
- 59% of people say their partner snores
- 25% of married couples are no longer sleeping in the same bedroom
- Narrowing of the airway and vibration of the soft tissue
- With no arousal

Upper Airway Resistance Syndrome (UARS)

- Arousals associated with snoring but no accompanying oxygen desaturation
- Common in young female TMD patients
- RERA’s - Respiratory Effort Related Arousals

Central Sleep Apnea

- Arousals lead to sleep fragmentation/hypersomnia and/or sleepiness

- Mayo Clinic finding: High correlation between insomnia patients failing pharmaceuticals and undiagnosed OSA
OSA
Complete obstruction of the airway

Pathophysiology

Hypopnea

Obstructive Sleep Apnea

AHI
Apnea-Hypopnea Index
Apneas + Hypopneas/# of hours slept

Hypopneas + # of hours slept

<5 normal - no coverage
5-15 mild - must show EDS with ESS
15-30 moderate - green light
>30 severe - CPAP intolerance
### Epworth Sleepiness Scale

**MUST BE ≥11**

### CO-MORBIDITIES

<table>
<thead>
<tr>
<th>EDS</th>
<th>HISTORY OF ISCHEMIC HEART DISEASE</th>
<th>HISTORY OF STROKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOCUMENTED HYPERTENSION</td>
<td>DOCUMENTED SYMPTOMS OF IMPAIRED COGNITION, MOOD DISORDERS OR INSOMNIA</td>
<td></td>
</tr>
</tbody>
</table>

### RDI

Respiratory Disturbance Index (RDI) takes into account Apnea + Hypopnea + RERA's/number of hours slept.

### Oxygen Desaturation

**ODI**

- How much time was spent under 90%?

**Nadir**

- How much time was spent under 80%?

### Epidemiology

- 17-20% of adults have OSA
- 1 in 4 men and 1 in 10 women
- 50% over the age of 50
- Incidence becomes > in men and women at menopause age
- Up to 80-90% remain undiagnosed
- More prevalent than diabetes or asthma

### Sequela: Why should we treat this?

- Stroke
- Heart Attacks
- Hypertension
- Dementia
- Acid Reflux
- Cancer
- Diabetes
- Auto Accidents
- Depression
- Impotence
- Periodontal Disease
- Optometry
- Obesity
Obesity is a dominant factor in only 60% of the cases of OSA.

Wisconsin Sleep Cohort

Twice as likely to die in men aged 30-70 with severe untreated OSA.

Sleep disordered breathing

The dentist's role in CREATING AWARENESS

Workflow Success

Health History

- Heart Disease
- Previous Strokes
- Depression
- Diabetes
- Fibromyalgia?
- Periodontal Disease
- High Blood Pressure
- Headaches
- Acid Reflux/GERD
- Glaucoma
- Periodontal Disease
- Headaches
- Acid Reflux/GERD
- Glaucoma
Add Questions

**Health History**

- Do you wear a C-PAP? or have you in the past?
- Have you been told to?

- Have you snored or have you been told you snore?
- Have you had a sleep study or been told to get a sleep study?

- Have you been diagnosed with sleep apnea?
- Have you been told to get a sleep study?

- Have you had a sleep study or been told to get a sleep study?

- Have you been diagnosed with sleep apnea?

78% predictive of AHI >5

89% positive predictive of O2 desaturation >4%

**Scalloped Tongue**

- 78% predictive of AHI >5

- 89% positive predictive of O2 desaturation >4%

**Crico-Mental Space**

- Overbite = Positive predictor value of 95% OSA

**Overbite**

- Crico-mental space <1.5mm

- Pharyngeal grade 2 or greater

**Bruxing**

- Overbite = Positive predictor value of 95% OSA

- Bruxing

  - Lavigne et al; 2006 n= 13
  - OAT reduced bruxism by 42%

  - Kobayashi et al; 2002 n=20
  - Direct relationship between AHI severity and bruxism severity
Presence or absence of OSA (Obstructive Sleep Apnea) must be determined before initiating treatment to diagnose and to provide a baseline.
Split-Night Study

An overnight PSG in which the patient is fitted with a C-PAP if they meet criteria.
Saves the insurance company money

Patient only has to come to the lab once
Can have the patient “titrated”

HST (Home sleep studies)

Types II, III, and IV
Dependent on how many channels
Must have a Type II or III to be covered by medical insurance

Pulse-Oximetry

Considered a Type IV device
Can get false negatives
Only measures pulse and oxygen

Used often because cheap and accessible

Workflow Success

Accurately predict who and how to treat

Awareness → Diagnosis → Financials

All you need to know

Consult-exam
9920X, 3D CBCT
70486/ 78376

HST- 95806
(preauth)

Records- N/A

Delivery- E0486
(physician)

F/U exam 9921X

HST- 95806
(preauth)
You will need:

1) Medical claim form printing- CMS 1500 as a paper claim or electronic claim- Cannot be hand-written
2) ICD diagnosis code made by a physician from the sleep study
3) The sleep study with the diagnosis of OSA from a sleep MD
4) CPT codes (E0486, exam codes, etc)
5) SOAP reports and narratives that the patient was seen by you and is an appropriate candidate for OAT
6) C-PAP Intolerance Form
7) An order (or prescription) for the oral appliance signed by a physician or healthcare provider (MD, DO, ARNP, PA-C)

Workflow Success

Awareness
Diagnosis
Treatment
Financials

Treatment Options

Lifestyle Modifications
Pharmacological Treatment
Oral Appliance

Positional Therapy
Sleep Hygiene
Surgery
C-PAP

Sleep Hygiene

- 7-7 hours of sleep
- Early to bed, early to rise- same routine every night
- Hot shower to cold, dark room
- No electronics
- Avoid big meals
- No dogs/pets

Pharmacological Treatment

- Floxine
- Nasovent
- Sinus rinses
- Falls short of being primary treatment

C-PAP

- Continuous Positive Airway Pressure
- Different types of masks, tubes, and machines
- Compliance rate reported as 40-80%
OAT (Oral appliance therapy)

Practice Parameters

AASM
2006

Sleep study and/or recommendation from an M.D.

Presence or absence of OSA must be determined before initiating treatment to diagnose and to provide a baseline.

Practice Parameters

Practice Parameters - Treatment Objectives

Primary snoring with no OSA

Treat snoring to subjectively acceptable level

OSA

Resolution of clinical signs and symptoms

Normalization of AHI (oxygen saturation)
Practice Parameters

C-PAP is a gold standard

Mild to moderate OSA

Are not appropriate candidates for C-PAP

When patients prefer MADs to C-PAP (new recommendation)

Who do not respond to C-PAP

Fail treatment attempts with C-PAP: weight loss or sleep position change

MAD’s have a more limited use in severe OSA and high BMI

Practice Parameters Follow-up

Not indicated in primary snoring

Follow-up PSG with oral appliance in place after final adjustments have been made

Changed to include mild OSA due to data that shows even low AHI is associated with adverse health outcomes

New Practice Parameters

Published in July 2015:

“In the first official joint guideline from the American Academy of Sleep Medicine (AASM) and American Academy of Dental Sleep Medicine (AADSM), oral appliance therapy is recommended for the treatment of adult patients with obstructive sleep apnea (OSA) who are intolerant of continuous positive airway pressure (CPAP) therapy or prefer alternate therapy.”

Effectiveness Studies

AHI <5 or decrease of 50% and <20 from baseline in a patient with no symptoms

AHI < 5

Effectiveness

Good for mild to moderate

Conclusion: “There is no clinically relevant difference between MAD and CPAP in the treatment of mild/moderate OSA when both treatment modalities are titrated objectively.”

Compliance, Fit, Occlusion, Patient Alteration

Patients must return for follow-up visits with dentist

Must return to referring physician to assess signs and symptoms of worsening OSA

Follow-up

Not indicated in primary snoring

Follow-up PSG with oral appliance in place after final adjustments have been made

Compliance, Fit, Occlusion, Patient Alteration

Conclusion: “There is no clinically relevant difference between MAD and CPAP in the treatment of mild/moderate OSA when both treatment modalities are titrated objectively.”
Conclusion: A custom-made device turned out to be more effective than a thermoplastic device in the treatment of SBD. Results suggest that the thermoplastic device can’t be recommended as a therapeutic option nor can it be used as a screening tool to find a good candidate for mandibular advancement therapy. [Bold added]
EMA

Silent-nite

TAP-3 and TAP-3 Elite

Two liners available: Thermacryl and Durasoft

Dream TAP

SUAD

Herbst
Dorsal Fin

Edentulous

Acrylic Appliances

<table>
<thead>
<tr>
<th>Classic (hard acrylic vs. Flex)</th>
<th>Elastic hooks- I put on all appliances</th>
<th>Anterior opening option</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE (Discluding Element) ramp option</td>
<td>Cover distal of mandibular 2nd molars</td>
<td>Metal reinforcement</td>
</tr>
</tbody>
</table>

Prosomnus (Prosomnus lab only)

Optisleep- Sicat

**Approach:**

- Can I make a Optisleep? (have the technology, posterior teeth and retention)
- Can I make a Prosomnus?
  - Select if small mouth/female, otherwise IA
  - Add DE if they are a clencher
- Do I need to make a Herbst (Prosomnus PH)?
  - side to side wear pattern
  - or insurance mandates
- Somnomed Fusion w Flex liner (dorsal fin) if all else fails
  - Great for edentulous areas
- SUAD or SUE: big, strong bruxers that break everything
They need help

- Financial arrangements
- Tracks down referrals
- Works with appeals and denials

Scheduling

Consult without sleep study - 4 units
Consult w/ sleep study & Impressions - 9 units
Impressions - 4 units
Delivery - 3 units - Assistant time
One - Three week check - 3 units - Assistant time

Prosomnus (IA, CA, PH, Select):
Prosomnus
jsaenz@somnomed.com

Dental Sleep Medicine Champions

Trained to do consults, deliveries, adjustments, medical insurance, follow-up visits
Financial arrangements
Someone who has passion and loves to learn

Sirona-
Optisleep

Somnomed - SUAD and Dorsal Fin
jsaenz@somnomed.com

Labs

Protocols

Maybe even someone who struggles with OSA
Trained to do consults, deliveries, adjustments, medical insurance, follow-up visits
Financial arrangements
Someone who has passion and loves to learn

Scheduling

One month check - 3 units - Assistant time
3/6 month check - 3 units - Assistant time
Annual check - 3 units - Assistant time
Reviewing Sleep Study

- Review AHI or RDI
- supine vs. non-supine
- apneas vs. hypopneas

Reviewing Sleep Study

- Oxygen level
- Nadir
- how long <90%?

Reviewing Sleep Study

- Snoring
- PLM
- Sleep stages- any REM?
- Sleep efficiency- "Doc, I didn't sleep at all"

Better Candidate

- Low BMI
- Female
- CPAP pressure under 10.5
- Positional OSA
- Younger
- More hypopneas vs. apneas
- Retrognathic
- Big ROM
- Shallow MP angle
- No nasal obstructions

Consult

- Initial Paperwork
- Overview of OSA
- Treatment options
- Sample oral appliances
- Discussion of their CC and sleep study
- Doctor exam- including discussion of previous history

Previous History

- Surgeries
- Previous sleep studies
- C-PAP experience
- Previous oral appliances?
- Previous TMJ
Patient History

Hours of sleep a night
Morning headaches
Dry Mouth
Exercise Habits
Caffeine Intake
Alcohol Intake

Full Exam

Vital signs- BP and Height and Weight
Tooth exam
Neck size
Periodontal disease
Occlusion and Orthodontic Class
Range of Motion
TMJ- Clinical, palpation, stethoscope
Tongue
Soft palate and uvula

Full Exam

Jaw relationship
Malampatti score
Nasal exam- Narrow nares? Large turbinates?
Septal deviation?
Occluded? Mouth breather?

Cottle Maneuver:

If it’s easier, then it is a valve issue. There are no good surgical treatment for this Patient is a good candidate for MUTE

Nasal Breathing

www.mutesnorings.com
www.breathright.com
www.maxairnosecones.com

Cone Beam

Location and severity of airway obstructions
Nasal passageways and sinuses
Skeletal and dental classifications
Oral Maxillofacial pathology

MUTESNORING.COM/DRELLIOTT
Paperwork

If no sleep study?
- Refer to MD
- Refer directly to sleep lab for PSG or HSAT
- Third party service
- Get diagnosis from a board certified sleep physician

You will need
1) Medical claim form printing: CMS 1500 as a paper claim or electronic claim. Cannot be hand-written
2) ICD diagnosis code made by a physician from the sleep study (G47.33)
3) The sleep study with the diagnosis of OSA
4) CPT codes (E0486, exam codes, etc)
5) SOAP reports and narratives that the patient was seen by you and is an appropriate candidate for OAT
6) C-PAP Intolerance Form
7) An order (or prescription) for the oral appliance signed by a physician or healthcare provider (MD, DO, ARNP, PA-C)

What You Will Need:
- Impressions
- Putty/ Wash
- Digital
- Bite

Appointment 3: Delivery
- Soak prior to arrival
  (ONLY IF ACRYLIC)
- Have patient lay back or sit upright in chair with it in for 5 minutes
- Adjust/ Occlude or Hydent (white) spray
- Check occlusion
- Discuss morning exercises and make “chew toy”

Delivery
- Go over informed consent again (meaning discuss there may be TMJ pain and a different bite in the morning)
- Instructions
  - Show the patient how to advance if you feel they can handle it
One/two week check

"When you wore it, how did it fit?"

Questionnaire

Adjustments/try it in

Show them how to advance/calibrate

Proof of delivery

Morning Exercises

One-month check

BP/Pulse

Epworth

Questionnaire

Experience?

Consider calibration HST

Try to get rid of them (IN THE NICEST WAY POSSIBLE)

Three/six-month check

BP/Pulse

Epworth

Questionnaire

Build value into these appointments

Consider possible calibration check with HST
Success?

- Release on an annual basis
- Letter to Physician and copy of HST report
- Request for follow-up PSG

Annual check

- BP/Pulse
- Questionnaire
- Epworth
- Adjustments? Fit? Comfort?
- Compliance?
- CLEAND THE APPLIANCE/Try in

6 Step Action Plan:

- #1 - Change Health History
  - Do you snore? Or have you been told you snore?
  - Do you wear a CPAP? Have you in the past? Or have you been told to get one?
  - Have you had a sleep study? Or have you been told to get one?

6 Step Action Plan:

- #2 - Put Evaluator in each operatory
  - Scalloped tongue
  - Small airway
  - Bruxing/ Wear
  - Acid Reflux

6 Step Action Plan:

- #3 - Medical Insurance
  - Collect cards on EVERY patient
  - DRIVER'S LICENSE!
  - Learn how to do EC (Eligibility Checks)
  - Sign up with 3rd party biller
6 Step Action Plan:

• #4- Morning Huddle Identification
  • Did they check any of the questions?
  • Previous nightguards
    • Hypertension
    • Psych meds
    • Acid Reflux
    • Diabetes

6 Step Action Plan:

• #5- Photos
  • Bruxing Wear
  • Airway
  • 3D

6 Step Action Plan:

• #6- Start talking to patients and get more in depth training

www.joinsleep101.com
fb: erin.elliottdds
twitter: @erinelliottdds
insty: @erinelliottdds
linkedin: Dr. Erin Elliott