Texas A&M University College of Dentistry
Dallas, Texas

Informed Consent to Participate in a Research Study

Study Title: Effects of myTAP Oral Appliance Therapy on Cardio-Respiratory Dynamics in Mouth-Breathers who Snore.

Short Title: OA Therapy for Snoring Mouth-breathers

Principal Investigators: Emet Schneiderman, PhD; emet@tamhsc.edu, 214-828-8377
Co-Principal Investigator: Preetam Schramm, PhD; schramm@tamhsc.edu;
Co-investigators: Jason Hui, DDS; Pollyana Moura DDS, MS, PhD; William Stenberg DDS, MS; Amrittej Virk, DMD; Margaret Newton, BS; JuYing Lin, DDS

Research Coordinator & Emergency Contact: Zohre German, MS, german@tamhsc.edu 214-828-8291.

To Participants:

This research study is investigator-initiated. Please read the following document as a part of the informed consent process. The informed consent process is to advise you of the risks and benefits involved in the study so you can freely make a decision whether or not to participate. Informed consent includes having the study fully explained to you, an opportunity to ask questions, your questions answered to your satisfaction and a written copy of the informed consent document to read and sign.

Description of Study:

You are being invited to participate in this research study by the Principle Investigators: Emet Schneiderman PhD and Preetam Schramm, PhD at Texas A&M College of Dentistry. It will take place in the Rooms 20 and 725 at 3302 Gaston Avenue, Dallas TX 75246.

The purpose of this pilot study is to determine whether snoring and oral health problems in mouth breathers can be reduced by using a myTAP oral appliance (OA) with a mouth shield (OA + MS). This is an interventional study to objectively evaluate OA therapy on breathing during sleep, sleep quality, and whether it can improve problems related to mouth breathing such as dry mouth, bleeding and inflammation of the gums and tissues that support the teeth (gingivitis and periodontitis). If you are 18 years of age or older, and you snore and mouth breath, have at least 8 teeth in each arch, and your oral health is adequate to wear an OA, you may be eligible to enroll. You will be expected to wear on oral appliance (Fig. 1) for at least 8 weeks and as many as 12 weeks. Over this same time period, you will do home sleep studies at regular intervals at 3 to 5 time points (see Table 1). At each of these time points you will do two consecutive nights of sleep recording. In addition to the sleep studies performed at each of these time points, subjects will complete several brief questionnaires. All participants will be given the opportunity to use and keep their OA after the 12 week period. To help you adjust the OA to the optimal position, you will wear EverSleep wearable sleep coaching device for as many nights as needed to achieve the ideal position of your lower jaw. The device includes a small cuff worn on a finger and a wrist watch-like device.

IRB NUMBER: IRB2019-0421-CD-FB
IRB APPROVAL DATE: 10/23/2020

Justification for the trial: Why is this study being done?

The purpose of this study is to evaluate whether the MyTAP + MS can improve sleep, breathing (respiration) during sleep, and reduce periodontal conditions. The oral appliance will be given to you and fitted by one of the team dentists in a single appointment. The adjustable OA consists of two plastic plates that cover the upper and lower teeth. The OA acts by moving your lower jaw forward to increase the space in the back of your mouth (upper airway/throat). The increased space is expected to improve breathing during sleep and lessen snoring. This well-established OA design includes a midline screw apparatus that allows the user, under close dentist supervision, to gradually bring the lower jaw forward to a position that optimizes your airway and comfort. The saliva that is produced in your mouth protects your teeth, gums and other tissues in your mouth. Mouth breathing interferes with this process, so it is expected that the mouth shield may lessen this interference. This may lead to healthier gums and teeth, as well as less the discomfort of dry mouth.

This study is called a randomized control trial because you will be randomly assigned to the OA+MS (OAM) group or the Control group (OA only, OAA) at the beginning. Random assignment is done in a fashion similar to flipping a coin. After 4 weeks all participants will be given the MS to wear for the remainder of the study. Phase 1 of the study is completed at T_3, after having worn the OAs for 8 weeks. Based on our recently completed study (IRB2017-0390) and research published on this kind of appliance (Hoekema, 2007), some participants will not have achieved maximal benefit from the OA, and will require addition adjustment. These participants will enter Phase 2 of the study where they will have 1 or 2 more sleep studies done at 2 week intervals, and will further adjust their OAs (that is, advance their lower jaws) to eliminate snoring.

We will evaluate differences in sleep respiration events, snoring and other measures at all time points. Periodontal exams (gums and supporting tissues) will be performed at T_1-T_5. Comparison will be done between and within groups (that is, with and without the MS).

The purpose of collecting sleep data with OA use is to determine its success in promoting stable respiration during sleep and reducing the number of events in which breathing stops (apneas) or diminished (hypopneas) and the amount of oxygen in the blood is low (oxygen desaturation).

The sleep recorder (NOX T3, Nox Medical, Reykjavík, Iceland) is a Food and Drug Administration (FDA) cleared and CE marked. The midline traction oral appliance (myTAP, AMI Inc., Dallas Texas) is currently marketed as a medical device to treat snoring and obstructive sleep apnea and is FDA cleared. The EverSleep device (Somnohealth, Golden Colorado) is a wearable sleep coaching device (like a Fitbit) and is not considered a “medical device” requiring FDA clearance.

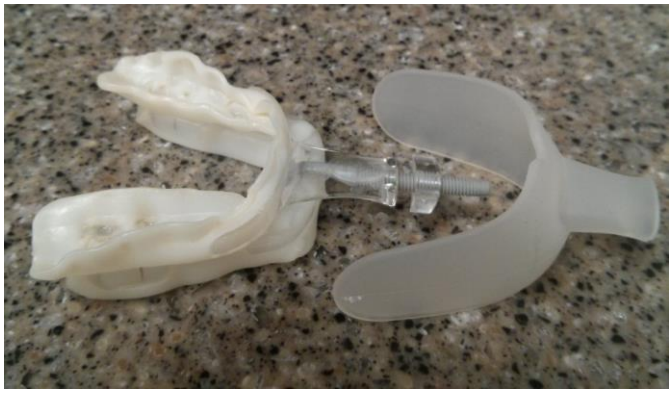

Figure 1. Oral appliance with mouth shield (MyTAP + MS)

Why am I being asked to participate in this study?

You are being asked to participate in this study because you believe you snore and mouth breathe. We will give you a home sleep test to confirm this; if confirmed you may be eligible to enroll, based on the other inclusion criteria. If you have stable cardiopulmonary disease (heart failure, Chronic Obstructive Pulmonary Disease, ventricular dysrhythmia), morbid obesity or other serious health conditions, you must be under a physician's care and obtain written permission from him/her to participate in this study.

How long will the study take?

Approximately 9 weeks for Phase 1, and up to an additional 4 weeks if needed (Phase 2).

How many people are participating in this study?

Up to 120 participants will be screened with a home sleep test with the expectation of 40 fully enrolling and completing both phases of the study (13 weeks total)

Procedures you will be asked to follow:

Study participants will be required to visit the Sleep Research Program Office at Texas A&M College of Dentistry (COD) approximately four to six times.

Table 1. The number and purpose of visits to the research study center at Texas A&M College of Dentistry.

Phase 1 – All Participants							**Phase 2 – Participants Requiring Additional OA Adjustment**			
	Visit 1	Visit 2	Visit 3		Visit 4		Visit 5		Visit 6	
Time Point	T_0	T_1	T_2		T_3		T_4		T_5	
		COMPLETE DAILY SLEEP LOG								
Time (min)	60 (1 hour)	90 (1.5 hrs)	10 – 15 minutes	10 – 15 minutes	45 minutes	10 – 15 minutes	30 – 45	10 – 15 minutes	10 – 15 minutes	45 minutes
Purpose	Prescreening by CRC Study orientation, informed consent, Take home sleep recorder; record 1 night's sleep without OA (baseline recordings)	**Within a week of Visit 1:** Screening by team dentist; if eligible, fully enroll; randomize to groups OAM or OAA. Periodontal exam; fill-out baseline questionnaires; OA fitted by dentist to begin wearing. Take home sleep recorder & daily sleep log; record 2 night's sleep	**After 4 weeks:** record 2 consecutive nights of sleep; dentist adjusts OA as needed; Group OAA begins wearing MS	Drop off sleep recorder at COD; adjust OA as needed	**After 8 weeks:** Periodontal exam; Pick up sleep recorder; record 2 consecutive nights of sleep	Drop off sleep recorder & daily sleep log to COD	**After 10 weeks:** Pick up sleep recorder & record 2 nights of sleep	Drop off sleep recorder Adjust OA as needed	Pick up sleep recorder & record 2 nights of sleep	**After 12 weeks:** Perio-dontal exam Fill-out online end-of-study questionnaires

Table 2. Visit 1 - your requirements

Item no.	Visits 1 & 2 - Processing and Your Requirements	Check List
1	Informed consent	
2	Medical / Dental history	
3	Medication(s) currently taken	
4	Complete questionnaires	

IRB NUMBER: IRB2019-0421-CD-FB
IRB APPROVAL DATE: 10/23/2020

During Visit 1, the Clinical Research Coordinator (CRC) will explain the study and answer any questions you may have. The CRC will then ask you additional questions concerning eligibility. If you are eligible and wish to participate, you will then complete the informed consent process by signing this form. The CRC will provide you with the Home Sleep Recorder to record 1 night of sleep. Upon returning the recorder the research team will objectively determine whether or not you snore and mouth breath to further determine your eligibility.

During Visit 2 you will be given an oral exam by one of the team dentists to insure that your teeth, gums, jaw joints and jaw muscles are sufficiently healthy and stable for your safe participation in the study. Your overall health will also be evaluated to insure that you meet all inclusion/exclusion criteria. If determined to be adequate, you will then be fully enrolled in the study and your tasks will be explained to you in detail. The dentist will then fit you with the OA by the dentist which you will take home that day. You will receive instructions how to use and care for the OA as well as how to use the sleep recorder. You may or may not be assigned to use the Mouth Shield (MS) at that time.

You will only wear the sleep recorder (sensors on your chest; Figure 2) the first two nights (T_0) without your OA. At each of the remaining time points (at least two, and as many as or four) you will record your sleep for 2 consecutive nights. For at least 8 weeks you will complete the daily sleep log each morning. The sleep recorder will take a few minutes to add new adhesive electrodes and place it on your chest at bedtime. The sleep recorder is removed from your chest each morning upon awakening. The OA plus sleep recorder must be used simultaneously for at least 4 nights (T_2 and T_3; 2 nights at each time point) during the 8 weeks. Up to 4 additional nights of sleep recordings may be required to optimally adjust the OA, if any of the designated nights of recording fail; a "failed sleep recording" is defined as a night recording less than 5 hours in duration or contains sufficient artifact ("noise") to make the data uninterpretable. You will also fill out several short questionnaires concerned with sleepiness, snoring and quality of life at two of the visits (T_0 and T_3). For those who participate in Phase 2, the final questionnaires will be given at T_4 or T_5. To help you adjust the OA to the optimal position, you will wear an EverSleep sleep-coaching device for as many nights as needed to achieve the ideal position of your lower jaw. It includes a small cuff worn on a finger and a wrist watch-like device and it will connect to your smart phone using Bluetooth. We will give you instructions as to when to stop advancing the OA based on the device readings generated by the app. You will also be asked to fill out a sleep diary each morning upon awakening during the study. This takes less than 2 minutes per day.

In addition to the basic oral exam described above, you will be given a complete periodontal exam (gums and their attachments to the teeth) at T_1, T_2 , T_3 and T_5; each of these exams takes about 30 minutes. The periodontist will probe and take measurements of the depths of the pockets between the gums and teeth.

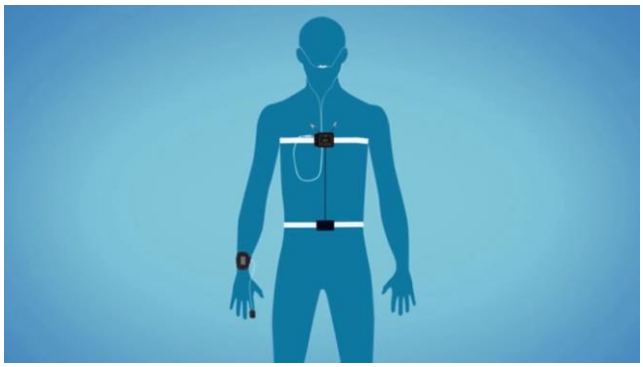

Figure 2. At bedtime, position and attach the NOX recorder **over** your pajama or T-shirt. You will use tape to help secure some of the sensors connected to the device.

To use the NOX Recorder:

1. Push the start button on the recorder to start recording.
2. Place the oximeter on a finger of the non-dominant hand (that is, if you are right-handed place it on your left hand).
3. Collect a minimum of 5 hours of sleep data.
4. Stop recording by removing the device from your body upon awakening the following morning and discard the adhesive electrodes. Replace the NOX recorder in its carrying case and return it to the study coordinator.

Risks

The minor physical risk associated with the sleep-monitoring aspects of this study are no more than those involved with standard tests of bodily (physiological) functions, for example wearing a heart monitor. The oral appliances are FDA cleared and are in wide use by dental patients throughout the US, Europe and Australia. The OA may cause pain in the jaw joint and teeth, and difficulty in opening or closing the jaw; these conditions are usually temporary. In the long term, the OA may cause changes in tooth position and in the bite (occlusion), as well as damage to the teeth and gums. A morning-aligner device will be custom made for you that helps to minimize changes in the teeth, gums or occlusion.

The Mouth Shield (MS) has been in use for 3 years in the market place as an accessory to the OA to prevent dry mouth and improve patient comfort. There have been no adverse incidents reported to the manufacturer (AMI) or the FDA. If for any reason you are unable to breathe adequately through your nose, for instance due to a bout of severe nasal congestion, you are to remove the MS. We anticipate that in many individuals, the MS will lessen the nasal congestion, and improve the ability to breathe through the nose. The aspects of this experience that make it “research” rather than “routine clinical care" is that additional physiological and behavioral measurements will be made go beyond what are typically gathered during standard clinical practice. All of these tests are noninvasive.

We do not anticipate any significant physical risk from participating in this study. Though not impossible, we do not expect the adhesive hypoallergenic electrodes used with the NOX recorder to cause itching or rashes. By wearing an OA, a subject may experience some discomfort and/or reduced function of the jaw joint (temporomandibular joint) and muscles of the jaw (chewing muscles) and of the face during and after treatment. Subjects may also experience some reduction in sleep quality due to discomfort while getting used to wearing the OA (adaptation). Other minor risks include temporary irritation of the mouth and oral cavity due to contact with the OA, and excessive salivation or dry mouth from mouth breathing. Repositioning of the lower jaw and tooth movement may also occur, but are typically minor and reversible. Also highly unlikely, a subject could swallow or aspirate part of an OA should it break. The periodontal examination (of the gums) may also involve some temporary discomfort. Participants will be carefully monitored for all of these risks by one or more of the study dentists.

We cannot guarantee any direct benefits. However, the potential benefits of taking part in this study and choosing to wear the oral appliance may be:

1. A dentist-fitted oral appliance at no charge
2. Reduced snoring
3. Oral exam; Periodontal assessment
4. Potential improvement in periodontal (gum) and dental health, and reduced dry mouth
5. Improved sleep quality such that it is more stable and restorative (less disrupted/disturbed)

6. An effective treatment for snoring and obstructive sleep apnea that does not require wearing a face mask in which pressurized air is blown through your nose (continuous positive airway pressure or CPAP device).
7. Using a device for reducing snoring that does not require electricity for operation (CPAP)
8. Potentially improving quality of life
9. Potentially improving the health and well-being
10. Receiving detailed information on your sleep respiration

For all participants, the researchers or study coordinator will discuss with you possible options that might be of benefit to you if a sleep issue is discovered.

Alternative Treatments:

No alternative treatment options are directly part of this study. If you decide that oral appliance therapy is not right for you, we can refer you to a physician for alternative treatments that may include the use of CPAP.

Voluntary Participation or Withdrawal: Is my participation voluntary?

Instead of being in this study, you have the option to not participate. Participation in this study is voluntary. You may quit the study at any time without giving reasons.

Can I participate in another study during this Study?

No, by signing this Consent Form, you confirm that you will not participate in another study during the term of this study that includes the final visit.

Confidentiality: What happens with my data?

Efforts will be made to keep your personal information private and confidential. Absolute confidentiality cannot be guaranteed. If information from this study is presented, you will not be identifiable. You will be assigned a coded number. The identifiable information from your recordings will be maintained within Texas A&M College of Dentistry. We will protect your records so that your name and any identifying information will be kept private. The chance that this information will be given out to someone else is very small. Anonymous and coded summarized data might be shared. No identifiers linking you to this study will be included in any sort of report that might be published or presented without your explicit permission. A description of this clinical trial will be made available on http://www.ClinicalTrials.gov. This Web site will not include information that can identify you. At most, the Web site will include a summary of the results. You can search this Web site at any time. This consent form will be filed securely in an official area. People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the United States Office of Human Research Protections (OHRP) or the Food and Drug Administration (FDA) and entities such as the Texas A&M University Human Research Protection Program (HRPP) may access your records to make sure the study is being run correctly and that information is collected properly. If there are any reports about this study, your name or other identifiable information will not be in them. Information about you and related to this study will be kept confidential to the extent permitted or required by applicable state and federal laws.

Cost/Compensation:

There are no costs to you if you participate in this study, nor will there be monetary compensation. The dentist-fitted oral appliance is yours to keep upon completion of the study. The approximate value of the OA therapy is

$450. All participants are required to promptly return the home sleep study kits and EverSleep devices as required by the research coordinator.

Clinical care, discomforts and injuries related to this study will be carefully monitored and managed by the dentists on the research team. They will provide treatment for injuries or conditions directly related to the research procedures performed throughout the phase 1 study period, up to 9 weeks. You will not be responsible for the cost of such treatment.

What if New Findings Occur During the Study?

During the course of the study, you will be informed of any significant new findings (either good or bad), such as changes in the risks or benefits resulting from participation in the research or new alternatives to participation, that might cause you to change your mind about continuing in the study.

If new information is provided to you, your consent to continue participating will be re-obtained.

Investigator Payment:

The investigators conducting this study are compensated only for their time to do the study and will not get any payment for specific results of the study.

Participant Rights:

Your participation in this research study is voluntary. You may choose not to join or may leave the study at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your dental or medical care, employment, evaluation, student status, academic standing or relationship with Texas A&M University. This decision will also not involve penalties or loss of benefits to which you are otherwise entitled.

If the investigator decides that participating in this study is not in your best interest (for instance, if you become ill), your participation in the study will be stopped. The principal investigator also has the option to terminate the participation of subjects who are uncooperative or otherwise affect the integrity or conduct of the research. Participation in this study does not guarantee that you will be able to obtain care at Texas A&M University College of Dentistry beyond the scope of this study. After the study, if you wish to become a regular patient of the College, you will need to go through the standard screening process to determine eligibility. This will involve additional cost to you.

Your personally identifiable health information, including your contact information will be retained, but held confidential, for up to 20 years after the completion of the study, unless you opt for the usual retention schedule of 7 years. The 20-year retention period will enable the researchers to evaluate long-term responses to oral appliance therapy, which has not been done before; it will enable the research team to invite you back to the clinic for regular recall appointments (for example, every 6 months). Only non-invasive oral exams and sleep studies and data collection, such as done in the initial study, would be taken. **Please check one of the following boxes:**

I agree to allow the investigators to retain my personally identifiable data for ☐ 20 or ☐ 7 years.

For questions about this research study contact: Emet Schneiderman, PhD emet@tamhsc.edu, (214)-828-8377 or Zohre German, M.S. german@tamhsc.edu, 214-828-8291. If you experience a research-related injury that is not serious, call (214)-828-8291; if serious or an emergency, call 911. For questions about your rights as a research

participant or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Research Protection Program office at (979) 458-4067 or send an email to the office: irb@tamu.edu.

I agree to participate in this study. I have read all of the above, or have heard it read to me. I have had the opportunity to ask questions about this study, and my questions have been answered to my satisfaction. I consent to release my records to the research staff.

_____	_____
Subject's Name	Date of Birth
_____	_____
Subject's Signature	Date
_____	_____
Name of Person Obtaining Consent (Print)	Date
_____	_____
Principal Investigator's Signature	Date

YOU WILL BE GIVEN A SIGNED COPY OF THIS CONSENT DOCUMENT TO KEEP

IRB NUMBER: IRB2019-0421-CD-FB
IRB APPROVAL DATE: 10/23/2020