

The image features two boxing gloves, one blue and one red, positioned horizontally against a dark background. The blue glove is on the left and the red glove is on the right. They are facing each other, with their fists touching. The gloves are made of a shiny, leather-like material. The text is overlaid on the gloves and the background.

George Gauge

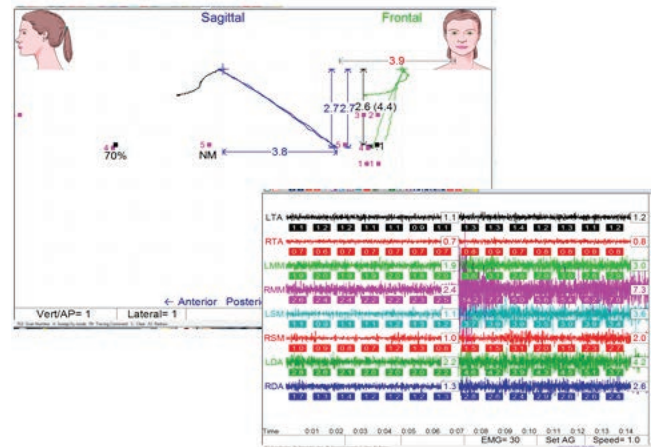
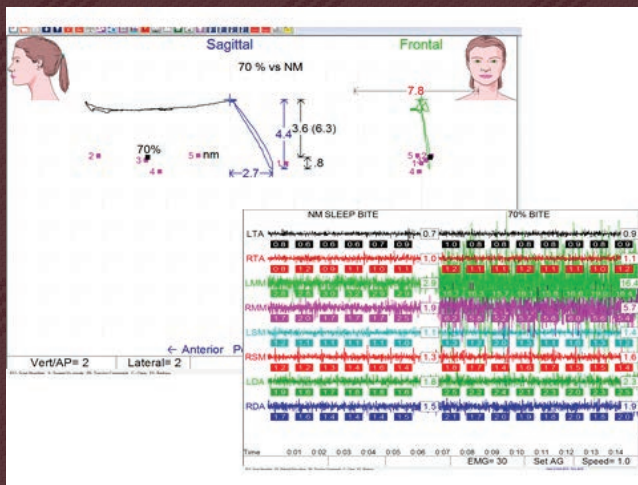
vs.

**The
Physiologic
Bite**

In Treating SBD

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One of the biggest drawbacks with **MAD (Mandibular Advancement Device)** treatment for sleep breathing disorders is jaw discomfort. Often this will lead to compliance issues and TMD problems associated with wearing the sleep appliances. This issue has caused many MD's to be reluctant in recommending MAD's over CPAP as the treatment of choice. It would behoove dentistry to find a comfortable position for the bite position for MAD's not only for patient compliance, but for the prevention of post treatment complications.



IF IT CAN BE
MEASURED
IT'S A FACT.
IF NOT, IT'S
AN OPINION

Eleven subjects were TENSEd (Transcutaneous Electrical Neural Stimulation) for one hour to relax the muscles of mastication. One subject had a pacemaker which is contraindicated for TENSing so he was not TENSEd giving us twelve subjects for this study. It is understood that using the George Gauge doesn't utilize the TENS, however in an effort to equalize each treatment; all subjects were to go through the same pre-bite routine. Obviously this would be a benefit to the George Gauge results as pre-bite relaxation of the muscles of the airway is beneficial regardless of the bite technique. It is this author's belief that the results would have been worse had pre TENSing of the patients not occurred.

Jaw tracking was placed on each subject. EMGs were recorded with duatrode placement over the anterior temporalis, masseters, digastrics and sternocleidomastoids. In all but two of the subjects, the existing bite position was recorded (marked) and the end to end position as well. In the other two, only the end to end position was recorded. A 3 mm wafer was placed in the subjects mouth and the subject was asked to retrude the mandible as far as they can and then protrude the mandible as far as they can. Each of those positions were recorded and marked on the tracking display.

The distance between the most retruded and most protruded position of the mandible was measured and recorded. Calculations were made to determine where 70% maximum protrusion was and a target was set on the jaw tracking screen at that position.

While the subjects were TENSing, they were asked to relax and allow the mandible move to its physiologic resting position. A 3 mm wafer was placed between the teeth to insure enough room for the MicrO2 sleep appliance. A target line was then placed at that vertical position as a target for the Physiologic Neuromuscular Bite. The wafer was removed and the patient was asked to relax again allowing the pulse to dictate the position of physiologic rest and direction of closure position as taught at the OSA program at LVI. The bite was taken along the target line at that pulsing position with quick setting bite registration material.

The subject was then moved to the 70% position and another bite was taken at that position using the same quick setting bite registration material. The EMGs were recorded using a five second scan for each. In some of the subjects the 70% bite position was recorded first and in others, the physiologic (NM) bite position was recorded first. It was expected that the muscle of interest would be the masseters to determine the effect on over protrusion would cause it to contract to try and correct. The sum of the microvoltage of each subject was totaled and divided by the number of subjects to come up with an average. The measurement of the 70% protrusion position beyond the physiologic bite position was also totaled and divided by 12 to come up with an average difference.

RESULTS

The table of the distance of protrusion between the NM position and the 70% position is below. The average George Gauge (70%) position is 4.5mm more protruded than the average NM starting position.

The table showing the masseter EMG difference between the physiologic (NM) position and the George Gauge (70% maximum protrusion). The average EMG reading for the GG position was 7.5 mv and the EMG reading for the LVI Physiologic position was 1.68 mv.

There is a saying that if it can be measured it's a fact. If not, it's an opinion. Using EMGs we can quantitatively measure the effect that the bite has on the patients comfort with the appliance. High hypertonicity would indicate muscle discomfort and lead to possible TMD problems for the patient. Obviously the success of the bite position is important for patient compliance. Achieving a more comfortable position for a sleep appliance would lead to better long term results. The study on page 10 will show that in the physiologic position, AHI results are very good with even severe cases being restored to normal levels, so there is no need to over protrude the patient to achieve the desired results. From a muscular comfortable position, the physiologic bite position proved to be better than the George Gauge position.

DISTANCE OF PROTRUSION BETWEEN NM VS 70%

3.5 mm
6.0 mm
6.0 mm
5.0 mm
2.0 mm
5.5 mm
3.0 mm
5.5 mm
3.0 mm
2.75 mm
3.0 mm
4.5 mm

AVG - 4.15 mm

**Average George Gauge Position is 4.5 mm
More Protruded Than The Average NM Starting Position**

MASSETER EMG DIFFERENCE BETWEEN NM VS 70%

MASSETER EMG READINGS				
	NM L	NM R	70% L	70% R
	2.9	1.9	16.4	5.7
	1.9	2.4	3	7.3
	1	1.2	3.8	1.4
	1.3	1.2	17.5	22.2
	0.4	1.1	1.5	3.7
	1.6	1.1	9.3	8
	1.4	1.3	1.9	1
	0.8	0.6	5.6	4.9
	1.7	2.4	7.9	2.6
	0.6	0.7	11	4.6
	7.1	1.9	20.2	7.7
	1.4	2.5	1.7	11.2
	22.1	18.3	99.8	80.3
AVG/SIDE	1.84	1.53	8.32	6.69
TOTAL AVG	1.68		7.50	

**Average George Gauge Masseter EMG Readings = 7.5 mv
Average NM Sleep Bite EMG Readings = 1.68 mv**