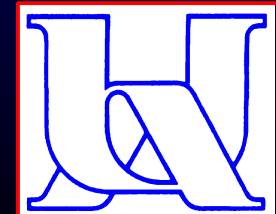


Vanderveken O.^{1, 3}, Boudewyns A.¹, Braem M.², Willemen M.³, Okkerse W.², Verbraecken J.³, Hamans E.¹, De Backer W.³ and Van de Heyning P.¹

**Subjective assessment
of the effect of a one-piece
mandibular advancement device
out of thermoplastic material
on snoring and daytime sleepiness.**

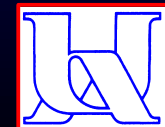
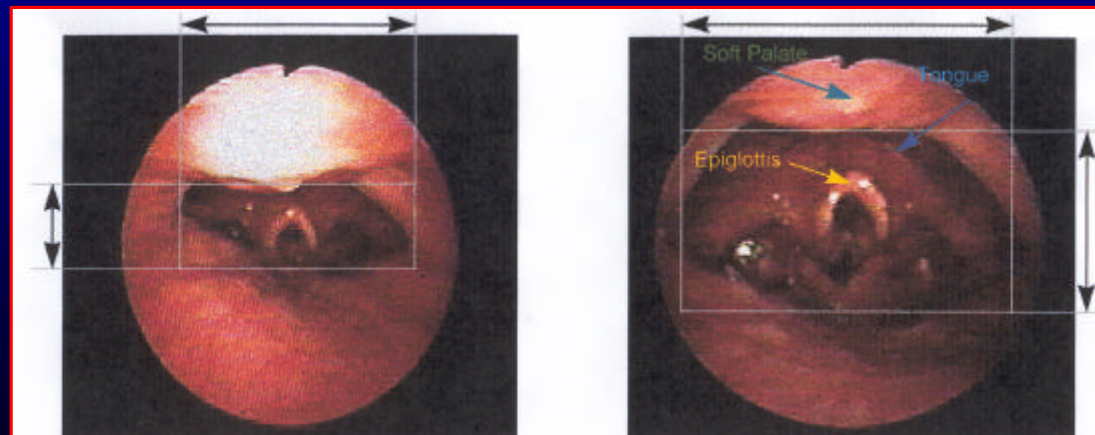


¹ENT; ²Dentistry, and ³Respiratory Medicine,
University Hospital Antwerp, Edegem,
Antwerp, Belgium.



Mandibular advancement device (MAD)

- Enlargement of retroglossal space
 - Collapsibility of upper airway ↘
 - Cross-sectional dimension UA ↗



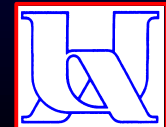
Mandibular advancement device (MAD)

- **Popular alternative to control SRBD**
- **Habitual snorers or mild OSA**
+/- excessive daytime sleepiness (EDS)
- **Moderate to Severe OSA**
 - **Intolerance / no compliance / refusal nCPAP**
 - **or as a temporarily alternative**

Standards of Practice Committee of the American Sleep Disorders Association. Practice parameters for the treatment of snoring and obstructive sleep apnea with oral appliances. *Sleep*. 1995; 18(6): 511-3.

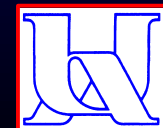
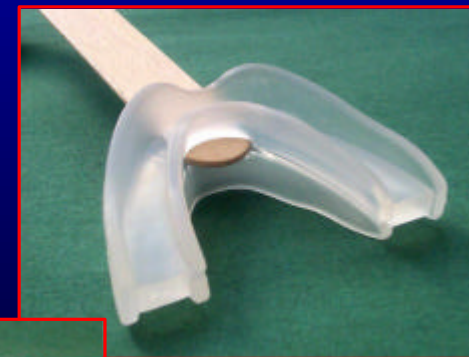
Mandibular advancement device (MAD)

- Various design
- Usually “custom-made”
 - Individually fabricated
 - Polymethyl-methacrylate
 - Potential disadvantages:
 - Costs
 - Time

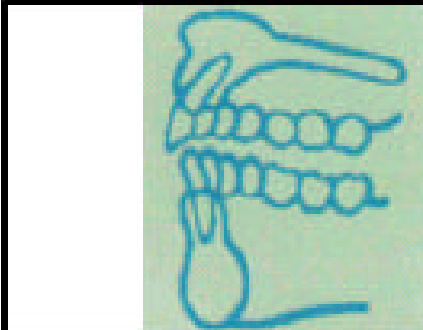


Somnoguard®

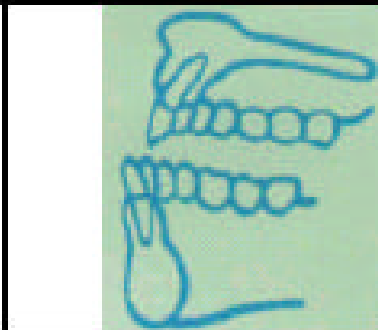
- MAD out of thermoplastic material
- Immediately intraorally adaptable
- 'Boil-and-bite' device
- Low cost appliance



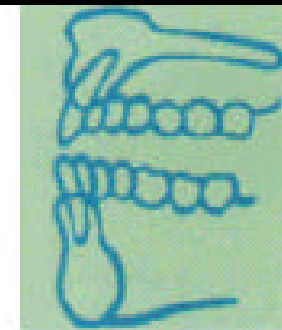
Somnoguard®



normal position jaw



maximal extension



searched position halfway

O.M. Vanderveken, A.N. Boudewyns, M.J. Braem, W.A. De Backer & P.H. Van de Heyning
Prospective evaluation of a thermoplastic mandibular advancement device in 20 patients
with sleep related breathing disorders. Eur Respir J 2002; 20 (suppl 38) : 103s

Aim of the present study

- Subjective evaluation of thermoplastic MAD for the control of daytime sleepiness and snoring
- Instruments:
 - Daytime Sleepiness: Epworth Sleepiness Scale (ESS)
 - Snoring: Visual Analogue Scale (VAS)



Epworth Sleepiness Scale (ESS) (0-24)

- Subjective daytime sleepiness evaluated by the ESS
- EDS defined as ESS score > 10

Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep*. 1991; 14(6): 540-5.

Visual Analogue Scale (VAS) (0-10)

- Standard 10 cm visual analogue scale (VAS) to evaluate snoring during sleep assessed by the sleeping partner
- 0 (no snoring noise) - 10 (extreme noise-bedpartner leaves the room)
- Heavy snoring defined as $VAS \geq 7$



Patients & Methods

- 36 heavy snorers
(29 males; age 47.1 ± 11.6 years (mean \pm SD); body mass index(BMI) 25.9 ± 3.4 kg/m²; AHI 6.3 ± 7.0)
- 1-month & 6-months follow-up visits
- End-point: follow-up after 0.8 ± 0.4 y
- Responder = use of the device + important reduction in snoring ($VAS \leq 3$)

Statistical analysis

- Data presented as mean \pm SEM
- Bonferroni method
- SPSS for Windows
- Statistical significance: $p < 0.05$



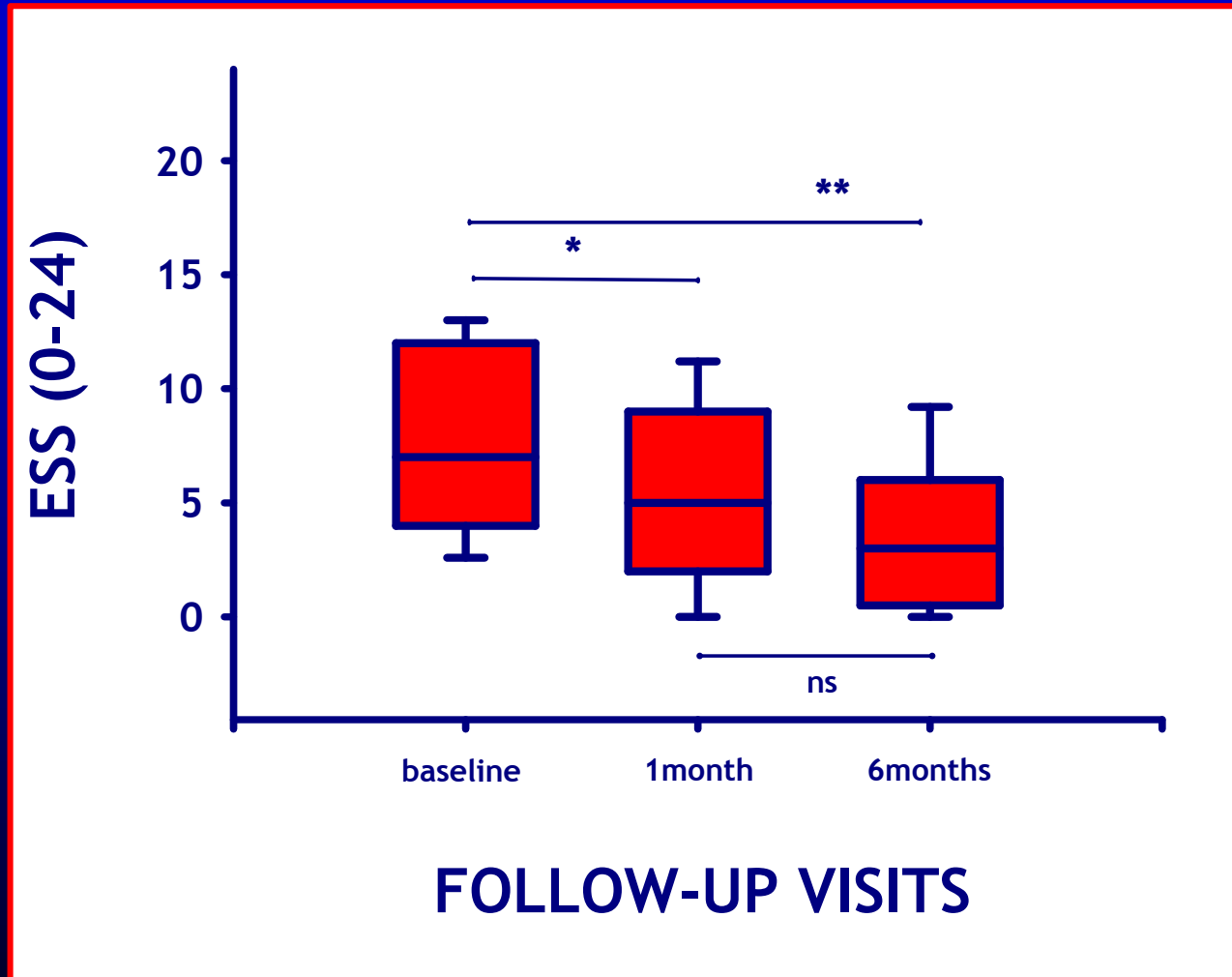
Subjective evaluation (n=36)

Daytime Sleepiness - Epworth Sleepiness Scale

- 9 patients reporting EDS at baseline
- Six out of 9: ESS $\leq 10/24$ with MAD (67%)
- Statistically significant reduction in ESS at both follow-ups compared to baseline

baseline	7.4 \pm 0.8
1month	5.3 \pm 0.8
6months	4.1 \pm 0.7

ESS values (n=36) before adaptation and at a 1-month and a 6-months follow-up; * p = 0.005; ** p < 0.001; ns = no significance



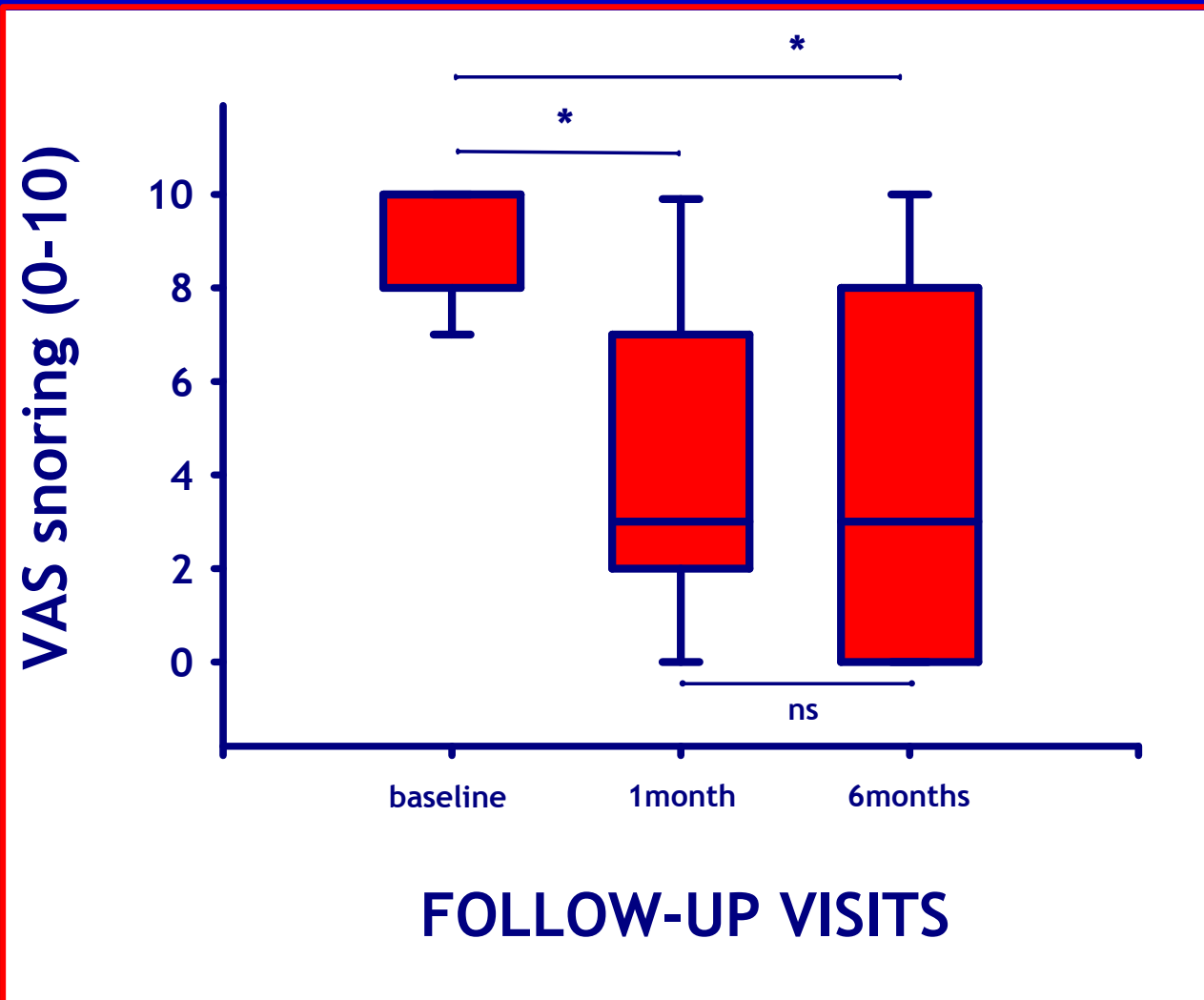
Subjective evaluation (n=36)

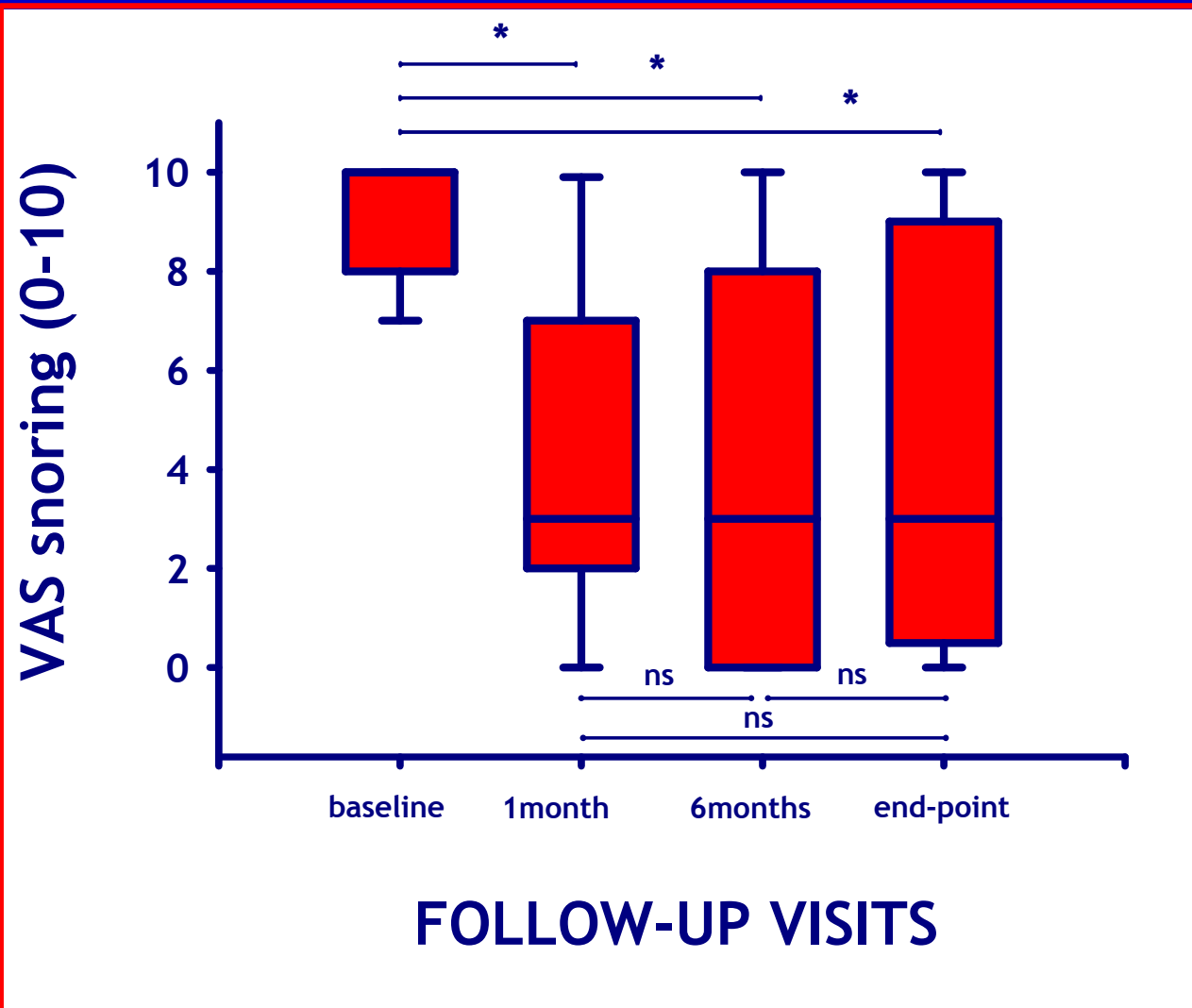
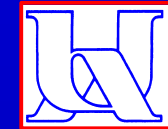
Snoring - Visual Analogue Scale

- At end-point follow-up (0.8 ± 0.4 y):
56% responder rate
- Statistically significant reduction in VAS
at both follow-ups compared to baseline

baseline	9.0 ± 0.2
1month	4.1 ± 0.6
6months	4.2 ± 0.6

VAS values (n=36) before adaptation and at a 1-month and a 6-months follow-up; * $p < 0.001$; ns = no significance





Conclusions

- Significant reduction of subjective snoring and daytime sleepiness in heavy snorers and mild OSA
- Cost-effective & valuable treatment for heavy snoring +/- EDS



Considerations for future study

- Screening of candidates for custom-made MAD with thermoplastic MAD ?
 - Further evaluation of the immediately adaptable technique
 - Studies that compare custom-made & thermoplastic devices

Schönhofer B, Hochban W, Vieregge HJ, Brunig H, Kohler D. Immediate intraoral adaptation of mandibular advancing appliances of thermoplastic material for the treatment of obstructive sleep apnea. *Respiration*. 2000; 67(1): 83-8.