

Case 1 - Underweight Patient with Severe OSA

This case reveals that some patients with severe sleep apnea can be successfully treated with OAT, in combination with postural therapy, and that only modest mandibular protrusion may be required.

Patient Profile

- 56 year old female
- Pre-study AHI = 34.4
- BMI = 18.3
- Confirmed side sleeper

Dental Assessment

(OATRx scale readings for titration study)

- Lower Limit (Habitual Bite – 1mm) = 10.0mm
- Upper Limit (Maximum Protrusion) = 16.0mm

MATRx Study Analysis

During the study, the patient slept reasonably well (sleep efficiency = 77.5%) but displayed little REM sleep (5.2%). No REM supine was sampled despite sleeping supine most of the night. Two REM cycles were observed in the lateral position. The arousal index was 22.4. Arterial oxyhemoglobin saturation was normal throughout the study, except for periods of mild desaturation during REM sleep. No periodic limb movements were observed. Effective mandibular protrusion was observed in both REM lateral periods (Intervals 2 and 4) and the NREM supine period (Interval 3).

Mandibular Titration Summary

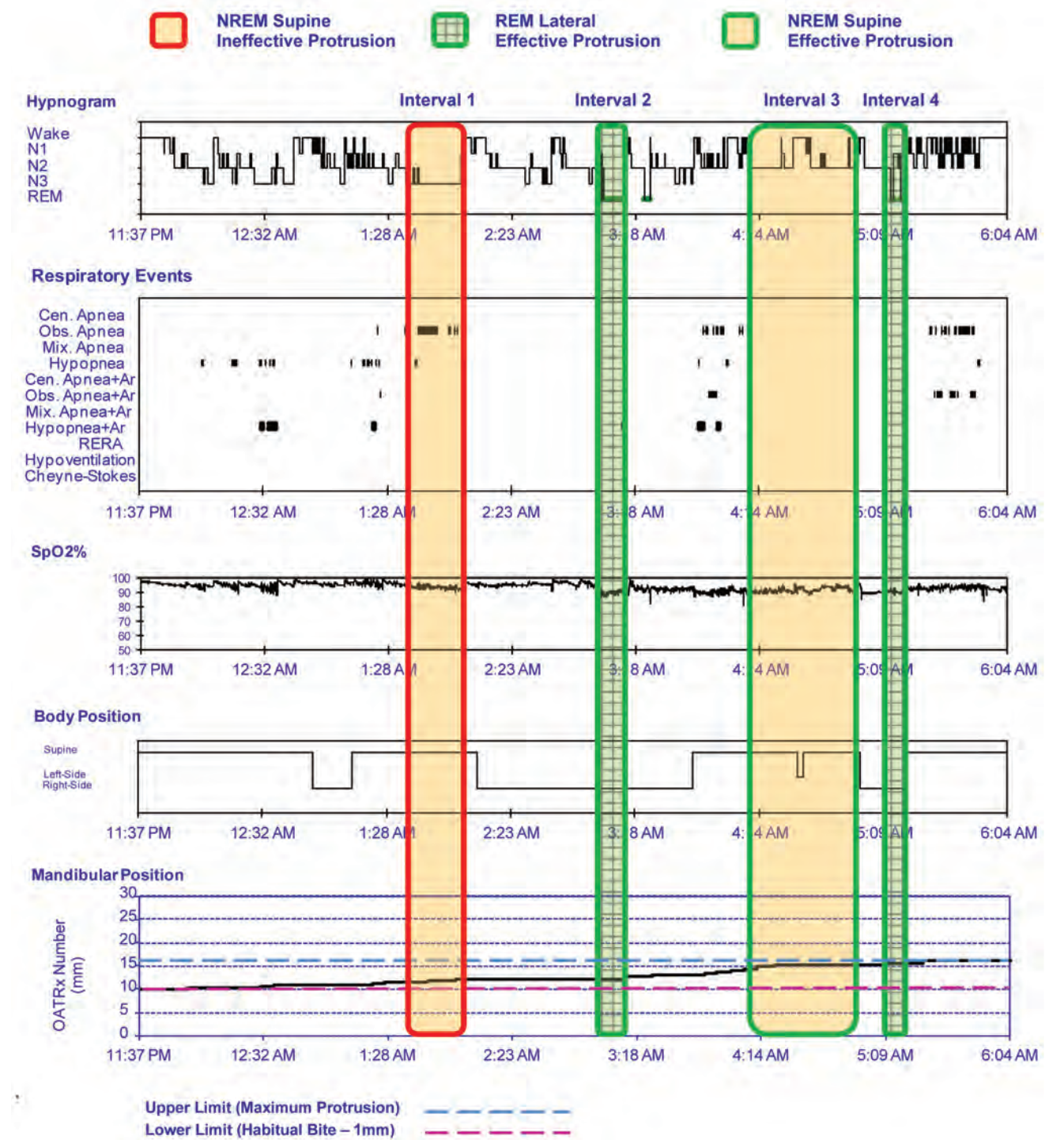
<p>Interval 1</p> <p>NREM cycle; 30 minutes</p> <p>SUPINE position</p> <p>Ineffective protrusion</p> <p>» mandibular position 11.8–12.2mm</p>	<p>Interval 3</p> <p>NREM cycle; 50 minutes</p> <p>SUPINE position</p> <p>Effective protrusion</p> <p>» mandibular position 14.4–15.2mm</p>
<p>Interval 2</p> <p>REM cycle; 12.5 minutes</p> <p>LATERAL position</p> <p>Effective protrusion</p> <p>» mandibular position 12.2–12.6mm</p>	<p>Interval 4</p> <p>REM cycle; 3 minutes</p> <p>LATERAL position</p> <p>Effective protrusion</p> <p>» mandibular position 15.6mm</p>

MATRx Study Interpretation

- **Prediction:** Patient is a predicted success in the lateral position
- **MATRx Interpretive Criteria Applied:** Interpretive Criteria #2
 - This criteria was applied to the 12.5 minute period of REM lateral (Interval 2)
- **OATRx Number (Target Protrusive Position):** 15.0mm

Therapeutic Outcome

The patient was fitted with a SomnoDent® oral appliance adjusted to the target protrusive position. A therapeutic outcome study, with the appliance set at this position, revealed a decrease in the AHI to 7.8.



Case 2 - Obese Patient with Severe OSA

This case reveals that in the presence of both obesity and severe sleep apnea, each thought to impede the response to mandibular protrusion, some patients can achieve an excellent response to a mandibular advancement device. Moreover, such a response can occur well short of the patient's upper limit for mandibular protrusion.

Patient Profile

- 42 year old female
- Pre-study AHI = 41.4
- BMI = 32.3

Dental Assessment





(OATRx scale readings for titration study)

- Lower Limit (Habitual Bite – 1mm) = 10.0mm
- Upper Limit (Maximum Protrusion) = 17.0mm

MATRx Study Analysis

During the study, the patient slept reasonably well (sleep efficiency = 82%) and displayed fairly normal sleep architecture with three REM cycles observed; two in the supine position. The arousal index was 20.3. Arterial oxyhemoglobin saturation was normal throughout the study. One 40 minute episode of periodic limb movements was observed. Effective mandibular protrusion was observed in the NREM lateral period (Interval 1) and both REM supine periods (Intervals 3 and 4).

Mandibular Titration Summary

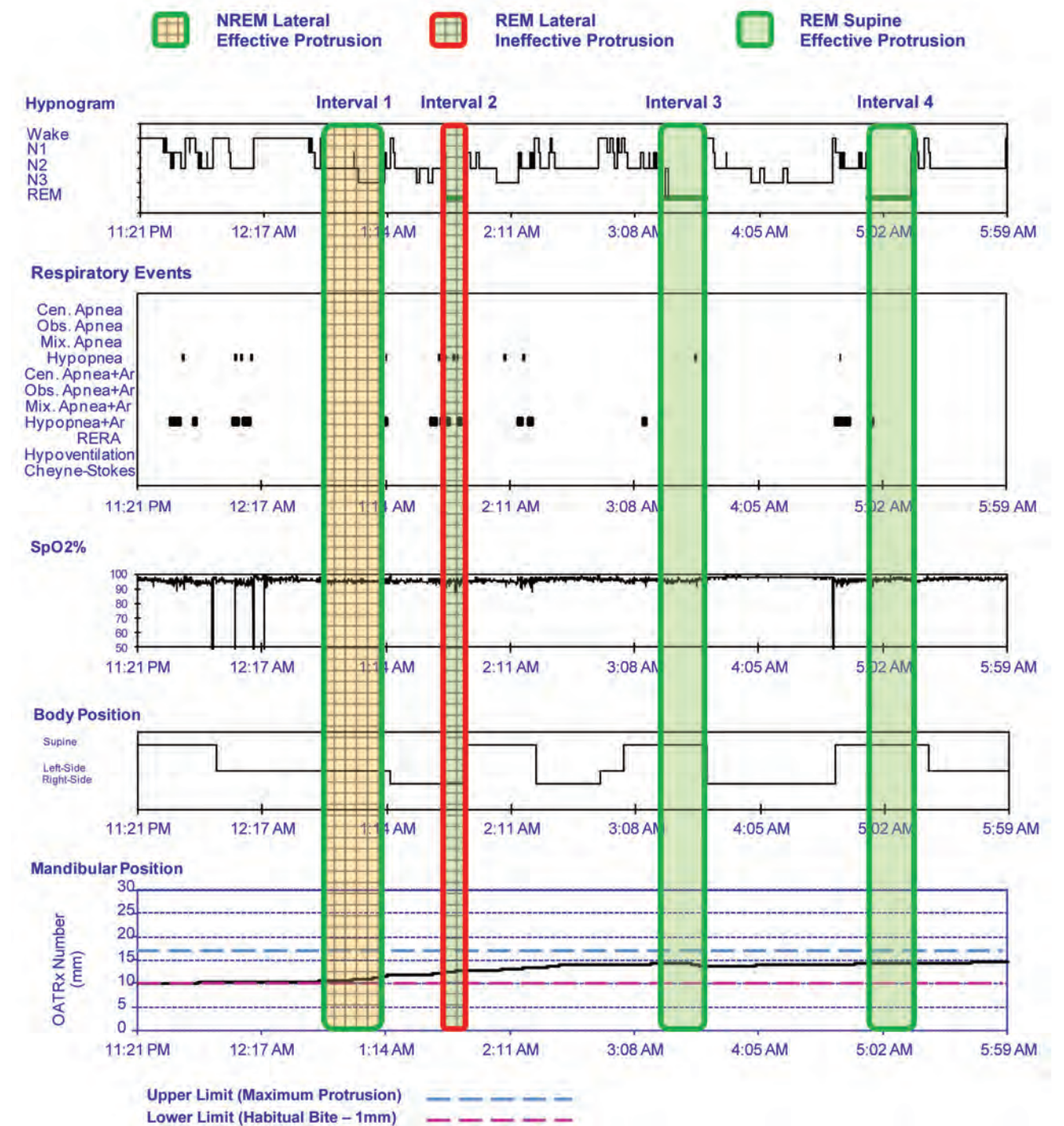
<p> Interval 1 NREM cycle; 30 minutes LATERAL position Effective protrusion » mandibular position 11.0–12.0mm</p>	<p> Interval 3 REM cycle; 25 minutes SUPINE position Effective protrusion » mandibular position 13.9–14.2mm</p>
<p> Interval 2 REM cycle; 5 minutes LATERAL position Ineffective protrusion » mandibular position 12.4mm</p>	<p> Interval 4 REM cycle; 25 minutes SUPINE position Effective protrusion » mandibular position 13.7–14.5mm</p>

MATRx Study Interpretation

- **Prediction:** Patient is a predicted success in the supine position
- **MATRx Interpretive Criteria Applied:** Interpretive Criteria #1
 - This criteria was applied to both 25 minute periods of REM supine (Intervals 3 and 4)
- **OATRx Number (Target Protrusive Position):** 14.5mm

Therapeutic Outcome

The patient was fitted with a SomnoDent® oral appliance adjusted to the target protrusive position. A therapeutic outcome study, with the appliance set at this position, revealed a decrease of the AHI to a normal value of 4.0.



Case 3 - Obese Patient with Moderate OSA

This case reveals that in some OSA patients, sleeping in the supine position can dramatically increase airway collapsibility and the occurrence of apneas and hypopneas. In addition, this case demonstrates the utility of the OATRx number in confirming that minimal mandibular protrusion can result in efficacious OAT. This patient was successfully treated by simply stabilizing the mandible at a position 2mm greater than (i.e. more protrusive) than the patient's habitual bite. Without this knowledge, OAT may have been initiated at a position that resulted in overprotrusion.

Patient Profile

- 74 year old female
- Pre-study AHI = 23.5
- BMI = 34.3
- Confirmed side sleeper

Dental Assessment

(OATRx scale readings for titration study)

- Lower Limit (Habitual Bite – 1mm) = 15.0mm
- Upper Limit (Maximum Protrusion) = 21.0mm

MATRx Study Analysis

During the study, the patient slept predominately in the lateral position. She slept reasonably well (sleep efficiency = 76.9%) and displayed a somewhat disordered sleep architecture with two REM cycles observed. One full REM cycle was observed near the end of the study; no REM supine was observed. Arterial oxyhemoglobin saturation was normal throughout the study, except for periods of mild desaturation during REM sleep. The arousal index was 15.0. A two hour period of periodic limb movements was observed during the first half of the night. Effective mandibular protrusion was observed in the NREM lateral period (Interval 1) and the REM lateral period (Interval 2). In Interval 3, we can clearly see the effect of body position on airway collapsibility, despite titrating to the patient's upper limit (i.e. maximum protrusion).

Mandibular Titration Summary

Interval 1	Interval 2	Interval 3
NREM cycle; 50 minutes	REM cycle; 20 minutes	NREM cycle; 45 minutes
LATERAL position	LATERAL position	SUPINE position
Effective protrusion » mandibular position 15.0mm (Lower Limit)	Effective protrusion » mandibular position 16.6–17.2mm	Ineffective protrusion » mandibular position 17.2–21.0mm (Upper Limit)

MATRx Study Interpretation

- **Prediction:** Patient is a predicted success in the lateral position with minimal protrusion
- **MATRx Interpretive Criteria Applied:** Interpretive Criteria #2
 - This criteria was applied to the 20 minute period of REM lateral (Interval 2)
- **OATRx Number (Target Protrusive Position):** 17.0mm

Therapeutic Outcome

The patient was fitted with a SomnoDent® oral appliance adjusted to the target protrusive position. A therapeutic outcome study, with the appliance set at this position, revealed a decrease in the AHI to 5.2.

