

**COMPARISON OF DETERMINATION METHODS  
TEETH COLORS**

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**Relevance**

In the practice of modern dentistry, due to the increased aesthetic requirements, one of the factors that determine the success of prosthetics with all-ceramic, metal-ceramic, zirconium dioxide orthopedic structures is the correct and accurate determination of the color of the teeth and the reconstruction of its anatomical shape and function according to the age of the patient.

This allows achieving high aesthetic quality of orthopedic constructions and reducing the incidence of expensive re-prosthetics.

The teeth color is determined by the dentin, with translucent enamel, which is playing a lesser role through scattering at wavelengths in the blue range [3]. It was reported that: shade selection is a crucial clinical step during prosthetic treatment [4]. During the visual teeth color determination it is suggested that the first impression is frequently the best match, and shade matching trials should be limited to 5 seconds at a time to prevent eye fatigue, because the vision pigment is used up quickly in the mechanism of color perception. Many times in the dental literature has been given the recommendation to relax the eyes by observing a blue card between two shade matching trials (because blue and yellow are complementary colors) [5].

An adequate analysis of the shade of the teeth, as well as the reproduction of their color in order to maximize the imitation of the natural appearance, is one of the most difficult tasks of practical dentistry in the rehabilitation of patients using different types of restorations.

Shade matching systems continue to evolve, but so far none of them can provide a sufficiently objective result.

Various protocols for the analysis of tooth color have been known on the market for many years, but most of them provide efficiency only for the chewing group of teeth, or only for the initial analysis of the aesthetics of the frontal region, based on the parameters of photographs and modifications of the algorithms for their visualization and processing. The Vita company also introduced the Vita EASYSHADE® spectrophotometer for tooth shade matching. Shade evaluation with the spectrophotometer used in that study showed a high degree of correlation with visual shade determination of the color of natural teeth. The oldest color system was created by Albert H. Munsell in 1905. Consists from three attributes—hue (H), value or lightness (V) and chroma (C), denoted as H/V/C. Value/Lightness is the quantity of light reflected by an object compared to a pure white diffuser (reflecting 100%), and a black absorber (absorbing all incident light with no reflection). If a material reflects most of the light falling on its surface, it appears bright, i.e. it has a high value. Towards the center of the color wheel, no hue dominates and becomes less and less saturated [1]. Hue is described with the words we normally think of as describing color: red, purple, blue, etc. It is also a term which describes a dimension of color we readily experience when we look at color.

The action of many factors complicates the process of objectifying the color analysis of teeth and its reproduction. These are the different illumination of the area of interest, which distorts the color perception effect of the final restorations, the use of aesthetic materials of different quality, and the individual difference in color perception among people participating in dental treatment.

The factor of the latter is also influenced by what kind of shade matching system each of the participants in the rehabilitation process uses. In addition, it should be borne in mind that the complex morphology of the tooth, its shape, surface texture, as well as the corresponding shine - all these are parameters that cannot be ignored in the process of treating any tooth.

**Keywords:** Teeth Color, Visual Perception, Spectrophotometer, Accordance

**Purpose:** formation of the concept and development of a universal method for determining the color of teeth, to compare methods for determining the color of teeth.

**Material and methods.** We examined 40 patients with defects in the coronal part of the teeth, which were divided into 4 groups of 10 patients each. In patients of the first group, a doctor and a dental technician determined the color of the teeth by a visual method using the VITAPAN Classical color scale. In the second group, the doctor determined the color of the teeth by visual and colorimetric methods using a VITA EasyShade spectrophotometer (VITA Zahnfabrik, Germany), the dental technician used the visual method.

In patients of the third group, a doctor and a dental technician determined the color of the teeth by visual and colorimetric methods. In patients of the fourth group, the doctor determined the color of the teeth only by the colorimetric method, the dental technician used the visual method during his work.

The quality criteria for the restoration were determined visually by a physician, patient, or dental technician under standard lighting conditions.

An "ideal" assessment does not show the difference between the color of the restoration performed and the color of the teeth in the patient's mouth. The difference between the color of the restoration and the color of the teeth in the patient's oral cavity, visible to the physician, was rated as "good".

When judged "satisfactory", the difference between the color of the restoration performed and the color of the dentition in the patient's mouth was noticeable by both the doctor and the patient.

**Results.** When analyzing the results obtained, it was revealed that in patients of the first group, the number of ideally performed restorations was 51%. In this group, 47% of the restorations were rated "good", and the number of works rated "satisfactory" was 2%.

In the second group, the number of perfectly executed works increased to 60%, and 40% of the restorations were rated "good". In the third group, the result with the "perfect" rating reached 80%, and 20% of the work was the work with the "good" rating.

There were no restorations rated "satisfactory" in the second and third groups. In patients of the fourth group, the percentage of "ideally" performed work decreased to 38%. 52% of jobs rated "good" and 10% "satisfactory" were completed.

**Conclusions .**The best aesthetic result of the restoration is obtained when using the visual and colorimetric method both by the doctor and the dental technician. However, the indirect restoration takes three times longer than usual, therefore, from a practical point of view, the use of a combined method of determining the color of teeth by a dentist is optimal.

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## ОПРЕДЕЛЕНИЕ ДИСКРИМИНАЦИОННОЙ ЧУВСТВИТЕЛЬНОСТИ ЯЗЫКА ПРИ ГЛОССАЛГИИ У ПАЦИЕНТОВ, ПЕРЕНЕСШИХ COVID-19 НА ЭТАПЕ РЕАБИЛИТАЦИИ

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### РЕЗЮМЕ

*Представлена статья, посвященная актуальной проблеме Терапевтической стоматологии определению дискриминационной чувствительности языка при глоссалгии у пациентов, перенесших COVID-19 на этапе реабилитации*

Цель: определить дискриминационную чувствительность языка при глоссалгии у пациентов, перенесших COVID-19 в стадии реабилитации.

**Материалы и методы:** в исследование включены 88 пациентов в возрасте от 35 - 70 лет, из них 51 больных с глоссалгией, перенесшие COVID 19 и имеющие воспалительные заболевания СОПР включены в основную группу, из них 36 женщин, 15 – мужчин; 37 пациентов глоссалгией, не болевшие COVID 19, из них 29 женщин, 8 мужчин составили группу сравнения; 20 здоровых лиц служили контролем. Осмотр полости рта пациентов с глоссалгией проводили при обращении пациентов в поликлинику терапевтической стоматологии ТГСИ, при этом заполняли стоматологическую анкету, осуществляли фото- и видеодокументацию. Средний возраст больных составил  $52,57 \pm 1,20$  лет.

Провели определение глубокой дискриминационной чувствительности языка, основанный на измерении в единицах длины (мм) циркулем Вебера зоны слизистой оболочки языка. Исследования проводились при комнатной температуре 18-20 градусов с применением циркуля Вебера. Бранши циркуля Вебера одновременно касаются обследуемого участка слизистой оболочки кончика языка. При этом определяли минимальное расстояние между участками слизистой оболочки языка, когда исследуемый пациент четко отличал прикосновение обеих браншей циркуля.

**Результаты исследования и обсуждение.** Следует отметить, что при измерении циркулем Вебера дискриминационная чувствительность кончика языка составила  $2,92 \pm 0,01$  мм в основной группе,  $2,45 \pm 0,01$  мм - в группе сравнения, в контрольной группе у здоровых лиц дискриминационная чувствительность составила  $1,1 \pm 0,01$  мм. Из полученных результатов измерения, проведенных у пациентов обеих клинических групп, следует, что глубокая тактильная чувствительность была достоверно ( $p < 0,01$ ) снижена у больных глоссалгией, особенно у лиц, перенесших COVID 19 (основная группа) и пациентов с глоссалгией, не болевших COVID 19 по сравнению с контрольной группой

**Выводы:** Представленные результаты исследования, полученные у пациентов с глоссалгией, перенесшие COVID-19 отмечается достоверное ( $p < 0,01$ ) снижение дискриминационной чувствительности языка, что еще раз доказывает психоэмоциональную природу глоссалгии, перенесших COVID-19 в периоде реабилитации.

**Ключевые слова:** глоссалгия, определение дискриминационной чувствительности языка, циркуль Вебера