

# EXECUTION AND BREATHING TECHNIQUES EMPLOYED BY PROFESSIONAL WIND INSTRUMENT PLAYERS – AS CAUSE OF DYSHOMEOSTASIS IN THE DENTO-MAXILLARY SYSTEM WITH IMPLICATIONS IN IMPLANTOLOGY

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**Keywords:** breathing, wind instrument players, dyshomeostasis

**Abstract:** For centuries vocal and instrumental musicians faced a series of orofacial health problems: diseases of the neck and facial asymmetry in violinists, problems arising from the lips in trumpeters, dermatitis in cellists, cramps in harpists, stomatitis in oboists, reflections of a developed dyshomeostasis. Our study aims at quantifying the specific dental problems of professional wind instrument players from three major centers of the country so as to establish the management of orodental and implanto-prosthetic rehabilitation programs suitable for these patients.

**Cuvinte cheie:** respirație, suflatori, dishomeopatie

**Rezumat:** De-a lungul secolelor, instrumentiștii vocali și instrumentali au întâmpinat o serie de probleme de sănătate orofacială: afecțiunile gâtului și asimetria facială la violoniști, afecțiuni la nivelul buzelor apărute la trompetiști, dermatitele violonceliștilor, crampele cântăreștilor la harpă, stomatita oboiștilor, reflectarea unei dishomeostazii manifeste. Studiul nostru urmărește cuantificarea problemelor specifice dentare la suflători profesioniști din trei centre mari ale țării pentru a stabili managementul programelor de reabilitare orodentară și implanto-protetică adecvat acestor categorii de pacienți.

## INTRODUCTION

The beauty and vividness of the interpretation of a composition for wind instruments are often appreciated only through the unilateral aspect of musical aesthetics. Few people in the ranks of expert musicologists, composers or the general public foresee the consequences of the intense and prolonged physical exercise presented by the musician in order to create the uniqueness of the interpretation. Beginning with the mid-twentieth century the music and the medical world have managed to consolidate a strong partnership in terms of public health issues in the field of musical performers, while today many medical musical associations with this profile are distinguished.

Through our study we attempt to answer a number of questions which are inherent to the signals which arise from within the domain, through our daily practice regarding the professional interpretation of performance wind instrument players:

- Is the practice of the wind instrument detrimental to the dento-maxillary system?
- Do chronic transformations of the dento-maxillary status persist in professional wind instrument players?
- What causes the appearance dental problems and the dyshomeostasis state?

From the physical perspective, the resonating means in wind instruments is the blasting of air, which is driven by the instrumentalist's lips either through a mouthpiece, as it is the case with trumpets, or towards a fine lip, like with the transverse flute, or towards one (or two) blades of reed, wood or metal (for oboe, bagpipe, harmonica). The area of ample expressivity in wind instruments is greatly reduced compared to bow

instruments and limited to the medium registry. The compass of these instruments is narrower, and the element of coloristic expressivity is the tremolo, which can be vibrated, bound or dental. The execution technique in wind instruments itself has four variations: the technique of the lips, of the tongue, of the respiration and of the fingers.

At the trumpet the perioral muscles (orbicularis oris) and tongue muscles are trained to trigger various sounds with high intensity. For example, singing in a high tone pitch is done by compression on the mouthpiece (orbicular, squared lower lip) to produce the vibration of the lips. In this technique, the mouthpiece of the instrument is pressed firmly, the orbicularis is devoid of blood irrigation, the lips swell and become hard, allowing their vibration within the big space occurred between the teeth and the mouthpiece of the instrument. At the oboe, for example, the sounds are produced by pronouncing the syllables *te* and *tu*. By doing so, the back incisive area, the orbicular area of the upper and lower lip and the inferior incisive area are claimed. At the transverse flute by a trembling movement of the tongue between the teeth, while pronouncing the consonants *trrr* or *drrr* the so called dental tremolo, which was first introduced by Strauss in the opera *Don Quijote*, is obtained. The bassoon demands for the production of sounds the pronunciation of the syllables *ti*, *te*, *ta*.

These techniques of emission use the tongue muscles which press heavily on the oral side of the teeth. As a result of the entire technique of blowing it was discovered throughout centuries, that the vocal and instrumental musicians encountered a number of problems: for violinists neck disorders, paralysis for bugle players, sore lesions or allergies occurred on the lips for trumpeters, dermatitis for cellists, cramps for harpists, stomatitis

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for oboists, but also serious periodontal diseases which lead to early tooth structure disfiguration. These are just a few examples from a long list of health problems. Often the insertion of implants in the frontal area comes into consideration, but the high pressure provoked by the instrument and associated with the blowing technique complicate the implant supported overdenture.

### METHODS

For this study, we used the operation method of "survey-questionnaire", given that groups of people in different centers were included in the study, namely the National Philharmonic "George Enescu" of Bucharest, the Sibiu State Philharmonic and the National Opera Iasi. It is a method of direct research aiming at clear answers to a series of questions.

The questionnaire addressed to wind instrument players integrate specialized musical questions that are designed to elucidate and explain existing symptoms and directly found in the questioned patients, but it was also intended with a prognostic role, as based on the responses the dental and periodontal damage to the teeth can be assessed

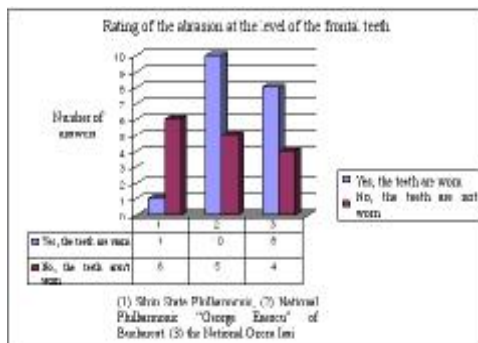
### RESULTS

In the context of the submitted questionnaire, the following statistic information resulted:

- The average age of the participating people to the questionnaire is 35,4 years
- The average age at which the study of the instrument was begun is 11,4 years
- The patients have a seniority (in the mastery of the instrument) of 26.7 years
- Pain in the neck muscles after a concert/show appears at a rate of: 47%
- Pain in the cervix muscles appears at a rate of: 47%
- Pain in the temporomandibular joints (T.M.J.) secondary we consider, the involuntary propulsion, which the player does when the instrument is applied to the mouth. It occurs at instruments with simple reed (clarinet, saxophone) or double reed (oboe, English horn, bassoon, contrabassoon) and at labial instruments (flute) and appears at a rate of: 47%
- Cheek atony after a concert appears at a rate of: 53%
- Paraesthesia at the level of the lips after a concert appears at a rate of: 35%
- More common in instruments with mouthpieces: tuba, trumpet, but also with labial instruments, where the sound is produced by the vibration of the lips.
- Xerostomia with the sensation of a dry mouth, after a concert/show appears at a rate of: 64%

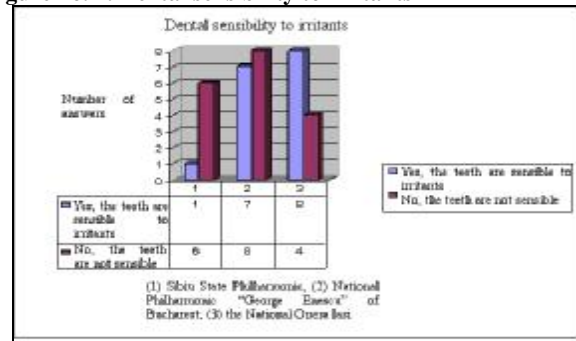
Abrasion at the level of the frontal inferior teeth appears at a rate of 58% in the interrogated subjects

**Figure no. 1. Abrasions at the level of the frontal teeth**



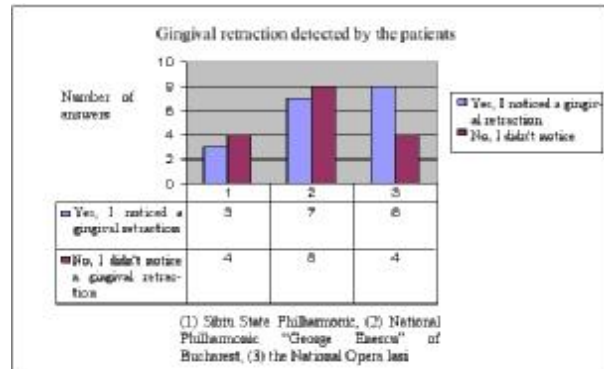
Sensibility to irritants appears secondly to the gingival reaction and it was detected in 47% of the subjects.

**Figure no. 2. Dental sensibility to irritants**



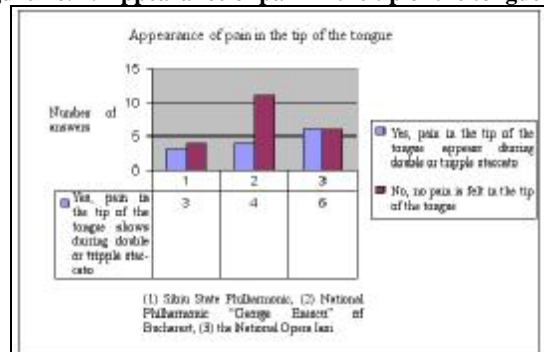
Gingival retraction, appear second to the intraoral pressure while playing at a rate of 53%

**Figure no. 3. Gingival retraction detected by patients**



Pain at the level of the tongue, the tip of the tongue or the base of the tongue is reported by 38% by the so-called articulation, which is the beat of the tip of the tongue on the cervical area of the frontal teeth for sound release.

**Figure no. 4. Appearance of pain in the tip of the tongue**



### CONCLUSIONS

1. The statistical data concludes that there are serious problems in oral and orofacial health in professional brass musicians,
2. Although related to the general population, these patient groups are small in numbers, the health problems are complex and represent the premises for a developed dyshomeostasis through the permanence of a forced posture,
3. The large number of hours of practice, of exercise in order to prepare a piece of music lead to a number of muscle disorders, sensitivity and dental morphology not at all

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negligible, which must be taken into account in the management of dental health of professionally experienced practitioners so as to prevent and treat existing and/or future conditions,

4. Implant-prosthetic rehabilitation management requires extraordinary attention for the superstructures applied on the implant in order to avoid overstraining the osseointegrated implant.

### BIBLIOGRAPHY

1. Amariei C. Introducere în managementul stomatologic, Editura Viața Românească; 1998.
2. Demian W. Teoria instrumentelor, Editura Didactică și Pedagogică, București; 1968.
3. Săbăduș I. Proteza totală, știință, artă, tehnică, editura Dacia Cluj-Napoca; 1995.
4. Burlui V. Protetica Dentara, Editura Institutului de medicina si farmacie, Iasi; 1988.
5. Hoshimoto K, Clark GT. The effect of altering jaw position on the transmission of vibration between the skull and teeth in humans, Arch Oral Biol. 2001 Nov 46;(11):1031.
6. Brattström V, Odenrick L, Kvam E. Dentofacial morphology in children laying musical wind instruments: a longitudinal study. Eur J Orthod 1989;11:179-185.
7. Bergström J, Eliasson S. Dental care habits, oral hygiene, and gingival health in Swedish professional musicians. Acta Odontol Scand. 1985;43:191-197.
8. Herman E. Dental considerations in the playing of musical instruments. J Am Dent Assoc. 1974;89:611-619.
9. Herman E. Orthodontic aspects of musical instrument selection, Am J Orthod. 1974;65:519-530.
10. Norris R. The Musician's Survival Manual: A Guide to Preventing and Treating Injuries in Instrumentalists. St. Louis: MMB Music; 1993.