



Biomedical Research Award 2023

Juan Martin Palomo DDS, MSD

Case Western Reserve University

Short bio:

Dr. Juan Martin Palomo is a tenured professor and the Orthodontic Residency Director at Case Western Reserve University in Cleveland, Ohio. Dr. Palomo's contributions to craniofacial imaging, informatics, and airway analysis have been recognized through medical and dental research awards, national and international presentations, and numerous peer-reviewed publications. He is a member of the AAO Committee on Conferences, AAO Council on Education, the Associate Editor for the Digital Orthodontics section of the AJODO, Associate Editor for the Sleep and Breathing Journal, the AAO representative for Image Gently, and the past chair of the AAO Committee on Technology. He was also a member of the AAO Task Force that provided a white paper on the orthodontist's role in treating patients with Sleep Apnea. He is a board-certified orthodontist, an Angle Society member, and an active member of the American Association of Orthodontics, the American Academy of Oral and Maxillofacial Radiology, as well as the American Academy of Sleep Medicine.

Project Summary

The impact of technology in the myofunctional therapy treatment of Obstructive Sleep Apnea Syndrome.

The aim of this study is to compare the effects of myofunctional exercises in subjects diagnosed with OSA when using a smartphone app versus a traditional analog method, after 3 months of myofunctional therapy.

A total of 60 subjects between the age of 18 and 75, diagnosed with obstructive sleep apnea (OSA), will be divided into a group prescribed with myofunctional exercises, and

another group setup with a smartphone app that monitors and reminds the patient about the daily need of those myofunctional exercises.

The outcome assessment includes the use of wearable technology (ring) which evaluates sleep, the Iowa Oral performance Instrument which is a validated intra oral device that measures tongue elevation strength and endurance, and well as lip strength and endurance, a separate smartphone app which will monitor snoring, and the use of validated questionnaires.

Baseline data will be collected at the first visit, followed by monthly progress data, and final data will be at the 3-month mark.

The specialty of Orthodontics may benefit from this project, by finding a new treatment alternative for patients with OSA, in addition to the use of oral appliances. Since oral appliances are designed to manage OSA and not improve it or cure it, the addition of myofunctional exercises may be an important complement to this therapy.

The American Association of Orthodontists Foundation is the one making this project possible, and this way, significantly contributing to my academic career.

Budget

Item	Individual Price	N	Total	
Patient Incentive	\$100.00	60	\$6,000.00	A \$100 gift certificate is planned to be provided to each subject in order to incentivize participation.
Belun Ring	\$800.00	10	\$8,000.00	A Belun Ring measures oxygen saturation, pulse rate, and movement.
Airway Gym	\$4.99	40	\$199.60	A total of 40 licenses for the exercise app Airway Gym are being requested since those apps will be installed on the subject's personal smartphones. We are planning on 30 subjects for the app group, but considering dropouts, we are requesting additional licenses.
Snore App	\$23.99	15	\$359.85	This Smartphone App will be used to capture snoring and categorize its intensity and duration.
iPad	\$329.00	15	\$4,935.00	iPads will be used in order to standardize microphones for the snoring capture and evaluation.
IOPI	\$2,695.00	1	\$2,695.00	An Iowa Oral Performance Instrument (IOPI) measures tongue and lip strength.
IOPI Supplies	\$78.95	24	\$1,894.80	IOPI supplies are needed in order to maintain proper infection control.
EMG Kit	\$14,519.00	1	\$14,519.00	A surface electromyogram is a non-invasive way to measure muscle activity.
Spirometer	\$19.95	70	\$1,396.50	The spirometers standardize the Mueller maneuver used while taking the ultrasound image, and they can only be used by the same patient.
Total			\$39,999.75	