

BS Brazilian Dental Science



PROCEEDINGS

of the 26th Meeting of the Brazilian Group of
Restorative Dentistry Professors



**Grupo
Brasileiro**
de Professores de
Dentística

unesp 

UNIVERSIDADE ESTADUAL PAULISTA
"JÚLIO DE MESQUITA FILHO"
Instituto de Ciência e Tecnologia
Campus de São José dos Campos



Combatendo o **sobretreatamento** **na Dentística**

June 5-7, 2025

Words from the presidents

Given a challenging period for our specialty, marked by numerous cases of overtreatment in which ethical principles are not respected, along with fake news and information of dubious origin, the Brazilian Group of Restorative Dentistry Professors felt the need to take a stand. This is how the main theme of the 26th GBPD meeting emerged: Combating Overtreatment in Restorative Dentistry.

For the first time, a GBPD meeting took place in Santos - SP. And what a responsibility it was to organize an event following such a successful edition held in Gramado. This edition featured lectures and discussions on topics such as Minimally Invasive Dentistry, Adhesion, Tooth Whitening, Tooth Wear, and of course, the Teaching of Restorative Dentistry. The aim was to return to the fundamental aspects of Restorative Dentistry, which have always been discussed and disseminated by the GBPD.

In addition to the lectures, there were also hands-on activities, podcast recordings, and research presentations, highlighting the relevance of the GBPD to Restorative Dentistry and Dentistry as a whole. We must also emphasize the creation of the Women in Science Award, named after Professor Maria Fidela de Lima Navarro, who has greatly contributed, and continues to contribute, to Dentistry and dental research.



All this was only possible thanks to the organizing committee, which dedicated significant effort to ensure the event's success and smooth operation. We must also thank the companies and institutions that believed in the event and contributed financially to make it feasible: CAPES, CROSP, Dental Miura, DFL, Ivoclar, Kuraray, SDI, Ultradent, Align, FGM, Haleon, Pronew, Dentsply Sirona, Golgran, Hebron, KG Sorensen, Kulzer, Orais, Santos, Shofu, Solventum, and Wagner. Thank you very much!

We are grateful for the trust placed in us by the GBPD and to the editorial board of the Brazilian Dental Science, represented by Editor-in-Chief Sergio Eduardo de Paiva Gonçalves, also GBPD president until the 26th meeting, for publishing the event proceedings in this BDS special edition. We take this opportunity to wish success to the new GBPD board, and we extend our thanks to everyone who contributed directly or indirectly to the event!



Prof. Antônio Carlos da Silva Tavares



Prof. Carlos Alberto Kenji Shimokawa

*Presidents of the 26th Meeting of the Brazilian Group of
Restorative Dentistry Professors (GBPD)*



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FPCC

Clinical Cases

C

PCC 1

1st place
MARCELO GALANTE
Award



Transurgical fragment reattachment of a premolar with a coronoradicular fracture: A multidisciplinary clinical case report

Silva-Júnior JP*, Lins MLG, Gualberto-Júnior EC, Garrido AA, Silva LM, Martins LM

The aim of this report is to present a multidisciplinary and conservative approach for the aesthetic and functional restoration of a premolar with a complex subgingival fracture. A 42-year-old male patient presented to the dental clinic at the Federal University of Amazonas complaining of unilateral sensitivity during mastication. Intraoral examination revealed an extensive fracture involving the main groove of tooth #24, with approximately 4mm probing depth and a positive response to pulp vitality tests. Radiographic analysis showed no alterations in the periodontal ligament space. Based on the clinical and radiographic findings, and in agreement with the patient, a surgical approach was chosen for precise delimitation of the fracture. This was followed by absolute isolation, direct pulp capping with bioceramic cement, and subsequent bonding of the fragment with low-viscosity resin, all performed in the same operative session. Maintaining the original tooth's shape, color, and texture contributes to a seamless transition between the bonded fragment and the remaining tooth structure, avoiding the need for extensive artificial restorative materials. The viability of this technique crucially depends on the fragment's integrity and its adaptation to the remaining tooth structure.

The conservative multidisciplinary approach involving dental fragment reattachment proved to be a successful resolution in this case, preserving the tooth structures and restoring the aesthetic and functional profile of the tooth without complications or adverse events.



PCC 2

Aesthetic rehabilitation in hypoplastic AI with injected fluid resin technique: case report

Oshiro STK*, Freitas LR, Pereira ECFL, Santana FFM, Fonseca MVA, Grangeiro-Jr. LED, Agra CM, Aires OV

Amelogenesis imperfecta (AI) is a rare genetic condition that affects the development, in quantity and quality, of tooth enamel, compromising aesthetics, function and oral health. A 13-year-old female patient with hypoplastic AI in permanent teeth and deciduous teeth presented with tooth sensitivity, aesthetic complaints, changes in tooth shape and color, anterior crossbite, and difficulty with hygiene. After extraction of tooth number 55, intraoral scanning, digital planning with mock-up, and transparent molds were performed. Treatment included restorations in the upper teeth with injected flowable composite resin (IFCR). Two years later, she returned for maintenance of the upper teeth and restoration of the lower teeth with the same technique. She was advised to stop thumb sucking, referred for orthodontic evaluation, and received new oral hygiene instructions.

The injected fluid resin technique proved to be viable and effective in the multiple aesthetic and functional rehabilitation of young patients with AI, with positive impacts on oral health and quality of life.



PCC 3

The challenge in restoring paralyzed injuries

Regalado DFR*, Santos LCC, Souza JGB, Andrade KMG

The case describes a restorative approach to extensive inactive carious lesions with aesthetic indication. A 35-year-old male patient, working in customer service, presented inactive cavitated lesions in teeth 12 and 13, located on the cervical vestibular surface and with well-defined edges. The therapeutic strategy adopted consisted of using composite resin, applied through the incremental technique, evolving to aesthetic rehabilitation. The main clinical challenge was the appropriate color selection, in order to accurately mimic the remaining tooth structure. The final result presented high aesthetics, with natural integration to the metal set, providing full patient satisfaction. Among the advantages, aesthetic and psychosocial rehabilitation stand out. Among the limitations are the loss of daily tooth structure for the preparation of the preparation, ensuring that there is no guarantee of restoration, the absence of intervention due to biological necessity and the risk of caries recurrence in patients with high cariogenic risk.

Although inactive lesions do not require intervention from a biological point of view, restoration may be indicated for aesthetic reasons, considering the impact of the smile on self-esteem, social interaction and quality of life, in addition to the need for effective oral hygiene instruction, essential to prevent recurrence and ensure the longevity of restorations.



PCC 4

Reconstructing esthetics using the injectable composite resin technique: A case report

Nadais MS*, Mottola LTL, Jacob BEM, Rigo LMB, Forlin TS, Shimokawa CAK, Sobral MAP

Objective: To describe an esthetic rehabilitation using the injectable composite resin technique. **Case Report:** The patient presented dissatisfaction with the anatomy and color of direct restorations on the maxillary anterior teeth. An in-office bleaching procedure was performed with 35% hydrogen peroxide, followed by at-home bleaching with 10% carbamide peroxide. After 15 days, a restorative mock-up was done using conventional composite resin without adhesive. Once the esthetic and functional outcomes were approved, the anatomy was replicated on a plaster model, from which a transparent silicone guide (Transil F) with incisal perforations was fabricated. The inadequate restorations were removed, and the teeth were conditioned with 37% phosphoric acid and a universal adhesive. The injectable resin (Beaufil Injectable XSL) was applied with the guide in place, followed by light curing. After guide removal, proximal contacts were adjusted, and finishing and polishing were performed. At the 6-month follow-up, the restorations remained functionally and esthetically satisfactory. **Advantages and Limitations:** This is a fast, predictable, low-cost, single-session technique. However, the silicone guide may hinder light curing, requiring longer exposure time.

The rehabilitation was predictably executed in line with the initial treatment plan, yielding excellent esthetic and functional results at the 6-month follow-up. Nonetheless, closer monitoring is recommended due to the properties of flowable composite and potential light-curing limitations.



PCC 5

Closure of Maxillary Incisor Diastemas with Composite Resin: A Case Report

Buriozzi EA*, Ramos AB, Bezerra SJC

The objective of this study is to report a clinical case of diastema closure between maxillary incisors using the monochromatic direct composite resin technique. A female patient presented to the clinic complaining about the aesthetics of her smile due to the spaces between her upper incisors. Clinical examination revealed the presence of mesial diastemas between teeth 11, 12, 21, and 22. A treatment plan was developed, and the patient was advised to undergo diastema closure through direct composite resin restorations. Tooth shade selection was performed using light-cured composite increments. The restorative procedure began with acid etching using 37% phosphoric acid (Condac, FGM), followed by the application of an adhesive system (Ambar APS - FGM). The composite resin (Elóra A2 - FGM) was applied in 1 mm increments, using a polyester strip to help build the palatal wall and achieve proper interproximal contact. The resin was then applied incrementally toward the buccal surface. One week after the restoration, finishing was performed using diamond burs, and polishing was completed with abrasive discs and rubber points.

The results demonstrated that the composite resin closure technique is an effective alternative, restoring both the function and the aesthetics of the patient's smile.



PCC 6

Deep infiltration as an esthetic alternative for a severe case of Molar-Incisor Hypomineralization

Silva LH*, Nery GB, Souza FB, Amaral SF

Objective: To report the use of deep infiltration (DI) as a conservative esthetic approach in a patient with severe molar-incisor hypomineralization (MIH). **Case Report:** A 14-year-old male patient presented dissatisfaction with his smile due to white/yellowish stains on the anterior teeth, with psychosocial impact and reports of bullying. Clinical examination revealed well-demarcated yellowish opacities on the molars (teeth 26 and 46), incisors (11, 12, 21, 32), and canines (13, 23, 43), consistent with a diagnosis of MIH. Transillumination indicated deep lesions. The DI technique was proposed as a conservative alternative for masking these defects. The macroabrasion step was performed using a spherical diamond bur to minimally remove the hypomineralized enamel and gain access to the lesion body. The effectiveness of this step was confirmed through transillumination, which showed increased light transmission through the affected area. Subsequently, the resin infiltrant (ICON®, DMG) was applied according to the manufacturer's protocol, followed by composite resin restoration (Empress®, Ivoclar). **Advantages:** Preservation of dental structure, especially important in a young patient, along with effective masking of the enamel opacities. **Limitations:** The need for minimal enamel removal and the requirement for final restoration using composite resin.

Deep infiltration proved to be a viable and conservative esthetic approach for the treatment of deep enamel lesions in anterior teeth affected by severe MIH.



PCC 7

3rd Place
Honorable Mention



RESIN INFILTRANT IN THE MICRO-INVASIVE RESTORATIVE TREATMENT OF WHITE SPOT LESIONS ON ANTERIOR TEETH: A CASE REPORT

Ramos ACB*, Costa CAGA, Menezes LB

Objective: To report the use of resin infiltrant as a micro-invasive approach for the treatment of white spot lesions on the labial surfaces of anterior teeth. **Case report:** The integrity of the dental structure and the depth of the lesions were evaluated using transillumination, indicating the use of ICON® resin infiltrant to mask enamel alterations. The treatment was performed following prophylaxis and isolation of the operative field, Icon-Etch was applied to the lesions for 2 minutes, followed by suction, rinsing for 30 seconds, and air-drying. Icon-Dry was then applied for 30 seconds to promote moistening and cauterization of the enamel. Since the color of the spots was not completely changed, the procedure was repeated and then Icon-infiltrant was applied to the spot for 3 minutes and photopolymerized for 40 seconds. A new layer of the infiltrant was applied for 1 minute, photoactivated and polished, masking and uniformizing the color of the spots. **Advantages and limitations:** The advantage of this procedure was that no dental tissue was removed, demonstrating that when well planned and executed, resin infiltration is an effective and minimally invasive technique for masking white lesions. The limitation of the technique is related to the depth of the lesions, which compromises the predictability of clinical time as well as the number of sessions, reinforcing the importance of accurate diagnosis for adequate indication.

Conclusion: The resin infiltration proved to be an effective microinvasive alternative for the aesthetic management of white spot lesions.



PCC 8

2nd Place
Honorable Mention**Restorative Challenge in a Young Patient: Direct Veneer on a Trauma-Induced Discolored Tooth**

Ramos AB*, Bezerra SJC

The aim of this study is to report a clinical case of a direct composite veneer on a tooth discolored due to trauma. A 16-year-old female patient presented with a complaint of darkening of tooth #11, which responded positively to the pulp vitality test. Initial treatment consisted of at-home dental bleaching using 10% carbamide peroxide for 20 sessions. A direct composite veneer was then planned. Tooth preparation involved approximately 1.2 mm reduction and rubber dam isolation. The restorative technique included the construction of a palatal shell using Incisal resin (Forma - Ultradent), followed by masking with Pink Opaque pigment (Creative Color - Cosmedent). Selective enamel etching was performed, and Single Bond Universal adhesive (Solventum) was applied. Stratification was done using A2 and A1 dentin shade composites (Herculite Precis - Kerr), and optical effects were added with Trans Opal Flow resin (Empress Direct - Ivoclar). Characterizations were done with white stain, and the final enamel layer was applied using WE shade (Palfique LX-5 - Tokuyama). Finishing was performed with Sof-Lex discs (Solventum), multi-blade burs, and a polishing spiral system (JOTA AG - Switzerland).

This case highlights that even in teeth with severe chromatic alteration, knowledge of the optical properties of materials combined with precise application of restorative techniques allows for highly satisfactory results in direct composite veneers.



PCC 9

Use of Resin Infiltrants as a Minimally Invasive Alternative for Restorations in Patients Diagnosed with MIH

Figueiredo RM*, Kairalla CA, Iatarola BO, Shimokawa CAK, Forlin TS, Bezerra SJC

This report presents the use of resin infiltrant as a minimally invasive alternative for the esthetic management of Molar-Incisor Hypomineralization (MIH) lesions. A 16-year-old female patient presented with a chief complaint of white spots on her maxillary central incisors and canines, with a diagnosis of MIH. The treatment plan included infiltration followed, when necessary, by composite resin restorations. For the infiltration procedure, two applications of hydrofluoric acid (Icon Etch) were performed for 2 minutes each. Between the first and last application, selective abrasion of the lesion was carried out on teeth 21 and 13 using an Arkansas abrasive stone to improve the infiltration potential. After the etching step, the surface was rinsed and Icon Dry was applied to assess the masking potential of the lesion. Upon confirming satisfactory masking, Icon infiltrant (DMG) was applied and maintained for 40 minutes before light-curing. Following infiltration, a restoration was performed on tooth 21, which had the greatest loss of tooth structure. For the restoration, a universal adhesive system (Single Bond Universal, 3M ESPE) was used with total-etch technique, followed by the application of a single layer of enamel composite resin (Ecosite Elements Pure, A1, DMG).

The combination of Icon infiltration and composite resin proved effective for the esthetic resolution of MIH-related lesions, yielding positive clinical results through a minimally invasive approach.



PCC 10

Restorative Management of Molar-Incisor Hypomineralization: A Case Report

Marcelino L*, Shimokawa CAK, Forlin TS

Molar-Incisor Hypomineralization (MIH) is a qualitative enamel defect clinically manifested by well-demarcated opacities of varying colors, increased porosity, and reduced mechanical resistance. This condition typically affects the molars and often involves the incisors as well. The aim of this study is to report the restorative management of MIH. A 15-year-old patient presented with extensive molar involvement, including dentin exposure, partial enamel loss in the premolars, and aesthetic compromise of the incisors, characterized by opacities ranging from white to brown. The molars were prepared and rehabilitated with milled resin full crowns, a choice based on the patient's age and cost-effectiveness. The premolars were restored with composite resin to reestablish function and esthetics. The incisors were treated with resin infiltration to improve the appearance and resistance of the affected enamel. The main limitation of the treatment was the fragility of the hypomineralized enamel, which interferes with adhesion and may affect the longevity of the restorations.

The restorative management of MIH, based on minimally invasive dentistry, provided satisfactory aesthetic and functional outcomes while preserving the remaining tooth structure.-



PCC 11

USING THERMOCOMPACTION INTEGRATED WITH WHITENING FOR THE TREATMENT OF DISCOLORED TEETH: CASE REPORT

Bagnara RBR*, Pimentel LC, Cunha CSD, Aires OV, Amaral SF, Souza FB

Objective: Preheating composite resins can enhance their physical properties. But how can this technique be applied in cases of whitening failure? This study reports a clinical case in which thermocompaction was combined with dental bleaching to rehabilitate teeth with chromatic alteration. **Case Report:** A 36-year-old male patient sought treatment for discoloration of teeth 21 and 22. The treatment began with external whitening (40% hydrogen peroxide) and internal whitening (37% carbamide peroxide). After five sessions, tooth 22 responded satisfactorily. However, tooth 21 remained discolored and was rehabilitated using a direct composite veneer with preheated resin. A transparent silicone guide was fabricated as a reference. After tooth preparation and isolation, stratification was performed using Forma (Ultradent) and Empress Direct (Ivoclar) composite resins. The final layer was applied inside the silicone guide, preheated to 60 °C, and adapted intraorally to achieve the final anatomy of tooth 21. **Advantages and Limitations:** Although preheating improves resin properties, the resulting high fluidity may represent a technical limitation. Thermocompaction using a silicone guide overcomes this critical point, simplifies the process, and offers greater predictability of the outcome by restoring the tooth's original anatomy.

The integration of thermocompaction with bleaching proved to be an effective clinical approach for rehabilitating discolored anterior teeth, bringing both simplicity and predictability to the restorative procedure.



PCC 12

Management of Dentin Hypersensitivity using different therapeutic methods of the same technology: a case series

Rodrigues CB*, Costa MP, Araújo FRC, Giacomini MC, Mosquim V, Zabeu GS, Wang L

Dentin hypersensitivity (DH) presents a challenging clinical scenario, affecting patients' quality of life, especially among young adults. The acute, rapidly declining pain not attributed to any other pathology is variable, which encourages a personalized approach for better treatment adherence and reduced risk of overtreatment. *Objective:* This study aims to present the use of S-PRG bioactive particle-based agents in two different delivery vehicles. *Case Report:* Case 1: A 35-year-old female patient was treated with Pro Care Gel (a professionally applied paste) and PRG Barrier Coat (a resin-based varnish). Case 2: A 20-year-old male patient was treated exclusively with PRG Barrier Coat prior to at-home tooth whitening. Case 3: A 22-year-old female patient underwent biweekly applications of Pro Care Gel. In each case, quality of life questionnaires were applied, including the OHIP-14 (Oral Health Impact Profile) and the VAS (Visual Analog Scale). *Advantages and Limitations:* Through individualized management and data collection, it was possible to measure the impact of DH on patients' quality of life and monitor the effectiveness of the treatment strategies. Patient involvement, combined with the selected products, was a determining factor.

Conclusion: The diverse possibilities offered by the same technology, available in different products, support its use in the management of DH. This expands treatment options and optimizes outcomes, especially when patients consider themselves active participants in their own care.



PCC 14

Composite resin rehabilitation of VDO in a severe bruxism patient: clinical case report

Zaia WLS*, Belini BB, Belini MCB, Marquette DES, Gonçalves HHSB

Objective: To report the restoration of the Vertical Dimension of Occlusion (VDO) in a patient with severe tooth wear associated with bruxism, using direct composite resin restorations to reestablish masticatory function, aesthetics, and comfort. **Case Report:** A 57-year-old male patient presented with severe occlusal wear and loss of VDO. The treatment involved anatomical impressions, mounting on a semi-adjustable articulator, diagnostic wax-up, and the use of occlusal matrices and silicone guides to assist in the restorative procedures. Direct restorations were performed using nano-hybrid composite resins, followed by polishing, occlusal adjustments, and the delivery of a myorelaxant occlusal splint to protect the rehabilitation. **Results:** The VDO was successfully reestablished, with improvement in masticatory function, facial aesthetics, and overall balance of the stomatognathic system.

The patient reported comfort and satisfaction with the treatment. Interdisciplinary planning and the use of direct restorative techniques proved to be effective in rehabilitating patients with severe wear due to bruxism, providing functionality, aesthetics, and improved quality of life.



PCC 15

Dental Bleaching Associated with Deep Infiltration as a Therapeutic Approach for a Case of Hypomineralization in Permanent Canines

Oliveira RC*, Moura IR, Amaral SF

Aim: To present a clinical case of hypomineralization in permanent canines, treated with the combination of at-home bleaching and deep infiltration (DI) as a conservative esthetic approach. **Case Report:** A 19-year-old male patient reported "white spots" on the anterior teeth, present since childhood, which affected his esthetics. After anamnesis and clinical examination, demarcated white and yellow-brown opacities were observed on the buccal surface, middle-incisal third of the canines (teeth 13, 23, and 33). Transillumination indicated deep lesions. Treatment included at-home bleaching (Opalescence 22%) for 21 days, followed by DI. Macroabrasion of the opacities (teeth 13 and 23) was performed using a spherical diamond bur to minimally remove hypomineralized enamel and access the lesion body. Subsequently, the resin infiltrant (ICON, DMG) was applied according to the manufacturer's instructions, and the procedure was finalized with a composite resin restoration (Empress®, Ivoclar). For tooth 33, only the conventional infiltrant protocol was used. **Advantages:** Masking of the opacities and preservation of healthy dental structure. **Limitations:** Removal of the superficial hypomineralized layer and the need for composite resin restoration.

Conclusion: The combination of techniques proved to be effective as a conservative esthetic approach for cases of deep hypomineralization in permanent canines.



PCC 16

Minimally Invasive Approach for Treatment of White Spot Lesions in Adolescent Patient

Gusmão AS*, Forlin TS, Shimokawa CAK

Objetivo: Apresentar o manejo clínico conservador de uma paciente de 12 anos com lesões de mancha branca decorrentes de fluorose dental e cárie incipiente após tratamento ortodôntico, priorizando técnicas minimamente invasivas. **Relato de Caso:** Paciente do sexo feminino, 12 anos, procurou atendimento odontológico relatando desconforto estético causado por manchas brancas visíveis, situação que impactava negativamente suas interações sociais escolares. Ao exame clínico, foram identificadas manchas remanescentes de fluorose dental, anteriormente tratadas com técnicas abrasivas, e novas lesões de mancha branca cariosas decorrentes de higienização inadequada durante o tratamento ortodôntico. O plano de tratamento consistiu em clareamento caseiro supervisionado com peróxido de hidrogênio a 6%, seguido de aplicação de infiltrante resinoso (ICON) e polimento das superfícies tratadas. **Vantagens e Limitações:** A abordagem conservadora permitiu a preservação máxima dos tecidos dentários saudáveis enquanto tratava efetivamente as lesões estéticas. Contudo, devido à imaturidade radicular evidenciada pelo ápice dentário aberto, foi necessário limitar a concentração do agente clareador a 6%, evitando formulações de maior concentração comumente disponíveis no mercado. Esta limitação terapêutica, imposta pela idade da paciente, demandou um planejamento personalizado para garantir eficácia sem comprometer a segurança.

O protocolo mostrou excelentes resultados, eliminando manchas brancas, preservando a estrutura dental e restaurando o sorriso.



PCC 17

Aesthetic Rehabilitation with E-max Ceramic Veneers on Maxillary Central Incisors: A Case Report

Gonçalves NCR*, Almeida EN, Couto-Neto MP, Feiten ILA, Schneider LFJ, Cavalcante LMA

Objective: To report a case of aesthetic rehabilitation using E-max ceramic veneers on the maxillary central incisors. **Case Report:** A 22-year-old female patient presented with dissatisfaction due to recurrent fractures of Class IV composite restorations on the central incisors and discoloration of tooth #21, previously endodontically treated after childhood trauma. The treatment plan involved the placement of two E-max veneers. A combined teeth whitening protocol was performed for three weeks to harmonize the shade and minimize discoloration. Subsequently, intraoral scanning, digital wax-up, and mock-up were carried out and approved by the patient. Tooth preparations were guided by reduction guides to ensure proper minimal thickness. After scanning (Trios®) and 3D printing of the models, the veneers were fabricated and adhesively cemented, followed by occlusal adjustments and polishing. **Advantages:** E-max ceramics provided excellent aesthetics, reliable adhesion, and minimal tooth structure reduction. **Limitations:** The discoloration of tooth 21 required increased ceramic thickness control and slightly more aggressive tooth preparation.

Conclusion: E-max veneers proved effective in achieving both aesthetic and functional rehabilitation, resulting in high patient satisfaction.



PCC 18

Two-Year Clinical Follow-Up Report of an Anterior Esthetic Rehabilitation Using the Injected Resin Technique

Sampaio MCC*, Martins LD, Feiten ILA, Couto-Neto MP, Almeida EN, Schneider LFJ, Cavalcante LMA, Henriques FQ

This report describes the two-year clinical follow-up of an anterior esthetic rehabilitation using the injected resin technique with Beautifil Injectable XSL (flow) and Beautifil II LS (Shofu). The patient, JM, sought treatment due to dissatisfaction with the shape of her teeth and smile. Clinical examination revealed diastemas, incisal wear, and zenith irregularities. The treatment plan included gingivoplasty of teeth 14, 13, 12, 22, 23, and 24; a diagnostic wax-up with modifications to the shape of the maxillary anterior teeth; and the fabrication and approval of a mock-up. During the restorative phase, a barrier for the palatal shells was created using Beautifil II LS, followed by the application of Beautifil Injectable XSL resin with a transparent silicone matrix using the injection technique. After two years, there was evidence of color change, cervical staining, wear on vestibular characterizations, and an incisal chip. However, there was no esthetic or functional compromise, and the patient remained satisfied. Only polishing will be required for ongoing clinical maintenance. The technique proved to be accessible, cost-effective, and yielded satisfactory results. As expected for polymeric materials, degradation in the oral environment underscores the importance of maintenance protocols.

The two-year follow-up confirms that the use of high-fill flowable resins provides stable, esthetic, and functional outcomes with patient satisfaction.



PCC 19

Aesthetic management for developmental defects of enamel masking utilizing polymer color stains: a case report

Silva ACP*, Alvim HH, Dutra DJB, Fernandes IB, Morgan LFS, Nakagawa RK

Developmental defects of enamel are structural changes during the stages of enamel formation and are often related to dental caries, sensitivity, pain, and aesthetic impact. Aiming to preserve tooth structure, especially in pediatric patients, this clinical report describes a minimally invasive aesthetic approach based on color theory to neutralize stains. Patient Y.F.G.S., a 9-year-old, presented to the Pediatric Dentistry Clinic of UFMG with aesthetic concerns and significant sensitivity in tooth 11. Clinically, the patient has cream-yellow enamel hypoplasia associated with an active carious lesion. Treatment included a combination of a desensitization protocol with low-level laser application and the use of desensitizing paste with obliterating action. A home-use supplement was administered twice daily for two weeks. After controlling sensitivity, a glass ionomer provisional restoration was done. In the subsequent session, the restorative technique was performed, which involved opacification and direct pigmentation, followed by a final layer of translucent resin for improved durability and aesthetics.

The approach has demonstrated efficacy in addressing sensitivity and enhancing aesthetics, thereby providing increased comfort and satisfaction to the patient. The characterization technique using resin pigments represents a non-invasive alternative that preserves structural integrity and is practical and simple for correcting mask defects, especially in pediatric cases patients.



PCC 20

Biomimetic concepts combined with indirect restoration: case report

Oliveira FBS*, Cardoso PVP, Siqueira AM, Yamamoto JLD, Birino TA, Torres SAS, Sales MSM, Moura AS

OBJECTIVES To report a clinical case of a semi-indirect composite resin (CR) full crown, using some principles, methods and materials of restorative biomimetics in an extension project of a School of Dentistry in Montes Claros - MG. **METHODS** Case report. **RESULTS AND DISCUSSION** A patient attended the Endodontically Treated Teeth Extension Project (Prodente). It was found that tooth 35 had a small amount of remaining tooth. The filling core was made with polyethylene fiber tape (PFT) (Ribbond)[®] and CR, the abutment was made, the full crown was prepared, the molding, the working model was made and the full crown was made in RC indirectly. Finally, the crown was cemented and adjusted in the oral cavity. **ADVANTAGES AND LIMITATIONS** Biomimetics uses adhesiveness and protocols that mimic the strength of the dentin-enamel bond, providing restorations similar to healthy teeth and with a lower risk of fracture (Palma, 2021). A structural analysis of the remaining tooth must be performed beforehand, for the correct indication of semi-indirect RC and PFT, to avoid overtreatment of the teeth.

CONCLUSIONS The clinical case of semi-indirect RC performed at Prodente indicated that restorations with semi-indirect RC with PFT can be performed within the scope of dental schools and that biomimetic techniques allow for more durable, aesthetic and functionally effective restorations, which meet the growing demands of patients for conservative and high-quality treatments.

(Apoio: N° UnifipmocAfya)



PCC 21

ORAL REHABILITATION USING THE INJECTABLE RESIN TECHNIQUE: CLINICAL CASE REPORT

Martins LD*, Henriques FQ, Almeida EN, Saraiva DG, Eustáquio IL, Sampaio MCC, Campos KPL, Cavalcante LMA

Objective: To describe the aesthetic rehabilitation of a patient using the injected composite resin technique. **Case Report:** A patient dissatisfied with their smile aesthetics sought treatment at the dental clinic of the Federal Fluminense University (UFF). After evaluation, a conservative approach was chosen, involving the replacement of unsatisfactory restorations, photographic documentation, study models, digital smile planning, and diagnostic wax-up. Following approval of the intraoral mock-up, a transparent silicone guide was fabricated. The rehabilitation was performed by injecting low-viscosity composite resin through the guide, which was positioned after dental conditioning. The treatment was finalized with occlusal adjustment, finishing and polishing. **Advantages:** The technique proved to be conservative, cost-effective, relatively quick to perform, and required fewer postoperative adjustments, providing high aesthetic predictability. **Limitations:** Due to the lower wear resistance of flowable composite resins, this technique is recommended for low-stress occlusal areas and requires periodic maintenance and regular follow-up visits. **Conclusion:** The injected resin technique demonstrated effectiveness as an aesthetic rehabilitation alternative, delivering satisfactory, predictable results while preserving tooth structure.

Conclusion: The injected resin technique demonstrated effectiveness as an aesthetic rehabilitation alternative, delivering satisfactory, predictable results while preserving tooth structure.



PCC 22

Aesthetic Approach and Treatment of Dentin Hypersensitivity Using Er:YAG Laser in a Patient with Amelogenesis Imperfecta

Oliveira G*, Monção JBCN, Iasco MC, Domingues IAF, Medeiros J, Santos EM

Objective: To report the aesthetic and hypersensitivity treatment in a kidney-transplanted patient with hypoplastic amelogenesis imperfecta and gingival hyperplasia using Er:YAG laser and direct composite restorations. **Case Report:** A 26-year-old male with multiple kidney transplants and amelogenesis imperfecta reported aesthetic concerns and dentin hypersensitivity. Clinical exam showed enamel hypoplasia with linear defects, structural loss, dentin exposure, and gingival hyperplasia, without vertical dimension loss. For hypersensitivity, Er:YAG laser (40 mJ/20 Hz/0.8 W) was used. For aesthetics, gingivoplasty was performed with Er:YAG laser (100 mJ/20 Hz/2.0 W), followed by direct composite veneers from upper to lower second premolars. Tooth preparation was done with diamond burs, self-etch adhesive, and stratification technique. Finishing involved diamond burs, abrasive discs, and polishing rubbers. **Advantages and Limitations:** The patient reported improved aesthetics and reduced hypersensitivity. Er:YAG laser enabled a minimally invasive, anesthesia-free approach with hemostasis, surgical control, and desensitizing effects. Sensitivity was noted during dentin bonding. Mild recurrence of gingival hyperplasia is under evaluation.

Conclusion: The use of the Er:YAG laser and direct veneers provided satisfactory aesthetics and relief of hypersensitivity, improving the patient's quality of life.



PCC 23

Clinical Case Report: Esthetic Re-treatment with Composite Resin on Upper and Lower Teeth

Iasco MCPS*, Monção JBC, Oliveira G, Domingues IAF, Medeiros J, Santos EM

Objective: Esthetic re-treatment using composite resin on upper and lower teeth, from premolar to premolar, in a patient presenting with unsatisfactory direct veneers. **Case Report:** A 24-year-old male patient presented with direct composite veneers, featuring 2 mm increments without prior tooth surface preparation. Clinical examination revealed contour irregularities, cervical overcontouring, gingival hyperplasia, and spontaneous bleeding. The re-treatment involved removing the veneers using diamond burs and multi-blade carbide burs when approaching the tooth substrate. Tooth preparation was performed with finishing diamond burs, followed by application of a self-etch adhesive system. The restorations were carried out using the stratification technique and finalized with diamond burs, abrasive discs, and polishing rubbers. **Vantagens:** Conservative approach preserved dental structure and improved the emergence profile. Periodontal health improved, with reduction in gingival bleeding. The final restorations showed good marginal adaptation and esthetic satisfaction. **Limitations:** Excessive bleeding during veneer removal, transient pain, and prolonged clinical time due to the complexity of the case and the need to preserve dental structure.

Conclusion: The re-treatment allowed for the correction of the emergence profile, promoting periodontal health, and restored esthetic and functional harmony in a minimally invasive manner, respecting biological principles.





PE

Education

PE 1

Can you sculpt teeth on the beach, design in 3D, and create parodies? Yes, in the project "I Came to Anatomize"

Borges BCD*, Dias AF, Bessa MS, Barbosa BFS, Boa PWM

Objectives: This study aimed to report the experience of an integrated action project (teaching and extension) developed at UFRN, focusing on dental anatomy, titled "I Came to Anatomize." **Methods:** The project involved a professor, undergraduate and graduate students, and the community. The activities included a hands-on session for 3D drawing of the occlusal surface of tooth 26, a practical dental sculpture lesson on the sand of Ponta Negra beach in Natal-RN, and the creation, presentation, and posting on social media of parodies about dental groups: incisors, canines, premolars, molars, and deciduous teeth. **Results:** The hands-on session facilitated the theoretical memorization of the anatomical details of the occlusal surface of the target tooth, contributing to its proper sculpture on the beach sand, an unconventional setting that motivated the students involved. Knowing that the parodies would be posted on social media, reaching the community and enabling knowledge exchange, made the students feel special, as they were contributing to scientific development using a widely accepted and employed digital medium-Instagram. Their artistic skills were also fostered in this activity.

Conclusion: Dynamic methods and attractive teaching-learning scenarios, combined with extension activities, can be an alternative for enhancing skills and competencies in occlusal dental anatomy and providing knowledge to the community.



PE 2

An innovative approach to the teaching of Dentistry through the active case study methodology: Experience Report

Moura IR*, Oliveira RC, Matos AM, Silva LH, Aires OV, Souza FB, Amaral SF

Purpose: The use of diverse teaching-learning strategies in the undergraduate dental curriculum offers the potential for a stronger connection between theoretical and practical content. This study aims to present an experience report based on the implementation of a pedagogical approach using the active learning methodology (AM) of case studies in teaching current adhesive systems within the preclinical Operative Dentistry course at Universidade Cruzeiro do Sul. **Methods:** Initially, 60 students received theoretical instruction on the topic. Subsequently, they were divided into four groups, each assigned a clinical case presented through an image of a cavity preparation. Various boards displaying images of each step of different types of adhesive systems, their application times, and substrate types were provided. Each group was tasked with analyzing and discussing their clinical case and creating a flowchart using the boards to illustrate the step-by-step application of the adhesive system selected for their case. **Results:** The implementation of AM fostered extensive discussion among students and encouraged critical reflection on the application of different adhesive systems.

Conclusion: It can be concluded that the case study-based AM was effective in enhancing the learning process, as it helped consolidate students' understanding of each step in the adhesive systems and clarified previously existing doubts on the topic. (Funding: CAPES No. 88887.151092/2025-00)



PE 3

TESTING YOUR KNOWLEDGE (TESC): a student and teacher perception about gamification in the teaching-learning process in Dentistry

Miranda DA*, Castro AS, Pieroli DA, Santos RM, Péret ACA, Antunes ANG, Seraidarian PI

The National Curricular Guidelines (DCN) for Dentistry courses are based on active teaching methodologies, autonomy of disciplines, and the development of cognitive and formative skills. In order to make this assessment moment a fairer experience, a gamified assessment strategy called Testing Your Knowledge (TESC) was developed, contributing to making the assessment moment an experience of learning and mutual cooperation among students, making them protagonists of knowledge. TESC is structured as a game composed of numbered cards, a question bank, assessment/reward sheets, a data collection panel, and slides with various images of content and numbered cards according to the chosen topics (diagnosis, cariology, adhesion, and restoration techniques). The activity begins with the distribution of investigated cards to the students and, through a draw, an image is projected on a high-definition interactive screen. The question is asked and the answer is prepared by the pair. The teacher gives feedback on the question, categorizing the answer using the colors green (correct answer), yellow (partially correct answer) and red (incorrect answer). If any of the students received the "help a classmate" card, the pairs can interact to improve the answer.

TESC is a playful, dynamic and fun assessment strategy that promotes learning, discussion and interaction among students, also allowing knowledge verification with reinforcement of learning by teachers.

(Apoio: CNPq N° 2022/28405)



PE 4

Innovative practice incorporated into the teaching of occlusion applied to dentistry: teaching perception

Akaki E*, Drumond SN, Santos ACP, Bugança LR, Campos FL, Monteiro ALAG

Occlusion is an essential subject for dental practice. What is noticeable is a lack of confidence in its application during clinical practice. This may be the result of stagnation in the teaching of the subject, which has been taught in the same way for years. Objective: to describe this subject in the undergraduate course at CMMG College. The innovative part is in the practical activities. Methods: the study models, mounted on the semi-adjustable articulator, present occlusal anomalies: lack of guides, extruded teeth, and changes in the occlusal plane. The practical activities consisted of correcting these anomalies through waxing. The students were able to combine theory with practice, becoming aware of and correcting occlusal problems, similar to real situations. The second activity was the work "Occlusal diagnosis", in which the students answered a questionnaire about their own occlusal situation. Presence or absence of anterior guides, interferences and signs of traumatic occlusion. Videos and photos of lateralities and protrusion were also requested. A second data collection will take place in the 9th period, to generate a longitudinal, quantitative study and evaluate possible occlusal pathologies generated or aggravated during the period. Results: the innovations resulted in greater interest and participation from students

The teaching of occlusion must be rethought and reformulated to adapt to clinical needs and the new intellectual and behavioral profile of the student.



PE 5

Impact of an AI-assisted Virtual Academic Tutor on motivation, satisfaction, and academic performance of dental students

Saravia-Rojas MA, Casas-Chavez E, Huanambal-Tiravanti V, Orejuela-Ramirez JF, Geng-Vivanco R*

Objective: This study evaluated the impact of the use of an artificial intelligence-assisted Virtual Academic Tutor (VAT) on the motivation, satisfaction, and academic performance of students enrolled in a Restorative Dentistry course. **Methods:** The VAT "OdontoSmartGPT" was developed using ChatGPT and the official course content. Eighty-eight third-year undergraduate students were instructed to use the VAT to complete three academic tasks: (1) summarize an article on tooth preparations; (2) synthesize a document about dentin-pulp protective materials; and (3) write an essay on the physical and optical properties of dental materials. Each task was assessed by a chatbot using a validated rubric. Students' perceptions regarding the use of the VAT were collected through a questionnaire. Data were analyzed using Student's t-test, ANOVA, Spearman's correlation, and linear regression ($p < 0.05$). **Results:** Students reported high levels of motivation ($M = 4.58/5$; $SD = 0.50$), engagement ($M = 4.62/5$; $SD = 0.45$), and satisfaction ($M = 4.65/5$; $SD = 0.43$). Academic performance progressively increased across the tasks ($T1 = 15.16$; $T2 = 16.15$; $T3 = 17.16$; $p < 0.001$). Additionally, a positive correlation was found between motivation, engagement, and academic performance ($p > 0.60$; $p < 0.01$).

Conclusions: The use of an artificial intelligence-assisted VAT had a positive impact on students' learning experience and academic performance, highlighting its potential as an innovative educational tool.



PE 6

Transforming the Teaching of Operative Dentistry through Team-Based Learning: An Experience Report

Matos AMN*, Silva MS, Souza FB, Amaral SF

Objective: Exploring innovative teaching-learning strategies in undergraduate Dentistry enhances the integration of theory and practice in a more dynamic and contextualized way. This work reports the experience of using Team-Based Learning (TBL) to teach cavity classification and terminology in the Preclinical Operative Dentistry course at Universidade Cruzeiro do Sul. Methods: Different cavity types (based on Black's Classification) were prepared using plaster macromodels, identified by color and number, along with their anatomical components (walls and angles). The activity began with a lecture, followed by the division of the class (60 students) into four groups. Each group received information boards about cavity classification and terminology, a macromodel, and a QR code linking to an online form (Google Forms) for submitting answers. Results: TBL proved effective in encouraging active and collaborative learning. It promoted discussion among students and deepened their understanding of theoretical concepts. The use of digital tools enabled immediate feedback, making the activity more dynamic and engaging.

Conclusion: The adopted strategy enhanced student participation and made the learning process more meaningful. It contributed to better content retention and greater engagement with the proposed activities



PE 7

Team-based learning as an active methodology for teaching rubber dam isolation: an experience report

Pimentel LC*, Bagnara RBR, Fuziama CDH, Romano ROG, Ferreira ACFM, Aires OV, Amaral SF, Souza FB

Proposition: Team-Based Learning (TBL) is an active methodology that promotes communication skills and collaborative work. This report aims to describe the use of TBL as a strategy for teaching the topic of rubber dam isolation. **Methods:** TBL was applied to students in the Preclinical Operative Dentistry course at the Dentistry program of UNICSUL and consisted of two phases. In the first phase, students had asynchronous access to instructional videos on rubber dam isolation in operative dentistry, made available virtually (flipped classroom model). The second phase took place in the classroom and included: 1. An assessment answered individually; 2. Division of students into teams for discussion and collective elaboration of the assessment answers; 3. Debate between teams about the questions that presented greater difficulty; 4. A game in which each team analyzed images and clinical steps related to rubber dam isolation, assigning the most appropriate sequence for case management. **Results:** Students actively engaged and improved their performance after team discussions. Furthermore, they were able to apply their knowledge by identifying and organizing the correct sequence of rubber dam isolation through a playful activity.

Conclusions: TBL proved to be a positive approach and promoted student engagement in the teaching of rubber dam isolation in Operative Dentistry, providing a motivating, collaborative, and cooperative learning environment.



PE 8

Master Trainee: An Educational Training Program to Enhance the Teaching-Learning Process in Higher Education

Picolo MZD*, Barros LS, Montalli VAM, Basting RT

The Master Trainee Program aimed to develop teaching competencies through the creation of innovative educational solutions. Participants, including faculty members and postgraduate students, were divided into groups and challenged to design an educational proposal focused on the training and application of a dental material. The groups were instructed to apply methodological tools based on the Design Thinking approach in order to understand the needs of the target audience (undergraduate dental students and recent dental graduates) and to develop a suitable educational strategy. The proposals developed by the groups were tested with volunteers who matched the target profile. Four educational interventions were created, validated, and evaluated by the program's faculty coordinators, representatives of the partnering dental materials company, and the test-phase participants. The proposals incorporated methods such as station rotation, gamification, and virtual reality. All groups implemented customized approaches that effectively addressed the target audience's needs, employing active learning methodologies.

The Master Trainee initiative served as an important tool for both faculty and students to strengthen their skills in innovation, technical feasibility, and practicality in the development of educational methodologies. Moreover, it offered a unique opportunity for meaningful contribution to the advancement of dental education.



PE 9

"Science in Focus": Dissemination of Scientific Knowledge for Clinical Practice/

Barros LS*, Ávila DMS, Torres CRG, Borges AB, Mailart MC

Objective: This project aims to organize, produce and disseminate scientific knowledge through the Instagram social network account "Ciência em Foco" (Science in Focus). **Methods:** The "Ciência em Foco" account (@cienciaemfoco_unesp) was created to share scientific content related to research findings, innovative techniques, and clarifications of dental treatments, using accessible language, in both Portuguese and English. With a focus on guiding professionals in clinical practice, the content is selected from scientific articles published in high-impact journals, and discussed during monthly meetings between professors and students from ICT Unesp. **Results:** The posts achieved significant reach at both national and international levels, with 97.2% of monthly engagement from Brazil, the United States, Canada, and Poland, and more than 6,000 views recorded over the past three months. Additionally, the monthly meetings contributed to the professional development of postgraduate students by fostering educational skills through discussions on the most appropriate approaches for communicating scientific content to audiences outside the academic setting.

Conclusion: In addition to supporting evidence-based clinical decision-making, the "Ciência em Foco" project contributes to human resources development by promoting the acquisition of didactic and pedagogical skills among participating postgraduate students.



PE 10

1st place
HENRIQUE TEITELBAUM
Award



Rubric as a Formative Assessment Tool in Dental Practice: An Experience Report

Pizi ECG*, Matuda LSA, Pomini M, Faleiros PL, Logar GAG, Coelho COL

Objectives: To present formative assessment strategies adopted in dental practice, with an emphasis on the use of rubrics. **Experience Report:** Among the strategies implemented, the use of rubrics, student self-assessment, and individualized feedback from tutor professors stand out, forming a structured system for monitoring and promoting clinical and laboratory development. Specific rubrics were developed for different areas of knowledge, such as operative dentistry, endodontics, and periodontics, allowing students to recognize their performance level in each procedure based on a three-level classification (gold, silver, and bronze). These rubrics guide the students' daily self-assessment, conducted at the end of each clinical session, and support the feedback provided by the tutor professor, fostering a continuous reflective process. Rubrics offer greater clarity regarding assessment criteria, reduce instructor subjectivity, and provide students with a concrete guide for their improvement. For laboratory training in Operative Dentistry, an ebook was created containing rubrics for all procedures, also promoting moments of reflection after each class.

Conclusion: The use of rubrics has significantly strengthened clinical learning, promoting reflection, self-awareness, and greater interaction between students and tutors.



PE 11 2nd Place
Honorable Mention**Didactic Booklet for Teaching Perforation Techniques in Rubber Dam Isolation Based on an Original and Innovative Device**

Tabuse HE*, França FMG

Objective: To develop a didactic booklet aimed at teaching the perforation technique in rubber dam isolation, using as a foundation the Perforation Atlas, an original and innovative device created to systematize the clinical process. **Methods:** A printed material was developed with accessible language, structured clinical-technical content, and self-explanatory illustrations, covering topics from the fundamentals of isolation to the practical application of the Atlas. The booklet provides guidance on positioning, hole sizes, and clinical adaptations in cases such as diastemas, cervical lesions, isolated molars, and wide arches. **Results:** The combined use of the Atlas and the booklet proved essential for a complete understanding of the device, enhancing its clinical applicability. The proposal systematizes the technique, reduces procedural errors, and strengthens strategic reasoning. The project is currently under utility model patent application.

Conclusion: The booklet acts as a bridge between theory and practice, being essential for the proper use of the Atlas. The proposal contributes to the technical, visual, and strategic teaching of rubber dam isolation, with a direct impact on the training of dentists. Furthermore, it promotes the creation of standardized systems and processes that facilitate clinical routines, optimizing the performance of the dentist and their technical support team.



PE 12

Development of the Opalescence App for Monitoring Lightening Treatment

Soares J*, Basting RT

The Ultradent Challenge, promoted in partnership with Faculdade São Leopoldo Mandic and Ultradent Products Inc., aimed to stimulate innovative solutions for optimizing clinical procedures with a focus on digital workflow. Using the Design Thinking methodology, the difficulty in monitoring whitening treatments with trays was identified. The winning proposal was the development of the Opalescence application, which allows remote monitoring of dental whitening. The platform allows the dentist to configure personalized protocols and the patient to record symptoms, images and receive notifications. The solution optimizes clinical time, improves communication and ensures greater predictability and safety in supervised treatment.

It is concluded that the Opalescence app allows for effective remote monitoring of teeth whitening, improves communication between dentist and patient, assists in treatment management and control of complications, and acts as a motivational tool. Usability assessments indicate the need for updates, such as standardized photos, educational content, gamification, and multilingual support. Marketing strategies are recommended to expand its reach and engagement with the target audience.



PE 13

Teaching Operative Dentistry in Undergraduate Education: A Pedagogical Competition as an Active Learning Tool

Zago JLG*, Vieira-Junior WF, Marchi GM

The objective was to stimulate the learning and retention of foundational concepts in Restorative Dentistry, develop clinical skills, and promote integration between students and professors. Methods: In the Caries IV course (DM041) of the undergraduate Dentistry program at FOP-UNICAMP, faculty members and graduate students organized a pedagogical competition to conclude the semester. The class was divided into 8 groups of 9 students each. Four stations with theoretical and practical activities based on the course content were created, along with four rest stations. After rotating through the stations, the groups participated in a "treasure hunt" with clues spread across the campus and quick-response challenges. At the final destination, a quiz was held on an online platform. The scores from the activities determined the three winning groups. Results: The students successfully completed the activities and received feedback during the rest periods. During the treasure hunt, they demonstrated integration and engagement. In the final quiz, there was greater involvement compared to the beginning of the activity. All teams achieved satisfactory performance; the top three groups were awarded, and prizes were raffled among the participants. Faculty members and graduate students also had the opportunity to develop their communication and organizational skills through the use of active learning methodologies.

The activity was highly well-received, effectively promoting learning, clinical development, and interpersonal integration.



PE 14

Education in Restorative Dentistry beyond technique: Home Care in Comprehensive Oral Health Care

Robles FRP*, Braga GT, Jandre CS, Santos LLD, Silva GT, Perrut LF, Lemos-Neto A, Silva DP

Oral health care for bedridden individuals or those with reduced mobility still lacks effective attention, especially in home care settings. Since 2018, the 'Melhor em Casa' Program (MS/SUS/Nova Friburgo-RJ) has integrated oral health actions through a partnership with Universidade Federal Fluminense, also becoming a training space for Dentistry students. This study analyzed the contributions of this practice, with emphasis on Atraumatic Restorative Treatment (ART), among other interventions in home and community environments. A mixed-methods approach was adopted, using the Discourse of the Collective Subject technique, grounded in Social Representation Theory, to capture students' perceptions on the formative impacts of the experience. Testimonials from 10 interns were analyzed. The results indicated the development of technical, ethical, and relational competencies, compassion, listening, adaptability, and the appreciation of creativity, responsible improvisation, and relationship-building-key elements for humanized care in adverse settings. Technical development was a resource to enable care in this context.

It is concluded that this practice stimulated the consideration of collective factors and the real epidemiological needs of oral health, in addition to effective promotion, recovery, and maintenance of health, rather than a purely commercial perspective. Acting outside the clinical environment strengthened the ethical stance of the healthcare professional, especially during the formative period of undergraduate education.



PE 15

3rd Place
Honorable Mention



Implementation of the Dental Instrument Bank of FAO-UFMG as a proposal for affirmative action aimed at student retention

Araujo PV*, Abreu LG, Peixoto RTRC, Costa MDMA, Soares BF, Silva MPA, Drummond AMA

The objective of this paper is to describe the implementation stages of the Dental Instrument Bank (BIO) of the School of Dentistry of the Federal University of Minas Gerais (FAO-UFMG), an institutional initiative aimed at promoting equity in higher education, by offering loans of dental instruments and supplies to students in situations of socioeconomic vulnerability. A permanent committee appointed by the FAO Board of Directors prepared a report based on a mapping of needs, identifying the number of students assisted by the Mendes Pimentel University Foundation (FUMP). The visual identity of the BIO was developed and discussions on instrument bank models were held, culminating in the approval of the BIO's Internal Regulations by the Egregious Congregation in March 2025. At the beginning of each semester, notices will be published for loans in three modalities: full (complete list), complementary (remaining items) and temporary supplies. The selection will be based on FUMP's socioeconomic criteria. The BIO collection is being acquired with financial support from the Office of the Pro-Rector for Student Affairs (PRAE) at UFMG, in addition to donations from individuals, organizations, the academic community, and government agencies.

The importance of BIO goes beyond material support: it represents an instrument for social inclusion and guaranteeing the right to education under equal conditions. The bank will contribute significantly to reducing the financial impact on students, which can lead to a reduction in school dropout rates.





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PCCL

Scientific Research

PCL 02

Physical and Mechanical Properties of a Bioactive Light-Cured Resin Cement

Lhano NC*, Turssi CP, França FMG, Basting RT

Objectives: To evaluate the physical properties (sorption, solubility and surface roughness) and mechanical property (surface microhardness) of conventional light-cured resin cements (NX3/Kerr and Variolink Esthetic/Ivoclar Vivadent) compared to a bioactive resin cement (BeautiCem/Shofu). **Methods:** 30 disc-shaped specimens (2 mm x 5 mm) of the resin cements were prepared for sorption and solubility tests (n=10), and another 30 specimens (n=10) for roughness and microhardness tests. Cements were handled according to manufacturers' instructions, placed into the matrices in a single increment and photoactivated (Valo, Ultradent) for 20 seconds (irradiance of 1000 mW/cm²). Sorption and solubility tests used ISO 4049:2009 standards. Surface roughness (Ra) was measured under a static load of 4 mN and a speed of 0.5 mm/s (cut-off of 0.08 µm), with three measurements taken at different positions. For surface microhardness, three Knoop indentations were made (150 µm apart) on the top surface of each sample with a load of 10 g for 5 seconds. **Results:** BeautiCem Veneer and Variolink Esthetic showed lower sorption (p<0.0001) and solubility (p<0.0001), and higher surface roughness than NX3 cement (p=0.0026) (Kruskal-Wallis and Dunn tests). The highest surface microhardness was observed for BeautiCem Veneer compared to the conventional cements (p<0.0001).

BeautiCem Veneer or Variolink Esthetic could be the first choice for use due to their favorable characteristics in sorption, solubility, roughness, and surface microhardness.



PCL 03

SURFACE MICROHARDNESS AND FLUORIDE ION RELEASE OF BASE MATERIALS OF RESTORATIONS AFTER ACID CHALLENGE

Lima EMSL*, Basting RT, Turssi CP, França FMG

The objective of this study was to evaluate the microhardness and fluoride release of materials used as restorative bases containing fluoride or bioactive materials after an acid challenge. Ten specimens (6 mm X 2 mm) were prepared for each material (n=10): polyacid-modified resin (IONO - Ionoseal), fluid resin containing S-PRG particles (SPRG - Beautifil Flow F10), and conventional fluid resin (Z350 - Filtek Z350 XT flowable). The specimens were subjected to acid challenges (2.5 mL of demineralizing solution, pH 4.3). Before and after the acid challenges, Knoop microhardness and fluoride release in the solutions were measured over time. The microhardness data were analyzed by two-way ANOVA and Tukey, while the fluoride release data were analyzed using Kruskal-Wallis, Friedman, and Dunn tests, with a significance level of 5%. The Z350 resin showed the highest microhardness values, followed by IONO, which had higher values than SPRG ($p<0.001$). There was no influence of the acid challenge on the microhardness of materials ($p=0.395$). Up to 48 hours, S-PRG released more fluoride than IONO, and both released more than Z350 ($p<0.001$). At the end of 96 hours, there was no difference between IONO and Z350 ($p<0.001$), and at 102 hours, S-PRG released more fluoride than IONO and Z350 ($p<0.001$).

It concludes that exposure to acidic challenges did not interfere with the microhardness of the resins used as a base. The fluoride release from the polyacid-modified resin was intermediate, and the fluid resin with S-PRG showed the highest fluoride release over time.



PCL 04

Microhardness of resin-based composite light cured through a translucent silicone barrier simulating the index technique

Moreira JC*, Gonçalves SR, Dantas RVF, Araújo DS, Spigariol IM, Shimokawa CAK, Shimokawa CAK

The aim of this study was to evaluate the microhardness of Tetric N-Ceram Bulk Fill resin-based composite specimens prepared using different light curing methods through a 6 mm-thick translucent silicone barrier. The specimens measured 5 mm in diameter and 4 mm in thickness. All light curing methods used the Bluephase Style device. In Group 1 (G1), specimens were light cured for 10s without any silicone barrier between the resin and the light curing unit (LCU). In Group 2 (G2), specimens were light cured for 20s through a 6 mm-thick translucent silicone barrier (Transil F). In Group 3 (G3), specimens were light cured for 10s through the silicone barrier. In Group 4 (G4), specimens were initially light cured for 10s through the barrier and, after its removal, received an additional 10s of light curing. Hardness tests (n=5) were conducted on the top and bottom surfaces using the HMV-G (Shimadzu) device with a load of 50 gf for 15s. Data were analyzed using a two-way repeated measures ANOVA and Tukey's post-hoc test ($\alpha=0.05$). When comparing the light curing methods in terms of top surface microhardness, G4 showed higher microhardness than G2 and G3 ($p<0.05$), but no significant differences were found between the other methods. For the bottom surface microhardness, G4 showed higher microhardness than the other groups, and G1 had higher microhardness than G3 ($p<0.05$).

The use of a silicone barrier results in lower bottom surface microhardness, except when an additional 10s of light curing is applied after removing the barrier or when the light curing time is doubled.



PCL 05

PHYSICOMECHANICAL STUDY OF BisGMA- CONTAINING AND BisGMA-FREE ADHESIVE SYSTEMS

Oliveira P*, Benzi JG, Bonato LL, Silva TM

BisGMA-based monomers are fundamental constituents of adhesive systems and composite resins. However, these monomers may release bisphenol A (BPA) into the oral environment. As a result, BPA-free adhesives are emerging as an alternative to improve the durability of restorations. Objective: Evaluate the physical and mechanical properties, such as flexural strength, sorption and solubility of adhesive systems with and without BisGMA. Methods: Two adhesive systems were evaluated: one containing BisGMA (Single Bond Universal) and another without it (Scotchbond Universal Plus). Ten circular samples of each adhesive were prepared and individually stored for water sorption and solubility analyses. Another fifteen samples were prepared and subjected to a flexural strength test until fracture occurred. Data were analyzed using the Student's t-test ($p < 0.05$). Results: The adhesive containing BisGMA exhibited greater flexural strength, differing statistically from the adhesive without BisGMA. For sorption, there was a statistically significant difference, with the highest means observed in the group without BisGMA. No significant difference in solubility was found between the two adhesive systems.

Conclusions: The adhesive containing BisGMA demonstrated superior mechanical performance and durability. The adhesive without BisGMA showed greater water sorption, which could affect its long-term stability. No differences in solubility were observed between the adhesives, suggesting equivalent water stability in both materials.



PCL 06

PHYSICOMECHANICAL STUDY OF BisGMA- CONTAINING AND BisGMA-FREE ADHESIVE SYSTEMS

Rocha MB*, Gonçalves JC, Pacheco CS, Marinho RMM, Chagas GS, Gomes NM, Pucci CR

BisGMA-based monomers are fundamental constituents of adhesive systems and composite resins. However, these monomers may release bisphenol A (BPA) into the oral environment. As a result, BPA-free adhesives are emerging as an alternative to improve the durability of restorations. Objective: Evaluate the physical and mechanical properties, such as flexural strength, sorption and solubility of adhesive systems with and without BisGMA. Methods: Two adhesive systems were evaluated: one containing BisGMA (Single Bond Universal) and another without it (Scotchbond Universal Plus). Ten circular samples of each adhesive were prepared and individually stored for water sorption and solubility analyses. Another fifteen samples were prepared and subjected to a flexural strength test until fracture occurred. Data were analyzed using the Student's t-test ($p < 0.05$). Results: The adhesive containing BisGMA exhibited greater flexural strength, differing statistically from the adhesive without BisGMA. For sorption, there was a statistically significant difference, with the highest means observed in the group without BisGMA. No significant difference in solubility was found between the two adhesive systems.

Conclusions: The adhesive containing BisGMA demonstrated superior mechanical performance and durability. The adhesive without BisGMA showed greater water sorption, which could affect its long-term stability. No differences in solubility were observed between the adhesives, suggesting equivalent water stability in both materials.



PCL 07

Evaluation of the Influence of Surface Treatment with a Universal Adhesive System Containing Silane on the Bond Strength in Resin Repairs

Compagno SMC*, Turssi CP, Basting RT, França FMG

This study evaluated the influence of surface treatments using a universal adhesive containing silane on the bond strength to resin composites in repair procedures. Forty cylindrical specimens (2 mm × 6 mm) of each resin-nanoparticulate (Z350, Solventum) and suprananoparticulate (Palfique, Tokuyama)-were fabricated. Surface treatments were then applied as follows: (1) adhesive without silane (Adper Single Bond 2, Solventum), (2) universal adhesive containing silane (Scotchbond Universal Plus, Solventum), (3) silane (Ceramic Primer, Solventum) combined with adhesive without silane, and (4) silane combined with adhesive containing silane. Four cylindrical matrices (0.8 mm internal diameter) were placed and filled with the same resins. After 7 days, two specimens were subjected to a micro-shear bond strength test. Next, thermocycling was performed (2000 cycles, 5°C and 55°C), followed by micro-shear bond strength testing of the remaining two specimens. Mann-Whitney and Kruskal-Wallis tests were used with a significance level of 5%. It was observed that the adhesive containing silane provided higher bond strength values ($p < 0.05$). The isolated application of silane yielded intermediate bond strength values for the nanoparticulate resin and values similar to those of the silane-containing adhesive for the suprananoparticulate resin ($p < 0.05$).

It was concluded that the use of silane alone or in combination with adhesives, as well as the use of a universal adhesive containing silane, resulted in the best bond strength outcomes in repair procedures.



PCL 08

Comparison of Physical-Mechanical Properties of Bulk-Fill Composites: Reinforced with Fibers and S-PRG Particles

Cândido AF, Obeid AT, López AJC, Brondino NCM, Bombonatti JFS, Velo MMAC*

Considering that more than 60% of restorations are replaced due to failures, resulting in significant damage and costs, studies on new biomaterials are needed. This in vitro study compared the physico-mechanical properties of fiber-reinforced bulk-fill flowable resin composites (RCFs) and Giomer-based technology (S-PRG), forming four groups: G1 (SDR Universal, Dentsply), G2 (EverX Flow, GC), G3 (Beautiful Flow Plus, Shofu), and G4 (G-ænial Universal, GC). The response variables were surface hardness (SH), depth of cure (DC), and surface morphology (SEM). For SH, samples (n=6) were prepared using a metal mold (4x4 mm²), simulating the clinical condition of a single-increment bulk-fill insertion. SH was measured on the top and bottom surfaces (n=6) (MicroMet 6040-Buehler, 50KgF load for 10s). For DC, the bottom/top hardness ratio was calculated, with a minimum acceptable value of 80%. T-tests followed by Tukey's test were used for intergroup comparisons. The SH results (top/bottom) were, respectively: G1 (27.5±5.72ab and 25.7±2.42a); G2 (38.9±2.05cde and 33.3±3.53abc); G3 (43.3±2.0de and 35.6±4.97cd); G4 (43.6±3.68e and 33.6±7.59bc). G1 showed the lowest top surface hardness (p<0.0005). For DC, Welch-James ANOVA showed no significant differences (p=0.30). G4 presented a cure depth below 80%. SEM analysis revealed irregular fractures, with the EverX resin showing a "pulling out" effect.

The resins showed similar DC, with SDR and EverX Flow exhibiting superior mechanical properties based on SH.



PCL 09

Color Stability of Whitened Teeth After Treatment with Bioactive Gels

Souza AM*, Vieira-Junior WF, Turssi CP, França FMG, Basting RT

The stability of color in bleached teeth after treatments with bioactive gels was evaluated. Forty bovine teeth received bleaching treatment (Whiteness HP, FGM) in four clinical sessions lasting 45 minutes each. At the end of the last session, the teeth were separated (n=10) and received one of the following treatments with bioactive gels: control (absence of gel), gel containing calcium phosphopeptide and amorphous calcium phosphate (CPP-ACP) (MI Paste/GC Brasil), gel containing S-PRG particles (PRG Pro Care Gel, Shofu Dental Incorporation), or gel containing 2% sodium fluoride (Fluor Gel/Maquira), applied according to the manufacturers' instructions. Subsequently, the teeth were immersed in a coffee solution (3 times/day for 15 minutes) for 14 days. Color assessments were conducted using a spectrophotometer, evaluating the color parameters Vita Classical and CIELab* at the initial time (baseline), after bleaching treatment, and after coffee staining. Statistical tests were applied using generalized linear mixed models for repeated measures over time, Friedman and Nemenyi, and/or Kruskal-Wallis tests for the different studied variables, with a significance level of 5%.

It can be concluded that bleaching promoted a change in the color of the teeth, while exposure to coffee led to staining even after the application of bioactive gels, demonstrating that the different agents are dispensable and increase the resistance to staining of the enamel after dental bleaching.



PCL 10

INFLUENCE OF THE TYPE OF DENTIN SEALANT AND THE WAITING TIME FOR CEMENTATION ON DENTIN BOND STRENGTH

Carmo JVJ*

This study evaluated the influence of the type of dentin sealer and the waiting time for cementation on dentin bond strength. Thirty dental blocks with exposed middle dentin were obtained and divided into three groups (n=10): no previous treatment; dentin sealing with universal adhesive (Scotchbond Universal Plus, Solventum) and dentin sealing with adhesive associated with flowable resin (Beautifil Flow Plus F00, Shofu). After 24 hours, the dentin surface of each dental block was split in half and two plastic tubes (0.8 mm diameter) were attached. The tubes were filled with dual resin cement (RelyX Ultimate, Solventum) and photoactivated for 20 seconds. After 24 hours, the micro-shear strength test was carried out. The same process of fixing two more tubes was carried out on the other half of the samples 30 days after dentin sealing and the microshear test was carried out. The fracture pattern was also analyzed. The data was submitted to a generalized linear model at a 5% significance level. It was observed that in all three groups, cementation after 30 days showed lower bond strength when compared to cementation after 24 hours ($p < 0.05$). The universal adhesive system and fluid resin group obtained the best bond strength values regardless of the cementation time ($p < 0.05$). Most of the fractures were mixed.

It was concluded that sealing the dentin with a fluid resin and cementing it in a shorter time contributed to better bond strength values.



PCL 11

INFLUENCE OF THE TYPE OF DENTIN SEALANT AND THE WAITING TIME FOR CEMENTATION ON DENTIN BOND STRENGTH

Freitas K*, Turssi CP, Basting RT, França. FMG

This study evaluated the influence of the type of dentin sealer and the waiting time for cementation on dentin bond strength. Thirty dental blocks with exposed middle dentin were obtained and divided into three groups (n=10): no previous treatment; dentin sealing with universal adhesive (Scotchbond Universal Plus, Solventum) and dentin sealing with adhesive associated with flowable resin (Beautifil Flow Plus F00, Shofu). After 24 hours, the dentin surface of each dental block was split in half and two plastic tubes (0.8 mm diameter) were attached. The tubes were filled with dual resin cement (RelyX Ultimate, Solventum) and photoactivated for 20 seconds. After 24 hours, the micro-shear strength test was carried out. The same process of fixing two more tubes was carried out on the other half of the samples 30 days after dentin sealing and the microshear test was carried out. The fracture pattern was also analyzed. The data was submitted to a generalized linear model at a 5% significance level. It was observed that in all three groups, cementation after 30 days showed lower bond strength when compared to cementation after 24 hours ($p<0.05$). The universal adhesive system and fluid resin group obtained the best bond strength values regardless of the cementation time ($p<0.05$). Most of the fractures were mixed.

It was concluded that sealing the dentin with a fluid resin and cementing it in a shorter time contributed to better bond strength values.



PCL 12

INFLUENCE OF THE TYPE OF DENTIN SEALANT AND THE WAITING TIME FOR CEMENTATION ON DENTIN BOND STRENGTH

Carvalho IC*, Almeida MGS, Torres CRG, Borges AB, Mailart MC

This study evaluated the influence of the type of dentin sealer and the waiting time for cementation on dentin bond strength. Thirty dental blocks with exposed middle dentin were obtained and divided into three groups (n=10): no previous treatment; dentin sealing with universal adhesive (Scotchbond Universal Plus, Solventum) and dentin sealing with adhesive associated with flowable resin (Beautifil Flow Plus F00, Shofu). After 24 hours, the dentin surface of each dental block was split in half and two plastic tubes (0.8 mm diameter) were attached. The tubes were filled with dual resin cement (RelyX Ultimate, Solventum) and photoactivated for 20 seconds. After 24 hours, the micro-shear strength test was carried out. The same process of fixing two more tubes was carried out on the other half of the samples 30 days after dentin sealing and the microshear test was carried out. The fracture pattern was also analyzed. The data was submitted to a generalized linear model at a 5% significance level. It was observed that in all three groups, cementation after 30 days showed lower bond strength when compared to cementation after 24 hours ($p<0.05$). The universal adhesive system and fluid resin group obtained the best bond strength values regardless of the cementation time ($p<0.05$). Most of the fractures were mixed.

It was concluded that sealing the dentin with a fluid resin and cementing it in a shorter time contributed to better bond strength values.



PCL 13

Evaluation of the integrity of ceramic laminates after adhesive cementation

Soares LM*, Araújo-Neto VG, Funabashi DK, Fronza BM, Braga RR, Rueggeberg FA, Hirata R, Giannini M

This study evaluated the polymerization shrinkage stress (PSS), the polymerization kinetics (POK) of resin-based materials (RBM) used for the cementation of ceramic laminates (CL) and the formation of cracks in CL after cementation by transillumination (TRA) and scanning electron microscopy (SEM). Four RBM were evaluated: Variolink Esthetic LC/VLNC (Ivoclar), Surefil SDR/SSDR (Dentsply), preheated Filtek Z100/Z100 (Solventum) at 69°C and preheated Viscolor Bulk/VISC (Voco) at 65°C. PSS was measured by a universal testing machine (n=5) and POK by FTIR spectroscopy (n=5). PSS and maximum polymerization rate (MPR) were analyzed by ANOVA and Tukey's test ($\alpha=0.05$). The flexural strength (FLS) and modulus (MOD) of a feldspathic ceramic (EX-3, Noritake) (n=18) were obtained from samples of 0.65 mm diameter and 0.6 mm thickness. Twenty-eight premolars were prepared, and CL were cemented with the four RBM (n=7), which were evaluated by TRA with a curing light (Valo Grand) and "Translume len" tip (Ultradent). Epoxy resin replicas of the cemented CL were obtained and analyzed by SEM (magnification: 14x). VISC showed the lowest PSS (74.2 ± 15.3 MPa), and VLNC the highest (135.4 ± 8.4 MPa). VLNC exhibited the highest MPR (15.5 ± 2.3 %/s), and SSDR the lowest (10.0 ± 1.2 %/s). FLS and MOD of the feldspathic ceramic were 88.0 ± 9.8 MPa and 16.1 ± 3.5 GPa, respectively. No cracks were observed in the CL in the TRA and SEM analyses.

Although the PSS generated by polymerization of the three RBM (VLNC, SSDR and Z100) exceeded the FLS of the feldspathic ceramic, no fractures were observed in the CL.



PCL 15

Evaluation of the potential of dipotassium oxalate in experimental mouthrinses for the prevention of erosive tooth wear

Scontre LS*, Kairalla CA, Sakae LO, Garcia RM, Scaramucci T

Aims: To formulate and evaluate experimental solutions simulating mouthrinses containing dipotassium oxalate, fluoride, and tin for their effectiveness in protecting against erosive tooth wear. **Methods:** six experimental groups were tested: C-: distilled water; C+: solution containing NaF and SnCl₂; F: solution containing NaF; OXP: solution containing dipotassium oxalate; F+OXP: solution containing NaF and dipotassium oxalate; F+Sn+OXP: solution containing NaF, SnCl₂, and dipotassium oxalate. The concentrations used were: 14.000 ppm of dipotassium oxalate (1,4%), 225 ppm F⁻ (NaF), and 800 ppm Sn²⁺ (SnCl₂). 60 enamel and 60 dentin specimens were used (n = 10/substrate). The specimens were tested in a 5-day erosive-abrasive challenge consisting of 2 min of immersion in 1% citric acid and 60 min in artificial saliva, 4x a day. Brushing was performed after the 1st and 4th erosive challenges, followed by immersion in the experimental solution for 1 min. Surface loss (SL, in µm) was measured using optical profilometry. Data were analyzed using one-way ANOVA and Tukey's test (α = 0.05). **Results:** For enamel, F+Sn+OXP showed the highest SL reduction (69.94%), not significantly different from C+ (63.3%). F, F+OXP, and OXP did not differ significantly from C-. For dentin, F+Sn+OXP also showed the highest SL reduction (67.60%), not significantly different from F+OXP, OXP, and F (61.25%-63.96%). The highest SL was observed in C-, followed by C+.

Dipotassium oxalate proved to be a promise for the prevention of erosive tooth wear and should be further explored in future studies.



PCL 17

Influence of thickness and light transmission on irradiance, translucency, and microhardness of conventional and bulk-fill composites

Romano BC*, Soto-Montero J, André CB, Shimokawa CAK, Giannini M

This study evaluated irradiance (IRR) at the bottom of composite specimens, translucency (TRA) at the top surface, and Knoop microhardness (MIC) at both top and bottom surfaces. Three conventional composites (Filtek Universal Restorative/3M; Tetric N-Ceram/Ivoclar; and Vittra APS/FGM) and three bulk-fill composites (Filtek One Bulk Fill/3M; Tetric EvoCeram Bulk-Fill/Ivoclar; and Opus Bulk Fill APS/FGM) were tested at four thicknesses (1 mm, 2 mm, 3 mm, and 4 mm). These composites were light-cured using two light-curing units (LCUs): Elipar Deep Cure-L (3M) and Valo (Ultradent). Silicone molds with a 9 mm diameter were used to fabricate the specimens, and a spectroradiometer (MSC15W, Gigahertz-Optik) was positioned at the base of the mold to measure IRR at the bottom during light activation. The TRA parameter and MIC (top and bottom) were evaluated after light-curing using the Easy Shade device (Vita) and a microhardness tester (Future-Tech), respectively. Data were analyzed using generalized linear models and Bonferroni correction ($\alpha = 0.05$). Significant differences were found in IRR, TRA, and MIC, with reductions observed as thickness increased. These reductions were more pronounced in bulk-fill composites and were dependent on their composition. The use of different LCUs resulted in distinct values of IRR, TRA, and MIC, regardless of the composite evaluated.

IRR, TRA, and MIC were influenced by the type of LCU used and decreased as composite thickness increased.



PCL 18

Application of Artificial Intelligence in the Analysis of Periapical Radiographs

Velace LCSF*

Objective: To evaluate the accuracy of artificial intelligence (AI) tools in interpreting periapical radiographs, comparing the results with human specialists.
Methods: A total of 289 radiographs were analyzed by two AI platforms (ChatGPT and Gemini), based on AAE criteria. The evaluations were compared to a gold standard defined by specialists, using the McNemar test and the Kappa index.
Results: ChatGPT achieved 50.0% accuracy with a Kappa of 0.41, while Gemini showed 35.7% accuracy with a Kappa of 0.21. The agreement between the two systems was 46.4%. Statistical analysis revealed a significant difference between the AI responses and the gold standard ($p < 0.05$).

Conclusion: Although they show potential, AI tools have not yet reached the accuracy of human specialists. Their use in clinical practice should be cautious, serving as an auxiliary tool under professional supervision.



PCL 19

Effect of high irradiance and short exposure times on the depth of cure of six bulk-fill resin composites

Dos-Santos DB*, Romano BC, Pecorari VGA, Price RB, Giannini M

This study examined the effect of high irradiance and short exposure times on the depth of cure of six resin-based composites (RBCs). Bluephase PowerCure and the Valo X light-curing units (LCUs) were used to photocure bulk-fill RBCs for their recommended exposure times: Admira Fusion x-tra (AFX/20s), Aura Bulk Fill (ABF/20s), Filtek One Bulk Fill (FOB/20s), Opus Bulk Fill APS (OBF/30s), Tetric EvoCeram Bulk Fill (TEC/10s) and Tetric PowerFill (TPF/10s). In addition, all bulk-fill RBCs were tested for depth of cure with one short 3 s exposure time from the Bluephase PowerCure or the Valo X in the Xtra Power mode. The RBCs (n=10 per RBC) were inserted into a 4 mm diameter metal mold and covered by a polyester strip before being photocured. After 24 h of storage, uncured RBC was scraped away to determine the depth of cure of the RBCs. None of the RBCs achieved a 4 mm depth of cure. The depth of cure of TEC and TPF was unaffected by the exposure times (recommended or short) when using the Valo X. The depth of cure of AFX/20s, AFX/Xtra Power, ABF/Xtra Power, FOB/Xtra Power, and OBF/30s RBCs was greater when using Valo X compared to the Bluephase PowerCure.

It was concluded that short exposure times can reduce depth of cure and should only be used for some RBCs.



PCL 20

Effect of printing orientation and post-curing on the properties of 3D-printed dental resin

Souza LS*, Medonza A, Osorio SVS, Caneppele TMF, Sellan PLB, Bresciani E

Objective: To evaluate the effect of printing orientation and post-curing on color stability, gloss retention, and surface microhardness of a 3D-printed dental resin. **Materials and Methods:** Circular specimens (6 mm × 1.5 mm) were printed in three orientations (0°, 45°, and 90°) and divided into two groups: with additional post-curing (PC+A), using a pre-programmed curing profile (n = 10), and without additional post-curing (PC) (n = 10). After polishing, initial color coordinates (L*, a*, b*) were recorded using a spectrophotometer to calculate ΔE_{00} . Initial gloss and Knoop microhardness values were also measured. The specimens were then immersed in a staining solution for 14 days and re-evaluated for all parameters. Data were analyzed using two-way ANOVA, repeated measures ANOVA ($\alpha = 0.05$), and Tukey's test. **Results:** No specimens in the PC+A group exhibited perceptible color changes ($\Delta E_{00} > 1.2$; $p < 0.05$), remaining within clinically acceptable limits. Microhardness decreased after staining ($p < 0.05$), regardless of post-curing. Gloss also decreased across all groups ($p < 0.05$), but PC+A samples printed at 45° retained higher gloss levels ($p < 0.05$). Printing orientation influenced color stability in the PC+A group ($p < 0.05$), with 0° demonstrating greater stability.

Post-curing enhances color stability and gloss retention. Printing orientation affects these outcomes in PC+A samples, reinforcing the clinical benefits of additional post-curing.



PCL 21

Effect of surface roughness on color stability, gloss and fluorescence of resin composites

Pereira TP*, Carvalho IC, Mailart MC, Borges AB, Torres CRG

Objective: To evaluate the effect of surface roughness on color, gloss and fluorescence of resin composites before and after staining. **Methods:** Specimens of two flowable resin composites, AF-AlignerFlow LC (Voco) and AC-Aligner Connect (GC), were made and divided into five subgroups (n=8), according to the polishing carried out: 1) P1200 sandpaper; 2) P2000 sandpaper; 3) P4000 sandpaper; 4) diamond suspension with a particle size of 3µm; 5) diamond suspension with a particle size of 1µm. Surface roughness (Ra) was assessed by contact profilometry. Initial color (C), gloss (B) and fluorescence (F) were measured with a colorimetric spectrophotometer, a gloss meter and an analytical spectrophotometer, respectively. The specimens were immersed in a 3% soluble coffee solution under agitation for 3 days and the C, B and F measurements were repeated. The data were subjected to two-factor ANOVA and Tukey's test ($\alpha=5\%$). **Results:** Reducing the grit size of the sandpaper resulted in smoother ($p<0.05$) and shinier ($p<0.05$) surfaces but did not affect fluorescence ($p=0.10$). After staining, only the roughest surfaces (P1200 and P2000) showed a significant reduction in gloss, and this was only observed for the AF resin. Staining reduced the fluorescence of both resins, with a greater impact on AF resin, regardless of the degree of polishing.

Rougher surfaces can compromise the gloss of resin composites but do not affect color alteration and fluorescence after staining.



PCL 22

Postoperative Sensitivity Assessment of Restorations Using Chemically Activated Resin: A Double-Blind Randomized Clinical Trial/

Silva CCF*, Costa SAGF, Amado TVS, Poubel LAC, Barceleiro MO, Barceleiro MO, Calazans FS, Amin IC

The objective of this study was to evaluate the postoperative sensitivity associated with restorations performed using a chemically activated composite resin (Stela, SDI) when applied to posterior teeth. To this end, a double-blind randomized clinical trial (involving both patient and evaluator blinding) was conducted at the dental clinic of the Fluminense Federal University (UFF), located at ISNF. A total of 110 cavities (with or without proximal surface involvement) in posterior teeth were allocated into two groups: one restored with a conventional light-cured composite resin (Control Group / Forma Resin - Ultradent) and the other with a chemically activated composite resin (Test Group / Stela Resin - SDI). The conventional resin was applied using the Peak adhesive system and an incremental layering technique. In contrast, the Stela resin was applied using the bulk-fill technique, in accordance with the manufacturer's recommendations. The presence and intensity of postoperative sensitivity were assessed at four time intervals: within 1 hour, within 24 hours, within 48 hours, and within 1 week after the restorative procedures, using a visual analog scale (VAS). In the control group, only three patients reported mild levels of sensitivity. The same outcome was observed in the test group. Therefore, no statistically significant differences were identified between the groups.

The authors concluded that both restorative materials are clinically acceptable with regard to the incidence of postoperative sensitivity.



PCL 23

In-office bleaching with low vs. high concentrate hydrogen peroxide: a randomized clinical trial

Martini EC*, Favoreto MW, Centenaro GG, Carneiro TS, Cordeiro DCF, Silva KL, Reis A, Loguercio AD

This randomized, parallel, double-blind clinical trial aimed to evaluate the equivalence in the bleaching efficacy (BE), intensity, and risk of tooth sensitivity (TS) of participants undergoing to low vs. high concentrate hydrogen peroxide in in-office dental bleaching. 140 participants were randomly assigned according to the bleaching gel concentration used: 6% or 35% hydrogen peroxide. BE was evaluated using a Vita Easyshade spectrophotometer, Vita Classical and Vita Bleachedguide shade guides (Δ SGU) on the 7th, 14th, and 21st days, and one month after treatment completion. The intensity and risk of TS were recorded using a visual analog scale (VAS) from 0 to 10. All data were subjected to statistical analysis ($\alpha = 0.05$). The groups achieved different bleaching efficacy, with a significant difference at one month ($p < 0.05$) in all parameters. Regarding the absolute risk of TS, 74% of participants in the 35% group and 44% in the 6% group reported TS (odds ratio 0.59; 95% CI 0.44 to 0.8; $p = 0.0005$), with low TS intensity for the 6% hydrogen peroxide in the immediate post-treatment evaluation ($p < 0.001$; $p = 0.002$, $p < 0.001$), up to 1 hour ($p < 0.001$; $p < 0.001$; $p < 0.001$), and up to 24 hours ($p = 0.001$; $p < 0.001$; $p < 0.001$).

In-office dental bleaching with 6% and 35% hydrogen peroxide resulted in significant differences in bleaching efficacy, with the 35% concentration yielding superior results. Tooth sensitivity was higher in the 35% group compared to the 6% group.



PCL 24

Air abrasion of 45S5 in teeth with molar-incisor hypomineralization prior to cementing a restoration: a randomized clinical trial

Firoozmand LM*, Silva DKC

Objective: This randomized clinical trial aimed to investigate the influence of 45S5 bioglass (BAG) air abrasion on teeth affected by molar-incisor hypomineralization (MIH), before cementation of semi-direct restorations (SDR). **Methods:** Patients aged 9 to 20 years were selected from a total of 33 permanent first molars with Nolla stage 8-10 and extensive MIH lesions. Clinical examination revealed painful hypersensitivity and at least 2 yellow-brown areas affected by MIH. Onlay preparations were planned, and the randomized teeth received dentin treatment according to groups: MIH (dentin without air abrasion) and MIH-BAG (dentin previously air-abraded with 45S5 bioglass). Teeth in the MIH-BAG group received 3 sessions of 45S5 air abrasion and were protected with a temporary restoration. The SDRs were fabricated with a flexible matrix, Z350XT resin (3M), and cemented with self-adhesive bioactive cement (SetPP, SDI). Clinical evaluations (esthetic, functional, and biological) were performed at 1 and 6 months according to the FDI criteria. Fisher's exact test, multivariate Cox regression, and absolute and relative frequencies (%) ($p > 0.05$) were used. **Results:** There was no significant difference between MIH and MIH-BAG when aesthetic, functional, and biological criteria were evaluated ($p > 0.05$).

Conclusion: Previous air-abrasion with 45S5 did not affect the esthetic, functional, and biological performance of SDR cemented in dentin affected by MIH, guaranteeing retention and absence of sensitivity.



PCL 25

Bioactive technologies in dentifrices and their effects on post-radiotherapy dentin: Physical and biological properties

Giacomini MC*, Rodrigues CB, Vicente L, Martins JA, Braga HB, Mosquim V, Santos PSS, Wang L

Objectives: The use of dentifrices containing bioactive ingredients is of interest due to their interaction with post-radiotherapy dentin. This study aimed to characterize dentifrices with distinct bioactive technologies for the treatment of human dentin following radiotherapy, by evaluating surface microhardness (SM), wettability (W), and in situ zymography (IZ). **Methods:** One hundred molars ($n = 10$ per group) were distributed into two groups according to dentin condition: sound (S) and post-radiotherapy (PR - 35 doses of 2 Gy). Specimens were subdivided into three groups according to the dentifrice used: Colgate Total 12 (C), Biomin F (B - bioactive glass), and 5% S-PRG (S - S-PRG particles). Dentifrices were applied twice daily, diluted at a ratio of 1:3 in deionized water. SM (KHN, 10 kgf, 10 s) and W were measured before and after application. For IZ ($n = 5$), 0.1 mm slices were incubated for 48 h at 37 °C and analyzed via confocal laser scanning microscopy. Data were tested for normality. A repeated-measures three-way ANOVA was performed for SM and W, and a two-way ANOVA for IZ, followed by Tukey's post hoc test ($p < 0.05$). **Results:** SM revealed lower values for PR dentin, which recovered after dentifrice application. Regarding W, dentifrices enhanced wettability, while IZ showed greater gelatinolytic activity in sound dentin.

Radiotherapy reduces surface microhardness and gelatinolytic activity, whereas bioactive dentifrices enhance dentin interaction regardless of the substrate condition or bioactive technology.



PCL 26

Influence of agitation and pH of bleaching gels on the enamel surface: an *In-vitro* study

Santos AO*, Zonta ME, Esteves LMB, Aidar KMS, Correa JAC, Briso ALF

Objective: To comparatively evaluate the use of bleaching gels with acidic and basic pH values under different application protocols, analyzing the variables of enamel surface microhardness and roughness. **Methods:** Ninety bovine enamel discs (3.5 mm) were treated with either an acidic gel (A) (Mix One - pH 3.5) or a basic gel (B) (Whiteness HP Blue - pH 8.1), applied using three different protocols: three 15m' applications without agitation (3x15A and 3x15B), a single passive 45m' application (PA and PB), and an active 45-minute application with 30 seconds of agitation every 15 minutes (AA and AB), totaling six experimental groups (n=15). Surface roughness was assessed using the mean of three readings, with a stylus moving at 0.05 mm/s and a force of 0.7 mN. Microhardness was measured using a Knoop indenter, with a static load of 25 g for 10 seconds, and the mean of three indentations spaced 100 µm apart was calculated. Both surface roughness and microhardness were evaluated before and after three bleaching sessions. Data were analyzed using repeated measures three-way ANOVA ($\alpha = 0.05$). **Results:** Regarding surface roughness, the groups treated with acidic pH gels exhibited the highest roughness values, while the basic pH groups showed the lowest, across all application protocols. For microhardness, the highest values were observed in the basic pH groups, with the AB group showing the greatest microhardness.

Conclusion: The use of basic pH bleaching gels resulted in less deleterious effects on the enamel structure compared to acidic gels, regardless of the application method.



PCL 27

Evaluation of the mechanical resistance of printed nanohybrid resins facing an erosive/abrasive challenge

Peres ME*, Bezerra SJC, Bezerra SJC, Maia MB, Pena CE, Shimokawa CAK, Forlin TS

Nano-hybrid resins used for 3D printing may undergo erosive and abrasive challenges in the oral environment. The objective of this study was to evaluate the hardness of nano-hybrid resins obtained through 3D printing when subjected to an erosive/abrasive challenge. Specimens of 3D-printed and milled nano-hybrid resin measuring 14 mm x 14 mm and 3.0 mm in thickness were obtained and divided into four groups (n = 10): definitive milled resin (G1 - Grandio Blocs, VOCO), provisional milled resin (G2 - Vita CAD-TEMP, VITA), 3D-printed nano-hybrid resin (G3 - Varseo Smile Crown Plus, Bego), and 3D-printed provisional resin (G4 - Varseo Smile Temp, Bego). All specimens were polished using a polisher with #800, #1200, and #400 grit abrasive papers. The specimens were then subjected to an erosive/abrasive challenge consisting of four immersions of 5 minutes each in 4 ml of 1% citric acid, followed by 60 minutes of exposure to artificial saliva. After the first and last erosive challenge, brushing was performed for 15 seconds using a suspension of fluoridated toothpaste and water (1:3), with soft-bristled toothbrushes, over a period of five days. Before (baseline) and after (final) the erosive/abrasive challenge, the specimens were analyzed for surface microhardness. Data were analyzed using one-way ANOVA followed by Tukey's ($\alpha = 5\%$).

The results showed a statistically significant difference, with G1 exhibiting the greatest reduction in hardness compared to the other groups.



PCL 28

3D Printing in Restorative Dentistry: in vitro evaluation of resins applied in definitive restorations

Lalvay EJA, Oliveira JRS*, Münchow EA

Objective: To evaluate the physicochemical properties of two permanent-use 3D printing resins compared to direct composite resin. **Methodology:** Three resins were tested: two 3D (Permanent Crown, Formlabs; Bio Crown, PriZma 3D) and one direct (Filtek Z250, Solventum). Samples were prepared (15×1 mm); the 3D resins were printed by stereolithography, cleaned in alcohol and post-cured in a UV chamber. The samples (n=5) were divided into a sanded group with an abrasive sequence of SiC-600, -1200 and -2000, and a sanded and polished group (Opal L, Reinfert). Vickers hardness (0.5 kN/10 s), roughness by optical profilometry, and wettability via water contact angle were evaluated before and after immersion in alcohol for 24 h. Data were analyzed with two-way ANOVA and Tukey ($p < 0.05$). **Results:** The 3D resins presented lower microhardness than the composite resin, with greater reduction after chemical aging. The roughness was greater in the sanded samples of the 3D groups, with no variation in the composite resin. There was no significant difference in the level of hydrophilicity of the materials.

Conclusion: The 3D resins evaluated presented inferior performance to the composite resin, especially regarding hardness. However, when subjected to adequate polishing, they demonstrated surface behavior comparable to the conventional material.



PCL 29

DOES THE INTERVAL BETWEEN APPOINTMENTS INFLUENCE SENSITIVITY IN TOOTH WHITENING? RANDOMIZED CLINICAL TRIAL

Costa SAGF*, Silva CCF, Amado TVS, Loguercio AD, Favoreto M, Reis A, Calazans FS, Barceleiro MO

Objective: To evaluate the risk and intensity of postoperative dentin hypersensitivity (DH) associated with the use of the Whiteness HP bleaching gel (FGM Dental Group), with acidic pH, applied at intervals of 2 days or 7 days. **Methods:** A randomized, blinded clinical study with 47 volunteers at the School of Dentistry of the Instituto de Saúde de Nova Friburgo-UFF. Two in-office tooth whitening sessions were performed using the mentioned product, with 7-day intervals for the control group (GC) and 2-day intervals for the test group (GT). DH was assessed using the Visual Analog Scale (VAS) immediately after, and at 1h, 24h, and 48h following each session. Tooth color change was also evaluated subjectively (shade guide) and objectively (Easysshade), comparing the initial shade with the final shade (30 days after the second session). **Results:** No statistically significant difference was observed between the groups regarding the risk of DH (GC 91.3% and GT 91.7%, $p = 0.32$), nor the intensity of DH (GC 5.1 ± 2.5 and GT 4.9 ± 2.8 ; $p = 0.545$). On average, there was a whitening of 5 shades on the VITA Classical scale and 6 shades on the VITA Bleachedguide 3D-Master scale. For the Delta E values (GC 9.59 ± 3.24 and GT 9.92 ± 4.21), no statistically significant difference was observed ($p = 0.447$).

Conclusion: Reducing the interval between sessions did not increase sensitivity nor compromise the results. This change in interval may optimize treatment time and improve patient adherence.



PCL 30

Dentifrices containing β -TCP nanoparticles functionalized with fluoride and stannous ions to prevent dentin wear

Weiss GS, Silva FRO, Garcial RM, Viana IEL, Hara AT, Lippert F, Lima LC*, Scaramucci T

Objectives: To formulate dentifrices containing beta-tricalcium phosphate (β -TCP) nanoparticles functionalized with fluoride and tin, to test their ability in reducing dentin surface loss, and to measure dentifrice abrasivity. **Methods:** Dentifrices were formulated with 1100 ppm fluoride (as sodium fluoride - F^-), 3500 ppm of stannous ions (as stannous chloride, $SnCl_2$) and 800 ppm of β -TCP (two particle sizes: a - 20 nm; b - 100 nm). Dentin slabs were randomized into the following groups: 1. Commercial fluoride toothpaste; 2. Placebo; 3. F^- ; 4. $F^- + \beta$ -TCP_a; 5. $F^- + \beta$ -TCP_b; 6. $F^- + SnCl_2$; 7. $F^- + SnCl_2 + \beta$ -TCP_a; 8. $F^- + SnCl_2 + \beta$ -TCP_b. Specimens were submitted to two experimental models: A) 20,000 brushing strokes (n=5) and B) 5 days of erosive/abrasive challenges (n=10). Dentin surface loss (SL, in μm) was determined with an optical profilometer. Data were analyzed statistically ($\alpha = 0.05$). Dentifrice abrasivity was determined by relative dentin abrasivity- RDA. **Results:** In model A, there were no differences among the dentifrices. In model B, placebo showed the highest SL (14.57 ± 5.56) which was not different from the benchmark product and $F^- + SnCl_2 + \beta$ -TCP_b. $F^- + \beta$ -TCP_a showed the lowest SL (7.74 ± 2.42), although there were no differences between dentifrices containing fluoride. The RDA ranged from 5.90 to 13.30.

The functionalization of β -TCP nanoparticles with fluoride and stannous ions in dentifrices did not enhance their protective effect against erosive tooth wear. The experimental dentifrices showed low abrasivity.



PCL 31

2nd Place
Honorable Mention**Effect of experimental polymer-based toothpaste in preventing erosive tooth wear on enamel and dentin**

Garcia RM*, Lima LC, Sakae LO, Viana IEL, Borges AB, Lippert F, Hara A, Scaramucci T

Objective: To evaluate experimental toothpastes (ETs) with polymers (0.5% chitosan [CHI], 2% linear polyphosphate [LPP], 0.1% polyacrylic acid [PAA]) isolated or combined with fluoride (1350 ppm [F]) or fluoride plus stannous (3500 ppm [F+Sn]) in reducing erosive tooth wear (ETW). **Methods:** Bovine enamel and dentin blocks (n=8/group) were allocated into 24 groups based on: (1) cycling model (erosion or erosion-abrasion); and (2) toothpaste (DIW, Elmex Erosion [EE], ET/placebo, CHI, CHI+F, CHI+F+Sn, LPP, LPP+F, LPP+F+Sn, PAA, PAA+F, PAA+F+Sn). A 5-day cycling protocol included saliva exposure (2h), four erosive challenges (1% citric acid, pH=2.6), and brushing or slurry 2x/day. Surface loss (SL, μm) was measured via profilometry. Data were analyzed using 2-way ANOVA and Tukey test ($\alpha=0.05$). **Results:** For enamel, PAA (mean $\pm$ standard deviation; μm ; 12.6 ± 5.0) presented the lowest SL, not differing from PAA+F+Sn (16.7 ± 2.5 , $p=0.113$), and both showed lower SL than DIW (29.8 ± 2.6 , $p<0.001$) and EE (24.9 ± 3.0 , $p<0.001$). For dentin, PAA+F+Sn showed the lowest SL (9.4 ± 2.4) differing significantly from DIW (22.3 ± 3.9 , $p<0.001$), and ET (16.7 ± 5.1 , $p<0.001$), but not from PAA (12.1 ± 3.8 , $p=0.534$), LPP+F (11.8 ± 3.9 , $p=0.39$), LPP+F+Sn (12.6 ± 5 , $p=0.176$).

The incorporation of PAA into toothpastes stands out as a promising alternative to reduce ETW.



PCL 32^{1st place}
LINCOLN STEAGALL
Award**Bleaching Hydrogels with Different Concentrations of Hydrogen Peroxide and MnO-doped 45S5 Bioglass**

Dascanio R*, Guimarães CM, Coelho CSS, Trevelin M, Zanotto ED, Cavalli V

This study evaluated the incorporation of 45S5 Bioglass (BG) and manganese oxide-doped Bioglass (BG_MnO) into experimental bleaching hydrogels containing different concentrations of hydrogen peroxide (HP), with or without violet LED irradiation. In Phase 1, bovine blocks (n=10) were treated with the following: 35%HP; HP combined with BG (0, 2.5, 5, 7.5, and 10 wt%); and a negative control. Whitening was performed in 3 sessions of 40 min with 7-day intervals, and evaluations included color change (ΔE_{00}), whitening index (ΔWI_D), surface hardness loss (%SHL) at baseline (T_0), 24h (T_1), and 14 days after bleaching (T_2), and morphological analysis (SEM) at T_2 . In Phase 2, gel pH (0, 10, 20, and 30 min), decomposition (%HP), and treatment groups (n=10) were evaluated as follows: 35%HP (positive control), 6%HP gel containing BG or MnO_BG (0-10 wt%), irradiated or not with LED. Bleaching was performed in 3 30-min sessions, 7-day intervals, and the same parameters from Phase 1. Data were analyzed by ANOVA and Tukey's test ($\alpha = 0.05$). 35%HP_BG and 35%HP showed no differences in ΔE_{00} and ΔWI_D . At T_2 , 10%BG presented lower %SHL than 0%BG and 35%HP, as well as a higher pH ($p < 0.05$). Groups 35%HP and 6%HP_MnO_BG_LED showed no differences in ΔE_{00} and ΔWI_D ($p < 0.05$). 35%HP presented the highest %SHL among the groups, followed by 6%HP, while 6%HP_MnO_BG and 6%HP_BG maintained surface hardness ($p < 0.05$).

10%BG was the most effective in reducing %SHL. BG and BG_MnO decreased %SHL, increased pH, maintaining bleaching effectiveness even with a lower concentration of HP when associated with MnO



PCL 33

Longitudinal evaluation of the application of remineralizing substances post-conditioning on dentin adhesion using universal adhesives

Mendonça RP, Figueiredo CS, Lee DK, Silva-Junior JP*, Silva TM, Campos TMB, Gonçalves SEP

This study evaluated the immediate and long-term effects on the bond strength to conditioned dentin (BS), after the application of two solutions containing remineralizing bioparticles (Combeite and α -Wollastonite), followed by the use of a universal adhesive (UA). 72 bovine teeth were divided into 3 groups: Control (CER), Wollastonite (WOL), and Combeite (CMB). 20 teeth from each were conditioned, rinsed, and, prior to UA application, treated with WOL or CMB solutions and restored for microtensile BS analysis. 4 samples from each group were analyzed using FTIR and prepared for microscopy with Masson's Trichrome staining (MOTM) and scanning electron microscopy (SEM). Half of the samples were analyzed immediately (24h), while the other were stored for 6 months. Data was processed using two-way ANOVA and Weibull modulus analysis. WOL (47.0 MPa) and CMB (42.8 MPa) exhibited superior BS compared to CER (36.9 MPa), with a statistically significant difference between them ($p=0.044$). After aging, there was a significant decrease in CER (31.2 MPa), while WOL (45.1 MPa) and CMB (42.2 MPa) maintained their values, with no difference from their immediate counterparts. FTIR analysis of WOL/CMB showed effective mineral replenishment in demineralized dentin. SEM revealed differences in hybridization quality between CER and WOL/CMB. MOTM showed a reduced fragility zone in WOL/CMB compared to CER.

The bioparticles proved to be effective in mineral replenishment of conditioned dentin and showed promise for immediate and long-term adhesion using UA in the etch-and-rinse mode.



PCL 34

Evaluation of the physical properties of an experimental resin infiltrant containing hydrophobic monomer

Rodrigues IC*, Costa SC, Zago JLG, Aguiar FHB, Marchi GM

Objective: The objective was to evaluate the degree of conversion and the sorption and solubility of experimental resin infiltrants containing different concentrations of the monomer 1, 12-dodecanediol dimethacrylate (DDDMA). **Methods:** The experimental infiltrants were manipulated with 85% TEGDMA, 15% DDDMA, 1% EDAB and 0.5% CQ (IE15) and 70% TEGDMA, 30% DDDMA, 1% EDAB and 0.5% CQ (IE30). To analyze the degree of conversion (CG) (n = 5), measurements were performed before and after photoactivation of the infiltrant samples, using a Fourier transform infrared spectrometer (FTIR). For the analysis of sorption (So) and solubility (Sol) (n=16), infiltrant discs were produced and, after dissection, the polymerized samples were weighed, stored in distilled water for 7 days and weighed again, after further drying, until the final mass was obtained. **Results:** The degree of conversion was significantly higher in the IE15 group when compared to the control group (Icon). When compared to the control group, the IE30 group presented lower sorption, while the IE15 group presented statistically equal results to both groups. No significant differences were found between the groups regarding solubility.

The addition of the DDDMA monomer influenced all the analyses performed. Both experimental groups showed promising results when compared to the control group, with better results in the IE15 group.



PCL 35

Effect of Gingival Barrier Application on Enamel Crack During Tooth Bleaching

Jiménez-Díez D*, Favoreto MW, Barbosa LMM, Fuentes V, Reis A, Ceballos L, Loguercio AD

Objectives: To evaluate hydrogen peroxide (HP) permeability into teeth with enamel cracks and to investigate the effectiveness of gingival barrier application as a protective strategy. **Methods:** Thirty human premolars were allocated into three experimental groups ($n = 10$): intact teeth, teeth with enamel cracks, and teeth with enamel cracks protected by a gingival barrier. Cracks were detected using transillumination and measured using ImageJ software. The gingival barrier (Total Blanc Gingival Protector, DFL) was applied over the cracks in the third group. Bleaching was performed with 35% HP (Total Blanc One-Step, DFL) for 30 minutes. HP permeability into the pulp chamber was quantified by UV-Vis spectroscopy, and bleaching efficacy was assessed by digital spectrophotometry (ΔE_{00} , and WI_D). Permeability data were analyzed using One-way ANOVA, and bleaching efficacy was analyzed by Two-way ANOVA ($\alpha = 0.05$). **Results:** Vertical cracks had a mean length of 4.2 ± 1.3 mm. All groups exhibited HP penetration into the pulp chamber, which was 78% higher in teeth with enamel cracks compared to sound teeth ($p < 0.001$). The application of the gingival barrier over the cracks did not reduce permeability ($p = 0.26$). Bleaching efficacy increased over time and was similar among groups, with no statistically significant differences ($p > 0.05$).

Enamel cracks significantly increase HP permeability. However, applying a gingival barrier over these cracks does not limit this penetration, although it does not compromise the bleaching efficacy.



PCL 36

EFFECT OF SURFACE SEALANT ON COLOR STABILITY AND SURFACE ROUGHNESS OF COMPOSITE

Yoshihara EY*, França FMG, Basting RT

Composite resins are restorative materials that offer good clinical and aesthetic performance, although they are susceptible to degradation processes, color variability, limitations in their physical and mechanical properties, and staining when exposed to the oral environment. The aim of this study is to evaluate the effect of surface sealants on the color stability and surface characteristics of the suprananofilled resin Palfique LX5 Tokuyama and the nanofilled resin Filtek Z350 XT, which were immersed in a staining challenge using coffee and artificial saliva. It was observed that the application of the surface sealants Biscover and PermaSeal did not significantly alter the roughness of the composite resins, regardless of whether they were suprananofilled or nanofilled. After immersion in the solutions, roughness was significantly higher in the samples immersed in coffee. Regarding the ΔE_{ab} and ΔE_{00} color change parameters, the samples stored in coffee exhibited significantly greater color change compared to those stored in artificial saliva. However, when comparing the different sealants, Biscover reduced this color change in both resins.

The results of this study demonstrate that the application of the surface sealants Biscover and PermaSeal does not promote significant changes in the roughness of composite resins, regardless of the resin matrix type, when evaluated prior to exposure to staining agents.



PCL 37

Scientific Trends in Clinical Trials on Dental Bleaching: A Bibliometric and Altmetric Review

Barchiki N*, Rocha AO, Anjos LM, Cardoso M, Loguercio AD, Matos TP, Reis A, Favoreto MW

This study analyzed the characteristics and trends of publications on clinical trials related to dental bleaching through a bibliometric and altmetric analysis. A comprehensive search was performed in September 2024 using the Web of Science Core Collection (WoS-CC) and Scopus databases. Two researchers selected the articles and extracted key study characteristics. VOSviewer was used to generate bibliometric networks, while Dimensions was consulted to assess altmetric data. A total of 416 studies published between 1990 and 2024 were included. The most cited study received 164 citations in WoS-CC and 201 in Scopus. Most trials focused on bleaching efficacy ($n = 232$) and were randomized ($n = 307$). Hydrogen peroxide was the most commonly used active agent ($n = 200$), and at-home bleaching was the most frequently employed technique ($n = 199$). The majority of publications originated from Brazilian authors ($n = 165$), with Loguercio AD ($n = 70$) and Reis A ($n = 56$) being the most prolific. The manufacturer FGM led in terms of the number of investigated products ($n = 153$), particularly the Whiteness HP Maxx 35% ($n = 40$). VOSviewer revealed significant collaborations among authors and keyword clustering. According to Dimensions, Mendeley users and news outlets showed substantial interest in clinical trials on dental bleaching.

This study highlighted a growing trend in dental bleaching clinical trials over the past 30 years, with a strong predominance of studies conducted in Brazil, mainly focusing on bleaching efficacy.



PCL 38

Analysis of Color Matching of Simplified Resins Composite With and Without Opaque in Anterior Restorations

Silva DF*, Pinatti RFA, Oliveira TA, Torres CRG, Borges AB

To evaluate the color matching of simplified resins composite in Class III preparations, with and without the use of an opaque layer. Class III cavities were prepared on the proximal surfaces of acrylic incisors, with translucent/opaque layers (A1, A3, and A4). The teeth were restored with Admira Fusion - Voco (conventional system), Filtek Universal - 3M/ESPE (group-shade system), and Omnicroma - Tokuyama (single-shade system). One cavity was restored with a combination of opaque/enamel (or single shade), and the other was restored using only enamel (or single shade) (n=20 per tooth). For the evaluation of color matching, the teeth were photographed using a digital camera (manual mode, ISO 3200, F32, speed 1/6) under D65 illuminant. The L*, a*, and b* coordinates of the teeth and restorations were obtained using Adobe Photoshop, and the color difference (ΔE_{ab}) was calculated. Statistical analysis was performed using three-way ANOVA and Tukey's test (5%). Significant differences were found for all three factors (resin, tooth shade, and opaque) ($p < 0.05$). Filtek Universal showed the best color match ($\Delta E = 2.42 \pm 0.71$)^a, followed by Admira Fusion ($\Delta E = 3.91 \pm 1.25$)^b, and Omnicroma ($\Delta E = 5.68 \pm 2.60$)^c. The combination of opaque and enamel/single shade did not improve the esthetic outcome. Color matching was more favorable in A3 teeth, followed by A1 and A4, respectively

Group-shade resin composite showed better color matching compared to single-shade system. Overall, the use of an opaque layer did not significantly influence the esthetic outcome of simplified materials.



PCL 39

Effect of Post-Curing Protocols on the Color Stability of 3D-Printed Dental Restorative Materials

Feiten ILA*, Lima ACR, Almeida EN, Couto-Neto MP, Magalhaes-Filho TR, Weig KM, Schneider LFJ, Cavalcante LMA

Objective: To evaluate the influence of different post-curing protocols on the color stability of resin composites used in the 3D printing of dental restorations. **Methods:** Discs of the resin composites Horus Bioprint Crown and Horus Bioprint Prov (Astro Science, Brazil), measuring 10 mm in diameter and 1 mm in thickness, were printed (Any Cubic Mono 4, China) and divided into six experimental groups (n=3), subjected to different post-curing protocols varying in time, power, and temperature control. Color stability was assessed using a spectrophotometer (CM2600d - Konica Minolta, Japan), based on the ΔE_{ab} and ΔE_{00} parameters. Measurements were taken after 7 days of dry storage, 15 days, and following saturation in distilled water. Data were analyzed using ANOVA and Tukey's test ($\alpha=0.05$). **Results:** Significant changes were observed in the L, a^* , and b^* values, with color differences recorded across the different times and protocols. The Bioprint Prov composite showed higher mean ΔE_{00} values compared to Bioprint Crown, indicating lower color stability.

Conclusions: Post-curing protocols with longer exposure times (e.g., Anycubic 60 min) and those using chambers with thermal control (e.g., Procure 1 ONX, Procure 2 Crown) demonstrated greater effectiveness in maintaining the color stability of the composites.



PCL 40

Influence of Violet LED and Biocatalysts on In-Office Whitening: A Randomized Split-Mouth Clinical Trial

Esteves LMB*, Costa CAS, Aidar KMS, Santos AO, Cintra LAT, Vidal CMP, Fagundes TC, Briso ALF

Objective: To compare conventional in-office whitening with 35% hydrogen peroxide (HP) for 45 minutes to alternative 15 minute therapies using a nanofiber scaffold and peroxidase enzyme, with or without violet LED, by assessing color change and trans and postoperative tooth sensitivity. **Methodology:** 60 patients were randomized into three groups (n=20): TC45 (35% HP for 45 minutes), T15 (35% HP for 15 minutes), and TSP15 (scaffold + 35% HP with peroxidase for 15 minutes). One hemiarch in each case was irradiated with violet LED (L) (8 cycles of 1 minute with 30 second pauses). Color change was evaluated using ΔE_{00} and WID with a portable spectrophotometer, while spontaneous (questionnaire) and provoked (thermal sensory test) sensitivity were assessed at sessions S1, S2, and S3, and after 7, 14, and 90 days (three-way repeated measures ANOVA). As secondary outcomes, pH and HP consumption were evaluated in the first session (one-way ANOVA). **Results:** For ΔE_{00} , TC45 = TSP < T15; in irradiated groups, TCL45 = TSPL < TL15. For ΔWID , TC45 = TSP < T15; in irradiated groups, TCL45 < TSPL < TL15. A significant irradiation effect was observed only for T15 and T15L. TC45 and TCL45 showed higher levels of spontaneous sensitivity and greater variation in thermal sensory threshold, with irradiation being significant in all groups. TSP15 and TSPL15 showed smaller pH drops and greater HP degradation. Scaffold and peroxidase therapies, with or without LED, have proven to be effective, safe and cause less sensitivity, making them promising alternatives to the conventional technique.



PCL 41

Adverse reactions to tin-containing dentifrices: a scoping review

Neves YR*, Luna LR, Souza LAP, Carvalho RLA, Sochacki S, Scaramucci T, Lima LC

Objectives: The present scoping review aimed to map and summarize the adverse effects due to the use of tin-containing toothpastes. **Methods:** The study protocol was designed according to PRISMA-ScR, followed Joanna Briggs Institute guidelines and was registered on the Open Science Framework platform. PubMed and Embase databases were searched up October 2024. Randomized clinical trials and case reports were considered for inclusion. In vitro and in situ studies were excluded. Two independent reviewers extracted data concerning adverse effects, tests methods, patients and toothpaste's details. **Results:** A total of 444 studies were identified, however, only 5 were included. Adverse effects can occur in atopic and non-atopic patients. Allergies and irritations are shown after a few days of toothpaste use. Oral tissues such as lips, tongue and intraoral mucosa are usually affected, presenting as cheilitis, ulcers, and erythema. The outcome for all studies was the same: switching for a sodium fluoride toothpaste eliminates the adverse effects.

Conclusion: Tin-containing toothpastes can cause irritations and allergic reactions with oral manifestation, such as cheilitis, ulcers, and erythema, which affect lips, tongue and intraoral mucosa. Pain is not common but can occur. Switching to fluoride toothpastes without tin (as sodium fluoride) seems to eliminate these adverse effects, but only after a few weeks. Adverse effects can occur at different ages, despite the gender and atopy condition.



PCL 42

Ozonized Sunflower Oil Orabase Ointment: A biocompatible option with significant healing power

Yunis MCD*, Maia LP, González AHM, Gregorio D

The aim of this *in vitro* study was to develop an ozonized sunflower oil (OGO) orabase ointment, with subsequent evaluation of its biocompatibility in the L929 fibroblast lineage, investigating the parameters of cytotoxicity and genotoxicity, as well as the potential for bioactivity in tissue healing. Additionally, the physicochemical properties were characterized. To this end, the methods employed were cytotoxicity assays (MTT) with serial dilutions of OGO (1:32 to 1:128), the micronucleus test for genotoxicity assessment, and the scratch assay for healing analysis. The ointments were subjected to the determination of pH, relative density, and viscosity. The results obtained showed dose-dependent cytotoxicity of OGO, with no significant cytotoxic effect at dilutions $\geq 1:32$ up to 72 hours. A significant increase in the frequency of micronuclei was observed in the groups treated with OGO at dilutions of 1:32 and 1:64 on the seventh day. In the healing assay, the group treated with the 1:32 dilution showed a smaller lesion area on the third day. The physicochemical analysis revealed an acidic pH for the formulations, a positive correlation between OGO concentration and ointment density, and Newtonian rheological behavior for viscosity at all concentrations evaluated.

In conclusion, the OGO ointment demonstrated *in vitro* biocompatibility at specific concentrations, bioactive potential in accelerating the tissue repair process, and physicochemical characteristics that suggest formulation stability.



PCL 43

Effect of different thicknesses of translucent 3D-printed resin and silicone barriers on light transmission and spectrum

Gonçalves SR*, Moreira JC, Dantas RVF, Araújo DS, Shimokawa CAK

This study aimed to evaluate the emission spectrum and light transmission of light curing units through translucent barriers made of silicone and flexible 3D-printed resin. Barriers were fabricated using three types of silicone, both with and without the use of a pressure pot, as well as with a 3D-printed resin in varying thicknesses: 2, 4, 6, 8, and 10 mm. The light emitted by two LCUs, as well as their emission spectra and the transmission of light through the different barrier thicknesses, were analyzed using the Mini Gig spectroradiometer (Gigahertz Optik) ($n = 3$). The data obtained were statistically analyzed using two-way ANOVA and Tukey's test ($\alpha = 0.05$). Light transmission was higher through the silicones fabricated without the use of a pressure pot ($p < 0.05$). For both silicones and the resin, decreasing thickness resulted in increased light transmission and a higher percentage of violet light transmitted through the barriers ($p < 0.05$). When comparing barriers made of different materials, the 3D-printed resin showed greater light transmission at greater thicknesses (10 mm, 8 mm, and 6 mm). At the intermediate thickness (4 mm), higher transmission was observed only in comparison to silicones fabricated with a pressure pot. At 2 mm thickness, silicones produced without a pressure pot transmitted more light than the resin.

It can be concluded that reducing the thickness of the barriers results in greater transmission of light emitted by the light curing units, and that the barrier material influences light transmission.



PCL 44

Degree of Conversion of Experimental Resins with Alternative Initiators to Camphorquinone

Massarenti AHM*, Feng J, Kury M, Andia DC, Schmitt M, Lalevee J, Lima AF

Objective: To evaluate the efficiency of two novel polymerization initiators on the degree of conversion of experimental resins. **Methods:** Two type II initiators (B1 and NTZD1) were synthesized. Camphorquinone (CQ), widely used in dental resins, was employed as a reference. Experimental resins composed of 70% BisGMA and 30% TEGDMA were prepared and combined with different concentrations of the initiators (0.01%, 0.05%, 0.1%, and 0.3%), along with the co-initiator EDAB and the iodonium salt DFI, in an initiator:co-initiator:iodonium ratio of 1:2:2. **Results:** For CQ, the highest degrees of conversion were observed at 0.1% and 0.3% (80% and 85%, respectively). B1 showed better performance at 0.05% and 0.1% (65% and 31%), while NTZD1 achieved 71% and 74% at the same concentrations. Using the "Design of Experiments" statistical method, the most effective ratios were identified as follows: CQ - 0.3-0.6-0.6 (85%) and 0.1-0.2-0.2 (80%); B1 - 0.05-1-1 (80%) and 0.05-0.44-0.26 (68%); NTZD1 - 0.05-1-1 (80%) and 0.1-1-1 (81%).

Conclusion: The alternative initiators demonstrated similar performance to CQ, except for B1 at the 0.05-0.44-0.26 ratio. Further studies are needed to assess their influence on the properties of dental resins.



PCL 45

Influence of the UV Component and Observer Angle on Spectrophotometric Assessment of Color Differences

Fernandes JB*, Souza LFA, Mailart MC, Torres CRG, Borges AB

This study aimed to evaluate the impact of including or excluding the UV component and changing the observer angle on the ability of a spectrophotometer to detect statistically significant differences among shades in the Vita Bleachedguide (VB) scale, organized by L* values. The VB shades were numbered according to their L* values (T1 = highest; T15 = lowest) and mounted on a standardized support for measurement. L*, a*, and b* coordinates were obtained using a spectrophotometer under D65 illumination. Five readings were taken for each of four setting combinations: observer angle of 2° or 10°, with or without UV component. ΔE_{00} was calculated by comparing each shade to the darkest one in the scale (T15). Data were analyzed separately using one-way ANOVA and Tukey's test (5%) to assess the equipment's ability to distinguish shades under each condition. All settings enabled differentiation of some shades ($p \leq 0.001$). The setting with a 10° observer angle and UV component included showed the best performance, with the following mean $\pm$ standard deviation and Tukey's test results for ΔE_{00} : T1: $15.38 \pm 0.11A$; T2: $12.01 \pm 0.04B$; T3: $10.30 \pm 0.07C$; T4: $9.59 \pm 0.09D$; T5: $9.19 \pm 0.05E$; T6: $8.65 \pm 0.11F$; T7: $8.26 \pm 0.11G$; T8: $7.00 \pm 0.17H$; T9: $5.94 \pm 0.07I$; T10: $4.61 \pm 0.08J$; T11: $3.95 \pm 0.06K$; T12: $3.48 \pm 0.11L$; T13: $2.84 \pm 0.06M$; T14: $1.68 \pm 0.04N$.

Spectrophotometer settings directly influence the absolute values of color differences. The configuration with a 10° observer angle and UV component included optimized the detection of color variations among the shades of the Vita Bleachedguide scale.



PCL 46

Addition of chitosan to at home bleaching gel with and without calcium on the physical properties of tooth enamel

Barbosa CM*, Ferraz LN, Franco LS, Benati MRL, Vieira-Junior WF, Dotta TC, Aguiar FHB, Lima DANL

The aim of this in vitro study was to evaluate the effect of adding chitosan to at-home bleaching gels with and without calcium on the physical properties of dental enamel. Bovine enamel specimens were stained with black tea (6 days) and randomized into 5 groups (n=12): no bleaching (control), 7.5% hydrogen peroxide (HP 7.5%), HP 7.5% + 2% chitosan (HP 7.5% + Chi), HP 7.5% + calcium (HP 7.5% + Ca), and HP 7.5% + Ca + 2% chitosan (HP 7.5% + Ca + Chi). Bleaching was performed for 14 days, 1 hour/day. Color analyses (ΔE^*ab , $\Delta E00$), surface roughness (Ra), and surface microhardness (SMH) were performed after staining (T1) and after 14 days of bleaching (T2). Elemental composition (weight %) of Ca, P, and Na, as well as the Ca/P ratio, were determined by energy-dispersive X-ray spectroscopy (EDS), and qualitative analysis of the enamel surface was performed by scanning electron microscopy (SEM) at T2. Color data were analyzed using Kruskal-Wallis and Dunn tests; Ra and SMH using a linear mixed model; and EDS using ANOVA. HP 7.5% + Chi and HP 7.5% + Ca + Chi showed the lowest Ra values and the highest SMH at T2. The HP 7.5% and HP 7.5% + Ca groups showed lower SMH at T2 compared to T1 and also lower SMH at T2 when compared among groups. No statistically significant differences were found between groups for the EDS analyses.

The addition of 2% chitosan to a 7.5% hydrogen peroxide-based at-home bleaching gel proved promising in reducing changes in enamel roughness, microhardness, and mineral content, without compromising bleaching effectiveness.



PCL 47

Mechanical and Physical properties of 3D-printed resins for dental crowns

Lozada MIT*, Rondón AKA, Bautista IC, Junqueira PCB, Mendonça G, Soares CJ

This study evaluated the physical-mechanical properties of 3D-printed resins indicated for definitive dental crowns using MSLA and DLP printing technologies. Four commercial A2-shade resins (Ceramic Crown, SprintRay; OnX Tough 2, SprintRay; Sculpture 2.0, Rodin; and Voxelprint, FGM) were processed according to the manufacturers' instructions. The following properties were assessed: flexural strength (MPa), elastic modulus (GPa), compressive strength (MPa), tensile strength (MPa), Vickers microhardness (N/mm²), surface roughness (μm), water sorption (%), and degree of conversion (%). Surface topography was analyzed using scanning electron microscopy. Data were analyzed using ANOVA and Tukey's test ($\alpha = 0.05$). Significant differences were observed for all parameters analyzed ($P < 0.001$). Voxelprint and Ceramic Crown demonstrated superior mechanical performance. OnX Tough 2 showed a high degree of conversion but poor mechanical performance and porous morphology. Sculpture 2.0 exhibited higher roughness and irregular topography. It was concluded that resin composition, printing technology, and post-curing significantly influence physical-mechanical properties. The 3D-printed resins Voxelprint, Ceramic Crown, and Sculpture 2.0 are suitable for definitive dental crown applications.

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PCL 48

Mussel-inspired dentin remineralization: Effect of dopamine on morphology and permeability following erosion and abrasion cycling

Falcon-Aguilar M*, Marques JFL, Vieira-Júnior WF, Pecorari VGA, Rischka K, Aguiar FHB

This study aimed to evaluate the effects on morphology and permeability of dentin after an erosive and abrasive cycling protocol followed by treatment with an experimental solution containing dopamine. **Materials and Methods:** Dentin hypersensitivity was simulated in human dentin discs by applying EDTA for 5 min. After assessing maximum dentin permeability (initial), specimens were randomly allocated into four groups: distilled water (control), NaF 0.05% solution, a commercial solution (Colgate® Sensitive Pró-Alívio™), or an experimental solution containing dopamine and laccase (n=15). An erosive/abrasive cycling protocol was applied, including 0.3% citric acid for 2 min 4x/day, brushing for 5 s 2x/day, treatments for 5 min 2x/day. Dentin permeability was reassessed (final). Percentage permeability for each time point was calculated relative to maximum permeability (%Lp) and analyzed by generalized linear mixed models ($\alpha = 0.05$). Surface effects were analyzed by scanning electron microscopy. **Results:** A significant reduction in permeability occurred in all groups post-cycling and treatment ($p < 0.05$), with no significant differences between groups ($p=0.6082$). All groups exhibited sparse surface deposits, with few occluded tubules. Tubules appeared smaller in diameter in the Colgate® and experimental solution groups, while distilled water and NaF groups showed more open tubules.

Dopamine showed a limited effect, with no significant protection of the dentin surface or reduction in permeability, similar to the other tested solutions.



PCL 49

Mussel-inspired dentin remineralization: Effect of dopamine on morphology and permeability following erosion and abrasion cycling

Silva JMR*, Turssi CP, Höfling RTB, França FMG

This study aimed to evaluate the effects on morphology and permeability of dentin after an erosive and abrasive cycling protocol followed by treatment with an experimental solution containing dopamine. Materials and Methods: Dentin hypersensitivity was simulated in human dentin discs by applying EDTA for 5 min. After assessing maximum dentin permeability (initial), specimens were randomly allocated into four groups: distilled water (control), NaF 0.05% solution, a commercial solution (Colgate® Sensitive Pró-Alívio™), or an experimental solution containing dopamine and laccase (n=15). An erosive/abrasive cycling protocol was applied, including 0.3% citric acid for 2 min 4x/day, brushing for 5 s 2x/day, treatments for 5 min 2x/day. Dentin permeability was reassessed (final). Percentage permeability for each time point was calculated relative to maximum permeability (%Lp) and analyzed by generalized linear mixed models ($\alpha = 0.05$). Surface effects were analyzed by scanning electron microscopy. Results: A significant reduction in permeability occurred in all groups post-cycling and treatment ($p < 0.05$), with no significant differences between groups ($p=0.6082$). All groups exhibited sparse surface deposits, with few occluded tubules. Tubules appeared smaller in diameter in the Colgate® and experimental solution groups, while distilled water and NaF groups showed more open tubules.

Dopamine showed a limited effect, with no significant protection of the dentin surface or reduction in permeability, similar to the other tested solutions.



PCL 50

Physical-Mechanical Performance of EVAs and 3D-Printed Resins Used in the Fabrication of Mouthguards

Rondón AKA*, Lozada MIT, Cordeiro IB, Mendonça G, Soares PBF, Soares CJ

This study aimed to compare the mechanical properties and stress and strain distribution via impact simulations using the finite element method of different commercial ethylene-vinyl acetate (EVA) copolymers (Bioart, Essence, and Proform) and two 3D-printed resins (DimaPrint, Kulzer; Keyguard, Keystone) used in mouthguard fabrication. Specimens ($n = 10$) were fabricated according to ISO 37-II. Shore Hardness, rupture force (N), elongation (mm), and ultimate tensile strength (MPa) were evaluated. Surface characterization was performed using scanning electron microscopy. Two-dimensional finite element models, with and without a mouthguard (4 mm thickness), were developed for frontal impact simulation (1 m/s), and analyses were conducted based on the modified von Mises criterion. Results: The tested materials exhibited statistically significant differences in mechanical properties ($P < 0.001$). Essence EVA showed the highest strength values, while DimaPrint resin had the lowest. Bioart EVA and Keystone resin exhibited higher hardness. The presence of the mouthguard significantly reduced stress, especially in the cervical region. All materials showed similar impact absorption capacity, with a slight advantage for the EVAs.

Despite differences in mechanical properties and failure modes, all evaluated materials were effective in dissipating the stresses generated by the simulated impact.



PCL 51

MODELING LIQUID WITH AND WITHOUT FILLER PARTICLES AND ITS EFFECT ON THE COHESIVE STRENGTH OF COMPOSITE RESIN SUBJECTED TO MECHANICAL CYCLING

Pires L*, Vieira-Junior WF, Basting RT, Turssi CP

This study evaluated whether the application of modeling liquids (ML), with or without filler particles, between increments of a composite resin (CR) affects its cohesive strength (CS) under mechanical cycling (MC). In a Teflon matrix (6 mm height × 2 mm diameter), 72 samples were prepared with 2 mm increments of CR (Filtek Z350 XT, 3M/Espe). In 24 samples, ML containing filler particles (Wetting Resin, Ultradent) was applied; in another 24, ML without filler particles (Signum, Kulzer) was used; and the remaining 24 samples received no ML (control group). Photoactivation was performed using an LED device (Valo, Ultradent). This process was repeated for the second increment in all groups, and no ML was used in the third increment. Half of the samples from each group were stored in distilled water at 37°C and tested for CS using a universal testing machine (DL-2000, Emic). The other half were embedded in acrylic and addition silicone to simulate periodontal tissue and underwent 500,000 mechanical cycles (120 N, 2 Hz). Data were analyzed using ANOVA and Tukey's test ($\alpha=5\%$). A significant effect of ML type and mechanical cycling on CS was observed. After mechanical cycling, the group that received ML with filler particles showed significantly higher CS than the control group ($p<0.05$), while the control group had significantly lower CS after cycling ($p<0.05$).

It was concluded that the use of modeling liquid containing filler particles between increments of composite resin subjected to mechanical cycling increased the cohesive strength of the restoration.



PCL 52

Efficacy of Copaiba Oil-Resin on Post-Bleaching Tooth Sensitivity and Color: A Randomized Clinical Trial

Dias HB*, Gil GS, Xavier GMB, Canelas CAA, Rodrigues APD, Passos MF, Silva CM

This randomized clinical trial evaluated the effectiveness of an experimental gel based on copaiba oil-resin (CO) in controlling tooth sensitivity (TS) and color change following dental bleaching with 35% hydrogen peroxide (HP). The study involved 75 volunteers, randomized into three groups (n=25): placebo gel (CG), 5% potassium nitrate + 2% sodium fluoride gel (GKF2%), and CO gel (GCO). Each group underwent three bleaching sessions at 7-day intervals, preceded by the application of the respective gel. TS was assessed daily for 21 days using a visual analog scale. Tooth color was measured using a spectrophotometer before and 7 days after the final session, following the CIEDE2000 protocol for color variation analysis. Group comparisons were performed using the Kruskal-Wallis test (between-group) and Friedman test (within-group) for TS, and one-way ANOVA with Tukey's post hoc test for color ($p \leq 0.05$). Results showed that both the GCO and GKF2% groups had significantly lower levels of TS compared to the CG group in both intergroup and intragroup analyses. Intragroup analysis revealed that GCO and GKF2% maintained stable TS levels between the first and third bleaching sessions, while the CG group exhibited a significant increase. Regarding color change, no statistical differences were observed among the groups.

The experimental CO gel reduced post-bleaching tooth sensitivity with HP without affecting the efficacy of the whitening treatment.



PCL 53

Association between fluoride and polymer in experimental toothpastes for controlling enamel erosive wear

Bottesini VC*, Ávila DMS, Scaramucci T, Torres CRG, Borges AB

The protective effect of experimental fluoride-based toothpaste associated with aminomethacrylate copolymer against enamel initial erosion and erosive wear was investigated. Bovine enamel specimens were allocated into groups (n=12) according to the tested toothpastes: sodium fluoride - F (1450 ppm F⁻); aminomethacrylate - AMC (4%); AMC+F; negative control for erosion - CNE (no abrasion); negative control for abrasion - CNA (no toothpaste); and placebo toothpaste - PL (no active agent). The specimens were initially exposed to human saliva (1h) to allow for acquired pellicle formation. The cycling protocol consisted of: 0.3% citric acid (5 min - 4x/day), human saliva (1h), and treatments/brushing (2x/day) for 5 days. The rehardening (%Re) and protection (%Prot) potentials of the treatments were evaluated by Knoop surface microhardness (KN) in the first cycle, and surface loss (SL in μm) by profilometry after the 5th day. Fluoride adsorption on enamel was analyzed at the end of the cycle ($\mu\text{g}/\text{cm}^2$). ANOVA/Tukey tests (5%) were applied. The AMC+F group showed significantly higher %Re and %Prot values among the groups ($p<0.05$). Mean $\pm$ standard deviation data for SL were: CNE (7.46 ± 2.26)a, CNA (10.14 ± 2.08)ab, PL (13.11 ± 2.69)c, AMC (7.74 ± 2.10)a, F (11.38 ± 2.07)bc, AMC+F (7.52 ± 2.59)a. Fluoride adsorption on enamel was detected in the F and AMC+F groups, with no significant difference between them ($p>0.05$).

The addition of the aminomethacrylate copolymer to the fluoride-based toothpaste enhanced its protective effect against enamel initial erosion and erosive wear.



PCL 54

Association of aminomethacrylate copolymer with fluoride solutions for controlling dental erosion: a randomized crossover in situ study

Prado TP*, Santos KC, Torres CRG, Scaramucci T, Aoki IV, Borges AB

The anti-erosion effect of solutions containing fluoride associated with aminomethacrylate copolymer on enamel and dentin was evaluated using a randomized crossover in situ model. Volunteers (n=12) installed intraoral devices containing bovine enamel and dentin specimens and rinsed them with seven experimental solutions in a randomized sequence, with a 2-day interval between them: ultrapure water-C; sodium fluoride-F (225 ppm F-); stannous chloride-Sn (800 ppm Sn+2); aminomethacrylate-AA (2%); FSn; F+AA; FSn+AA. After the treatments, the devices were kept in the mouth for maturation of the acquired pellicle (30 min). The specimens were then exposed extraorally to 0.03% HCl, pH 2.3 (3 min). This cycling was repeated six times. The calcium released from the acid solutions was measured in a colorimetric spectrophotometer and the mineral loss was calculated (μg). The soluble fluoride in KOH ($\mu\text{g}/\text{cm}^2$) and the enamel surface microhardness (%KHNalt) were also measured. The RM-ANOVA and Tukey (5%) tests were applied. For the mineral loss in enamel, the AA+F and AA+FS solutions were statistically superior ($p<0.001$). In dentin, the AA+F solution presented the best performance ($p<0.001$). The results of the %KHNalt were: C = Sn < AA = F = FSn < F+AA = FSn+AA. The FSn groups presented a higher concentration of fluoride adsorbed on the enamel and dentin surfaces ($p<0.05$).

It was concluded that aminomethacrylate was able to intensify the anti-erosion potential of fluoride solutions in the presence of the acquired film, being a promising polymer for the control of erosive wear.



PCL 55

Psychosocial Impact and Quality of Life after Bleaching with Different Desensitizing Strategies: A Randomized Clinical Trial

Silva JS*, Trinta LB, Souza YVMF, Nascimento-Neto IA, Costa SA, Favoreto MW, Lago ADN

Objective: To evaluate the psychosocial impact and quality of life after dental bleaching with the prior use of desensitizing agents. **Methods:** Seventy-two participants were divided into four groups: control (no desensitizer), potassium nitrate, Gluma Desensitizer, and the combination of both. All underwent three in-office bleaching sessions with 35% hydrogen peroxide. Sensitivity was assessed using a visual analog scale. Whitening effectiveness was measured using the Vita Classical, Bleachguide scales, and spectrophotometry (ΔE_{ab} , ΔE_{00} , ΔWID). Subjective outcomes were assessed with the PIDAQ and OHIP-14 questionnaires, applied before and after treatment. Data were analyzed using one-way ANOVA with Tukey's post hoc test, Chi-square test, and paired t-test. **Results:** Desensitizing groups showed significant improvement in PIDAQ domains, especially the combined group ($p < 0.001$), while the control group showed reduced self-confidence. OHIP-14 scores decreased significantly in all groups ($p < 0.001$), with the best result in the combined group ($p < 0.05$). Sensitivity was lower in desensitized groups, with no significant difference in color change ($\Delta E \approx 9.0$; $p > 0.05$).

Prior application of desensitizing agents enhanced comfort, preserved aesthetic outcomes, and improved quality of life, reinforcing their clinical use in dental bleaching protocols.



PCL 56

3rd Place
Honorable Mention

Influence of Hydrogen Peroxide Catalysis on the Cytocompatibility and Esthetic Efficacy of an In-Office Whitening Gel

Ribeiro RAO*, Peruchi V, Mon FKW, Soares IPM, Bolonhezi MF, Soares DG, Hebling J, Costa CAS

Aim: To evaluate the influence of the combined use of a nanofiber scaffold (NS), a polymeric catalyst primer (PCP) with 10 mg/mL peroxidase, and violet LED (vLED) on the whitening efficacy (WE) and trans-amelodentinal cytocompatibility (TC) of a gel containing 35% H₂O₂. **Methods:** Enamel/dentin discs were adapted to artificial pulp chambers. On the enamel surface, with or without the application of NS+PCP, the 35% H₂O₂ whitening gel was applied or not, generating the following groups (n=8): G1 - Negative control (no treatment); G2 - 35% H₂O₂/45 min; G3 - NS+PCP+35% H₂O₂/15 min + vLED/15 min. WE (ΔE_{00} and ΔWID) was assessed on the enamel/dentin discs. Extracts (culture medium + components diffused through the discs) were applied to 3D cultures of human dental pulp cells (HDPCs), which were then evaluated for TC (AlamarBlue) as well as gene expression (RT-qPCR) of inflammatory markers (TNF, IL1B, PTGS2, IL8, IL6, PPARG, HMOX1) and mineralization markers (DSPP, DMP1, SPP1, BGLAP, ALPL) (ANOVA/Tukey; $\alpha=5\%$). **Results:** WE was similar between G2 and G3 ($p>0.05$). Cells in G3 showed higher viability and lower oxidative stress (carboxy-H2DCFDA) compared to G2 ($p<0.05$). In G3, there was lower expression of inflammatory genes and higher expression of mineralization markers compared to G2 ($p<0.05$).

Conclusion: The combination of NS+PCP+vLED with a gel containing 35% H₂O₂ promotes a WE similar to the conventional in-office protocol, but in a shorter time. The evaluated whitening strategy reduces TC and modulates the expression of inflammatory and mineralization-related genes.

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PCL 57

Evaluation of light-curing devices used in a university dental clinic

Araújo DS*, Spigariol IM, Moreira JC, Dantas RVF, Gonçalves SR, Turbino ML, Shimokawa CAK

Objectives: To characterize the light-curing devices used in the dental clinic of the School of Dentistry at the University of São Paulo (USP) and to evaluate their efficiency in polymerizing resin discs. **Methods:** Forty-eight devices were analyzed. Radiant power was measured using the Bluephase Meter II, the radiometer attached to the base of the Optilight Prime, and the MSC15-W spectroradiometer, which also assessed the emission spectrum of the devices. Resin discs (12 mm x 2 mm) (Forma and Z350XT) were light-cured for 10 seconds. After 24 hours, microhardness (n=2) was measured (50 gf/15 s) at the center and in four directions on the top and bottom surfaces. Data were grouped according to irradiance (≤ 800 , 800-1600, and > 1600 mW/cm²), emission spectrum (single or multiple peaks), and tip diameter (< 9 mm or ≥ 9 mm). The t-test, Shapiro-Wilk, ANOVA, Tukey ($\alpha=0.05$), and Pearson correlation were used. **Results:** Devices with irradiance ≤ 800 mW/cm² showed lower hardness values ($p < 0.05$), except for Z350 on the top surface ($p > 0.05$). Devices with tips ≥ 9 mm resulted in higher hardness compared to those with tips < 9 mm ($p < 0.05$). Radiant emittance values obtained from the different radiometers showed a direct correlation among the evaluated devices ($p < 0.05$). A positive correlation between power and hardness was observed ($p < 0.05$), considering the MSC15-W and Bluephase Meter II radiometers ($r=0.84$).

Significant variability in irradiance was observed, even among units of the same model, potentially affecting resin composite polymerization.



PCL 58

Effect of Photoinitiator Concentration and Post-Curing on 3D Resin: Optimization of Mechanical and Optical Properties

Almeida EN*, Couto-Neto MP, Feiten ILA, Marques VN, Faria-E-silva AL, Cavalcante LMA, Schneider LFJ

Objective: To investigate the influence of photoinitiator concentration and post-curing time on the optical and mechanical behavior of a resin developed for 3D-printed provisional dental restorations. **Methods:** A photoinitiator-free resin (BioPrint Prov, Horus) was used as base. TPO was added at 0.5 wt%, 1.0 wt%, and 1.5 wt%. Specimens were printed using a DLP printer (AnyCubic Mono 4) in disc (color) and bar (mechanical) formats. Post-curing was performed for 30, 45, or 60 minutes (Crealight UW-03), and a non-post-cured group served as control. Color was evaluated by spectrophotometry (CIELab) at three time points: pre-post-curing, immediately after, and after one week of dry storage. Flexural strength was measured using a three-point bending test. Statistical analysis included ANOVA/Tukey or Kruskal-Wallis. **Results:** The 1.0 wt% TPO group post-cured for 30 minutes showed the lowest ΔE and b^* values and the highest flexural strength. Higher TPO levels (1.5 wt%) and longer curing (45-60 min) led to greater ΔE . Storage increased ΔE and b^* in all groups, especially in the control.

Conclusion: Resin with 1.0 wt% TPO and 30-minute post-curing showed a favorable balance between color stability and mechanical performance, supporting the development of efficient protocols using low photoinitiator content and shorter curing times.



PCL 59

Characterization of highly filled printable resins: An optical and mechanical perspective

Couto-Neto MP*, Almeida EN, Feiten ILA, Marques VN, Alves WP, Motta LG, Schneider LFJ, Cavalcante LMA

The aim of this study was to characterize different 3D-printed materials considered for definitive use, comparing them to a control group. Printed samples were designed in two specific formats: disks ($n = 5$) and bars ($n = 20$) and 3D-printed (FlashForge Hunter) using the following composites: Smart Print Bio Vitality (Smart Dent) and Varseo Smile Crown Plus (Bego). These were cleaned and post-cured in a Wash and Cure unit (Creality) for 30 minutes. The control group (Z350) was fabricated using conventional molds. Flexural strength tests were conducted at two time points. Disk-shaped samples were evaluated for color, translucency, and surface roughness at two intervals. Data were analyzed using ANOVA and Tukey's test ($\alpha = 0.05$). All groups showed reduced elastic modulus and flexural strength values over time, but only the Z350 group exhibited a statistically significant reduction. Significant color variation was observed between time points. All materials showed a significant increase in translucency after aging. The control group (Z350) had a non-significant increase in roughness, whereas Vitality and Varseo materials displayed a significant increase.

In conclusion, all evaluated materials underwent changes after aging. However, the 3D-printed materials showed more pronounced variations over time, highlighting the need for further studies to optimize their properties and clinical performance.





PIC

Undergraduate
Research Fellowship

PIC 1

1st place
MARIA SALETE CÂNDIDO
Award



Analysis and Comparison of the Physical and Mechanical Properties of 3D-Printed Resins with Conventional and Milled Resins

Uno TK*, Gracia E, Lopez TT, Mayer E, Trevelin LT

Introduction: 3D printing has revolutionized dentistry by enabling fast, customized, and cost-effective fabrication. However, its mechanical properties remain controversial, requiring comparison with well-established materials. Objective: To compare the mechanical properties of 3D-printed, conventional, and milled resins. Materials and Methods: Discs (n=12) measuring 12 mm in diameter and 1.2 mm in thickness, shade A2, were fabricated using five different restorative materials: Z350 Composite Resin (3M); VarseoSmile Crown Bego; BioCrown-Prizma-Markertech; Brava Glass-Ceramic Composite (FGM); and PProCrown-Straumann. These were tested until fracture to assess flexural strength and elastic modulus. The fractured specimens were embedded in acrylic resin (JET) and polished for Knoop microhardness testing, using a 1.96 N load for 15 seconds at five surface points of each sample. Data were analyzed using one-way ANOVA and Tukey's test ($p < 0.05$). Results: Z350 (83.25 HK) exhibited the highest microhardness, followed by Brava (67.5 HK), while Prizma and Bego (19.86 and 25.78 HK, respectively) had the lowest. Straumann and Brava showed higher flexural strength values (232.07 and 219.51 MPa, respectively), whereas Z350 had the lowest (114 MPa). Brava presented the highest elastic modulus (14.45 GPa) and Prizma the lowest (3.28 GPa).

The 3D-printed resins demonstrated satisfactory mechanical properties, particularly Straumann, which shows promising potential for future clinical application.



PIC 2

2nd Place
Honorable Mention**Adhesion of Universal Adhesives to Lithium Disilicate Ceramic**

Montagner IB*, Moreira PM, Araújo-Neto VG, Giannini M

To evaluate the bond strength (BS), failure patterns and reactivity of silane in universal adhesives (SC-UAs) to lithium disilicate glass ceramic. Ceramic plates were etched with hydrofluoric acid for 20 s, ultrasonic bath for 5 min and divided into the following treatments (n=15): Control: silane (Ceramic Primer, Solventum) + adhesive (Scotchbond Multi-Purpose, Solventum); CUBQ: Clearfil Universal Bond Quick (Kuraray); SBUP: Scotchbond Universal Plus (Solventum); OC7U: One Coat 7 Universal (Coltene); AAPU: Ambar APS Universal (FGM); UBII: Universal Bond II (Tokuyama). Adhesives were light-cured for 10 s using valo x (Ultradent). Composite resin cylinders were constructed on the ceramic using flowable resin (Clearfil AP-X, Kuraray) and light-cured for 20 s. Failure modes were analyzed under a digital microscope. The reactivity of SC-UAs and pure silane to ceramic was evaluated by FTIR ATR analysis (n=3). BS data was analyzed by one-way ANOVA and Tukey test ($\alpha=0.05$). No significant differences in BS were found among Control, AAPU, and SBUP, which showed higher BS. CUBQ and UBII showed intermediate BS, while OC7U the lowest. Adhesive failures were most frequent in AAPU (100%), followed by SBUP and UBII (90%), CUBQ (80%), Control (74%), and OC7U (60%). For reactivity analysis, siloxane bonds (Si-O-Si; 1120 cm^{-1}) were observed in SBUP, UBII, and Control. OC7U showed weak peaks, while no peaks were detected for CUBQ. BS and silane reactivity depended on the SC-UA type

BS and reactivity of silane to ceramic depended on the type of SC UAs used.



PIC 3

Impact of Microabrasion and a Remineralizing Agent Before In-Office Bleaching on Hydrogen Peroxide Permeability

Silva NG*, Condolo L, Cruz KR, Lima RR, Reis A, Matos TP, Loguercio AD, Favoreto MW

This in vitro study evaluated hydrogen peroxide (HP) penetration into the pulp chamber, bleaching efficacy, and enamel surface morphology of human teeth subjected to enamel microabrasion (MA) combined with in-office bleaching (IB), with or without the application of the remineralizing agent casein phosphopeptide-amorphous calcium phosphate (CPP-ACP). Forty sound premolars were randomly assigned to four groups: no treatment (CONT), IB only, MA followed by IB (MA+IB), and MA followed by CPP-ACP and then IB (MA+CPP-ACP+IB). HP concentration in the pulp chamber was measured using UV-Vis spectrophotometry, while bleaching efficacy was assessed with a digital spectrophotometer. Surface morphology was examined using scanning electron microscopy (SEM), and data were statistically analyzed. The CONT group showed the lowest HP penetration compared to all experimental groups, while the MA+IB group exhibited significantly higher HP levels than the IB and MA+CPP-ACP+IB groups. All experimental groups demonstrated significant color changes, except the CONT group. The MA+IB group showed more surface grooves on the enamel compared to the MA+CPP-ACP+IB group, which exhibited deposits of the remineralizing agent.

The combination of MA and IB increases HP penetration into the pulp chamber, but the application of CPP-ACP after MA can mitigate this effect without compromising bleaching efficacy. The use of the remineralizing agent CPP-ACP following microabrasion may help reduce HP levels in the pulp chamber while maintaining whitening effectiveness.



PIC 4

3rd Place
Honorable Mention**At-Home Dental Bleaching in Young and Middle-Aged Adults: A Double-Blind, Parallel, Non-Randomized Clinical Trial**

Perlott GP*, Forville H, Dias RM, Bosco LD, Loguercio AD, Matos TP, Reis A, Favoreto MW

This double-blind, parallel, non-randomized clinical trial evaluated the effectiveness of at-home dental bleaching in two age groups: young adults (15-24 years) and middle-aged adults (45-78 years). The study also assessed the intensity and risk of tooth sensitivity (TS), gingival irritation (GI), and participants' aesthetic self-perception. A total of 130 individuals (65 per group) underwent bleaching with 10% carbamide peroxide for 2 hours daily over 21 days. Color change was measured using a digital spectrophotometer (VITA Easyshade) with ΔE_{ab} , ΔE_{00} , and Whiteness Index for Dentistry (ΔWID) parameters, in addition to visual shade guides (VITA Classical and Bleachedguide; ΔSGU). The intensity and risk of TS and GI were assessed using a 0-10 visual analog scale. The Orofacial Esthetic Scale (OES) was administered before and after treatment. Bleaching efficacy was significantly higher in the younger group, with a mean ΔE_{ab} difference of 6.3 (90% CI: 4.8 to 7.7). While the risk of TS was similar between groups ($p > 0.05$), middle-aged participants exhibited a 30% lower risk of GI (RR = 0.7; 95% CI: 0.5 to 2). TS intensity did not differ between groups ($p > 0.4$), but GI intensity was significantly lower in the middle-aged group ($p = 0.02$). All OES items improved significantly in both groups ($p < 0.05$).

Younger participants achieved greater whitening efficacy, while adverse effects were similar between groups. The procedure positively impacted aesthetic self-perception regardless of age.



PIC 5

Light-Curing Time and Thermal Behavior of Gingival Barriers Used During In-Office Dental Bleaching

Teixeira MB*, Wendlinger M, Cochinski GD, Barbosa LMM, Oliveira VB, Reis A, Loguercio AD, Favoreto MW

This in vitro study evaluated the degree of conversion (DC) and temperature variation (TV) of different light-cured gingival barriers (GBs) subjected to two light-curing irradiance settings and increasing exposure times. A total of 576 specimens were allocated into 72 groups ($n = 8$) based on three factors: (1) GB type (Gingival Barrier - SDI; Lase Protect - DMC; OpalDam - Ultradent; Potenza Blocco - PHS; Top dam - FGM; and Total Blanc Protetor Gengival - DFL), (2) exposure times (3, 5, 10, 15, 20, and 30 s), and (3) LED curing unit settings (900 mW/cm² at 1 mm or 450 mW/cm² at 10 mm). DC was measured using micro-Raman spectroscopy. TV was assessed in 360 simulated GB applications ($n = 5$) using a T-type thermocouple positioned at the cervical area of incisor models. Data were analyzed using three-way ANOVA and Tukey's post-hoc test. DC was significantly affected by all variables ($p < 0.00001$). At 900 mW/cm², most GBs reached >50% DC after 10 s, with a maximum of 87% after 30 s. At 450 mW/cm², at least 20 s were required to achieve acceptable DC, with a maximum of 75% after 30 s. Temperature rise varied across conditions; OpalDam and Potenza Blocco exceeded 50 °C after 30 s at 900 mW/cm² ($p < 0.03$), while the lower irradiance resulted in milder thermal changes.

A 10-second photoactivation at 1200 mW/cm² ensures adequate polymerization for most GBs. Longer exposures improve DC but may lead to excessive heat. At 600 mW/cm², at least 20 seconds are required to achieve sufficient DC with lower thermal risk.



PIC 6

Tooth Sensitivity in Different Arches After In-Office Bleaching: A Multicenter Randomized Clinical Trial

Pereira LFP*, Silva KL, Hul EA, Cruz KR, Reis A, Matos TP, Loguercio AD, Favoreto MW

This multicenter randomized clinical trial compared the risk and intensity of tooth sensitivity (TS) and gingival irritation (GI), as well as the bleaching efficacy (BE) in the maxillary and mandibular arches following in-office bleaching. Ninety participants were randomized across two centers into two groups according to the treated arch (maxillary or mandibular). Each patient underwent two bleaching sessions with a 35% hydrogen peroxide gel (Total Blanc One-step, DFL) applied for 30 minutes per session, with a one-week interval. TS and GI were recorded immediately, at 1 h, 24 h, and 48 h post-treatment using a Visual Analog Scale (VAS) from 0 to 10. BE was assessed before treatment and 30 days after completion using subjective shade guides [Δ SGU] and a digital spectrophotometer (CIELab [Δ Eab], CIEDE2000 [Δ E00], and Whiteness Index [Δ WID]). TS and GI were compared using the McNemar test and paired t-test. BE outcomes were analyzed using the Wilcoxon test (Δ SGU) and paired t-test (Δ Eab, Δ E00, and Δ WID) ($\alpha = 0.05$). The risk and intensity of TS were significantly higher in the mandibular arch ($p < 0.003$). No significant differences in GI were observed between arches ($p > 0.38$). Both arches demonstrated significant BE across all parameters, with no differences between them ($p > 0.08$).

In-office bleaching induces a higher risk and intensity of tooth sensitivity in the mandibular arch compared to the maxillary arch, without significant differences in gingival irritation or bleaching efficacy.



PIC 7

Effect of Boiling Water Heat Treatment on the Properties of 3D-Printed Resins

Marques VN*, Schneider LFJ, Cavalcante LMA, Guimarães-Junior VO, Almeida EN, Feiten ILA, Couto-Neto MP, Nogueira VP

Objective: To evaluate the effect of additional heat treatment in boiling water on the flexural strength, Knoop microhardness, and optical properties of the 3D-printed resin BioPrint Crown (Horus - shade BL). **Methods:** Disc-shaped (10×2 mm) and bar-shaped (25×2×2 mm) specimens were 3D printed. G1 was the negative control (no post-curing), and G2 was the positive control (60-minute post-curing). G3, G4, and G5 underwent the same post-curing process and were then subjected to heat treatment in boiling water for 1 minute, 2 minutes and 30 seconds, or 5 minutes, respectively. Three-point flexural tests, Knoop microhardness testing (10 g/5 s), and optical evaluation (color/translucency) based on the CIEDE2000 color space were performed. Statistical analysis was conducted using ANOVA and Kruskal-Wallis tests ($\alpha=0.05$). **Results:** Microhardness increased in the treated groups (G3=27.7; G4=27.7; G5=28.1) compared to G2 (12.2). G5 exhibited the highest flexural strength (134.7 MPa) and elastic modulus (2144 MPa). Optical analysis revealed intergroup variations with no pattern of degradation.

Conclusion: Boiling water heat treatment significantly increased the hardness and strength of the printed resins, while maintaining visual stability.



PIC 9

Evaluation of the Bond Strength of Universal Adhesives to Human Dentin Using Different Strategies and the Influence of Chlorhexidine

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Objective: To evaluate, using the microtensile bond strength (μ TBS) test, the adhesive performance of two universal adhesives-Single Bond Universal (SBU) and Prime & Bond Universal (PBU)-on human dentin, comparing adhesion strategies and assessing the effect of chlorhexidine (CHX). **Materials and Methods:** Seventy-two human teeth were divided into 12 groups ($n = 6$), with six strategies per adhesive (acid-etched and dry; acid-etched and wet; unetched, with/without CHX). The smear layer was standardized using 600-grit Al_2O_3 sandpaper. Teeth were restored with Z350 XT composite. Specimens (1×1 mm; ≥ 7 /tooth) were tested in a universal machine (0.5 mm/min). Data were analyzed using ANOVA and Tukey's HSD ($\alpha = 0.05$). **Results:** At 24h, without CHX, the highest μ TBS occurred in acid-etched groups: $SDU > SDS > SAC$ and $PDU = PDS > PAC$. Between adhesives, significant difference appeared only in self-etch mode ($SAC > PAC$). With CHX applied 24h prior, μ TBS increased in SDS-C and PDU-C.

Conclusion: CSBU and PBU had higher μ TBS with etch-and-rinse. In self-etch, SBU outperformed PBU. CHX improved bonding in SDS-C and PDU-C.



PIC 10

EFFECTIVENESS OF TRY-IN PASTES TO PREDICT THE CEMENTATION SHADE OUTCOME

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The aim of this study was to evaluate the effectiveness of try-in pastes in predicting final shade after cementation of indirect veneers. To simulate the tooth structure (background color), 90 discs (6 mm x 3 mm) were prepared using GradioSO Heavy Flow resin composite (Voco) in shades A1, A2, and A3. Another 90 discs, 0.5 mm thick, simulated the veneers. Veneer Resin Cement (Voco) and try-in pastes in Translucent (T), Natural Opaque (NO), and White Opaque (WO) shades were used. A thin layer of try-in paste was applied to the veneer, placed over the corresponding background disc under a standardized load. Color was measured using a spectrophotometer (CM2600d, Konica Minolta). After separation, the process was repeated with the definitive cement. Color difference (Delta E00) was calculated. Two-way ANOVA and Tukey's test were used for analysis. Significant differences were found for "Background/Veneer Shade," "Try-in/Cement Shade," and their interaction ($p < 0.05$). Tukey's results: A2/NO-0.49(0.22)a, A2/T-0.56(0.16)a, A3/NO-0.85(0.21)b, A3/WO-0.88(0.17)b, A3/T-1.13(0.20)bc, A1/T-1.36(0.14)cd, A1/NO-1.36(0.12)cd, A1/WO-1.57(0.15)de, A2/WO-1.65(0.3)e. Groups with the same letters did not differ significantly.

Accordingly, no significant differences were found between the results obtained with the try-in pastes and the final cement only for background/veneer shade combinations A1 and A3. The color difference magnitude depends on the background/veneer shades, being greater for A1 and smaller for A2 and A3.



PIC 11

Influence of UV Light Wavelength on the Fluorescence of Composite Resins

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Objective: The objective of the study was to evaluate the influence of ultraviolet light wavelength on the intensity of fluorescence emitted by composite resins. **Method:** Disc-shaped specimens were obtained using 30 different brands of composite resins, and sound human teeth were selected as controls. The specimens were photographed inside a standardized light box, illuminated with wavelengths of either 365 nm or 395 nm. The images obtained were converted to the CIE Lab standard using Adobe Photoshop, and the L* values were obtained for each specimen, representing the fluorescence value. Data were analyzed using two-way ANOVA (wavelength x type of resin) and Tukey's test, with a significance level of 5%. **Results:** ANOVA showed significant differences for all factors ($p < 0,05$). Tukey's test results for the wavelength factor were: 365nm-34,10(10,88)a, 395nm-58,39(26,02)b. The different resins exhibited varying levels of fluorescence, with some higher and others lower than natural teeth.

Conclusion: We concluded that the wavelength of ultraviolet light significantly influenced the intensity of fluorescence emitted by composite resins, with higher emission observed at 395nm.



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