

# Integrating Sleep Medicine into the Dental School Curriculum: *Current and Future Plans at UMSOD*

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• No disclosures of conflicts of interest.



### Objectives

- Review the history, trends, and status of pre-doctoral sleep medicine education in the U.S.
- Outline the University of Maryland School of Dentistry's current sleep medicine curriculum, philosophy of care, and future goals
- Discuss UMSOD's pre-doctoral SRBD/OSA screening protocol







### A brief history and status update of U.S. predoctoral sleep medicine education

#### • 1978: National Survey of US Medical Schools <sup>2</sup>

- Pre-doctoral MD Programs: <1 hour of sleep medicine education</li>
- 93% of American medical schools had, "essentially no preparation of physicians to deal with clinical sleep disorders"

#### 1988: Taskforce Consensus Document on Medical School Curriculums

• "No complete and truly global understanding of human health and disease is possible without an understanding of sleep and its recognition as a system on par with circulation, digestion and reproduction."

#### 1991: National Survey of US Medical Schools

- Pre-doctoral MD Program: <2 hours of sleep medicine education</li>
- % of schools listing the topic of sleep disorders increased from 54% to 63%



#### 1992: National Commission on Sleep Disorders Research

- Recognized the epidemic of sleep disorders, its consequences, and the complete lack of sleep education
- Urged health care professionals to
  - increase the number of sleep medicine experts
  - validate experts via training, testing, credentialing, and accreditation of their facilities
  - increase pre-doctoral university educational hours in topics of sleep

#### 1995: American Academy of Sleep Medicine Taskforce 2000 6

- Established competency-based goals for pre-doctoral medical education in sleep medicine
- Set goal to establish <u>sleep medicine curriculums in all medical schools by 2000</u>

#### • 1998: AASM Taskforce 2000 National Survey of US Medical Schools 7

- Majority of respondents (65%) are teaching sleep medicine in some capacity
- <u>2.11</u> pre-doctoral and <u>4.8</u> post-doctoral hours of sleep medicine achieved
- Taskforce 2000 competency-based goals not met

#### 2003: National Survey of U.S. Dental Schools

Pre- & Post-doctoral Dental Programs: 2.5 hours of sleep medicine education



- 2006: National Commission on Sleep Disorders Research, Guest Editorial by Dr. Dement 9
  - "Teaching somnology and sleep medicine remains outside the mainstream educational system. As a result, vast numbers of health professionals are inadequately informed."
- 2006: AASM & AADSM Clinical Practice Guidelines for OAT (updated in 2015, 2017) 10
- 2011: Global Survey of Medical Schools \* 11
  - Pre-doctoral MD Programs: <2.5 hours of formal instruction in sleep medicine
- 2009, 2012: Sleep Research Society Survey 12
  - Cohesive, self-sustaining, and independent administrative structures for sleep medicine academic curriculums rare
- 2012: National Survey of US Dental Schools\* 13
  - Pre-doctoral DDS Programs: <u>3.92 hours</u> of formal instruction in sleep medicine
  - 75.5% of US pre-doctoral DDS programs are providing some sleep medicine education



#### • 2013: UNC School of Dentistry hosts Inaugural National Dental Educators Conference 14

- Evaluated the status of sleep medicine education in US and Canadian dental schools
- Found that dental schools are <u>not</u> meeting the educational needs of their students with respect to sleep medicine

#### • 2017: American Dental Association House of Delegates Policy Statement 15

"The Role of Dentistry in the Treatment of Sleep Related Breathing Disorders"

#### • 2018: American Academy of Dental Sleep Medicine Policy Statement 16

"A Dentists Role in Treating Sleep Related Breathing Disorders"

#### 2021: AASM Position Statement: Sleep is Essential to Health 17

• "It is the position of the AASM that sleep is essential to health. Because of sleep's significant and multifaceted connections to health and chronic disease, sleep education should have a prominent place in K-12 and college health education, medical school and graduate medical education, and educational programs of other health professionals."



• "Sleep medicine education at the pre-doctoral level in the US in medicine and dentistry shows a <u>slow trend</u> to increased number of hours." <sup>1</sup>

- Pre-doctoral DDS Programs: 3.92 hours (from 2.5 h in 2003) 11
- Pre-doctoral MD Programs: <2.5 hours (from <1 h in 1978)<sup>13</sup>
- Barriers: insufficient time, lack of trained staff/qualified instructors, lack of resources, lower priority/relevance to program <sup>11</sup>



## How do most dentists receive training in sleep medicine today?

#### Formal Pre-Doctoral Sleep Medicine Curriculum

- Tufts University School of Dental Medicine
- UNC School of Dentistry
- University of Tennessee College of Dentistry
- West Virginia University School of Dentistry

#### Dental Sleep Medicine Fellowships

- Tufts University School of Dentistry
- University of Pacific Dental School

#### Continuing Education

- American Academy of Dental Sleep Medicine Mastery Program
- Spear Dental Education

#### Mini-Residencies

- Tufts University School of Dentistry
- University of Michigan School of Dentistry
- UCLA School of Dentistry









#### Faculty

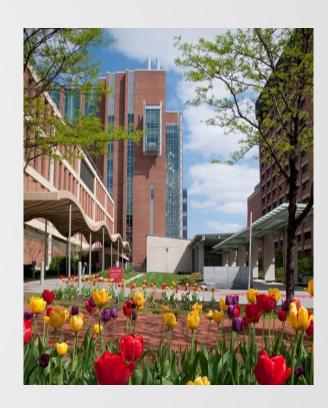
- Larry Cohen, DDS, Comprehensive Care Department
- Dennis Stiles, DDS, Advanced Education in General Dentistry
- Stephanie Dennison, DDS, Comprehensive Care Department

#### Philosophy of Care

- Sleep Medicine vs Dental Sleep Medicine
- Prevent, Control, Resolve
- Comprehensive, interdisciplinary care

#### Current Focus

- Awareness of and introduction to sleep medicine
- Proper screening and referral of at risk SRBD patients





#### • **Didactic**

- D3 Removable Prosthodontics Course (REST 538C)
  - Introduction to Sleep Medicine (4 hours)
    - Sleep (physiology, upper airway anatomy, sleep disorders)
    - OSA (pathophysiology, diagnosis, management)
    - Dentistry's Role (screening, prevention, management)
    - Oral appliance therapy
    - Myofunctional therapy

#### D3 Treatment Planning Course (TXPL 538)

- Systemic Phase Case Review (1 hour)
  - Case based review of risk factors for OSA
  - Proper referral protocol to PCP

#### H1 Hygiene Course

Introduction to Sleep Medicine (2 hours)



#### Clinical

- No formal pre-doctoral clinical sleep medicine curriculum
  - Dr. Cohen and Dr. Dennison work to educate faculty and students in the clinical setting regarding proper SRBD screening/referral
  - No clinical training in oral appliance therapy, myofunctional therapy

#### Research

- ODSC- 599 Research with a mentor
- D4 students can elect to do sleep medicine research with Dr. Dennison





- Interdisciplinary Efforts
  - Ongoing, 2-year UMB IPE Seed Grant
  - Purpose:
    - Develop formal UMSOD pre-doctoral OSA screening/referral
      - Incorporate OSA into medical history form in EHR/Axium
      - Develop sleep medicine referral form in EHR/Axium
    - Develop UMB IPE activity for pre-doctoral dental and medical students to mimic interdisciplinary management of OSA patient



#### Sleep Medicine

#### Sleep Medicine Care Under One Roof: A Proposed Model for Integrating Dentistry and Medicine

Sunil Sharma, M.D., F.A.A.S.M.1; Greg Essick, D.D.S., Ph.D.2; David Schwartz, D.D.S.2; Amy J. Aronsky, D.O., F.A.A.S.M.4 Jefferson Sleep Center, Thomas Jefferson University & Hospitals, Philadelphia, PA; <sup>2</sup>Department of Prosthodontics and Regiona Center for Neurosensory Disorders School of Dentistry, University of North Carolina, Chapel Hill, NC; 'The Center for Sleep Medicine, Chicago, IL; 'Comprehensive Sleep Associates, Capital Health Medical Center, Hamilton, NJ

for sleep-related breathing disorders has been a challenge for dental and medical professionals alike. We review the difficulties that have been faced and propose a multidisciplinary care delivery model that integrates dental sleep medicine and sleep medicine under the same roof with educational and research components. The model promises to offer distinct advantages to improved patient care, continu-

Integrating oral appliance therapy into the delivery of care ity of treatment, and the central coordination of clinical and insurance-related benefits

Keywords: Integrated sleep medicine, dental sleep medicine delivery of care

Citation: Sharma S: Essick G: Schwartz D: Aronsky AJ, Sleet medicine care under one roof; a proposed model for integrat ing dentistry and medicine. J Clin Sleep Med 2013:9(8):827

lthough sleep science has significantly advanced in the A last decade, the delivery of care for sleep-related breathing disorders remains fragmented. Oral appliances in particular have historically been underutilized. This article discusses some of the challenges we have faced and proposes a care appliance therapy for sleep disordered breathing among dentists delivery model that is designed to integrate the disciplines of dental sleep medicine and sleep medicine. While in the past there has been a natural tendency to build separate "shops" for each specialty (separate-office model), the current emphasis on multidisciplinary care stresses the need to be able to play in the same "sandbox" (care-under-one-roof model). As will be discussed below, this model offers distinct advantages to improved patient care, continuity of treatment, and the central coordination of benefits, both insurance-related and clinical.

#### Past Challenges to Integrated Care

Reasons for the inability of dental sleep medicine to integrate fully with the delivery of sleep medicine care have been many. First, the growth of dental sleep medicine has not kept pace with the exponential growth of sleep medicine in the treatment of obstructive sleep apnea syndrome (OSA). Dentists who provide appliance therapy for sleep-related breathing disorders are seemingly few in number. Although the American Academy of Dental Sleep Medicine (AADSM) website (http://www.aadsm. org/FindADentist.aspx) lists about 3,000 US dentists as members, only about 200 dentists have obtained diplomate status awareness of oral appliance therapy, it can undermine recogwith the American Board of Dental Sleep Medicine (ABDSM) (http://www.abdsm.org/Diplomates.aspx), and only about a dozen dental practices have been accredited as dental sleep centers. (http://www.aadsm.org/PDFs/AccreditationStandards. pdf). Thus, with the possible exception of using these websites, the thousands of sleep disorders centers (both accredited and non-accredited) in the United States have found no easy way to identify dental sleep medicine experts to whom patients can be

referred for evaluation and treatment with oral appliances and for whom the specialized training and experience in oral appliance therapy can be assured.

Second, the lack of education in the specialized use of oral and sleep physicians has been a limiting factor.1 A survey of dentists found that 40% knew little or nothing about oral appliances for treatment of OSA.2 Moreover, 49 responding dental schools of the 58 US schools recently surveyed reported only 3 hours of total curriculum time devoted to sleep medicine. With the exception of short courses offered by the AADSM, dentists have relied on training from marketing groups often associated with specific appliances and products for sleep medicine. Knowledge of new materials, techniques, procedures, and continuing education has also been attained from dental journals, periodicals, and advertisements. Efforts are under way to formalize dental sleep medicine training in our dental schools. The University of North Carolina School of Dentistry is hosting a conference for dental educators across the United States and Canada to begin the process of developing pre-doctoral DDS

Education to sleep physicians and technologists about oral appliances has been virtually nonexistent. Indeed, there have been recent efforts to train physicians to practice oral appliance therapy at professional meetings. Although this practice raises nition of the training dental sleep experts undergo to properly evaluate the integrity of the teeth, the surrounding bone, and temporomandibular joints: to obtain accurate impressions and fit removable oral appliances (such as dentures and bite guards) to the teeth; and to minimize negative side effects of their presence.

Third, communications between sleep physicians and dentists have been suboptimal in most healthcare settings. Even in academic settings, interactions between medical and dental

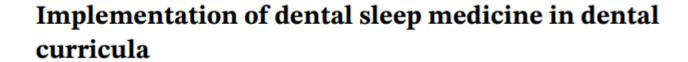


#### Other

- Post-Graduate AEGD introductory sleep medicine presentation given by Dr. Stiles
- UMSOD Sleep Medicine Interest Group established 2023
- Sleep Bootcamp

#### • Future Goals:

- Develop a Sleep Medicine Senior Clerkship
- Establish a <u>comprehensive 4-year sleep medicine curriculum</u> (didactic, clinical) that trains our predoctoral students to:
  - Develop a <u>strong foundational knowledge</u> in sleep medicine
  - Expertly screen for and refer pediatric and adult patients at risk for SRBD
  - Expertly manage OSA patients with the use of oral appliance therapy



Christina B. DeBiase MA, EdD<sup>1</sup> R. Constance Wiener DMD, PhD<sup>2</sup> 0

Decidents and Decided

Predoctoral I	ental			
Year 1	Fall	Gross anatomy	3	Introduction to sleep breathing disorders/anatomy of the airway
Year 1	Fall	Physiology	1	Clinic correlation of physiology and patient care associated with DSM
Year 1	Summer	Introduction to patient care	1	Patient examination and assessment of DSM—use of ESS, STOP, BANG, pediatric questionnaire; Mallampati tongue classification, pharyngeal space grading, tonsillar grading; evaluation of nasal breathing/anatomy of INV; ENV; columella (cottle test); and evaluation of the craniofacial profile of adolescents
Year 2	Fall	Introduction to clinical dentistry	3	Developing skills using DSM assessment forms
Year 2	Spring	Principles of medicine	1	Systemic conditions and management of comorbidities associated with DSM
Year 2	Summer	Craniomandibular occlusion	4	Eligible candidates for appliance therapy; options; 3-h laboratory
Year 3	Fall	Prosthodontics treatment planning	2	DSM appliance techniques-impressions, bite registrations, etc. billing/coding
Year 3	All	Clinical experience	Varies	Direct patient examination, assessment, referrals for DSM Students must meet treatment benchmarks
Year 4	Fall/Spring	Rotation to the sleep clinic	6	Capstone event



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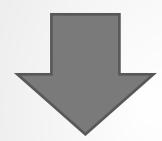
TABLE 1 Dental sleep medicine (DSM) curriculum integration	ABLE 1 De	ıtal sleen med	dicine (DSM)	) curriculum	integration.	2020-21
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	AD D Demai steep medicine (DSM) curriculum meglation, 2020-21				
Program	Term	Course	Hours of instruction	Торіс	
Dental Hygie	ene				
Year 3	Fall	Clinical methods	4	Introduction to DSM	
Year 3	Spring	Clinical methods	7.5	Patient examination and assessment	
Year 3	Spring	Dental materials	3	DSM oral appliances	
Year 4	Fall	Clinical experience	Varies	Working in groups of two students, the students integrate DSM in direct patient examination and assessment in the dental hygiene clinic with the use of Epworth sleepiness scale (ESS); snore/tired/obstruction/pressure (STOP) scale; body mass index/age/neck/gender (BANG) scale; pediatric/adolescent sleep questionnaire; Mallampati tongue classification; pharyngeal space grading; tonsilar grading; evaluation of nasal breathing/anatomy of internal nasal valve (INV); external nasal valve (ENV); columella (cottle test); and evaluation of the craniofacial profile of adolescents	





• **SCREEN** pediatric patients



• **PREVENT** SRBD/OSA development via intervention during craniofacial growth → establish optimal airway





- Medical History
- Extraoral Exam
- Intraoral Exam
- Dental Exam
- Parent Reported Symptoms



### Medical History

Obesity

Allergic Rhinitis
Tonsillitis

ADHD, Mood Disorders, Developmental concerns

Snoring

### Extraoral Exam

Forward head posture

Adenoidal face

Mouth breathing

Retrognathia, Micrognathia

Nasal obstruction, inflammation, deviation

### Intraoral Exam

Adeno-tonsillar hypertrophy

Mallampati Classification III/IV

> Macroglossia Ankyloglossia

### Dental Exam

Bruxism
Acid erosion

Xerostomia Caries Gingival inflammation

Narrow, tapered arch form







- Medical History
- Extraoral Exam
- Intraoral Exam
- Dental Exam
- Parent Reported Symptoms



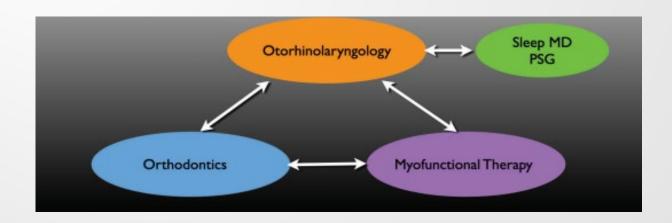
- Parent Reported Symptoms
  - Snoring?
  - Enuresis?
  - Moving around during sleep? Sleepwalking?
  - Mouth breathing?
  - Tired/groggy in the morning?
  - Peer or conduct issues?



- Medical History
- EOE/IOE
- Dental Exam
- Parent Reported Symptoms



- Referral to PCP/ENT
- Referral to orthodontist, myofunctional therapist





### **UMSOD Adult SRBD/OSA Screening**

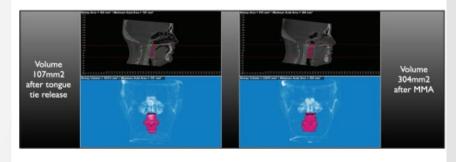


• **SCREEN** adult patients



- **CONTROL** via referral, OAT, MFT
- RESOLVE via oral surgery, orthodontics, airway prosthodontics







Photos courtesy of Dr. Jeff Rouse



### **UMSOD Adult SRBD/OSA Screening**

### Medical History

Obesity

Hypertension, Atrial Fibrillation, CHF, Stroke

Type II Diabetes

Snoring, Prior OSA diagnosis

### Extraoral Exam

Forward head posture

Neck circumference M 17", F 15"

Mouth breathing

Retrognathia, Micrognathia TMD

Nasal obstruction, inflammation, deviation

#### Intraoral Exam

Adeno-tonsillar hypertrophy

Mallampati Classification III/IV

Macroglossia Ankyloglossia

### Dental Exam

Bruxism Acid erosion

Xerostomia Caries Periodontal Disease

Narrow, tapered arch form



### **UMSOD Adult SRBD/OSA Screening**

- Medical History
- EOE/IOE/Dental Exam
- Patient Reported Symptoms
- OSA Screening Tools



#### Retrognathia, Micrognathia, Forward Head Posture

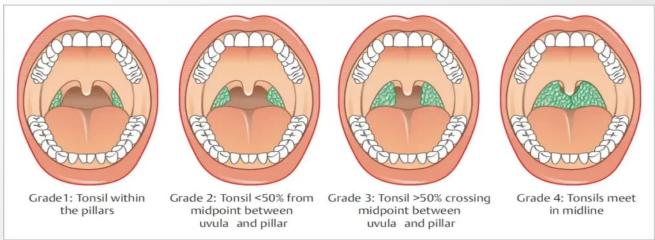






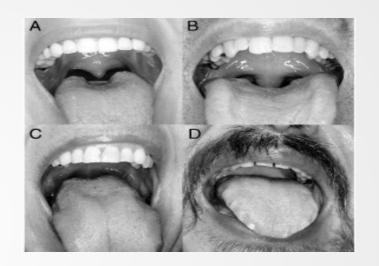
### Tonsillar Hypertrophy

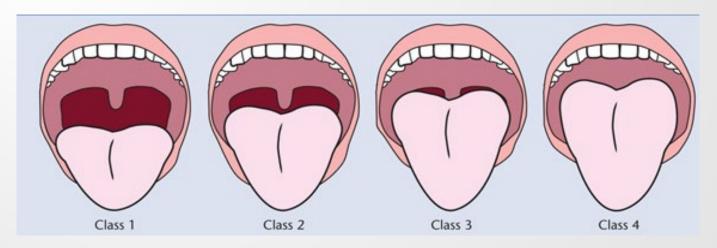






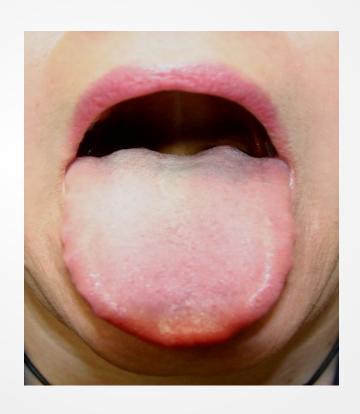
### Mallampati Classification







### Macroglossia









### Bruxism, TMD







### **Acid Erosion**

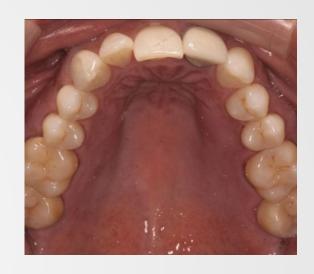






### Narrow/Tapered Arch Form

Broad or square arch forms may accommodate the tongue without impinging on the airway



 Narrow or tapered arch forms suggest less room to accommodate the tongue and potential risk for obstruction of posterior airway



Photos courtesy of Jay A. Nelson, DMD, FAGD



### **UMSOD Adult SRBD/OSA Screening**

- Medical History
- EOE/IOE/Dental Exam
- Patient Reported Symptoms
- OSA Screening Tools



#### **Patient Reported Symptoms**

- Snoring
- Witnessed apneas
- Choking arousals
- Gasping arousals
- Frequent nocturnal awakening
- Unrefreshing sleep
- Excessive daytime sleepiness
- Motor vehicle accidents



### **UMSOD Adult SRBD/OSA Screening**

- Medical History
- EOE/IOE
- Patient Reported Symptoms
- OSA Screening Tools



#### **OSA Screening Tools**

- 1. Epworth Sleepiness Scale, STOP BANG, Berlin questionnaire
- 2. High Resolution Pulse Oximetry (HRPO)
- 3. Home Sleep Apnea Test (HST)
- 4. Smart Phone Apps: Snore Lab, Reviva Softworks Ltd.



#### **OSA Screening Tools**

#### **Berlin Questionnaire** Category 1 positive (≥2) Category 2 positive (≥2) Category 3 positive (1 or BMI>30) PCP\_ **Patient Information** Height: How often do you feel tired or fatigued after you sleep? Weight: Male/Female Nearly every day 3-4 times a week 1-2 times a week Category 1 1-2 times a month Never or nearly never Do you snore? Yes No Don't Know During your wake time, do you feel tired, fatigued or not up to par? Nearly every day 3-4 times a week Your snoring is? 1-2 times a week 1-2 times a month Slightly louder than breathing As loud as talking Louder than talking Never or nearly never Can be hear in adjacent room Have you ever nodded off or fallen asleep while driving a vehicle? Describe the snoring frequency Yes No Nearly every day 3-4 times a week 1-2 times a week If yes, how often does it occur? 1-2 times a month Nearly every day ☐ Never or nearly never 3-4 times a week 1-2 times a week Has your snoring ever bothered other 1-2 times a month people? Yes No Never or nearly never Has anyone noticed that you quit Category 3 breathing during your sleep? Nearly every day Do you have high blood pressure? 3-4 time a week ☐ Yes ☐ No 1-2 time a week 1-2 time a month BMI= Never or nearly never



Snoring
Tired
Observed apneas
Pressure (high)
BMI >35
Age >50
Neck circ
Gender (M)

#### **Epworth Sleepiness Scale**

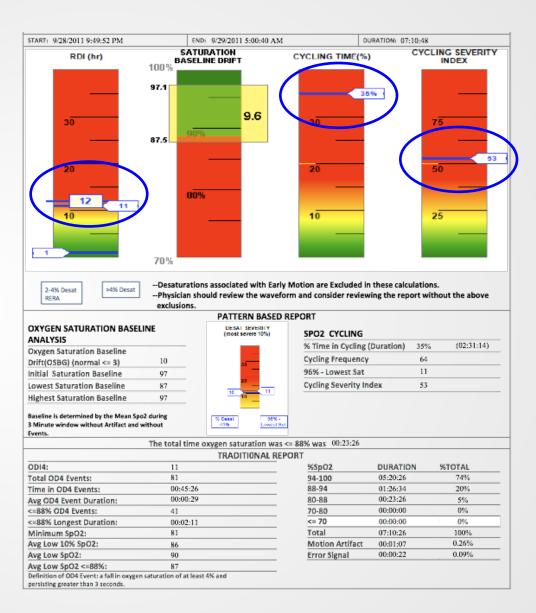
SITUATION	CHANCE OF DOZING (0-3)
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. theater or meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in traffic	
TOTAL SCORE	/ 24



### High Resolution Pulse Oximetry

Minolta 300i





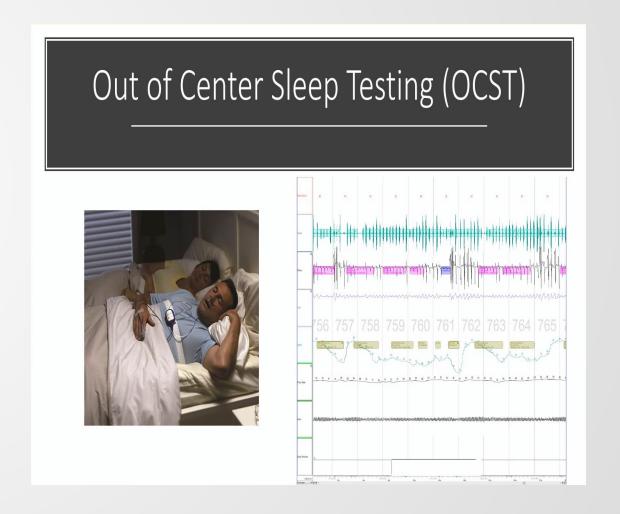




### Home Sleep Apnea Test

#### WATCH-PAT200---ITAMAR







### **UMSOD Adult SRBD/OSA Screening**

- Medical History
- EOE/IOE
- Dental Exam
- Patient Reported Symptoms



- Referral to PCP
- Referral to orthodontist, oral surgeon, myofunctional therapist



#### Conclusions

- Progress in pre-doctoral sleep medicine education has been slow over the decades but shows ever renewed interest and effort in medical and dental school pre-doctoral and post-graduate curriculums.
- Due to expertise in the stomatognathic system as well as the routine nature and volume of dental visits, dentists are well equipped to screen for and help manage SRBD.
- The sleep medicine curriculum at UMSOD introduces D3 pre-doctoral and hygiene students to sleep medicine and SRBD/OSA screening and referral protocols.
- UMSOD seeks to develop a comprehensive, integrated, and interdisciplinary sleep medicine curriculum in which students are adequately trained to screen for SRBD/OSA, properly refer at risk patients, and safely and effectively help manage OSA via OAT, myofunctional therapy, and referral to dental specialists.
- Continued effort is required to achieve these goals, but doing so will have a significant impact on health outcomes and the public health crisis that is SRBD.



- Thank you!
- For more information contact:
  - Stephanie Dennison at sdennison1@umaryland.edu



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