Oral Appliances - The use of advanced technology for cost effectiveness and patient care.

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Conflict of Interest Disclosure

1. I do not have any relationships with any entities producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients, OR

2. I have the following relationships with entities producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.

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<th>Type of Potential Conflict</th>
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<td>Grant/Research Support</td>
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<td>Financial support</td>
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3. The material presented in this lecture has no relationship with any of these potential conflicts, OR

4. This talk presents material that is related to one or more of these potential conflicts, and the following objective references are provided as support for this lecture:

   All Mandibular advancement devices are explained in a fair manner.
Understanding the advances in Oral Appliance Therapy

Dorsal Fin
Herbst
Cad Cam
Facial Integrity
Airway
Understanding the advances in Oral Appliance Therapy

Different types of Oral Appliances have their advantages and disadvantages. Most Appliances on the market have the option of Mandibular advancement to eliminate Sleep Apnea and Snoring by keeping the Jaw forward at all times.

What happens with an Oral Appliance?

Adjustable, non adjustable, and Muscle advancement Appliances

Adjustable-Non Adjustable

Advantage- helps to eliminate Sleep Apnea and Snoring


Muscular advancement

Advances Mandibular jaw forward when the muscle loses integrity. Therefore advancing the Jaw when needed instead of keeping the Jaw in a Rigid fixed position.

Advantage- No TMJ issues, Bite does not change, Appliance works when the body needs it to.

Oral Appliance Therapy Compliance Tracking

Credit: Braebon Medical
New technology in compliance tracking now allows a Sleep Physician to track the amount of usage a person has with their Oral Device. Previously no Oral Appliance therapy has been trackable. CPAP devices have the ability to track and document the many different parameters that are needed to make a CPAP effective.

Advantages- Patients with a lower AHI can now have an appliance that can be tracked with Position as well as usage. Allowing the Sleep Physician to track the usage as well as use positional therapy as another avenue of treatment. Detailed reporting for charting on patients using Oral Appliances.

Dis-Advantages- Only a few Oral Appliances have been approved for compliance placement. The appliances approved come with their own issues.
Consumer Advances in Oral Appliance Therapy

Credit: ZYPPAH
Consumer Advances in Oral Appliance Therapy

Sleep Apnea Devices Market size was over USD 4.8 billion in 2015 and forecast to grow at more than 7% from 2016 to 2023.
3D Airway Measurement Technology

New advancements in X-Ray technology allow Orthodontists to accurately measure a patient's airway through 3D Cone Beam Imagery. Very low radiation and much more information than before. Patients with a narrow airway can be more accurately diagnosed and treated.
Knowledge of 3D printing technology for use with Oral Appliance Therapy

Cost Effective

Expensive
Cost effective

Pros-
Very cost effective. Dental offices looking into doing their own printing can be set up for as little as $1200 Dollars.

Environment friendly- PLA 3D printers use a biodegradable plant based material that is made from tapioca rood and sugar cane.

Cons-
Relatively slow compared to their more expensive counterparts. Often needs maintenance. Multiple printers needed to accomplish time effective work.
Dental 3D printers can tend to be very effective in the dental Appliance industry. These printers can cost from $4000-$50,000 depending in size.

**Pros-**
Multiple prints can be done at once. faster than PLA type printers with less maintenance. Can be set and forgot.

**Cons-**
Not very cost effective printing just one model at a time. Models are made from toxic acrylic material and are not earth friendly. Models can tend to get brittle and break when making appliances. VERY EXPENSIVE!
While CPAP is considered the gold standard in sleep apnea treatment, combination therapy can make CPAP much more effective with many patients experiencing problems.

The following slides are examples of patients being treated with CPAP and the Mandibular advancement device.

Each patient experiences great rewards in the combination therapy, not only with leak, but with compliance and AHI.
CPAP PATIENT

Pre MAD

Post MAD

Leak (L/min)

Pre MAD

Post MAD

Pressure (cmH2O)

AHI (events/hour)
VPAP PATIENT

Pre MAD

Post MAD

Usage

Total Usage
Nasal CPAP with Combination Oral Appliance
Eliminating the negative effects of Full face mask displacement

Use of a full face mask without some kind of mandibular facial integrity can cause the Mandible to collapse with the pressure of the full face headgear.

Muscle loss during REM sleep contributes to the lack of adequate pressures during CPAP titration studies. Wearing an Oral Appliance that can provide Mandibular advancement during the initial titration can significantly reduce the amount of pressure and reduce mask leak.
Use of Nasal CPAP Masks with Combination Therapy

With combination therapy patients have the ability to wear a vast range of masks to include nasal masks. Some Appliances keep mouth remains closed allowing for the patient to wear a nasal mask comfortably.
Credit:
Braebon Medical Corporation
Resmed Sleep
Bandeen Orthodontics
Bfit Sleep LLC
ZYPPAH
Somnomed
OVENTUS
Global Market Insights
TAP 3 Elite
Oral Appliances- The use of advanced technology for cost effectiveness and patient care.