CRITERIA FOR CHOOSING THE COLOR IN DENTAL PROSTHETICS

V. NICOLAE¹

¹University "Lucian Blaga" of Sibiu

Keywords: the color, smile, dental prosthetics **Abstract:** "The smile is the soul's mirror". A sincere and warm smile is an expression of well being; it builds up connections between people and inspires sympathy. Our patients are becoming more and more pretentious concerning their teeth. A sophisticated outfit and an impeccably smile are the keys of a perfect selfimage. In dentistry, aesthetics represents a relatively new domain. The team doctor – dental technician, has not only the task to rebuild or replace the patient's teeth, but equally to improve the aesthetic aspect.

Cuvinte cheie: alegerea culorii, zâmbetul, protetica dentară **Rezumat:** "Zâmbetul este oglinda sufletului". Un zâmbet deschis și cordial este expresia poftei de viață și a stării de bine, construiește legături între oameni și trezește simpatia. Pacienții noștri devin din ce în ce mai pretențioși atunci când este vorba de dinții lor. O ținută sofisticată și un zâmbet impecabil sunt indispensabile imaginii proprii. În domeniul stomatologiei, estetica reprezintă un domeniu relativ nou. Echipei medic stomatolog - tehnician dentar, nu îi revine numai sarcina de a reconstrui sau de a înlocui protetic dinții pacienților, ci, în aceeași măsură, de a îmbunătăți aspectul estetic.

SCIENTIFIC ARTICLE PREDOMINANTLY THEORETICALLY

Choosing teeth color is an important phase that goes along with a number of dental procedures. Choosing teeth colour can be done by two methods: visual methods, consisting of comparing the tooth with the samples from the color key and instrumental methods, based on measurement instruments.

Instrumental analysis of the teeth's color was introduced with the purpose of transforming a subjective analysis into an objective one that allows numeric expression of different color parameters. This way, we can avoid variations induced by personal perception particularities.

Following, we will make a more detailed presentation of some color analysis systems.

1. Nunsel System = shade, saturation and brightness

The shade is perceived by the cone cells, having the wavelength of light radiation. For teeth, 10 shades can be discerned, having the wavelength located between 3.75 and 8.75.

Saturation is determined by the concentration of tooth color pigment. Tooth color saturation increases with age. Reducing the saturation effect consists of eliminating or reducing color pigment (underlying the bleaching techniques). Increased color saturation is made by resin composite polymerization techniques in multiple layers (Sandwich technique).

Brightness is perceived by rod cells and represents the amount of light energy reflected by an object. Alternations of reflection/absorption are games between white and black colors. Brightness perception system can exist independently of other opportunities to highlight the color. By reducing the brightness the vision will be reduced and the image is transformed into an image with a less intense color.

The system is presented as a color album which consists of 10 sheets: one sheet for each color and two lines: one

vertical - brightness and one horizontal - saturation.

2. CIELAB System identifies and determinate the color using three parameters: brightness, chromatic parameters: red (+) to green (-) and (+) to (-) parameter, where (+) is yellow and (-) is blue.

The system identifies the color based on some properties of surfaces to allow light radiation to pass through the coatings or how permissible is tooth surfaces to light radiation.

In teeth, light radiation penetrates depending of the degree of demineralization.

The system provides data about the color such as: information about the intensity of the color (intensity scale from 1 to 4) or color location information.

Fluorescence of teeth is an object's property to reflect radiation in the visible range after being exposed to a UV source (eg. identifying counterfeit money). For natural teeth, the dentin is the one that determines the degree of UV reflectance (degree of fluorescence of dentin). This quality has a very important practical application for dental materials manufactures. Dental materials (composites for fillings and ceramics for restaurations) must approach as much possible to the natural teeth.

Natural teeth color has the following features: color ranges in the color perceived spectrum, brightness of natural teeth is located between 5.8 and 8.5, saturation is the one which gives color to the natural teeth and is between 1.5 and 5.6 and the color of natural teeth varies according to the number and thickness of dental layers, the color pigment of dentin and the extent of dentin layers to the edges.

Natural tooth color is influenced by the quality of the pulp; at a young age we have transparent teeth, while at old age are present yellow teeth, the pulp being colonized secondary dentin. Young teeth's dentin surface can have pink and white reflexes by the reflection of light from the dental pulp. Biological changes of the dental pulp are necrosis, which can give teeth a yellowish-gray color shot (dead shot) or bleeding

¹Corresponding Author : V. Nicolae, 44-46 Bl Victoriei street, Sibiu, România; e-mail: dento.medica@yahoo.com; tel +40-0721212878 Article received on 28.05.2010 and accepted for publication on 20.08.2010 ACTA MEDICA TRANSILVANICA December 2010; 2(4) 312-313

pulp highlighted in a redish tooth, the color being transparent in cervical.

Restorative materials can change the appearance of natural teeth as follows: eugenol and zync phosphate cement turn the tooth into yellow, guttaperca gives a pink color to the tooth, while fiberglass pins are the most aesthetic.

One of the essential conditions of root filling material or pins is to not change the natural tooth color.

Channels filling materials release pigments that spread in dental hard tissues and set mainly in the dentin because pigments are fixed by the organic matrix of collagen.

Dentin has a role in determining the natural tooth color because the color of dentin is influenced by age, primary dentin, present in young natural teeth, having a yellowish-white color, while secondary dentin, present in adult's teeth, has a deeper orange shade, making the tooth more opaque. Therefore, we can say that the dentin has a key role in setting the basic color of natural tooth.

Natural tooth enamel looks as jade or translucent stone and influences the degree of translucency of natural teeth as follows: if the enamel is well represented throughout the vestibular surface, we have translucent teeth, if we have better represented enamel in the incisal area, then translucency and brightness are increased and if we have well represented enamel in the middle 1/3, there is a composition of color between the yellow shade of the dentin and the enamel translucency. To apical, translucency is neutral, dentin is poorly represented; usually we have a color with a higher pigment saturation while surface enamel gradually thins.

Growth and development of enamel on adult teeth surface increases the degree of opalescence and gives the teeth a petrified look (JAD dentin).

Choosing tooth color can be done with color keys, which can be color keys for the color of teeth, color keys for gum shades or color keys for color face.

It is necessary that key color samples cover all possible shades of natural teeth color. For example, VITA Classical Color key contains the following colors: color family A – brown rodent; family color B – yellow-orange; family color C – gray-green and family color D – yellow-gray.

Each color family has a certain degree of pigment saturation; for example family A - A1, A2, A3, A4; the degree of pigment saturation increases from A1 to A4 and reduces the light level.

The CROMOSCOP-Pan (Ivoclar) key is an arrangement of samples by the map of the tooth.

The VITA-3D Master key chooses a color by three parameters: code blue, code red and the basic color. After the form and light intensity there are five groups of natural teeth. As an observation, group 6 contains artificially bleached teeth within each group.

Factors which may influence the choice of color can be subjective – the clinician's level of experience or paravisual qualities (eg. individuals with high developed color visual affinity) or objective – distance from the object: when we determine the color, we farther the teeth. When choosing the color of teeth we'll take into account the overall color of the frontal group.

CONCLUSION

In conclusion of color choice, we can say that it is necessary to take into account the basic color of the setting in which we make the color selection, the incident light, the intrinsic properties of the color key (key material, sample thickness); color choosing is made at the beginning of the meeting, teeth should be hydrated and clean – we remove bacterial plaque, stains and colored restorations, then we remove all color sources around the mouth – lipstick, colorful jewelry and artificial light sources.

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