
73rd ORCA Congress Zagreb, Croatia

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Abstracts

Conflict of Interest Statement

The abstracts were reviewed and selected by the Scientific Committee responsible for Abstract Selection. The Committee has no conflicts of interest in connection with the congress and the selection of abstracts. Members of the Committee with submitted abstracts were not involved in their review.

An asterisk (*) indicate presenting authors.

Group authors are listed in the Supplementary file



Dear Colleagues and Friends,

It is my great pleasure to welcome you to Zagreb and to invite you to explore the Abstract Book of the 73rd ORCA Congress. This collection brings together the scientific contributions of researchers, clinicians, and educators from around the world, showcasing the latest advances in cariology, preventive dentistry, oral epidemiology, and related fields of oral health management.

The abstracts presented in this volume reflect the dedication, creativity, and scientific excellence of our international ORCA community. They highlight the diversity of ongoing research and provide a valuable opportunity to exchange knowledge, inspire new ideas, and foster collaborations that will contribute to improving oral health worldwide.

I would like to express my sincere gratitude to all authors for sharing their work and for their active participation in the 73rd ORCA Congress. My heartfelt thanks also go to the reviewers and members of the Scientific and NCJSA Committees, whose commitment, expertise, and invaluable efforts have helped ensure the highest quality of this publication.

I hope that this Abstract Book will serve not only as a guide to the scientific program but also as a source of inspiration throughout the Congress. May it stimulate engaging discussions, encourage meaningful exchanges, and foster new professional friendships and collaborations.

On behalf of the Local Organizing Committee, I am delighted to welcome you to Croatia and to our beautiful capital city of Zagreb. I wish you a successful and enjoyable Congress, filled with inspiring scientific discoveries, fruitful exchanges of ideas, and memorable encounters with colleagues from around the world. I also hope that you will have the opportunity to experience the warmth, culture, and hospitality of our city and country.

May your time here be both professionally rewarding and personally enriching, and may the connections made during this Congress continue to inspire future collaborations long after the meeting has concluded.

With kind regards,

Hrvoje Jurić
Co-President
73rd ORCA Congress
Zagreb, Croatia

Poster, poster presentation and oral sessions

Thursday afternoon

1. Poster presentation: Nathan Cochrane I
2. Poster presentation: Erosion
3. Poster presentation: Nathan Cochrane II
4. Poster presentation: Diagnosis and Public Health

Friday morning

5. Poster I: Clinical studies and Public Health
6. Poster II: Demineralization-remineralization, Erosion, Fluoride, Pulp-Dentinal Reactions, Behaviour
7. Poster III: Microbiology, Epidemiology, Education
8. Poster presentation: Clinical studies
9. Poster presentation: Microbiology, Artificial Intelligence and Pulp-Dentinal Reactions

Friday afternoon

10. Poster presentation: Demineralisation-remineralisation
11. Poster presentation: Epidemiology
12. Poster presentation: Fluoride
13. Poster presentation: Behaviour and Education

Saturday morning

14. Oral presentations

Poster presentation

Nathan Cochrane I

001 Time-dependent autofluorescence development in an in-vitro three-species caries biofilm

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In mature plaque, cariogenic bacteria produce metabolites emitting yellow, orange and red autofluorescence when excited at 405nm. This study aimed to examine autofluorescence development in an in vitro three-species caries biofilm over time. *S. mutans* (DSM20523), *A. naeslundii* (DSM43013) and *S. odontolytica* (DSM19120) were rehydrated and grown anaerobically overnight. Cultures were adjusted to OD₆₀₀=0.5 in caries biofilm medium (BCM) enriched with 0.1mM aminolevulinic acid. Equal volumes were mixed to form the inoculum. Following pellicle formation by incubating with artificial saliva at 21°C for 1 h, biofilms were formed in 24-well polystyrene-plates and incubated anaerobically for 4 h. Single-species biofilms were similarly prepared. Incubation took place aerobically at 37°C in a fluorescence spectrometer (CLARIOstar Plus, BMG Labtech, Germany) for 162.5 h. Biofilms were excited at 405 nm and fluorescence emission between 540 nm and 700 nm was recorded every 2.5 h. Peaks were identified at 582 nm (yellow), 624 nm (orange) and 682 nm (red), with the strongest fluorescence observed at 582 nm. The weaker 682 nm peak fluctuated over time, persisting only in *A. naeslundii* biofilms. *S. mutans* biofilm did not show significant fluorescence in the yellow to red spectrum, whereas *A. naeslundii* and *S. odontolytica* single-species biofilms fluoresced strongly. The earliest autofluorescence appeared in *A. naeslundii* biofilm after 5 h, while the three-species biofilm showed first signs of autofluorescence after 22.5 h. Although the autofluorescence spectra of *A. naeslundii* and the three-species biofilms were similar, *S. odontolytica* fluoresced more intensely and for longer. This study demonstrates that a three-species caries biofilm exhibits time-dependent red fluorescence when incubated in the presence of aminolevulinic acid, whereas a monospecies *S. mutans* biofilm did not. The autofluorescence intensity generally increased over time, indicating accumulation of fluorophores in the biofilm.

002 Radiographic Progression of Initial Proximal Caries in High-Risk Adolescents: 12-Month Pilot Study

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This pilot study investigated the natural progression of initial proximal caries lesions in permanent premolars and molars in adolescents with high caries activity over a 12-month period via bitewing radiographs despite covered in-office prevention. Teenagers aged up to 17 years, with at least one active proximal lesion in initial stages (RA1-RA3) in permanent teeth and presence of gingival bleeding on probing, participating in the control group of an ongoing RCT (DRKS00034145) on proximal caries management, were included. All participants received standard preventive care, including dietary/oral-hygiene counselling, professional flossing, fluoride varnish (22,600 ppm, up to 4x/year), and weekly at-home fluoride gel. Bitewing radiographs were taken at baseline and again after ≥ 11 months. Two blinded examiners evaluated lesion changes using the ICDAS radiographic classification system. Twelve adolescents (mean age 15.1 ± 1.2 yrs) with 105 proximal lesions completed 1-year follow-up (mean: 13.7 ± 1.9 months). Attendance at preventive visits was as follows: 3 months: 8/12 (67%), 6 months: 8/12 (67%), 9 months: 9/12 (75%), 12 months: 12/12 (100%). Overall, 39 lesions progressed (37.1%, McNemar-test, $p < 0.001$), none regressed. Lesions classified as RA2 or RA3 at baseline showed a higher risk of progression than RA1-lesions, with progression rates of 42.9% for RA3, 38.2% for RA2, and 31.6% for RA1. This pattern indicates increased vulnerability in deeper baseline lesions. Additionally, 28 new proximal lesions (RA1: $n=20$, RA2: $n=11$) were detected during the study period. Initial proximal lesions in high-risk adolescents showed radiographically significant progression over 12 months despite in-office-care. High proportion of progressed and newly developed proximal lesions in permanent teeth underscores the importance of early detection and strengthened non-operative preventive strategies in this vulnerable age group.

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003 A 3D-printed device for cariogenic *S. mutans* biofilm formation enabling three-dimensional architectural analysis

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Most conventional in vitro cariogenic biofilm models depend on destructive sampling, limiting the analysis of intact three-dimensional biofilm architecture. This study aimed to adapt an established *Streptococcus mutans* model by incorporating digital design and 3D printing to allow visualization and analysis of undisturbed biofilm architecture under cariogenic conditions. *S. mutans* UA159 biofilms (n=8) were formed on saliva-coated bovine enamel or resin slabs vertically suspended in a novel 3D-printed grid and incubated in ultrafiltered tryptone-yeast extract broth at 37°C and 10% CO₂ for 5 days, with 1 min exposure to 10% sucrose 8 times a day. After 48 h, some biofilms were analyzed as baseline, while others were grown for additional 3 days and treated twice daily (1 min) with 0.9% NaCl, 0.012%, 0.024% or 0.12% chlorhexidine (CHX), or 0.05% NaF. Biomass, viable bacteria, matrix composition, enamel mineral loss and pH were assessed. Undisturbed biofilms were stained and analyzed by confocal laser scanning microscopy followed by three-dimensional reconstruction. Data were analyzed using one-way ANOVA and Tukey's post hoc test ($\alpha = 5\%$). Biomass was lower in CHX-treated groups (0.9 ± 0.07 , 0.6 ± 0.1 and 0.3 ± 0.06 mg protein) than in NaCl (1.8 ± 0.3) and NaF (1.6 ± 0.3). Surface hardness loss was lower in the 0.024% and 0.12% CHX and NaF groups (19.1 ± 13.9 , 6.2 ± 5.5 and $21.0 \pm 8.8\%$, respectively) than in NaCl ($58.5 \pm 17.7\%$). Viability was lower with 0.12% CHX ($9.8 \pm 18 \times 10^6$ CFU/mg protein) than with NaCl ($2.9 \pm 2 \times 10^9$) and NaF ($1.9 \pm 3.2 \times 10^9$). The device preserved intact biofilm architecture while maintaining cariogenic responsiveness, supporting its use for three-dimensional evaluation of anti-cariogenic interventions.

004 Two-Year Clinical Outcomes of SMART Restorations in Primary Teeth: Retrospective Analysis

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Minimal Intervention Oral Care, including caries inactivation and less invasive restorative procedures, has become increasingly important in paediatric dentistry, replacing traditional “drill and fill” approaches and mindset. Aim: This retrospective study assessed the clinical outcomes of silver-modified atraumatic restorative treatment (SMART) using different restorative materials (e.g., glass ionomer cements (GIC), preformed metal crowns using the Hall Technique (HT), composite strip crowns, etc.) for managing carious lesions (ICDAS 3-6) in primary teeth in a specialised paediatric dentistry setting. Methods: Digital records from the Pediatric Dentistry Department, University of Greifswald, were retrospectively analysed (2018-2023) for treatments involving silver diammine fluoride (SDF). Two-year outcomes (success, minor failure, major failure) were evaluated according to patient-related (age, medical history, caries experience [dmft/DMFT]) and tooth-related factors (tooth type, caries and pulpal diagnosis). Statistical analyses included Kaplan–Meier survival analysis with group comparisons using Mantel–Cox statistics. Results: Of 831 screened patients, 226 children with 1,271 SDF-treated primary teeth met the inclusion criteria; 549 teeth (43.2%) received SMART restorations. The mean age at treatment was 5.6 ± 2.2 years, with a baseline caries experience of 5.73/0.16 dmft/DMFT. At 2 years, SMART restorations achieved a high overall success rate (90.9%), with 6.4% minor and 2.7% major failures ($p < 0.001$). Failure was mainly due to restoration loss (62.9%), followed by fracture (20.0%) and secondary caries (17.1%). Hall crowns showed the highest survival, while conventional GIC performed least favourably. Success varied significantly by tooth type, with first primary molars showing the best outcomes ($p < 0.05$), whereas medically compromised children had outcomes comparable to healthy peers ($p > 0.05$). Conclusion: SMART was highly effective for managing carious lesions in primary teeth, with success rates exceeding 90% at 2 years, supporting its reliability and suitability for diverse paediatric populations.

005 Extraction Bias Affects Detection of Cariogenic Bacteria Across Oral Sample Types

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Accurate characterization of the oral microbiome in cariology depends on reliable detection of cariogenic bacteria across diverse oral niches. This study aimed to compare DNA extraction workflows for their suitability in cariology-focused oral microbiome analysis. Three DNA extraction strategies were evaluated using a fully paired experimental design: the QIAamp DNA Microbiome protocol (QIAamp), a pre-commercial Tissue Microbiome kit optimized for host DNA depletion (TM), and a hybrid protocol combining DNeasy PowerBiofilm mechanical disruption with QIAamp host DNA depletion enzymes (QP). Saliva, tongue, mucosa, plaque, and in-situ biofilm samples (n = 30) were collected from three healthy volunteers at two time points and processed in parallel using all workflows. DNA yield and quality were assessed, followed by shotgun metagenomic sequencing (5 Gb raw data per sample n=24) and taxonomic profiling with a focus on cariogenic bacteria. QP consistently produced the highest DNA yields across all oral sample types while maintaining low host DNA levels. TM achieved the most effective host DNA depletion but yielded lower microbial DNA amounts. Community structure was primarily driven by sample type, with extraction-dependent differences most pronounced in plaque and in-situ biofilm samples. In paired comparisons, detection of low-abundance Gram-positive cariogenic taxa—including *Scardovia wiggsiae*, *Actinomyces naeslundii*, and *Bifidobacterium* species—varied by extraction workflow. TM showed more frequent detection dropouts of these taxa in plaque and biofilm samples, whereas QP demonstrated greater robustness with fewer complete losses. QIAamp exhibited intermediate performance. In conclusion, DNA extraction workflow selection significantly influences the detectable cariogenic microbiome across oral sample types. The hybrid QP protocol provides balanced performance for cariology-focused microbiome studies, particularly for plaque and biofilm samples central to dental caries research.

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006 Mapping Matrix Carbohydrate Networks in Oral Biofilms: A Colocalization-Based Approach

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The dental biofilm matrix is an essential determinant of virulence and plays an important role in the caries process. In addition to glucans, which have been studied extensively, galactose- and fucose-based carbohydrates have been identified as primary components of the dental biofilm matrix. This study used a digital-image-analysis-based approach to investigate the spatial relationship between biofilm matrix carbohydrates and the bacterial genera *Streptococcus* and *Veillonella* in a complex saliva-derived model of dental biofilm, in order to identify likely producers of specific matrix components. Biofilms, grown with (SUC) and without (NoSUC) 1% sucrose, were subjected to fluorescence-*in-situ*-hybridization combined with lectin-binding-analysis and fluorescence-dextran-mapping to visualize streptococci, veillonellae and galactose- (GAL), fucose- (FUC) or glucose-based (GLC) matrix carbohydrates. Samples were imaged by confocal microscopy, and a tile-based colocalization analysis was performed. Images were partitioned into 3- μm^2 -sized tiles, and for each matrix component, the percentage of tiles containing specific bacterial and matrix signals (Coloc%) was computed and compared using linear modelling followed by Tukey-adjusted pairwise comparisons. Biofilms grown with sucrose harbored higher amounts of streptococci (83.6% vs. 32.3%) and of all three investigated matrix components (GAL: 233.7% vs. 27.3%; FUC: 256.0% vs. 45.3%; GLC: 234.0% vs. 1.0%), normalized to the bacterial biovolume. The abundance of veillonellae was higher in biofilms grown without sucrose (16.6% vs. 3.1%). For all three investigated matrix components, Coloc% was significantly higher with streptococci than with *Veillonella spp.* (SUC-GAL: 41.7% vs. 1%, $p<0.0001$; SUC-FUC: 46.8% vs. 1.7%, $p<0.0001$; SUC-GLC: 38.5% vs. 0.7%, $p<0.0001$; NoSUC-GAL: 52% vs. 21.2%, $p<0.0001$; NoSUC-FUC: 64.8% vs. 14.8% , $p<0.0001$; NoSUC-GLC: 69.7% vs. 29.8%, $p<0.0001$). This suggests that streptococci are not only involved in the production of glucans, but also of galactose- and fucose-based matrix carbohydrates.

Funded by the Danish Dental Association.

007 Longevity of direct restorations in patients with erosive tooth wear

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The aim of this retrospective non-interventional clinical study was to evaluate the success of direct restorations during the rehabilitation of patients with erosive tooth wear (ETW). We screened the clinical records of patients diagnosed with ETW treated at the university and selected only rehabilitations performed with direct restorations. Data from 68 patients (1,724 restorations) were collected and analyzed. Restoration success was assessed using Kaplan-Meier analysis, with failure defined as any intervention. Cox proportional hazard models were applied to evaluate the association between clinical-related factors on restoration failure over time. Within a mean follow-up period of 61 (range:0-308) months 171 restorations failed. The annual failure rate was 2.0%. The main failure reason was erosive progression (n=63), restoration fracture (n=59), debonding (n=21) and (secondary) caries (n=19). Multivariate analysis revealed that failure rates were significantly lower in patients with bulimia or anorexia compared with those without these conditions (HR [95%CI] = 12.4 [1.9–79.8]; p=0.008). Reduced salivary buffer capacity and flow rate were associated with significantly higher failure rates compared with high buffer capacity (HR [95%CI] = 6.1 [2.5–15.0]; p<0.001) and normal salivary flow rate (HR [95%CI] = 8.7 [2.0–37.4]; p=0.003). Direct restorations demonstrated low annual failure rates of 2.0% over observation periods of up to 25 years and represent a viable long-term treatment option for the rehabilitation of erosive tooth wear. Restoration failures were significantly influenced by patient- and toothrelated factors.

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008 Long-term prospective evaluation of hypersensitivity of MIH-molars treated with glass-ionomer-cement and/or silver fluoride (SMART) in school children

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Objective: This prospective clinical study aimed to evaluate the long-term efficacy of glassionomer-cement (GIC) and/or silver-fluoride (AgF; SMART technique) in reducing hypersensitivity in permanent molars affected by molar incisor hypomineralisation (MIH) after more than 12 months. **Materials and Methods:** Children presenting with MIH-affected permanent molars classified with MIH treatment need index (MIH-TNI) grades 3 or 4, referring to hypersensitivity, were included within two separate originally mid-term prospective studies. All teeth had received desensitization treatment with either GIC (Ionostar Plus, VOCO GmbH) or AgF (Riva Star Aqua®, SDI Limited) at least 12 months prior to follow-up. The degree of hypersensitivity was assessed using the Schiff-Cold-Air Sensitivity-Scale (SCASS: 0-3) at baseline and at >12-month follow-up. Patient reported pain was evaluated using the Wong-Baker Faces Scale (WBFS: 0-10). Children's behaviour and acceptance of treatment were recorded using the Frankl Behaviour Rating Scale (FBRS: 4 definitely positive to 1 definitely negative behaviour). **Results:** A total of 29 participants (60 hypersensitive MIH-affected molars) of the 43 recruited patients (83 teeth) were included. The mean age at baseline was 8.97 ± 1.55 years, and the mean follow-up period was 30.76 ± 5.43 months. In the final follow-up, overall behaviour during evaluation was positive (mean FBRS score: 3.40 ± 0.82). Patient-reported pain assessed using WBFS showed a mean score of 0.97 ± 1.76 indicating slight to no discomfort associated with the sensitivity assessment (vs. baseline: 5.76 ± 2.58). Even further reduction in hypersensitivity was observed at the last follow-up, with the mean SCASS score being significantly lower (0.57 ± 0.95 ; $p < 0.001$) compared to baseline (2.61 ± 0.49) and the 3 months follow-up (0.89 ± 1.05). **Conclusion:** GIC coverage and/or AgF application is an effective approach for providing not only immediate and mid-term, but also long-term relief from hypersensitivity in MIH affected molars among school children.

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009 Effect of general anaesthesia settings on outcomes of fillings and preformed crowns in primary molars

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This retrospective cohort study assessed the effect of presumed general anaesthesia (GA), inferred from the number of teeth treated per appointment, on major treatment failure (extraction or endodontic treatment) of different-sized fillings and preformed metal crowns (PMCs) in primary molars. Billing data (2013-2020) from the Westphalia-Lippe Statutory Health Insurance Dentists' Association were analysed for 255,948 initial restorations in 90,392 children aged 2.5-5 years. Median follow-up was 5.4 years (Q1: 3.5; Q3: 7.8). The number of simultaneously treated teeth per appointment was categorised (1, 2, 3-5, 6-11, 12-20) and used as an indicator of treatment setting. Appointments involving ≥ 6 treated teeth were considered indicative of GA. Cox proportional hazards models assessed associations between treated teeth and time to major failure, analysed by restoration type and size (reference: single tooth treatment). For fillings, major failure occurred less with more teeth treated per appointment, up to 6-11 teeth. In this group, the hazard of major failure was reduced by 30% for single-surface fillings (HR 0.70; 95% CI 0.67-0.74) and by 58% for >3 -surface fillings (HR 0.42; 95% CI 0.37-0.47; both $p < 0.001$). Beyond eleven treated teeth, patterns varied by filling extent. Although PMCs generally perform far better than fillings, they also showed improved restoration survival when multiple teeth were treated, with a 42% lower hazard of a major event for appointments involving 6-11 teeth (HR 0.58; 95% CI 0.38-0.88; $p = 0.011$). However, the strongest reduction in hazard for PMCs was observed below six treated teeth, indicating a less consistent association with anaesthesia-related treatment conditions. These effects are relative and do not indicate absolute survival. Reduction in major restoration failure under presumed general anaesthesia was greater for multi-surface fillings than PMCs, reflecting higher setting sensitivity.

010 Experimental polymer and dicalcium phosphate dihydrate-based solutions in preventing enamel erosive tooth wear

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Aim: To formulate experimental solutions containing 2% sodium linear polyphosphate [LPP] or dicalcium phosphate dihydrate functionalized with 10-MDP [DCPD](40 ppm), either isolated, or associated with fluoride [F] (220 ppm F⁻, NaF), or fluoride plus stannous ions [F+Sn](800 ppm Sn²⁺, SnCl₂), and to test their ability in reducing enamel erosive tooth wear (ETW). **Methods:** Bovine enamel blocks were randomly assigned into 9 groups (n=10): 1. Control (distilled water – DIW); 2. DCPD; 3. LPP; 4. F; 5. DCPD+F; 6. LPP+F; 7. F+Sn; 8. DCPD+F+Sn; 9. LPP+F+Sn. The solutions were tested in a 5-day erosive-abrasive challenge: 2 min in 1% citric acid (pH=2.4), followed by 60 min in artificial saliva (4x/day), and 1 minute immersion in test solutions after brushing. Brushing was performed twice daily, with a slurry of standard toothpaste (Sorriso Extrafresh, 1450 ppm F). After cycling, the surface loss (SL, in µm) was measured with an optical profilometer. Fluoride availability was measured using an ion-selective electrode. Data were analyzed using one-way ANOVA and Tukey tests (α=0.05). **Results:** DCPD (mean±standard deviation; µm; 12.5 ± 1.3) and LPP (12.3 ± 2) isolated showed no significant protective effect. DCPD+F+Sn (7.5 ± 2.5) presented the lowest SL, not differing from LPP+F+Sn (8 ± 2.6)(p=0.774), F+Sn (8 ± 2.4)(p=1), and LPP+F (8.7 ± 2.5)(p=0.968). LPP+F showed better protective effect than DIW (15 ± 2.1)(p<0.05) and F (12.5 ± 1.8)(p<0.05). F-containing solutions exhibited the expected ion availability, and no interaction between F and DCPD functionalized was detected. **Conclusion:** The association of LPP with fluoride in mouthwashes stands out as a promising alternative to reduce ETW in enamel that needs to be further investigated.

011 Multifactorial *in vitro* enamel wear under combined mechanical, acidic and abrasive challenges

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As most *in vitro* erosive tooth wear models assess single factors, this study aimed to evaluate enamel wear under combined mechanical loading, pH cycling and thermo-cycling. Human enamel specimens ($n = 90$) were allocated to six groups. In Groups 1a–3a the samples underwent mechanical wear only or combined with pH cycling or thermo-cycling. In Groups 1b–3b the samples followed identical protocols and additional abrasion. Wear simulation was performed using the custom-developed WEAR iM system at 50 N and 20 rpm for 120,000 (4 days, T1) and 240,000 cycles (8 days, T2). pH cycling alternated citric acid (pH 3.8) and artificial saliva (pH 6.8) for 30 s, thermo-cycling alternated 5–55 °C for 30 s for 8 days. Abrasion was generated using a standardized millet seed-based slurry. Enamel loss was quantified by non-contact 2D/3D profilometry and surface morphology was evaluated by Scanning Electron Microscopy at T1 and T2. Data were analyzed using ANOVA with Tukey post hoc test ($p < 0.05$). Mechanical wear alone resulted in enamel loss of $21 \pm 6 \mu\text{m}$ (T1) and $28 \pm 5 \mu\text{m}$ (T2). pH cycling significantly increased wear (T1: $67 \pm 12 \mu\text{m}$; T2: $102 \pm 27 \mu\text{m}$; $p < 0.001$), whereas thermo-cycling produced lower enamel loss than pH cycling and higher loss than mechanical wear alone (T1: $48 \pm 14 \mu\text{m}$; T2: $52 \pm 11 \mu\text{m}$; $p < 0.001$). Abrasion further increased enamel loss, with significantly higher values in Groups 1b–3b compared with Groups 1a–3a ($p < 0.001$). The newly developed device (WEAR iM) allows simulation of enamel wear under combined mechanical, acidic and abrasive challenges. When associated with mechanical loading, pH and thermal variation, abrasion increases enamel wear.

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012 Influence of Lesion Location on Silver Fluoride Penetration in MIH Teeth: In Vitro Microscopic Study

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This *in vitro* study aimed to histologically assess Silver Fluoride (SF; 38% Riva Star Aqua®) penetration in Molar Incisor Hypomineralised (MIH) affected First Permanent Molars (FPM) according to lesion location (Ethical approval Nr. BB 127/23). Extracted MIH-FPM (MIH-Treatment-Need-Index 4c, n=9) were collected, SF was applied according to the manufacturer's instructions, and light cured (20 sec.). Lesion location was identified, and teeth were sectioned mesiodistally. One-third (n=36; 714 data points) of the total sections (>2,100 data points) was used to measure the total depth of the lesion (TDL) and depth of SF penetration (DSF) using an Olympus SZH10 stereomicroscope (7x,15x magnification) and AnalySIS software (Soft Imaging System GmbH, Germany). Descriptive statistics and non-parametric tests (Mann-Whitney U, Kruskal-Wallis) were used for analysis. The mean TDL was 1.54 ± 0.86 mm, while the mean SF penetration depth was 1.00 ± 0.77 mm, corresponding to an average penetration of $63.5 \pm 22.42\%$ of the TDL. When stratified by lesion location, SF penetration was greatest in enamel, where the mean TDL was 2.22 ± 1.19 mm and the mean DSF reached 1.82 ± 1.08 mm, corresponding to 80% of TDL. In the upper half of dentine, the mean DSF was 1.00 ± 0.73 mm and the mean TDL was 1.82 ± 0.74 mm, indicating 50% penetration. In the lower half of dentine, SF penetration decreased further, with a mean DSF of 0.87 ± 0.64 mm and a mean TDL of 1.31 ± 0.75 mm, corresponding to 60% of TDL. SF penetration decreased progressively with increasing lesion depth. Statistical analysis showed significant differences in SF penetration between enamel, upper dentin and lower dentin lesions ($p < 0.001$), with all pairwise comparisons reaching statistical significance. Silver Fluoride penetrates MIH lesions effectively in enamel, but its reach diminishes with depth, suggesting limited efficacy in deeper dentin.

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Poster presentation

Erosion

013 Protective effects of milk-based and plant-based yoghurts on enamel erosion and tooth wear

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This study evaluated the protective effects of milk-based and plant-based yoghurts against enamel erosion and tooth wear following citric acid exposure, with or without abrasion. Ninety-eight polished bovine enamel specimens were randomly allocated to seven groups (n=14). Over seven days, specimens underwent six daily erosive cycles (0.05 M citric acid/pH:2.3/2min) interspersed with remineralizing solution. Post acid exposure preventive measures consisted of immersion in milk-based yoghurt (pH:4.4), plant-based yoghurt (pH:4.7), or tap water for 3 min. One set received simulated toothbrushing abrasion with either a tin-containing fluoride toothpaste (1450 ppm F/, 3500 ppm Sn/0.5% chitosan) or a fluoride-free toothpaste; the other set received no abrasion. Enamel surface loss (μm) was measured at baseline, day 3, and day 7 using 3D-laser microscopy. Calcium and phosphorus (mg/g) contents of the yoghurts were quantified by optical emission spectrometry. Data were analyzed by two-way repeated measures ANOVA/Tukey tests, or t-tests ($\alpha=0.05$). At day 3, no significant differences were observed among the yoghurts and water for fluoride toothpaste-abraded groups. By day 7, abrasion with tin-containing fluoride toothpaste combined with plant-based yoghurt significantly reduced enamel wear ($7.9\pm3.3\mu\text{m}$) compared with the fluoride toothpaste + water group ($12.2\pm2.7\mu\text{m}$, $p<0.05$). The fluoride free toothpaste + water group ($23.2\pm2.8\mu\text{m}$) consistently showed the highest wear. In nonabraded groups, no significant differences between preventive measures were detected, although all exhibited progressive enamel loss from day 3 to 7. Calcium and phosphorus contents were significantly higher in milk-based ([Ca: $1.43\pm0.19\text{mg/g}$],[P: $1.03\pm0.12\text{mg/g}$]) than plant-based ([Ca: $0.16\pm0.01\text{mg/g}$],[P: $0.62\pm0.04\text{mg/g}$]) yoghurt. Post-acid preventive immersion in plant-based yoghurt combined with tin-containing fluoride toothpaste significantly reduced enamel wear compared to water control, highlighting the potential of dietary adjuncts to enhance erosion protection. These findings should be confirmed in preclinical models before clinical translation.

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014 Protective effect of a novel orange-derived cystatin against initial enamel erosion in vitro

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The present study aimed to evaluate the protective effect of a novel orange-derived cystatin (CsinCPI-2) and to identify the most effective concentration for preventing initial enamel erosion in vitro. A total of 105 bovine enamel specimens were cut (4 × 4 mm), polished, and allocated into seven groups, as follows: deionized water (Negative control; Water), Elmex™ (Positive control; Elmex™), 0.10mg/mL sugarcane-derived cystatin (CaneCPI-5), and CsinCPI-2 at concentrations of 0.01, 0.10, 0.25, and 0.50mg/mL. Specimens were treated with the respective solutions (250μL, 1h, 37°C), followed by the formation of the acquired enamel pellicle using unstimulated human saliva (250μL, 1h, 37°C), and subsequently subjected to an erosive challenge with citric acid (1mL, 0.65%, pH3.4, 1min, 25°C). This protocol was performed once daily for three consecutive days, and the specimens were rinsed and dried between each procedure. Surface microhardness change (%SMC) and relative surface reflection intensity (%SRI) were assessed. Data were analyzed using ANOVA/Tukey (p<0.05). For %SMC, Elmex™ (17.09±10.75), CaneCPI-5 (12.92±7.30), and CsinCPI-2 at concentrations of 0.01 (9.93±7.06), 0.10 (9.88±6.07), 0.25 (17.58±7.53), and 0.50 mg/mL (16.66±7.69) significantly reduced %SMC compared with the Water (29.02±9.12) (p<0.01). For the %SRI analysis, significantly greater protection was observed only for Elmex™ (84.9±12.12), CaneCPI-5 (83.72±8.04), and CsinCPI-2 at 0.01 mg/mL (85.14±8.29) compared with water (71.22±5.46), whereas CsinCPI-2 at 0.25 mg/mL (76.14±8.36) and 0.50 mg/mL (78.16±10.00) did not differ significantly from the water group. In conclusion, 0.01 mg/mL CsinCPI-2 exhibited the most effective protective effect against initial enamel erosion in vitro. These findings reinforce the potential of CsinCPI-2 as a bioactive agent in preventive strategies, opening promising perspectives for the development of dental formulations aimed at preventing erosive tooth wear.

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015 Effect of rheology modifiers in polymer-based toothpastes for erosive tooth wear control

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The aim of this study was to evaluate the influence of different rheology-modifying excipients on the protective effect of experimental toothpaste formulations containing aminomethacrylate copolymer (4%) and sodium fluoride (1450 ppm F⁻) against enamel erosive wear. Polished bovine enamel specimens were allocated to six groups (n = 12) according to the rheology-modifying excipient incorporated into an experimental aminomethacrylate–fluoride toothpaste formulation: Negative Control (NC – base formulation without rheology-modifying excipients or active agents); xanthan gum (XG); carboxymethyl cellulose (CMC); hydroxyethyl cellulose (HEC); silica (S); and polyvinylpyrrolidone (PVP). An erosive–abrasive cycling model was applied for 5 days. Specimens were immersed in human saliva for 5 min to initiate acquired pellicle formation, exposed to 0.3% citric acid for 1 min (4×/day), and treated with toothpaste slurries for 120 s (2×/day), with intermediate storage in human saliva (1 h). Abrasion was performed twice daily using a toothbrushing machine (15 s) during slurry treatments. Enamel surface loss was measured by stylus profilometry. Data were analyzed using one-way ANOVA and Tukey tests ($\alpha = 0.05$). Mean surface loss values ($\mu\text{m} \pm \text{SD}$) were: NC (4.36 ± 0.74)a; CMC (3.33 ± 0.30)b; XG (3.01 ± 0.47)b; PVP (2.42 ± 0.18)c; S (2.39 ± 0.15)c; and HEC (1.88 ± 0.20)d. Different letters indicate statistically significant differences among groups ($p < 0.05$). It was concluded that non-ionic rheology-modifying excipients demonstrated greater compatibility with the aminomethacrylate–fluoride toothpaste system, resulting in enhanced protection against enamel erosive wear. Hydroxyethyl cellulose showed the most favorable performance, reinforcing the relevance of polymer–polymer associations in optimizing toothpaste formulations for erosion control.

016 Obesity and erosive tooth wear: a scoping review of evidence in children and adolescents

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Erosive tooth wear is a growing concern among children and adolescents, influenced by various demographic, socioeconomic, and behavioral factors. Obesity has been suggested as a potential risk indicator for erosive tooth wear; however, evidence remains inconsistent. A scoping review was conducted in accordance with the Arksey and O'Malley framework and reported following PRISMA-ScR guidelines to map and summarise the available evidence on the association between obesity and erosive tooth wear in children and adolescents, and identify methodological characteristics. Searches were performed in five databases. Studies that assessed erosive tooth wear/dental erosion in obese or overweight children and adolescents (≤ 18 years) were included. Study selection and data charting were performed independently by two reviewers (L.G. and L.R.). From 10,717 records identified, 14 studies were included. Most studies were cross-sectional, with one prospective cohort study and 2 case-control studies. Most studies reported no independent association between obesity and tooth wear after adjustment for confounders. Population-based studies have consistently shown null associations, with effect estimates close to zero. In contrast, positive associations were mainly observed in studies involving populations or high-risk populations, such as children with extreme obesity or with special healthcare needs. When present, associations were often attenuated after adjustment for dietary factors, vomiting, gastroesophageal reflux, and salivary characteristics, suggesting that obesity may act as a marker of clustered behavioural and biological risk factors rather than an independent determinant of tooth wear. Overall, the available evidence suggests that obesity is unlikely to be an independent risk factor for erosive wear in children and adolescents, but rather reflects a clustering of behavioural, biological, and contextual risk factors that influence susceptibility to erosive tooth wear.

017 Proteomic composition of acid-resistant pellicles modified with fluoride-based solutions

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We evaluated the proteomic profile of the residual acquired enamel pellicle (AEP) after chemical modification and subsequent erosive acid challenge, focusing on proteins exhibiting resistance to acidic dissolution. In this cross-over, *in situ* study, 12 volunteers wore mandibular appliances containing six enamel specimens in four randomized phases (each phase for a test solution): deionised water (DW); Sn+F (commercial solution containing SnCl₂/NaF/AmF); NaF (500 ppm F⁻); and OPC+F (grape seed extract + 500 ppm F⁻). In each phase, appliances were worn for 1 min to allow basal pellicle formation, followed by a 1-min rinse with the test solution and an additional 28-min intraoral pellicle formation period. Then, a 1-min acid challenge was performed *ex vivo* (1% citric acid, pH 3.6, 25 °C). The residual AEPs were harvested and stored at -80 °C until proteomic analysis, including tryptic digestion and LC-MS/MS. Differential expression analysis was performed on label-free quantification data using an empirical Bayes approach, with significance defined as log₂ fold change ≥ 1 and adjusted p-values (Benjamini-Hochberg). A total of 2,846 proteins were identified, from which 2,416 were common for all solutions. Some proteins were exclusively found in each group: DW=2, Sn+F=19, NaF=1, OPC+F=28. A total of 316 proteins presented significant differential expressions (p<0.05), from which the vast majority (n=293) were more abundant in the groups containing fluoride: OPC+F (266 proteins), Sn+F (95 proteins) and NaF (53 proteins). These modified AEPs exhibited an enrichment of acid-resistant proteins that remained on the enamel surface after acid challenge. Fluoride-based solutions, especially containing plant extracts (OPC+F), significantly influence the proteomic diversity of the residual AEP.

018 Salivary pH during and immediately after intake of sour gummies – a pilot study

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This study aimed to assess the dental erosive potential of sour versus regular sweet gummies by evaluating salivary pH. Secondary objectives included comparing pH measurements obtained with strips versus electrode, examining differences between tongue saliva (TS) and whole saliva (WS), and investigating the potential influence of fasting and tooth brushing prior to sampling on salivary pH. Dental students (>18yrs) chewed either a sour or regular gummy variant (HARIBO® Stjernemix) for 1 min. In a cross-over design, 47 participants chewed both gummy variants; TS was collected at time_{0s/30s/1min/2min} and measured with pH-strips. In several substudies, four participants chewed either gummy variant, and electrode measurements were taken at time_{0s/10s/30s/1min/2min/5min} to test whether the pH-effect depended on TS or WS, or fasting and tooth brushing before chewing. Linear regression with cluster-robust standard errors, accounting for baseline pH and repeated measurements, was used. With pH-strips, sour gummies resulted in 0.35 (95% CI:[0.10;0.61]) lower pH in TS than regular variants. With electrode measurements, sour gummies were associated with lower pH than regular variants by 1.09 pH units (95% CI:[0.54;1.63]) in TS and 1.00 (95% CI:[0.52;1.48]) in WS. The greatest differences were observed in the measurements during chewing (time_{10s/30s}) or immediately after (time_{1min}). The differences few minutes after chewing were modest (time_{2min/5min}). pH was on average higher in WS than TS (WS_{sour}=5.1, WS_{regular}=6.1, TS_{sour}=4.2, TS_{regular}=5.3; time_{10s}-time_{5min} average), but the pH drop after sour gummy was similar for both sampling methods (p=0.55). Fasting and refraining from tooth brushing prior to chewing sour gummy did not influence pH levels. Sour gummy variants cause a transient but greater reduction in both tongue and whole salivary pH than regular sweet gummies, suggesting sour variants may contribute more to dental erosion.

019 Weight loss of dental enamel exposed to “Four Loko”, a carbonated alcoholic drink

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The aim of this study was to evaluate and compare the weight loss of dental enamel specimens after exposure to a carbonated alcoholic beverage (Four Loko, Phusion Projects, Mexico), a Burgundy wine (Borgoña, Taberner, Peru), and a carbonated soft drink (Pepsi, PEPSICO, USA). One hundred twenty-four extracted tooth specimens were distributed into four experimental groups (n=31). The roots were coated with nail varnish, leaving the dental enamel exposed. Specimens were immersed in each evaluated beverage 5 times a day for 5 minutes, resulting in a total daily exposure of 25 minutes. To simulate frequent consumption, specimens were weighed using an analytical balance (BCE124-1S, Sartorius, Germany) before and after the immersion cycles. Additionally, the pH of each beverage was determined to assess its erosive potential. Results showed a statistically significant weight loss in all groups. The group exposed to the carbonated alcoholic beverage (Four Loko) exhibited the highest mean weight loss (0.015 g; SD $\pm$ 0.003), followed by the carbonated soft drink (0.012 g; SD $\pm$ 0.002) and the Burgundy wine (0.009 g; SD $\pm$ 0.002). ANOVA and Tukey's post-hoc tests confirmed significant differences between the groups ($p < 0.001$). An inverse correlation was observed between the pH of the beverage and the loss of dental mass. In conclusion, the carbonated alcoholic beverage (Four Loko) demonstrated the highest erosive potential on dental enamel among the evaluated drinks, evidenced by a significant reduction in specimen weight. These findings suggest that frequent consumption of these beverages represents a critical risk to dental tissue integrity due to their acidity and composition.

020 Real-time assessment of dentinal fluid flow reduction by desensitizing agents using sub-nanoliter flow measuring system

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This study evaluated and compared the dentinal tubule–occluding efficacy of various desensitizing toothpastes and a sodium fluoride varnish using a sub-nanoliter scaled fluid flow measuring device (NFMD). Bovine dentin specimens were treated with four desensitizing toothpastes (Colgate, Median, Bamboo Salt, and Sensodyne), a 2.1% sodium fluoride varnish (Clinpro), and distilled water (DW) as a control. Real-time dentinal fluid flow was measured under simulated pulpal pressure (32 cm H₂O) for 1,000 seconds using the NFMD system. Each toothpaste was applied directly to assess chemical occlusion capability, with measurements recorded before application, during treatment, and after material removal. Surface morphology and the degree of dentinal tubule occlusion were evaluated using field-emission scanning electron microscopy (SEM) in both cross-sectional and surface views. Data were analyzed using one-way analysis of variance. A significant overall treatment effect was observed ($F(5,54)=5.34$, $p<0.001$). Bamboo Salt ($69.99 \pm 20.71\%$), Sensodyne ($68.27 \pm 21.22\%$), and Colgate ($67.73 \pm 14.24\%$) produced greater reductions in dentinal fluid flow than DW ($29.84 \pm 27.42\%$) ($p<0.01$). Clinpro achieved a moderate reduction ($60.01 \pm 24.17\%$), which was significantly greater than DW ($p=0.041$) but not significantly different from the desensitizing toothpastes. Median showed a lower reduction ($44.07 \pm 23.56\%$) and did not differ significantly from DW. SEM analysis was consistent with these findings, demonstrating dense and continuous tubule occlusion for Bamboo Salt and Sensodyne, partial occlusion for Colgate and Clinpro, and minimal occlusion for Median and DW. These findings indicate that desensitizing toothpastes can effectively reduce dentinal permeability to levels comparable to fluoride varnish, with formulations capable of forming mineralized or insoluble deposits exhibiting superior shortterm tubule sealing.

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021 Effect of hydrogen peroxide-containing toothpastes on enamel erosive–abrasive wear

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This study evaluated the effect of hydrogen peroxide (HP)-containing whitening toothpastes on enamel erosive-abrasive wear. Polished bovine enamel specimens were randomly assigned to toothpaste treatment groups ($n = 8$): deionized water (negative control – NC), a conventional toothpaste without HP (Elmex Sensitive Professional, positive control – PC), and whitening toothpastes containing 1% HP (Colgate Luminous White Lovers), 3% HP (Colgate Luminous White Glow), 4% HP (Crest 3D White Brilliance), and 5% HP (Colgate Optic White Pro Series). All tested toothpastes contained sodium monofluorophosphate. Specimens were subjected to a 5-day erosive–abrasive cycling model consisting of immersion in 0.3% citric acid (pH 2.6; 5 min, 4×/day), treatment with toothpaste slurries (120 s, 2×/day), and storage in artificial saliva during intermediate periods (1 h). Abrasion was performed twice daily using a toothbrushing machine (15 s) during slurry treatments. Enamel surfaces were evaluated using a contact profilometer at baseline and after cycling, and surface loss (μm) was quantified. Data were analyzed using one-way ANOVA followed by Tukey's test ($\alpha = 5\%$). Enamel surface loss significantly differed among groups ($p < 0.0001$). Mean surface loss values ($\mu\text{m} \pm \text{SD}$) were: NC (18.99 ± 3.77)a; PC (19.13 ± 2.37)a; 1% HP (26.39 ± 3.22)b; 3% HP (27.44 ± 3.85)b; 4% HP (19.28 ± 2.38)a; and 5% HP (25.80 ± 3.36)b. In conclusion, increased enamel wear was observed for some hydrogen peroxide-containing toothpastes and might be more strongly influenced by the overall formulation than by hydrogen peroxide concentration.

023 Surface-modifying effects of aminomethacrylate and fluoride antierosive solutions on enamel and dentin

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This study evaluated the surface-modifying potential of antierosive solutions containing aminomethacrylate copolymer (AMC) and sodium fluoride on enamel and dentin, in the presence or absence of acquired pellicle. Polished bovine enamel and dentin specimens (n=60 each) were subjected to an erosive challenge (0.3% citric acid, pH 2.6, 30s), and half of them additionally received pellicle formation (human saliva, 5 min). Specimens were then treated for 1 min with one of the antierosive solutions (n=5/group): ultrapure water (negative control, NC), Elmex Erosion Protection (500ppm F⁻ + 800ppm Sn²⁺; positive control PC), sodium fluoride (225ppm F⁻; F), aminomethacrylate (2%; AMC), or AMC with F (AMC+F). Surface wettability was assessed by contact angle analysis (CA) using a 0.5μL water droplet applied perpendicularly to the surface (20 fps, 30s, 3 readings per specimen). Data were analyzed by two-way ANOVA/Tukey tests (α=0.05). Surface morphology and elemental composition were analyzed by scanning electron microscopy (SEM) and energydispersive X-ray spectroscopy (EDS). In enamel, significant differences were observed only for treatment factor, with higher CA values for AMC and AMC+F compared with fluoridecontaining and control solutions (means±SD): NC (17.3±3.5)^A; PC (32.3±4.8)^B; F (20.9±4.8)^A; AMC (70.6±4.2)^C; AMC+F (70.3±4.5)^C. In dentin, significant differences were observed for both factors, with AMC-containing groups exhibiting the highest CA values. With pellicle: NC (37.7±1.7)^{CD}; PC (47.1±5.0)^E; F (44.6±2.9)^{DE}; AMC (67.0±5.7)^F; AMC+F (69.5±2.5)^F. Without pellicle: NC (19.2±2.6)^A; PC (30.6±4.5)^{BC}; F (26.0±3.4)^{AB}; AMC (67.8±4.2)^F; AMC+F (67.6±2.2)^F. SEM analysis revealed a non-uniform polymeric layer on AMC-treated surfaces, confirmed by increased carbon content detected by EDS. In conclusion, AMC polymer effectively adsorbs onto enamel and dentin surfaces, increasing surface hydrophobicity, thus representing a promising agent for antierosive oral care formulations.

024 Effect of fluoridated toothpaste and mouthrinse containing tin on erosive tooth wear: in situ study

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The benefit of a tin-containing mouthrinse in conjunction with fluoridated toothpaste, containing or not tin, in controlling erosive tooth wear (ETW) is unknown. , The aim of this *in situ* randomized, double-blind, crossover study was to evaluate the effect of fluoridated toothpaste containing sodium fluoride (NaF-T) or stannous fluoride (SnF₂-T), with or without tin-containing mouthrinse (MR), on the control of ETW in enamel and in dentin. Sixteen participants wore mandibular intraoral devices containing 3 discs of enamel and 3 discs of dentin, which were subjected, during four experimental phases of seven-day each, to *ex vivo* erosive challenges by exposure to citric acid 1% (pH 2.3) (4x/day) and abrasive challenges by tooth brushing (2x/day), followed or not by rinsing with tin-containing mouthrinse. Surface loss (µm) in enamel and dentin discs was quantified by 3D optical profilometry, and mean surface loss was compared among groups using a two-way ANOVA followed by the Bonferroni test (p<0.05). The results demonstrated that NaF-T and SnF₂-T showed similar performance in controlling mineral loss in both enamel and dentin (enamel and dentin= 26,85 ± 10,68 e 18,75 ± 12,10, respectively). The combination of NaF-T+MR reduced surface loss by approximately 60% compared to the isolated use of NaF-T (p<0.05). SnF₂-T+MR combination did not promote a surface hardness reduction compared to the isolated use of SnF₂-T. There was neither difference between the NaF-T+MR and SnF₂-T+MR treatments, nor between enamel and dentin. It is concluded that the combined use of NaF-T+MR significantly enhances protection against ETW, while the SnF₂-T+MR combination does not demonstrate any additional advantage over the isolated use of tin-containing toothpaste. These findings contribute to the clinical basis for the use of tin-containing products for the control of ETW.

Poster presentation
Nathan Cochrane II

025 Spin bias in randomised clinical trials of dentine caries lesion management in pediatric dentistry: Meta-research

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Randomised clinical trials (RCTs) are fundamental for evaluating dentine caries lesion management in pediatric dentistry. However, distortion in the reporting (“spin”) may mislead readers regarding RCT results, influencing clinical decision-making and patient care. We evaluated the prevalence and nature of spin in the abstracts and full text of RCTs of dentine caries lesion management in pediatric dentistry. A search of Medline (PubMed) identified RCTs comparing two or more caries lesion management procedures. Equivalence or non-inferiority trials, cost-effectiveness studies, and cluster, cross-over, or split-mouth designs were excluded. Two independent reviewers screened studies, extracted data, and identified spin strategies using established criteria by Boutron et al. (2010) for nonsignificant trials and Boutron et al. (2018) for positive trials. Descriptive statistics summarized study characteristics and the prevalence of spin as frequencies (percentages) with 95% confidence intervals. Of 1,956 retrieved records from PubMed, 177 RCTs were included. Among 119 non-significant trials, 50% were published in pediatric dental journals, and 69% lacked protocol registration. Among 58 RCTs with positive primary results, 46.6% were published in pediatric dental journals, and 72.4% were not registered. Spin in nonsignificant trials occurred in 88.2% of abstracts and 87.4% of full texts. The most common strategy was claiming equivalence despite statistically non-significant results (37.8%; 95% CI: 28.3–45.7). In positive trials, spin was identified in 48.3% of abstracts and 62.1% of full texts, most frequently through inadequate discussion of study limitations (46.6%; 95% CI: 30.2–56.0). In conclusion, spin was common in RCTs of dentine caries lesion management, particularly in non-significant trials, highlighting the need for improved reporting practices to support transparent interpretation and evidence-based pediatric dentistry.

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026 Acid-induced degradation of glass-ionomer cement: an in vitro study

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Objective: The purpose of this study was to investigate the degradative effect of two low-pH aqueous media on glass ionomer cement (GIC) specimens prepared using different surface protection protocols and curing methods. **Materials and Methods:** The study included 72 specimens of encapsulated glass ionomer cement Ketac Universal Aplicap (shade A2), prepared according to four protocols: chemical curing, thermo-curing, application of a protective coating, and a combination of coating application with thermo-curing. Over a 30-day period, each specimen was immersed daily for 2 hours in an energy drink (Hell) or 10% lactic acid, while being stored in artificial saliva between immersion cycles. Specimen mass was measured at baseline, after 10 and 30 days period. Statistical analysis was performed using one-way analysis of variance (ANOVA) with Tukey's post hoc test, at a significance level of $p < 0.05$. **Results:** Exposure to both acidic media resulted in a gradual reduction in specimen mass over time. Lactic acid demonstrated a more pronounced degradative effect, with a statistically significant change in mass observed across all preparation protocols. The energy drink exhibited a weaker, yet still statistically significant, degradative effect ($p < 0.05$). Specimens treated with a protective coating showed significantly greater resistance to degradation. **Conclusion:** Low-pH liquids negatively affect the stability of glass ionomer cements over time, with lactic acid exhibiting the greatest erosive potential. The application of surface protection and thermo-curing significantly enhances material resistance in acidic environments. Clinically, the use of protective coatings and appropriate dietary counselling may contribute to prolonging the longevity of GIC restorations.

027 Time-dependent modulation of erosive tooth wear by preventive agents in pre-eroded enamel, *in vitro*

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This study evaluated the time-dependent modulation of erosive tooth wear (ETW) progression by preventive agents applied to pre-eroded human enamel. Specimens ($n = 13/\text{group}$) underwent a standardized 5-day pre-erosion phase consisting of six daily erosive challenges with citric acid (0.05%; pH 2.4; 2 min), followed by immersion in artificial saliva (1 h; 25°C; 50 rpm) and twice-daily toothbrushing ($<3\text{ N}$; 15 s) with a fluoride-free toothpaste (Lavera Neutral Zahngel). Subsequently, specimens were treated with BlueRemin® (fluoride-copper solution; 24 000 ppm F⁻; 70 000 ppm Cu²⁺), CPP-ACP varnish (MI Varnish; 5% NaF; 22 600 ppm F⁻), or left untreated, followed by further cycling for 5 or 10 days. Enamel tissue loss (μm) was quantified by contact profilometry, and surface elemental composition was assessed by energy-dispersive X-ray spectroscopy (EDX; $n = 3/\text{group}$), with data analyzed using factorial models with robust variance estimators ($\alpha=0.05$). In untreated enamel, tissue loss increased progressively ($13.5 \pm 4.0\ \mu\text{m}$ after pre-erosion phase [5 days]; $20.9 \pm 6.6\ \mu\text{m}$, at day 10; and $39.3 \pm 11.7\ \mu\text{m}$, at day 15). At 5 days posttreatment (day 10 cumulative), both agents significantly reduced tissue loss versus untreated enamel (BlueRemin: $15.0 \pm 4.1\ \mu\text{m}$; CPP-ACP: $17.0 \pm 7.5\ \mu\text{m}$; $p<0.05$). However, after 10 days post-treatment (day 15 cumulative), tissue loss increased in both treated groups (BlueRemin: $39.8 \pm 20.9\ \mu\text{m}$; CPP-ACP: $37.5 \pm 10.8\ \mu\text{m}$), reaching values comparable to untreated enamel, with no significant differences between the two agents ($p>0.05$). Regarding surface composition, EDX revealed increased calcium in treated specimens and copper exclusively on BlueRemin-treated enamel at 5 days. In conclusion, preventive agents transiently modulated ETW progression in pre-eroded enamel, but protection was not sustained under prolonged erosive challenge *in vitro*.

028 Enhancement of erosive tooth wear monitoring using BEWE index associated with intra-oral scanning

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This prospective cohort study evaluated the influence of risk level, time, and assessment method on erosive tooth wear (ETW) using the Basic Erosive Wear Examination (BEWE) on clinical examination or digital models. Eighty patients were allocated into high-risk ($n = 40$) and low-risk ($n = 40$) groups based on dietary habits and the presence of gastroesophageal reflux. Assessments were performed at baseline, 3, 6, and 12 months. At each time point, patients underwent a conventional clinical examination and two intraoral scans obtained using the TRIOS 5 scanner (3Shape) and the Virtuo Vivo scanner (Straumann). The BEWE index was applied by the same calibrated examiner during the clinical examination and subsequently on three-dimensional digital models derived from both scanners. Data were analyzed using three-way analysis of variance (ANOVA) followed by Tukey's post hoc test ($\alpha = 0.05$). Significant main effects were observed for group, time, and assessment method ($p < 0.001$). The high-risk group presented significantly higher BEWE scores than the low-risk group. BEWE scores at 12 months were significantly higher than at baseline and 3 months, while no significant differences were observed among baseline, 3, and 6 months. Regarding assessment methods, BEWE scores obtained from TRIOS 5 were significantly higher than those from the clinical examination and the Virtuo Vivo scanner. No significant two-way or three-way interactions were detected. In conclusion, ETW progression was influenced by risk status, follow-up duration, and assessment method. Detectable changes required a minimum observation period of 12 months. Digital assessment, particularly using TRIOS 5, yielded higher BEWE scores than clinical examination, indicating that assessment method may influence ETW evaluation.

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029 Influence of Salivary Pellicle on Enamel Erosion Susceptibility Associated with At-home Whitening Systems

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To investigate the effect of hydrogen peroxide (HP)-based at-home whitening systems on enamel erosion susceptibility in the presence or absence of salivary pellicle. Polished bovine enamel specimens were randomly allocated into groups ($n = 8$) according to pellicle condition (present/absent) and whitening treatment: deionized water (negative control – NC); conventional at-home gel (9.5% HP, Pola Day/SDI – positive control – PC); prefilled tray-based system (10% HP, Opalescence Go/Ultradent – PT); and whitening strips (9.5% HP, 3D Whitestrips/Crest – WS). Specimens were subjected to five cycles consisting of: 2 h salivary pellicle formation or deionized water, 1 h of whitening treatment, and an erosive challenge (1% citric acid, pH 3.6, 1 min). Relative surface hardness (rSH), relative surface reflection intensity (rSRI), and 3D surface roughness (Sa) were analyzed. ANOVA and Tukey tests were applied ($\alpha = 0.05$). The presence of salivary pellicle significantly reduced enamel erosion for all evaluated parameters compared with deionized water ($p < 0.05$). Ready-to-use whitening systems (PT and WS) had similar effects on enamel erosion susceptibility, comparable to NC. The conventional at-home gel (PC) resulted in the lowest damage to enamel, especially in the presence of salivary pellicle (rSH: 73.4%, rSRI: 76.4%, and Sa: 0.006 μm), showing significantly better results than NC (rSH: 57.9%, rSRI: 44.4%, and Sa: 0.021 μm). The salivary pellicle acted as a protective factor against erosive challenges on bleached enamel. In addition, neither conventional nor ready-to-use HP-based at-home whitening systems increased enamel erosion susceptibility. Among the tested protocols, the conventional gel showed the most favorable outcomes, particularly when combined with salivary pellicle formation.

030 How different caries lesion severities have progressed in primary teeth: Systematic review and network meta-analysis

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This systematic review and network meta-analysis (PROSPERO #CRD 42017062388) supports an ongoing clinical cohort study with twins (CARDEC-Twins). We evaluated caries lesion progression in primary teeth by lesion severity, using direct and indirect evidence. In vivo longitudinal studies of caries progression reporting clinical or radiographic lesion severity were included. Relative risk (RR) with 95% confidence intervals (95%CI) was calculated using combined direct and indirect evidence, and a probability ranking was generated across lesion severities. Of 2,263 eligible studies, 17 met the inclusion criteria (1 to-7-year follow-up). Of these, 7 studies with similar follow-up data were summarized in the meta-analysis. After 2–2.5 years, clinically detected initial lesions presented approximately a 5-fold higher risk of progression than sound surfaces (RR=4.80; 95%CI:2.88–8.22; $I^2=96.3\%$), while moderate lesions showed a 16-fold higher risk of progression (RR=16.2; 95% CI:9.07–29.02; $I^2=96.5\%$). Similarly, one 4-year follow-up study showed that lesions had a 5-fold higher risk of progression to cavitation than sound surfaces (RR=5.1; 95%CI:4.5-5.8), while in a longer study (7-year follow-up), the risk of progression of moderate lesions was even higher compared to sound surfaces (RR=13.4; 95%CI:11.6–15.5). Radiographically, caries at the enamel–dentin junction presented about a 4-fold higher risk compared with radiolucency-free surfaces (RR=3.42; 95%CI:2.24–5.21; $I^2=78.5\%$), whereas lesions in the outer half of the dentin showed a progression risk of approximately 5 times (RR=4.68; 95%CI:3.36–6.53; $I^2=76.8\%$). Extensive lesions progressed to extraction in 13-40% in 2 and 3.5-year-follow up. After 2 years, the RR of untreated extensive lesions ranged from 6.9 (RR=6.93; 95% CI:5.1-9.4) to 11 (RR=11.12; 95%CI:9.2-13.4) times higher than sound spots depending on type of surface. These findings indicate that lesion severity, especially when clinically observed, is an important predictor of caries progression in primary teeth.

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031 Balancing caries lesion control and reinterventions: a discrete choice experiment to explore Brazilian's dentists' preferences

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Some treatment options may be effective for controlling caries progression but require subsequent interventions (repair, reapplication of cariostatic agents). This study investigated how dentists choose these options compared with treatments that control caries without requiring reintervention and those that require reintervention due to treatment failure. Additionally, we examined how other treatment-related attributes influence dentists' decisions. A discrete choice experiment was designed including levels of different attributes related to the treatment. Dentists were asked to choose between paired hypothetical alternatives varying in these attributes. Panel logit multivariate models were used to assess the effect of each attribute on preferred treatment outcomes, with odds ratios (OR; 95% CI) calculated and adjusted for plausible covariates. This study included 838 Brazilian dentists. Majority of dentists preferred interventions able to control caries lesions, even if it was necessary to repeat it (40.84%; 95%CI: 40.3-41.3%). Conversely, slight fewer dentists (39.5%;95%CI:39.0-39.9) preferred treatments that control caries but do not demand reinterventions. The preference for treatments independently of reintervention was influenced by minimizing child's discomfort (OR=1.54;95%CI:1.49-1.59; $p<0.001$) and reducing clinical time/complexity (OR=1.12; 95%CI:1.08-1.16). The need for adaptations in the work context or training also increased the preference for this option($p<0,001$). On the other hand, aesthetic changes not tolerated by the family could reduce the chance of choosing this preferred option by 34% (OR=0.67;95% CI:0.64-0.70; $p<0.001$). The Brazilian region as other working patterns also influenced their choices. Dentists slightly favored interventions that control caries lesions, even when reinterventions are required, particularly when aligned with minimal intervention principles, patient comfort, and family preferences. Contextual factors played a significant role in shaping these preferences.

033 Deep Learning Detection and Severity Assessment of Early Childhood Caries in Primary Molars

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Early childhood caries (ECC) remains highly prevalent, and early detection in primary teeth is essential for timely preventive and restorative care. This study aimed to develop and evaluate deep learning-based models for automated detection and severity assessment of ECC lesions in primary molars using bitewing radiographs. A data set of bitewing radiographs was retrospectively collected from a community-based cohort. Caries lesions were independently annotated by two calibrated examiners according to radiographic severity stages, corresponding to increasing lesion depth. Multiple state-of-the-art object detection architectures were trained and evaluated. Model performance was assessed on an independent test set using sensitivity, specificity, accuracy, F1-score, and weighted Cohen's kappa. Analyses were conducted across three clinically relevant thresholds: detection of all caries lesions, dentinal caries, and dentinal caries requiring operative treatment. A total of 1,440 bitewing radiographs were included. Across models, sensitivity ranged from 0.62 to 0.68 for detection of any caries and from 0.72 to 0.78 for dentinal caries, while specificity consistently exceeded 0.97. Accuracy reached up to 0.98 for dentinal lesions. F1-scores ranged from 0.74 for early-stage lesions to 0.86 for dentinal caries. The best-performing model achieved substantial agreement with expert annotations for severity assessment, with a weighted Cohen's kappa of 0.62. In conclusion, deep learning-based analysis of bitewing radiographs enables accurate and reliable detection and severity assessment of ECC in primary molars, with higher performance for dentinal lesions. These findings support the potential of such systems as decision-support tools in pediatric and community-based dental care.

036 Chemically Activated Glass-Ionomer Cements for Posterior Teeth Restorations - Systematic Review and Network Meta-Analysis

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To compare the clinical performance of different commercially available chemically activated glass-ionomer cements (GICs) used in posterior restorations of primary and permanent teeth through a systematic review and network meta-analysis (NMA). This systematic review was conducted according to the PRISMA-NMA guidelines and registered in PROSPERO (CRD42023494854). Randomized controlled clinical trials evaluating posterior restorations using at least two chemically activated GICs with at least 12 months of follow-up used for coronal dentin caries restoration were included. Searches were performed in electronic databases (PubMed/MEDLINE, Scopus, Web of Science, Cochrane Library and EMBASE) and grey literature (OpenGrey) without language or publication date restrictions. Risk of bias was assessed using the RoB 2 tool, and certainty of evidence was evaluated with GRADE. Random-effects Bayesian NMA were performed using success rates at 12 and 24 months as outcomes, stratified by dentition type. Ranking probabilities were estimated using SUCRA values. Twenty randomized clinical trials involving 2,833 participants and 4,471 restored teeth were included. In primary teeth with occlusal cavities at 12 months, EQUIA Fil showed the highest probability of success and significantly outperformed several conventional GICs. However, no significant differences among materials were observed for occlusoproximal cavities or at 24 months of follow-up for both type of cavities. In permanent teeth at 12 months, Miracle Mix demonstrated the highest probability of success, although differences among most materials were not statistically significant. Overall, the certainty of evidence ranged from low to very low, mainly due to risk of bias and imprecision. Clinically relevant differences among chemically activated GICs appear to be limited and dependent on dentition type. Despite favorable rankings for some materials, the overall evidence suggests comparable clinical performance among most GICs used in posterior restorations.

Poster presentation
Diagnosis and Public health

037 Clinical salivary parameters correlate with salivary gland perfusion measured by arterial spin labelling MRI after radiotherapy

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To assess perfusion in irradiated salivary glands using arterial spin labelling (ASL) MRI and explore associations with clinical measures of salivary function (flow, pH). Fifteen patients previously treated with radiotherapy for oral cavity tumours (mean age 62.5 ± 11.4 years; 13 male) were included (cumulative dose 64.6 ± 7.0 Gy). The magnetic resonance imaging was performed on a clinical 3T system with a 32-channel head coil. The parotid gland perfusion was assessed using an ASL sequence at baseline and at 1 and at 5 minutes following the gustatory stimulation with the lemon juice. The unstimulated and stimulated saliva were collected from each patient. The salivary flow rate of unstimulated saliva was 0.29 ± 0.27 mL/min and pH 6.61 ± 0.7 ; the stimulated salivary flow was 0.80 ± 0.6 mL/min and pH 7.40 ± 0.6 . The associations between ASL signal and clinical parameters were evaluated using Spearman correlation. The higher relative ASL signal at baseline was associated with the lower unstimulated salivary pH ($R = -0.666$, $p = 0.009$). The relative ASL signal obtained 5 minutes' post-stimulation also correlated with the unstimulated saliva pH ($R = -0.596$, $p = 0.023$). The post-stimulation ASL signal also correlated with pH of the stimulated saliva at 1 minute ($R = -0.566$, $p = 0.034$) and 5 minutes ($R = -0.615$, $p = 0.019$). Additionally, relative ASL signal at 5 minutes correlated with stimulated salivary flow ($R = -0.548$, $p = 0.041$). In irradiated parotid glands, ASL-derived signal showed consistent inverse association with salivary pH and the stimulated salivary flow, suggesting ASL MRI may reflect perfusion-related changes linked to gland dysfunction after radiotherapy. Larger, controlled studies with quantitative perfusion modelling are warranted to validate ASL as a biomarker in this setting.

038 A Time-Efficient Strategy for Biofluorescence Bleaching to Differentiate Discolored Carious Lesions

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This study evaluated whether applying 40% hydrogen peroxide (HP) and brushing to a previously proposed biofluorescence bleaching (BF-bleaching) protocol (15% HP), used to remove stains and reveal caries-indicative biofluorescence, could shorten treatment time while maintaining discrimination between caries-indicative stains (CS) and organic stains (OS). A total of 64 bovine enamel specimens were prepared and assigned to eight groups according to stain type, bleaching agent concentration, and bleaching with brushing ($n=8/\text{group}$). OS (G1–G4) were stained with a coffee solution, whereas CS (G5–G8) were stained with protoporphyrin IX followed by coffee staining to reproduce masked red biofluorescence. BF-bleaching was applied as follows: G1&G5, 15% HP; G2&G6, 40% HP; G3&G7, 15% HP with brushing; and G4&G8, 40% HP with brushing. Biofluorescence changes were recorded at baseline, 5, 10, and 15 minutes after BF-bleaching using quantitative light-induced fluorescence-digital (QLF-D) and fluorescence hyperspectral imaging (FHSI). Hue angle (h°) and spectral analyses were performed. Intergroup differences were analyzed using one-way ANOVA, and time-dependent changes were assessed using one-way repeated measures ANOVA with Bonferroni *post-hoc* tests ($p<0.05$). The h° revealed concentration-dependent differences from 5 minutes in both OS and CS groups, with the 40% HP 5-minute treatment achieving a bleaching effect comparable to 15% HP 15-minute treatment ($p<0.05$). Addition of brushing significantly affected only OS groups ($p<0.05$). The h° distributions remained in the orange–yellow region for OS groups and in the red–orange region for CS groups. FHSI analysis revealed a persistent secondary peak in the red region (620–780 nm) exclusively in CS groups, confirming preserved discrimination after BF-bleaching. Therefore, BF-bleaching incorporating 40% HP and brushing provides a time-efficient approach while maintaining discrimination between OS and CS, suggesting high potential for clinical application.

039 Clinical Perspectives on Enamel Defects and Hypoplasia: A Survey of Pediatric Dentists from 18 Countries

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The aim of the study was to investigate the diversity in diagnostic terminology and etiological perspectives regarding enamel defects and enamel hypoplasia in primary incisors among pediatric dentists. A cross-sectional online survey was conducted to evaluate clinical perceptions of pediatric dentists. A total of 96 pediatric dental specialists from 18 countries participated in the study. The survey instrument consisted four structured questions and two high-resolution intraoral clinical images of 14-month-old infants with four erupted maxillary primary incisors exhibiting varying degrees of enamel defects or hypoplasia. Participants were provided with a multiple-choice selection, including: (i) Enamel Hypoplasia, (ii) Non-cavitated lesions, (iii) Demineralized enamel surface, (iv) White spot lesions, and (v) Enamel opacities (demarcated or diffuse). Respondents were permitted to select multiple descriptors for each clinical case. The survey findings revealed significant diagnostic heterogeneity and a lack of etiological consensus among the participating pediatric dentists. Regarding nomenclature, 25.3% of respondents classified the first clinical image using a combination of "non-cavitated lesion," "demineralized enamel surface," and "white spot lesion," while the second image elicited more varied responses, with "enamel hypoplasia" and "enamel opacities" each favored by 12.1% of practitioners. A critical finding was observed concerning the origin of these defects; a majority (56.6%) attributed the anomalies to post-eruptive plaque accumulation, whereas 43.4% disagreed with this biofilm-centric etiology. Furthermore, only 36.4% of participants identified the conditions as developmental defects present at the time of eruption, with the remaining 63.6% rejecting a pre-eruptive origin. There is a lack of consensus among pediatric dentists regarding the nomenclature and etiology of enamel defects in the primary dentition. There is an urgent need for consensus.

040 QrayPen QS score for secondary caries under composite restorations

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Secondary caries adjacent to composite restorations is a major driver of re-restoration, yet detection by visual and radiographic methods can be uncertain. This prospective observational clinical study evaluated a QLF-derived fluorescence-image severity score (QS, 0–3) from QrayPen (AIOBIO) imaging for identifying secondary caries beneath posterior composite restorations indicated for replacement. A total of 82 posterior composite restorations were replaced according to revised FDI criteria, including biological indications (suspected secondary caries at the restoration margin) and functional indications (e.g., marginal defects/fracture, loss of retention). Before removal, restorations were scored visually (Nyvad 0–9) and on bitewing radiographs using ICCMS depth (0–6). QrayPen images were analysed to assign QS; maximum fluorescence loss ($\Delta F_{\max}$, %) and maximum red fluorescence ($\Delta R_{\max}$, %) were additionally recorded for supportive analyses. After restoration removal, secondary caries presence/absence at the same site served as the reference standard. Secondary caries was confirmed in 60/82 (73.2%) restorations. QS showed a strong positive association with ICCMS depth (Spearman $\rho = 0.909$, $p < 0.001$). Using QS > 0 as the positivity threshold, sensitivity was 85.0% (51/60; 95% CI 73.9–91.9) and specificity was 95.5% (21/22; 95% CI 78.2–99.2). In restorations indicated for replacement, QrayPen QS provides a clinically interpretable fluorescence assessment that complements visual and radiographic evaluation for secondary caries under composites.

041 Difference of training artificial intelligence systems by expert opinion or histology for caries detection on radiographs

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Systems based on ‘artificial intelligence’ (AI) designed to assist dental practitioners in the interpretation of radiographs are becoming increasingly integrated in daily workflow. The quality of this support stands and falls with the quality of the training or learning of these software systems. To obtain enough images, the expert opinion on the presence, absence or severity of carious lesions from large image archives is frequently used for training. As sensitivity and specificity of human observers is not absolute, this may be reflected in the quality of the information the practitioner receives. The present study aimed to compare the diagnostic performance and clinical reliability of an AI model trained using a histological reference standard with that of a model trained using expert consensus. Teeth extracted for periodontal or orthodontic reasons (n=142) and their periapical radiographies were obtained in clinical practice. After hemisecting, the severity of a carious lesion was established by two observers (ICC coefficient (3.1) = 0.96). In parallel, several experienced dental practitioners assessed lesion depth on radiographs using the ICDAS-based ICCM classification via a questionnaire. Two identical deep learning models based on the YOLO architecture were trained separately using histological ground truth and expert consensus labels (median score). Model performance was evaluated using Specificity, sensitivity, F1-score and ROC AUC as statistical metrics. The histologically based trained AI model showed significantly higher sensitivity (0.917 versus 0.587), F1-score (0.952 versus 0.722), AUC (0.935 versus 0.746) compared to the expert opinion-trained model ($p < 0.05$). In contrast, no statistically significant difference in specificity was observed between the two approaches (0.969 versus 0.879). These findings suggest that independent reference standards may represent a viable alternative to expert opinion for AI training, potentially improving diagnostic reliability.

042 Public Health Trends in German Children: Declining Caries Amid Persistent Obesity and High Sugar Intake

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Background: Children's oral health improved in Germany while obesity became a significant public-health concern. **Aim:** To compare trends in caries, obesity and sugar sweetened beverage (SSB) consumption in children in Germany for the past two decades. **Materials & Methods:** Caries data were drawn from national cross-sectional survey (DMS III-VI: 1997-2022 and DAJ 1997-2016). For obesity, the WHO indicator "Prevalence of obesity among children and adolescents aged 5–19 years" (BMI > +2 SD) was used, based on WHO data for Germany. Whereas, SSB consumption patterns were derived from KiGGS (Germany Study on the Health of Children and Adolescents) baseline (2003–2006) and KiGGS Wave 2 (2014–2017), including Diabetes Surveillance 2015 estimates. Trends in data sets were analysed descriptively to identify patterns, convergence, or divergence. **Results:** In Germany, the mean DMFT in 12-year-olds fell dramatically from 1.7 (1997) to 0.5 (2022) and caries prevalence from 50–60 % (1997) to 22.4 % (2022). Meanwhile, WHO data for obesity (ages 5–19 years) indicate in Germany a non-negligible increase of 3.7 percentage from 6.8% (1997) to 8.5% (2022). SSB intake decreased over time, but remained substantial: In 2005, an estimated 35% of children/adolescents consumed SSB daily. By 2014, this fell to about 20% and in 2016, levels remained around 19–20%, reflecting a slower decline than seen in caries. **Conclusion:** Caries levels in German adolescents have dramatically declined and stabilised at very low levels despite persistently high sugar intake and a continuing rise in obesity. This divergence suggests that improved dental prevention has compensated the consequences of sugar-related risks, while obesity seems to require broader intervention strategies beyond sugar reduction alone.

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044 Pricing Out Health: The "Poverty Multiplier" Effect of Diet Unaffordability on Global Pediatric Caries

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Introduction: Dental caries, a chronic disease influenced by diet, is also shaped by broader commercial and economic factors. While sugar availability has been widely studied, the role of a healthy diet unaffordability as a structural cause of dental caries is still not well understood globally. Methods: Using 1,025 country-year observations, we performed a longitudinal fixed-effects panel analysis of 149 countries between 2017 and 2023. The Global Burden of Disease Study provided age-standardized Disability-Adjusted Life Years (DALYs) for caries of permanent teeth in adolescents (10–14 years; primary outcome) and deciduous teeth in children under 5 years (secondary outcome). The cost of a healthy diet and the prevalence of unaffordability, two indicators of diet affordability, were taken from FAO data and delayed by two years to account for caries latency. GDP (PPP) and country fixed effects were taken into account in the models. In addition to WHO regional analyses and sensitivity tests, stratified analyses were carried out for high-income countries (HICs) and low- and middle-income countries (LMICs). Results: A 1% increase in the population unable to afford a healthy diet predicted a 0.032 increase in caries DALYs per 100,000 two years later ($p < 0.01$), indicating a significant correlation between diet unaffordability and higher adolescent caries burden in LMICs. A "wealth buffer" effect was supported by the lack of this association in HICs. Compared to toddlers, adolescents were twice as sensitive to unaffordability. At the regional level, Europe displayed a protective pattern, while the Americas showed positive associations. A biologically plausible lagged effect was verified by temporal sensitivity analyses. Conclusion: Diet unaffordability is a significant upstream determinant of dental caries in children, particularly adolescents in LMICs. Addressing commercial and economic barriers to healthy diets should be considered integral to global caries prevention strategies.

045 Unsupervised identification of lifestyle-based clusters associated with early childhood caries and longitudinal transitions

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Numerous studies regarding individual caries-related behaviors (CRB) have been presented; however, their clustering in early childhood, transitions over time, and associations with caries remain poorly understood. This study analyzed children aged 18 months (T1) and 42 months (T2) to identify unsupervised lifestyle-based clusters, examine transitions between clusters, and assess associations with caries experience at T2. Anonymized data for 4,009 children living in Toyonaka City, Japan, who underwent mandatory municipal health examinations at 18 and 42 months old between April 2018 and March 2020 were analyzed (ethics approval: R2-E25). Details regarding lifestyle behaviors were collected using questionnaires completed by their parents. Unsupervised cluster analyses were conducted separately at T1 and T2. Cluster transitions were analyzed using chi-square testing and associations with caries experience at T2 were evaluated with adjusted logistic regression models. At T1, a cluster characterized by an elevated prevalence of previously reported CRB, including breastfeeding (42.1%), frequent daily snacking (19.2%), and almost daily pre-bedtime food consumption (39.8%), was identified (T1 high cluster). At T2, a cluster with a high prevalence of CRB, including frequent daily snacking (28.9%) and almost daily pre-bedtime food consumption (30.6%), was detected (T2 high cluster). Notably, children classified in the T1 high cluster were significantly more likely to transition to the T2 high cluster ($P < 0.001$). Clusters characterized by multiple co-occurring CRB showed a greater prevalence for caries experience at T2. Also, adjusted logistic regression results indicated a stronger association of the T1 high cluster with caries experience at T2 than the T2 high cluster. These findings suggest that co-occurring CRB in early childhood may exert a strong influence on caries development, highlighting the importance of early preventive interventions targeting comprehensive lifestyle patterns.

047 Cariogenic Potential of Non-Specialized Nutritional Supplements for Older Adults on Root Dentine

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Introduction. There exists an increasing popularity and use of nutritional supplements among older adults, which aims to counteract age-related malnutrition. However, many products contain high levels of free sugars or other carbohydrates that may increase caries risk, particularly on exposed root surfaces. This study evaluated the cariogenic potential of commercially available non-specialized instant nutritional supplements for older adults using a validated experimental root caries biofilm model. **Methodology.** *Streptococcus mutans* UA159 biofilms were grown on bovine root dentine slabs and exposed 3x/day for 3 days to 3 non-specialized nutritional supplements (Bebida Láctea Años Dorados®, Ensure®, Ensoy®). A 10% sucrose solution served as a positive control, and 0.9% NaCl as a negative control. Biofilm acidogenicity was assessed by repeated pH measurements of the culture medium and quantified as area under the curve (AUC). Root dentine demineralization was evaluated by percentage surface hardness loss (%SHL) using Knoop microhardness testing. Viable bacterial counts were determined as colony-forming units (CFU). Data were analyzed using ANOVA and Tukey post hoc tests ($p < 0.05$). **Results.** All nutritional supplements induced significant biofilm acidification compared with the negative control ($p < 0.05$). Ensure® and Ensoy® produced lower pH values than the 10% sucrose control at multiple time points. Root dentine demineralization was substantial for all supplements (%SHL range: 38–49%), with Ensure® showing no significant difference from the sucrose control ($48.5 \pm 1.5\%$ vs. $51.3 \pm 1.4\%$; $p > 0.05$). Biofilm viability was high for all supplement-treated groups ($\approx 1.4 \times 10^9$ CFU), comparable to the positive control. **Conclusions.** Non-specialized nutritional supplements for older adults exhibit high cariogenic potential on root dentine in vitro, comparable to sucrose exposure. These findings highlight the need to consider oral health risks when recommending nutritional supplementation in older populations.

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048 School-Based Dental Caries Control: A Scoping Review of Study Designs, Geographic Distribution, and Intervention Strategies

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The aim of this scoping review was to map the types of study designs, their geographical distribution, and the strategies adopted by oral health professionals to address dental caries among children and adolescents in school settings. A comprehensive literature search was conducted in PubMed, Cochrane Library, Web of Science, Health Systems Evidence, and the Virtual Health Library in accordance with Joanna Briggs Institute methodological guidelines. Studies were screened and selected independently by two reviewers based on predefined inclusion criteria, with a third reviewer resolving discrepancies; inter-examiner agreement was high (Cohen's kappa = 0.95). A total of 8,118 studies were initially identified, of which 311 met inclusion criteria. Included studies were published between 1953 and 2025 and originated from diverse global regions, with the highest representation from the United States, Brazil, and China. Randomized controlled trials constituted the majority of study designs (37%), followed by non-randomized intervention studies (23%) and cross-sectional studies (8%). Despite extensive research activity, only 3% of the studies explicitly described and evaluated the implementation process of a policy aimed at caries control in schools. Key strategies reported included preventive clinical interventions, education and behavioral approaches, and community-based programs targeting risk reduction. However, there was a notable scarcity of pragmatic, real-world implementation research and policy evaluation studies. In conclusion, while a substantial body of research exists on school-based strategies to address dental caries, gaps remain in evidence on the implementation and effectiveness of public health policies in real-world school contexts. This limitation constrains evidence-informed decision-making and policy development to improve caries prevention and management worldwide.

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Poster I

Clinical studies and Public Health

049 Caries in Permanent Molars of Children Treated with SDF Gel/Varnish in Primary Dentition: A Retrospective Study

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Background: A previous clinical trial determined lesion arrest in primary teeth, where 38% SDF gel and 2.5% NaF varnish were applied sequentially. Two applications arrested >90% of caries surfaces at 1-y. This follow-up study determined prevalence of caries in untreated first permanent molars. **Materials and Methods:** The design was a retrospective cohort. Participants were 219 children in the initial trial; controls were in the same classes but did not participate. Participants were drawn from five Centros Educativos Iniciales, Puno, Peru. Examinations were conducted 19 months after the second treatment in the initial study. Prevalence of D2, D3 or D4 lesions, missing surfaces due to caries or filled surfaces was compared between groups. **Results.** 181/237 (76.4%) children treated at baseline were followed up; 104 control (untreated) children also examined. Prevalence of caries in first permanent molars was significantly lower in treated children (4.4%, 95%CI 1.4,10%) compared to controls (66.6%, 95%CI 53.6, 77.2%; $p<.001$). D₂₋₄MFS in 1st permanent molars was lower in the treated children (median [IQR] = 0, [0,0]) vs. controls (median [IQR]=1 [0,3]; $p<.001$). **Conclusion.** Two sequential applications of SDF gel and 2.5% NaF varnish at 3-4y old resulted in fewer caries in first permanent molars at 6-7y than untreated controls.

050 Clinical Effects of Toothpastes Containing Dextranase Alone or in Combination with Isopropyl Methylphenol (IPMP)

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Aim of this study was to evaluate the plaque-inhibitory efficacy of a toothpaste containing dextranase, an enzyme that degrades α -1,6-glycosidic bonds in glucans, used alone or in combination with the non-ionic antimicrobial agent isopropyl methylphenol (IPMP). This study was approved by the Ethics Committee of the Affiliated Stomatological Hospital, Chongqing Medical University (Approval No. 2024-LunReview-084). Conducted as a parallel, randomized, double-blind, placebo-controlled clinical trial, subjects were assessed for Plaque Index (PI) at baseline and randomized into three groups: Group 1 (n = 61) used toothpaste containing the effective amount of dextranase as determined by an *in vitro* study. Group 2 (n = 62) used toothpaste with five times the amount of dextranase in Group 1 along with IPMP. The control group (n = 63) used toothpaste without dextranase and IPMP. PI was evaluated at 2, 4, and 8 weeks. Differences between groups were analyzed using a mixed model for repeated measures (MMRM), with statistical significance set at $p < 0.05$. Compared with the control group, Group 1 showed PI reductions (mean $\pm$ SE) of 0.162 ± 0.030 , 0.278 ± 0.044 , and 0.369 ± 0.043 at weeks 2, 4, and 8, respectively (all $p < 0.0001$). Group 2 demonstrated greater reductions of 0.261 ± 0.032 , 0.528 ± 0.029 , and 0.620 ± 0.042 at the same time points (all $p < 0.0001$). The reductions in PI in Group 2 were significantly larger than those in Group 1 at all visits (all $p < 0.001$). No treatment-related adverse events were reported. In conclusion, toothpastes containing dextranase, either alone or in combination with IPMP, significantly reduce dental plaque *in vivo*, with the combination formula providing the greatest benefit.

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051 The Caries Diagnostic Advantage of Bitewing Radiographs

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The aim of this study was to assess diagnostic benefits of bitewing radiographs with children enrolled in a longitudinal study aiming to validate a caries risk assessment tool. Children received periodic caries examinations from age 1-12 years using International Caries Detection and Assessment System (ICDAS) criteria and bitewing radiographs at ages 6.5(n=639), 8 n=576), 9.5(n=569) and 12(n=474). Bitewing radiographs were reviewed by one board-certified dental radiologist. Caries prevalence and incidence for posterior tooth surfaces (dmfs+DMFS, defined as ICDAS $\geq$ 3 or radiographically into dentin), presented as (95% CI), were compared with/without bitewing radiographs using mixed-model ANOVA. Interproximal caries prevalence and incidence (from age 4) increased at age 6.5 from 0.77(0.66-0.90) and 0.66(0.56-0.77) without radiographs to 1.43(1.25-1.61) and 1.28(1.12-1.44) with radiographs; at age 8 from 1.22(1.05-1.40) and 0.52(0.44-0.60) without radiographs to 2.01 (1.77-2.26) and 0.70 (0.61-0.79) with radiographs; at age 9.5 from 1.16 (1.00-1.32) and 0.40 (0.23-0.47) without radiographs to 1.94 (1.72-2.18) and 0.64 (0.56-0.73) with radiographs; at age 12 from 0.36 (0.29-0.43) and 0.18 (0.13-0.22) without radiographs to 0.62(0.52-0.73) and 0.27 (0.22-0.33)with radiographs. Pit-and-fissure caries prevalence and incidence increased at age 6.5 from 0.94(0.81-1.08) and 0.73(0.63-0.84) without radiographs to 1.48(1.32-1.66) and 1.23(1.09-1.38) with radiographs; at age 8 from 1.55(1.35-1.75) and 0.70 (0.61-0.80) without radiographs to 2.29(2.29-2.93) and 1.20 (1.08-1.33) with radiographs; at age 9.5 from 1.57 (1.38-1.77) and 0.55 (0.48-0.63) without radiographs to 2.65 (2.39-2.93) and 0.92 (0.81-1.03) with radiographs; at age 12 from 0.79 (0.68-0.92) and 0.42 (0.35-0.49) without radiographs to 1.25 (1.10-1.42) and 0.54 (0.46-0.62) with radiographs. In conclusion, for all ages examined, adding bitewing radiographs resulted in more caries detected than clinical examination alone.

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052 Patient-Reported Outcome Measures in Randomized Controlled Trials of Treatments for Cavitated Dentin Caries Lesions: Meta-research

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This meta-research aimed to map the patient-reported outcome measures (PROMs) reported in randomized controlled trials (RCTs) assessing strategies for management of cavitated dentin caries lesions in primary teeth. This study was registered in the COMET Initiative database. Study selection and data extraction were independently performed by two reviewers. Comprehensive searches were carried out in MEDLINE/PubMed, Scopus, Web of Science, Embase, and the Cochrane Library, covering studies published up to February 14, 2025. Titles and abstracts were screened based on predefined eligibility criteria, including: (1) evaluation of management strategies for cavitated dentin caries lesions in primary teeth; and (2) RCT design. Full texts of potentially eligible studies were subsequently assessed. Studies were excluded if they failed to clearly report outcome measures and their assessment methods, were conducted in specific patient populations, or did not adequately describe the intervention and comparator groups. Extracted data were synthesized, and reported outcomes were categorized. In total, 3,485 records were identified, of which 318 studies met the inclusion criteria. Among these, 53 studies (16.7%) reported at least one PROM, totaling 72 PROMs evaluated. The most frequently assessed outcome was discomfort/pain reported by children (21; 29.2%), followed by acceptability (14; 19.2%), satisfaction (13; 18.1%), and oral health–related quality of life (13; 18.1%). Outcomes related to children’s behavior were reported in only 5 studies (6.9%), while anxiety was assessed in just 2 studies (2.8%). In conclusion, PROMs are infrequently incorporated into RCTs evaluating the management of cavitated dentin caries lesions in primary teeth and are predominantly focused on pain-related outcomes, with limited assessment of broader patient-centered domains such as behavior and anxiety.

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053 Comparison of restorative techniques following selective caries excavation - preliminary results of a 2-year RCT

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A randomised clinical trial (RCT) to compare two different restorative techniques following selective caries excavation (SE) has been initiated; preliminary results are presented here. SE is a treatment option for the management of deep dentinal caries lesions. However, there is a lack of consensus regarding the choice of the restorative technique following this minimal invasive approach. A randomised clinical trial has been designed with an intervention group and a control group. A total of 84 eligible teeth are required in each group to achieve statistical significance. Currently, eight public dental health clinics in western Sweden are participating in the study to recruit eligible teeth and perform the treatments. The intervention group will receive SE, followed by application of Biodentine and a composite restoration, whereas the control group will receive SE followed by direct composite restoration. Both groups will be followed after 1 and 2 years where the vitality of the teeth and the quality of the restoration will be assessed. As of the current date, 91 teeth have been recruited into the study, and the participating clinics are in the process of conducting the 1-year follow-up. Preliminary analyses of the descriptive data shows that deep caries lesions are equally distributed between genders with the highest incidence observed in individuals aged 30-39 years. Furthermore, lesions are most prevalent on the distal surfaces of posterior teeth and least prevalent on the occlusal surfaces. Finally, the distal surfaces of the left maxillary second premolars show the highest susceptibility to deep caries lesions, followed by the left maxillary and mandibular first molars.

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054 Are there Hawthorne-like participation effects in oral-hygiene research? Evidence from longitudinal plaque mapping

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Behavioural reactivity to being observed (study participation/Hawthorne-like effect) has been described across behavioural research, yet its relevance for oral-hygiene studies is unclear. If present, participation effects could lower baseline plaque between visits, inflate apparent intervention effects, and reduce generalisability to routine care. We therefore retrospectively assessed whether, in a flossing study, uninstructed general oral-hygiene behaviour improved over time, consistent with a Hawthorne-like participation effect. Intraoral scans from 37 participants (30 female, 7 male; 23.1 ± 3.2 years) enrolled in a flossing performance study were re-analysed. The original study comprised four sessions ≥ 2 weeks apart with standardised pre- and post-flossing scans after plaque disclosure; the present analysis used pre-flossing scans only. Percentage plaque coverage (P%) on Ramfjord teeth (oral/vestibular; mean $\pm$ SD) was quantified planimetrically. In addition to overall plaque, plaque hotspot surfaces (16 vestibular, 36 oral) were analysed. Images were superimposed to derive proportions of stable, gained, and lost plaque area between time points. Longitudinal effects were tested using linear mixed-effects models (random intercept for participant). Overall plaque remained stable across sessions (11.6 ± 6.0 , 11.1 ± 5.6 , 11.2 ± 7.2 , 11.2 ± 6.3 P%; $p=0.856$). Hotspot plaque changes were limited and site-dependent (16 vestibular: $p=0.371$; 36 oral: $p=0.057$). Despite a modest decline, stable plaque areas remained substantial in hotspots (16 vestibular: $47.9 \rightarrow 40.1$ P%, $p<0.001$; 36 oral: $58.7 \rightarrow 48.6$ P%, $p<0.001$). Dynamic components differed by site: at 16 vestibular, gain increased ($26.2 \rightarrow 34.0$ P%, $p=0.001$) while loss was unchanged ($p=0.25$); at 36 oral, loss increased ($21.6 \rightarrow 30.4$ P%, $p=0.012$) with no clear change in gain ($p=0.31$). Findings provide limited evidence for a Hawthorne-like participation effect on uninstructed oral hygiene. Persistently high stable plaque in hotspots suggests toothbrushing “no-go” areas, with redistribution over time rather than a uniform reduction in plaque burden.

055 Oral health-related quality of life and dental treatment 5-10 years after hematopoietic cell transplantation

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Hematopoietic cell transplantation (HCT) has been associated with xerostomia and reduced salivary flowrates. This study investigated patient-reported oral health-related quality of life 5 to 10 years after HCT, and its association with type of HCT and received dental treatment. Oral health-related quality of life was assessed using validated questionnaires (OHIP-14, Summated XI). After consent, dental records were reviewed to determine the number of extractions and restorations performed from 7 years before to 10 years after HCT. To evaluate the impact of HCT type (autologous vs. allogeneic) on questionnaire scores, extractions, and restorations, negative binomial and logistic regression models were used, adjusted for confounders. A total of 169 HCT recipients (84 allogeneic) completed questionnaires, and dental records were obtained of 145 patients. Allogeneic recipients had significantly higher sum scores for the OHIP, and XI questionnaires (OHIP IRR=2.1 [95% CI 1.4, 3.3]; XI IRR=1.17 [95% CI 1.03, 1.34]. Allogeneic HCT recipients were more likely to have one or more extractions (OR=4.5 [95% CI 1.3, 17.7]) compared to autologous HCT recipients. No significant difference was observed in the number of restorations between the two groups. Allogeneic HCT recipients reported worse oral health-related quality of life and higher xerostomia than autologous HCT recipients. They were also more likely to undergo extractions post-HCT but did not require more restorations.

056 JBI and AMSTAR 2 for appraising systematic reviews in pediatric dental caries management: a meta-research

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This study aimed to compare the AMSTAR 2 and Joanna Briggs Institute (JBI) critical appraisal tools, focusing on their ability to detect methodological and reporting weaknesses in systematic reviews (SRs) on pediatric dentin caries management. This meta-research was conducted within an umbrella review registered in PROSPERO (CRD42024544025). A comprehensive search of PubMed, EMBASE, Scopus, Web of Science, the Cochrane Database, and Epistemonikos was performed on 5 March 2025 to identify SRs of randomized controlled trials addressing dentin caries management. Two independent reviewers screened studies, extracted data, and assessed methodological quality using both tools. Descriptive analyses summarized SR characteristics and compared tool performance. Of the 2,641 records retrieved, 21 SRs published between 2010 and 2024 met the inclusion criteria. Only 12 SRs reported protocol registration, seven of which were prospective. According to AMSTAR 2, 92.6% of SRs were rated as “critically low” and 7.4% as “low.” In contrast, the JBI checklist classified 44.4% of SRs as “Exclusion” and 55.6% as “Seek further information.” AMSTAR 2 applied stricter criteria, particularly regarding protocol registration, reproducible search strategies, and explicit consideration of risk of bias and heterogeneity in result interpretation. The JBI checklist adopted a more flexible approach, assessing search strategies without requiring full reproducibility and evaluating risk of bias as a single item without mandatory integration into the synthesis. In conclusion, AMSTAR 2 demonstrated greater sensitivity in identifying critical methodological weaknesses, whereas the JBI tool may underestimate key limitations due to its less stringent criteria.

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057 Influence of Miswak-based Toothpaste on the Reduction of Glucosyltransferase Enzyme - A Randomized Controlled Trial

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Streptococcus mutans contributes to dental caries by synthesizing glucans via glucosyltransferase enzymes, thereby promoting bacterial adhesion to tooth surfaces. Therapeutic agents that inhibit these enzymes without adversely affecting the oral microbiota are of clinical interest. This triple-blinded randomized controlled trial evaluated the anticariogenic effects of a commercially available miswak (*Salvadora persica*)–containing toothpaste compared with a fluoridated toothpaste. Eighty-eight adults were randomly allocated to either a miswak-containing toothpaste or a fluoridated toothpaste using a computer-generated sequence. Baseline clinical examination included dental status assessment and plaque collection for analysis of glucosyltransferase enzyme levels and total bacterial counts. Participants used the assigned toothpaste for 6 months and were re-evaluated at 3 and 6 months. Primary outcomes were changes in glucosyltransferase enzyme levels, while secondary outcomes included DMFS scores and total bacterial counts. Statistical analyses were conducted at a 5% significance level. Intergroup comparisons were performed using the Mann–Whitney test, and intragroup changes over time were assessed using the Wilcoxon and Friedman tests. No significant intergroup differences were observed in glucosyltransferase levels, DMFS scores, or bacterial counts at any time point. However, both groups demonstrated significant intragroup reductions over six months in glucosyltransferase levels (A=0.42 ± 0.52 to 0.36 ± 0.44; B=0.39 ± 0.50 to 0.35 ± 0.45), DMFS scores (A=2.61 ± 1.67 to 2.55 ± 1.93; B=2.43 ± 1.42 to 2.41 ± 1.55), and bacterial counts ($p < 0.001$). These findings indicate that both miswak-containing and fluoridated toothpastes were effective in reducing cariogenic enzyme activity, bacterial load, and caries experience over the study period. Although miswak toothpaste did not demonstrate superiority over fluoride toothpaste, its comparable performance suggests potential utility as an adjunct to caries prevention strategies.

059 Impact of Achieving a basic Dental Discharge Threshold on Caries Incidence

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In outreach programs providing intermittent dental care to socially vulnerable populations, disease control is prioritized over episodic treatment. Basic Operative Discharge(BOD) denotes completion of preventive measures and simplified operative caries management; failure to achieve BOD reflects incomplete operative care rather than absence of prevention. This longitudinal study evaluated whether BOD was associated with lower caries incidence using clinical records from annual rural outreach programs of the Department of Preventive and Community Dentistry, UBA. Subjects were evaluated at baseline and at subsequent annual time points. Missed intermediate evaluations were assigned to the next available time point without imputation. Caries incidence between consecutive annual evaluations was defined as ≥ 1 dental surface transitioning from ICDAS 0 to >0 . Subjects were classified according to BOD status at the preceding evaluation. Risk ratios(RR) and 95% confidence intervals(CI) were estimated using Poisson generalized estimating equations with robust variance, adjusting for follow-up interval, clinical site, baseline disease severity, and number of restorations performed. A total of 165 subjects contributed 432 subject-intervals. Caries incidence was lower among individuals who achieved BOD in early follow-up: 59.65% vs 64.71% in T0–T1(RR=0.92) and 57.85% vs 61.36% in T1–T2(RR=0.94). In T2–T3, incidence was similar between groups(57.50% vs 54.55%; RR=1.05). Pooled crude incidence across intervals was 58.41% among patients achieving BOD vs 61.54%. In the adjusted longitudinal model, BOD was not significantly associated with reduced caries incidence(RR=1.02; 95%CI: 0.84–1.23). Operative disease control showed a trend toward lower caries incidence in early follow-up, without a statistically significant association in adjusted analyses.

060 Adolescent alcohol consumption and its association with dental caries and erosive tooth wear

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Alcohol consumption during adolescence may negatively influence oral health, particularly dental caries and erosive tooth wear. The aim of this narrative review was to summarize current evidence on the mechanisms and behavioral pathways linking adolescent alcohol use to caries development and tooth erosion. A structured narrative review of epidemiological, clinical, and experimental studies published in English was conducted, focusing on alcohol consumption patterns in adolescents and associated oral health outcomes. Particular attention was given to beverage composition, salivary effects, oral hygiene behaviors, and socioeconomic modifiers. Data from the 2023 National Survey on Drug Use and Health indicate that 33.1% of adolescents aged 12–20 reported lifetime alcohol use, with 14.6% reporting use in the past month; binge drinking was reported by 8.6%. Alcoholic beverages commonly consumed by adolescents are characterized by high sugar content and low pH, promoting enamel demineralization. Alcohol consumption is also associated with reduced salivary flow, increased frequency of acidic challenges, and vomiting-induced intrinsic erosion. Behavioral factors, including inadequate oral hygiene and frequent intake of sugary or acidic foods, further exacerbate dental caries and erosive tooth wear risk. Adolescents from lower socioeconomic backgrounds appear disproportionately affected due to reduced access to preventive dental care and oral health education. In conclusion, adolescent alcohol consumption is associated with increased risk for dental caries and erosive tooth wear through combined chemical, biological, and behavioral mechanisms. Preventive strategies integrating oral health education, dietary counseling, and early behavioral interventions may help mitigate alcohol-related dental risks in this vulnerable population.

Poster II

**Demineralisation-remineralisation, Erosion,
Fluoride, Pulp-Dentinal Reactions, Behaviour**

062 Surface Effects of Fluoride Gel and Resin Infiltration on Early Enamel Lesions

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The aim of this study was to evaluate the effect of topical fluoride gel and resin infiltration on enamel surface microroughness of non-cavitated white spot lesions. Fifteen freshly extracted human third molars were selected and stored in 0.09% NaCl solution. Crowns were sectioned, and specimens were randomly allocated into three groups (n = 10): untreated white spot lesions, topical fluoride gel treatment, and resin infiltration treatment. Artificial white spot lesions were created prior to intervention. Enamel surface microroughness was assessed using non-contact optical profilometry. Data were analyzed using one-way analysis of variance followed by Tukey's post hoc test ($\alpha = 0.05$). Normality assumptions were verified prior to analysis. Mean micro-roughness was significantly higher in untreated white spot lesions ($1.91 \pm 0.42 \mu\text{m}$), ($1.91 \mu\text{m}$; 95% CI: 1.62–2.20) compared with specimens treated with topical fluoride gel ($1.35 \pm 0.28 \mu\text{m}$), ($1.35 \mu\text{m}$; 95% CI: 1.18–1.52) and resin infiltration ($1.34 \pm 0.26 \mu\text{m}$) ($p < 0.05$), ($1.34 \mu\text{m}$; 95% CI: 1.17–1.51) ($p < 0.05$). No statistically significant difference was observed between the fluoride gel and resin infiltration groups ($p > 0.05$). These findings indicate that both topical fluoride application and resin infiltration significantly reduce enamel surface microroughness associated with non-cavitated white spot lesions. Reduced surface roughness may influence surface conditions relevant to biofilm accumulation and early caries lesion activity. Both approaches represent noninvasive preventive strategies for managing early enamel demineralization. Further studies are required to evaluate the relationship between microroughness reduction and long-term caries behavior.

063 Influence of uptake of S-PRG filler derived minerals by demineralized enamel on remineralization by fluoride

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This depth-specific trial was conducted to test the hypothesis that the enhancement of remineralization in demineralized enamel occurs when fluoride is applied with other mineral ions released from prophylaxis paste containing surface pre-reacted glass-ionomer (S-PRG) filler. Two fluoride filtrate solutions (163 ppm) from the slurry of prophylaxis paste were prepared: One with and another without S-PRG filler (FA and FB). FA contained aluminum (397 ppm), borate (532 ppm), silicate (23 ppm) and strontium (1047 ppm), while FB contained silicate (48 ppm). Thirty polished enamel-slabs each with an exposed window (4x4 mm) were demineralized. Half of the windows was then nail-varnished as the control area. Afterward these slabs were divided into two groups and treated twice daily with either FA or FB and immersed in the remineralization solution for 9 days. The slabs were cut in the middle to quantify cross-sectional surface mineral density in the remineralized and control areas using energy dispersion spectrometry. Subsequently, two enamel posts were taken from the residual remineralized area. Three serial layers (30 μ m thick) were separated by abrasion to determine fluoride level electrometrically, and aluminum, borate, silicate, strontium and calcium were determined using ICP-atomic emission spectroscopy. The results were corrected by volume and statistically evaluated using non-parametric methods. F concentrations (ng/mm³, mean $\pm$ SD) in the outer, middle, and inner layers of enamel treated with FA (EA) were, respectively, 505 $\pm$ 491, 337 $\pm$ 314, 158 $\pm$ 128 and 499 $\pm$ 451, 307 $\pm$ 269 and 218 $\pm$ 170 with FB (EB). This indicated no significant differences in F levels in any layer between EA and EB. However, Sr significantly rose ($p<0.05$) but Ca became significantly lower ($p<0.001$) in all layers in EA. These results could not confirm the hypothesis that S-PRG filler-derived minerals promote fluoride-induced enamel remineralization.

064 Comparative Analysis of Healthy and Carious Enamel and Dentin using FTIR and NMR Spectroscopy

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The aim of this study was to conduct a comparative molecular-level analysis of healthy and carious tooth tissues, with a specific focus on sound enamel and layer-specific structural and biochemical alternations in dentine during the progression of dental caries. Sound enamel, sound dentine, deep carious dentin (outer and inner layers), and severely/grossly decayed dentin (outer and inner layers) were obtained from 41 extracted human teeth. The experimental methodology utilized Fourier-transform infrared (FTIR) spectroscopy to evaluate changes in the organic-to-mineral ratio (Amide I/phosphate). Complementary solid-state nuclear magnetic resonance (NMR) spectroscopy (^{13}C ^{15}N ^{31}P) was employed to assess collagen degradation and molecular disorder and phosphate crystal organisation through chemical shift anisotropy (CSA) and asymmetry (κ). FTIR analysis revealed a progressive increase in the Amide I/phosphate ratio from healthy to carious tissues, indicating demineralization and organic matrix exposure. NMR data confirmed that healthy tissues exhibited highly ordered phosphate structures. Deep carious layers showed moderate mineral loss with largely preserved collagen, while grossly or severely decayed dentine displayed significant collagen degradation. ^{31}P NMR identified partially ordered phosphate regions in grossly decayed dentine, consistent with the formation of sclerotic dentine even in layers approaching the pulp. The layer-specific spectroscopic analysis demonstrates that the structural and biochemical response of dentine to caries is highly heterogeneous and dependent on lesion depth and severity. The presence of sclerotic dentine within grossly decayed layers provides molecular evidence of an active defensive mineralisation response in advanced lesions thereby highlighting the need for further investigation.

065 Fluoride Response of Human Deciduous, Permanent and Bovine Enamel and Caries Lesions under Demineralizing Conditions

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This in vitro study investigated the fluoride response of sound enamel and early caries lesions created in human deciduous (HDE), permanent (HPE) and bovine enamel (BPE) under demineralizing conditions using Knoop surface microhardness (K-SMH) and transverse microradiography (TMR). Enamel specimens were divided into 27 groups (enamel (HDE/HPE/BPE) × demineralization times (0/4/16h) × fluoride concentrations (0/0.1/0.5 ppm F) during secondary demineralization). Specimens remained either sound or were demineralized using a partially saturated lactic acid solution before being demineralized (again) in the presence/absence of fluoride. K-SMH was used to investigate specimens throughout the study, TMR at the end. Data were analyzed using three-way ANOVA. Based on TMR data, enamel types responded to fluoride with HPE showing the most consistent and obvious dose-response. HDE was more comparable to BPE than HPE in its fluoride and demineralization response with respect to integrated mineral loss (e.g., HDE:1058±503 / BPE:1138±535 / HPE:629±164; mean±standard deviation, all vol%min×µm; initially sound enamel and 0 ppm during demineralization groups only). Lesion depth differed between all tissues in the order HPE<HDE<BPE, although mineral distributions were similar. Hardness data were difficult to interpret as calculated variables offered sometimes conflicting results. Overall, Knoop hardness numbers (KHN) correlated well with TMR data. HPE was less prone to surface softening than HDE and BPE which were comparable. In terms of numerical change in KHN, HPE showed the clearest fluoride response and regardless of baseline lesion severity. Again, HDE were more comparable to BPE than HPE data. In conclusion, all tissues responded to demineralization challenges in the absence/presence of fluoride in a similar manner but at different magnitudes. BPE appears to be a better surrogate tissue for HDE than for HPE.

066 Ultrastructural insights of the impact of resveratrol against dentin erosion *in situ*

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The aim of the present pilot study was to investigate the impact of resveratrol as antierosive treatment on the ultrastructure of an *in situ* pellicle. Intraoral splints with buccally fixed bovine dentin specimens were used for 2h and rinsed for 1 min with 0.05 mg/ml resveratrol solution or water as negative control. The specimens were removed and treated with 1 % citric acid for 10 s. The specimens were fixed, embedded in acrylic resin and ultrathin sections were examined using transmission electron microscopy (TEM). The 2-h pellicle exhibited a continuous granular and globular morphology, with occasional bacterial attachment. Exposure of the specimens to citric acid resulted in a reduction in pellicle thickness; however, complete removal of the pellicle did not occur. In the basal layer of the pellicle, needle-like electron-dense structures were observed, corresponding to hydroxyapatite crystals. Rinsing with resveratrol effectively protected the dentin surface and modified the ultrastructure of the pellicle. After acidic challenge, the pellicle exhibited increased acid-resistance, and no discernible signs of erosion were evident in TEM when compared to the water rinse. The *in situ* application of the mouth rinse containing resveratrol provided protection against dentin erosion. These findings suggest that resveratrol may contribute to the reinforcement of the dentin pellicle, thereby improving its protective function against erosive challenges in the oral environment, however the effects should be evaluated in further subjects.

067 Combined Polymer-Fluoride Approaches to Control Initial Enamel Erosion

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This study aimed to evaluate the effect of associated treatments with varnish, toothpaste, and mouthrinse containing aminomethacrylate copolymer (AMC) and sodium fluoride (NaF) in preventing initial enamel erosion. Experimental formulations were prepared: toothpaste (AMC 10% + NaF 1450 ppm F⁻); mouthrinse (AMC 2% and NaF 225 ppm F⁻), and varnish (AMC 30% and NaF 5%). Polished bovine enamel specimens were allocated to five groups according to the treatment (n = 12): Negative Control (NC – toothpaste without active agent); Toothpaste only (T); Toothpaste followed by Mouthrinse (TM); Varnish followed by Toothpaste (VT); and Varnish associated with Toothpaste and Mouthrinse (VTM). Specimens were immersed in human saliva (5 min) to initiate acquired pellicle formation. An erosive/rehardening cycling model was performed with exposure to 0.3% citric acid (5 min), varnish application, human saliva (6 h), treatment with toothpaste slurry (120 s), treatment with mouthrinse (60 s), human saliva (30 min), and a final citric acid challenge (5 min). Calcium released during the final acid challenge (µg/ml) was quantified using a colorimetric assay based on Arsenazo-III reaction as an indicator of enamel dissolution. Data were analyzed using One-Way ANOVA and Tukey tests (5%). Mean calcium concentrations (± SD) were: NC (5.91±1.07)a; T (3.54±0.85)b; TM (3.24±0.85)b; VT (1.13±0.4)c; VTM(1.11±0.39)c. Different letters indicate statistically significant differences among groups (p < 0.05). It was concluded that all AMC-based experimental treatments reduced initial enamel erosion, with treatment protocols including polymer-based varnishes providing the highest level of protection.

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068 Grape seed extract can reduce the erosive potential of drinks on dentine

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The frequent consumption of acidic beverages, such as isotonic sports drinks or cola, is considered major causative factor for the progression of dental erosion. Oligomeric proanthocyanidins (OPC) derived from grape seed extract have shown protective effect against dental erosion. This in vitro study aimed to evaluate whether the addition of grape seed extract could reduce dentine surface loss caused by Powerade and Coca-Cola. Sixty dentine specimens were randomly assigned to six groups (n=10): water (control), Powerade, Coca-Cola, and each beverage supplemented with 0.2% OPC. Specimens were immersed into the respective solution for 6 min (25 °C, shaking at 70 rpm), washed with deionized water for 5 s, slightly dried with oil-free air and then immersed in a mineral solution for 60 min (pH 7.4, 37 °C, not shaking). This was repeated 10 times. Dentine surface loss (median, IQR) was measured using an optical profilometer. Statistical analysis was performed using Kruskal–Wallis and post-hoc Dunn tests ($\alpha=0.05$). Both Powerade (13.03, 9.06–15.85) and Coca-Cola (10.89, 8.35–11.89) without OPC supplementation caused significant dentine loss, with Powerade showing a more pronounced erosive effect. The addition of OPC significantly reduced dentine loss for both beverages ($p<0.001$; 2.06, -0.71–3.37 and 1.70, -0.91–3.44, respectively), to the same level as the water ($p>0.05$). The control groups (water and water with OPC) did not differ to each other ($p=0.579$; -0.23, -0.29– -0.03 and -0.21, -0.77–0.17) neither cause erosion. It can be concluded that OPC significantly reduces the erosive potential of acidic beverages on dentine. The supplementation of sports drinks or soft drinks with grape seed extract may represent an effective preventive strategy against dental erosion, particularly for individuals with frequent consumption of such beverages.

069 Determination and visualization of EFU of fluoride gels in vitro

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Highly concentrated fluoride products, such as gels, have been shown to be effective in caries prevention. This study aimed to compare the enamel fluoride uptake (EFU) of different gels of high fluoride concentration to that of a regular toothpaste. For treatment based on FDA-Method#40, demineralized (24h, 0.1M lactic acid, 0.2% Carbopol 907, pH5.0) human enamel samples were exposed to a commercial (CFG) or an experimental (EFG) fluoride gel (both with 12,500 ppm F from amine and sodium fluoride, undiluted), or to a sodium fluoride toothpaste slurry (TP, 1,450ppm NaF; 1 part toothpaste, 3 parts DI water w/w) for 30min (n=3). EFU was characterized by time-of-flight secondary ion mass spectrometry (TOF-SIMS; M6, Iontof) via surface depth-profiling to 8 μm by alternating measuring and sputtering. Additional cross-section imaging in chemical mapping mode was performed to visualize fluoride penetration and to distinguish the fluoride environment. TOF-SIMS depth-profiling revealed similarly high fluoride intensities in the enamel for both gels. Values are statistically significantly higher (ANOVA, Bonferroni test, $p < 0.05$) than those for the toothpaste (arithmetic mean normalized fluoride intensity $\pm$ SD of 50-500nm depth: CFG: 0.182 ± 0.039 counts, EFG: 0.236 ± 0.027 counts, TP: 0.009 ± 0.001 counts). Fluoride intensities decreased exponentially between 100 and 1000 nm in depth. Cross-section mappings clearly visualized a layer-like formation of calcium fluoride with similar intensities on the enamel surfaces (ca. 1-3 μm) for all test groups. Further incorporation of fluoride into the enamel structure up to a depth of 10-20 μm on average was observed, but with significantly lower intensities for the toothpaste. High-fluoride gel applications lead to significant EFU, whereby fluoride is incorporated into deeper enamel structures beneath the surface and exhibits statistically significantly higher intensities than those observed for regular toothpaste.

The study was sponsored by Colgate-Palmolive Company.

070 Fluoride release and recharge capabilities of experimental toothbrush bristles containing S-PRG filler

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We investigated fluoride release and recharge capabilities of bristles containing S-PRG fillers, using three kinds of toothbrushes (10 each) prepared with the bristles containing 0, 10, and 20 wt% of S-PRG fillers, respectively. These toothbrushes were divided into two groups and soaked for 5 minutes in 10 mL of ultra-pure water (H₂O) or Hanks' Balanced Salt Solution (HBSS), to release fluoride into the solutions (A). After drying the bristles, they were charged with fluoride for 5 minutes in 10 mL of 1000 ppm F solution, and were then washed in 10 mL of H₂O for 10 seconds. After drying again, each bristle was immersed for 5 minutes in a new set of 10 mL of H₂O or HBSS to estimate the fluoride recharging capabilities (B). Fluoride concentrations were quantified using a fluoride-selective electrode. The fluoride released from the bristle without S-PRG filler were used as the blank. The results were corrected, and statistically evaluated using parametric methods. The fluoridereleasing capabilities were significantly higher in 20 wt% group than those of 0 wt% ($p < 0.001$) and 10wt % ($p < 0.05$, $p < 0.001$) groups in both H₂O as well as HBSS. Significant differences were observed among three kinds of bristles ($p < 0.05$) in (B), with 10 wt% group being higher than 0 wt% ($p < 0.05$). However, there were no significant differences in fluoride-recharging capabilities (B-A) between 10 and 20 wt% groups. Two-way ANOVA analysis showed that the S-PRG filler concentrations and the extractant affected the rate of fluoride release from bristles, and the interaction was also significant. We conclude that toothbrush bristles containing S-PRG filler demonstrated concentration dependent fluoridereleasing capabilities, but no fluoride-recharging capabilities.

071 Papain-based microparticles for chemical treatment of dental caries: formulation and characterization

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Different chemical treatment models for dental caries have been proposed, based on the selective removal of necrotic and infected dentin using proteolytic enzymes. The aim of this study was to develop a chemical caries removal system using papain aggregates formulated as a suspension of defined-size microparticles that can be dispensed in a controlled manner onto necrotic tissue, minimizing potential effects on the dental pulp. Papain particles were synthesized by gamma radiation-induced crosslinking (10 kGy) of a 30 mg/ml solution of pure enzyme in sodium phosphate buffer pH 7.0 containing 30% (v/v) ethanol. Particle size was assessed by static light scattering using a He-Ne laser (633 nm) in a Mastersizer 2000E instrument. Proteolytic activity was assessed by UV spectroscopy of tyrosine residues in a gelatin degradation assay in the presence and absence of cysteine, and by separation on polyacrylamide gels under denaturing conditions (SDS-PAGE). All particles exhibited diameters below 20 μm , with an average particle diameter of 0.37 μm . Addition of cysteine to the particle suspension buffer resulted in significant enzyme activation ($p < 0.05$) in proteolytic activity compared to controls lacking cysteine, as also shown by SDS-PAGE, which indicated a decrease in 95 and 100 kDa bands of gelatin α -chains and increase in lower-molecular-weight degradation products. In conclusion, this papain-based enzymedelivery system consists of an enzymatically active, uniformly sized particulate formulation that may be useful for chemical treatment of dental caries. The use of defined microparticles may help restrict excessive diffusion toward the pulp, potentially improving safety and selectivity of enzymatic caries removal.

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072 Shear Bond Strength and Microleakage of a Bioceramic Pulp Capping Agent to Different Base Materials

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The aim of this study was to investigate the shear bond strength and microleakage between a pulp capping agent, iRoot BP Plus (Innovative Bioceramix, Inc., Vancouver, Canada; BP), and a self-adhering flowable composite (Dyad Flow, Kerr, Germany; DF), a light-cured resinmodified glass ionomer (Ionosit Baseline, DMG, Germany; RMGI) or a glass ionomer cement (Changshu Shangchi Dental Materials Co., Ltd., China; GIC). Ninety polytetrafluoroethylene blocks with a hole (3 mm in diameter and 2 mm in thickness) were filled with BP and divided into 3 groups ($n = 30$) according to the type of overlying base material. The specimens were stored at 37°C and 100% humidity for 24 hours. The shear bond strength of each group was measured using a universal testing machine ($n = 10$), and the failure modes were examined under a stereomicroscope. Microleakage was assessed using 0.05% methylene blue staining ($n = 10$) and observation of three-dimensional morphology via micro-CT ($n = 10$). Data were analyzed using 2-tailed ANOVA. No significant differences in shear bond strength were observed among the groups ($P > 0.05$). The failure modes were predominantly cohesive failure in the DF and RMGI groups, while mixed failure was most common in the GIC group. The DF group exhibited the least microleakage ($P < 0.05$). DF demonstrated the best bonding performance to BP, suggesting its efficacy as the base material for immediate restoration in vital pulp therapy.

073 Face and Content Validity of an instrument used to define oral health-related behaviours among children

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This study assessed the face and content validity of an instrument composed of attributes and levels developed for a discrete choice experiment (DCE) investigating preferences related to oral hygiene and dietary behaviours among children and adolescents. The DCE is part of a broader project on oral health-related habits among twins (ClinicalTrialsNCT06961890/CEP92199325.6.0000.0075). The instrument used in the experiment was developed using standard methodological steps. Face and content validation was conducted with 10 children and adolescents (mean age: 13.9 years). Participants evaluated six attributes related to dietary behaviors and other six related to oral hygiene, as well as their respective levels. For each level, comprehension of the wording (face validity) was assessed. Participants also indicated their preferred option and provided justification, which was considered evidence of content validity when coherent with the attribute presented (content validity). Responses were analysed qualitatively and quantitatively to inform refinement of the final DCE instrument. For dietary and oral hygiene attributes, comprehension rates of tested levels ranged from 90% to 100%. The highest comprehension was observed for levels related to marketing influence on dietary and oral hygiene-related levels. Regarding content validity, participants were mostly able to select preferred levels and provide coherent justifications consistent with most of the proposed attributes. For dietary choices, the proportions of adequate justifications for choices across different attributes ranged from 70% to 100%, while for oral hygiene ranged from 80% to 100%. The poorest content validity was observed for the attribute related to health consequences (70%; 95%CI: 39.7–89.2). However, when re-presented for oral hygiene, the attribute could be comprehended in 90% of cases (95% CI: 59.6–98.2), which was considered acceptable. These findings indicate that the instrument may adequately captured preference-based decision-making, supporting its face and content validity.

074 Using Ant Colony Optimization to Develop a 20-Item COM-B ICCMS™ Questionnaire: A Cross-National Validation Study

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Understanding determinants of dental caries management behaviors requires a comprehensive assessment of dentists' Capability, Opportunity, and Motivation (COM-B). The 47-item COM-B ICCMS™ questionnaire provides robust measurement across five dimensions, yet research examining multiple constructs simultaneously often requires briefer instruments. Short forms reduce respondent burden while enabling integration of behavioral determinants with clinical outcomes and treatment decisions in large-scale studies. The aim was to develop and cross-validate a 20-item short form that preserves the original COM-B ICCMS™ psychometric properties. We employed ant colony optimization to systematically reduce the questionnaire to 20 items (4 each for Capability, Opportunity-Relevance, Opportunity-Resources, Motivation, and Behavior), simultaneously optimizing model fit, dimensional reliability, and preservation of latent correlations. The short form was developed using a Colombian sample (N=489) and cross-validated in a Dominican Republic sample (N=346), with both samples comprising clinicians and clinical-practice educators. Exploratory structural equation modeling (ESEM) demonstrated excellent fit of the measurement models in both samples (CFI>0.95, RMSEA<0.05, SRMR<0.05). Additionally, all dimensions showed adequate reliability (ω) exceeding 0.70 across samples. The short form preserved the original latent correlation structure (mean absolute deviation <0.02), and scalar measurement invariance was established across countries and professional roles. The 20-item Short Form COM-B ICCMS™ questionnaire is a psychometrically sound instrument that achieves 57% length reduction while maintaining construct validity and cross-cultural equivalence. The brief format facilitates comprehensive research protocols examining clinical decision-making, implementation science, and evidence-based practice adoption. This approach demonstrates how automated item selection can efficiently develop valid measurement tools for dental caries research and broader dental science applications.

Poster III
Microbiology, Epidemiology, Education

075 Coverage and specificity of Fluorescence In Situ Hybridization (FISH) probes to visualize oral streptococci

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Fluorescence *In Situ* Hybridization (FISH) is a powerful method to investigate the composition and architecture of health- and caries-related biofilms. The method relies on fluorescently-labelled oligonucleotide probes designed to bind to specific bacterial groups, allowing their visualization and quantification in biofilm samples. This study aimed to evaluate the coverage and specificity of all published FISH probes targeting oral streptococci, key organisms in the dental caries process. A search was conducted on PubMed to identify articles published from 1989-2025 that have applied FISH with 16S rRNA-targeted oligonucleotide probes to investigate oral bacteria. From these, all probes specific to oral streptococci at the genus, group, or species level were retrieved. Additional probes were identified through cross-referencing and manual searches in ProbeBase. Probe coverage (% target sequences covered by the probe) and specificity (number of non-target sequences targeted by the probe) were analysed using a semi-automated, batch-processing pipeline developed in ARB (v.7.0) that aligns probe sequences against reference sequences from the expanded Human Oral Microbiome Database (eHOMD; v.15.23). A total of 31 probes were identified from N=2045 screened and N=206 included articles. Six probes targeted the genus *Streptococcus*, seven targeted streptococcal groups (*mutans*, *salivarius*, *anginosus*, or *mitis*), and 18 were species-specific. Most probes exhibited high or intermediate target coverage (100% for N=25 probes; 57% for N=1 probe; 27% for N=1 probe); however, N=4 probes had 0% target coverage (no match with any reference sequence). Twenty-one probes (68%) exhibited low-weight mismatches ($W_m \leq 1$) with non-target oral bacteria, indicating a potential risk of cross-hybridization. In conclusion, published FISH probes for oral streptococci generally show high coverage but limited target specificity, which can potentially lead to false-positive identification of nontarget bacteria in oral FISH studies.

076 Probiotic effects on community composition, microscale pH, and matrix architecture in saliva-derived oral biofilms

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This study investigated the effects of *Streptococcus salivarius* K12 and M18 on virulence associated characteristics of a complex saliva-derived oral biofilm model, compared with *Limosilactobacillus reuteri* DSM 17938 and untreated controls. Biofilms were grown for 72 h under low (0.05%) or high (1%) sucrose conditions and supplemented after 24 and 48 hours with *S. salivarius* K12, *S. salivarius* M18, or *L. reuteri*. Microscale biofilm pH was assessed by confocal microscopy-based ratiometric imaging. Biofilm matrix components (glucans and extracellular DNA) were quantified by confocal imaging, and microbial community composition was analyzed by 16S rRNA gene sequencing. The effect of probiotic supplementation and sucrose on biofilm pH and the amounts of eDNA and glucan were analyzed using linear mixed-effects models, followed by Tukey's pairwise comparisons. High sucrose conditions considerably increased acidogenicity (mean pH 5.43 vs. 6.21), glucan biovolumes (76.1% vs. 13.6%), and the relative abundance of streptococci (69.1% vs. 46.3%) and lactobacilli (23.4% vs. 0.5%), compared to the low sucrose conditions. Under low sucrose conditions, supplementation with *S. salivarius* M18 significantly increased biofilm pH (6.35, 95% CI [6.05;6.65], $p=0.006$) compared to control (6.22, CI [5.92;6.52]), whereas *S. salivarius* K12 showed no effect (6.25, 95% CI [5.95; 6.55], $p=0.88$). In contrast, *L. reuteri* significantly reduced biofilm pH (6.02, 95% CI [5.72;6.32], $p<0.0001$). No significant pH effects were observed under high sucrose conditions ($p=0.81$). Probiotic supplementation induced only minor compositional shifts, most notably an increased abundance of lactobacilli in *L. reuteri*-treated biofilms, and did not significantly affect biofilm matrix components. In conclusion, probiotic supplementation exerted limited effects on virulence-associated biofilm properties. *S. salivarius* M18 slightly increased pH under low sucrose conditions, whereas *L. reuteri* was associated with a significant pH reduction and compositional changes.

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077 Oral characteristics of young children with dental caries

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Dental caries develops due to bacterial infection. Early childhood caries may significantly impact on future quality of life, including the oral cavity. We believe that the host's susceptibility to infection in the oral environment is also a factor in the onset of caries. Aim of this study was to clarify the characteristics of the oral environment in young children who develop caries. Oral swabs were collected from the oral cavity of 12 children, including 6 children diagnosed with severe early childhood caries (caries group) and 6 children without caries (non-caries group), aged 5 years, who visited the pediatric dental clinic of Hiroshima University Hospital. DNA and RNA were extracted and subjected to 16S rDNA analysis of oral bacteria, and RNA-seq was performed on living samples. The characteristics of the oral cavity were examined in terms of the bacterial flora and RNA expression of the caries and non-caries groups. 16S rDNA analysis revealed that *Haemophilus* accounted for 2.79% and 8.56% of the bacterial populations in both groups at the genus level, indicating a significant difference. Gene Ontology (GO) enrichment analysis was performed on the gene groups extracted from the caries group using RNA-seq, and some genes classified into the Biological Process and Molecular Function categories were highly expressed. In conclusion, it was suggested that the caries group may differ from the non-caries group in the total bacterial flora and in the expressed RNA in the oral cavity. Further investigation is required to determine whether the oral environment was conducive to the development of caries, or whether the RNA expression status changed as a result of the onset of caries.

078 Salivary Microbiome Biomarkers Associated with Longitudinal Dynamics of Dental Caries

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Objective: To characterize the compositional and structural dynamics of salivary microbial communities during the transition from filled status to post-treatment recurrence of dental caries. **Methods:** A longitudinal cohort of 103 children aged 3~5 years from a kindergarten in Beijing was followed for 18 months. Participants who developed caries recurrence after treatment were selected, and salivary samples collected at three consecutive time points were analyzed via full-length 16S rRNA sequencing. Differences in microbial composition and structure across time points were examined to delineate oral microbial community changes associated with recurrence. **Results:** In salivary microbiota, *Gemella haemolysans*, *Prevotella oulorum* and *Saccharibacteria HMT_346* were significantly associated with caries recurrence, whose relative abundances decreased dramatically at the recurrence stage. A predictive model incorporating these three biomarkers demonstrated strong diagnostic performance, achieving AUC values of 84.30% and 83.47% for predicting recurrence at three and six months in advance, respectively. **Conclusion:** Caries recurrence is associated with specific alterations in the salivary microbial community. *Gemella haemolysans*, *Prevotella oulorum*, and *Saccharibacteria HMT_346* in saliva could be potential microbiomic biomarkers for dynamic monitoring and early prevention of caries recurrence.

080 Oral Health Conditions of Primary School Children in Cambodia Before and After the COVID-19 Pandemic

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The study aimed to investigate the oral conditions of Cambodian primary school children before and after the COVID-19 pandemic by a cross-sectional study. We visited a public primary school in Cambodia for dental support activities annually from 2017 to 2019 and in 2023. We conducted oral examinations and oral health education with 3,430 students (grades 1-6) and calculated the prevalence of dental caries, total and by tooth type, number of decayed and filled teeth (DFT), and percentage of decayed and filled teeth (DFT rate). We analyzed each data on dental caries condition before the COVID-19 pandemic (2017-2019) and after the pandemic (2023). The prevalence of dental caries was very high, exceeding 95% annually in both the lower (grades 1-3) and upper (grades 4-6) groups, with no notable change observed before and after the COVID-19 pandemic. When examining the prevalence of dental caries in permanent teeth by tooth type, the left and right mandibular first molars consistently showed the highest and second-highest prevalence across all survey years and groups. The DFT and DFT rate showed a tendency to decline each year, reaching their lowest levels in 2023 for both groups. Notably, the average DFT rate for lower grades was significantly lower in 2023 (13.4%) than in 2017 (17.4%, $p=0.001$), 2018 (16.2%, $p=0.034$), and 2019 (16.4%, $p=0.015$). In conclusion, the prevalence of dental caries among primary school children in Cambodia has consistently remained high. However, the mean DFT and DFT rates in 2023 were lower than those recorded between 2017 and 2019. The oral health education provided as part of our ongoing dental support activities, along with changes in lifestyle habits, may have contributed to the changes in children's oral health conditions.

081 A Spatial Population Study of Oral Health and Socioeconomic Indicators in Preschool Children, Buenos Aires

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The aim of this study was to assess caries treatment needs among preschool children in Buenos Aires and examine their ecological and spatial association with key socioeconomic indicators. An ecological population study included 54,337 six-year-old children attending public schools across the Autonomous City of Buenos Aires (CABA) between 2017 and 2020. Caries severity was recorded using the Caries Treatment Needs Index (CTNI) by calibrated examiners. Socioeconomic indicators included individual health coverage, neighborhood housing prices, distance to the nearest primary health center, population density, and the proportion of households with unsatisfied basic needs. Statistical analyses comprised descriptive tests, multivariate regression, Mantel–Haenszel odds ratios, and spatial modeling using spatial autoregressive methods. Overall, 67.9% of children presented treatment needs (CTNI>2) and 17.5% high needs (CTNI>10), with significant heterogeneity across municipalities ($p<0.01$). CTNI scores were consistently higher in municipalities with lower socioeconomic indicators. Public health coverage was strongly associated with greater caries severity, showing a dose–response pattern across increasing CTNI categories (OR 1.77–3.68; $p<0.01$). Multivariate models indicated that lower housing prices, greater distance to health centers, higher population density, and higher unmet basic needs were significantly associated with worse CTNI outcomes ($p<0.01$). Spatial autoregressive analyses revealed significant spatial dependence, confirming that contextual deprivation and territorial inequalities shape the geographic distribution of treatment needs. In conclusion, caries treatment needs in Buenos Aires exhibit a strong socioeconomic gradient and a distinct spatial pattern, reflecting entrenched social and territorial inequities. Both individual-level and neighborhood-level disadvantage independently contribute to higher treatment needs. Findings underscore the need for targeted territorial public health strategies, expansion of preventive services in underserved municipalities, and integration of oral health actions within broader social policies aimed at reducing structural inequality.

083 Oral-health-related quality of life in schoolchildren in an endemic fluorosis area of Argentina

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The aim of this study was to determine the impact of dental fluorosis on Oral-health-related quality of life (OHRQoL) in children from a rural area of La Rioja, Argentina. Using a descriptive study, in a sample of 46 schoolchildren (♀ = 26/ ♂ = 20) caries free with mild fluorosis (Thylstrup and Fejerskov index 1 to 3), the Child Perception Questionnaire (CPQ 11-14) was used to determine the OHRQoL. Statistical analysis: averages, standard deviation, and 95% confidence interval (95% CI) of the CPQ 11-14 were calculated. To evaluate the impact on quality of life related to oral health among the dimensions, repeated measures ANOVA with Bonferroni post-hoc was applied. The average score in the Oral Symptoms dimension was 48.3% (95% CI 43.6%-52.9%); Functional Limitation was 36.7% (95% CI 31.5%-42%); Emotional Well-being was 42.3% (95% CI 35.3%-49.2%), and Social Well-being was 33.8% (95% CI 28.3%-39.3%). Statistically significant differences were observed in the Oral Symptoms dimension in relation to functional limitation and social wellbeing ($p \leq 0.05$). No statistically significant differences were found between genders ($p > 0.05$). In conclusion, under the conditions of this study, there is a low to moderate impact of oral conditions on quality of life in children with mild fluorosis. The greatest impact on quality of life was observed in oral symptoms.

085 Caries Experience of German Special Olympics Athletes with Down Syndrome

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Various systematic reviews show that people with Down syndrome (P-DS) have mostly less caries experience than the general population. Since 2010, the Special Olympics Germany (SOG) database has included DMFT-values for athletes with Down syndrome (A-DS) and athletes without Down syndrome (A-NoDS) but with intellectual disabilities. Aim of this study was to determine and compare the caries experience of Special Olympics athletes with and without DS. Dental data collected at seven national SOG-Games between 2010 and 2018 were evaluated. All athletes could voluntarily undergo dental examinations conducted by trained dentists as part of the Special Smiles®-Program. Using artificial light, mirrors, and blunt probes the DMFT-index was determined following WHO-recommendations. The mean DMFT-index of A-DS and A-NoDS and their corresponding 95% CI were calculated using SPSS. From 2010 to 2018, 583 A-DS and 4,266 A-NoDS aged between 12 and 70 took advantage of the Special Smiles®-Program. The mean age for both groups was calculated to 28.0 and 27.7 years, respectively. The mean-DMFT was 5.3 (95% CI 4.8–5.8) for A-DS and 6.5 (95% CI 6.3–6.7) for A-NoDS. This difference was statistically significant. DMFT-values revealed no difference between male (5.5; 95% CI 4.8–6.2) and female A-DS (5.1; 95% CI 4.2–5.9) or male (6.6; 95% CI 6.33–6.85) and female (6.3; 95% CI 6.3–6.9) A-NoDS. It can be concluded that, P-DS not only have less caries experience than people in the general population, but also than other people with intellectual disabilities. When evaluating the results of this study, however, it must be considered that Special Olympics athletes are not representative of all people with intellectual disabilities. Further research on this issue is needed.

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086 Artificial Intelligence Avatars as a Learning Tool for Simulated Patient–Clinician Caries Risk Interviews

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Objectives: To evaluate dental students' perceptions of the educational benefits and limitations of artificial intelligence (AI)–based avatar simulations for caries risk interviewing. **Methods:** Two AI patient avatars were created using the HeyGen platform, each programmed with a custom knowledge base: (1) an adult truck driver focused on diet and habit-related caries risk, and (2) a parent of a three-year-old child focused on caregiver education and pediatric oral hygiene counseling. First-year dental students enrolled in a cariology course at the University of Michigan voluntarily engaged in a 10-minute simulated patient–clinician interaction outside of class. Following completion, participants submitted anonymous written reflections regarding their educational experience with the avatars. Thirty student responses were analyzed using qualitative thematic analysis following Braun and Clarke's six-phase approach. Two independent coders systematically reviewed the data to identify and define recurring themes; coder discrepancies were resolved through discussion to ensure reliability. The frequency of each theme was quantified within the total sample. **Results:** Analysis revealed six major themes across the 30 responses: improvement in communication skills, including use of patient-centered language, targeted questioning, and empathy/rapport building (83.3%); recognition of the benefits of practicing in a low-stress environment (13.3%); perceived value of immediate AI-generated feedback (43.3%); identification of technical limitations of AI-avatar technology (33.3%); overall positive evaluation of the experience (83.3%); and suggestions for enhancement of the simulation (26.6%). **Conclusions:** AI-based avatar simulations were perceived as engaging and educationally beneficial for practicing caries risk communication in a supportive environment. Despite noted technical limitations, students reported strengthened communication skills and expressed enthusiasm for future integration. Findings support further development and adoption of AI avatar simulations in dental education.

087 Dental Caries Knowledge among Healthcare and Social Care Professionals Working with Vulnerable Groups in Lithuania

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Aim. To assess associations between work-related factors and dental caries knowledge among healthcare and social care professionals working with vulnerable populations in Lithuania. **Methods.** This cross-sectional study used a convenience sample of Lithuanian healthcare and social care professionals participating in an online educational event in 2024. Participants completed a questionnaire including demographic characteristics, workrelated factors (professional role, years of practice, participation in oral health training, and provision of oral health counselling), and 16 caries knowledge-related items, which were used to calculate a total knowledge score (range 0–16). The Mann–Whitney U test and multivariate linear regression were used for statistical analysis, with $p < 0.05$ considered statistically significant. **Results.** Among 435 professionals (mean age 45.8 ± 11.2 ; 95.9% women), the mean knowledge score was 6.9 ± 3.6 . Most participants provided oral health advice (83% in healthcare vs 65% in social care), but participation in oral health knowledge training was lower in social care (5.5% vs 43%). Those who had attended oral health training had higher knowledge scores (median 10.0, IQR 3.2 vs 8.0, IQR 3.0; $p < 0.001$), and those providing oral health counselling also scored higher (median 9.0, IQR 3.0 vs 7.0, IQR 3.0; $p < 0.001$). In adjusted linear regression, oral health training ($B = 1.12$; $p < 0.001$), counselling provision ($B = 0.85$; $p < 0.001$), and years of practice ($B = 0.03$; $p = 0.003$) were independently associated with higher knowledge scores ($R^2 = 0.102$). **Conclusions:** Dental caries knowledge was associated with oral health training, provision of oral health counselling, and years of practice; enhancing access to continuing oral health education may improve knowledge in this workforce.

Poster presentation

Clinical studies

088 Adoption of CariesCare International in postgraduate clinics: One-year caries-risk follow-up and process evaluation

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The CariesCare International (CCI), a patient-centered, risk-based, tooth-preserving caries management system was adopted in paediatric dentistry and operative dentistry postgraduate clinics at Universidad El Bosque Bogotá, Colombia. This study aimed to assess, on participating patients, the one-year follow-up of their caries risk and the CCI adoption process evaluation. A total of 82 patients and 18 residents were included. Previously trained residents adopted the CCI 4D-cycle in their patients. After caries risk (1D) and lesions assessment (2D), caries lesions' severity and activity and caries risk were decided (3D). The risk of caries was classified through an algorithm included in the related developed digital oral-health record into low/high. Personalised preventive and toothpreserving care followed (4D). After one year patients were followed-up by same residents. They completed a 15-item Treatment Evaluation Inventory questionnaire (TEI) assessing the CCI acceptability, perceived usefulness, and its impact on their and patients' oral-health awareness. Descriptive statistics was used. Seventy-one patients (88.8%) were reassessed after one year by all residents (100%). At baseline, 91.5% of patients were classified as high risk, decreasing to 32.4% after one year ($P = 0.0001$). Residents reported high acceptability and perceived usefulness of the CCI system, with 77.7%–94.4% improving understanding of caries risk assessment, caries care, and CCI. Non-operative caries care showed the greatest perceived impact on controlling caries lesions progression (66.7% strongly agreed). Residents also perceived positive behavioural changes in patients, particularly increased oral-health motivation (55.6%) and adherence to twice-a-day toothbrushing (55.6%). Satisfaction with the risk-based recall protocol was very high (94.5%). After one year, implementing CCI in postgraduate clinics un Bogotá, Colombia, not only reduced patients' caries risk significantly, but also showed a high acceptability and perceived usefulness.

089 Assessment of Caries Risk Behaviors' Trajectories in US Children from Age 1 to 9.5 Years

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Caries Risk Study Group[#]

Objective: To determine trajectories of caries risk (CR) factors/behaviors among a cohort of U.S. children aged 1–9.5 years and their primary caregivers (PCG), and the association with new caries experience trajectories in the primary dentition. **Methods:** A total of 519 children underwent caries examinations using the International Caries Detection and Assessment System (ICDAS) criteria at ages 1, 2.5, 4, 6.5, 8, and 9.5 years, with bitewing radiographs obtained at ages 6.5, 8, and 9.5 years. PCGs completed CR questionnaires at corresponding time points. Latent class analysis (LCA) was employed to identify subgroups based on child and PCG CR responses and trajectories from ages 1–9.5. Subsequently, CR latent classes were matched with previously identified trajectories of new cavitated, filled, or missing carious surfaces (ICDAS>3) in primary teeth from ages 1–9.5 using Chi-square tests. Caries experience trajectories included: Trajectory 1 (2%)—early onset and persistent high caries (declining at 9.5y); Trajectory 2 (38%)—onset at age 4 with consistently high caries; Trajectory 3 (28%)—onset at age 6, remaining high until age 8 then declining; Trajectory 4 (32%)—almost no lesions throughout. **Results:** Each LCA model identified 2-5 risk subgroups (latent classes) from the child oral care (OC), PCG OC, child diet, and PCG diet CR factor/behavior trajectories, with additional LCAs using combinations of those areas. Trajectories of CR factors/behaviors within risk subgroups showed relatively stable child and PCG CR factor/behavior over time. LCA trajectories of CR factors/behaviors were significantly associated ($p<0.05$) with caries trajectories. **Conclusions:** Distinct latent classes of CR trajectories were identified from child and PCG CR factors/behaviors. These trajectories are significantly associated with the patterns of caries experience identified in this cohort.

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090 Effectiveness of silver diamine fluoride versus Duraphat for initial proximal caries in primary molars: RCT

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The effectiveness of silver diamine fluoride (SDF+Duraphat varnish) versus Duraphat alone in halting initial staged proximal caries lesions in primary molars was compared over a period of 2-3 years. Sample size calculations indicated that 30 children were required. This interim report presents results from children (n=17) who completed 1-year follow-ups, December 2025. Caries progression was assessed radiographically by blinded examiner after 1 year. McNemar test was used for statistical analysis. This ethically approved split-mouth RCT was conducted in the Public Dental Healthcare Service (PDHS), Odense, Denmark. Children aged 5–7 years with paired primary molars in proximal contact (regions 55/54;65/64;75/74;85/84) and with initial staged lesions, distally/mesially, identified on bitewing radiographs were eligible for inclusion. Paired molars were randomly allocated within each child to test and control teeth. Test lesions received two SDF applications at a 2–4-week interval. The SDF was applied using a standardized protocol including flossing, gingival protection, and 1-minute application. Both groups received Duraphat varnish every fourth month. Seven boys and 10 girls with 68 treated lesions completed the 1-year follow-up. Four lesions were not assessable due to proximal overlap. Progression was observed in 9 lesions in the test group and 12 lesions in the control group ($p=0.64$); however, only 4 lesions progressed from initial to moderate in both groups. Mean baseline defs was 7.4 (range 2–17). This RCT demonstrates the feasibility of a standardized SDF application protocol for proximal staged initial caries lesions in primary molars within a PDHS setting. Preliminary 1-year results suggest comparable effectiveness of SDF treatment. However, longer follow up including all enrolled children, is needed to confirm 2-3 years long-term outcomes.

091 Oral complications in patients after hematopoietic stem cell transplantation - a three month follow-up study

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The aim of this prospective, case-controlled study was to assess the occurrence of oral complications in blood cancer patients undergoing hematopoietic stem cell transplantation (HSCT). The patients were examined at 3 different timepoints: before HSCT (T1), 10-15 days after HSCT (T2) and 3 months after HSCT (T3). In this ongoing study, dental caries experience (DMFT: decayed, missing and filled teeth, score 0-28), mucositis status (WHO Oral Mucositis Grading Scale, score 1-4), self-reported dental health (score 1-5) and oral health impact profile (OHIP-14, score 0-56) were registered in patients at T1 (n=59, mean age $\pm$ SD : 55.4 $\pm$ 9.7 yrs), T2 (n=42, mean age $\pm$ SD: 55.0 $\pm$ 10.5 yrs), T3 (n=29, mean age $\pm$ SD: 53.0 $\pm$ 10.2yrs), and compared with healthy controls (n=49, mean age $\pm$ SD: 46.5 $\pm$ 9.6 yrs). The results showed that compared to controls, patients had a higher DMFT (mean $\pm$ SD) (patients T1: 13.1 $\pm$ 6.0, T2: 13.8 $\pm$ 6.4, T3: 12.1 $\pm$ 5.9, controls: 9.8 $\pm$ 5.0, p=0.01) and higher occurrence of mucositis (mean $\pm$ SD) (patients T1: 0.0 $\pm$ 0.1, T2: 2.0 $\pm$ 1.5, T3: 0.1 $\pm$ 0.5, controls: no mucositis, p<0.001). Patients reported poorer perceived dental health than controls (mean $\pm$ SD) (patients T1: 4.04 $\pm$ 0.6, T2: 3.4 $\pm$ 1.1, T3: 4.0 $\pm$ 0.6, controls: 4.0 $\pm$ 1.0, p<0.001). Higher OHIP-14 scores were found in patients compared to controls (mean $\pm$ SD) (patients T1: 5.1 $\pm$ 7.0, T2: 16.4 $\pm$ 14.1, T3: 4.5 $\pm$ 4.6, controls: 2.2 $\pm$ 3.7, p<0.001). The results indicated that patients experience more oral disease and have a poorer oral health quality of life following HSCT treatment. These findings call for increased awareness of oral complications in patients undergoing HSCT.

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092 Clinical Outcomes in Randomized Controlled Trials of Treatments for Cavitated Caries Lesions in Primary Teeth: Meta-Research

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The objective of this meta-research was to map the clinical outcomes used in randomized controlled trials (RCTs) evaluating strategies for the management of cavitated dentin caries lesions in primary teeth. This study was registered in the COMET Initiative database. Two independent examiners performed study selection and data extraction in duplicate. Searches were conducted in MEDLINE/PubMed, Scopus, Web of Science, Embase, and the Cochrane Library up to February 14, 2025. Initially, titles and abstracts of potentially relevant studies were screened according to the following inclusion criteria: (1) studies investigating management strategies for cavitated caries lesions in primary teeth; and (2) RCT design. Studies meeting the inclusion criteria underwent full-text assessment. Articles were considered ineligible if they met at least one of the following exclusion criteria: (1) failure to clearly report outcome measures and their assessment methods; (2) studies conducted in specific patient groups; or (3) failure to clearly describe the intervention and comparator groups. Data were extracted and clinical outcomes were grouped into categories. A total of 3,485 potentially eligible studies were identified, of which 318 were included. Of these, 308 evaluated at least one clinical outcome, totaling 378 clinical outcomes. The most frequently assessed outcome was treatment success (62%), followed by lesion arrest (20%), cost analysis (5.5%), and pulp vitality (5%). Periodontal health, adverse events, and tooth survival were also identified, although they were the least frequently assessed outcomes, accounting for 4%, 2%, and 1%, respectively, of the outcomes identified. In conclusion, a wide range of clinical outcomes is used in RCTs on cavitated caries management, with predominance of treatment success and lesion arrest.

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093 Clinical Evaluation of a Novel Flake-Glass Dental Varnish for Hypersensitivity Management in Children and Adults

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This study evaluated the clinical efficacy of a novel flake-glass resin-based varnish (Varnish VLC, PSP Dental, UK) compared with 3M Clinpro White varnish (3M Oral Care/Solventum) for the management of dentinal hypersensitivity in children with molar–incisor hypomineralisation (MIH) and adults with dentinal sensitivity. A randomised, split-mouth clinical trial was conducted in 21 paediatric MIH patients (42 teeth) and 14 adults (28 teeth). Teeth were assessed at baseline, after each application, and at 3- and 6- month follow-up using the Schiff Sensitivity Scale and a modified Visual Analogue Scale (VAS). Non-parametric Mann–Whitney U tests, ANOVA and Tukey post-hoc analyses were performed ($\alpha=0.05$). In children, both varnishes significantly reduced sensitivity after two applications ($p<0.001$). Median VAS scores for Varnish VLC decreased from 3.4 at baseline to 1.4 at 3 months, and median Schiff scores from 3.1 to 2.0. No statistically significant difference between materials was detected at 3 or 6 months ($p>0.05$). At 6 months, a mild increase in sensitivity was observed in both groups, although scores remained significantly lower than baseline ($p<0.001$). In adults, Varnish VLC provided superior subjective pain relief at 3 months (VAS: 1.2 vs 1.6 for Clinpro; $p=0.042$), while Schiff scores showed no significant inter-group difference ($p=0.270$). These results demonstrate that Varnish VLC provides rapid and durable desensitisation following two applications, with peak efficacy at 3 months and partial attenuation by 6 months, supporting a reapplication interval of 3–6 months. Varnish VLC performed at least equivalently to Clinpro in children and showed superior subjective pain relief in adults.

094 Salivary Proteomic Profile in Individuals with High- and Low-Erosive Tooth Wear: an Exploratory Study

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Aim. Salivary protection against erosive tooth wear (ETW) largely depends on its biochemical composition. This study compared salivary proteomic profiles of healthy individuals with high and low ETW by identifying differentially abundant and exclusive proteins and their associated biological pathways. **Methods.** In this observational cross-sectional study, 20 healthy adults were classified using the Basic Erosive Wear Examination (BEWE) index into High-BEWE (HB; n=10) and Low-BEWE (LB; n=10) groups. Potential confounders (diet, age, sex, socioeconomic status, and salivary flow) were controlled through matching and restriction. Stimulated saliva samples were analyzed by mass spectrometry with label-free quantification. Proteins with $p < 0.05$ and $|\log_2FC|$ (fold-change) > 0.5 were considered significant. Functional enrichment analyses (Gene Ontology, KEGG, Reactome) were performed using consolidated lists of differentially abundant and group-exclusive proteins. **Results.** From 1,982 quantified proteins, 176 were differentially abundant proteins (DAPs: 57 increased in HB and 119 in LB). In addition, 13 proteins were detected exclusively in HB, 74 exclusively in LB, while 1,895 were shared. Functional analyses indicated distinct biological profiles according to BEWE. In HB, enrichment of glycosylation and N-glycan biosynthesis pathways was consistent with increased secretory processing and glycoprotein alterations, potentially influencing the composition and protective properties of the acquired enamel pellicle. In contrast, LB showed predominance of innate immune signatures, protein turnover, and epithelial and keratinization-related proteins, suggesting a salivary environment with enhanced surface barrier and immune surveillance, compatible with lower wear severity. **Conclusion.** Salivary proteomic profiles differed between individuals with high and low ETW, indicating pathways potentially linked to increased vulnerability in HB and enhanced protective profiles in LB. These exploratory findings describe salivary differences associated with ETW severity and support further validation in larger cohorts.

095 Clinical Study on Prolonged Resin Infiltration of Hypomineralized Enamel

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The aim of this study was to evaluate the masking efficacy of a prolonged resin infiltration protocol in hypomineralized enamel. Twenty-one children and adolescents (mean age (standard deviation [SD]): 10.7 (3.0) years) with 103 anterior teeth affected by hypomineralization (molar incisor hypomineralization and fluorosis), situated from canine to canine, were treated using resin infiltration (Icon, DMG) with a modified infiltration protocol. Etching was performed using 15% HCl (Icon etch, DMG) up to 4 times, 2 minutes each, followed by ethanol drying (Icon dry). Brownish defects were additionally bleached up to 2 times before re-drying. Icon Infiltrant was then applied for 20 minutes, light-cured, and polished. Standardized digital photographs were taken before treatment (T_0), after each etching cycle (T_{1E} - T_{4E}), during infiltration at 3, 5, 10, 15, and 20 minutes (T_{3min} - T_{20min}), immediately after treatment (T_1) and 7 days post-treatment (T_7). Outcome assessment included quantitative colorimetric analysis (ΔE) to evaluate color differences between hypomineralized and sound enamel. Statistical analysis was performed using ANOVA with Bonferroni post hoc tests ($\alpha = 0.05$). The mean color difference ΔE_0 (SD) decreased significantly from 14.9(5.8) at T_0 to 5.0(2.3) at T_7 ($p < 0.001$). A significant reduction was observed after 3 minutes of infiltration (ΔE_{3min} : 9.9(7.1); $p = 0.01$), with a further significant decrease at 20 minutes (ΔE_{20min} : 7.6(6.1); $p = 0.019$). ΔE values at T_7 were significantly lower than at T_{20min} ($p < 0.001$). Bleaching caused a temporary, significant increase in ΔE during infiltration ($E_{3min} - E_{20min}$) ($p \leq 0.003$); however, at T_1 and T_7 , ΔE values were significantly lower than baseline ($p < 0.001$), and brown discolorations were no longer clinically visible. Prolonged resin infiltration significantly improved the masking of enamel hypomineralizations, revealing superior aesthetic outcomes after 20 minutes compared with 3-minutes application. Bleaching effectively eliminated brown discolorations. The authors received no specific funding for this work.

096 Survival of Repaired Restorations in Failed Primary Molars: A 24-Month Randomized Clinical Trial

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Aim of this study was compare 24-month survival repaired restorations survival with composite resin (CR) or high-viscosity glass ionomer cement (GIC) in primary molars. This randomized controlled trial (ClinicalTrials.gov NCT04491981), approved by the ethics committee (4.064.030), included children aged 3–10 with failed primary molar restorations. The tooth was the unit of analysis (multiple teeth/participants allowed). Restorations were stratified by defect size (≤ 1 mm or > 1 mm) and randomly allocated using a computergenerated sequence to repair with CR (Filtek Bulk Fill/Flow, 3M ESPE) or GIC (Riva Self Cure, SDI). Follow-ups occurred at 6, 12, 18, and 24 months using Frencken (2009) criteria for occlusal and Roeleveld (2006) criteria for occlusoproximal restorations. Primary outcome was 24-month survival; secondary was success (no reintervention). Analyses included Kaplan–Meier, log-rank ($\alpha=0.05$), and Cox regression for covariates (gender, surfaces, arch, base/repair material, defect size). Success was analyzed by ITT logistic regression ($\alpha=5\%$). Participants and assessors were blinded. Of 315 children included, 24-month survival was 46.8% (CR) and 41.7% (GIC), with no significant difference ($p>0.05$). Cox regression showed only the number of restored surfaces was significantly associated with failure ($p<0.001$); restorations involving ≥ 3 surfaces presented lower survival. No associations were found for material or other variables. ITT analysis confirmed similar success rates. No adverse events occurred. In conclusion, repaired restorations in primary molars showed comparable 24-month survival for CR and GIC; however, repairs involving ≥ 3 surfaces had a higher failure risk.

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097 Selection bias in systematic reviews of dental caries management in children and adolescents: preliminary results

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The objective of this study was to assess the prevalence of selection bias in systematic reviews on caries lesions management in children and adolescents. The secondary objective was to investigate the association between this bias, the use of GRADE for certainty of evidence, protocol registration, and endorsement to PRISMA guidelines. Our protocol was registered in the Open Science Framework (10.17605/OSF.IO/UKFHA). Systematic reviews that evaluated non-invasive, micro-invasive, mixed and invasive interventions for the management of dental caries in children and adolescents were eligible. Searches were performed in the MEDLINE (PubMed), Embase, Cochrane Library, ProQuest, and LILACS databases. Reviews that addressed cost-effectiveness, diagnostic accuracy, special populations, or without separate data from adults were excluded. Study eligibility was assessed by two independent reviewers and the selection process was conducted in two phases: screening by titles and abstracts, and full text reading. Data extraction was performed independently by two reviewers, considering bibliometric, methodological, and editorial characteristics. Selection bias was identified based on the clarity and justification of eligibility criteria, the scope of sources and search strategy, and the date of the last search. The chi-square test ($\alpha=5\%$) was conducted using Jamovi software. Of the 1,912 records identified, 53 systematic reviews (published between 2012 and 2024) were included and 38 had selection bias, mainly related to inadequate search strategies. A significant association was found between selection bias and the use of GRADE ($p = 0.001$) and protocol registration ($p = 0.041$), with lower selection bias in reviews applying GRADE and registering a protocol. We conclude that methodological weaknesses are present and reinforce the importance of prospective planning and transparency in conducting and reporting systematic reviews.

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098 Pilot Clinical Experience with Biorestorative Dental Strips for Tooth Sensitivity

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Tooth sensitivity remains a prevalent clinical challenge, particularly in patients with gingival recession or undergoing common dental procedures. CrystLCare™ Biorestorative, FluorideFree (CCFF) strips are a newly-available, non-invasive treatment designed to reduce dentinal sensitivity and support enamel remineralization through targeted delivery of bioactive calcium and phosphate ions. The aim of this pilot study was to evaluate clinical feasibility, patient experience, and preliminary effectiveness of CCFF for reducing tooth sensitivity in routine dental practice. Twenty-five patients were enrolled in a prospective pilot evaluation and treated with CCFF for tooth sensitivity. Five patients received in-office treatment for procedural sensitivity following whitening (n=2), standard prophylaxis (n=2), or scaling/root planning (n=1). Twenty patients were provided take-home CCFF for traditional sensitivity triggered by stimuli. CCFF strips were applied according to manufacturer instructions. Patient- and provider-reported outcomes were collected using standardized questionnaires documenting baseline sensitivity, post-treatment sensitivity (prior to clinic discharge and at 7-day follow up), ease of use, and overall experience. Sensitivity was assessed using a 0–10 numerical rating scale, and pre- and post-treatment scores were compared using Student's T-Test. For procedural sensitivity, mean sensitivity scores decreased from 7.2/10 to 1.6/10 following CCFF application ($p=1.5\times10^{-4}$), with 80% reporting “much improved,” and 20% “slightly improved”. For traditional sensitivity, mean scores decreased from 5.95/10 to 1.84/10 ($p=6.72\times10^{-5}$). Complete relief was reported by 30.8% of patients, 38.5% reported “much improved,” 15.4% “slightly improved,” and 15.4% reported no change. Patient acceptability was high, with 100% reporting acceptable taste and 75% reporting “very easy” application. Limitations include small sample size, observational design, reliance on patient-reported outcomes, and short follow-up. These preliminary findings suggest CCFF strips are well tolerated and may provide clinically meaningful reductions in tooth sensitivity across procedural and traditional sensitivity indications, supporting further controlled clinical evaluations.

099 Survival of ART restorations and sealants using a novel GIC: randomized clinical trial

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The aim of this clinical trial was to evaluate the survival of ART restorations and sealants placed with a novel glass ionomer cement (GIC) in a school setting. Eighty-six children, 47 (54.7%) girls and 39 (45.3%) boys, aged 4 to 11 years (mean = 7.51; sd = 1.76), were randomized into a test (Deltafil capsules, DMG) or a control (Fuji 9 hand-mixing, GC) group. Randomization was stratified according to individual caries experience (dmft $\leq$ 2 or dmft > 2) and performed using blocks of ten random sequences. At baseline, mean dmft was 3.15 (sd = 2.81), mean DMFT was 0.50 (sd = 1.49), and the plaque index (OHI-S) was 1.03 (sd = 0.81). In total, 145 restorations were placed in 81 children (1.79/child), and 129 sealants were done in 57 children (2.26/child). After 12 months, two calibrated examiners (kappa $\geq$ 0.83 for filling and $\geq$ 0.77 for sealants) evaluated restorations (Kemoli and van Amerongen 2009), and sealants (Oba et al. 2012). Outcomes were dichotomized as follows: 1) restorations: totally satisfactory/gap < 0.5mm (success) versus gap > 0.5mm/partial lost/total lost (failure); 2) sealants: total retention (success) versus partial/total lost (failure). Chi-square and Mann-Whitney tests were used for bivariate analyses, and binary logistic regression for multivariate analyses. The success rate of restorations and sealants was significantly higher in the test group (80.7% and 76.5%, respectively) than in the control group (55.7% and 44.9%, respectively) ($p = 0.007$ and $p < 0.001$). Single surface restorations performed significantly better ($p = 0.001$). At the 12-month follow-up, Deltafil demonstrated a higher success rate than Fuji 9 for both restorations and sealants. Longterm follow-up studies are needed to confirm these findings.

100 Selective Caries Removal in Permanent Teeth (SCRiPT) Trial: Protocol and Primary Outcomes

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Complete, near complete or non-selective caries removal (CCR/NC) to hard dentine has been recommended for the management of deep caries. Systematic reviews over 20 years show this leads to increased risk of pulpal exposures and higher failure rates compared to partial caries removal or selective caries removal techniques (SCR). This pragmatic, multicentre, two-arm patient-randomised controlled trial was conducted in UK primary dental care settings: intervention SCR to soft dentine pulpally, control CCR/NC. Primary care dentists were recruited and trained in both techniques and adherence to protocol monitored using 3D printed teeth. Patients aged ≥ 12 years with deep carious lesions in permanent posterior teeth were recruited; one eligible tooth per participant randomised. Following SCR or CCR/NC the tooth was restored with the dentist's material of choice. Clinical examinations, patient-reported outcome measures, economic data and routinely collected NHS data were used to assess outcomes over a 3-year follow-up period. The primary clinical outcome was sustained tooth vitality, measured as time to treatment due to loss of vitality and the secondary outcome at intervention pulpal exposure. 43 dentists were recruited and 407 patients randomised and treated (n=201 SCR; 206 CCR/NC); 95.5% and 92.7% of participants respectively had at least one follow up (mean follow up period SCR 25.9 (SD=10.5) months; CCR/NC 25.3 (SD=11.1). Pulp exposure occurred in 0% of SCR versus 2.9% (n=6) CCR/NC (p=0.07). Treatment failure (loss of vitality) at up to three years was 9.1% in SCR versus 8.5% in CCR/NC groups (hazard ratio 1.09, 95% CI 0.57, 2.09; p=0.79). We found no evidence of difference in sustained tooth vitality following SCR or CCR/NC and a reduction in risk of pulpal exposure at cavity preparation with SCR.

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101 Selective Caries Removal in Permanent Teeth (SCRiPT) Trial: Secondary outcomes and subgroup analyses

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The aim of the SCRiPT trial (a pragmatic, multi-centre, two-arm patient-randomised controlled trial carried out in primary care) was to compare selective caries removal to soft dentine pulpally (SCR) with complete (near complete, non-selective) caries removal (CCR/NC) in permanent posterior teeth in ≥ 12 -year-olds. Dentists restored the teeth with their material of choice. Clinical examinations, patient-reported outcome measures and routinely collected NHS data were used to assess the secondary outcomes over 3-years. These included progression of any sealed caries, tooth/restoration failure, and need for reresoration. Treatment Effect was expressed as HR (95% CI) [p value]. Sub-group analyses investigated the effect of age (under 18 or ≥ 18 years), type of caries (primary or secondary), number of surfaces affected (1 or >1), restorative material used to restore tooth (adhesive or non-adhesive) and radiographic depth of lesion (deep or very deep) on the primary outcome, sustained tooth vitality (measured as time to treatment due to loss of vitality). 407 patients were randomised, treated, and followed up over 3 years ($n=201$ SCR; 206 CCR/NC). No statistically significant differences were found between SCR and CCR/NC groups for progression of any sealed lesions ($n=9$, $n=8$ respectively, HR 0.87 (0.34, 2.27) [$p=0.778$]), tooth/restoration failure ($n=40$, $n=35$ respectively, HR 0.86 (0.54, 1.35) [$p=0.510$]) or re-restoration ($n=12$, $n=14$ respectively, HR 1.18 (0.54, 2.56) [$p=0.683$]). Subgroup analyses showed no statistically significant effect of patient age, type of caries, number of surfaces affected, restorative material used, and depth of lesion on the primary outcome between the SCR and CCR/NC groups. We found no evidence of differences in the secondary outcomes following SCR or CCR/NC.

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102 Cost-effectiveness of selective vs. conventional / near complete caries removal: Results from the SCRIPT trial

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The aim was to conduct a cost-benefit analysis of selective vs. conventional / near complete / non-selective caries removal (SCR vs. CCR/NC) in permanent posterior teeth of people aged ≥ 12 -years with deep carious lesions in the UK. Resource use, quality-of-life, and costs were collected at dental visits using care report forms and annual patient questionnaires within the SCRIPT trial follow-up. A general population online discrete choice experiment (DCE) survey elicited preferences for treatments, and willingness to pay (WTP) for sustained tooth vitality, avoidance of re-restoration and pain. Public payer, patient and societal costs were included. Benefits were measured by assigning WTP tariffs to trial outcomes and quality adjusted life years (QALYs) were calculated based on participant responses to EQ-5D-5L questionnaires. The DCE was analysed using random parameters logistical regression models. Cost and QALY data were analysed using multilevel mixed-effects linear regression models, with a random effect for dentist. Economic value was described as net monetary benefit. A Markov cohort decision analytical model extrapolated trial results over a lifetime. Scenario analyses explored the impact of missing data on results. There was no statistically significant differences between groups over follow-up (SCR vs. CCR/NC) in terms of NHS payer costs, mean difference (MD): -£3.42 (-£62.55, +£55.75); all payer costs, MD: +£12.62 (-£51.34, +£85.89) or total societal costs, MD: +£84.36 (-£37.69, +£253.78), or in QALYs, MD: -0.029 (-0.228, +0.145). The probability of SCR being net beneficial ranged from 30% to 60% across a range of scenario analyses. There was no evidence of a difference in costs or QALYs over the trial follow-up.

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Poster presentation
Microbiology, Artificial Intelligence,
Pulp-dentinal Reactions

103 Analysis of Deep Learning Model Accuracy Metrics in Detecting Dental Caries using Smartphone-Based Intraoral Images

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Introduction: Dental caries remains one of the most common oral diseases globally, with a disproportionately high burden among populations with limited access to routine dental services. Early detection is essential to prevent disease progression and reduce associated treatment costs; however, community-level screening is often constrained by shortages in trained personnel. The integration of Artificial Intelligence (AI) with smartphone-based intraoral imaging offers a feasible and scalable strategy to enhance early diagnosis in community settings. **Aim:** To evaluate the diagnostic performance of various AI models in dental caries detection using standardized smartphone-based intraoral images. **Methodology:** A total of 2000 intraoral images were collected from 1000 participants, annotated and pre-processed for analysis. The study assessed classical machine-learning models (SVM, XGBoost), direct-diagnosis baselines (MedGemma and rule-based classifiers), and deep-learning architectures including EfficientNet, MobileNet, and ShuffleNetv2. Model performance on an independent test dataset was quantified using accuracy, precision, recall, specificity, F1 score, and ROC–AUC metrics. **Results:** Among all models tested, ShuffleNetv2 demonstrated the highest diagnostic capability, achieving an accuracy of 69.23%, an F1 score of 67.29, and a ROC–AUC of 0.732. MobileNet variants showed moderate performance (61% accuracy), whereas EfficientNet models exhibited limited diagnostic ability (51% accuracy). Classical machine-learning approaches and direct-diagnosis baselines achieved accuracies ranging from 50% to 62%. **Conclusion:** Among the models assessed, ShuffleNetv2 outperformed other models in detecting dental caries from smartphone-captured intraoral images. These findings support the integration of optimized ShuffleNetv2 architectures in AI-assisted community-level oral health screening. However, efforts should focus on improving the metrics of all the models for better prediction.

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104 Development and Validation of AI-based image-classifier to differentiate enamel-opacities requiring different etching protocols for Resin Infiltration

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The aim of this study was to build and evaluate an artificial intelligence (AI)–based image classifier to distinguish enamel lesions requiring one versus more than one etching cycle during resin infiltration (RI) for opacities in esthetic zones. 130 clinical photographs of maxillary anterior teeth were collected from the outpatient department and the institutional image repository. Images were then cropped to the region of interest, which included only one tooth per image. These were then independently annotated by two calibrated assessors; disagreements were resolved by a third assessor. Based on clinical management relevance, images were categorized as sound teeth requiring routine care (n=27), white spot (WSLs)/post-orthodontic lesions manageable with RI using 1 etching cycle (n=32), and fluorosis lesions requiring >1 etching cycle (n=69). Two images requiring surgical care were excluded. 17 images (4,4,9 from each class) were randomly selected as an independent test set, while the remaining 111 images were used for model development. A no-code AI platform (LandingLens, Landing AI) was used to deploy an image classifier using transfer-learning with a ConvNeXt architecture trained for 15 epochs. Before training, the platform automatically split images into training (n=88:22,18,48) and validation (n=23:6,5,12) sets. Performance was assessed using accuracy, precision, recall, and F1-score. The model was deployed as a QR code/API link for clinical use. Training accuracy reached 100%, while validation accuracy was 83% (19/23). Validation recall was 100% for WSLs (6/6) and sound teeth (5/5), and 66.7% for fluorosis (8/12). Precision was 85.7% for WSL, 62.5% for sound, and 100% for fluorosis, with a macro-F1 score of 83.1%. Most errors involved fluorosis misclassified as WSL/sound. The independent test set achieved 88.2% accuracy (15/17). Conclusively, an AI-based image classification shows potential to support etching decisions during resin infiltration of enamel opacities.

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105 Automated Tooth Loss Detection in 3D Intraoral Scans from a Population-Based Sample using Artificial Intelligence

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Objectives: This study aimed to validate an automated method for detecting tooth loss due to caries in intraoral scans (IOSs) compared to clinical evaluations in a population-based sample. **Methods:** 897 IOSs from 453 participants of the 1982 Pelotas Birth Cohort were included. The participants were clinically evaluated at age 40 by trained, calibrated dentists for several oral health conditions, and lost teeth were identified using ICDAS, later transformed into the DMF-T index. IOSs were acquired using a TRIOS 3® scanner (3Shape, Copenhagen, Denmark). Ground-truth annotations of present teeth were established using 3DMedX (3DLab, Nijmegen, Netherlands) by two experienced researchers, using the same DMF-T index. A deep learning model for tooth segmentation and FDI numbering in IOSs predicted the present teeth. The clinical evaluations and model predictions of missing teeth were compared to the ground-truth annotations at three levels: any tooth, tooth types (incisors, canines, premolars, molars), and FDI numbers. **Results:** The model was highly effective for tooth detection (F1-score: 0.994) and tooth typing (macro-F1: 0.998), and less effective for FDI numbering (macro-F1: 0.965). Furthermore, it was more accurate than the clinical evaluations for any tooth (F1-score: 0.940 vs. 0.946) and tooth types (F1-score: 0.896 vs. 0.917), and less effective for FDI numbers (F1-score: 0.815 vs. 0.768), mainly due to extracted premolars and ambiguous molars. **Conclusions:** The automated method was accurate for detecting any tooth loss and for detecting missing teeth of a certain type. Automated tooth loss detection in intraoral scans using deep learning appears to be a feasible approach for epidemiological studies.

107 Fluoride modifies the composition of the biofilm formed on enamel and dentine in situ

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This cross-over in situ study investigated how a fluoride rinse modifies the composition of the biofilm formed on enamel and dentine. It consisted of two randomized phases, with a 10day washout between them: deionised water (DW) or a NaF solution (500 ppm F⁻). Twelve volunteers wore mandibular appliances containing 3 enamel and 3 dentine specimens for 1 min, to allow basal pellicle formation, then rinsed (1 min) with DW or NaF and kept the appliance overnight (8h). Biofilm was harvested, DNA extraction performed for 16S rRNA sequencing, and data processed in QIIME2 for relative abundance calculation and diversity analysis, using DADA2 for denoising and ASV generation. Taxonomy was assigned via the Silva SSU 138.2. Differential abundance was analysed in R using DESeq2 and Benjamini–Hochberg correction. A total of 228 species were identified; 28 exclusively on enamel and 17 on dentine. All groups had predominance of *Streptococcus* spp. (61.4-70.9%), followed by *Haemophilus* spp. (15.2-24.5%), *Gemella* spp. (4.0-6.3%), *Veillonella* spp. (0.9-2.6%) and *Rothia* spp. (0.9-2.0%), with *Veillonella* spp. being more prevalent on enamel than on dentine after rinsing with NaF (+2.74-fold, p=0.04). For both enamel and dentine, NaF rinse significantly increased (p<0.05) the relative abundance of at least 11 species (mainly *Streptococcus* spp. such as *S. salivarius*, *S. symci* and *S. toyakuensis*) and decreased (p<0.05) at least 10 species (mainly *Streptococcus* spp, *Neisseria* spp. and *Prevotella* spp.). Furthermore, NaF rinse decreased levels of *S. gordonii* (-6.72-fold, p=0.01) and increased levels of *S. oralis* (+2.60-fold, p=0.04) and *S. parasanguinis* (+9.36-fold, p<0.01) on enamel. Shannon diversity index varied from 3.86 to 4.68. In conclusion, NaF rinse modifies the composition of the biofilm formed on enamel and dentine in the species level, but the predominant genera are not influenced.

108 Effects of oral probiotics on salivary *Streptococcus mutans* count

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For high caries-risk individuals, antibacterial home-care agents such as additional fluoride and chlorhexidine products are recommended, yet these carry notable side effects and restrictions on use. This study aimed to assess the effect of probiotics on the salivary *Streptococcus mutans* count and to compare its efficacy with that of fluoride and chlorhexidine. Randomized controlled trials published before November 2024, which compared the effects of fluoride, chlorhexidine mouthwash and probiotics were searched in electronic databases, including PubMed, EMBASE, Web of Science, and Cochrane Library. The outcome was salivary *Streptococcus mutans* (*S. mutans*) count. The control group received standard of care meaning daily use of recommended amount of fluoride containing toothpaste. Standardized mean differences were calculated (SMD), estimates on *Streptococcus mutans* counts were created for interventions and mean difference of changes were evaluated for different probiotic categories. Probiotic interventions significantly attenuated *S. mutans* count (SMD = -1.38 [-1.89; -0.87]) and there were no significant differences between SMD of fluoride (-1.92 [-3.18; -0.66]) and probiotics, however chlorhexidine (-2.59 [-3.54; -1.65]) showed a significantly greater reduction than probiotics. *Lactobacillus rhamnosus* (-0.67 [-0.86; -0.47]) and *Lactobacillus paracasei* (-0.97 [-1.89; -0.05]) were the most effective in reducing salivary *S. mutans* count. Short-term use of probiotics was found to have a beneficial effect on salivary *S. mutans* count. Strain-specific, long-term clinical trials are necessary to fully understand the caries-preventive potential of individual probiotic strains.

109 Effect of different mouthwashes on the composition of the dentine biofilm

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In this cross-over *in situ* study, we investigated the composition of the biofilm formed on dentine after rinsing with one of the following solutions: DW (deionised water); NaF (500 ppm F⁻); OPC+F (grape seed extract + 500 ppm F⁻); and Sn+F (commercial solution containing SnCl₂/NaF/AmF). Twelve volunteers wore mandibular appliances containing three dentine specimens for 1 min to allow basal pellicle formation. They rinsed for 1 min with one of the solutions in four randomized phases, with a 10-day washout period, and wore the appliance overnight (8h). Biofilm was harvested and pooled for DNA extraction and 16S rRNA sequencing. Data were processed in QIIME2 and taxonomy was assigned via the Silva SSU 138.2. Differential abundance was analysed using DESeq2 and microbial diversity (Bray-Curtis index) with PERMANOVA. Benjamini–Hochberg correction was used. A total of 202 species from 47 genera were identified. *Streptococcus* spp. predominated across all groups (48-71%), followed by *Haemophilus* (15-41%), *Gemella* (4-6%), *Rothia* (1-2%) and *Veillonella* spp. (1-2%). Compared with DW, the NaF, OPC+F, and Sn+F solutions significantly ($p < 0.05$) reduced the abundance of 3, 5, and 5 genera and increased the abundance of 4, 2, and 4 genera, respectively. At the species level, a total of 69 amplicon sequence variants (ASVs) – mostly *Streptococcus* spp. – exhibited significant changes in abundance ($p < 0.05$), compared to DW: 22 for NaF, 19 for OPC+F and 49 for Sn+F. Shannon diversity index ranged from 3.8 to 4.4, but no significant changes in the overall microbial diversity was observed ($p > 0.05$). In conclusion, all tested mouthwashes altered the composition of the dentine biofilm, but despite the significant changes in abundances at genera and species levels, there was no impact on biofilm diversity.

110 Prevalence of *cnm*-positive *Streptococcus mutans* strains in Japanese individuals

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Streptococcus mutans, a major pathogen of dental caries, is also known to be associated with various systemic diseases, while the cell surface 120-kDa protein of Cnm encoded by the *cnm* gene has been reported to have roles in their pathogenesis. However, few reports regarding the prevalence of *S. mutans* organisms harboring *cnm* in Japanese individuals have been presented. The present study analyzed the prevalence of *cnm*-positive *S. mutans* strains in subjects across a broad age range and was conducted following approval of the protocol by the Ethics Committee of the Graduate School of Dentistry Ethics, The University of Osaka (R1-E51). Enrolled were 892 Japanese individuals aged 12-90 years (males: 444, females: 448) who visited eight university hospitals throughout Japan. *S. mutans* strains were isolated from dental plaque specimens collected from all teeth using sterile swabs according to a conventional method and *cnm*-positive strains were identified based on polymerase chain reaction analysis. The results were analyzed after dividing into three age groups (≤ 29 , 30-59, ≥ 60 years) and intergroup differences were assessed using Fisher's exact test for trend. *S. mutans* organisms were isolated from 403 subjects (45.2%), of whom 56 (13.9%) were positive for *cnm*. The prevalence of *cnm*-positive *S. mutans* strains was 5.2% ($n=5$) in the ≤ 29 years group, 12.6% ($n=24$) in the 30-59 years group, and 23.3% ($n=27$) in the ≥ 60 years group. The distribution frequency of *cnm*-positive strains indicated a significant increase associated with age ($P<0.001$). Similar trends were observed when males and females were analyzed separately, with no significant sex-related differences. These findings suggest that the prevalence of *cnm*-positive *S. mutans* in Japanese individuals is approximately 10% and increases with age.

111 Caries Removal Efficacy Of Gentle Hand Burs In Primary Teeth (Ex Vivo) And In-Vitro Artificial Lesions

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The Gentle Hand Bur System (GHBS) is a promising minimally invasive caries removal technique using carbide burs mounted on a handle to operate without handpieces. This study investigated the effectiveness of GHBS on artificial carious lesions and exfoliated caries-affected primary molars. Control groups included manual excavation (ME) and rotary handpiece burs (RB). Standardized lesions (n=6/group) were obtained by bioreactor-developed *Streptococcus mutans* biofilms on bovine incisors after 2 weeks (enamel) and 4 weeks (dentin) of incubation. Eighteen caries-affected primary molars were stratified by ICDAS and assigned to the 3 test groups (n=6/group). Applied force, operating time, and heat generation were measured for each procedure. Analysis of variance & Student's t-test were applied ($p < 0.05$), and results were presented as means $\pm$ 1 standard deviation (SD). Light microscopy (LM) and scanning electron microscopy (SEM) provided morphological examination. The in-vitro treatments showed GHBS operating time (111 s $\pm$ 20 enamel, 30 s $\pm$ 6 dentin) two times longer ($p < 0.05$) than ME (59 s $\pm$ 37 enamel, 16 s $\pm$ 6 dentin) and RB (50 s $\pm$ 13 enamel, 19 s $\pm$ 8 dentin). Applied force was GHBS (4447 g $\pm$ 1349 enamel, 2457 g $\pm$ 745 dentin) > ME (1910 g $\pm$ 285 enamel, 1410 g $\pm$ 181 dentin) > RB (817 g $\pm$ 332 enamel, 752 g $\pm$ 315), $p < 0.05$. GHBS increased substrate temperature ($0.72 \pm 0.95^{\circ}\text{C}$), while RB lowered it ($-0.92 \pm 1.10^{\circ}\text{C}$) due to spray cooling, with no differences induced by ME. LM showed more smear layer after GHBS treatment compared to RB, while SEM revealed leftover affected dentin after GHBS. In vitro data showed favorable correlation with ex-vivo treatments and lower SD, demonstrating good translatability. In conclusion, GHBS adoption must be cautiously balanced against its performance, needing further research to assess its clinical applicability.

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112 Experimental resin infiltrants for the management of initial caries lesions: mechanical behavior and antibacterial activity

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The aim of this study was to evaluate experimental resin infiltrants containing antibacterial monomer and nanohydroxyapatite for potential management of initial caries lesions. Dimethylaminohexadecyl methacrylate (DMAHDM) was added at 0 (control, E) 2.5 and 5 wt% to 75% triethylene glycol dimethacrylate (TEGDMA), 25% Urethane dimethacrylate (UDMA), 0.5% camphorquinone and 1% Ethyl 4-(dimethylamino)benzoate (EDMAB), with or without the addition of nanohydroxyapatite at 10wt% (noted by H), totaling 6 groups: E, E2.5, E5, EH, EH2.5, EH5. Icon™ (DMG®) was used as the commercial control. Degree of conversion (DC) (n=6), surface microhardness (SM) (n=6), viscosity (n=3), antibacterial activity against *S. mutans* biofilm formation (colony-forming units, CFU, n=3), biomass, n=6; planktonic activity, n=6) were evaluated in non-solvated formulations. Initial caries lesions were induced in bovine enamel samples (n=3) with demineralization solution (0.1M Acetate Buffer, 1.28mM Ca, 0.74mM KH₂PO₄, 0.03µg F/ml, pH=5, 16h), treated with solvated infiltrants (70% ethanol added at 15 and 40 vol% respectively for E and EH groups to match the initial viscosity for Icon, polymerized at 750mW/cm² for 40s), imaged with scanning electron microscopy (SEM). Data were analyzed with one-way ANOVA/Tukey tests (alpha=5%). All experimental infiltrants had similar DC, higher than Icon (p<0.001). EH and Icon showed the highest SM values, with Icon showing statistically lower values than any other groups (p<0.001). DMAHDM reduced CFU (p<0.001), biomass (p=0.005) and cells (p<0.001) in all groups. SEM images revealed resin tag formation, indicating effective penetration in groups I, E, E5 and EH5 through demineralized enamel. The mean lesion depth was approximately 50µm. In conclusion, experimental infiltrants containing DMAHDM exhibited significant antibiofilm properties and effective enamel pore infiltration. These findings highlight a promising advancement in the development of treatments for non-cavitated lesions.

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113 Bacterial and Fungal Community in Biofilm and Carious Dentin in Early Childhood Caries

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The aim of this study was to characterize bacterial and fungal communities in paired supragingival biofilm and carious dentin samples from children with early childhood caries, presenting active dentin lesions, in order to assess niche-specific microbial profiles. Supragingival biofilm (n = 8) and carious dentin (n = 9) samples were collected from preschool children aged 1–5 years with cavitated lesions (ICDAS 5–6). Bacterial (16S rRNA gene) and fungal (18S rRNA gene) communities were profiled using Illumina sequencing, with amplicon sequence variants (ASVs) inferred and taxonomically assigned using curated reference databases, followed by alpha- and beta-diversity, differential abundance, and multivariate analyses. Bacterial richness did not differ significantly between substrates (Richness $p = 0.059$; Chao1 $p = 0.064$); however, biofilm samples exhibited significantly higher bacterial diversity (Shannon $p = 5.1 \times 10^{-5}$; inverse Simpson $p = 0.0045$). Betadiversity analysis revealed strong separation between biofilm and dentin communities (PCoA weighted UniFrac; PERMANOVA $p = 0.001$). Bacterial community profiles differed markedly between substrates. Supragingival biofilm was enriched in *Neisseria*, *Leptotrichia*, *Porphyromonas*, *Capnocytophaga*, and *Haemophilus*, whereas carious dentin showed higher relative abundances of *Scardovia*, *Olsenella*, *Parascardovia*, and *Lactobacillus*. Fungal communities also showed niche specialization, with carious dentin enriched in amplicon sequence variants (ASVs) from the *Candida*–*Lodderomyces* clade and *Saccharomyces*. In contrast, supragingival biofilm harbored fewer differentially abundant fungal taxa, predominantly *Brettanomyces* and members of the *Debaryomycetaceae* family. In conclusion, distinct bacterial and fungal community profiles characterize supragingival biofilm and carious dentin in ECC, highlighting carious dentin as a highly selective ecological niche.

114 MRI T_2 Mapping Reflects Dental Pulp Response to Caries Progression

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The aim of this study was to evaluate magnetic resonance imaging (MRI) T_2 relaxation times and their spatial variability as a histological markers of dental pulp tissue response to caries progression. In the study, 52 extracted permanent premolars from 14 patients (mean age 14.2 ± 1.97 years) were included. Before tooth extraction, the teeth were scanned using 3T clinical MRI with the head coil to obtain dental pulp T_2 relaxation times. Teeth caries status was evaluated with the International Caries Detection and Assessment System (ICDAS). After extraction, pulp tissues were processed histologically to quantify the densities of macrophages, T-lymphocytes, B-lymphocytes, and vascular density. Mean T_2 relaxation times differed significantly across ICDAS categories: 111.9 ± 11.2 ms for ICDAS 0, 132.3 ± 18.5 ms for ICDAS 1, 124.6 ± 14.8 ms for ICDAS 2, and 112.6 ± 18.2 ms for ICDAS 3 ($p = 0.013$). In ICDAS 0 teeth, a positive correlation was observed between T_2 values and macrophage and T-lymphocyte densities; for ICDAS 1, a positive correlation with vascular density and a negative correlation with macrophage density emerged. In ICDAS 2 teeth, the spatial variability of T_2 relaxation times correlated positively with macrophage and Tlymphocyte densities. In ICDAS 3 teeth, both T_2 relaxation time and its variability correlated positively with B-lymphocyte density. These results provide evidence that both T_2 relaxation time and its intra-regional variability reflect histological tissue alterations associated with pulp inflammation and vascular changes due to caries progression. In conclusion, our findings confirm that MRI T_2 mapping could serve as a valid non-invasive biomarker of pulp tissue response to carious lesions and support its potential in clinical dental diagnostics.

Poster presentation

Demineralisation-remineralisation

116 Effects of Honey on Oral Bacteria and Caries Development

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Objective: The aim of this study was to investigate the influence of honey on mixed species biofilm and caries prevention in comparison with fluoride toothpaste. **Methods:** Eighty bovine enamel blocks were randomly assigned to four treatment groups (n=20): Manuka honey, Spotted Lanternfly (SLF) honey, fluoride toothpaste (Fluoride), and untreated control. The study employed a microbial caries model with 4-day exposure of enamel blocks to biofilm growth for caries development. Enamel blocks were treated with 10% sucrose once daily for 6 minutes to promote plaque growth followed by 2- minute twice daily treatment with their respective agent. Surface microhardness (SMH) was measured before and after exposure to plaque. A second set of 20 enamel blocks, used for testing the effects of the agents on microbial viability, was subjected to mixed species biofilm formation in equal ratio for 4 days. Biofilm was treated with Manuka honey, SLF honey, or fluoride toothpaste for 5 days, with no treatment to the control group. Data was analyzed by paired t-test and ANOVA followed by Tukey's multiple comparison tests. **Results:** With SMH, demineralization was significantly greater in the control group compared to treatment groups ($p < 0.0001$). Fluoride showed significantly greater demineralization inhibition compared to both honey types ($p=0.03$), with no significant difference between Manuka and SLF honey. Blocks in Manuka group showed lowest biofilm, followed by SLF and fluoride, compared to control group ($p < 0.0001$). Manuka significantly reduced biofilm formation compared to both fluoride toothpaste ($p < 0.0001$) and SLF ($p < 0.001$). **Conclusion:** This study demonstrated the potential of Manuka and SLF honey to prevent caries development based on their antimicrobial effects. While fluoride toothpaste exhibited superior demineralization inhibition, honey may offer a viable alternative or complementary treatment in caries prevention.

117 Calcium hypophosphite as a novel remineralizing agent for initial caries lesions

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This *in vitro* study evaluated the remineralization efficacy of calcium hypophosphite (CaP) on initial caries lesions and assessed whether combining CaP with hydroxyapatite (HAP) provides additional benefit. Bovine enamel blocks (n=120) with plaque-induced initial lesions were randomized (n=30/group) to toothpaste formulations containing 1% CaP, 20% HAP + 1% CaP, 20% HAP, or 1,450 ppm fluoride provided as sodium fluoride (NaF). A 14day pH-cycling model simulated daily challenges: three 2-minute applications of toothpaste slurry (1:3 paste:water), one 2-hour acid exposure, and storage in artificial saliva for the remaining time each day. Remineralization was quantified by micro-computed tomography (micro-CT) as change in mineral density (MD) of the lesion volume and expressed as percent remineralization (%Rem). Statistical analyses included paired t-tests for within-group changes and one-way ANOVA with Tukey's post hoc tests for between-group comparisons ($\alpha=0.05$). All groups exhibited significant MD increases from baseline (paired t-test, $p<0.001$), indicating remineralization under the model conditions. CaP alone achieved %Rem 80.42 ± 5.49 ; NaF and HAP achieved 67.3 ± 7.81 and 69.42 ± 4.79 , respectively (ANOVA/Tukey's, $p<0.001$ for comparisons). The HAP + CaP combination produced the highest outcome (%Rem 95.7 ± 3.26), significantly greater than each single-agent group ($p<0.001$). All other pairwise comparisons were significant ($p<0.001$) except NaF vs. HAP, which did not differ under these conditions. Calcium hypophosphite was effective in this *in vitro* caries model and exceeded the outcomes of NaF and HAP. Adding CaP to HAP further increased remineralization efficacy, indicating added benefit when combined. The effect is consistent with CaP supplying bioavailable calcium and, upon contact with saliva, forming hydroxyapatite, supporting CaP as a novel promising active ingredient for caries prevention both in HAP-based formulations and as a standalone remineralizing agent.

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118 Antibiofilm and Demineralization-Inhibiting Effects of Arginine-Containing Toothpastes on Dentin in a Microcosm Biofilm Model

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This *in vitro* study investigated the antibiofilm activity and demineralization-inhibiting potential of arginine-containing toothpastes on dentin using a microcosm biofilm model. Microcosm biofilm derived from pooled multi-donor human saliva and McBain saliva (0.2% sucrose) was cultivated on 84 standardized bovine dentin samples over 4 days. Following treatments were applied (twice daily/2min): 8% arginine with sodium monofluorophosphate (ArgF/1,450ppm); 8% arginine with zinc phosphate and sodium monofluorophosphate (ArgZnF/1,450ppm); arginine with sodium fluoride (ArgF-2/1,450ppm); stannous fluoride with sodium fluoride (SnF/1,450ppm); fluoride-free hydroxyapatite formulation (HA, toothpaste-negative control); 0.2% chlorhexidine (CHX, positive control); phosphatebuffered saline (PBS, solution-negative control) (n=12/group). pH was measured daily. Bacterial colonization was analysed by quantitative polymerase chain reaction (qPCR) (*Lactobacillus spp.*, *S. mutans*, total bacteria), and confocal laser scanning microscopy (CLSM). Dentin surface height changes were analysed by 3D-laser-microscope. Statistics were done by one-way ANOVA/Tukey's post-hoc test, Kruskal-Wallis test/Dunn's post-hoc test (p=0.05). Transitioning to sucrose-containing medium significantly reduced pH (6.76 ± 0.32 to 4.70 ± 0.39), only CHX restored pH > 5.5. ArgF-2 (median [lower/upper 95% confidence limit], (log₁₀ genomes/μL DNA)) (7.68 [7.56/7.99]) and SnF (7.93 [7.02/8.11]) significantly reduced total bacteria compared to PBS (8.32 [7.99/8.38]) and both (ArgF-2 (6.87 [6.54/7.23]); SnF (6.97 [5.83/7.21])) showed significant reduction of *Lactobacillus spp.* Compared to HA (7.78 [7.59/7.96]) and PBS (7.82 [7.48/8.1]); while *S. mutans* was significantly reduced by SnF (2.88 [2.65/4.12]) compared to PBS (4.84 [3.44/5.04]). The negative controls (HA/PBS) showed the greatest surface height loss, significantly to ArgF-2, SnF and CHX. CLSM confirmed lower biofilm biomass in all treated groups compared to negative controls. In conclusion, arginine-containing formulation combined with sodium fluoride (ArgF-2) and a stannous fluoride only toothpaste (SnF) significantly reduced *Lactobacillus spp.* And total bacteria counts, and resulted in less alteration of dentin surface height.

119 Comparison between micro-computed tomography and transverse microradiography of demineralized enamel

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This in-vitro study compared micro-computed tomography (μ CT) with transverse microradiography (TMR) for the quantitative assessment of enamel demineralization. Fifty bovine enamel specimens were prepared, demineralized (pH 4.95; 21 days) and subsequently subjected to an in situ period of 28 days. Afterward, thin plano-parallel slices were prepared for standardized TMR and μ CT (μ CT_{slice}) measurements, enabling direct sliceto-slice comparison. In addition, μ CT scans of the original enamel blocks were used to generate virtual slices with thicknesses of 2 μ m (μ CT₂), 20 μ m (μ CT₂₀), and 100 μ m (μ CT₁₀₀). Paired comparisons were assessed using repeated-measures ANOVA, while method agreement was evaluated using Pearson correlation. Mean (SD) mineral losses (Δ Z) and lesion depths (LD) were 4155(1288) vol% $\times\mu$ m, and 155(37) μ m for TMR, respectively, and 4180(885) vol% $\times\mu$ m and 154(38) μ m for μ CT_{slice}, respectively. No significant difference could be observed for mineral loss ($p\geq 0.447$) and lesion depth ($p\geq 0.858$) between TMR and all μ CT values. A significant, very strong correlation was found between TMR and μ CT_{slice} for Δ Z ($r=0.859$; $p<0.001$), while correlations for virtual slices ranged from strong (μ CT₂: $r=0.573$; $p<0.001$) to weak for thicker slices (μ CT₂₀: $r=0.380$; $p=0.014$; μ CT₁₀₀: $r=0.0370$; $p=0.017$). For LD, correlations were very strong for μ CT_{slice} ($r=0.904$; $p<0.001$) but weak for μ CT₂ ($r=0.231$; $p=0.151$). Overall, μ CT provided Δ Z and LD values similar to TMR on matched physical sections and showed acceptable agreement on virtual slices. These results support μ CT as a nondestructive alternative for analysis of mineral profiles of enamel caries lesions.

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120 Enhancement of SnF₂ remineralization and antimicrobial bioactivities by CPP-ACP

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The aim of this study was to investigate the effects of the saliva biomimetic CPP-ACP on remineralization and antimicrobial bioactivities of SnF₂. Enamel and dentine remineralization was measured using an *in situ* model where participants wore removable appliances containing human enamel and dentine blocks with subsurface lesions. Participants were randomly assigned to rinse with a 1 in 5 diluted solution of 1100ppm F as SnF₂ (SF) or 10% CPP-ACP/SnF₂ (CPPSF) for one min, four times a day, for 14 days. Posttreatment saliva samples were collected and analysed for bioavailable ions. At the end of each treatment period, the enamel and dentine blocks were removed and compared to untreated controls. The blocks were assessed for percent surface microhardness recovery (%SMHR) and remineralization by transverse microradiography. Scanning electron microscopy (SEM) was used for visual assessment of dentine tubule occlusion. The antimicrobial activities of SF and CPPSF *in vitro* were measured using a range of cariogenic oral bacterial pathogens. The results were statistically analysed using Welch's t-test. CPPSF (35.9±1.5%) produced significantly ($p<0.001$) higher remineralization than SF (15.9±1.1%) in enamel and in dentine (CPPSF 37.9±2.5%; SF 21.8±2.3%). Similar findings were observed for %SMHR with CPPSF 38.2±8.7% and SF 4.7±3.0%. Post-rinse saliva analysis revealed significantly higher ($p<0.01$) Ca and Sn ion levels in saliva after CPPSF compared with SF. Greater dentine tubule occlusion was observed with CPPSF than SF. CPPSF was superior to SF in inhibiting growth of cariogenic species which correlated with CPP-ACP's ability to solubilise and stabilise Sn ions. In conclusion, CPPSF produced higher amounts of bioavailable Sn and Ca in saliva and was superior to SF alone in remineralization of enamel and dentine *in situ* and inhibition of cariogenic species *in vitro*.

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121 Evaluation of the Efficacy of Calcium Hypophosphite Toothpastes to Enhance Caries Remineralization

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This in vitro study used a pH cycling model to compare the caries remineralizing efficacy of toothpaste formulations containing either calcium hypophosphite (CaP), hydroxyapatite (HAP), or sodium fluoride (NaF). Bovine enamel blocks with plaque-induced initial caries lesions were randomized (n=30/group) to toothpaste formulations containing 1% CaP, 20% HAP and 1% CaP, 20% HAP, or 1450 ppm fluoride provided as NaF. Lesion-bearing samples were subjected to a 14-day remineralization using a pH-cycling model with daily regimen of three 2-minute applications of toothpaste slurry (1:3 toothpaste:water), one 2-hour acid exposure, and storage in artificial saliva for the rest of the day. Remineralization was quantified as change in surface microhardness (SMH) of each sample measured before and after toothpaste treatment and expressed as percent remineralization (%Rem). Statistical analyses included paired t-tests for within-group changes and one-way ANOVA with Tukey's post hoc tests for between-group comparisons ($\alpha=0.05$). All groups exhibited significant (paired t-test, $p<0.001$) increase in SMH from baseline, indicating remineralization. Combining CaP and HAP achieved significantly (ANOVA/Tukey's, $p<0.001$) greater %Rem (89.7 ± 3.3) when compared with CaP alone (75.4 ± 5.5), HAP alone (62.4 ± 4.8), or NaF (60.3 ± 7.8). While %Rem achieved with CaP alone was significantly ($p<0.001$) greater than that of HAP and NaF, there was no significant difference in %Rem between HAP and NaF. The present study demonstrated that CaP promoted caries remineralization. Combining CaP with HAP significantly enhanced the caries remineralization efficacy of hydroxyapatite. The outcome of this study highlights the effectiveness of CaP as an active ingredient for remineralization of caries lesions.

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122 Effect of different periods of a cariogenic microcosm biofilm model on enamel and dentine demineralization

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This study aimed to evaluate enamel and dentin demineralization induced by different periods of cariogenic microcosm biofilm model. Polished and sterilized bovine enamel (4 mm x 4 mm, n=12) and root dentin specimens (n=13) were randomly assigned to three biofilm formation periods (3, 5 and 7 days) and two treatment subgroups (0.12% chlorhexidine/PerioGard®-CHX and PBS) to validate the model. A pool of saliva collected from 10 healthy individuals was used for biofilm formation. In 24well plates, samples were allocated according to two factors under study: biofilm formation time and treatment. The samples were exposed to 1.5 mL of inoculum (human saliva–glycerol + McBain saliva, 1:50) for 8 h. Thereafter, the inoculum was removed, the samples were washed with PBS (5 s), and received 1.5 mL of fresh medium (McBain's artificial saliva with 0.2% sucrose) for 16 h, completing 24 h. The samples were daily treated for 1 minute with CHX or PBS, and the medium containing sucrose was replaced once a day. Tooth demineralization was quantified by using TMR. Data were compared using two-way ANOVA/Tukey tests ($p<0.05$). ANOVA showed significant effect of period, treatment and interaction between the factors for the integrated mineral loss-deltaZ and lesion depth. With respect to DZ (%vol.um), the values were: dentine (day 3: CHX-2738±377 and PBS-4033±406, day 5: CHX-3352±546 and PBS-4589±445 and day 7: CHX-4023±561 and PBS-6127±986, period $p<0.0001$, treatment $p<0.0001$) and enamel (day 3: CHX-3079±627 and PBS-5281±711, day 5: CHX-3373±1414 and PBS-6531±499 and day 7: CHX-3129±489 and PBS-7691±721, period $p<0.0001$, treatment $p<0.0001$). In conclusion, the demineralization progresses with the microcosm biofilm formation time, except for dentin when treated with CHX. Further, the model was able to differentiate the effect of CHX and PBS on demineralization.

123 Creation of artificial white spot lesions – A scoping review

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Artificial white spot lesion (WSL) models are widely used to investigate early enamel caries, yet substantial methodological variability limits comparability across studies. This review critically examined the in vitro methodologies used to create WSLs and evaluates how accurately these approaches reproduce the characteristics of natural lesions. A structured literature search of PubMed, Web of Science, and Google Scholar identified studies published between 2014 and 2024 using the keywords *white spot lesion*, *enamel demineralisation*, and *artificial caries models*, with exclusions for *root caries*, *dentin**, and *erosion*. One hundred eligible in vitro studies on primary enamel caries were included after applying predefined exclusion criteria. Considerable heterogeneity was found in substrates, storage conditions, demineralisation protocols, and outcome measures. Human enamel was most frequently used in chemical models, whereas bovine enamel predominated in microbiological systems. Thymol was the most commonly reported storage agent, although storage parameters were often inadequately described. Chemical protocols (n = 64), particularly those employing pH-cycling and acetic acid-based solutions, were more common than microbiological protocols (n = 36), which typically utilised multispecies biofilms containing *Streptococcus mutans*. Most models produced WSLs within one week, but lesion depth and structural features varied widely, with inconsistent reporting across studies. The findings highlight a significant lack of standardisation and limited alignment with the complexity of natural caries. Rigorous, clearly defined protocols and comprehensive lesion characterisation are essential to improve reproducibility and clinical relevance. Future research should prioritise physiologically representative models that more accurately simulate biofilm–tooth interactions and early caries dynamics.

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124 Are conventional acid conditioning protocols appropriate for in vitro resin infiltration models?

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Although artificial caries lesions (ACL) present shallower lesion body and thinner hypermineralized surface layer (HSL) than natural white spot lesions (WSL), many in vitro resin infiltration studies apply aggressive hydrochloric acid conditioning (HAc) designed for natural lesions, potentially compromising lesion integrity and outcome validity. Thus, this study evaluated surface loss (SL) and resin infiltrant (RI) penetration in ACL subjected to different acid conditioning protocols. ACL were induced in bovine enamel using a lactic acid-based demineralizing solution (pH 4.7; 45 days), producing lesions $154.94 \pm 34.10 \mu\text{m}$ deep and with HSL thickness of $23.05 \pm 5.4 \mu\text{m}$. Half of each lesion was protected, while the exposed half was conditioned with 35% phosphoric acid (PAC) for 5 s (PAC5) or 15 s (PAC15), or with 15% HAc for 5 s (HAc5) or 120 s (HAc120; manufacturer's recommendation) ($n = 6/\text{group}$). SL was measured by scanning electron microscopy, and RI penetration by crosssectional Knoop microhardness (10-280 μm). Natural WSL conditioned with HAc120 were included for comparison. ANOVA/Tukey's tests were applied ($\alpha = 0.05$). HAc120 caused the greatest SL in ACL ($45.8 \pm 9.39 \mu\text{m}$), with complete HSL removal ($p < 0.05$). PAC5 showed the lowest SL ($2.3 \pm 1.68 \mu\text{m}$), not differing from PAC15 ($5.9 \pm 0.87 \mu\text{m}$). HAc5 produced intermediate loss ($14.3 \pm 4.37 \mu\text{m}$), differing from PAC5 and HAc120. In WSL, HAc120 caused SL of $48.73 \pm 11.19 \mu\text{m}$. RI penetration occurred throughout the lesion body in all groups, with no differences among protocols ($p > 0.05$). In conclusion, the conventional acid conditioning protocol developed for natural WSL is inappropriate for in vitro ACL models. Milder protocols preserve lesion structure without compromising resin infiltration, providing a more realistic in vitro simulation of clinical conditions.

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125 Bulk fill composite curing under paediatric constraints: depth dependent microhardness and clinical safety margins

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In paediatric dentistry, behaviour management, moisture control and limited chairside time favour restorative approaches that are fast and less technique-sensitive; bulk-fill composites are attractive, but only if curing at depth is adequate. This in-vitro study aimed to assess Vickers microhardness and microhardness-based depth of cure (DOC) of six bulk-fill resin composites (Tetric EvoCeram Bulk Fill, Filtek Bulk Fill Posterior, Filtek One Bulk Fill, SonicFill 2, Admira Fusion X-tra, GrandioSO X-tra) when placed in a single 6-mm increment and light-cured with a standard protocol. Cylindrical specimens (4 mm diameter × 6 mm thickness; n=3/material) were light-cured for 20 s using an LED unit (irradiance 12–13 kW/m²) and stored in water for 24 h at 37 °C. Microhardness was measured at the top surface and at 1-mm intervals to 6 mm (0.49 N, 30 s; five indentations/level). DOC was calculated as the hardness ratio (depth/top) at 4 mm and 6 mm (≥0.80 acceptable). ANOVA showed significant effects of depth and material (p<0.01). Microhardness decreased with increasing depth for all materials, yet DOC ratios exceeded the acceptability threshold in every group, ranging from 0.904 to 0.983 at 4 mm and from 0.870 to 0.966 at 6 mm. GrandioSO X-tra and Admira Fusion X-tra showed the highest DOC at 6 mm (0.966 and 0.960), while Tetric EvoCeram Bulk Fill showed the lowest (0.870). Under a 20-s LED protocol, all tested bulk-fill composites achieved adequate curing up to 6 mm, supporting single-increment posterior restorations and chairtime-efficient treatment strategies relevant to paediatric clinical care.

126 In-SEM Digital Transverse Microradiography with an Nb target of x-rays

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Transverse Microradiography (TMR) remains the gold standard in cariology to measure the mineral loss of dental hard tissue but the conventional method uses photographic films, which is time-consuming and prone to procedural errors. The aim of this study was to develop a digital TMR prototype using element-specific X-rays emitted within a custom-built LaB6 scanning electron microscope (SEM -AMRAY1810). The system is equipped with a Niobium (Nb) target, with externally controlled rotation multisample holders facing an X-ray sensitive XIMEA CMOS sensor (target- camera-distance 13.5 cm) operated by an N20 controller (Neoscan). Digital images of 100µm thin enamel/dentin specimens with artificial caries lesions were taken with different electron high-voltages and exposure times. Images were analysed with a custom-made FIJI plugin. The Nb target adds high energy emission photons once the K-edge energy of 18.99 kV is exceeded. This was observed by a series of measurements in enamel, dentin and emptyholder (vacuum) image domains with 13 kV, 15 kV, 17 kV, 19 kV, 21 kV and 25 kV (6s exposure). Transmission for enamel decreased: 0.63, 0.58, 0.57, 0.51, 0.52 and 0.53 respectively, whereas for dentin the corresponding values were 0.65, 0.61, 0.59, 0.58, 0.59 and 0.62. The ratios of enamel to dentin transmissions were 0.97, 0.956, 0.955, 0.883, 0.875 and 0.859 respectively. We determined effective pixel resolutions of 1.15 µm with a smaller (9 samples, target-sample-distance 5.5 cm) and 3.5 µm with a larger (21 samples, target-sample-distance 2cm) sample holder respectively. Measurements on a copper TEM-grid (1000-mesh) demonstrated a resolution of 4 µm. The presented arrangement enables rapid analysis of mineral loss as compared to analogue TMR methods, strongly reducing procedural biases and paves the way to absolute determination of mineral densities using element-specific X-rays.

127 pH modulation, ion release and erosive–abrasive stability of restorative materials commonly used in primary teeth

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Primary teeth are frequently exposed to acidic challenges related to dietary habits. Restorative materials may influence the acidic environment adjacent to dental hard tissues through pH modulation and ion release, while their surface stability under erosive–abrasive conditions is clinically relevant. However, comparative data on these functional properties across different restorative material classes used in primary teeth are limited. This in vitro study compared pH modulation, ion release and erosive–abrasive surface stability of restorative materials commonly used in primary teeth. Seven restorative materials from different classes were investigated: glass ionomer cement, glass hybrid, resin composite, ormocer-based, alkasite, giomer and compomer materials. Changes in pH were assessed by repeated measurements in citric acid over up to 450 days. Fluoride, calcium and phosphate ion release was quantified over 15 days. Erosive–abrasive surface stability was evaluated using cyclic erosion–abrasion protocols followed by profilometric surface analysis. pH values and ion release were analysed using linear mixed models, while erosive–abrasive surface changes were analysed using nonparametric tests. Materials showed significant and material-specific differences in pH modulation, ion release and erosive–abrasive surface changes. Distinct time-dependent pH trajectories were observed, ranging from persistently low pH values (<3.5) to sustained elevation above pH 6–7, depending on material class (material × time, $p < 0.001$). Ion release was most pronounced for glass-based materials, whereas resin-based materials showed no relevant ion release despite marked pH changes in some cases. Erosive–abrasive surface changes differed significantly between materials ($p < 0.001$). In conclusion, restorative materials commonly used in primary teeth exhibit distinct and material-specific patterns of pH modulation, ion release and erosive–abrasive stability, indicating that chemical reactivity and surface stability are not directly coupled.

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128 Experimental Insights into the Remineralization Anticaries Mechanism of Professional Fluoride Application

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Professional fluoride application (PFA) generates CaF_2 -like reaction products that dissolve rapidly ($\approx 70\text{--}90\%$ within 24–48 h). Because patients usually face minimal cariogenic challenges during this early period, the clinical relevance of this short-lived fluoride release may primarily lie in enhancing lesion remineralization at the moment of application. To test this hypothesis, an in vitro study using enamel blocks ($n=6/\text{group}$) with artificial caries lesions was conducted. A 2×3 factorial design was used, with two treatments (placebo – P; and acidulated phosphate fluoride solution – APF) and three immersion times in artificial saliva to induce CaF_2 -like depletion (0, 24, and 48 h), resulting in six groups: P-0h, P-24h, P-48h, F-0h, F-24h, and F-48h. After immersion, the blocks were subjected to pH cycling (Re > De model). CaF_2 -like ($\mu\text{g F}/\text{cm}^2$) and mineral changes ($\Delta\Delta\text{S}$, $\text{Kg}/\text{mm}^2 \times \mu\text{m}$) were quantified and analyzed by two-way ANOVA. As a result, CaF_2 -like levels (mean $\pm$ sd) remained unchanged with saliva exposure in the placebo group (1: $0.6 \pm 0.4\text{A,a}$; 2: $1.0 \pm 0.5\text{A,a}$; 3: $0.3 \pm 0.1\text{A,a}$) and decreased markedly in the PFA group (4: $77.6 \pm 2.1\text{B,a}$; 5: $3.3 \pm 3.1\text{A,b}$; 6: $5.9 \pm 1.8\text{A,b}$). Remineralization ($\Delta\Delta\text{S}$) was greatest when CaF_2 -like was intact and declined with its depletion in the PFA group (4: $-6128.3 \pm 2571.8\text{a}$; 5: $-2693.6 \pm 4322.4\text{ab}$; 6: $-1180.9 \pm 1370.7\text{b}$), showing a dose–response relationship between retained CaF_2 -like and lesion repair ($r=-0.5$, $p<0.01$), as well as between lesion repair and time in saliva ($r=0.63$, $p<0.01$). In contrast, no significant correlations were found for the placebo groups ($p>0.05$). Different uppercase letters indicate differences between treatments, and different lowercase letters indicate differences among saliva exposure times ($p<0.05$). In conclusion, early fluoride release appears to be relevant for enhancing the remineralization of pre-existing (including subclinical) lesions at the moment of application.

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Poster presentation

Epidemiology

130 Epidemiological caries prediction in 3-year-olds in Germany for the upcoming national oral health survey 2026

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Background: Ten years after Germany's first national oral health survey of 3-year-olds, a follow-up will take place in 2025/26. Since then key early childhood caries (ECC) preventive measures were introduced: higher fluoride containing children's toothpaste (1,000 ppm F), reimbursed routine check-ups with individual prophylaxis including up to four risk-based fluoride varnish applications annually. **Objective:** To predict caries experience (dmft and prevalence) for 3-year-olds in 2026 based on more recent publicly available regional public dental health data from predominantly obligatory dental examinations in kindergarten. **Methods:** Representative regional data from 6 German federal states (Brandenburg, Saxony, Saxony-Anhalt, Thuringia, Mecklenburg-Western-Pomerania, and Hesse) were obtained from public sources and/or through direct requests to federal health ministries. The data were analysed for temporal trends and extrapolated to estimate national caries prevalence and dmft for comparison with the forthcoming national survey. Trend lines were applied to model regional developments and predict 2026 outcomes. **Results:** In 2016, the national mean caries experience among 3-year-olds (n=95,127) was 0.48 dmft, with a prevalence of 13.7%. In Brandenburg (n=13,514-14,595/examined 3-year-olds per year), mean dmft declined from 0.50 (2015) to 0.35 (2024), and prevalence from 14.3% to 10.2%. In Saxony (n=15,885-23,653/year), dmft decreased slightly from 0.40 (2015) to 0.37 (2024). Thuringia (n=6,843-10,225/year) showed a decline (2016-2024) in prevalence from 15.9% to 13.1% and mean dmft from 0.58 to 0.50. Similar trends in mean dmft (2015-2024) were observed in Saxony-Anhalt (0.66 to 0.46), Mecklenburg-Western-Pomerania (0.50 to 0.40) and Hesse (0.51 to 0.37) with overall caries reductions ranging from 7-27%. Extrapolation predicts for 2026 national values of 0.39 ± 0.08 dmft and mean caries prevalence of $10.8\% \pm 2.0\%$. **Conclusion:** Regional trends indicate a continued decline in ECC among 3-year-olds in Germany over the past decade, supporting expectations of further improvements in the 2025/26 national oral health survey.

131 Oral health status in persons aged ≥ 65 years in Switzerland: a systematic review and meta-analysis

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This systematic review aimed to analyse data on the oral health status of individuals aged ≥ 65 years in Switzerland. Eligible studies included participants aged ≥ 65 years living in Switzerland and published from 1970 onwards. Studies that did not meet these criteria were excluded. Electronic searches were conducted in Embase, MEDLINE (via PubMed), Scopus, Swiss data repositories, grey literature, and manual hand searching. Risk of bias was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools selected according to study design. Subgroup meta-analyses were performed using a random-effects model with 95% confidence intervals for the prevalence of edentulism, mean number of missing teeth, and mean DMFT. Analyses were stratified by living situation (community-dwelling, longterm care facilities [LTF], and hospitals) and by decade of data collection. A total of 45 studies were included in the review. Over time, a declining trend was observed in the prevalence of edentulism (44% in 1980–1990 to 4% in 2020–2025), as well as in the mean number of missing teeth and mean DMFT. The prevalence of edentulism was higher among residents of LTFs (46%, 95% CI 36–56%) and in hospital settings (32%, 95% CI 22–43%) compared with community-dwellers (7%, 95% CI 3–11%). Community dwellers had a lower mean number of missing teeth (8.43, 95% CI 5.77–11.09) and a lower mean DMFT (19.33, 95% CI 15.52–23.15) than those living in LTFs and hospitals (mean missing teeth: 16.91, 95% CI 13.54–20.28; mean DMFT: 26.60, 95% CI 25.52–27.72). Overall, the oral health status of the Swiss elderly population has improved over time. Across several decades, community-dwelling older adults consistently exhibited better oral health than those living in LTF or hospital settings.

134 Global scientific production on food insecurity and dental caries: a bibliometric analysis (2009-2025)

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Food insecurity has emerged as an important social determinant of oral health, particularly in relation to dental caries. This study aimed to map and characterize the global scientific production addressing the relationship between food insecurity and dental caries. A bibliometric analysis was conducted using data retrieved from the Scopus database, covering the period from 2009 to 2025. Bibliometric indicators related to publication trends, sources, authorship, institutional and country productivity, citation impact, and keyword cooccurrence were analyzed using the Bibliometrix package. A total of 35 documents published in 22 sources and authored by 213 researchers were identified; the annual growth rate was 7.11%. No single-authored documents were observed, and international collaboration accounted for 22.9% of publications. The United States and Brazil were the most productive and most cited countries. Core journals, identified according to Bradford's Law, included Community Dentistry and Oral Epidemiology, International Journal of Paediatric Dentistry, and Journal of Public Health Dentistry. Author productivity followed Lotka's Law, with a small number of highly productive and influential authors. Keyword analysis revealed strong thematic clustering around "dental caries," "food insecurity," "oral health," "children," and "cross-sectional studies," indicating a predominant epidemiological focus. Citation analysis showed a concentration of highly cited documents addressing socioeconomic inequalities, nutrition, and childhood caries. Overall, the scientific literature on food insecurity and dental caries has expanded steadily over the past decade, with increasing international collaboration and a strong public health orientation. However, the predominance of cross-sectional designs highlights the need for longitudinal and interventional studies to better elucidate causal pathways. These findings provide a comprehensive overview of research trends and may inform future research agendas, as well as policy-oriented investigations in cariology and social determinants of oral health.

135 Geographic Patterns of Sugar Intake Related to Early Childhood Caries in Romania

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This study evaluated early childhood caries (ECC) prevalence and dietary sugar intake patterns in Romanian children aged 4–5 years enrolled in the Smilebright Romania program (Ethical approval 59/17.12.2023, revised 2024 from the University of Medicine and Pharmacy “Victor Babeș,” Timișoara). A stratified sample of 460 children was determined according to WHO guidelines ($\alpha=0.05$, power=0.9, SD=2, design effect=2, 10% drop-out) with study areas defined using NUTS 2024 level 1 regions. Dietary information was collected at baseline via caregiver self-report, and clinical oral examinations were performed by calibrated examiners using the International Caries Detection and Assessment System (ICDAS). Data were analyzed in R Studio (vs 2024.12.1+563). Locally estimated scatterplot smoothing (LOESS) was applied to explore potential non-linear associations between sugar intake and geographic distribution: These relationships were subsequently assessed using generalized additive models (GAMs), with outcomes reported as effective degrees of freedom (edf), F statistics, p-values, and adjusted R^2 . County-level mean sugar intake indices were visualized using choropleth maps. Caries prevalence, expressed as the dmft index, was 5.82. LOESS curves revealed distinct patterns by region; natural sugar intake was higher in South-Western Romania and lower in central areas, with narrow confidence bands. In contrast, processed and total sugar intake displayed minimal regional variability. GAMs confirmed a statistically significant geographic association for natural sugar intake (edf=1.69, F=7.32, $p<0.01$; adjusted $R^2=0.03$), whereas no significant area effects were identified for processed or total sugar intake. Spatial mapping further demonstrated higher total sugar intake in North-Eastern counties and lower levels in southern and South-Western regions. These findings underline the usefulness of flexible non-linear modeling and spatial visualization in identifying regional dietary patterns that may be relevant for ECC risk assessment in Romanian preschool children.

136 Dietary and oral hygiene habits impact on tooth erosion in pregnant women with toxicosis

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The aim of the study was to identify habit-related risk factors for tooth erosion in pregnant women. Methods: 115 women (9-14 weeks of pregnancy) aged 18-45-yrs-old were randomly selected and divided into groups: group-A - with tooth erosion and toxicosis (n=54); group-B - erosion without toxicosis (n=23); group-C - toxicosis without erosion (n=38). Erosion was assessed by Dental Erosion Grading Scale (Eccles and Jenkins, 1974). Modified and validated WHO oral health questionnaire (2013) was used for interviewing. Statistical analysis included t-test, chi-square test, and bivariate correlation. Results: Mean number of teeth with erosion were 7.91 ± 0.41 in group-A and 7.61 ± 0.37 group-B ($p > 0.05$). Pregnant women with tooth erosion had higher prevalence of toxicosis symptoms versus group C: nausea –35% and 11%, acid regurgitation –28% and 16%, vomiting –17% and 11%, respectively ($p < 0.05$). Higher daily consumption of low-pH beverages (soft drinks, juices) and food (fruits, pickles, sour cabbage, citrus, berries) was observed in pregnant women with erosion ($p < 0.05$). Snacking 4-5 times/day was observed in 33%, 22%, 18%; twice/day toothbrushing in 41%, 22%, 58%, with soft toothbrushes in 26%, 22%, 34%; with medium toothbrushes in 31%, 48%, 23%; with fluoride-toothpaste in 15%, 26%, 26%; and with calcium-toothpaste in 22%, 44%, 29% of women in groups A, B and C, respectively ($p > 0.05$). Toothpaste for sensitive teeth was used by 50% in group-A, 57% in group-B and 26% in group-C ($p < 0.05$). Significant correlation was found between erosion stage and nausea ($r = 0.31, p < 0.01$), toothbrushing with lateral movements ($r = 0.23, p < 0.05$), medium toothbrush use ($r = 0.25, p < 0.05$), calcium toothpaste ($r = -0.27, p < 0.05$), soft drinks consumption ($r = 0.24, p < 0.05$), fresh juice ($r = 0.29, p < 0.05$), cakes ($r = 0.27, p < 0.05$), pickles ($r = 0.34, p < 0.01$), sour cabbage ($r = 0.27, p < 0.05$), and citrus fruits ($r = 0.28, p < 0.05$). Conclusion: The severity of dental erosion in pregnant women with toxicosis correlated with dietary and oral health habits.

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137 Dental Caries in Belgian Adults: Oral Health Data Registration and Evaluation Survey 2023-2024

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This cross-sectional study assessed coronal and root caries in the Belgian adult population based on findings from the Oral Health Data Registration and Evaluation Survey (OHDRES) 2023-2024 and evaluated time trends. A national, stratified multistage cluster sampling design was applied. OHDRES 2023-2024 combines data from face-to-face interviews as part of the national Health Interview Survey, oral health examinations, and selected health care utilisation data retrieved from the Belgian Inter-Mutualistic Agency. Of the 7,001 participants who were interviewed, 1,724 underwent an oral examination, and 1,245 adults (≥ 15 years) consented to one-to-one linkage of their data. The World Health Organisation caries diagnostic criteria and age group-standardised categories ranging from 15-24-yrs to ≥ 75 -yrs were used. Data were weighted. The proportion of caries-free adults (DMFT=0) varied from 49.4% in the youngest group to 0.9% in the oldest groups, and the DMFT scores varied from 2.3 ± 3.7 to 13.2 ± 6.6 with filled teeth constituting the largest component (from 1.6 ± 2.5 to 10.1 ± 5.8). The overall proportion of adults with exposed carious or filled tooth roots was 17.0%, being practically absent in the 15-24-yrs age group and increasing steadily from 25-34-yrs age group onward. Time trends analysis comparing OHDRES 2023-2024 and OHDRES 2008-2010 showed an increase in the proportion of caries-free adults across all age groups, reaching statistical significance for age groups 15-24-yrs and 25-34-yrs (Fisher's exact test; $p < 0.003$). A significant reduction in DMFT scores was observed for all age groups (two-way ANOVA $p < 0.0001$). While the filled and missing components showed significant reductions, the decayed component did not. In conclusion, the oral health of Belgian adults, as measured by the proportion of caries-free adults and overall caries experience, improved significantly over the past 15 years.

138 Genomic Basis of Caries Clusters in the Hispanic Communities Health Study/Study of Latinos (HCHS/SOL)

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Dental caries is a complex disease with demonstrated genetic susceptibility. We aimed to estimate the heritability of biologically informative caries clusters and identify associated genetic loci in a Hispanic/Latino population from the United States. We conducted a genome-wide association study (GWAS) of these empirically derived caries clusters in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL; $n=11,308$). We used 5 caries clusters (pit-and-fissure molars, mandibular anterior teeth, posterior non-pitand-fissure surfaces, maxillary anterior teeth, and mid-dentition surfaces) as quantitative traits, which were regressed on age, age-squared, and sex followed by transformation to standardized residuals. GWAS models were adjusted for the first five ancestry principal components. SNP-based heritability (h^2) estimated in unrelated participants ranged from 10% to 49% across clusters. In the GWAS, two loci met genome-wide significance ($P<5\times10^{-8}$) for the cluster involving maxillary incisors. The first on chromosome 7 (lead SNP: rs56144152, minor allele frequency [MAF]=0.05, $P=2.9\times10^{-9}$, 60kb 5' of *NAMPT*) has been previously reported for the DMFS trait. The second locus intronic to *EDAR* (chromosome 2, lead SNP: rs922452, MAF=0.30, $P=3.5\times10^{-8}$) has an established role in enamel formation. Four loci met genome-wide significance for the cluster representing premolars and canines. Among these, the *ZMYM4* locus (chromosome 1, lead SNP: rs7543131, MAF=0.05, $P=3.4\times10^{-9}$), has been associated with neural crest cell specification and craniofacial development. To conclude, our findings from an underrepresented population and biologically information phenotypes nominate 6 genetic loci associated with dental caries. These susceptibility markers can be used to aid risk stratification and other precision dentistry approaches for caries prevention and management upon further validation and replication.

139 Age-related patterns of cavitated caries lesions in primary teeth: a cohort-based analysis

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The aim of this study was to identify age-related patterns of cavitated caries lesions distribution across dental surfaces in primary teeth. Repeated cross-sectional analyses were conducted within a 7-year prospective cohort in Santa Maria, Brazil. Clinical oral examinations were performed in 2010 (n=639), 2012 (n=469), and 2017 (n=449) in children aged 1-9 years. Only cavitated dentine lesions were recorded and classified according to tooth and surface type (occlusal, proximal, smooth). The frequency of decayed teeth was calculated by age and dental surface involved. Principal Component Analysis (PCA) was applied to identify patterns in caries distribution, followed by descriptive analyses across grouped age ranges. A total of 100,597 dental surfaces were assessed, of which 3,077 (3.06%) presented cavitated dentine lesions. PCA identified homogeneous patterns of lesion distribution across three age groups: 1-3, 4-6, and 7-9 years. Lower molars were the earliest and most frequently affected teeth in all age groups. Upper anterior teeth showed a higher proportion of lesions on smooth surfaces. In children aged 1-3 years, proximal surfaces were less frequently affected; however, their involvement increased markedly in the 4-6-year group, when proximal and occlusal lesions occurred at similar proportions. In conclusion, cavitated caries lesions in primary teeth follow predictable, age-dependent distribution patterns influenced by tooth morphology and eruption sequence, supporting the need for age-specific preventive and clinical strategies.

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140 Extremely high caries prevalence in children living in a European capital region: a cross-sectional study

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The aim of the study was to assess caries prevalence and severity in primary teeth among first-grade children living in Riga, Latvia, and the surrounding Pierīga region. A cross-sectional epidemiological study (Ethics Committee approval: 2-PĒK-4/835/2025; protocol: 10.17605/OSF.IO/YFVPS) was conducted in eight randomly selected schools from November 2025 to January 2026. Clinical examinations were performed by calibrated dentists (interexaminer kappa: 0.75–0.80; intra-examiner kappa: 0.80–0.88) using merged ICDAS criteria at enamel (d_1), dentine (d_3) and cavitated dentine (d_5) thresholds. Descriptive and inferential analyses (χ^2 for regional comparisons, $p < 0.05$) were performed using R. Of 567 eligible children, 517 participated (response rate 91.2%); 52% were boys, mean (min–max) age was 7.1 years (6–8). Caries prevalence was high at all thresholds: 91.3% at d_1 , 79.1% at d_3 and 72.9% at d_5 . The prevalence of dentine-level caries was higher in Rīga than in Pierīga (d_3 : 84.2% vs 74.4%, $p = 0.006$; d_5 : 77.7% vs 68.5%, $p = 0.02$), whereas no difference was observed at the enamel level (92.7% vs 90.0%, $p = 0.274$). Mean dmft values were 6.1 (SD 3.7) at d_1 , 4.1 (SD 3.4) at d_3 and 3.6 (SD 3.3) at d_5 . In conclusion, almost all 6–8-year-olds in Riga and Pierīga had caries experience, and more than two-thirds had cavitated dentine lesions, indicating a severe accumulated disease burden despite publicly funded dental care. While overall caries experience was similarly high in both regions, dentine-level lesions were significantly less prevalent in the region surrounding the capital, generally considered to have a higher socio-economic profile. The observed levels of disease represent one of the highest caries burdens reported for a European capital region and highlight the urgent need for strengthened population-level prevention and earlier, more effective intervention strategies.

141 The influence of maternal multimorbidity on childhood caries

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The aim of this study was to examine the association between maternal multimorbidity, defined as the presence of two or more long-term conditions, and dental caries in children using linked Scottish administrative health data. A population-based cohort of 332,502 mother–child pairs was constructed using routinely collected, linked administrative datasets. Maternal multimorbidity was identified using ICD-10 diagnostic codes and prescribing records. Childhood caries was assessed using outcomes from the National Dental Inspection Programme (NDIP) basic inspection conducted at approximately age five years. Modified Poisson regression models were used to estimate unadjusted and adjusted relative risks (RRs). The cohort included all children born in Scotland between 2010 and 2020 with available NDIP data. The prevalence of multimorbidity was 9.8% (n=32095). The prevalence of childhood caries in the entire cohort was 28.3% (n=93931). In unadjusted analyses, children of mothers with multimorbidity had a higher risk of dental caries compared with those whose mothers had no multimorbidity (RR = 1.14, 95% CI 1.12–1.16; $p < 0.001$). This association remained after adjustment for behavioural, physical, and sociodemographic factors (adjusted RR = 1.10, 95% CI 1.09–1.12; $p < 0.001$). Area-based deprivation modified this relationship, the association was attenuated in the least deprived group. Sensitivity analyses using urgent care need as an alternative caries definition supported this association. Using near-complete national coverage, this study provides the first population-level evidence of an association between maternal multimorbidity and childhood caries in Scotland. The findings highlight deprivation as a key driver of widening oral health inequalities and support the need for integrated, family-centred prevention strategies. The study also demonstrates the value of linked national data infrastructure for addressing emerging public health challenges.

Poster presentation

Fluoride

142 Effect of dental varnishes and similar products on the CaF₂like deposition

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The aim of this study was to evaluate the effect of different sodium fluoride varnishes or similar products on CaF₂-like deposits formation. Seventy-seven enamel specimens with 3mm of diameter and flat/polished surfaces were obtained. They were divided into 7 groups (n=11) according to the kind of varnish or gel applied: PRO- 5% NaF varnish (Profluorid, Voco), PBM- 5% NaF + BioMin varnish (Profluorid BioMin, Voco); BIF- 5% NaF + 5% CaF₂ varnish (Bifluorid 10, Voco), CW - 5% NaF varnish (Clinpro White, Solventum), CC - 2.1% NaF + calcium phosphate gel (Clinpro Clear, Solventum) and EFV – 2.4% NaF experimental fluoride gel (Voco). A negative control (NC) without any treatment was also tested. The treatments were applied over the enamel surface, and, after 15min, the specimens were individually immersed into artificial saliva for 24h. After this time the varnishes were removed and the specimens immersed in 1M KOH solution, under gentle agitation, for 24 h at room temperature. The concentration of fluoride in the KOH solution was determined using a fluoride-sensitive electrode. The value of weakly adsorbed fluoride on the enamel surface was calculated according to the volume of the KOH-solution used and the surface area of the specimen, thus obtaining values in µg/cm². The data were analyzed by one-way ANOVA and Tukey tests. Significant differences were observed among the groups (p=0.0001). The means for each group, standard deviation and the results of Tukey test were: NC-0.3(0.23)a, CC-3.30(0.57)b, EFV-5.38(0.88)c, CW-5.93(1.04)cd, PBM-7.60(1.38)de, PRO-8.47(1.40)e, BIF-13.92(3.40)f. Groups followed by the same letters do not present significant differences. It was concluded that all varnishes tested induced CaF₂-like deposits formation, with the higher effect to Bifluorid 10 and the smaller to Clinpro Clear.

143 Does silver diamine fluoride interfere with dentin adhesion of 10-MDP containing adhesives?

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Silver diamine fluoride (SDF) is mainly used to manage dentin hypersensitivity and arrest dental caries. If restorative therapy is subsequently required, adhesive procedures on SDF-treated dentin may be compromised. This study evaluated the influence of SDF on dentin bond strength of two 10-MDP-containing adhesives. Sixty-four caries-free human molars were distributed to eight experimental and eight control groups, differing by the adhesive (Scotchbond Universal Plus vs. Clearfil SE Bond), the application (self-etch vs. etch&rinse), pretreatment (without (control)/with SDF (Riva Star Aqua Step 1) and artificial aging (initial/ thermocycling (TC, 15,000 cycles)). To selectively assess the effect of SDF, only the first application step of Riva Star Aqua was used. After composite buildups were fabricated, specimens were sectioned into sticks (n=36 per group) for microtensile bond strength testing (MPa). Data analysis was performed with STATA 19 using Tobit regression and Scheffé-correction (alpha 5%). Overall, all factors (adhesive, application, SDF pretreatment and aging) significantly influenced the results ($p<0.001$). SDF pretreatment significantly reduced bond strength in six of eight experimental groups, with the greatest reduction observed for self-etch application. In these experimental groups, initial bond strength decreased from 32.58 ± 11.80 to 2.96 ± 4.39 MPa for Scotchbond Universal Plus and from 33.83 ± 13.66 to 5.02 ± 4.67 MPa for Clearfil SE Bond (both $p<0.001$), with similar effects after TC. Switching from self-etch to etch&rinse application significantly improved bond strength to SDF-treated dentin ($p<0.001$). Initially, bond strength increased by more than 20 MPa for both adhesives (Scotchbond Universal Plus: 24.80 ± 16.06 MPa, Clearfil SE Bond 26.14 ± 17.21 MPa) (both $p<0.001$). This effect was even more pronounced after TC. SDF pretreatment significantly affected bond strength of 10-MDP containing adhesives during self-etch application. Switching to etch&rinse strategy can help to increase bond strength.

144 Fluoride changes the proteomic composition of the saliva acquired pellicle – a cross-over, in situ study

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This cross-over *in situ* study investigated how a fluoride rinse changes the proteomic composition of acquired pellicle. Twelve volunteers wore mandibular appliances containing either 6 enamel or 6 dentine specimens in two randomized phases (each phase for a test solution): deionised water (DW) or a NaF solution (500 ppm F⁻, pH 5.6). In each phase, enamel or dentine specimens were worn *in situ* (1 min) to allow basal pellicle formation, followed by a 1-min rinse with the test solution and 28 min pellicle formation in the mouth. After 1-week washout period, the procedure was repeated with the other solution. Pellicles were carefully harvested from each individual specimen, ultrasonicated, vortexed, and stored at -80°C until proteomic analysis, including tryptic digestion and LC-MS/MS. Differential expression was analysed on label-free quantification data using linear modelling with empirical Bayes moderation. P-values were adjusted for multiple testing using the Benjamini–Hochberg method. A total of 3188 proteins were identified for all groups. Considering the baseline pellicles (rinsed with DW), dentine pellicle presented more exclusive proteins (n=338) than enamel pellicle (n=302). Rinsing with NaF increased the number of exclusive proteins in both enamel (from 302 to 320) and dentine (from 338 to 369) pellicles. A total of 413 proteins presented significant differential expressions (p<0.05), the vast majority of which (n=287) more abundant in the dentine pellicles than enamel. Rinsing with NaF caused 7 proteins to be upregulated in enamel (2 were downregulated) and 11 upregulated in dentine (9 downregulated) (p<0.05). Fluoride rinse solutions greatly influence the pellicles, increasing the number of proteins in the acquired pellicles for both enamel and dentine, but dentine pellicles are generally more diverse and have more abundant proteins than enamel pellicles.

145 Fluoride release and retention in saliva after use of mouthrinses with different NaF concentrations

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Fluoride mouthrinses are used as an adjunct to fluoride toothpaste for caries prevention, in high-risk individuals. Higher fluoride concentrations enhance intraoral fluoride availability, but data on salivary fluoride release and retention from different mouthrinse formulations are limited. This study aimed to compare fluoride concentration over time following use of two 0.2% NaF-mouthrinses (mild mint and dry mouth formulations) and a prototype 0.3% NaF-mouthrinse (mild mint). A randomized-crossover-study was conducted in 15 healthy adults with normal salivary secretion rate. Each participant rinsed with 10 mL of each mouthrinse for 1 minute in randomized order, with a 5-day washout period between sessions. Whole and approximal saliva samples were collected at baseline and at 3, 5, 10, 15, 30, 45 and 60 minutes post-rinsing. Fluoride concentrations were measured using a fluoride ion-selective electrode. Time-course fluoride concentrations and area under the curve (AUC) were calculated. Differences between products were analyzed using one-way ANOVA. All mouthrinses produced a rapid increase in fluoride concentration directly after rinse, followed by a gradual decline over time. The 0.3% NaF-mouthrinse resulted in significantly higher peak fluoride concentrations and greater overall fluoride exposure (AUC) compared with both 0.2% formulations ($p < 0.05$). Among the two 0.2% NaF-mouthrinses, only minor numerical differences were found between the two formulations. Similar fluoride release and retention trends were observed in whole and approximal saliva, with elevated fluoride levels detectable up to 60 minutes post-rinsing. The area under the curve (AUC_{0-60}) was 867.1, 786.8, and 1243.4 for 0.2% FMM, 0.2% FMD, and 0.3% FMD, respectively ($p < 0.01$). The 0.3% NaF-mouthrinse resulted in higher and more sustained fluoride concentrations over time compared with 0.2% NaF-mouthrinses. Higher-fluoride mouthrinses may provide greater intraoral fluoride availability for high-risk individuals.

146 Dentin fluoride detection after treatment with toothpaste containing nicomethanol hydrofluoride – a TOF-SIMS study

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Dentin decay is often associated with teeth sensitivity. This study aimed to evaluate dentin fluoride uptake (related to remineralization potential) as well as dentin tubules occlusion after applying a toothpaste (TP) formulated with 1400ppm nicomethanol hydrofluoride (Fluorinol®). Human coronal dentin samples were prepared for reference and TP-treated specimens (n=3). Dentin surfaces were automatically brushed (ZM3.8, SD Mechatronic) twice for 3min with TP slurry (1TP/2water w/w) including a 4h-storage in artificial saliva in-between both applications. Tubules occlusion was analyzed by scanning electron microscopy (SEM). Time-of-flight secondary mass spectrometry (TOF-SIMS; M6, Iontof) allowed to quantify depth-dependent distribution of fluoride ions (F⁻) up to 10µm by alternating measuring and sputtering and to visualize them by cross-section mapping in chemical mapping mode without sputtering (250x250µm²). TP induced a superficial occlusion of the dentin tubules with a layer-like precipitation and agglomeration of particles on the dentin surface. TOF-SIMS depth profiling revealed highest F⁻ intensities at the surface near region of TP-treated samples and superiority over the reference samples. Intensities decreased with increasing measurement depth approaching the intensity range of the reference samples. Statistically significant difference between TP and reference samples was revealed for 250-2000nm depth range (arithmetic mean normalized fluoride intensity±SD: TP-treated 0.00578±0.0008counts, reference 0.00135±0.0005counts, p=0.00131, ANOVA, Tukey test). Cross-section mapping confirmed the findings for the depth profiles. F⁻ was visualized within the entire measurement area and the signals appear to be located more in the tubules and the tubules orientation were clearly identified. In conclusion, the tested TP led to dentinal tubules occlusion and demonstrated significant fluoride incorporation into the dentin structure. Although further investigations are necessary to confirm the data, TP could help remineralize initial dentin caries.

147 Parotid Fluoride Secretion After Oral Fluoride Intake Using a 3D-Printed Collector

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Saliva from the parotid gland has been used as a marker of systemic fluoride exposure, but the classical Carlson-Crittenden collector suffers from poor anatomical fit, leakage and user discomfort, compromising pharmacokinetic analyses. This study aimed to develop a parotidspecific three-dimensional (3D)-printed collector and to evaluate parotid fluoride (F) secretion after oral fluoride intake. A modified Carlson-Crittenden collector was digitally designed with adapted dimensions for improved anatomical fit and fabricated by Liquid Crystal Display resin 3D printing using a biocompatible, autoclavable Ultraviolet-cured resin. Eight healthy adults ingested fluoride solutions containing 5, 10, or 20 mg F in separate experimental sessions after overnight fasting. Parotid saliva was collected at baseline and at 5, 15, 30, 60, and 120 min post-ingestion using the 3D-printed device. Fluoride concentrations were determined using a validated micro-method with an inverted fluoride ion-selective electrode and expressed as $\mu\text{g/mL}$. Pharmacokinetic parameters, maximum concentration (C_{max}) and area under the curve (AUC), were calculated. Data were analyzed by two-way ANOVA and linear regression ($\alpha = 0.05$). C_{max} increased dosedependently from $0.3 \pm 0.08 \mu\text{g/mL}$ (5 mg F) to $0.4 \pm 0.07 \mu\text{g/mL}$ (10 mg F) and $0.7 \pm 0.1 \mu\text{g/mL}$ (20 mg F). Corresponding AUC values were 24.2 ± 6.1 , 36.0 ± 4.5 , and $47.7 \pm 8.3 \mu\text{g}\cdot\text{min/mL}$, respectively. Two-way ANOVA showed significant effects of fluoride dose and time on parotid F secretion ($p < 0.05$), and linear regression demonstrated positive associations between fluoride dose and both C_{max} and AUC. In conclusion, the device enabled reliable pure parotid saliva sampling and confirmed dose-dependent fluoride secretion, supporting its broader application for systemic metabolomic and bioavailability studies in caries and oral health.

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148 Fluoride concentrations in 20-liter bottled water in a Peruvian region highly dependent on alternative water sources

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Piura, an administrative region on the northern coast of Peru, is characterized by limited water infrastructure, recurrent droughts, and summer temperatures that frequently exceed 38 °C. These conditions have increased reliance on commercial 20-liter bottled water containers for daily consumption. However, information about fluoride concentration (F) is rarely disclosed on these products despite its significance and relevance for oral and public health. Therefore, this study aimed to determine the fluoride concentration (F) in 20-liter bottled water containers sold by local enterprises for human consumption in the Piura region. Thirty-three brands of bottled water, classified as mineral or purified, were collected from the eight provinces of Piura. Fluoride levels were quantified in duplicate using an ion-specific electrode connected to a potentiometer. Descriptive analysis was performed, and the Shapiro-Wilk normality, Mann-Whitney U, and Kruskal-Wallis tests were applied to compare F across brands by district and province, at a 5% significance level. The Yan brand (Chulucanas, Morropón) exhibited the highest average F (0.529 mg/L), while Aqua Champion (Nuevo Colán, Paita) showed the lowest (<0.02 mg/L). There were significant differences in F across districts within the provinces of Ayabaca ($p=0.002$) and Piura ($p=0.042$), and also among the eight provinces ($p=0.004$) overall. Most analyzed brands presented F below the WHO recommended limit (1.5 mg/L) for drinking water and below the optimal F for caries prevention (0.7–1.0 mg/L) recommended by the WHO and PAHO. These results highlight significant variability in fluoride content among commercially distributed water jugs and the need for improved monitoring and labeling of alternative drinking water sources in the region.

149 Age-dependent predictive performance of bio-accessible fluoride intake for dental fluorosis

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Fluoride intake recommendations typically assume complete systemic availability of ingested fluoride. However, dietary composition influences fluoride bio-accessibility and may affect dental fluorosis risk. This study examined age-dependent differences in the predictive performance of total daily dietary fluoride intake (TDDFI) and bio-accessible dietary fluoride intake (BADFI) for dental fluorosis development. Dietary intake data were obtained from participants of the Iowa Fluoride Study who completed 3-day food diaries at multiple timepoints during early childhood. TDDFI and BADFI ($\mu\text{g F/kg bw/day}$) were calculated for each participant and age. Mean intakes were analysed to characterise age-related intake distributions, with non-parametric tests applied for within- and between-group comparisons. Logistic regression models were fitted separately at each age using participant intake data to predict dental fluorosis based on TDDFI, BADFI, and combined intake measures. Model performance was assessed using area under the receiver operating characteristic curve (AUC) and F1 score. Mean intake analyses showed a significant difference between mean TDDFI and BADFI at 12 months of age ($p < 0.05$), alongside a significant increase in BADFI between 6 and 12 months ($p = 0.029$). TDDFI displayed greater variability across ages, whereas BADFI showed a more consistent increasing trend. Predictive performance varied by age for all models. BADFI-based models generally demonstrated more consistent discrimination and classification balance than TDDFI-based models, with strongest performance observed at later developmental ages. In conclusion, both fluoride intake patterns and predictive capacity for dental fluorosis are age-dependent. Bio-accessible dietary fluoride intake demonstrated more consistent age-related trends and predictive performance than total intake, supporting its inclusion in age-specific fluorosis risk assessment models.

150 Effect of Zinc, Silver and Fluoride Compounds on the Demineralisation of Hydroxyapatite: An ISE Study

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Objective: To investigate the inhibitory effect of zinc, silver and fluoride compounds on demineralisation of hydroxyapatite. **Methods:** Hydroxyapatite discs (n=18) were demineralised for 4 hours at 37C in 50ml solution of 0.1 M acetic acid buffered to pH 4.0. Subsequently, the discs were removed and treated topically with one of the following agents: 3.16M zinc chloride, 3.16M zinc nitrate, 3.16M silver nitrate, silver fluoride (Riva Star Aqua, SDI), silver diammine fluoride (Riva Star, SDI), or zinc tetramine difluoride (SDI). Treatments were administered by dispensing two drops into a plastic well and brushing the solution onto the discs for 1 minute, followed by air-drying for 3 minutes. After treatment, discs were returned to the same demineralising solution for an additional 8 hours Calcium ion selective electrodes (ISEs) were used to monitor the ion concentration at 1-min intervals throughout the experiment. The percentage reduction of the rate of calcium loss (PRCL) was calculated, based on the change rates of Ca²⁺ release. All experiments were performed in triplicate. **Results:** Zinc chloride showed a mean PRCL of $70.47 \pm 7.64\%$, while zinc nitrate produced $62 \pm 12.76\%$ inhibition. Silver nitrate exhibited a lower inhibitory effect at $47.43 \pm 18.36\%$ with high variability. Fluoride-containing agents demonstrated higher inhibitory performance: silver fluoride achieved $87.82 \pm 4.76\%$ inhibition, silver diammine fluoride $81.38 \pm 10.3\%$, and zinc tetramine difluoride the highest inhibition at $92.57 \pm 0.4\%$. **Conclusion:** The presence of fluoride, particularly in combination with zinc, significantly enhances resistance to calcium loss in demineralising environments. Zinc tetramine difluoride demonstrated the superior protective effect among the tested compounds.

152 Seasonal variation of fluoride content in teas derived from *Camellia sinensis*

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This study aimed to evaluate the influence of seasonal variation on fluoride concentration in *Camellia sinensis* infusions. Forty-eight varieties of tea (black (n=16), green (n=21), red (n=7) and white (n=4)) commercially available as leaves (n=15) or tea-bags (n=33) were acquired in Buenos Aires, Argentina. To prepare the teas, one bag or 2.0 ± 0.05 g of leaves were infused for 5 minutes in 200 mL of distilled boiled water. The F concentration on infusions was determined using an ion-selective electrode. The fluoride concentrations found ranged from 0.1 to 15.5 µg/mL. The average of fluoride concentration (µg/mL) in the different seasons was 2.9 ± 3.65 in spring, 2.1 ± 1.09 in autumn, and 2.1 ± 1.33 in winter and 1.4 ± 1.43 in summer. The highest average value was observed in spring and the lowest in summer ($p < 0.05$, t test), while no significant differences were observed among the other seasons ($p > 0.05$). Seasonal variation influenced fluoride concentration in *Camellia sinensis*, with higher levels observed in spring and lower levels in summer, indicating that harvest period may play an important role in accumulated fluoride.

Poster presentation

Behaviour and Education

153 Oral Care Plans Co-Constructed with Families in Armero-Guayabal, Colombia: 1-year effect on Oral Health

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This mixed-method study aimed to evaluate the one year effect of co-designing family oral health care plans on dental caries and plaque in low income families in Armero-Guayabal, Colombia. Fifty families supported by the charity FCAA (Fundación-Creciendo-con-Amor-yAlegría) and a 5-researcher team participated. Baseline assessments included oral health of family members (presence (Y/N) of thick/visible biofilm, cavities, and caries activity (ICDAS)). At household level, a participatory approach explored oral health practices and the conditions under which these were carried out, through characterisation visits and interviews. Tailored family plans were designed to address observed deficiencies, including improving oral health care infrastructure (e.g. specific site for oral hygiene elements, a sink, face mirror and light); encouraging twice/day children assisted toothbrushing, enhancing adult self-care, and facilitating dental attendance. Each family signed a specific agreement to improve their oral-health practices. In addition, previously trained adolescent volunteers reinforced oral health practices at the charity/homes, while FCAA leaders periodically reviewed agreement fulfilment and sent reminders. Quarterly follow-up sessions included family reinforcement of educational activities. After one year, oral health clinical assessments and interviews were conducted to confirm agreement fulfilment. The 50 families averaged 3.7 ± 1.2 members, comprising 100 9-month to 18-year-old children and 91 19 to 87-year-old adults. After one year, 55% of families had accomplished their co-designed oral health plan. Baseline versus 1 year follow-up showed several respective improvements: Yearly dental attendance (10%-20%); twice/day fluoride-toothpaste toothbrushing (25% to 75%); visible thick biofilm, in children (54.7%-38.7%), in adults (67.6%-47.1%); cavities, in children (50.7%-42.7%), in adults (38.2%-32.4%); active caries, in children (74.7%-64%), in adults (73.5%-52.9%). In conclusion, care plan co-construction, implementation of agreed activities, and FCAA support contributed slightly to improvements in oral health, but these need the implementation of national health system care plan to be in place.

154 Beyond belief: assessing how the oral health of children is shaped by belief of parents

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Parental beliefs, specifically parental guilt (PG) and parental locus of control over oral health (PLOC-OH), may influence preventive behaviours and contribute to inequalities in childhood dental caries. This cross-sectional study examined associations between caries in deciduous teeth, parental beliefs, and socioeconomic and clinical factors. Fifty-seven child–parent dyads attending the Paediatric Dentistry Clinic at the University of Bern participated in the study. Parents completed questionnaires on PLOC-OH, PG, and sociodemographic characteristics. Socioeconomic variables included: parental education, family income, area-based socioeconomic position (SSEP), and immigration background. Caries was recorded using the dmf-t index, including non-cavitated lesions. Plaque presence, fluoride use, and sweet consumption were also assessed. Hierarchical multivariate linear regression analyses showed that parents who exhibited a more external PLOC-OH, reflecting a lower perceived parental control over their child’s oral health outcomes, were from low-income countries ($\beta = 4.94$, $p = 0.012$) and their children consumed sweets more frequently ($\beta = 4.00$, $p = 0.012$). Children with higher caries counts were significantly associated with more external PLOC-OH ($\beta = 0.02$, $p = 0.017$), slightly higher SSEP ($\beta = 0.01$, $p = 0.015$), and when one ($\beta = 0.57$, $p = 0.002$) or both parents ($\beta = 1.08$, $p < 0.001$) were from low-income countries. In contrast, parents who feel more guilty over their child’s oral health (greater PG) were associated with lower caries levels in children ($\beta = -0.27$, $p < 0.001$). These findings indicate that parental beliefs are significantly associated with childhood caries. A more external parental locus of control is linked to more frequent sweet consumption and higher caries burden. Interventions targeting parental beliefs and empowerment may help improve preventive behaviours and reduce oral health inequalities in children.

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155 Water consumption practices, knowledge and attitudes in an area with community water fluoridation

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The aim of this study was to explore the consumption practices, and the knowledge and attitudes that influence the families' water choices in a community with access to fluoridated tap water. A questionnaire to evaluate practices and variables that affect drinking water choices was developed and tested. It was implemented with parents in an interview style in English and Spanish. Simple and relative absolute frequencies were calculated for all variables. Statistical analysis was done using chi-square and Fisher's exact tests. Open ended questions were analyzed qualitatively. A total of 335 parents participated (58% Hispanic), and high caries frequency was noted, with 78% of children having reported caries experience. Regarding consumption, 47% of children drank tap water at home, while 53% did not. Safety/health was the primary reason for water choice (70%), followed by taste (19%). Daily water intake varied: 53% of children drank 4 glasses of water or more, 24% drank 3 glasses, and 19% drank 2 glasses. Increased tap water consumption was not significantly associated with parental education ($p=0.60$) or child's caries experience ($p=0.32$). While 90% of parents reported using tap water for cooking (with 57% cooking 3 meals/day at home), awareness of fluoridation was low: 47% of parents were unaware that NYC water is fluoridated. This knowledge was not significantly associated with education ($p=0.64$) or ethnicity ($p=0.47$). Many parents did not know of or understand the role of fluoride in caries prevention. Even though only half of the children drank fluoridated water from the tap, most of them had their meals cooked with it. The topical caries-preventive effects of cooking with tap water warrant further investigation.

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156 Dentists' Attitudes and Motivations Toward Oral Health Prevention in Six European Countries

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The aim of this study was to understand dentists' attitudes and motivations toward oral health prevention through the lens of the Theoretical Domains Framework (TDF). A validated questionnaire was distributed to dentists in the UK, Ireland, Denmark, Germany, the Netherlands, and Hungary. Participants were recruited through professional networks and social media platforms. The 36-item survey assessed dentists' attitudes toward and perceived importance of prevention (scale 1–10) (dependent variable). Items were mapped to TDF domains to identify factors influencing attitudes and motivations. Non-parametric tests examined associations between these factors and importance ratings; no country-level comparisons were performed. A total of 793 dentists participated (54.5% female), with the UK representing the largest share (33.3%). Almost all respondents (98%) rated prevention as highly important (score: 7 and above). Higher importance scores were strongly associated with beliefs about capabilities (confidence in delivering preventive advice), beliefs about consequences (perceived benefits for patients and practice), intentions (plans for further training), social influences (peer/professional norms), and behavioural regulation (strategies to maintain preventive behaviours) (all $p < .001$). Significant associations were also observed for environmental context and resources (organisational support; $p = .007$) and reinforcement (incentives or recognition; $p = .047$). Optimism (belief that prevention will succeed) and emotions (feelings such as motivation or frustration when patients do not act on advice) were less influential, while time pressures were linked to lower ratings ($p = .001$). Views on whether prevention should be dentist-led or shared with other professionals did not significantly affect importance ratings ($p = .078$). Dentists strongly value prevention, and while personal factors such as confidence, perceived benefits, social influences, and training intentions influence their values toward prevention, organisational support remains critical in sustaining preventive practices.

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157 The influence of physical and social environmental factors on oral health behavior in young adults

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This scoping review explored how the physical and social environment influences the oral health behavior of young adults. A systematic search in Ovid Medline, Embase, APA PsycInfo, Web of Science and Scopus identified 1070 records after de-duplication. Following title and abstract screening, 25 studies remained for full-text eligibility-screening based on inclusion criteria. 8 studies were included in this scoping review. Based on this selection, the findings indicate that socioeconomic status (SES), including parental education and employment, is a primary determinant of toothbrushing frequency and dental attendance. Young adults in deprived areas and those with non-domestic cultural affiliations exhibit significantly higher caries experience (DMFS scores). Barriers to professional care include financial burden and dental anxiety. Furthermore, low health literacy is associated with unhealthier dietary choices and poorer oral hygiene. The social context also plays a role; specific environments, such as military field exercises, have a more negative impact on habits than the home setting. In contrast, psychosocial resources—such as social support, motivation, and self-efficacy—were identified as essential foundations for healthy behavioral choices. Demographic factors, particularly male gender and lifestyle habits like smoking, serve as predictors for assigning low priority to future dental visits. Notably, the influence of social media on oral health behavior has not yet been researched. The review concludes that oral health is heavily determined by cultural and economic factors within the living environment. There is an evident need for targeted prevention programs and public policies that mitigate barriers like cost and fear while strengthening personal resources and health literacy. Professionals should adopt a holistic approach to ensure that healthy choices become the standard within the patient's social context.

158 Current Caries Risk in Children Previously Treated Under General Anesthesia: A Pilot study

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This pilot study aimed to evaluate caries risk of children previously treated under general anesthesia (GA) for early childhood caries (ECC) using the Cariogram model and to investigate its association with clinical, behavioral, and socioeconomic factors. A total of 44 systemically healthy children (mean age: 13.4±1.9 years) who had received dental treatment under GA for ECC between 2015–2019 and were recalled for follow-up evaluation in 2025 were included. The mean follow-up period was 9.36±1.18 years. Caries risk was assessed using the Cariogram model. Clinical examinations included the DMFT index, Plaque Index (Silness and Loe), and Gingival Index (Loe and Silness). Information on GA history, post-treatment oral health behaviors, dietary habits, fluoride use, and dental attendance was collected using structured questionnaires. Associations between caries risk categories and explanatory variables were analyzed using Chi-square tests with Monte Carlo simulation where appropriate, with statistical significance set at $p < 0.05$. Most participants were classified as having moderate (63.6%) or high (31.8%) caries risk, while only 4.5% were at low risk. High caries risk was significantly associated with higher plaque levels ($\chi^2 = 14.4$, $p = 0.0001$), poorer gingival status ($\chi^2 = 7.6$, $p = 0.016$), and higher DMFT scores ($\chi^2 = 9.3$, $p = 0.024$). Improvements in toothbrushing behavior after treatment were significantly associated with lower caries risk ($\chi^2 = 7.2$, $p = 0.049$). In conclusion, children treated under GA for ECC remain at moderate to high caries risk years after treatment. Clinical indicators and post-treatment oral hygiene behaviors appear to be key determinants of current caries risk, highlighting the need for sustained preventive strategies and longterm behavioral follow-up after GA.

159 Effect of Brochure and Video Education on Parents' Knowledge and Attitudes toward Oral Probiotics

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Oral probiotics are increasingly discussed as part of preventive oral health strategies related to caries-associated biofilm control [Meurman et al.: Caries Res 2018;52:1–10]. This study evaluated the effect of a brief brochure- and video-based educational intervention on parents' knowledge, attitudes, and negative perceptions regarding oral probiotic use in children. A single-group pre–post intervention was conducted among 49 parents attending a university pediatric dentistry clinic. Participants completed a structured questionnaire assessing demographic characteristics, knowledge level, attitudes, intention to use, and negative perceptions toward oral probiotics. The intervention was expected to increase parental knowledge, positively influence attitudes, and reduce negative perceptions. Following the pre-test, parents received a concise educational brochure and accessed a 2minute informational video via QR code, covering the definition of probiotics, their role in oral health, and potential benefits for children. The same questionnaire was administered immediately after the intervention. Internal consistency of the questionnaire was acceptable (Cronbach's $\alpha=0.737$). Due to non-normal data distribution, non-parametric analyses were used ($\alpha = 0.05$). Knowledge scores were significantly higher following the intervention (mean $\pm$ SD: 17.73 $\pm$ 2.23 vs. 20.57 $\pm$ 1.97; $Z=5.204$; $p<0.001$). Parents' attitudes and intention to use oral probiotics were also significantly improved after education ($Z=5.632$; $p<0.001$). In addition, negative perceptions toward probiotic use were significantly reduced following the intervention ($Z=2.831$; $p=0.005$). No significant associations were observed between demographic variables and changes in outcomes ($p>0.05$). In this sample, brief digital educational materials were associated with improved parental knowledge and attitudes, as well as reduced negative perceptions toward oral probiotics, supporting the potential role of targeted parental education within preventive oral health strategies for children.

160 Development of Toothbrushing Behaviour and Frequency of Nocturnal Feedings in Early Childhood: A Cohort Study

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Early preventive dental care is crucial as children become susceptible to caries from eruption of their first tooth. This study investigates the development of toothbrushing behaviour and nocturnal feeding habits over the first 36 months of life and influencing factors. Data was used from the Amsterdam Infant Microbiome Study, a birth-cohort among children and their caregivers (>18). Self-administered questionnaires were completed during pregnancy (week 34) and when children were 1, 6, 14, 24, and 36 months old. The study assessed toothbrushing practices and nocturnal feeding habits and explored influences including demographics, the introduction of solid foods, parental brushing habits, and presence of teeth. 155 Children (52.9% male; 54.8% firstborn) were included. Initial adherence to toothbrushing guidelines in children was low at 6 months (8.3%, N=37 with teeth) and increased to 48.5% by 14 months (N=136 with teeth), fluctuating thereafter. For children of mothers born in the Netherlands adherence was higher (14 months $p = 0.013$; 24 months $p = 0.034$; 36 months $p = 0.017$), as for children of mothers who followed adult guidelines for themselves (24 months $p = 0.001$). At 6 months 107 children received nocturnal feeding. This declined to 43 children at 14 months; 19 children at 24 months and 1 child at 36 months. Nocturnal feeding shifted from exclusive milk to inclusion of sugary drinks and solids. No significant differences in nocturnal feeding frequency were found related to demographic variables or the presence of teeth. The study revealed fluctuations in adherence to toothbrushing guidelines and a reduction in nocturnal feeding over the first 36 months. Maternal factors play a key role, underscoring the need for tailored caregiver support to improve early childhood oral health.

161 Use of CariesCare International in Latin American dental school clinics: Implementation among students and teachers

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This university clinical-practice project was planned for one academic year as part of the 'Latin American cariology curriculum framework implementation-science project' (2023) being conducted in eight regional dental schools (DS). This study aimed to assess in students and teachers the one-year patients' implementation outcomes and process evaluation of the CariesCare International (CCI) caries management system. All DS were invited to participate, each selecting a children/adults' practice involving around ten students (1-2 patients each) and 1 or more teachers. Participants were previously selftrained in CCI through e-learnings, presentations and a workshop. After one year, a 23-item questionnaire (Implementation outcomes: 18; Treatment Evaluation Inventory -TEI: 5) was distributed among participants via Google forms. Fidelity was verified through patients' OHR assessing patient's risk and caries-lesion care and follow-up CCI. A 5-point Likert answer scale was used (very-high/very-much: 5; none: 1). Descriptive statistics was used. Participants finishing the study: 7 DS (87.5%); 61 students (87.1%; range: 5-13 per DS) and 16 teachers. Students recorded implementation outcomes as high (Relevance: 4.3 ± 0.7 , Viability: 4.0 ± 1.0 , Acceptance: 4.0 ± 0.8 , Adoption: 4.4 ± 0.7 , Maintenance: 4.3 ± 0.8 , and Fidelity: 4.3 ± 0.8). However, the CCI-OHR Fidelity verification (excluding 10 incomplete OHR: 16.3%) was moderate (58.8%). Students' TEI results corresponded to 'a-lot' (cariescare knowledge increased: 4.0 ± 0.8 ; CCI facilitated a more-structured decision-making:

4.2±0.7; CCI approaches increased patients' and students' long-term oral health awareness: 4.0±0.9 and 4.3±0.8, respectively; would recommend colleagues using CCI: 4.0±0.8). Apart from Maintenance, which was significantly lower (moderate: 3.0±1.0) ($p<0.05$), teachers recorded implementation outcomes as high, as well as TEI (mean ≥ 4.0). Conclusion: Even though adopting a patient-centered risk-based tooth-preserving caries care system in the DS practice was overall evaluated as high by students and teachers, and both highly recommend using it, there is still a theory-to-practice translation gap.

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162 Are oral health-related behaviours being translated into practice among dental students?

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Background: Despite the strong evidence on daily fluoridated-toothpaste use and sugar intake control to prevent/control caries, its use into practice among dental students has not been explored in depth. This study aimed to analyse with the COM-B model how dental students are educating their patients on the daily use of fluoridated toothpaste and controlling daily sugar-intake. **Methods:** After ethical approval (PCI 2023-0049), 241 dental students from Universidad El Bosque (Bogotá, Colombia) were invited to participate. A 30item COM-B questionnaire on the frequency of 6 self-reported Behaviours (B) (educating patients on the two-above oral-health practices), and included Capability (C: 6), Opportunity-relevance (O-Rel: 6), Opportunities-resources (O-Res: 6), and Motivation (M: 6) COM-B component questions. The questionnaire was administered online. A 5-point Likert answer scale was used (1, lowest; 5, highest). Descriptive statistics were conducted, and correspondent means and SD were obtained. **Results:** A total of 121 students completed the questionnaire (mean age: 21.3 ± 1.6 ; studies' year: 3rd-5th; sex: 73.3% female). Data collected disclosed (mean $\pm$ SD) that both behaviours were performed 'most of the time' (4.4 ± 0.7), reporting high C (4.5 ± 0.6), O-Rel (4.9 ± 0.3), O-Res (4.1 ± 1.1), and M (4.4 ± 0.7). The most frequently and least performed behaviours were daily fluoridated-toothpaste use (4.5 ± 0.5) and recommendations on controlling free sugar intake to a maximum daily intake of 50g (4.3 ± 0.7). Other reported data were as follows: O-Opportunities-relevance: topical fluorides application for caries preventive/management proposes 4.9 ± 0.3 ; Opportunity-resources: time/equipment restrictions 3.9 ± 1.2 ; M-Motivation: satisfaction to recommend lower sugar intake 4.7 ± 0.6). **Conclusion:** Even though, oral health-related behaviours have been largely demonstrated and spread, its translation into the practice needs to be enhanced to increase its adoption among dental students.

163 Evaluation of a Customized AI Chatbot to Support Undergraduate Cariology Education

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This project evaluates the accuracy, usability, and student perceptions of a course-specific artificial intelligence (AI) chatbot designed to support undergraduate cariology education by clarifying lecture content and facilitating exam preparation. Based on the hypothesis that targeted educational chatbots are preferable to general-purpose AI tools (which bear greater risk of inaccurate information and hallucinations), a chatbot was developed using the PlayLab platform with Claude 4 Sonnet set at 70% variability. The chatbot was restricted to reference materials consisting of lecture slides and transcripts from seven onehour cariology lectures. The chatbot functioned as a teaching assistant for a first-year dental course enrolling 208 students. It provided explanations for lecture-related questions and generated multiple-choice study questions with answer rationales. Anonymous student–chatbot interactions were reviewed to assess usage patterns and response accuracy. Students were subsequently surveyed regarding chatbot utilization, perceived trustworthiness, usefulness, ease of use, and likelihood of future use. Associations between variables were analyzed using the chi-square test. Eleven percent of students engaged with the chatbot. Among users, 17% recorded more than forty interactions, whereas 54% had five or fewer interactions. All chatbot responses and explanations were fully consistent with the reference material, demonstrating 100% accuracy. Survey responses were obtained from 27% of students, of whom 28% reported using the chatbot. Significant positive associations were observed between chatbot use, student-reported trust, perceived usefulness, ease of use, and intention to use the tool again ($p < 0.05$). No significant association was found between use of the course-specific chatbot and use of other AI tools. These findings suggest that a personalized, reference-restricted AI chatbot serves as an accurate, reliable, and well-accepted study aid in cariology education and may offer advantages over unrestricted AI tools.

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Oral presentations

165 Artificial Intelligence-Driven Indication for Sealants: A GameChanger for Effectiveness?

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We aimed to evaluate whether the indication for dental sealants driven by Machine Learning (ML) algorithms could improve the effectiveness of preventing caries lesions in First Permanent Molars (FPM). We developed ML prediction models using real-world data from a 10-year follow-up cohort. A sample of 1- to 5-year-old children (n=639), who were followed up for 1, 7, and 10 years, was used. We developed prediction models using clinical and sociodemographic variables collected before the FPMs' eruption (Model 1), and adding the clinical appearance of the FPM occlusal surfaces after the eruption (Model 2). The occurrence of cavitated lesions was the outcome. Five algorithms were tested (training/test sub-datasets of 70%/30%). Then, we selected the outperforming models to simulate the impact of the indication for dental sealants, comparing them with the strategies of non-use of sealants (NS) on any teeth or use of sealants on all FPMs (AS). A total of 1,710 FPM (431 children) were followed up, with a caries incidence of 8.9%. The outperforming models 1 and 2 were obtained using XGboost, with ROC curves (95% confidence interval) of 0.59 (0.49; 0.68) and 0.79 (0.65; 0.87), respectively. For the simulations, we assumed an odds ratio of 0.21 for preventing cavitations with sealants. Compared with NS strategy, number of sealants necessary to prevent one tooth from decaying with the AS strategy was 14.5. When the placement of sealants was driven by model 1 or model 2, 9.9 and 11.0 sealants would be necessary, respectively. These values were lower in simulated scenarios with higher caries incidence. In conclusion, the NS strategy is more coherent in low-incidence caries populations. However, ML-driven indication for sealing FPM seems more promising when the incidence is higher.

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166 Individualized Cognitive-Behavioral Intervention Effects on Oral Health Habits in Twin Children and Adolescents

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This study aimed to evaluate changes in oral health-related habits before and after an individualized cognitive-behavioral intervention in monozygotic (MZ) and dizygotic (DZ) twins. This before-and-after study, conducted in a cohort of twins scheduled for dental treatment (NCT06961890; Ethical Approval 92199325.6.0000.0075). Sugar consumption and oral hygiene (OH) habits were assessed at baseline and after six months using standardized checklists - scores ranging from 0 (better habits) to 1 (worse habits). Each child received individualized intervention grounded in cognitive-behavioral principles, with personalized goals defined in collaboration with the child and caregivers. Paired t-tests estimated withinindividual changes and effect sizes calculated using Cohen's d. Intrapair similarity was assessed using intraclass correlation coefficients (ICC) and mixed-effects models, stratified by zygosity. Judgement of coefficient patterns was used to interpret the genetic and environmental contributions to the assessed effects. 76 children (38 twin pairs; 17 MZ and 21 DZ) were included. Significant moderate effects were observed for sugar consumption (mean difference=0.13; 95%CI: 0.07–0.20; $p<0.001$; Cohen's $d=0.52$; 95%CI:0.20-0.85) and oral hygiene habits (mean difference=0.14;95%CI:0.08–0.20; $p<0.001$; Cohen's $d=0.69$;95%CI:0.36-1.02). Intrapair correlations were consistently higher among DZ than MZ twins after the intervention, unlike the pattern observed at baseline (ICCs were higher for MZ than DZ). For sugar consumption, ICCs were 0.37 (95%CI: –0.11–0.71) in MZ twins and 0.49 (95%CI: 0.09–0.75) in DZ twins. For oral hygiene, ICCs were 0.34 (95%CI: 0.08–0.77) in MZ twins and 0.47 (95%CI: 0.19–0.77) in DZ twins. In conclusion, the individualized cognitive-behaviour intervention has a moderate effect on improving oral health-related habits among children and adolescent twins. Results suggest a predominance of non-shared environmental influences caused by intervention, possibly related to differential engagement with individualized behavioral goals.

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167 Radiation-related caries and its association to potential causative factors – a cohort-study

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Radiation related caries is still a huge threat for patients undergoing radio-therapy in the head-neck-region. The multitude of oral sequelae makes it difficult to identify the most effective measures for caries prevention. The aim of this part of a cohort-study observing oral sequelae of patients treated with chemo-radio-therapy in the head-neck-region was to analyze potential associations between saliva flow rate, dental biofilm, sugar consumption and caries progression. Patients were examined before (BL), during (d18), at the end of (EOT), eight weeks after (FU1) and 20 weeks after (FU2) chemo-radio-therapy. Reported outcomes are unstimulated/stimulated saliva flow rate (ml/min), plaque index according to Silness and Loe (PI, 0-3), frequency of daily sugar consumption (0-6) and ICDAS given as percentage of the maximal sum score possible, taking existing tooth surfaces of patients into account. Results are given as mean±standard deviation. Level of significance: 5%. Thirty patients were included (female N=7, male N=23, age=63.8±10.2 years) treated with chemo-radio-therapy (total radiation doses 66.8±6.8 Gy) in the head-neck-region. Number of patients at defined time points were N=29 (BL), N=27 (d18), N=22 (EOT), N=22 (FU1), and N=20 (FU2). Unstimulated/stimulated saliva flow rate diminished from 0.46±0.34/2.04±1.56 (BL) to 0.19±0.25/0.60±0.49 (FU2), respectively. PI did not change significantly, ranging between 1.22±0.76 (d18) and 1.46±0.69 (FU1). Frequency of daily sugar consumption decreased from 1.63±1.04 (BL) to 1.08±0.95 (EOT). Patients had 17±8 teeth and ICDAS scores increased from 10%±8% (BL) to 15%±8% (FU2); increase was higher in patients having higher PI values and consuming sugar more frequently (correlation coefficients: 0.551, p=0.0145 and 0.556, p=0.0134, respectively). No association between ICDAS and saliva flow rate was found. Conclusively, patients with less dental biofilm and less frequent sugar consumption showed less caries progression after chemo-radio-therapy.

168 Comparing mineralisation parameters measured by a novel optical fluorescence microscope (QTM) with transverse microradiography (TMR)

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Transverse microradiography (TMR), whether based on film or digital image capture (TMRD™), is considered the gold standard for evaluating tooth lesions in caries research. However, the method requires expensive equipment, and preparing tooth sections (100–200 µm) is tedious and prone to sample loss. This paper introduces a novel optical fluorescence microscope, Quantitative Transverse Microscopy (QTM™), which enables instantaneous lesion image capture and analysis of hemi-sectioned teeth, with potential for longitudinal assessment. Enamel blocks were cut from 9 freshly extracted bovine incisors. The half portions of the abraded enamel surfaces were covered with transparent nail varnish. Specimens were demineralized in a 0.1 M lactic acid gel (6% CMC, pH 4.5) at 37°C for 4 days. Perpendicular 150-µm-thick slices were cut from the top surface of the enamel blocks, and mineral distributions in the demineralized areas were measured by TMRD™ (Inspektor Research Systems, The Netherlands). The corresponding demineralized areas on the remaining hemisections were measured with QTM™ (Inspektor Research Systems, The Netherlands). Data were analysed by paired t-tests for lesion depth (Ld, µm) and integrated mineral loss (IML, vol%.µm), and by Pearson's correlation between Ld and IML. Geometric mean Ld values were 242.9 µm (QTM™; 95% CI: 193.4–292.3) and 157.2 µm (TMRD™; 95%CI: 137.2–177.2); QTM™ was significantly higher ($p<0.01$). IML values were 7,993 vol%.µm (QTM™; 95%CI: 5,615–10,372) and 2,992 vol%.µm (TMRD™; 95% CI: 2,300–3,684); QTM™ showed significantly higher values ($p<0.01$). The correlation between Ld and IML was significant for TMRD™ ($r=0.97$, $p<0.001$) and for QTM™ ($r=0.74$, $p<0.05$). Quantitative Transverse Microscopy (QTM™) shows promise as a practical alternative for quantitatively assessing lesion depth and mineral loss in hemi-sectioned teeth, with potential for longitudinal monitoring of lesion progression.

169 How does a novel caries risk self-assessment digital tool perform versus Cariogram in Latin-American countries?

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Aim: This study aimed to evaluate the performance of a novel caries-risk self-awareness digital tool (CRT) in terms of caries-risk classification agreement with Cariogram® and participants' acceptance, in three Latin American countries. **Methods:** A caries-risk self-awareness digital application (CRT) was developed in Spanish and Portuguese for three age groups (6–24m, 3–12y, ≥13y). Risk factors included: daily fluoridated-toothpaste use, sugar intake, toothbrushing frequency; recent dental pain/infection/cavities; last-year preventive dental attendance, and health-condition impairing toothbrushing ability. In ≥13y, dry-mouth sensation and flossing frequency were added. Four sites participated (Brazil: 2; Chile: 1; Colombia: 1). A 524-participant sample size was calculated (176/age group, limiting ≥13y to 34 years). After obtaining consent/assent, participants and/or parents independently used CRT. A low/moderate/high caries-risk classification resulted upon the application of algorithm-based weighted risk factors. Trained examiners independently assessed caries risk using Cariogram® (reference standard). Age-group agreement between instruments was analysed. Participants received CRT risk-based general/specific recommendations and rated its user friendliness and recommendations' satisfaction (5-point Likert scale: 1-lowest; 5-highest). **Results:** A total of 527 individuals (99.4%) were included per age group: n=175; n=175; n=177, respectively). Both programmes classified most participants as low risk (Cariogram®: 58.8%; CRT: 85.5%). Overall agreement between tools was moderate (57.1%) with high agreement for 6–24m (68.6%) and moderate agreement for 3–12y (46.9%) and 13–34y (56.0%). User friendliness was rated as moderately-completely satisfactory (96%) and recommendations' satisfaction as moderate-total (91%). **Conclusion:**

Given its self-assessment nature, moderate agreement with Cariogram®, and high user acceptance, the caries risk tool shows promise as an accessible digital instrument to increase caries-risk self-awareness and support improved oral health in children and young adults. Importantly, future algorithm refinements will enhance the sensitivity while maintaining usability of the CRT.

170 Early childhood caries in Sweden from 1938–2024: Longterm trends from systematic and registry data

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Despite being highly preventable, dental caries continues to impose substantial global health and economic burdens. Understanding long-term trends requires extensive epidemiological data. Sweden provides a unique setting with early epidemiological surveys, major public dental health reforms, and comprehensive modern dental registries. A systematic review of the analogue and digital literature was conducted following the PRISMA guidelines, identifying epidemiological studies reporting caries prevalence in children aged 3 years old, expressed as deft, or percentage of individuals with manifest caries. These data were combined with contemporary national data from 2007 and onwards, extracted from the Swedish Quality Register for Caries and Periodontitis (SKaPa) and data from the National Board of Health and Welfare. Data collected from year 1938 to 2024 yielded 74 datapoints. Of these, 22 were from 13 published papers and 52 datapoints were from registers. Caries prevalence (deft > 0) ranged from 91% in 1951 to 4% in 2023. A non-linear regression analysis confirmed a significant long-term decline in caries prevalence ($p < 0.01$, $R^2 = 0.84$). Regional studies showed higher caries rates compared to national datasets ($p = 0.01$), indicating contextual differences in disease burden and preventive implementation. Thus, when excluding the local data, the regression was stronger ($p < 0.01$, $R^2 = 0.97$). This review offers the first long-term overview of early childhood caries trends in Sweden using both historical, modern, and registry data. The dataset spans over almost a century and reflects major shifts in caries burden over the years, associated with changes in diet, fluoride exposure, public dental programs and universal dental care for children. Conclusively, this data highlights the impact of sustained public health measures on population level oral health.

171 Looking into the depth - advanced data analysis of toothpastes as anti-erosion agents on dental enamel

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Since the combination of stannous ions with fluoride (F/Sn) is considered to have anti-erosive properties, it is increasingly being added to toothpastes. Stannous ions are highly reactive, so sufficient stabilization is necessary. Various options are conceivable, such as amines, gluconate, or polyphosphates, the impact and interaction of which on toothpaste's efficacy, however, is not fully understood. Therefore, results of a previous in-vitro study were statistically reanalyzed to determine to which extent a specific factor explains results. In the study, flat human enamel samples (n=32 per group) were treated in a cyclic erosion-abrasion model for 10days: demineralization 6x2min/day (1% citric acid), treatment with toothpaste suspension 2x2min/day, 15s brushing during this period, intermittent storage in mineral salt solution. Ten toothpastes with F/Sn (differently stabilized) and one toothpaste without F/Sn (negative control) were investigated. Substance loss was quantified profilometrically; tin content (wt%) on sample surfaces was examined using energy-dispersive X-ray spectroscopy. Standard regression analyses showed that nine(erosion)/ten(erosion&abrasion) of the ten toothpastes significantly ($p<0.05$) reduced substance loss (erosion mean ranging from $8\mu\text{m}$ - $30\mu\text{m}$ /erosion&abrasion $32\mu\text{m}$ - $39\mu\text{m}$) compared to negative control ($33\mu\text{m}$ / $43\mu\text{m}$) and that it decreased with a regression coefficient of $5.6\mu\text{m(erosion)}/1.8\mu\text{m(erosion\&abrasion)}$ per wt% tin on sample surface. However, wt% tin on sample surface varied between erosion (mean($\pm$ sd) $0.93(\pm 0.83)$) and erosion&abrasion conditions ($0.62(\pm 0.64)$) and could be explained to $73.8\%(erosion)/72.8\%(erosion\&abrasion)$ by toothpaste ingredients. Combining the results of all investigated toothpastes, measured substance loss was explained by amount of available tin measured in toothpastes (15.9% erosion/ 1.2% erosion&abrasion), presence of gluconate ($26.1\%/0.05\%$), amines ($1.1\%/21.0\%$), pH-value ($9.2\%/28.3\%$), hexametaphosphate ($28.4\%/5.3\%$), trimetaphosphate ($4.4\%/8.9\%$), and toothpaste's particulate fraction ($1\%/2.3\%$). The advanced analysis helps to better understand the influences of the various components of the formulations and shows that additional abrasion significantly alters the effects of these factors once again.

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172 Ratiometric pH monitoring in dental biofilms using epifluorescence microscopy

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The pH environment within dental biofilms is central to the initiation and progression of dental caries. pH ratiometry, which leverages the pH-dependent emission characteristics of fluorescent probes, is an established, non-invasive approach for assessing biofilm pH dynamics in both laboratory models and clinical plaque samples. Conventional ratiometric setups rely on confocal microscopy, enabling detailed spatial mapping but limiting broader use due to high equipment costs. This study presents a simplified version of the technique employing a more accessible and cost-effective epifluorescence microscope, widely available in microbiological and clinical laboratories. Plaque samples were obtained from 17 orthodontic patients, collected from the buccal surfaces of lower canines and first and second premolars across two quadrants. Samples were homogenized, adjusted to pH 7, divided into two aliquots (30 μ L), exposed to 4% sucrose, and analyzed either by epifluorescence-based pH ratiometry or by microelectrode measurements. pH values were recorded after 5, 10, 15, and 60 minutes. Ratiometric data were calibrated using titrated MES-buffer standards, and agreement between methods was evaluated through Spearman rank correlation. Acidogenic responses varied substantially between samples, with final pH values ranging from 4.82 to 6.31. Ratiometric measurements showed excellent concordance with MES-buffer calibration curves (asymmetric sigmoidal fit; $R^2=0.99$; summed square of residuals=0.26). Correlations between ratiometry and microelectrode measurements were significant at 15 and 60 minutes ($\rho=0.58$, $p=0.014$; $\rho=0.48$, $p=0.049$), while earlier time points did not show significant associations. These findings indicate that epifluorescence-based pH ratiometry is a viable and rapid approach for monitoring bulk pH responses of clinical dental biofilms to sucrose challenge, broadening the applicability of ratiometric pH assessment. The study was approved by the Ethical Committee of Region Midtjylland (case nr. 1-10-72-77-24).

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