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PROCEDURES FOR SMILE TRANSFORMATION WITH PORCELAIN VENEERS

Asst. Prof. Julija Zarkova Atanasova

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GOCE DELCHEV
UNIVERSITY

Faculty of Medical sciences, Dental Medicine

DentiMax Dental Office, Skopje

Our team

Meet the team that will create your smile at an enviable level.

Christian Tashkovski

Specialist in orthodontics

Creative, detail oriented, always focused.

Julia Zarkova Atanasova

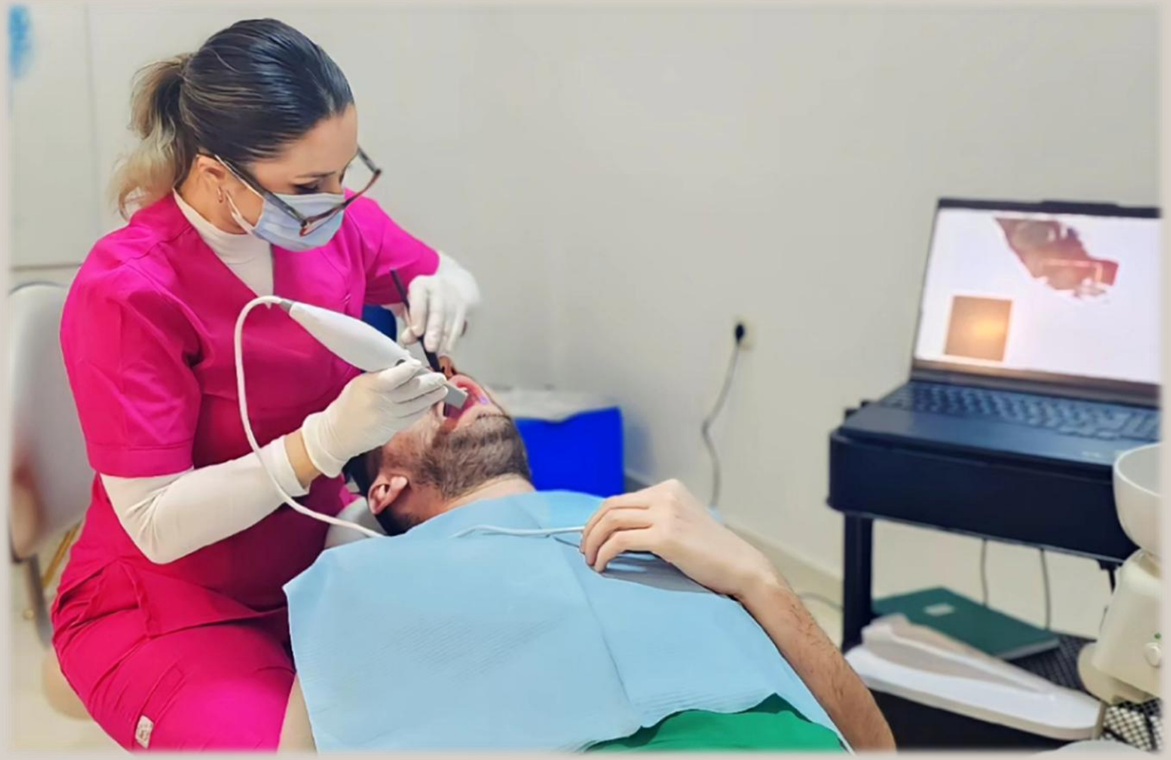
Specialist in dental prosthetics

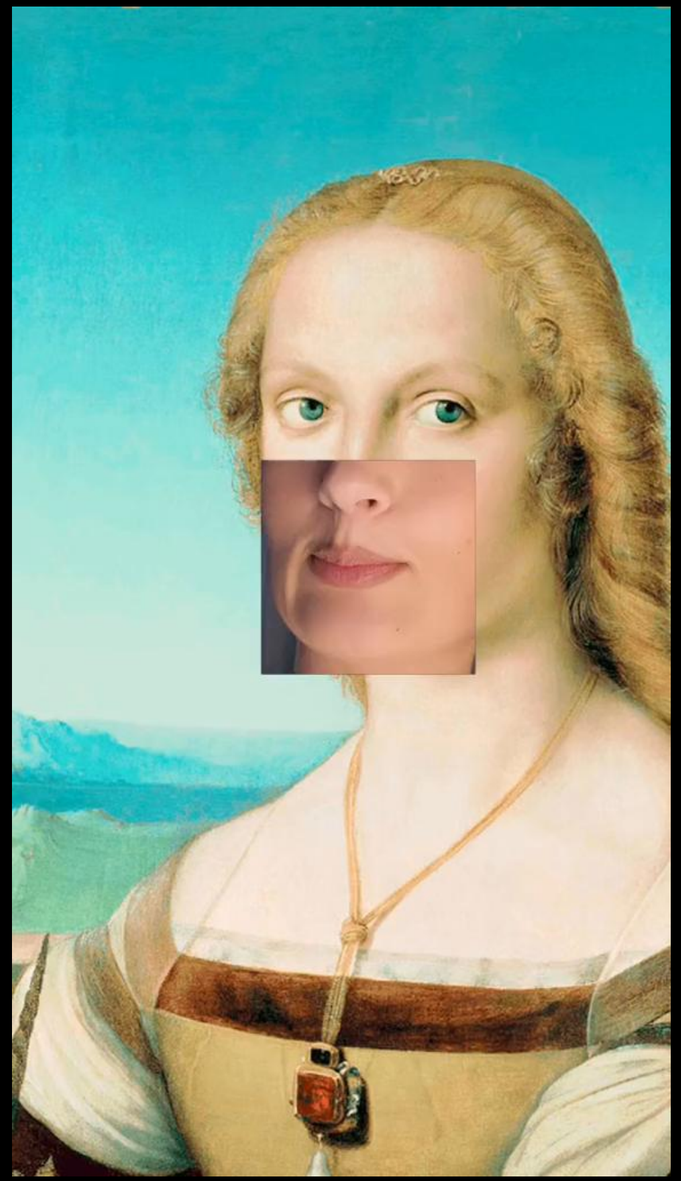
Experienced, ambitious, ready to meet all challenges.

3DISC

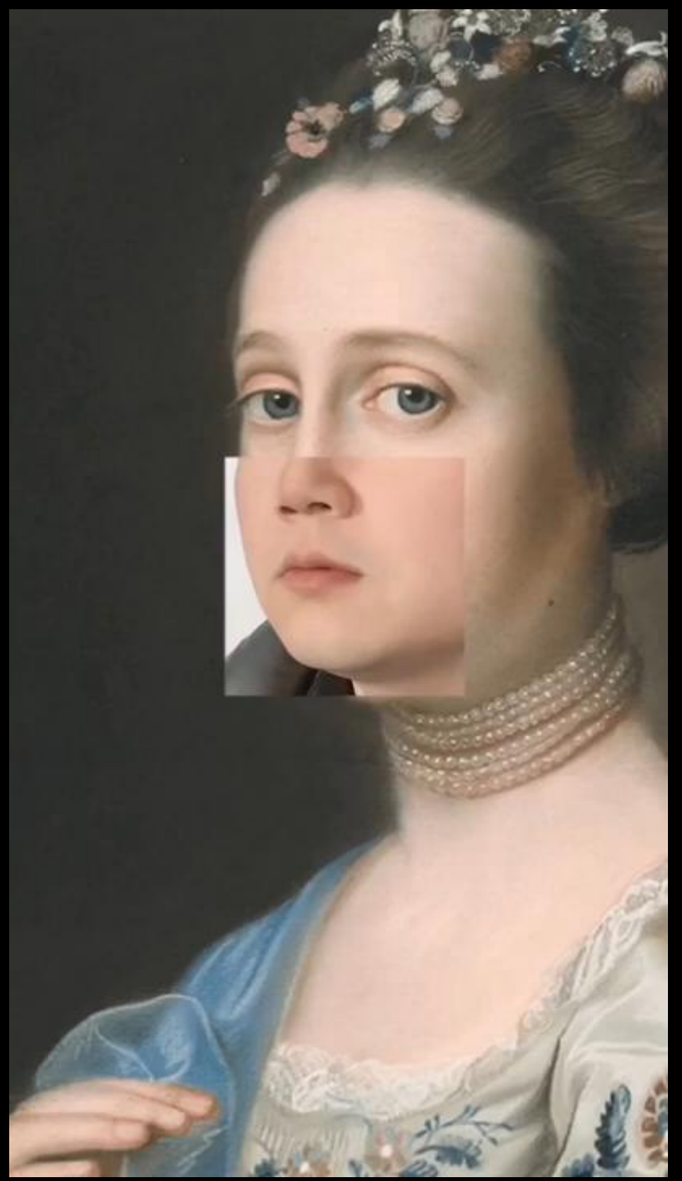
Taking Digital Beyond

Key Opinion Leader For Heron IOS, 3Disc, intraoral scanner





How smile influence the appearance of a person face!



aesthetic noun

aes·thet·ic es-ˈthe-tik is-, *British usually* ēs-

variants *or less commonly* **esthetic**

aesthetics *also* **esthetics** es-ˈthe-tiks is-, *British usually* ēs- **plural in form but singular or plural in construction** : a branch of philosophy dealing with the nature of beauty, art, and taste and with the creation and appreciation of beauty

The term "esthetics" is borrowed from the Greek word "aesthesia", which means sensation or sensibility

Creating esthetically pleasing smile is a complex process!!!


PORCELAIN VENEERS (PLV)

Literature review

1

Survival rate and longevity

Cumulative survival rates for:

- 5 years (94.4%)
- 10 years (93.5%)
- 20 years (82.93%)

› Int J Prosthodont. 2012 Jan-Feb;25(1):79-85.

Clinical performance of porcelain laminate veneers for up to 20 years

Ulrike Stephanie Beier [1], Ines Kapferer, Doris Burtscher, Herbert Dumfahrt

Affiliations + expand

PMID: 22259802

Abstract

Purpose: The aim of this clinical retrospective study was to evaluate the clinical quality, success rate, and estimated survival rate of anterior veneers made of silicate glass-ceramic in a long-term analysis of up to 20 years.

Materials and methods: Anterior teeth in the maxillae and mandibles of 84 patients (38 men, 46 women) were restored with 318 porcelain veneer restorations between 1987 and 2009 at the Medical University Innsbruck, Innsbruck, Austria. Clinical examination was performed during patients' regularly scheduled maintenance appointments. Esthetic match, porcelain surface, marginal discoloration, and integrity were evaluated following modified California Dental Association/Ryge criteria. Veneer failures and reasons for failure were recorded. The study population included 42 (50.0%) patients diagnosed with bruxism and 23 (27.38%) smokers. The success rate was determined using Kaplan-Meier survival analysis.

Results: The mean observation time was 118 ± 63 months. Twenty-nine failures (absolute: 82.76%, relative: 17.24%) were recorded. The main reason for failure was fracture of the ceramic (44.83%). The estimated survival rate was 94.4% after 5 years, 93.5% at 10 years, and 82.93% at 20 years. Nonvital teeth showed a significantly higher failure risk (P = .0012). There was a 7.7-times greater risk of failure associated with existing parafunction (bruxism, P = .0004). Marginal discoloration was significantly greater in smokers (P ≲ .01).

Conclusion: Porcelain laminate veneers offer a predictable and successful restoration with an estimated survival probability of 93.5% over 10 years. Significantly increased failure rates were associated with bruxism and nonvital teeth, and marginal discoloration was worse in patients who smoked.

Beier U S, Kapferer I, Burtscher D, Dumfahrt H. Clinical performance of porcelain laminate veneers for up to 20 years. Int J Prosthodont. 2012;25(01):79–85.

Literature review

2

Tissue response

- Perfect periodontal response placement, there was an increase in cervical fluid; there was a significant decrease in plaque index and plaque bacteria vitality.

J Clin Periodontol. 1994 Oct;21(9):638-40. doi: 10.1111/j.1600-051x.1994.tb00756.x.

The effect of porcelain laminate veneers on gingival health and bacterial plaque characteristics

S Kourkouta [1], T T Walsh, L G Davis

Affiliations + expand

PMID: 7806682 DOI: 10.1111/j.1600-051x.1994.tb00756.x

Abstract

The aim of this study was to evaluate the response of microbial plaque and gingival inflammation to the placement of porcelain laminate veneers on anterior teeth. 9 patients, 7 female and 2 male (mean age of 30 years), with a total of 35 veneers were examined. The volume of gingival crevicular fluid (GCF), level of neutral proteolytic enzyme activity, gingival index (GI), plaque index (PlI) and plaque bacteria vitality were measured at baseline and after the placement of veneers. The volume of GCF increased after the placement of veneers ($p = 0.03$). No statistically significant differences were found in proteolytic enzyme activity or GI ($p > 0.05$). There were statistically significant reductions in PlI ($p = 0.000$) and plaque bacteria vitality ($p = 0.018$). Further research is required to assess the long-term influence of porcelain laminate veneers on gingival health and microbial plaque characteristics.

Korukent S, Walsh TF, Davis LG. The effect of porcelain laminate veneers on gingival health and bacterial plaque characteristics. J Clin Periodont 1994;21:638-640.

Literature review

3

Materials for PLV

- Castable glass ceramic;
- Heat pressed ceramic;
- Computer-aided manufacturing (CAD/CAM) processed factory produced ingots;
- Feldspathic porcelain backed :1.Over platinum foil-matrix or 2.Refractory die

Fixed Prosthodontics and Operative Dentistry

Flexural strength of an infused ceramic, glass ceramic, and feldspathic porcelain

Russell A. Giordano II, DMD, DMSc,[a] Lionel Pelletier, DMD, MMSc,[b] Stephen Campbell, DMD, MMSc,[c] and Richard Pober, PhD[d]
Boston University, Goldman School of Graduate Dentistry, Boston, Mass., Harvard School of Dental Medicine, Boston, Mass., University of Illinois at Chicago, Chicago, Ill., and Massachussetts Institute of Technology, Cambridge, Mass.

In-Ceram material is a relatively new all-ceramic restorative material with improved properties that require research. The clinical selection of restorative materials is based on a number of parameters such as esthetics, fit, and strength. This study determined the flexural strength of In-Ceram system components and compared the core material with conventional feldspathic ceramics and with Dicor all-ceramic restorative material. Four-point flexural strength values of bend bars of each ceramic were 18.39 ± 5.00 MPa for In-Ceram sintered alumina, 76.53 ± 15.23 MPa for In-Ceram infusion glass, and 236.15 ± 21.94 MPa for In-Ceram infused alumina core. Flexural strength of self-glazed feldspathic porcelain was 69.74 ± 5.47 MPa, as-cast Dicor ceramic 71.48 ± 7.17 MPa, and polished Dicor ceramic was 107.78 ± 8.45 MPa. (J Prosthet Dent 1995;73:411-8.)

Dental ceramics of various compositions are popular as restorative materials. Dental restorations should fulfill three main criteria—strength, fit, and esthetics. Feldspathic porcelain is the most commonly used dental ceramic; but the flexural strength of feldspathic porcelains is only 60 to 70 MPa, which necessitates the use of a reinforcing metal substructure.[1] Unfortunately, metal prevents light transmission and that decreases reproduction of the depth of color and vitality of natural teeth.

Artificial crowns are designed to reproduce the depth of color, translucency, and texture of natural teeth. While a natural tooth permits both specular and diffuse transmission of light, a metal-ceramic crown permits only diffuse and specular reflection of light. Therefore, all-ceramic restorations that permit light transmission are indicated when esthetics is essential. Restorations that are completely formed from ceramics create the most natural appearing replacements for teeth, primarily because of their transmission of light. These restorations are capable of incorporating color generated from underlying tooth structure and surrounding tissues similar to natural teeth. All-ceramic systems were developed to fulfill this esthetic requirement.

McLean and Hughes[2] developed aluminous porcelain jacket crowns that partially addressed problems of esthetics and strength. A veneer porcelain placed on a core containing approximately 50 wt% fused alumina crystals resulted in a dental ceramic with flexural strength from 100 to 130 MPa. Although this was an improvement in strength, light transmission was limited because of the alumina crystals.

Dicor castable glass ceramic (Dentsply International, Inc., York, Pa.) was developed by Grossman[3] at Corning Glass Works (Corning, N.Y.). Dicor ceramic consists of a glass matrix of SiO_2, K_2O, MgO, and small amounts of Al_2O_3 and ZnO_2. The crystalline phase of Dicor ceramic is composed of tetrasilicic fluoromica ($K_2Mg_5Si_8O_{20}F_4$), which provides fracture resistance and strength from generation of compressive stress around the crystals.[3] It is one of the most translucent of the all-ceramic systems. However, color must be developed with several coats of surface glaze, or Dicor ceramic must be veneered with an aluminous porcelain. Micaceous crystals are formed during heat treatment that reportedly provide Dicor ceramic material improved strength and machining qualities because of the generation of compressive stress that surround the crystals.

Dicor ceramic presents a unique analysis problem. This material is textured; the surface has an appreciably different composition—called the "ceram layer"—from the remaining ceramic material. Removal of the external ceram layer has been reported to affect fracture strength and elevate strength from 93 to 154 MPa or decrease strength

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[d]Associate Research Professor, Ceramics Processing Research Laboratory, Massachusetts Institute of Technology.

0022-3913/95/$3.00 + 0. **10/1/63105**

Giordano RA, Pelletier L, Campbell S, Prober R. Flexural strength of an infused ceramic, glass ceramic and feldspathic ceramic. J Prosthet Dent 1995;73:411-418.

PLAN

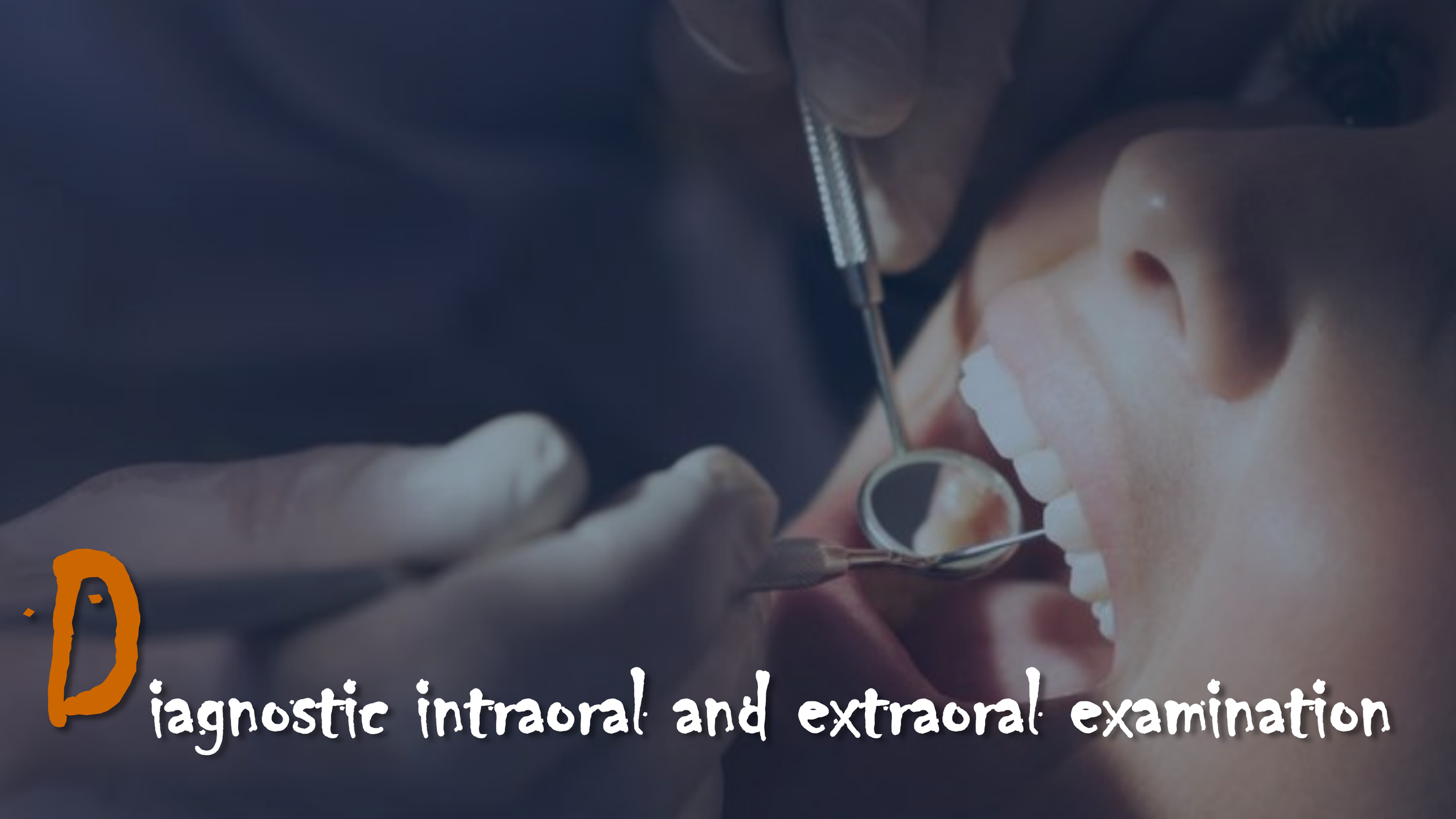
PREP

SCAN

DESIGN

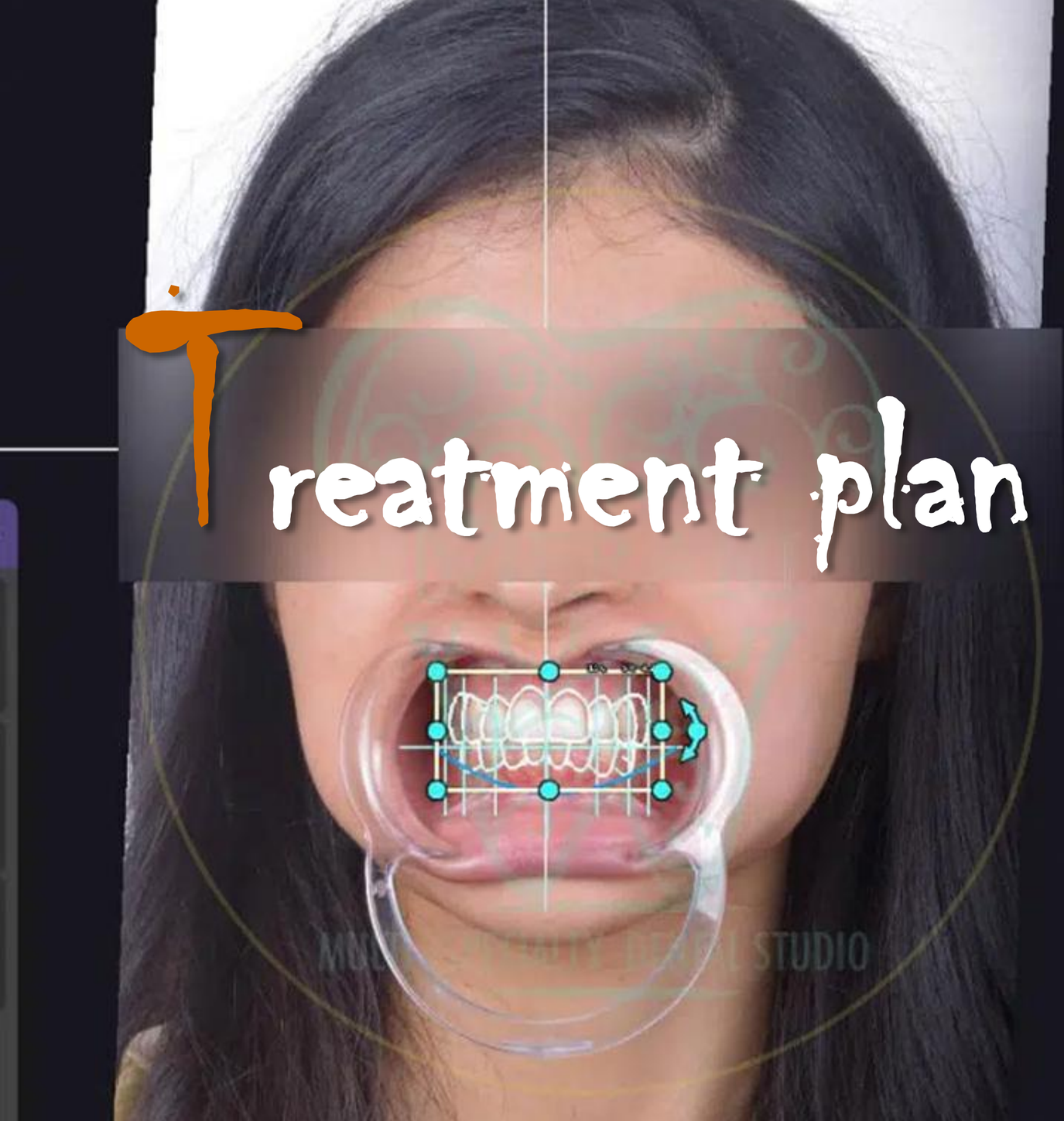
MILL

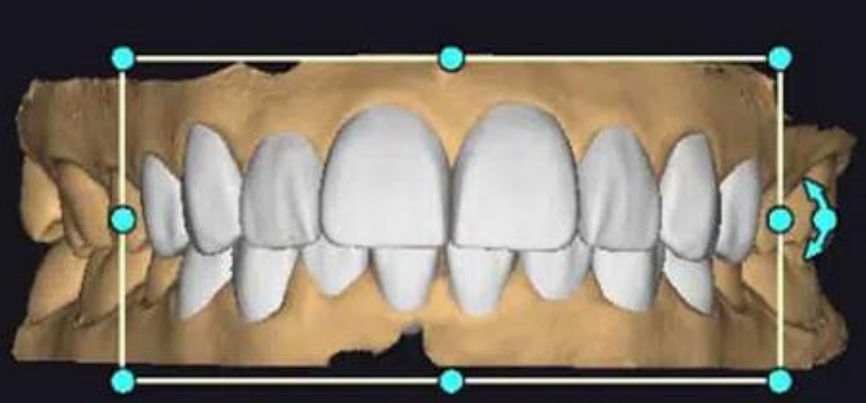
BOND

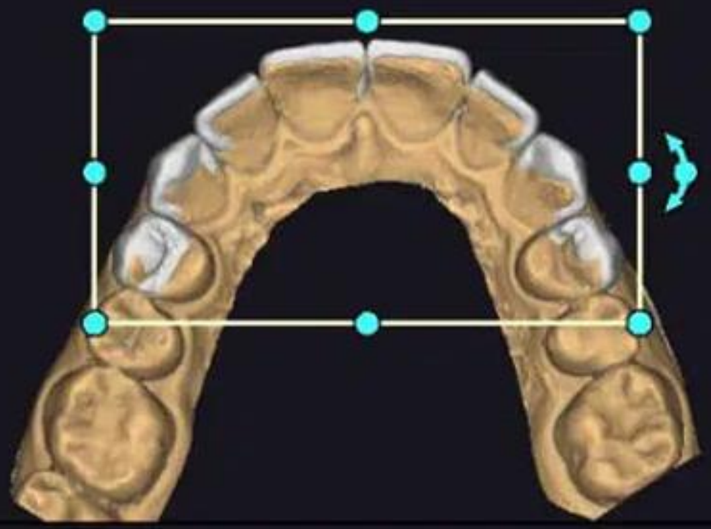


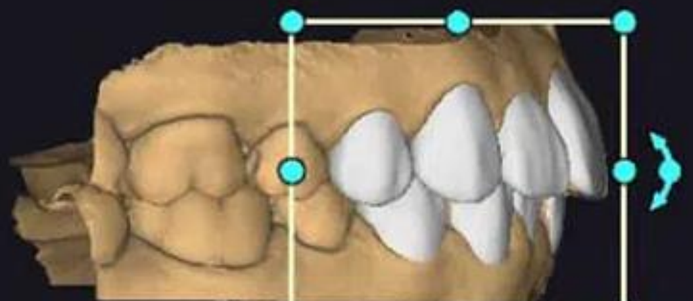
Diagnostic intraoral and extraoral examination

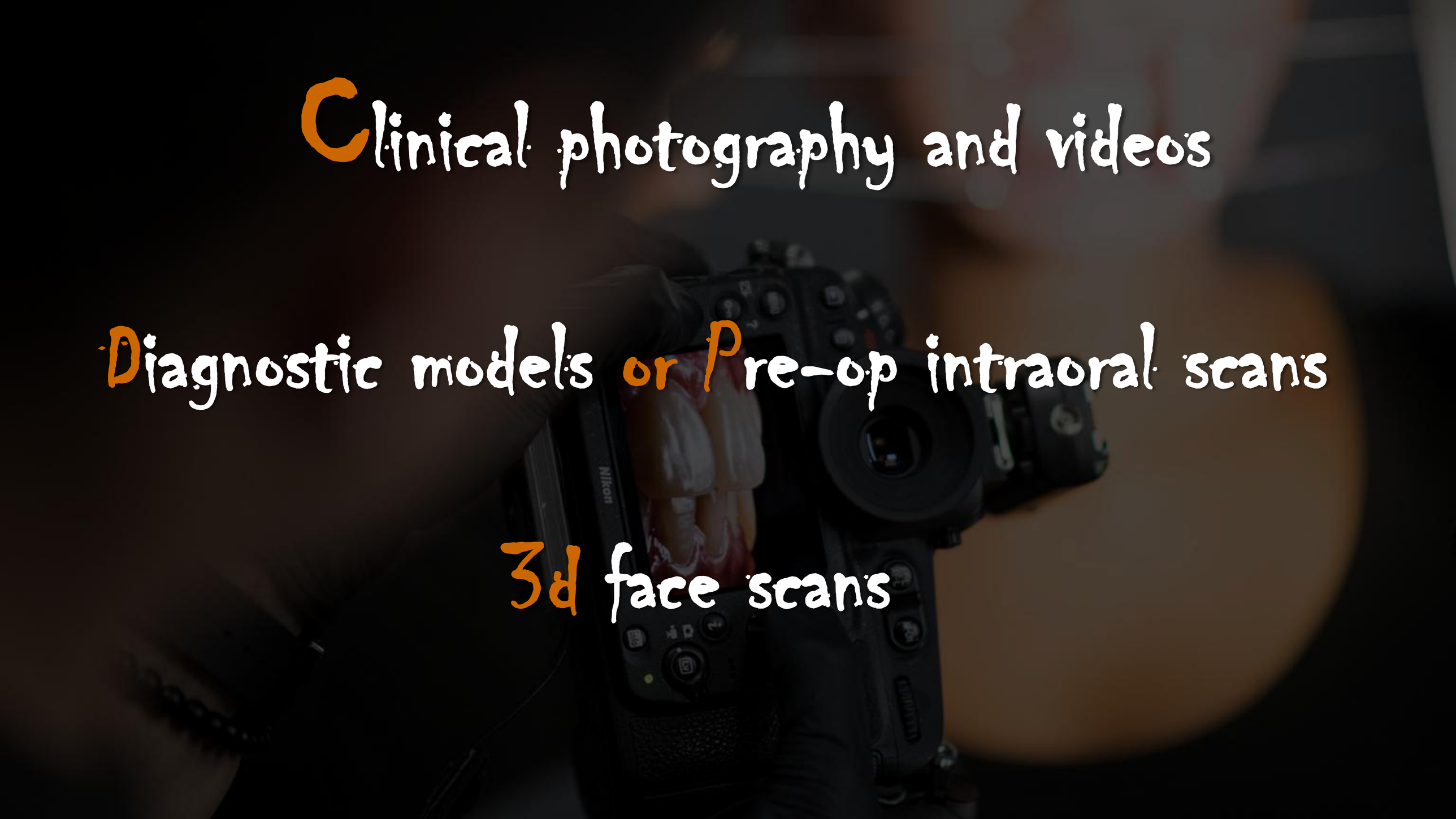
Treatment plan



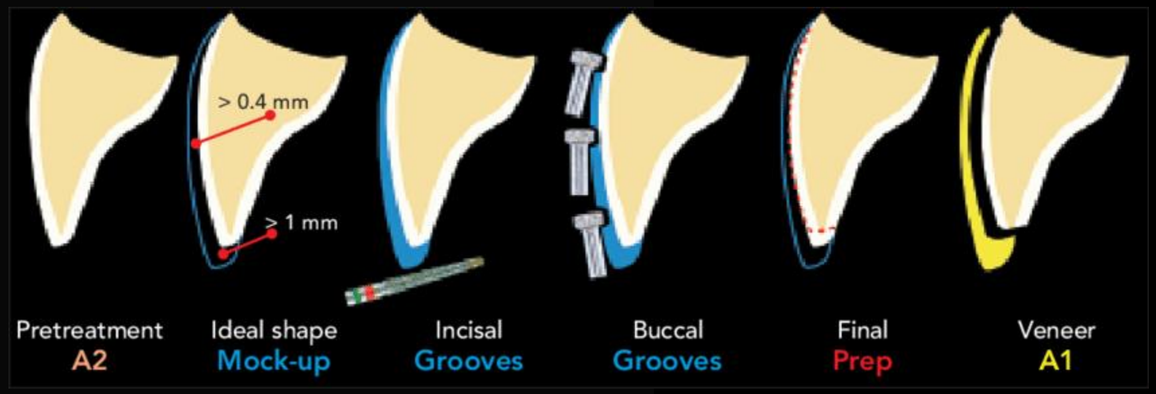






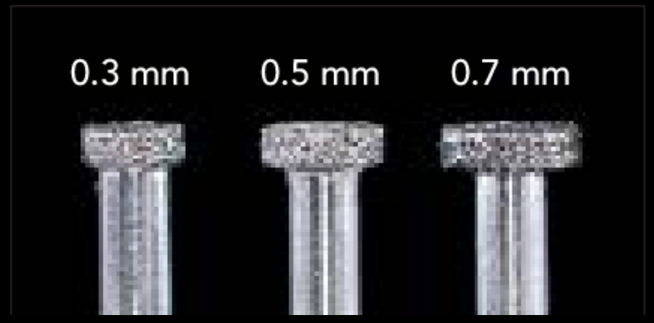

Clinical photography and videos
Diagnostic models or Pre-op intraoral scans
3d face scans


Tooth preparation



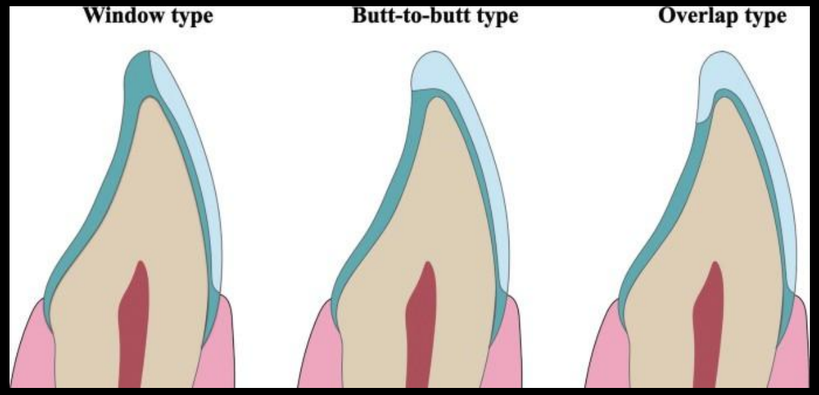
Guides for preparations

- Silicone index
- Mock-ups
- Burs for marked preparation



Tooth preparation for veneers principles

- Stay in enamel whenever possible(too much dentin –crown)
- When to break contact and how to deal with proximal?
- Tooth preparation can be no prep, minimal prep, classical prep
- Minimal thickness for material durability
- Incisal preparation design (best but joint)
- Preparation finish line light chamfer



AVERAGE ENAMEL THICKNESS

0.3 to 0.4 mm

0.8 to 1.0 mm

0.8 to 1.0 mm

1.0 to 1.3 mm

0.2 to 0.4 mm

0.5 to 0.7 mm

0.7 to 0.9 mm

1.5 to 2.0 mm

Cord placement 000 or 00 prior preparation or margin

Conclusion

Porcelain veneers offer highly aesthetic solutions for patients seeking smile transformation, but given the sensitivity of the procedures, each step in the process plays a key role in achieving optimal results.

THANK YOU FOR YOUR ATTENTION !!!
FALEMINDERIT !!!

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