Protocol for the Management of Oral Appliance Therapy by Dental Professionals

Additional information available at: www.advancedbrainmonitoring.com/apneaguard/
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# Table of Contents

Message to Fellow Dentists .............................................................................................................................................. 4  
Section I: Introduction to the Apnea Guard® Protocol ...................................................................................................... 5  
Section II: Frequently Asked Questions ....................................................................................................................... 6  
Section III: Patient Considerations Impacting Outcomes .............................................................................................. 8  
  A. Patient Limitations ............................................................................................................................................... 8  
  B. TMD and Bruxism ................................................................................................................................................. 8  
  C. Dental and Periodontal ......................................................................................................................................... 9  
  D. OSA Severity, Variable Outcomes ....................................................................................................................... 9  
Section IV: Appliance Considerations Affecting Outcomes ............................................................................................. 10  
  A. Mandibular Protrusion ....................................................................................................................................... 10  
  B. Vertical Dimension of Occlusion .......................................................................................................................... 10  
Section V: Selection of Custom Appliance Features .................................................................................................... 11  
  A. Materials and Design: Retention .......................................................................................................................... 11  
  B. Lateral Freedom of Movement .............................................................................................................................. 11  
  C. Tongue Space ....................................................................................................................................................... 12  
  D. Buccal Keratosis ................................................................................................................................................... 12  
  E. Bruxing ................................................................................................................................................................. 12  
  F. Miscellaneous Clinical Tips .................................................................................................................................. 12  
  G. Transferring Apnea Guard settings to the Custom Appliance ........................................................................ 13  
Section VI: OAT Preparation and Treatment ................................................................................................................... 14  
  A. Initial Visit – 90 minutes ....................................................................................................................................... 14  
  B. One-Week Telephone Follow-up to the Apnea Guard Titration – 15 minutes ............................................... 15  
  C. Custom Appliance Insertion Visit – 60 minutes ................................................................................................. 16  
  D. Follow-up Visit When Necessary – 30 minutes ................................................................................................. 16  
Section VII: Apnea Guard Troubleshooting .................................................................................................................. 17  
  A. Improper Initial Fitting ..................................................................................................................................... 17  
  B. Retention Material Disengages from Tray(s) ....................................................................................................... 18  
  C. Apnea Guard falls out during sleep - retention ................................................................................................ 18  
  D. Nocturnal drooling .............................................................................................................................................. 18  
  E. Sore selected teeth ............................................................................................................................................... 18  
  F. Generalized Loosening of Teeth ........................................................................................................................... 19  
  G. Lingering discomfort/pain in the afternoon ....................................................................................................... 19  
  H. Lingering afternoon bite discrepancy ................................................................................................................ 19  
Section VIII: Custom Appliance Troubleshooting .......................................................................................................... 20  
  A. Asymmetrical discomfort ................................................................................................................................. 20  
  B. Disengagement during sleep or poor retention .............................................................................................. 20  
  C. Lingering discomfort or bite discrepancy in the afternoon ......................................................................... 20  
  D. Generalized Sore/Loosening Anterior Teeth .................................................................................................. 21  
  E. Sore selected teeth ............................................................................................................................................ 21  
  F. Nocturnal drooling ............................................................................................................................................. 21  
Section IX: Long-Term Management of Custom Appliance ........................................................................................... 22  
  A. Bite changes ......................................................................................................................................................... 22  
  B. Tooth movement ................................................................................................................................................... 22  
  C. Crowns and bridge .............................................................................................................................................. 22  
  D. Gum disease and Caries ...................................................................................................................................... 23  
  E. Appliance Breakage .......................................................................................................................................... 23  
Appendix I – Comfort Surveys for Seven Nights .......................................................................................................... 24
Message to Fellow Dentists

I would like to congratulate you for taking a path toward Dental Sleep Medicine. It is our sincere desire to help you along that path and improve your enjoyment of this fascinating field. One of the most intriguing aspects of Dental Sleep Medicine is discovery. That is, we are very early in our understanding of many aspects of the science involving oral appliances, such as the impact we will have on patient’s overall health, wellness and longevity. Also, for example, how can we become better at selecting the appropriate candidates for this therapy, how can we improve outcomes, and how can we better avoid complications?

The content of this manual is a condensed roadmap for patient management in oral appliance therapy and reflects cutting edge ideas, including the authors’ opinions. This manual may also serve as a planner for clinical management, including the typical appointments to be scheduled and length of time, to successfully integrate these patients into a general practice. We also propose models of practice and how to measure our patients’ progress and improve treatment outcomes with portable home sleep monitors.

The mechanics of the dental exam, the work-up, and the delivery of oral appliances are second nature to a dentist. But the medical aspect of this care demands that we develop new skills in order to interpret our progress and outcomes, often based on a variety of patient responses that still occasionally baffle even the more seasoned practitioner. Unlike our dental practices, providing a medical treatment that could fail to produce the expected results means the dentist has to shift their mindset dramatically and begin to accept measured success. This being said, the appreciation that comes from our patients who have successfully regained a restful night’s sleep and often a new quality of life is, indeed, extremely rewarding.

Dental Sleep Medicine offers us an opportunity to partner with our physician colleagues. Your rightful place in the collaborative management of this chronic disease is based on your capability to fit and effectively treat sleep apnea with an oral appliance. You do not need to learn or discover all of the clinical nuances of sleep medicine before you begin practicing dental sleep medicine.

We believe that committed effort in combination with the guidance provide in this manual will allow you to get started today and attain early success.

Todd Morgan, DMD
Section I: Introduction to the Apnea Guard® Protocol

The Apnea Guard protocol is the evidence-based approach which resulted from $1.1 mm U.S. National Institute of Dental and Craniofacial Research grant to develop novel sleep medicine practices that improve oral appliance therapy outcomes.

The Apnea Guard protocol allows dentist to:

- Define the optimal vertical, protrusive, and bite settings which are prescribed for use by the dentist for the custom oral appliance.
- Provide immediate therapeutic benefit while the patient is waiting for the fabrication of the custom appliance.
- Reduce chair time by delivering the custom appliance at the optimized settings.
- Inexpensively determine which patients will have a successful outcome with OAT prior to fabrication of a custom appliance.

The Apnea Guard appliance is fitted in less than 15 minutes and can be worn for up to 30 nights. It incorporates a built-in sliding ruler to determine optimal positioning of the mandible that can be transferred directly to the custom appliance and eliminates the need for a George Gauge.

Select the vertical dimension of occlusion (VDO) that increases the likelihood of a successful outcome:

- Women: Use LOW VDO size unless scalloped tongue or predominantly a supine sleeper, then fit with MEDIUM size.
- Men: Use MEDIUM size unless scalloped tongue or predominantly a supine sleeper, then fit with TALL size.

When you first introduce the Apnea Guard to your patient, manage their expectations. Identify the Apnea Guard as a trial appliance and it is intended for up to 30 nights of use. Show them a custom appliance and identify the features which will improve long-term comfort.

To prepare for delivery of an optimized custom fabricated appliance at 70% protrusion:

- Place ALL patients on Aleve during the first week of therapy to reduce the effects of muscular adaptation.
- Initiate Apnea Guard therapy 1 mm less than 70% of maximum voluntary protrusion.
- Use the comfort surveys to help patients identify when they may need to be referred to interact with the dentist or should temporarily suspend therapy.

To watch a YouTube video on how to fit an Apnea Guard, go to www.advancedbrainmonitoring.com
Section II: Frequently Asked Questions

Q. **What is the primary benefit of using the Apnea Guard instead of the convention approach for fitting custom appliances?**
A. The Apnea Guard protocol allows a dentist who is developing their skills to obtain outcomes similar to a master in dental sleep medicine. The system simplifies the steps need to establish the settings for the custom appliance and provides guidance for the dentist and patient that minimizes complications.

Q. **How does the Apnea Guard reduce the chair time associated with fitting a custom appliance?**
A. Multiple office visits are usually required to manage patients, particularly when problems occur as a result of a poor initial bite registration or the patient does not follow the instructions for advancement of the appliance from 60% to 70% protrusion. When therapy is initiated using the Apnea Guard protocol the number of office visits are reduced without a compromise in quality. The likelihood a poor outcome is reduced with use of the Comfort Surveys because this tool saves time and is less dependent on your staff to provide complex instructions. Both patient calls and mistakes made during adjusting their appliance are reduced.

Q. **What is the benefit in having the patient sleep in the jaw-forward position prior to insertion of the custom appliance?**
A. Management of the muscle adaptation period which occurs during the first four to seven days of mandibular advancement is facilitated and the side effects associated with initiation of therapy have resolved by the time the custom appliance is inserted. This allows the insertion visit to focus primarily on making the appliance fit properly. Depending on the patient, subsequent appointments to manage the custom appliance will be reduced.

Q. **How far is the jaw advanced in order to obtain the optimal oral appliance setting?**
A. Patients will usually receive optimal treatment when the jaw is advanced to approximately 70% of maximum voluntary protrusion.

Q. **What other settings are available on an oral appliance?**
A. One other factor to consider is the amount of separation between the upper and lower teeth that the appliance provides. This is called vertical dimension, it is an adjustment that is distinctly different from protrusion, and most custom appliances have a fixed vertical dimension. Increasing the vertical space in men and women with big tongues improves comfort, reduces TMJ side effects, and improves outcomes.

Q. **Do patients experience side effects during the first few days of use of an oral appliance?**
A. Yes, muscle soreness for the first week is common, and usually subsides in the first few hours after removal. Long-term side effects are uncommon.
Q. **What is the recommended protocol for determining the optimal jaw-forward setting with a titration appliance?**
A. Initiate therapy with the Apnea Guard at a 1 mm less than 70% of maximum advancement for three to four nights; have the patient advance 1 mm after side effects diminish so they are at 70% advancement on the night of their titration study.

Q. **What if the patient doesn’t advance their appliance the 1 mm to 70% prior insertion of the custom appliance?**
A. Once the titration appliance has been worn for several nights in the jaw forward position, further titration of 1 or 2 mm when the custom appliance is inserted should not contribute to side effects.

Q. **How are the settings determined with the Apnea Guard transferred to the custom oral appliance?**
A. The trial determines the vertical size and protrusive distance with the Apnea Guard that can be directly prescribed for a custom appliance.

Q. **Since the settings established with the Apnea Guard are assumed near-optimal, how many more adjustment may be necessary?**
A. Assuming the Apnea Guard was properly fitted when the optimal settings were confirmed, and the transfer of the settings was performed by an Apnea Guard certified dental lab, the sub-millimeter adjustment should have minimal impact on therapeutic outcomes. However, the dentist and patient have the further opportunity to “fine tune” appliance settings with greater ease and less time spent.

Q. **If the patient is fitted with a titration appliance and they notice immediate benefit, what will keep them from cancelling their sleep study?**
A. The Apnea Guard is only cleared for 29 night of use. Explain that the appliance will wear out and has potential side effects (i.e., tooth damage) if used beyond the recommended time.

Q. **How can I learn how to effectively fit an Apnea Guard?**
A. The Apnea Guard training videos will assist you your staff with prepared responses as well as training on how to select and fit the Apnea Guard.

Q. **How do I identify preexisting dental conditions that might preclude therapy or manage complications attributed to long term oral appliance use?**
A. The Apnea Guard protocol provides the background needed to take a thorough dental history assessment and provides guidance for managing short and long term complications.
Section III: Patient Considerations Impacting Outcomes

A. Patient Limitations
During the initial consultation the dentist should assess the patient’s ability to carry out duties related to appliance hygiene, insertion, and removal and adjustment procedures. The selection of the appropriate custom appliance for a patient may be dependent, in part, on dexterity and/or comprehension difficulties regarding use of their appliance. Devices that utilize pin tools or have components that need to be adjusted in a certain direction (hyrax screws) may be inappropriate for patients of advanced age or poor eyesight. Appliances that utilize bilateral screws may confuse some patients, resulting in asymmetrical adjustment and Temporomandibular Joint sequelae. Anterior, single screw type appliances are very easy for patients to understand and should be considered first in these difficult situations. Supervision during titration procedures by the dentist or a caregiver should also be considered to reduce the complexity of the OAT orientation.

B. TMD and Bruxism
Current science supports a link between bruxism and sleep disordered breathing that has not been appreciated in the past and practitioners should familiarize themselves with this literature. For example, it is well shown that treatment of OSA reduces nocturnal bruxism, alluding to an association. Current literature supports screening for OSA in Temporomandibular Disorder patients due to these associations.

Evaluate patients carefully for signs of bruxism and myofacial pain syndrome. In most cases, these patients will have more difficulty adapting to OAT initially. A panoramic X-ray is suggested to rule out obvious radiographic evidence of degenerative Temporomandibular Joint (TMJ) changes, as well as a full masticatory muscle palpation exam. Mild TMJ dysfunction may be expected to resolve with appliance use. However, occasionally the practitioner may have to rehabilitate joint function in a patient before beginning OSA therapy. The dentist beginning in dental sleep medicine should avoid patients with active myofacial pain syndrome, although a history of joint sounds alone is not necessarily a contraindication to OAT. TMJ complications from OAT are rare but require immediate and knowledgeable attention.

Bruxing patients present unique problems associated with breakage, reduced lifespan of appliances, muscular pain and bite change. For heavy bruxers select an appliance that is robust and avoid thermally active acrylics that may distort under added force. An appliance that allows some freedom of opening and lateral movement may prevent dislodgement during sleep. As shortened/worn teeth can present unique retention issues, an oral appliance that includes wire clasping may be ordered in the laboratory prescription. Retention of the oral appliance in bruxing patients deserves special attention and these considerations are discussed below.
C. Dental and Periodontal

Oral appliances should only be fitted in patients with at least eight upper and eight lower teeth. To reduce the risk of tooth movement resulting from oral appliance therapy (OAT), an uncontrolled periodontal condition or dentition in poor repair should be addressed first, whenever possible. However, the start of treatment should not be delayed unnecessarily, especially if the patient suffers from excessive daytime sleepiness. When indicated, the laboratory prescription may be designed to circumvent fractured, decayed or mobile teeth with die relief. Restorations in poor repair or periodontally compromised teeth can also be handled this way. Teeth that are to be restored or missing teeth may be waxed to full contour on the working model prior to fabrication, facilitating future adjustments.

Most oral appliance designs allow patients to place medicaments (i.e. chlorhexidine or fluoride) prior to insertion which may be helpful. Contact the patient’s dentist of record to discuss these issues and potential side effects prior to insertion. As mentioned, treatment for sleep disordered breathing should not be delayed if possible and the clinician should carefully weigh the risk and benefits of treatment and discuss these with the patient.

D. OSA Severity, Variable Outcomes

OAT is generally recommended for patients with mild to moderate OSA severity. This guideline evolved from the fact that OAT reduces but does not eliminate obstructive breathing during sleep, and not all patients exhibit a significant reduction in OSA severity with OAT. New studies show that patients with predominantly supine/positional sleep apnea have good outcomes, independent of OSA severity. In contrast, patients with moderate OSA severity in the non-supine position seldom exhibit a good treatment response from OAT. The standard of care is for patients with severe OSA is first to attempt a continuous positive airway pressure (CPAP) trial which routinely displays a robust effect. OAT becomes the next option if the patient is non-compliant with CPAP therapy.

Most patients exhibit increased OSA severity when they sleep in the supine position or after consumption of alcohol and/or sleeping pills. Thus, if the patient is diagnosed for OSA at a sleep center by polysomnography, their OSA severity may be greater when they sleep in their home. This variability may impact the ‘perceived’ benefit of OAT when results acquired in the home are compared to the lab results.
Section IV: Appliance Considerations Affecting Outcomes

A. Mandibular Protrusion

At the start of OAT, retaining the mandible in an advanced position for 6 – 8 hours during sleep will likely cause muscle and/or tooth soreness. To minimize the initial muscular inflammation, therapy should be initiated at less than 70% of maximum in combination with the use of Aleve (or other over-the-counter anti-inflammatory). Patients are then instructed to increase the protrusion when the initial symptoms subside. In most cases the patients reach an optimal end-point near 70% of maximum. It is important to note that the optimal protrusive position may not be the most advanced.

Most custom appliances are adjustable in 1mm increments, or less. These small incremental adjustments are thought to be the key to added patient comfort and the dentist’s ability to fine tune therapy. However, there may be reluctance with regard to a patient’s individual “readiness to launch” and proceed with the recommended protrusive advancement schedule, especially in light of any muscle/tooth soreness. The literature strongly supports the notion of coaching and encouragement when it comes to CPAP adherence, and the same may hold true for oral appliance therapy. A series of recommended appointments are suggested in the Section IV.

B. Vertical Dimension of Occlusion

Studies suggest the dimension of occlusion (VDO) of the appliance impacts outcomes. Restricted VDO limits room in the oral cavity for the tongue to advance. One study suggests that outcomes improve if VDO is lower in females and greater in males. Patients with large tongues, identified by scallops in the sides, show improved outcomes with increased VDO. Increased VDO also improves outcomes in patients who sleep supine, presumably because more room is provided for the tongue to advance and overcome the effects of gravity on airway blockage. When VDO is increased, mandibular advancement may be a consequence for most depending on the incline of condylar eminence. Excessive VDO is uncomfortable, may cause mouth breathing and dry mouth.

In order to optimize the starting setting of the oral appliance, neutral and maximum voluntary protrusion should be determined in combination with the expected VDO of the custom appliance.

Some appliances do not support adjustment of the VDO, while others allow the VDO to be set at the time of fabrication, requiring forethought and a bite registration technique that is suited to adjusting the starting VDO. We suggest that in patients with a history of TMD, have large tongues, or sleep predominantly in the supine position have the option available to increase vertical dimension. The Apnea Guard™ allows the starting VDO to be determined so that additional vertical adjust of the custom appliance chair-side using cold cure acrylics to address large tongues, TMJ discomfort or inadequate outcomes is limited.
Section V: Selection of Custom Appliance Features

A variety of appliance design features are available to the clinician and proper selection can improve patient satisfaction and therapeutic outcome. A list of some of these features is found below:

A. Materials: Retention

Patients with a severe apnea index may initially experience poor appliance retention. It is generally believed that jaw and other muscle movements are linked to arousal from sleep and apnea events. Thus, appliances that resist mouth opening are more likely to dislodge until the oral appliance is sufficiently advanced toward the optimal position that achieves passive, normal nocturnal respirations.

It is advisable that retention be maximized as much as possible with each patient. We suggest telling the patient to expect some degree of unconscious “wrestling” with their device during their adaption and titration period. Assure them this is OK and encourage them to continue titration and wait for airway muscles to calm as relief of obstruction is obtained.

Alternatively, appliances that allow mouth opening may be employed in these cases, and certainly solve these specific issues, but patients who prefer sleeping on their back or exhibit a dry mouth at night generally need to maintain mouth closure, and elastics should be added back once titration nears end. In our experience, patients will decide for themselves whether elastics are preferred. A clasping technique is recommended in most situations where teeth are shortened due to wear. The clinician may find themselves grateful to activate clasps that have been held “in reserve,” later in the life of an appliance when plastic fatigue and loosening occurs. A discussion with your lab tech leader about these options is helpful. Patients should be warned that appliance longevity depends greatly on hygienic care and on the above described “nocturnal activities.” We like to discuss a range of appliance lifespan of 2-5 years.

Retention may also be obtained by utilizing thermoforming acrylics and requesting extension of flanges onto soft tissues. These softer materials provide ease of delivery and are found to be comfortable around compromised dentition. They can also be extended onto edentulous areas for added support.

Newer bi-laminate materials may be an ideal compromise between hard and soft materials, with an exceptional amount of retention. Adjustments to the softer laminate are difficult, however, and precise impression techniques along with careful laboratory techniques are paramount.

B. Lateral Freedom of Movement

The decision whether to restrict lateral freedom or use an “unlocked” appliance impacts outcomes, comfort and possible long term side effects. Restricting lateral freedom provides optimal outcomes when patients are sleeping lateral or prone (especially in rapid eye movement sleep, when muscular tone is lost) because it ensures that mandible protrusion remains in at a fixed distance. Research has suggested that patients who have positional apnea (defined as an apnea index that is twice worse sleeping supine v side sleep) will respond better to an oral appliance that has limited lateral movement. Appliances that allow lateral movement may
provide reduced therapeutic benefit in the supine or lateral positions and, additionally these patients may be more prone to hyper-extension of the TM joint if the chin gets pushed aside during sleep. Unlocked appliances often offer the option/feature of added elastics to help restrict opening and movement.

C. **Tongue Space**
For large and scalloped tongues it is advisable to select an appliance that provides additional space between trays inter-occlusally (i.e., Dorsal, Herbst, Narval) and minimize hardware that limit tongue space (i.e., Tap, SomnoGuard, Lamberg). Initiate therapy with Apnea Guard medium size for women and high size for men. Select appliances that make it easy to add acrylic chair-side to increase the vertical dimension and avoid appliances that require the device to be returned to the laboratory or the device cannot be modified (Narval) for vertical adjustment.

D. **Buccal Keratosis**
Linea alba conditions usually present in patients who lack adequate space in the buccal corridor due to obesity or narrowed craniofacial form. Hyperkeratosis is often found at the occlusal plane of the teeth. It is recommended that oral appliances with hardware at the buccal aspect (i.e., Herbst, Oasys, Z-Appliance) be avoided in these patients. Trauma and discomfort to the buccal mucosa can be expected.

E. **Bruxing**
As alluded to earlier, bruxing patients introduce special concerns for the dentist. Of course, an oral appliance for OSA replaces all previous nocturnal appliances, and all appliances, as well as Apnea Guard, are fitted without prosthetics in place. In bruxers, the Apnea Guard retention material may break or loosen, and not provide the standard 29-nights of use. Selection of a robust custom appliance design is important for those who brux (i.e., TAP, Strong, SUAD, etc.) Posterior pads are necessary to maximize contact and the transfers of forces to the tray.

F. **Miscellaneous Clinical Tips**
Retention can be customized within the lab prescription to reduce forces on teeth that are compromised for a variety of reasons. For example, we have found that patients with flared maxillary anterior teeth, and especially those who have tongue thrust swallowing patterns, may necessitate facial surface die-relief on the fabrication model prior to heat forming. Other consideration should be paid to periodontally compromised teeth or fragile crown and bridgework. Planning these changes is best accomplished by close communication with your lab technician and pre-fabrication model preparation.
G. Transferring Apnea Guard settings to the Custom Appliance

Transferring the Apnea Guard setting to the custom appliance is straight forward when using an Apnea Guard certified dental lab (list available at www.advanced-sleep.com). The Apnea Guard certified dental lab is prepared to combine the Apnea Guard jig and bite registration with pre-fabricated shims to accurately match the Apnea Guard VDO into a high quality control articulation to a range of commonly prescribed custom appliances (e.g., Herbst, Tap, dorsal).

The dentist will:

The Dental Lab will:

1. Fit the retention material, and determine the neutral, maximum and 70% protrusions settings, while custom appliance is being fabricated.

2. Remove retention material for bite registration. Then refit AG with retention material for continued patient use while custom appliance is being fabricated.

3. Insert the retention material that defines the bite registration into their Apnea Guard jig.

4. Insert the models with the bite registration into the prescribed Apnea Guard jig size (VDO) at the prescribed protrusion.

3. Submit prescription with AG size and protrusion setting, and include with bite registration and dental models.

3. Place the Apnea Guard and models into and adjust the articulator.

4. Use the articulated settings to confirm the custom appliance is set to the Apnea Guard settings and bite registration.

Photos courtesy of Great Lakes Orthodontics/Christine LaJoie
Section VI: OAT Preparation and Treatment

A. Initial Visit – 90 minutes

- Discuss risks and benefits of treatment, obtain consent,
- Conduct physical examination,
- Take photographs, impressions and obtain bite registration,
- Prepare castings and select appliance,
- Initiate therapy with Apnea Guard

1. When applicable, review the sleep study results. Set the patient’s expectations by discussing the predicted likelihood of a successful outcome.

2. Perform a physical and radiographic examination:
   a. Identify teeth, restorations or periodontal conditions that may influence case planning or oral appliance design selection, including:
      1) A poor dentition that precludes the use of an oral appliance,
      2) Consider die relief for compromised teeth or restorations.
   b. TMJ pre-treatment baseline assessment:
      1) Record envelop of function and para-functional habits
      2) Palpation of myofacial musculature
      3) Auscultation of joints
      4) TMJ stress test using bite tabs
   c. Baseline images:
      1) Panoramic or full mouth radiograph, Cephalometric (optional)
      2) Intraoral photography to obtain records of baseline occlusion and soft tissues

3. Obtain accurate impressions and casts.

4. Explain the differences between the Apnea Guard and the custom appliance – manage the patient’s expectations.

5. Use the technical manual and training video to fit the Apnea Guard:
   a. Determine and note the “fitting” setting. Make sure:
      1) The jaw and lips are relaxed
      2) Both trays are against the teeth
   b. Advance the lower tray fitting setting +4 mm
   c. Fit the lower tray
      1) Mix and be ready to insert in < 1 min 15 Sec
      2) Remind patient to:
          Center, bite down very firmly
          Smooth edges with tongue
      3) Explain contraindications while waiting 3 minutes
   d. If the front teeth within 2 mm of the anterior or posterior edge of the tray, remove and reset the retention material
      1) Advance the lower tray if the teeth are too close to the anterior edge
2) Reduce the advancement if the teeth are too close to the posterior edge
e. When finished with the lower tray, reduce the advancement setting -4mm
f. Fit upper tray
   1) Mix and be ready to insert in < 1 min 15 Sec
   2) Remind patient to:
      Center, bite down very firmly
      Smooth edges with tongue
   3) Explain possible side effects while waiting 3 minutes
g. With the Apnea Guard inserted, measure neutral and max three times and note the average settings.
h. Use the Work Table to determine and note the exact 70% advancement (i.e., retain the x.5 if applicable).
i. Write the neutral, maximum and 70% advancement on the handle (include the x.5 if applicable)
j. Set the lock 1 mm less than 70%, 1.5 mm less if 70% is x.5 setting

5. Explain the adaption protocol:
a. Review what to expect during the first week of jaw-forward positioning:
   • Some minor discomfort for the first 3 to 7 days is part of the accommodation process,
   • Recommend Aleve (or aspirin or ibuprofen) at bed time to daytime reduce symptoms,
   • Explain how and when to adjust the Apnea Guard by 1 mm to 70% protrusion.
b. Introduce the Comfort Surveys and identify symptoms that warrant calling the Doctor’s office
c. Describe how to care for the Apnea Guard and that it is limited to nights of use.

B. One-Week Telephone Follow-up to the Apnea Guard Titration – 15 minutes
   ➢ Determine if the patient has advanced the Apnea Guard,
   ➢ Resolve issues by phone or schedule follow-up appointment.

1. If patient is doing well, encourage and remind them to increase the Apnea Guard protrusion by 1 mm.

2. Questions that maybe using in assessing patient adaptation (use scale of 1---5)
a. Have you adjusted the appliance? Yes/no
b. If yes, was the 1 mm tolerable? ____ If no, is it because of pain? **
c. Do you have any trouble with insertion or removal?
d. Is your bite off in the AM? How long? _____ More than 3hrs/Pain associated? **
e. Are there any specific areas of tooth/ gum discomfort? **
f. Are the jaw muscles sore in the AM? Both sides? One side? **
   * 1= no problem, 5= very significant problem, 4 or 5 requires office follow up
C. **Custom Appliance Insertion Visit – 60 minutes**

- Fit the appliance to obtain necessary retention and comfort,
- Instruct the patient on the proper care and adjustment,
- Provide a bite tab and demo use for morning alignment

1. Confirm the patient received therapeutic benefit from the Apnea Guard study
   a. Stopped snoring,
   b. Less tired/more energy during the day,
   c. Sleeping longer and remembering dreams,
   d. Urinating/waking less during the night.

2. Adjust the custom appliance for comfort and retention in the standard fashion. A generalized “tight feeling” is preferred. It is recommended that a patient sit with the oral appliance in place for up to 15 minutes to confirm comfort.

3. Demonstrate the oral appliance insertion and removal.

4. Demonstrate appliance-appropriate titration adjustment and have the patient reciprocate.

5. Discuss long term care for the oral appliance.

6. Discuss factors that might require increased adjustment or replacement of the oral appliance to maintain efficacy
   a. Weight gain
   b. Adaptation of soft tissue
   c. Deformation (i.e., elongation) of the acrylic

7. Discuss long-term issues related to oral appliance use.
   a. Bite change
   b. Tooth movement
   c. Required adjustments to device as a result of dental work
   d. Need for back-up appliance (for those severe OSA and/or daytime drowsiness)

8. Design/schedule a long term follow-up strategy

D. **Follow-up Visit When Necessary – 30 minutes:**

- Address any side effects such as lingering bite change in morning,
- If bite recovery is delayed by more than 1hr, review use of bite tab
- Refer to physician if required.

1. Identify titration side effects that may require intervention (see Section IV: Titration Trouble shooting).
   a. Asymmetrical discomfort
   b. Sore selected tooth or teeth
   c. Bite open on one side only
Section VII: Apnea Guard Troubleshooting

The troubleshooting guidance provided below correspond to the recommendation that the patient seeks further instruction when they “agree” to potential issues identified by use of the daily protocol surveys (see Appendix 1).

<table>
<thead>
<tr>
<th>No.</th>
<th>Question as presented in the protocol survey</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Apnea Guard fell out of my mouth during the night?</td>
<td>A, B, C</td>
</tr>
<tr>
<td>2</td>
<td>I had muscular or jaw pain in the morning when I woke up after wearing my appliance?</td>
<td>G</td>
</tr>
<tr>
<td>3</td>
<td>My bite felt “off” in the morning when I woke up?</td>
<td>H</td>
</tr>
<tr>
<td>4</td>
<td>I had a difficult time due to excessive salivation throughout the night?</td>
<td>A, D</td>
</tr>
<tr>
<td>5</td>
<td>One or two teeth hurt when I woke up and continued past 2 PM in the afternoon?</td>
<td>A, E, F</td>
</tr>
<tr>
<td>6</td>
<td>The muscular or jaw pain continued past 2 PM in the afternoon?</td>
<td>G</td>
</tr>
<tr>
<td>7</td>
<td>My bite was off past 2 PM in the afternoon?</td>
<td>H</td>
</tr>
<tr>
<td>8</td>
<td>Please log adjustments to your appliance setting?</td>
<td>C, G, H</td>
</tr>
</tbody>
</table>

A. **Improper Initial Fitting**

1. Possible cause:
   - The “fitting” setting is too far posterior. This limits the amount of retention material between the teeth and tray and causes the excessive retention material to exude posterior to the tray and limit tongue room.
   - “Fitting” setting is far anterior. When teeth are set to far posterior in the tray, retention material may exude posteriorly and may result in retention issues during sleep. Incorrect setting of the lower tray wills likely cause improper setting of the upper tray.
   - All teeth do not seem to be impressed fully into the retention material. An uneven bite may cause the unavoidable condition where the front but not rear, the rear but not front, or the left but not right teeth to not reach the bottom of the tray.

2. Possible solution:

   ![Image](image1)
   When teeth are too far anterior, advance the “fitting” setting by 2 mm and reset the tray.

   ![Image](image2)
   When teeth are too far posterior, reduce the “fitting” setting by 2 mm and reset the tray.

   ![Image](image3)
   When all teeth do not touch the bottom of the tray, reset the retention material. Take care not to exceed the work time, and instruct the patient to bite fully.
B. **Retention Material Disengages from Tray(s)**

1. Possible cause:
   - Did not use heavy base polyvinyl siloxane (PVS).
   - Did not remove saliva from the Apnea Guard tray prior to applying PVS

2. Possible solution:
   a. Dry the tray and retention material. Reinsert the retention material and ask the patient to bite into both trays. In many cases the problem will be resolved.
   b. If the material falls out a second time, replace by following the instructions.
   c. Increase retention in selected cases by placing more retention features such as dimples and/or small bur holes along the side walls of the trays.

C. **Apnea Guard falls out during sleep - retention**

1. Possible cause:
   - Insufficient retention material around teeth
   - Severe OSA – oral appliances have a tendency to disengage during apnea events until advanced sufficiently to maintain the airway in a sufficiently open position.

2. Possible solution:
   a. Refit the upper and lower trays and ensure patient bites fully to the tray(s).
   b. Advance the appliance more aggressively, use Aleve or similar medication to manage pain, or have the patient remove the appliance for a portion of the night until the soreness subsides.
   c. Wear a CPAP chin strap, see photo

D. **Nocturnal drooling**

1. Possible cause:
   - Stimulation of tongue or cheeks by foreign object in mouth during sleep
   - Too much retention material was used and has exuded outside the tray

2. Possible solution:
   a. Prescribe Atropine.
   b. Trim the retention material exuding beyond the tray, being careful not to create sharp edges for the tongue to rub against.

E. **Sore selected teeth**

1. Possible cause:
   - Insufficient retention material between the tooth and tray
   - Patient sleeping prone and Apnea Guard handle is pressed against the mattress.
   - Loading on teeth is problematic as a result of periodontal or endodontic status

2. Possible solution:
   - Replace the retention material.
   - Inform patient to avoid prone sleeping or to prop their head with a pillow.
F. Generalized Loosening of Teeth

1. Possible cause:
   - Periodontal pathology
   - Nocturnal clenching into the trays/material

2. Possible solution:
   a. Advance the appliance 1mm or refit patient with a higher (VDO) size
   b. Discontinue Apnea Guard trial

G. Lingering discomfort/pain in the afternoon

1. Possible causes of discomfort:
   - Provocation of, or replicate muscle action that elicits pain
   - TMJ overnight fluid accumulation keeping condyle forward

2. Diagnosing muscular pain:
   - Place cotton rolls at 1st premolar region and have the patient bite with moderate force.
     If pain is elicited then source is muscular (pterygoids)

   Possible solutions for muscular pain:
   a. Temporarily reduce protrusion 1 mm
   b. Use Aleve or similar medication
   c. Consider TENS therapy and moist heat

3. Diagnosing capsular pain:
   - Place cotton rolls or saliva ejector over both the 2nd molar regions and bite. Pain apparent with loading.
   - Palpate joint capsule, pain relieved somewhat by lateral pressure and biting
   - Pain is relieved when appliance is worn

   Possible solution for joint (capsular) pain:
   a. Discontinue Apnea Guard trial
   b. Recommend soft foods and reduced activity
   c. Consider Medrol dose pack, Aleve or similar medication

H. Lingering afternoon bite discrepancy

1. Detecting lingering bite discrepancy:
   - The upper and lower teeth do not return to their normal bite relationship by 2 PM each day to due poor muscular adaptation.

2. Possible solution for lingering bit discrepancy:
   a. Jaw movement exercises and gum chewing
   b. Reduce protrusion by 1 mm
   c. Try passive stretching with a “leaf gauge”
   d. Fabricate morning repositioner
Section VIII: Custom Appliance Troubleshooting

A. Asymmetrical discomfort
1. Possible cause:
   - Sleeping on one side,
   - Asymmetrical advancement of the appliance by the patient
   - Occlusal contact is uneven

2. Possible solution:
   a. Restrict lateral movement of the oral appliance (add elastics or acrylic)
   b. Check symmetry of posterior pads (even contact is required and this may change with protrusion)
   c. Temporarily reduce protrusion if necessary Additional reduction on affected side is sometimes helpful
   d. Prescribe NSAID (non-steroidal regimen)
   e. Reeducate patient on symmetrical appliance adjustment
   f. Discontinue OAT for 1-2 weeks if pain is severe and consider prednisone Rx.
      (caution a drowsy patient about driving during this time)

B. Disengagement during sleep or poor retention
1. Possible cause:
   - Severe OSA – oral appliances have a tendency to disengage during apneic events until the protrusion is sufficient to maintain the airway in a sufficiently open position.

2. Possible solution:
   a. Advance the appliance more aggressively.
   b. Wear a CPAP chin strap, see photo.
   c. With unlocking appliance, take rubber bands off, allows patient to open their mouth and breathe until advancement is sufficient.

C. Lingering discomfort or bite discrepancy in the afternoon
1. Possible causes of discomfort:
   - Bite discrepancy
   - Provocation of, or replicate muscle action that elicits pain
   - TMJ overnight fluid accumulation keeping condyle forward

2. Possible solution for lingering bit discrepancy:
   a. Try passive stretching with a “leaf gauge”
   b. Fabricate morning repositioner

3. Diagnosing muscular pain:
   - Place cotton rolls at 1” premolar region and have the patient bite with moderate force. If pain is elicited then source is muscular (pterygoids)

4. Possible solutions for muscular pain:
e. Temporarily reduce protrusion 1 mm
f. Use Aleve or similar medication
g. Consider TENS therapy and moist heat

5. Diagnosing capsular pain:
   - Place cotton rolls or saliva ejector over both the 2nd molar regions and bite. Pain apparent with loading.
   - Palpate joint capsule, pain relieved somewhat by lateral pressure and biting
   - Pain is relieved when appliance is worn

6. Possible solution for joint (capsular) pain:
   a. Discontinue OAT for 2-3 weeks or until all pain subsides
   b. Recommend soft foods and reduced activity
   c. Consider Medrol dose pack, Aleve or similar medication
   d. Reduce advancement by 1 mm
   e. Increase anterior vertical dimension by 1.5 mm.

D. Generalized Sore/Loosening Anterior Teeth
1. Possible cause:
   a. Bruxism – clenching increases as a result of obstructive breathing events
   b. Periodontal pathology

1. Possible solution:
   a. Problem should diminish as titration increases and apnea events subside
   b. Relieve lingual acrylic of lower anteriors or facial acrylic of upper anteriors
   c. Increase anterior vertical dimension by 1.5 mm.

E. Sore selected teeth
1. Possible cause:
   a. Oral appliance is not fit properly
   b. Loading on teeth is problematic as a result of periodontal or endodontic status

2. Possible solution:
   a. Slight adjustment of acrylic to reduce pressure
   b. Remove those teeth from retentive scheme

F. Nocturnal drooling
1. Possible cause:
   - Stimulus from foreign object in mouth during sleep

2. Possible solution:
   a. Wait and observe until patient reaches titration endpoint
   b. Reduce the vertical dimension (if the appliance allows)
   c. Reduce acrylic on the upper lingual aspect
   d. Rx (e.g., atropine)
Section IX: Long-Term Management of Custom Appliance

The effectiveness of the custom appliance at a prescribed advancement setting may diminish over time as patients age, gain weight, etc. Minor movement of the advancement screws over time or improper maintenance on the part of the patient (i.e., reduces instead of increases or asymmetrically advances) can also impact efficacy. Even with proper care, wear and tear on the appliance materials can increase the likelihood of tooth movement. Thus it is important for the dentist to at least annually: 1) check the appliance for proper functionality and setting, 2) ensure the effectiveness of the appliance is being monitored, and 3) assess for possible long term side effects as described below.

A. Bite changes

Maximal advancement to obtain the necessary treatment adjustment may increase likelihood of bite change. Recommendations:

a. Reinforce the need for routine stretching exercises with a “leaf gauge.” Fabricate morning repositioning device.

b. Consider repositioning device: fabricate AM Aligner™ (AMI laboratories, Dallas TX)

c. Combination therapy with CPAP should be considered to reduce protrusion

d. Discontinue use of appliance (6 months) and employ other therapy if drowsiness is present (i.e., CPAP, body position control, Tongue Repositioning Device)

e. Upon patient return, evaluate occlusion and patient concerns, consider more time off OAT. Refer back to his/her MD for further consideration. NOTE: The patient’s health and safety often outweigh occlusal changes.

B. Tooth movement

Dimensional characteristics of the acrylic will change with use and can result in the increased mobility or tipping of anterior teeth. Recommendations:

a. Consider orthodontic intervention.

b. For open posterior teeth contacts – restore contact and refit appliance. Tightly “wrap” distal marginal ridge of 2nd molar. Consider a small acrylic button at the wrap or reset molar position on fabrication model to create anterior movement.

c. Consider acrylic reline or oral appliance replacement every 24 months to ward off problems associated with material elongation (stretch) and loosening.

d. Consider a daytime orthodontic retainer to maintain tooth position.

C. Crowns and bridge

To accommodate future general dentistry treatments, the following procedure is recommended:

a. Remove (hollow-grind) acrylic in preparation for treatment so the patient can continue to wear the appliance while waiting for the permanent cementation

b. Following treatment reline the acrylic as needed (cold cure or laboratory)

c. Ask the laboratory to add teeth to the working model in anticipation of future tooth replacements
D. **Gum disease and Caries**

Oral appliances restrict saliva flow and have a buffering effect on teeth.

Recommendations include:

a. Consider having patient coat the appliance with medicaments (e.g., fluoride gel, chlorhexidine) prior to insertion at night.

b. Provide appropriate dental hygiene counseling.

E. **Appliance Breakage**

Warn patient of potential side effects if treatment is interrupted. Recommendations:

a. Use the Apnea Guard to:
   - Provide immediate attention to symptomatic patients (pre-treatment AHI > 30 and/or very drowsy)
   - Provide therapy while the custom appliance is being repaired

b. Cold cure the acrylic for minor repairs

c. Frequent breakage is a sign of para-function habits – consider more robust oral appliance and/or reduce lateral freedom

d. Consider combination therapy (oral appliance plus CPAP) or a titration sleep study to confirm efficacy of adjustment
Appendix 1 – Comfort Surveys for Seven Nights

For management of patients during the first week of an Apnea Guard trial
AN INTRODUCTION TO YOUR FIRST WEEK OF ORAL APPLIANCE THERAPY FOR SLEEP APNEA

Congratulations on your decision to begin oral appliance therapy! In preparation for your custom oral appliance, the Apnea Guard was selected so you could begin therapy immediately.

To treat your sleep apnea, the oral appliance positions your lower jaw and tongue forward during sleep. Because the muscles are affected by this new jaw position, most patients feel soreness during the first week of therapy. Some patients also feel differences because the oral appliance is anchored to their teeth. Don’t worry, muscles adapt very quickly and teeth can handle this job. The key to getting through the first week is recognizing when a symptom is expected and knowing it will resolve once the adaptation is completed, or when the problem is unusual and requires discussion with your doctor and his team.

To help guide you through this adaptation period, we ask that you complete the Apnea Guard Comfort surveys each morning and evening during the first seven days of therapy. In the morning you will respond to four questions related to your comfort and symptoms that occurred at night, and each evening respond to four questions related to your comfort and symptoms that occurred during the day. Under each question notes are provided to remind you of instructions you were provided or to assist you in determining next steps.

Upon successful completion of adaption period you will likely be instructed to advance the Apnea Guard one setting (i.e., from 12 to 13). Remember, the arrow on the locking mechanism points to the left for odd and right for even numbered settings. You will always need to shift the locking strap to the opposite side of the lock to adjust one setting. If you lose track of your setting, look at the number written on the handle. The setting for “70%” is the target for your custom appliance.

Your doctor and his team are always standing by to help if the notes suggest that you seek consultation or when you have an urgent question. So relax and enjoy the benefits of better sleep as you and your professional team go forward together.
Apnea Guard Comfort Survey  Patient Name: ________________________________

DAY 1: COMPLETE IN THE MORNING:  Date: ________________

1. The Apnea Guard fell out of my mouth during the night:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  If the material fell out, call for instructions. The problem should resolve once you advance the appliance.

2. I had muscular or jaw pain in the morning when I woke up after wearing my appliance:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  This is normal for the first week, remember to take Aleve before bedtime.

3. My bite felt “off” in the morning when I woke up:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.

4. I had a difficult time due to excessive salivation throughout the night:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  This is normal and it may take several nights for this symptom to begin to subside.

IN THE EVENING:  DAY 1

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  Avoid having the Apnea Guard handle press against your mattress. Monitor for two more days.

6. The muscular or jaw pain continued past 2 PM in the afternoon:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  Remember to take Aleve before you go to sleep. Monitor for two more days.

7. My bite was off past 2 PM in the afternoon:
   Strongly Agree  Agree  Neither Agree or disagree  Disagree  Strongly Disagree
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Note:  It is important to do jaw movement exercises or chew gum for one-hour in the morning to stretch the muscles.

8. Please log adjustments to your appliance setting:
   Adjusted   |-------------------------------|  to setting number: ______
   Circle one response  |-----------------|-----------------------|----------------------|---------------------|
   Comments: ________________________________________________________
**Apnea Guard Comfort Survey**  Patient Name: _____________________________________

**DAY 2: COMPLETE IN THE MORNING:**  Date: ______________

1. The Apnea Guard fell out of my mouth during the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  If the material fell out, call for instructions. The problem should resolve once you advance the appliance.

2. I had muscular or jaw pain in the morning when I woke up after wearing my appliance:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  To reduce daytime symptoms, take Aleve before bedtime.

3. My bite felt “off” in the morning when I woke up:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.

4. I had a difficult time due to excessive salivation throughout the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  This is normal and it may take two to three more nights for this symptom to begin to subside.

**DAY 2: IN THE EVENING**

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  Avoid having the Apnea Guard handle press against your mattress. Monitor for one more day.

6. The muscular or jaw pain continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  Remember to take Aleve before you go to sleep. Monitor for one more day.

7. My bite was off past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response  |-----------------|-----------------------|----------------------|---------------------|

   Note:  It is important to do jaw movement exercises or chew gum for one-hour in the morning to stretch the muscles.

8. Please log adjustments to your appliance setting:

<table>
<thead>
<tr>
<th>Backward 1 mm Adjust</th>
<th>Did not Adjust</th>
</tr>
</thead>
</table>

   Circle one response  I adjusted  |-----------------|-----------------------|----------------------|---------------------|

   to setting number: ______

Comments: ___________________________________________________________________
**Apnea Guard Comfort Survey**  
Patient Name: _____________________________________

**DAY 3: COMPLETE IN THE MORNING:**  
Date: ______________

1. The Apnea Guard fell out of my mouth during the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: If the material fell out, call for instructions. The problem should resolve once you advance the appliance.*

2. I had muscular or jaw pain in the morning when I woke up after wearing my appliance:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: This is normal for the first week, to reduce daytime symptoms, remember to take Aleve before bedtime.*

3. My bite felt “off” in the morning when I woke up:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.*

4. I had a difficult time due to excessive salivation throughout the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: This is normal and it may take another night or two for this symptom to begin to subside.*

**DAY 3: IN THE EVENING**

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: Avoid having the Apnea Guard handle press against your mattress. If any teeth feel like they are becoming “loose” discontinue use and call for instructions.*

6. The muscular or jaw pain continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: If you took Aleve and the pain has been constant and getting worse, call for instructions.*

7. My bite was off past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

Circle one response |-----------------|-----------------------|----------------------|---------------------|

*Note: It is important to do jaw movement exercises or chew gum for one-hour in the morning to stretch the muscles.*

8. Please log adjustments to your appliance setting:

<table>
<thead>
<tr>
<th>Backward 1 mm</th>
<th>Did not Adjust</th>
<th>Forward to 70%</th>
</tr>
</thead>
</table>

Circle one response I adjusted |-----------------|----------------|----------------|

Comments: ___________________________________________________________________
**Apnea Guard Comfort Survey**  Patient Name: ____________________________

**DAY 4: COMPLETE IN THE MORNING:**  Date: _________________

1. The Apnea Guard fell out of my mouth during the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** If the material fell out, call for instructions. If you DO NOT have afternoon pain, advance to 70% setting.

2. I had muscular or jaw pain in the morning when I woke up after wearing my appliance:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** Remember to take Aleve before bedtime. If you DO NOT have afternoon pain, advance to 70% setting.

3. My bite felt “off” in the morning when I woke up:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.

4. I had a difficult time due to excessive salivation throughout the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** Apnea Guard causes more salivation than the custom appliance, if it is getting worse, call for instructions.

**DAY 4: IN THE EVENING**

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** Avoid having the Apnea Guard handle press against your mattress. If any teeth feel like they are becoming “loose,” discontinue use and call for instructions.

6. The muscular or jaw pain continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** If you took Aleve and the pain has been constant and getting worse, call for instructions.

7. My bite was off past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

   Circle one response

   **Note:** It is important to do jaw movement exercises or chew gum for one-hour in the morning to stretch the muscles.

8. Please log adjustments to your appliance setting:

<table>
<thead>
<tr>
<th>Backward 1 mm</th>
<th>Did not Adjust</th>
<th>Forward to 70%</th>
</tr>
</thead>
</table>

   Circle one response I adjusted

   **Note:**

   Comments: ___________________________________________________________________

- 29 -
Apnea Guard Comfort Survey  Patient Name: _____________________________________

DAY 5: COMPLETE IN THE MORNING:  Date: ______________

1. The Apnea Guard fell out of my mouth during the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle one response</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: If the material fell out, call for instructions. If you DO NOT have afternoon pain, advance to 70% setting.

2. I had muscular or jaw pain in the morning when I woke up after wearing my appliance:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
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</thead>
<tbody>
<tr>
<td>Circle one response</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Remember to take Aleve before bedtime. If you DO NOT have afternoon pain, advance to 70% setting.

3. My bite felt “off” in the morning when I woke up:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.

4. I had a difficult time due to excessive salivation throughout the night:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Apnea Guard causes more salivation than the custom appliance, if it is getting worse, call for instructions.

DAY 5: IN THE EVENING

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
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<tbody>
<tr>
<td>Circle one response</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Avoid having the Apnea Guard handle press against your mattress. If any teeth feel like they are becoming “loose” discontinue use and call for instructions.

6. The muscular or jaw pain continued past 2 PM in the afternoon:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or disagree</th>
<th>Disagree</th>
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<td>Circle one response</td>
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Note: If you took Aleve and the pain has been constant, discontinue use and call for instructions. If the problem started after you advanced to 70%, adjust the setting backward, wait two nights before trying the 70% setting again.

7. My bite was off past 2 PM in the afternoon:

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<tr>
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Note: If the problem has been constant and you’ve been doing your jaw movement exercises, call for instructions.

8. Please log adjustments to your appliance setting:

<table>
<thead>
<tr>
<th>Backward 1 mm</th>
<th>Did not adjust</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Circle one response I adjusted</td>
<td></td>
<td>to setting number: _____</td>
</tr>
</tbody>
</table>

Comments: _____________________________________________________________________
Apnea Guard Comfort Survey  Patient Name: ______________________________

DAY 6: COMPLETE IN THE MORNING:  Date: ______________

1. The Apnea Guard fell out of my mouth during the night:

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<th>Neither Agree or disagree</th>
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Circle one response: ________________________________________________

Note: If the material fell out, call for instructions. If you don’t have afternoon pain, advance to 70% setting.

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Note: Remember to take Aleve before bedtime. If you DO NOT have afternoon pain, advance to 70% setting.

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Note: Remember to do jaw movement exercises or chew gum for one-hour to stretch the muscles in the morning.

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Circle one response: ________________________________________________

Note: Apnea Guard causes more salivation than the custom appliance, if it is getting worse, call for instructions.

DAY 6: IN THE EVENING

5. One or two teeth hurt when I woke up and continued past 2 PM in the afternoon:

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Circle one response: ________________________________________________

Note: Avoid having the Apnea Guard handle press against your mattress. If any teeth feel like they are becoming “loose” discontinue use and call for instructions.

6. The muscular or jaw pain continued past 2 PM in the afternoon:

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Note: If you took Aleve and the pain has been constant, discontinue use and call for instructions. If the problem started after you advanced to 70%, adjust the setting backward, wait two nights before trying the 70% setting again.

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Circle one response: I adjusted ________________________________ to setting number: ______

Comments: ________________________________________________
Apnea Guard Comfort Survey

DAY 7: COMPLETE IN THE MORNING: Date: ______________

1. The Apnea Guard fell out of my mouth during the night:

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<thead>
<tr>
<th>Strongly Agree</th>
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DAY 7: IN THE EVENING

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   I adjusted |---------|----------------|

   to setting number: _____

Comments: ________________________________________________