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Abstract Booklet

Abstract Index

STUDENT AND JUNIOR FACULTY ORAL PRESENTATIONS:

APPLIED RESEARCH

Multimorbidity Increases Periodontal Disease in Older Canadians

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Introduction: Projected growths in Canada's aging population highlight the need to investigate the burden of chronic disease in older age, its contribution to oral health and how this relationship varies by biological determinants such as age and sex.

Objectives: To examine the extent of the association between multimorbidity (MM) and periodontal disease (PD) in Canadians and whether this differs by age and sex.

Methodology: Data were retrieved from the Canadian Health Measures Survey (CHMS) (Cycle 1 2007-09) for adults aged 45+ years old. PD was operationalized using the modified Centers of Disease Control and Prevention and American Academy of Periodontology (CDC/AAP) definition. MM was defined as per the Public Health Agency of Canada as having 2 or more chronic conditions. Multivariable logistic regression models adjusted for confounders and stratified by age groups (45-54, 55-64, 65+ years) and sex (males and females) were constructed.

Results: In our total sample (n=1,270), 45% of respondents were middle-aged (45-54 years old), 48% were male and 88% were of White race/ethnicity. MM affected 41% of the sample. MM was associated with higher odds of PD in the oldest age group (65+years) (OR= 5.2, 95% CI= 2.8,9.4) compared to the 45-54y-old group. In those without MM, older adults continued to show higher odds of PD than their middle-aged counterparts (OR= 2.4, 95% CI= 1.5,3.8), although halved compared to those with MM. No sex differences were observed in the association between MM and PD.

Conclusions: Older Canadians living with MM are at the highest risk of PD suggesting they may benefit from medical-dental integration and enhanced oral health care.

Key words: periodontal disease, multimorbidity

Application of Deep Learning Models in Children Dental Anxiety Assessment

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Introduction: Dental anxiety is prevalent among children and can lead to adulthood dental phobia. Anxiety assessment is subjective and time-consuming. Moreover, verbal feeling expression is challenging for young children.

Objectives: The purpose of this study was to automate children's drawing analysis for dental anxiety assessment.

Methodology: For this secondary data analysis, 92 drawings collected in dental settings pre-and post-operatively by Ortiz and Baghdadi from 5 to 12-year-old children were included. The drawings were scored and categorized into low, average, and high levels of anxiety based on Children Drawing Hospital(CD:H) scoresheet. A three-step classification was applied. First, a classifier differentiated between drawings that showed high and average/low levels of anxiety. Then the human figures in the average/low category were extracted using an object detector model. Finally, a second classifier classified these figures as low and average. For training the detector model, 962 artificial intelligence-generated images and a Draw-a-Human dataset with a You Only Look Once (YOLO) architecture were utilized.

Results: Findings suggested support for each stage of the study. The first stage yielded an accuracy of 83% during training, 69% in validation, and 89% during testing. The detector model demonstrated a precision of 92% and recall of 64%. The average/low classification, demonstrated accuracy of 99% during training, 98% during validation, and 88% for testing.

Conclusions: This study presents an alternative to evaluating children's dental anxiety through drawing analysis by applying machine learning with initial results. Automated scoring models can be used for screening young children with high dental anxiety, enabling clinicians to gain insights into pediatric patients' concerns and implement effective anxiety management techniques. Moreover, there is promise in enhancing communication with non-verbal or cognitively challenged children.

Key words: Dental Anxiety, computer vision systems

Pediatric TMJ disc identification and displacement classification with machine learning

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Introduction: Temporomandibular joint (TMJ) disorders are common, even in children. TMJ arthritis affects 7-11% of healthy adolescents and up to 78% of children with juvenile inflammatory arthritis. MRI, which is considered the reference standard imaging tool for diagnosis, suffers from poor spatial resolution and poor anatomic structure definition, especially of the articular disc, requiring expert interpretation of the images.

Objectives: In this study, we aimed to evaluate the performance of an automated two-step pathway interpreting pediatric TMJ MRI using artificial intelligence (AI). AI first automatically identifies the mandibular condyle, articular eminence, and TMJ disc via convolutional neural network (CNN), and then an automated algorithm classifies disk displacement.

Methodology: MRI from 235 pediatric patients (470 joints) were reviewed by a pediatric radiologist, articular structures segmented, and discs classified as dislocated or not. The UNet ++ CNN model was trained on MRI images from 135 of these patients and tested on images from 100 patients. Disk displacement was then classified by an automated algorithm assessing the location of disc centroid and surfaces with respect to bony landmarks.

Results: The mean age was 14.6±0.1 years (Female: 58%), with 22% of 470 discs anteriorly dislocated. UNet++ CNN model performed well in segmenting the 3 anatomical structures, with Dice coefficient 0.67 for the disc, 0.91 for condyle, and Hausdorff distance 2.8 mm for the articular eminence. The classification algorithm showed disc displacement classification comparable to that of human experts, with AUC 0.80-0.90 for the distance between disc center and the eminence-condyle line.

Conclusions: A two-step automated model can accurately identify disc and TMJ osseous structures and accurately classify disc dislocation in pediatric TMJ MRI. This tool could potentially assist clinicians who are not MRI experts when assessing pediatric TMJ disorders.

Key words: Temporomandibular joint disc, magnetic resonance imaging, machine learning

The Causal Effect of Human-Papillomavirus Vaccination on Head-and-Neck Cancer Risk

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Introduction: In Canada, the incidence of human papillomavirus (HPV)-related head and neck cancer (HNC) is increasing and has recently surpassed that of cervical cancer, making it the most common HPV-associated cancer. Prevention of HNC through HPV vaccination is particularly relevant due to difficulties in implementing an effective screening program. However, evidence of its effectiveness is limited.

Objectives: The aim of this study was to estimate the causal effect of HPV vaccination on HNC risk.

Methodology: We used data from a hospital-based case-control study. Incident HNC cases (n=460) and frequency matched controls (n=458), by age and sex, were recruited from four main referral hospitals in Montreal. In-person interviews collected information on an array of life course exposures and exfoliated cells from the mouth and cancer site were analysed by PCR to detect HPV genotypes. Individuals with no targeted HPV were assumed to be vaccinated and those with at least one targeted HPV genotypes were assumed to be unvaccinated. We estimated the average treatment effect on the treated (ATT), average treatment effect on the untreated (ATU) and relative risk (RR) using case-control weighted targeted maximum likelihood estimation (CCW-TMLE).

Results: Of 818 participants (389 cases, 429 controls), 663 were vaccinated and 155 were unvaccinated. There was a 4% point reduction in HNC risk among those who were vaccinated [ATT= 0.04, 95% CI; -0.05, -0.03] and 5% point increase in HNC risk among those who were not vaccinated [ATU= 0.05, 95% CI; -0.03, 0.14]. Participants who were vaccinated had a 96% lower risk of HNC compared to those who were not vaccinated [RR= 0.04, 95% CI; 0.03, 0.05].

Conclusions: Our findings indicates that HPV vaccination protects against HNC, thus lends further support to the implementation of primary prevention strategies targeting oral HPV infections to reduce the incidence of HNC in the Canadian population.

Breaking Barriers: Initiatives for Dental Care Access in Immigrant Children

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Introduction: Immigrants encounter numerous challenges that impede their access to oral health care. This leads to worse dental outcomes for their children compared to their Canadian-born counterparts.

Objectives: This study aimed to evaluate the effectiveness of community referrals for dental care among immigrant children and identify factors that influence parental compliance with these referrals.

Methodology: 610 parent-child pairs were included, focusing on demographics, oral health behaviors, and parental reports on the oral health status of children aged 1-12 years. All children underwent dental examinations, and those requiring dental care were referred to the University dental clinic for complimentary treatment. Clinic admissions were tracked using the Axium database. Comparative analyses between compliant and non-compliant families were conducted through multivariate regression and chi-square tests.

Results: 151 children were referred with mean (SD) age of 6 (2.4) years, 60% were female, and 37% were born in Canada. 67% of mothers possessed college or higher education, and 46% of families fell into the middle-income level. 39% of the referred children had dental coverage and 42% had dental visit within the last year; 56% brushed their teeth ≥twice a day, and 54% consumed one or more sugary snack per day. The mean (SD) DMFT/dmft was 6.2 (4.0). Only 38% attended at least one dental appointment, with child gender demonstrating a significant association—female children exhibited a higher attendance rate than males. No other demographic characteristics displayed statistically significant associations.

Conclusions: The study underscores the low attendance of participants, emphasizing the impact of non-financial barriers on dental attendance among immigrant families. This research highlights the multidimensional nature of low dental utilization in the immigrant population. Addressing these barriers is imperative for enhancing oral health outcomes and ensuring equitable access to dental care for immigrant children.

Key words: oral health, referral

The Societal Costs and Benefits of a Comprehensive Dental Care Program

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Introduction: One-quarter of Canadians avoid dental care due to costs. This results in negative individual and societal outcomes.

Objectives: To estimate the societal costs and benefits of providing a comprehensive dental care program.

Methodology: This quasi-experimental single-group repeated-measures study the impact of providing comprehensive dental care, free of charge. Participants received dental care and were followed for one year after achieving oral health stability (i.e., no oral pain and infection and does not require any immediate treatment). We estimated the societal costs of the treatment by capturing the direct and indirect costs. Direct costs included the cost of dental services. Indirect costs included opportunity costs, travel, and caregiving expenses. We also captured changes in 1) Self-Reported Oral Health (SROH), 2) untreated tooth decay, 3) Oral Health Related Quality of Life (OHRQoL), 4) healthcare utilization and medication use due to dental problems, and 5) economic productivity at baseline (T0) and one-year (T1) after addressing their dental needs.

Results: Fifty participants completed their treatment plan and reached the one-year follow-up timepoint. The total direct and indirect costs of dental care were estimated at CAD $2,580 (SD:1,730), and CAD $532 (SD: 489), respectively. Forty-two percent of participants reported excellent and very good SROH at T1 compared to 12% at T0 ($p<0.05$); the average number of untreated teeth declined from 4.3 (SD: 4.8) at T0 to 0.5 (SD: 0.7) at T1 ($p<0.05$). The average Oral Health Impact Profile (OHIP-14) score decreased from 17.3 (SD: 11.2) at T0 to 10.3 (SD: 8.1) at T1, indicating an improvement in OHRQoL ($p<0.05$). Additionally, regular access to dental care resulted in total healthcare utilization and medication use cost-savings of CAD $201 (SD: 5.6), and economic productivity gains of CAD $18,623 (SD: 8,143).

Conclusions: After one year of implementation, free dental care led to significant improvements to many individual and societal oral health outcomes.

Key words: Oral Health, Quality of Life, Follow-Up Studies

Adverse childhood experiences and co-occurring poor oral health and multimorbidity

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Introduction: Adverse childhood experiences (ACEs) may increase the risk of chronic conditions later in life. Their role in the co-occurrence of poor oral health with multimorbidity (MM) i.e. having 2+ chronic conditions, is unknown.

Objectives: To determine the extent to which ACEs are associated with the co-occurrence of poor oral health and MM in middle-aged and older Canadians.

Methodology: We accessed data from the baseline wave of the Comprehensive Cohort of the Canadian Longitudinal Study on Aging (CLSA) (n=20,697, 45-85 years old). Self-reported oral health (SROH) was dichotomized as good or poor. The co-occurrence of poor SROH with MM was determined by categorizing respondents into 4 groups: (1) good SROH and no MM, (2) poor SROH and no MM, (3) good SROH and MM, and (4) poor SROH and MM. Multinomial logistic regression models were constructed to examine the associations between ACEs and the co-occurrence of poor SROH and MM, adjusting for socioeconomic position, smoking, and alcohol consumption, and stratified by age and sex.

Results: Higher ACEs scores were associated with greater odds of co-occurring poor SROH and MM (OR=1.37, 95% CI: 1.30, 1.44). This association remained when stratified by age and sex, where ACEs had the greatest odds of co-occurring poor SROH and MM in females aged 45-54 years old (OR=1.52, 95% CI: 1.31, 1.76) and in males aged 55-64 years old (OR=1.36, 95% CI: 1.20, 1.53).

Conclusions: ACEs may exacerbate the co-occurrence of poor SROH and MM in the aging Canadian population.

Key words: Adverse childhood experiences, aging

Impeding Implementing the Canadian CRA Tool in Indigenous Communities

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Introduction: Indigenous children in Canada suffer from high burden of dental caries due to complex interplay of social determinants of health.

Objectives: To identify the barriers impeding the implementation and integration of the Canadian caries risk assessment (CRA) tool into the primary care of Indigenous children in Manitoba through the perspectives of non-dental primary care providers (NPCPs).

Methodology: Thirty-six NPCPs who care for Indigenous children aged <6 years were purposefully selected from 7 Indigenous communities in Winnipeg, Selkirk, Camperville, Pine Creek and Pine Falls, Manitoba. A qualitative constructivist grounded theory methodology was used in this study. Data was generated through 5 focus groups and 4 in-depth key informant interviews between April and November 2023. Data were analyzed using an inductive thematic analysis with NVivo software.

Results: The participants consisted of 24 nurses, 4 nurse practitioners, 1 dietician, 1 physician, 2 physician assistants and 4 child development workers with mean age (42 years), mean years of practice (15 years). Thematic analysis of barriers to implementation and integration of the Canadian CRA tool into primary care revealed 5 major themes: service level (limited funds, workload, competing illnesses); community level (food insecurity, caries normalization, competing priorities); caregiver level (poor dental awareness, personal beliefs, bad experience); knowledge level (limited knowledge on fluoride and application); and child level (disability, lack of childcare support) barriers. Participants were positively disposed to receiving training on early childhood caries, fluoride application, and the use of the CRA tool.

Conclusions: This study showed that NPCPs in Manitoba view the Canadian CRA tool as beneficial for Indigenous children to access early preventive dental care. The barriers highlighted will help inform strategies, guidelines, and policies to improve access to preventive oral health services for Indigenous children in Manitoba.

Key words: Caries, Prevention

Bitter Taste Genetics and Oral Health in Canadian Adults

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Introduction: Genetic variations within Bitter Taste Receptors (TAS2Rs) may affect overall health, given their widespread expression throughout the body and various roles including in immunity and inflammation. However, a comprehensive study of all TAS2R genetic variants within the Canadian population remains unexplored.

Objectives: To assess the allele frequencies of TAS2R genetic variants in the Canadian Longitudinal Study on Aging (CLSA) cohort and compare them to global population allele frequencies. We also aim to evaluate the correlation between TAS2R variants and self-reported oral health symptoms within the CLSA cohort.

Methodology: The CLSA GWAS database contains genotype data generated using the Affymetrix Axiom array for 26,622 participants. We used PLI NK (v.1.9) to perform quality control of samples and TAS2R genetic variants, and calculate allele frequencies for comparison with other populations. Assessment of the association with oral health as measured by the Oral Health Questionnaire is currently underway and results will be discussed.

Results: This study included 22,974 individuals of European ethnicity and 124 SNPs. Allele frequencies for 121 SNPs were available from the 1000 Genomes Project for the European population. Chi-squared analysis revealed significant differences in 48 SNPs in CLSA compared to 1000 Genomes, mainly in TAS2R20, TAS2R15P, and TAS2R42. Among all, 14 were in pseudogenes, 7 in untranslated regions, 12 synonymous, and 15 missense variants.

Conclusions: This study presents a comprehensive analysis of TAS2R genetic variants and their association with oral health within the CLSA cohort, revealing potential differences compared to other populations.

Key words: Taste receptors, Genetic variations

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STUDENT AND JUNIOR FACULTY ORAL PRESENTATIONS:

FUNDAMENTAL RESEARCH

Intercellular crosstalk in external inflammatory root resorption

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Introduction: External root resorption is a complex process wherein differentiation of Mφ to multinucleated osteoclasts is temporally regulated by resident PDLF and other immune cells.

Objectives: The study aims to understand the crosstalk mechanism between periodontal fibroblasts (PDLF) and macrophages (Mφ) in different root resorptive conditions.

Methodology: PDLF-Mφ direct coculture (juxtacrine) was seeded on substrates (dentin, cementum, and polystyrene) with/without LPS, MCSF and RANKL for 7 and 14 days and stained for TRAP activity. On day 2 and 7, PDLF-Mφ cocultured on polystyrene were immune stained for CD80, CD206, NFATc1, STAT6 and periostin and cell-culture supernatants were assessed for inflammatory markers. Mφ grown in conditioned media of PDLF (Paracrine), and Mφ monoculture were used as controls. Statistical analyses t-test and one-way ANOVA with Tukey's multiple comparisons test were used ($p < 0.05$).

Results: PDLF-Mφ coculture showed a higher number of TRAP+ multinucleated cells (MNC) than Mφ monoculture on dentin and polystyrene. No TRAP+ MNC were observed in paracrine and on cementum. Expression of CD80 and 206 in PDLF-Mφ were similar at day 2, while CD 206 >CD 80 at day 7. Expression of STAT6 > NFATc1 at both day 2 and 7. Periostin expression in presence of LPS was downregulated in PDLF monoculture, while upregulated in PDLF-Mφ coculture. The cytokine profile of PDLF-Mφ at day 2 was predominated by IL-1β, TNF-α, and MMP9, day 7 by MMP2. IL-6 showed steady expression at both the time points.

Conclusions: The study highlights the juxtacrine effect of PDLF on the clastic differentiation of Mφ with difference in clastic activity between dentin and cementum. The study also emphasizes the temporal effect of TNF-α, MMP2, MMP9 and IL-1β on intercellular crosstalk in resorptive environments.

Key words: Root resorption, cellular crosstalk, macrophages, Periodontal fibroblasts

Funding: The current study was supported in part by a research grant from the American Association of Endodontists Foundation (##120877) and Natural Sciences and Engineering Research Council of Canada (Discovery grant) (AK-RGPIN-2020-05844).

Role of Oral Microbiome and Host Factors in Early Childhood Caries

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Introduction: Early childhood caries (ECC), which is tooth decay in the primary dentition of children less than 72 months of age, affects nearly half of children worldwide. ECC is influenced by the interplay of microbial, behavioral, and social factors that may determine its development and severity.

Objectives: This study explored multifactorial aspects of ECC in a cohort of 554 children from Manitoba. We aimed to examine the trans-kingdom dynamics in the oral microbiome of children and its association with various factors, such as social, behavioral, oral health, and nutrition. We also investigated the relative importance of these variables with ECC.

Methodology: Dental plaque samples were subjected to 16S rRNA and ITS1 sequencing, and sequencing data were analyzed using Qiime2. Parents or caregivers provided information on the relevant host factors via a questionnaire. Univariate, multivariate, and machine-learning models in R were used to identify significant variables in ECC using both taxonomic profiles and host variables. The relationship between the fungal and bacterial species was evaluated using correlation and network analyses.

Results: Streptococcus mutans and Candida dubliniensis were significantly enriched in samples from children with ECC, whereas Neisseria oralis was associated with caries-free individuals. Furthermore, a significant association was found between ECC and several host variables such as oral health score, age, place of residence, and mode of delivery. For correlation analysis, among many correlations, a strong connection between the cariogenic bacteria Neisseria bacilliformis and the fungi Candida dubliniensis was identified in children with ECC.

Conclusions: Our study identified the impact of the oral microbiome and other host factors with the presence of ECC, and the correlations between the inter-kingdom microbiome in both caries-free and ECC-affected children. Our findings provide valuable insights into ECC that will guide prevention efforts.

Key words: Early childhood caries; Oral microbiome; Dental plaque; Machine learning; Host factors; Socioeconomic variables

Funding: Operating grant from CIHR (PJT-159731)

In Situ Antimicrobial Effect of DJK-5-containing Mouthwashes on Oral Biofilms

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Introduction: The antimicrobial D-enantiomeric peptide (DJK-5) has been proposed for the treatment of oral multispecies biofilm-induced infections in vitro. However, in situ studies to validate these findings have not yet been conducted.

Objectives: This study aimed to assess the substantivity effect of DJK-5 on plaque biofilms and microbial composition using an intraoral disk-holding splint model.

Methodology: Three healthy adults underwent a single mouthwash with DJK-5, DJK-5 + 0.2% chlorhexidine (CHX), 0.2% CHX, and sterile water after wearing an individualized disk-holding splint for 3 days. Each volunteer conducted two daily mouthwashes per cycle. All volunteers completed the 12 rinsing cycles, with a 2-week rest period between each test. Confocal laser scanning microscopy analyzed the dynamic percentage of dead bacteria, while DNA sequencing identified microbial composition.

Results: The percentage of dead bacteria treated with DJK-5 + 0.2% CHX and DJK-5 alone remained constant between days 1 and 3. DJK-5 + 0.2% CHX exhibited the highest percentage of dead bacteria within the tested 3 days, followed by DJK-5 alone ($P < 0.05$). 0.2% CHX had the lowest bacteria-killing effect, and day 1 demonstrated better performance than day 3 ($P < 0.05$). From the standpoint of gate levels, there were no notable changes in composition before and after the administration of mouthwash in each group.

Conclusions: DJK-5 combined with 0.2% CHX demonstrated superior efficacy in killing bacteria within plaque biofilms in situ, compared to traditional mouthwash. The combination of DJK-5 with 0.2% CHX demonstrates superior antimicrobial efficacy as a daily mouthwash for short-term oral hygiene improvement.

Key words: Biofilms; Antimicrobial peptides

The role of nociceptors in dental-derived stem cell-macrophage crosstalk in inflammation

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Introduction: Nociceptors modulate immune response by releasing neuropeptides that influence activation, differentiation, and proliferation of immune cells. However, we are yet to fully understand the underlying mechanism of neurogenic inflammation in persistent periodontal diseases.

Objectives: This study aims to characterize the role of nociceptors in mediating cellular crosstalk between human periodontal ligament (hPDL) cells and macrophages (MQs) in inflammation.

Methodology: Conditioned media from LPS-treated hPDL-derived nociceptors (Np) and SCAP-derived nociceptors (Ns) was applied to hPDLs, SCAPs, and MQs to assess cellular response. Neuronal response was studied by applying conditioned media from LPS-treated hPDLs, SCAPs, and MQs on Np and Ns. Expression of Substance P (SP), Calcitonin-Gene Related Peptide (CGRP), TNF-α, IL-1β, IL-6, TGF-β1, and IL-10 were assayed at 1h and 3h.
Statistical analyses t-test and one-way ANOVA with Tukey's multiple comparisons test were used ($p < 0.05$).

Results: LPS-treated Np increased SP, TNF-α, IL-1β and reduced CGRP in MQ-hPDL cocultures. LPS-treated MQ-hPDL increased SP, reduced CGRP in Nps and a slow increase in TNF-α, IL-1β, IL-6 with a concurrent increase in IL-10 was observed. LPS-treated Ns decreased SP and CGRP with late expression of TNF-α, IL-1β, IL-6 in MQ-SCAP cocultures. LPS-treated MQ-SCAP

Conclusions: It was found that nociceptors reduced CGRP expression while dampening proinflammatory response in MQ-PDL cells. MQ-PDL cells in turn increased SP expression and elicited protracted proinflammatory response with IL-10 expression. Similar trends in SP and CGRP were mediated by nociceptors in SCAP-MQ interactions. This study highlights the distinct role of SP and CGRP in modulating neuroimmune interactions.

Key words: neuropeptides, neuroimmune crosstalk

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Prognosis of Head and Neck Cancer Outcomes Using Artificial Intelligence

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Introduction: Head and neck cancer (HNC) constitutes a substantial global health concern. In Canada, projections for 2023 anticipate approximately 7,900 new HNC cases and 2,100 deaths. These estimates highlight the imperative need for advanced diagnostic and prognostic tools in the management of HNC.

Objectives: This systematic review aimed to evaluate machine learning (ML) models' performance in predicting post-treatment survival and disease progression outcomes in HNC, utilizing structured clinicopathological data.

Methodology: A systematic search was carried out across Medline, Scopus, and EMBASE databases. The methodological characteristics and performance metrics of clinical studies reporting ML algorithms were assessed. The risk of bias was evaluated using the Prediction model Risk Of Bias ASsessment Tool (PROBAST).

Results: Out of 2,971 unique records, 23 articles were included after thorough screening and selection. Five studies were judged to have an overall low risk of bias, while all showed low risk concerning applicability. For time-to-event analyses related to survival outcomes, the ML models demonstrated a higher concordance index (C-index) ranging from 0.71-0.89 compared to the Cox regression models which ranged from 0.57-0.82. Among these, the DeepSurv and Random Forest models stood out in performance. Additionally, when using binary classification to assess survival outcomes, the ML models achieved an area under the receiver operating characteristic (AUROC) ranging from 0.77-0.95 and F1-scores between 0.69-0.92. In the context of disease progression outcomes, particularly concerning loco-regional recurrence, the F1-scores ranged from 0.78-0.81. Overall, the performance of ML models varied across different outcomes, HNC sites, and survival periods.

Conclusions: This systematic review highlights ML models' potential in predicting post-treatment outcomes using structured data. Despite limitations concerning the generalizability of models for survival outcomes and a need for further focus on disease progression outcomes, ML models consistently outperformed traditional methods.

Key words: machine learning, head and neck cancer

Oral Health Inequalities in Adolescents and Young Adults in Ontario

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*Presented by Limo, L.

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Introduction: Little is known about the state of oral health inequalities in adolescence and young adults in Ontario.

Objectives: We sought to assess the extent of the association between annual household income and each of oral health status and dental care utilization adolescents and young adults in Ontario and whether these differ between both age groups.

Methodology: We retrieved data of 4,316 Ontario adolescents and young adults (12 – 24 years old) from the Canadian Community Health Survey (CCHS) (2017–2018 cycle). Four step-wise logistic regression models were constructed to examine the relationship between annual household income and each of self-reported oral health (SROH) and dental care utilization (number of dental visits in the past 12 months). Models were sequentially adjusting for smoking and alcohol consumption, psychosocial stress and the availability of dental insurance, and stratified by age group into adolescents (12 – 17y) and young adults (18 – 24y).

Results: Respondents from higher income families were less likely to report poor SROH and showed a lower prevalence of infrequent dental visits (PR=0.55, 95% CI 0.35,0.89; PR=0.40, 95% CI 0.28, 0.58, respectively) When stratified, this protective association was significant in the young adult age group but not adolescents in fully adjusted models.

Conclusions: Socioeconomic inequalities in oral health and dental care utilization in Ontario's adolescents and young adults are evident. These may be accentuated by the loss of provincial dental benefits in young adulthood (18+ years of age).

Key words: adolescence, social determinants of health

Investigating Periodontitis Phenotype Occurring in Transgenic Mice Overexpressing Pitx1 Gene.

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Introduction: The transcription factor PITX1 plays a pivotal role in regulating gene activity. Complete silencing of PITX1 results in abnormal hind-limb development, an undersized mandible, and fusion of mandibular molars. Conversely, partial silencing triggers phenotypes akin to osteoarthritis, while overexpression leads to senile osteoporosis. This study delves into the potential correlation between PITX1 overexpression and various dental developmental anomalies. Moreover, we investigate the differing manifestations observed in the mandible compared to the femurs.

Objectives: To ascertain whether the upregulation of the transcription factor PITX1 contributes to dentinogenesis imperfecta-like phenotype by triggering age-related osteoporosis.

Methodology: A 2.3 kb fragment of the mCol1α1 promoter was utilized to generate transgenic mice exhibiting elevated Pitx1 expression within their bone cell lineage. At various intervals, 24 mice (12 wild types - 6 males, 6 females; 12 transgenic - 6 males, 6 females) were examined. Bone Mineral Density was assessed via dual-energy X-ray absorptiometry, three-point-bending tests were performed using a Mach 1TM micromechanical testing system, and lateral and dorsoventral radiographs of mouse skulls were captured using Faxitron MX20. Histological analysis of the tissues was conducted, along with primary osteoblast cultures derived from the mandible and femur samples from the mice.

Results: Transgenic mCol1α1-Pitx1 mice exhibited severe dental abnormalities, such as occlusal attrition, tooth loss, and reduced jawbone density and content. The histological analysis illustrated dentin de-mineralization and odontoblast deterioration. Osteoblast culture demonstrated significant mineralization differences between the mandible and femur bone.

Conclusions: In conclusion, the overexpression of Pitx1 generates a wide array of oral health issues, including diminished bone and dentin density, and misaligned and missing teeth.

Key words: Dentinogenesis imperfecta; PITX1, osteoblasts, mandible, femurs

Dysfunctional Immuno-host Cell Crosstalk under LPS-induced and Hyperglycemia in Chronic Wounds

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Introduction: Non-healing chronic wounds are a major complication in diabetes due to hyperglycemia. This leads to dysfunctional interaction between macrophages as primary responder of inflammation and fibroblasts as primary effector cell delaying the healing.

Objectives: To elucidate the interactions between macrophages and fibroblasts stimulated by LPS under hyperglycemic environment.

Methodology: 2D mono- and co-culture models representing paracrine and juxtacrine interactions between THP-1 induced macrophages and primary fibroblasts were established. Hyperglycemia and LPS-induced macrophage polarization towards M1 or M2 was characterized using CD and STAT markers. Fibroblasts' migration was estimated under different co-culture conditions and cytoskeleton was characterized. Secretome profiling including various pro- (IL-β, TNF-α, IL-6) and anti-inflammatory cytokines (IL-1RA, IL-10, TGF-β), VEGF, MMP9, TIMP1 and chemokines (CC and CXC) were evaluated using multiplex immunoassay and compared using one-way ANOVA.

Results: 2D mono- and co-culture model systems under hyperglycemia and LPS- induction successfully represented autocrine, paracrine and juxtacrine signalling between macrophages and fibroblasts as observed in an infected chronic wound scenario.
Macrophages were found to be more in pro-inflammatory state in the presence of hyperglycemia and LPS combination. Differential fibroblasts migration pattern was observed under different co-culture conditions. Overall, it was hampered under the hyperglycemia and exacerbated by LPS, dependent on the interaction type.
Autocrine and paracrine interactions lead to higher pro-inflammatory (IL-β, TNF-α, IL-6), lower anti-inflammatory (IL-RA, VEGF, TGF-β) molecules, higher MMP 9/TIMP 1 ratio, and reduced chemokine (RANTES) levels whereas juxtacrine interaction led to reduction in chemokine (MCP-1) and IL-10. This indicates delayed infiltration of macrophages, uncontrolled inflammation, higher degradation of ECM in chronic wounds.

Conclusions: Dysfunctional crosstalk between macrophage and fibroblasts is governed by paracrine or juxtacrine interactions. Differential cellular behaviour in terms of fibroblasts' migration, cytoskeleton, and secreted molecules are dependent on type of interplay between immune and host cells.

Key words: Chronic inflammation, Immuno-host cell interaction, Wound healing, Oral diabetic wounds

The Epigenetic Regulator ANKRD11 Controls Tooth Development

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Introduction: Ankyrin repeat domain-containing protein 11 (ANKRD11) interacts with histone deacetylases and, thus, participates in the epigenetic control of cell differentiation. Individuals with KBG syndrome, which carry variants in ANKRD11, present with macrodontia of upper incisors, and frequently with root duplications, and mineral anomalies.

Objectives: To establish the requirement for precise epigenetic control during tooth development to ensure tooth shape, mineralization, root, and accessory tooth formation using Ankrd11-mutant mice.

Methodology: Epithelium (Ankrd11oeko) or neural crest (Ankrd11ncko) -specific Ankrd11 mutant mice were obtained by mating Ankrd11flx with K14-Cre or Wnt1-Cre2 mice. Embryos and postnatal mice were collected, fixed, and then processed for histology, immunofluorescence, or microCT. E15.5 wild-type and mutant tooth buds were transplanted under the kidney capsule of adult recipient mice. Single-cell RNA sequencing was performed on cells isolated from P0 molars.

Results: Ankrd11oeko mice are born but initially fail to thrive. They show rapid cusp attrition suggestive of reduced enamel quality. Epithelial-specific markers show inappropriate expression within the various epithelial layers of the enamel organ. Short roots and delayed eruption were also observed. Ankrd11ncko teeth show abnormal pulp and odontoblast differentiation. The 2nd molar is larger than the 1st molar. Single-cell RNA sequencing identified several genes that showed a much broader expression pattern among the various cell clusters than normally observed. Furthermore, reduced expression was observed in genes associated with enamel mineralization (Amelx, Ambn) and tooth size (Edar) indicating that epigenetic changes to dental mesenchyme also affects epithelial-mesenchymal crosstalk.

Conclusions: The phenotypic changes observed following loss of Ankrd11 illustrate the importance of precise epigenetic programming for correct differentiation of highly specialized cells such as odontoblasts and ameloblasts. Both mouse models recapitulate many of the reported tooth anomalies in KBG patients. Future studies will focus on the specific mechanisms of Ankrd11.

Key words: Tooth development; KBG syndrome

STUDENT AND JUNIOR FACULTY POSTER PRESENTATIONS:

APPLIED RESEARCH

L’effet d’un antibiotique préopératoire sur le remodelage osseux péri-implantaire et la douleur postopératoire : Un essai clinique randomisé contrôlé

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Introduction: L’impact des antibiotiques préopératoires sur le niveau osseux péri-implantaire, la douleur et l’inconfort n’est toujours pas clairement établi en implantologie dentaire.

Objectives: Primaire : Évaluer si l’administration d’azithromycine 500 mg avant la pose d’implant simple « platform-switching » avait un impact sur le remodelage osseux péri-implantaire après quatre mois chez les patients en bonne santé.
Secondaires: Évaluer la sévérité de la douleur postopératoire, la morbidité postopératoire associée à la chirurgie implantaire et le taux de survie des implants à quatre mois

Methodology: Dix-neuf participants ont été recrutés dans un essai clinique randomisé à double insu. Les participants du groupe d’intervention ont reçu 500 mg d’azithromycine une heure avant la pose d’implant tandis que le groupe contrôle a reçu un placebo identique. Les changements du niveau de l’os crestal péri-implantaire ont été mesurés quatre mois plus tard à l’aide de radiographies standardisées. La sévérité de la douleur et la morbidité postopératoire associées à la chirurgie ont été évaluées à une semaine et quatre mois postopératoires. Le taux de survie des implants et la santé péri-implantaire ont été évalués quatre mois après la pose d’implant. Des analyses descriptives et bivariées ont été utilisées pour analyser les données.

Results: Dix-huit participants ont complété l’étude (âge moyen : 52,8 ± 13,9ans). Les changements moyens du niveau osseux péri-implantaire pour le groupe intervention et le groupe contrôle étaient respectivement de -0,79 ± 0,57mm et de -0,35 ± 0,37mm. Il n’y avait pas de différences statistiquement significatives entre les deux groupes en ce qui concerne le remodelage osseux moyen péri-implantaire, la douleur et la morbidité postopératoire, ainsi que le taux de survie implantaire (100%) ($P>0,05$).

Conclusions: Les résultats préliminaires de cette étude clinique suggèrent qu’une dose préopératoire d’antibiotique chez les patients en bonne santé ayant une pose d’implant simple de type « platform-switching » n’apporte aucun bénéfice clinique.

Key words: Azithromycine, placébo, os crestal, douleur, morbidité postopératoire

Interim Canada Dental Benefit (CDB) Evaluation

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Introduction: Accessing oral health care for the vulnerable population due to cost and lack of dental benefits is a major determining factor of oral health. In March 2022, the Federal Government introduced the Interim Canada Dental Benefit (CDB) to improve access to oral health services for eligible children under the age of 12 years.

Objectives: This study assessed the awareness of dental personnel in Manitoba on the new Interim CDB for children < 12 years of age.

Methodology: Invitations to participate in an electronic Microsoft Forms survey on the Interim CDB were distributed to all dentists, dental hygienists, and dental assistants in Manitoba by their respective regulatory bodies, and oral health providers, including dental receptionists and therapists via social media.

Results: A total of 382 dental personnel responded. Dentists accounted for 24% of respondents. The majority of respondents 355 (92%) were aware of the Interim CDB and most (92 %) reported receiving information from their respective professional organizations in Manitoba and social media. Overall, 40% indicated the information they received about the interim CDB was adequate while 36% disagreed and 24% were neutral. Most of the respondents 259 (68%) believed the information provided by the federal government was not clear with only 121 (32%) respondents thought it was clear. Majority of respondents 207 (54%) were not confident in providing parents with information about the program. Only 57% believed that the CDB has improved access to oral health care for young children.

Conclusions: The preliminary results reveal that most dental providers in Manitoba are aware of the interim CDB and received information about the program from their respective member organizations. However, many did not feel that the information they received about the program was adequate and most felt they were not well prepared in sharing details of the CDB with parents. The study showed the need for transmission of precise and comprehensive information on the CDB to health care professionals.

Key words: Interim Canada Dental Benefit (CDB), Electronic survey.

Funding Source: University of Manitoba

Patient/Caregiver's Experience with Home-Based Oral Care: A Qualitative Study

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Introduction: The aging population and their co-morbidities strain the healthcare systems. To address the needs of seniors, integrated and equitable health care is instrumental. In Quebec, the pilot project "Dent Ma Maison" has been implemented in partnerships with key healthcare decision makers to test the feasibility of home-based oral care.

Objectives: To explore the experience of homebound elders and their caregivers regarding home-based oral care.

Methodology: A qualitative research using an interpretive description approach was conducted in two home services programs in Quebec health institutions. Participants were homebound elders, aged 65 years and over, living with cognitive and physical disabilities and their caregivers. Semi-structured telephonic interviews of purposively sampled elders and their caregivers were conducted, lasting up to 45 minutes. A descriptive and thematic analysis have been conducted. Data synthesis is guided by Warwick's Patient Experience framework.

Results: Of the 11 interviews, there are 5 patients, 8 female participants, 1 participant coming from the indigenous community and 6 from visible minority. The study has 5 overarching themes such as access barriers in reaching out to dental clinics, patient/caregivers satisfaction, and oral healthcare services tailored to the needs, communication and support, and recommendations for continuity of care.

Conclusions: Participants expressed high satisfaction and positive experience for the home-based oral care services received under the project. The study highlights the urgent need for these services. Themes identified may be useful in the design of a patient experience survey tool specific to this population. Our results will inform decision-makers regarding elders' realities and preferences, helping to develop patient centered oral healthcare approach.

Key words: Home-based oral care services, Patient experiences.

Endodontic Case Complexity: Are Students and Faculty in Agreement?

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Introduction: Root canal therapy is an integral part of the curriculum and ensures students have the skills and knowledge to treat pulpal diseases. The Case Difficulty Assessment Form (CDAF) is a tool used to help students and clinicians determine the complexity of endodontic cases, as well as the skill level required to perform the treatment. In dental schools, students fill out the form, which is then reviewed by faculty, who determines if the case is appropriate for their skill level.

Objectives: This study aimed to determine the agreement between students and faculty at Dalhousie University Faculty of Dentistry in the scoring when utilizing the CDAF.

Methodology: A random sample of patients (2019 to 2023) from the undergraduate clinics was selected and assigned an ID. A standardized form was used to collect information from different databases. Data was reviewed by two calibrated clinicians and correlation with student was then measured.

Results: A total of 132 forms were reviewed. Pearson's correlation coefficient of 0.584 revealed a moderate positive correlation between student and faculty scores. Spearman's rank correlation coefficient of 0.322 revealed a weak positive correlation between student and expert classification.

Conclusions: Students underscored 91% of the cases. Students and faculty disagreed 54% of the time, suggesting the importance of frequent calibration and training, faculty bias toward student needs and form design flaws. Correctly classifying cases is important to ensure that undergraduate students are treating cases for their skill level. Instructors should be calibrated on how to score the CDAF.

Key words: classification, calibration

Use of Case Difficulty Assessment Form and Iatrogenic Errors Occurrence

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Introduction: The Case Difficulty Assessment Form (CDAF) is a tool used to help clinicians determine the complexity of endodontic cases, and the skill level required to perform the treatment. In dental schools, after students fill out the form, it is reviewed by faculty. It is hypothesized that incorrect utilization of the CDAF will result in improper classification of level of difficulty of a case, leading to treatment errors.

Objectives: This study aimed to evaluate the accuracy of CDAF usage among dental students and faculty at Dalhousie University Faculty of Dentistry and determine its impact on iatrogenic errors during endodontic procedures.

Methodology: A retrospective chart review of 200 endodontic cases treated between January 2019 and June 2023 in the Dalhousie University Faculty of Dentistry clinics was performed. The CDAF scores assigned by students and faculty were compared to expert-determined scores. The occurrence of iatrogenic treatment errors was also documented for each treated tooth. The correlation between CDAF usage and iatrogenic errors was analysed using the Chi-square test.

Results: The assessment of CDAF scores by students and faculty revealed numerous inaccuracies. Notably, a significant association was observed between incorrect CDAF diagnosis and the occurrence of iatrogenic treatment errors ($P = 0.005$). Additionally, a negative correlation was identified between accuracy on the CDAF and the frequency of treatment errors.

Conclusions: The findings of this study highlight the critical impact of inaccurate interpretation and scoring of CDAF by students and faculty, leading to iatrogenic treatment errors during endodontic treatment in the undergraduate clinics. Accurate data collection and analysis by students, followed by thorough review by faculty is imperative when utilizing the CDAF and have the potential to mitigate endodontic treatment complications.

Key words: iatrogenic errors, prevention

Implementation Strategies of Evidence-Based Caries Management Approach in Dental Education: A scoping review

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Introduction: Despite the publication of the Evidence-Based Caries Management (EBCM) approach over two decades ago, its integration into dental education and practice has been slow and inconsistent, leading to variations in clinical practices. The lack of education has been identified as one of the most prevalent barriers to EBCM's implementation. However, there is limited understanding of the implementation strategies commonly used to standardize EBCM in dental education settings.

Objectives: This scoping review aims to map and summarize the evidence on implementation strategies of EBCM in dental education settings and to identify knowledge gaps.

Methodology: Following the Joanna Briggs Institute manual and Arksey and O'Malley framework, an experienced librarian developed a comprehensive search strategy covering four databases, including Medline and Scopus. Hand and grey literature searches supplemented the search. Except for non-educational studies, all 1990–present study designs were included without language restrictions. Data was screened, selected and extracted from studies by two independent reviewers. Proctor's framework and ERIC taxonomy were used to synthesize data.

Results: A total of 23 research articles were identified for inclusion after thorough examination of titles, abstracts, and full texts. The studies focused on developing a comprehensive cariology curriculum or implementing different components of EBCM. Various study designs were employed, with studies conducted at dental faculties between 2007 and 2022. Implementation strategies included dynamic training, ongoing training, local consensus discussions, and educational meetings, targeting undergraduate students, instructors, or both. Outcomes included the development of tailored curricula and improvements in knowledge, decision-making, and performance.

Conclusions: Dynamic training, continuous training, local consensus discussions, and educational meetings dominate implementation strategies. This review highlights cariology education trends, innovations, and future directions. To understand how these techniques affect clinical practice, future research should focus on patient outcomes.

Northern Ontario Dental Professionals' Perceptions of Silver Diamine Fluoride

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Introduction: Silver Diamine Fluoride (SDF) represents a potentially beneficial caries management strategy in Northern Ontario where geography and accessibility can be barriers to timely dental care.

Objectives: Analyze the awareness, acceptability, general and economic perception, potential patient acceptance of SDF for caries management in pediatric and older adults, and the impact of an educational workshop among Dental Professionals (DPs) in Northern Ontario.

Methodology: A 42-item structured questionnaire was administered on volunteer attendees of a minimally invasive dentistry workshop held in Thunder Bay, Ontario. Ethics approval was obtained from UofT REB (#45469) The instrument collected information regarding respondents' demographics, general and economic perception of SDF, acceptability and use, and the workshop's influence on their SDF perceptions. Descriptive and inferential statistics were conducted with statistical significance at p= 0.05.

Results: Forty-six DPs, including hygienists (58.7%) and dentists (41.3%) participated. All DPs had heard of SDF before the engagement, but less than half had used it (43.5%). Certain differences amongst DPs arose, as hygienists were more likely: to choose SDF to treat early childhood caries compared to dentists (p=0.041), to agree that their patients' parents would accept staining in their children's front teeth (p=0.013), and that SDF would be a good root caries management strategy for adults in long-term care (p=0.019). Most participants perceived that SDF was cost-effective (78.3%) and had a reasonable cost when compared to their current treatment options (80.4%). Finally, 84.4% and 90.9% of participants agreed that the workshop has made them more likely to choose SDF to treat caries in children and older adults respectively.

Conclusions: The results suggest that even though DPs surveyed hold some different opinions on SDF, there is an avenue for the uptake of the material if access to SDF is facilitated and accompanied by an educative component.

Key words: Silver Diamine Fluoride, Public Health Dentistry

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A Realist Review on Implementation Strategies to Optimize Teledentistry

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Introduction: Teledentistry, a complex intervention, has the potential to enhance the quality of care and the health care system. Its multi-faceted and dynamic context of delivery implies different outcomes in different settings. Consequently, conventional knowledge synthesis approaches have limited answers on its evidence. Furthermore, the successful implementation of teledentistry requires strategies that are tailored to settings and the use of theory-based approaches.

Objectives: To understand what context, mechanisms, and outcomes (CMOs) are critical to teledentistry implementation in dental practice and to provide recommendations to maximize its adoption. Specially, we will outline: i) implementation strategies used to improve the adoption of teledentistry, ii) mechanisms by which teledentistry results in its intended or unintended outcomes; and iii) contextual factors that result in successful outcomes for teledentistry.

Methodology: We will conduct a realist review following Pawson and Tilley's approach framework. The search strategy will involve collaboration with an expert librarian and include data sources like Medline (Ovid), Embase, CINAHL, PsychInfo, Cochrane library, and grey literature We will include all modalities of using teledentistry, all settings, and patient/population groups. All study designs will be considered with no restriction on language/publication date. Two people will screen, select, and extract data. Data extraction and synthesis will align with Realist and Meta-review Evidence Synthesis: Evolving Standards (RAMESES) guidelines.

Results: To describe the implementation strategies to foster teledentistry adoption, the explicit explanation of how and why teledentistry may or may not work, in what context and circumstances, and a list of outcomes.

Conclusions: To our knowledge, this first realist review on teledentistry will identify critical contexts, mechanisms, and fill out gaps to promote the successful teledentisty's implementation. These findings will provide valuable information to evidence-informed practices, education, and policy making.

Key words: Teledentistry implementation, realist review

Bridging the Gap in Global Oral Health: Challenges, Opportunities, Collaboration

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Introduction: Learners participating in global health community-service learning (GHCSL) are provided with the opportunity immerse themselves in new cultures and work in real-world settings, yet few qualitative studies explore the experiences of learners engaged in community-service learning placements in global regions.

Objectives: This study explored the experiences and impact of the GHCSL program in East Africa among undergraduate dental learners at Schulich Dentistry.

Methodology: Eight undergraduate dental learners were enrolled in GHCSL pilot placements in summer of 2022 and 2023. Placement agreements were established with Makerere University in Uganda and the University of Rwanda in Rwanda. Stakeholders from both institutions were engaged in the development and implementation of these placements. Learners engaged in weekly reflection through a 'storytelling and incident-based narrative' during their placement. An inductive interpretive approach was utilized to thematically analyze the reflective essays.

Results: Five major themes emerged from the reflective essays: (1) experiential clinical learning; (2) enhanced cultural and social integration; (3) awareness of contrasting healthcare systems; (4) commitment to service; and (5) personal and professional growth. Learners reflected on their interactions with diverse communities and exposure to unique patient cases, while emphasizing the adaptability exuded in resource-constrained communities. Cultural humility and a newfound commitment to mitigating global oral health disparities in populations beyond their local communities were developed. Learners also reflected on their improved social integration and the contrasting healthcare systems between Canada and their placements, leading to the development of empathy, communication, and compassion skills, along with an understanding of the disproportionate burden of conditions in resource-constrained communities.

Conclusions: The GHCSL placements had a positive impact on the learners, with many developing a lifelong desire to address oral health disparities within a global context as a result.

Key words: Global health community service-learning, Dental education

Community Service-learning in Dentistry: Going beyond drill, fill, and bill

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Introduction: Community service-learning (CSL) provides learners with an opportunity to work in real-world settings, engage with diverse communities, and apply their learning to address the unique oral health needs of equity deserving patient populations. Such experience promotes the critical understanding of social determinants of health, enabling learners to assess their actions and decisions and draw valuable lessons for their future practice as oral health professionals.

Objectives: The CSL program was designed and integrated into the Schulich School of Medicine and Dentistry, Western University undergraduate dental curriculum in Canada in the academic year of 2021-22.

Methodology: Community engagement sessions were conducted with stakeholders from community organizations and service users in both Ontario and East Africa to facilitate the development of 'personalized' CSL placements that were reflective of the challenges and needs of the service users. The CSL aims to: 1) provide person-centered dental treatment to equity-seeking community members through evidence-informed care, and 2) expand experiential learning opportunities for undergraduate dental learners.

Results: Two didactic courses, focusing on social determinants of health in conjunction with experiential learning placements in Ontario and East Africa, were integrated in the third year (D3) and fourth year (D4) undergraduate dental curriculum. D3 learners rotated through several equity-seeking community sites and conducted on-site dental screenings to provide free-of-cost dental care, while D4 learners rotated through primary healthcare facilities in Ontario and East Africa to provide dental care under the supervision of a community dentist. Learners were encouraged to write guided reflections as part of the formative assessment, and clinical instructors were encouraged to provide summative assessments.

Conclusions: The CSL program addresses the unique oral health needs of equity-seeking community members in both local and global contexts, while simultaneously promoting the personal and professional growth of the learners.

Key words: Community service-leaning, Dental education

Effects of Recreational Cannabis on DMFT and Psychiatric Health

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Introduction: Canada legalized cannabis use for non-medical purposes in 2018, yet there is currently no Canadian study exploring its effect on oral health. This retrospective study assessed the oral and psychiatric health impact of adult recreational cannabis use, with the goal of informing future prevention and risk-benefit discussions among dental professionals and their patients.

Objectives:
Compare prevalence of cannabis use pre- and post-legalization
Assess association between cannabis use and decayed, missing, and filled teeth (DMFT) scores
Assess association between cannabis use and reported psychiatric disorders

Methodology: 300 undergraduate clinic patient charts of adults aged 18-63 were obtained; 150 each having completed a treatment plan before and after October 2018. Included were patients who were fully or partially dentate on both arches with at least one panoramic or four bitewing radiographs at the time of treatment plan completion. Data were analyzed using linear and logistic regressions adjusting for tobacco smoking.

Results: There was no significant difference in the prevalence of recreational cannabis use before and after legalization. Mean DMFT scores of cannabis users were significantly higher than non-users ($p = 0.0429$, 95% CI: 0.059, 3.64). Tobacco smoking was more significantly related to DMFT than cannabis use ($p = 0.0021$, 95% CI: 0.830, 3.69). However, cannabis use adjusting for tobacco smoking did not strongly predict mean DMFT with an effect size ($R2$) of 0.06. Cannabis use was not significantly associated with reported psychiatric disorders.

Conclusions: Recreational cannabis use does not strongly predict DMFT and psychiatric health. Further research is needed to adjust for other potential confounding variables to better understand how cannabis may influence the onset of caries and other oral diseases.

Key words: Cannabis, Decayed, missing, and filled teeth (DMFT), Dental public health, Psychiatric health

Restorative Protocol & Fracture Resistance of Endodontically Treated Immature Teeth

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Introduction: There is no consensus in the literature on the appropriate restorative protocol that optimizes the strength of root canal walls in the cervical area of immature anterior teeth that received endodontic treatment.

Objectives: The aim of this study was to compare the fracture resistance of endodontically treated immature teeth restored with different protocols following endodontic treatment.

Methodology: 64 specimens were randomly assigned into 4 groups: control group, fiber-post, gutta percha (GP) extending up to 3mm apical to the CEJ, and GP extending to the CEJ. The teeth in the control group were left at their original length, while teeth in the experimental groups were altered to standardize their length to simulate immature teeth. Following the restorative procedures, specimens were brought to fracture under compressive forces applied on the middle third of the buccal wall at a 135-degree angulation. Fracture strength, location, and direction were recorded.

Results: Kruskal-Wallis test revealed no statistical differences in fracture resistance among the four groups ($p = .179$). A Pearson Chi-square test was conducted to assess differences in fracture location (crown, CEJ, root) among the groups ($p = .013$). A post-hoc tests (Chi-Square with Bonferroni correction) shows that fractures occurred more frequently in the crown for the control group ($p = .0031$) and in the root for the group GP at CEJ. The fiber-post group had the least root fractures, and the GP percha 3mm below the CEJ had the most fractures at the CEJ.

Conclusions: The results of this study suggest that, when restoring immature teeth, GP should be placed 3mm apical to the CEJ, with the composite restoration extending to that point. No advantage was found with a fiber post. Restoring endodontically treated immature teeth with composite 3mm apical to the CEJ seems to help prevent catastrophic fractures.

Key words: fracture, immature teeth

The Effect of Oral Health Policies in Continuing Care Facilities

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Introduction: In Alberta, a provincial daily oral hygiene policy (OHP) for Long Term Care Facilities (LTCF) was approved in 2018 and a mouth care training program (MCTP) in 2015. These policies established that all residents in LTCF should have the opportunity for oral hygiene twice a day and included online and in-person staff training modules.

Objectives: The objectives of this ongoing survey are to quantify the provincial scope of the daily oral hygiene program in LTCF across Alberta; the LTCF compliance with the policy; to identify the oral health impact on residents in LTCF; and opportunities for improvement.

Methodology: A web-based questionnaire was developed and distributed by email to managers of LTCF across Alberta. The questionnaire is divided in four sections: Facility Demographics/ Program Implementation; Oral Health Support; Staff Perceptions; Resident Assessments.

Results: Managers of 64 facilities with 11,000 residents responded so far. Overall 66.7% of facilities have implemented the OHP and 54% implemented the MCTP. Following implementation of the MCTP and OHP there was a 19.1% increase in facilities providing oral hygiene 2x/day and 53.7% reported improved oral cleanliness. Most importantly, 39% report improved resident quality of life and 55.6% report that staff have become more knowledgeable in providing oral hygiene assistance. However, 79.4% are dependent on family/caregivers to provide oral health products and 68.3% report that the majority of residents fail to attend external dental appointments.

Conclusions: From these preliminary results, the establishment of oral hygiene policies and training have improved resident quality of life and staff oral health knowledge. However, key areas remain unaddressed including a lack of oral hygiene resources, professionals, and poor dental attendance. Future policies should focus to streamline access to oral health professionals and reduce dependence on resources from family/caregivers.

Key words: Continuing Care, Hygiene Policy

Identifying Barriers to Sustainable Oral Health Care Practices: A Scoping Review

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Introduction: The resource-intensive nature of the dental industry contributes substantially to environmental pollution and climate change, necessitating a transition towards sustainable practices. Previous initiatives to support sustainability dentistry have been proposed, however challenges persist due to environmental, social, and financial constraints.

Objectives: This scoping review aims to map and assess the quality of the literature on sustainable oral health care practices, identify barriers and explore their associations with the commercial and social determinants of health.

Methodology: Using a systematic search strategy following the PRISMA ScR guidelines, we retrieved records in July 2023 from MEDLINE, EMBASE, CINAHL, Scopus, and Web of Science, published in English between 2000 and 2023. We considered observational, experimental, and review articles available for full-text reading. Analysis included descriptive and thematic analysis, and critical appraisal using the Joana Briggs Institute (JBI) tools.

Results: A total of 31 studies (21 observational, 11 review articles) were included for data analysis. Three primary barrier types were identified: lack of awareness and compliance among dental professionals, infrastructural challenges including resource limitations, and gaps in existing policies and regulations. Environmental factors emerged as the most common barrier, including the impact of dental practices, waste management, and the use of plastics and amalgam. The majority of studies reported a need for environmental sustainability curricula in education, training, and practice for dental professionals.

Conclusions: Despite positive initiatives aimed at reducing the environmental footprint of dental practices, there exist substantial barriers rooted in environmental, social, and financial challenges in global settings. The integration of sustainable practices is crucial for environmental responsibility and public health.

Key words: Sustainability, Dental care

Effects of SDF on Oral Microbiome: A Randomized Clinical Trial

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Introduction: Silver diamine fluoride (SDF) is a simple and non-invasive agent to arrest caries. As the oral microbiome is essential for oral health, any potential changes to the oral microbiome due to SDF treatment needs to be examined.

Objectives: To investigate potential changes to the oral microbiome in young children treated with SDF.

Methodology: Forty-five children with early childhood caries (ECC) were recruited into this subset of a larger randomized clinical trial. One participant was lost to follow up. A total of 195 carious lesions in 44 children were treated with two applications of SDF and assessed over three study visits. Plaque samples were collected at each visit. Sequencing of the 16S and ITS1 rRNA genes were used to study the oral microbiome.

Results: The overall arrest rates were 75.9% at Visit 2 and 92.8% at Visit 3. The alpha and beta diversity analyses showed no significant differences in the supragingival microbiome after SDF treatment. However, significant changes in abundance of specific bacteria and fungi, particularly Lactobacillus, Bifidobacterium spp., and Candida tropicalis were observed after treatment. Furthermore, compared with children who had 100% of arrest rates at Visit 2, children with at least one lesion not arrested after one SDF application had overabundance of Streptococcus mutans and Candida dubliniensis at baseline.

Conclusions: Two applications of SDF were highly effective in arresting caries. No loss of diversity but changes in the abundance of specific bacteria and fungi were a consequence of SDF treatment. The level of abundance of S. mutans and C. dubliniensis prior to SDF treatment may be an important predictor of treatment outcome and this requires further investigation.

Key words: Silver Diamine Fluoride; Early Childhood Caries; Oral Microbiome.

Funding source: The Children's Hospital Research Institute of Manitoba and Dr. Gerald Niznick College of Dentistry Endowment Funds.

Head and neck cancer burden among solid organ transplant recipients

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Introduction: Solid organ transplant recipients (SOTR) have a higher risk of cancer compared to the general population. Immunosuppressive agents (IAs) play a crucial role in preventing organ rejection because of their effect on immune system inhibition making SOTR more susceptible to diseases, including cancer. However, the burden of different types of cancers including head and neck cancer (HNC) among this population in Quebec is not well documented.

Objectives: To estimate the age and sex standardized incidence ratio (SIR) of primary cancers among SOTR in Quebec from 1997 to 2016 with a particular focus on HNC.

Methodology: We reconstructed a retrospective cohort study of SOTR from 1997 to 2016 with a maximum follow-up of 20 years. SOTR were identified using procedure codes from Régie de l'assurance maladie du Québec (RAMQ). Cancer incidence retrieved using ICD codes from the hospital discharge database of Quebec: Maintenance et exploitation des données pour l'étude de la clientèle hospitalière (MED-ECHO). Population estimates from the 2011 census for Quebec, from Statistics Canada, were used to estimate age and sex SIR. 95% confidence intervals were estimated via bootstrapping. In addition, the incidence ratio of cancers among Quebec's general population was obtained from the cancer registry.

Results: We identified 6873 first-time SOT recipients, among which 1142 patients developed primary cancer. The cancer incidence rate was 2346.1 per 100,000 person-years with 95% CI (2212 – 2486.2). The incidence rate of HNC was 58.57 per 100,000 person-years 95% CI (31.08 – 78.57). The age and sex standardized incidence rate ratio showed a 2.45-to-4.19-fold risk from 1997-2016.

Conclusions: This study shows a higher Incidence of de novo malignancy, and HNC among SOT than in the general population.

Key words: Head and neck cancer, solid organ transplantation, administrative database

Benchmark Datasets for evaluating AI models in Dentistry: Scoping review

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Introduction: AI-aided decision making is fast becoming ubiquitous in dentistry. With this growth, recognition around the need for more methodological rigor in development and evaluation of these models are rising. High quality, open access datasets are essential to benchmark AI models for various tasks. Benchmarking is the process of comparing different AI models against a common standardized data specifically designed for the task. Moreover, recent FDI whitepaper on AI for dentistry highlights the need for having heterogenous. Benchmark Datasets. Prior to this, it is essential to scope the literature to document gaps in the currently available benchmark datasets in dentistry.

Objectives: To conduct a scoping review and compilation of Benchmark Datasets available for the evaluation of AI models for various task related dental medicine.

Methodology: The JBI methodology will be used for the scoping review. Along with the usual sources like Ovid MEDLINE, EMBASE, SCOPUS, we will also uSlize SemanSc Scholar for peerreviewed literature. Furthermore, we will explore pre-prints on arXiv, bio-arXiv, and medarXiv, and code repositories (e.g., GitHub) for non-peer reviewed materials. Given the surge in published literature on applied AI in denSstry, we will limit our review to past 5 years. Identified Benchmark Datasets will be evaluated based on their intended use (e.g., caries detection from OPG). A web interface and associated open access repository will be created to easily browse identified datasets.

Results: We have iniSated the search process and will finalize the findings by end of April 2024. The findings and developed web-interface will be presented.

Conclusions: Our initial assessment reveals a lack of Benchmark Datasets for clinical application. While open-source datasets are emerging for general medicine, there is a need for it in Dental Medicine.

Key words: Artificial Intelligence, Oral diagnosis

Benchmark Datasets for evaluating AI models in Dentistry: Scoping review

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Introduction: A Canadian national public dental program is being developed and will receive $13.0 billion over five years. Data is needed to monitor the emerging Canadian program. Data on use of the medical sector for non traumatic dental conditions (NTDCs) may be monitored for public dental programs because access to dental care appears to be inversely related to an individual's use of medical sector use for oral health conditions.

Objectives: To show how existing medical sector databases can help monitor public dental programs, using data from Ontario to calculate baseline patterns of medical sector use for NTDCs.

Methodology: Using PubMed, Google Scholar and Google, we identified published articles and gray literature with information on medical sector provided oral healthcare. From these articles, we identified utilization rates for (I) physician visits, (ii) ED visits, (iii) hospital admissions, and (iv) day surgeries on and cost estimates for Ontario. We derived rates of use of medical sector services for the Ontario population and applied them to Ontario's population on April 2023 (15,500,000). Since cost estimates were highly variable for admissions and for ED visits for these types of medical sector use high and low-cost estimates were calculated.

Results: We estimated there were 196,50 physical visits for oral health issues, 60,636 ED visits, 775 hospital admissions, and 13,640 day surgeries for NTDCs. The total cost of medical sector oral health care use in Ontario for 2023 ranged from $46,352 (low estimate) to $91,233,310 (high estimate) in 2023 CAD.

Conclusions: Establishing a baseline for use of medical sector services for NTDCs is needed for Canada's provinces and territories.

Key words: Oral disease, oral health, non-traumatic dental conditions, medical services, cost, dental health service, dental public dental

Exploring Oral Health Challenges for Oral Health Providers and Young Adults Living with Diabetes

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Introduction: Type 1 diabetes (T1D) poses unique challenges for Canadians, such as heightened oral health conditions leading to increased medical costs and poorer outcomes. The transitional period into young adulthood further exacerbates these risks. Despite its significance, limited research has investigated the impact of this transitional phase experience for both patients and oral health providers.

Objectives: This study aims to identify specific barriers specific barriers experience during young adulthood, in the hope to enhance care delivery and improve diabetes oral health management.

Methodology: This mixed-methods study comprised two phases: i) an online survey conducted through Western's Qualtrics platform, and ii) semi-structured interviews analyzed through thematic analysis. For patient's eligibility included to be living with T1D and aged between 19 and 34 years, and for providers they had to be certified oral health providers who treated T1D or T2D patients.

Results: Sixty-eight patients responded to the survey, yielding no statistically significant data. In semi-structured interviews, ten patients and five providers participated. Through thematic analysis, patient themes included: i) the cost of dental treatment and insurance status, ii) the dental provider relationship and fear of treatment, iii) the presence of previous or co-existing oral health conditions, and iv) the lack of diabetes oral health education and resources. For oral health providers, themes included: i) limited number of T1D-specific patients, ii) the cost of treatment or insurance status, iii) unawareness of a transition period, and iv) limited educational resources.

Conclusions: This pioneering investigation sheds light on T1D experiences and challenges faced by both patients and oral health providers. Our results offer valuable insights into areas requiring attention and intervention to enhance diabetes oral experiences. Stakeholders can use these findings to implement targeted support systems and educational resources to support during this critical life stage.

Enhancing Orthodontic Treatment Predictability With Low-Intensity Pulsed Ultrasound (LIPUS)

Authors' names: Tarek El-Bialy, Mohsen Gholizadeh*

*Presenter

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Introduction: Clear aligner therapy (CAT) often faces challenges in treatment predictability. This study evaluates the impact of Low-intensity pulsed ultrasound (LIPUS) on enhancing treatment predictability in CAT, using the American Board of Orthodontics (ABO) difficulty index.

Objectives: To investigate the effect of LIPUS on treatment duration, number of refinements, and aligners used in CAT, with patients categorized into mild, moderate, complex, and very complex based on the ABO difficulty index.

Methodology: A retrospective analysis was conducted on 68 patients treated with LIPUS in conjunction with Invisalign aligners (34 patients) and compared to a control group (34 patients). Patients were divided based on complexity into mild, moderate, complex, and very complex categories. Key metrics included treatment duration, number of refinements, and aligners used.

Results: In mild and moderate cases, LIPUS significantly reduced treatment duration (mean reduction from 1100.94 to 496.88 days, $p < 0.001$) and the number of refinements (mean reduction from 3.75 to 2.38, $p < 0.01$). For complex and very complex cases, LIPUS led to a reduction in treatment duration (mean reduction from 843.83 to 587.17 days, $p = 0.02$), though the impact on refinements and tray usage was less pronounced.

Conclusions: LIPUS appears to significantly enhance treatment efficiency in mild and moderate cases of CAT, as indicated by reduced treatment durations and refinements. Its impact in complex cases, while positive, is less pronounced. This study contributes to the understanding of LIPUS as a non-invasive method to improve orthodontic treatment predictability, particularly in less complex cases, potentially influencing future CAT protocols.

Key words: Orthodontics, LIPUS

Funding Source: This research was supported by the Mitacs Accelerate Research award (Grant Number: IT34654).

Dental Education in Nursing Schools: A Pan-Canadian Study

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Introduction: Nursing schools often do not implement dental curricula into their program due to a repetitive cycle of non-implementation, and as such, there is a minimal understanding of dental and oral health in the nursing field. This study seeks to evaluate the understanding of dental and oral health in the nursing field.

Objectives: The aim of this study is to gather data on Canadian nursing programs regarding dental curriculum and attitudes towards dental curriculum to provide a reference for understanding dental and oral health education in the nursing field.

Methodology: A web-based questionnaire was distributed electronically to the head educators/directors of the nursing programs across Canada. Questions were categorized into six categories: background information about the institution, dental curriculum, knowledge about dental and oral health, personal confidence about different dental aspects, graduate knowledge about dental curriculum, and dental curriculum implementations. Data was initially analyzed individually and then analyzed on a pan-Canadian level.

Results: A total of 36 instructors from 27 Canadian dental schools filled the survey so far. In 91.7% of answers, dental trauma education was not included in the nursing curriculum. Only 25.1% of survey takers reported having a confidence level of over 6 (medium knowledge) in oral cancer knowledge, and only 14% of survey takers noted nursing graduates having over 6 (medium knowledge) about oral cancers. However, 83.3% of survey takers noted that oral and dental curricula should be an aspect of the nursing curriculum.

Conclusions: Minimal curriculum regarding oral and dental health is taught among Canadian nursing schools Additional curriculum and unification between Canadian nursing schools could result in an enhanced understanding of health concerns regarding oral and dental health in the general population.

Key words: Curriculum, Nursing, Oral health

Epigenetic clocks, oral health, and the role of adverse childhood experiences

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Introduction: Epigenetic clocks have become a hallmark for quantifying biological age. Adverse childhood experiences (ACEs) have been suggested to accelerate biological/epigenetic aging.

Objectives: To characterize four epigenetic clocks (Horvath, Hannum, GrimAge, PhenoAge) in relation to oral health, and the extent to which these associations may differ by ACEs scores.

Methodology: We retrieved data from baseline and 3-year follow-up waves from the Comprehensive Cohort of the Canadian Longitudinal Study on Aging (CLSA) (n= 1,445, 45-85 years old). Self-reported oral health (SROH) and ACEs were assessed using a validated self-reported questionnaire. DNA methylation was used to derive epigenetic age, and epigenetic age acceleration (ΔClockAge) was computed by regressing each epigenetic age estimate on
chronological age, as previously established. Associations between each ΔClockAge with SROH at each timepoint, stratified by ACEs scores were estimated using ordinary least squares regression, adjusting for sex, socioeconomic position, smoking, and alcohol consumption.

Results: ΔGrimAge was associated with poor SROH at baseline (OR=1.08, 95% CI 1.05, 1.11). At 3-year follow-up, ΔGrimAge and ΔHannum were associated with poor SROH (OR=1.06, 95% CI 1.03, 1.09; OR=1.03, 95% CI 1.00, 1.05, respectively. Individuals with the highest ACEs score (5+) exhibited a stronger association between ΔGrimAge and SROH at baseline (OR=1.14, 95% CI: 1.01, 1.29) and ΔHannum and SROH at 3-year follow-up (OR=1.11, 95% CI: 1.01, 1.22) than those with lower ACEs score.

Conclusions: Accelerated epigenetic aging may associate with poor SROH. ACEs may further accentuate this relationship.

Key words: Burnout, adverse childhood experiences, epigenetic clock

Minimally Invasive Endodontic Protocol: An Assessment of Treatment Outcome

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Introduction: This multicenter retrospective analysis aims to compare the treatment outcomes of conventional endodontic treatment utilizing syringe needle irrigation with sonic active (CI/NI), with the more conservative minimally instrumented endodontic treatment combined with multisonic enhanced irrigation (MI/EI).

Objectives: The study addresses the limited research in this area and aims to optimize treatment protocols.

Methodology: 116 out of 1152 teeth treated by two endodontists in the province of British Columbia were consented and selected retrospectively according to the inclusion criteria. Teeth with obvious signs of periapical pathosis were treated utilizing either MI/EI or CI/NI and obturated using single cone and bioceramics sealers. Teeth were evaluated clinically and radiographically at 12-36 months.

Results: At 12-month, 92.3% of MI/EI and 84% of CI/NI cases exhibited healed or healing. MI/EI showed a statistically significant reduction in post-operative pain compared to CI/NI. However, at 36 months, success rates decreased to 89.1% for MI/EI and 74.4% for CI/NI. Furthermore, the apical surgery rate was 7.8% when MI/EI was used, which was statistically less compared to CI/NI group (16.7%). Multivariate logistic regression showed that the size of the lesion pre-operatively was the main determinant of the outcome, with a reverse relationship.

Conclusions: This study highlights the importance of optimizing irrigation techniques to achieve favourable results with a minimal instrumentation protocol. Utilizing enhanced multisonic irrigation device in conjunction with the minimally instrumented endodontic protocol yielded more successful treatment outcomes and reduced post-operative pain.

Key words: Minimally invasive endodontics, Detin Preservation, Advanced Irrigation, GentleWave

CBCT Usage in Undergraduate Dentistry Endodontics

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Introduction: Cone-beam computed tomography (CBCT) has progressively helped advance the field of endodontics by enhancing the evaluation of dental structures, diagnosis in traumatology and surgical planning.

Objectives: This study aims to analyze and describe the CBCT scans that were acquired in the undergraduate doctor of dental surgery program in the discipline of endodontics, their outcomes, possible changes in the treatment plan, and alignment with the current guidelines.

Methodology: Cross-sectional retrospective study done by using AxiUm dental software to extract data related to CBCT findings and information on the final diagnosis and treatment of an endodontic case. 'Cases' identified as scans that were acquired as part of an endodontic diagnosis or treatment (N=182). Parameters include: Patient sex, age, CBCT machine, resolution, FOV, tooth, reason for CBCT, previous 2D image, diagnosis prior to CBCT, outcome of the CBCT involving change in diagnosis, new findings and changes in treatment planning.

Results: Data was composed in an excel spreadsheet, quantitative analysis and descriptive analysis was completed. The demographics of patients with completed CBCT requisition had a mean age of 68.5 years and majority female (56.3%). Post CBCT imaging there was a change in 17.03% of periapical diagnosis. The most common new finding on CBCT was identification and confirmation of tooth pathology (18.9%), pathological origin (20.8%), changes in lesion size (14.1%), and confirmation of fractures (16.0%). The majority of patients (59%) had a change in treatment planning after CBCT requisition.

Conclusions: This study provides data showing how much supplementary CBCT imaging is influencing the final outcome and definitive treatment plan of endodontic cases at the pre-doctoral level. This knowledge will be used to improve the teaching of endodontic diagnosis in the disciplines of endodontics and radiology.

Key words: CBCT, Endodontics

Ultrasound and Emdogain Reduce Root Resorption in Amex Knockout Mice

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Introduction: In amelogenesis imperfecta (AI) affected patients, mutations are found in the amelogenin gene. Inactivation of amelogenin in 6-12 month-old mice has led to increased tooth root resorption.

Objectives: The objective of this study was to determine whether local injection of Emdogain (EMD) and low intensity pulsed ultrasound (LIPUS) application to the jaw have a synergistic effect on the regeneration of root resorption (RR) in Amelogenin knockout (AMEX) mice; the ideal model representing AI.

Methodology: 18 AMEX and 20 wildtype mice were divided into 4 groups (2 groups of wildtype mice and AMEX mice respectively). LIPUS and /or EMD was applied to the right maxillary region of treated mice for 20 minutes for 28 consecutive days. In EMD treated mice, 30-µL of Emdogain was injected in the right maxillary region. Left maxillary region was a control. After 4 weeks, mice were euthanized. RR was measured in the molars of all mice using MicroCT analysis. Total root resorption volumes were calculated and compared between groups using statistical tests.

Results: Minimum RR was observed in the right molars of the AMEX+EMD+LIPUS group (0.00065 mm^3 ± 0.00075 (SD) ($p<0.05$). The maximum RR was found in the left maxilla of the Wild+EMD+LIPUS group (0.00467 mm^3 ± 0.0073 (SD)). There was a significant difference in the RR volume between these two groups ($p =0.02$).

Conclusions: Based on the study, it can be concluded that EMD and LIPUS can minimize RR in AMEX knockout mice. Future studies to explain the mechanism of action of EMD and LIPUS in minimizing RR in AMEX mice are needed. This modality may be helpful in the future for patients with Amelogenesis Imperfecta.

Key words: Ultrasound, amelogenesis imperfecta

COVID-19-associated Anxiety among Trainees and Employees in Canadian Dental Schools

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Introduction: The COVID-19 pandemic significantly impacted the mental health of people from various backgrounds. However, we know little about the pandemic's psychological impacts on people in Canadian dental schools.

Objectives: We aimed to a) characterize COVID-19-associated Anxiety (C19A) in trainees (undergraduate and graduate students and residents) and employees (faculty and staff) across Canadian dental schools from April-2021 to April-2022; b) compare anxiety levels between trainees and employees.

Methodology: This was a one-year prospective cohort study with 600 participants from all 10 Canadian dental schools. Monthly questionnaires included demographics, roles, dental care provision, chronic conditions, vaccination doses, province location, and C19A. C19A was measured using a validated COVID-19 Anxiety Syndrome Scale (C19ASS), which has domains with scores: avoidance (0-12) and perseverance (0-24), with increased scores indicating higher anxiety. Following descriptive analyses, we used a linear mixed-effects (LME) model to assess the differences in anxiety among students and employees.

Results: We had 66.8% females, 53% trainees, 30% academic staff, and 17% support staff in our study. Baseline avoidance anxiety ratings were 7.3 (±3.2) for students and 6.1 (±3.6) for employees, decreasing to 2.6 (±3.0) and 3.5 (±3.5) by April 2022, respectively. Similarly, baseline perseverance anxiety ratings were 12.6 (±5.3) for students and 11.4 (±5.7) for employees, decreasing to 7.7 (±6.6) and 7.6 (±6.1), respectively. Females, participants with one vaccination dose, and those working in Ontario had higher avoidance and perseverance anxiety. LME revealed no significant differences in anxiety between trainees and employees over time.

Conclusions: C19A decreased over the one-year duration, with consistent trends across participant groups. No significant differences in anxiety levels between trainees and employees were observed. Understanding C19A among those studying and working in high-stress educational settings like dental schools will potentially promote the development of interventions to manage anxiety in this environment.

Key words: COVID-19 Anxiety, dental schools

Funding: COVID-19 Immunity Task Force

CAD/CAM vs Conventional Complete Dentures: A Systematic Review and Meta-Analysis

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Introduction: Computer-aided design and manufacturing (CAD/CAM) have been increasingly used to enhance the patient and clinician experiences with removable complete dentures (CDs). Yet, evidence from systematic reviews is lacking to validate the clinical significance of these digital prostheses.

Objectives: The purpose of this study was to compare CAD/CAM CDs with the traditional ones in terms of patient and clinician-reported outcomes, post-insertion adjustment visits, and costs.

Methodology: Four databases [Medline (Ovid), Embase, Scopus, and Cochrane CENTRAL] were searched to retrieve clinical studies comparing CAD/CAM and traditional CDs. Two independent reviewers screened the articles, extracted data and assessed the risk of bias. The following outcomes underwent meta-analysis (random-effects model): overall patient and clinician satisfaction, oral health-related quality of life (OHRQoL), number of post-insertion visits, as well as laboratory and total costs.

Results: The meta-analysis of 11 included studies revealed that CAD/CAM CDs are comparable to the traditional CDs in terms of overall patient satisfaction [pooled effect size (ES): -0.11; 95% confidence interval (CI), -1.15 to 0.93; I2=90%] and OHRQoL [ES: 0.10; 95% CI, -0.40 to 0.60; I2=32%]. Clinician-reported data depended on the manufacturing technique: whereas milled CDs performed better than traditional CDs in terms of clinician satisfaction and number of adjustments, 3D printed and traditional CDs were similar. Fabrication of CAD/CAM CDs required significantly less laboratory and overall costs than the traditional CDs.

Conclusions: There is some evidence showing that CAD/CAM CDs are at least comparable to traditional CDs. Further well-designed randomized clinical trials are needed to evaluate the performance of specific CAD/CAM approaches for manufacturing CDs, however.
This meta-analysis was the first to compare CAD/CAM and traditionally manufactured CDs in terms of overall patient and clinician satisfaction, and number of post-insertion adjustments, showing non-inferiority of the CAD/CAM technique.

Key words: digital technology, complete denture, patient-reported outcomes

Interactive Dashboard for CHMS Oral Health Data

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Introduction: Open access to large datasets like the Canadian Health Measure Survey (CHMS) enhances research transparency and collaboration. Yet, the complexity of such data often overwhelms researchers, emphasizing the need for effective metadata exploration tools.

Objectives: To develop an accessible web dashboard enabling users to visually explore and understand the CHMS Cycle 1 oral health data, promoting data transparency and research reproducibility.

Methodology: Using the CHMS Cycle 1 oral health Public Use Microdata File (PUMF), which encompasses 307 variables from 5,604 participants across 15 communities, we're creating an interactive R and Quarto-based dashboard. This dashboard will be hosted on the Digital Research Alliance of Canada's cloud, ensuring wide accessibility under an open access license.

Results: The project's initial phase has concluded with access to the PUMF, data cleansing, and the preparation of web application prototypes. The final web dashboard, to be showcased at the project presentation, promises to significantly improve the usability of CHMS oral health data.

Conclusions: The envisioned dashboard is vital for CHMS data exploration, fostering collaboration, and enhancing PUMF utilization. It will bridge the gap between CHMS-PUMF raw data and actionable insights, contributing to the Canadian oral health research plan.

Key words: CHMS-Cycle1, Dashboards, Oral Health Data, Open Access, Data Visualization

Burnout in Oral Health Students

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Introduction: Burnout is a psychological syndrome resulting from prolonged stress. It may reduce. students' motivation and affect their academic performance.

Objectives: To investigate feelings of burnout in oral health students and identify factors that predict burnout.

Methodology: This cross-sectional study was conducted with dental and dental hygiene students at Dalhousie University. Data were collected on a) burnout using the Maslach Burnout Inventory General Survey for Students (MBI-GS(S)); b) stress using the Perceived Stress Scale (PSS); and c) sociodemographic status. The MBI-GS(S) includes three domains: emotional exhaustion (EE, i.e., feelings of exhaustion, scores 0-30)), cynicism (CY, i.e., feelings of indifference, scores 0-30), and academic efficacy (AE, i.e., feelings of effectiveness at work, scores 0-36). Higher scores for EE and CY and lower scores for AE suggest burnout. PSS scores range from 0-40; scores 0-13 indicate low stress, 14-26 moderate stress, and 27-40 high stress. The data analyzed included calculating frequencies for the categorical variables, calculating means and standard deviations (SD) for the MBI-GS(s) by domains and PSS, and performing regression analyses to investigate which factors predicted burnout.

Results: Of the 108 (n=242) who completed the survey; 73% were females, 51% were 23 to 26 years, and 57% were pursuing a DDS program. Mean (SD) scores for EE and CY were 21.87(±5.64) and 12.16(±6.61), respectively. The mean scores for AE and PSS were 21.87(±4.73) and 21.26(±6.08), respectively. About 19% experienced high stress, and 69% had moderate stress. Regression analyses showed that PSS significantly impacted EE and CY (p=0.027) but not AE. Program, program year, sex, and age were not associated with outcome.

Conclusions: Our results indicate oral health students experience stress and burnout, which may affect their academic success and patient care. Recommendations include targeting their education programs to initiate stress management training at the onset of students' education.

Key words: Burnout, perceived stress, dental students, dental hygiene students

Dental Trauma Education in North America Dental Schools: Educators' Survey

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Introduction: The extent of education regarding dental trauma (DT) at the predoctoral level within dental schools around the world is believed to be diverse, spread among multiple disciplines, and largely unknown. The lack of knowledge regarding the training delivered in dental schools could be a potential cause for knowledge deficiencies in treatment delivered by dental professionals.

Objectives: This study aims to analyze and depict the current predoctoral DT curriculum among North American dental schools, in an effort to refine and consolidate the education system.

Methodology: An interview was conducted over a scheduled meeting with DT Instructors and curriculum coordinators from dental schools in North America. An expert validated questionnaire was designed and categorized into three sections, investigating: DT curriculum, students' assessments, and clinical exposure, provided to students during their predoctoral studies.

Results: Of the 108 (n=242) who completed the survey; 73% were females, 51% were 23 to 26 years, and 57% were pursuing a DDS program. Mean (SD) scores for EE and CY were 21.87(±5.64) and 12.16(±6.61), respectively. The mean scores for AE and PSS were 21.87(±4.73) and 21.26(±6.08), respectively. About 19% experienced high stress, and 69% had moderate stress. Regression analyses showed that PSS significantly impacted EE and CY (p=0.027) but not AE. Program, program year, sex, and age were not associated with outcome. Only three schools reported testing students following the completion of their DT course, and only one university conducted a final examination dedicated separately to DT. All instructors reported a lack of ample exposure to trauma cases during clinical rotations.

Conclusions: Many deficiencies exist in teaching DT among North American universities. Due to low clinical exposure, students might be underprepared to clinically handle trauma cases. Furthermore, the lack of unification in the curriculum creates confusion among students. Additional clinical exposure along with unification within, and between, dental schools could result in a more coherent and a better presented DT curriculum. Results from this study could provide rationale and knowledge to refine and consolidate the DT education for improved patients' care.

Key words: ankylosis; avulsion; fracture; teaching; tooth loss.

Intraoral Ultrasound for the Assessment of Gingival Biotype

Authors' names: Jhoyli Labrador-Stacey, Monica Gibson, Paul W. Major, Khaled Altabtbaei, Fabiana T Almeida.

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Introduction: Assessment of periodontal parameters such as gingival thickness are relevant during diagnosis and treatment planning in both periodontics and orthodontics. Thin and thick periodontal biotypes respond differently to inflammation, restorative trauma and surgical insult.

Objectives: To compare US measurements to probe visibility and visual assessment methods.

Methodology: 30 patients from the graduate periodontics and orthodontics clinic at the University of Alberta will be recruited. A 20MHz handheld intraoral ultrasound transducer will be used to scan maxillary and mandibular incisors for gingival thickness evaluation. US measurements will be compared to the probe visibility method will be used as the gold standard to compare ultrasound measurements.

Results: this is an ongoing study.

Can Dental Care Improve Chronic Disease Outcomes? A Systematic Review

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Introduction: Despite varying evidence, the discussion on whether the provision of dental care can reduce the burden of systemic non-communicable chronic diseases (NCDs) continues to be of growing interest to clinical practice and policy.

Objectives: To systematically map the evidence on the impact of the provision of dental care on select NCDs, based on their prevalence according to Public Health Agency of Canada.

Methodology: We used Medline, Embase, and Cochrane databases to included studies in adults that examined changes in NCDs and related outcomes following an oral health intervention, available for full-text review and published in English from 2012 to 2024. These comprised clinical or behavioural interventions or a combination of both. The five groups of NCDs included cardiovascular diseases, cancer, diabetes, respiratory diseases, and mental disorders.

Results: A total of 33 papers met the inclusion criteria. Study designs included cohort studies, and clinical trials. Out of these, 13 studies employed clinical interventions with preventative or therapeutic purposes such as periodontal scaling and root planning, while 4 studies employed a behavioural change intervention such as providing oral hygiene instructions, and 16 studies combined both. Changes in outcomes were assessed using the incidence of disease events, episodes of exacerbations, biomarker levels, and health care costs associated with the chronic condition. Most studies showed clinical interventions to positively contribute to mitigating the risk of the selected NCDs.

Conclusions: Oral health interventions may mitigate the risk of non-communicable chronic diseases. However, various methodological considerations should be accounted for.

Key words: Dental care, Non-communicable chronic diseases

Sub-Optimal Oral Health, Multimorbidity and Access to Dental Care

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Introduction: Mounting research has linked sub-optimal oral health with multimorbidity (MM), or the co-existence of multiple chronic conditions. Meanwhile, emerging Canadian oral health care policies prompt investigations into the potential of access to dental care to mitigate MM.

Objectives: To assess the extent of the association between sub-optimal oral health and MM and whether access to dental care can modify this association.

Methodology: We conducted a cross-sectional analysis using data from the Canadian Longitudinal Study on Aging (CLSA) (n=44,815, 45-84 years old). Edentulism, self-reported oral health (SROH), and other oral health problems (e.g., toothache, bleeding gums), were used as indicators of sub-optimal oral health. MM was defined according to the Public Health Agency of Canada as having 2 or more chronic conditions out of cancer, cardiovascular diseases,
chronic respiratory diseases, diabetes, and mental illnesses. Variables for access to dental care included: (i) dental visits within the past year, (ii) availability of dental insurance, and (iii) cost barriers to dental care. We constructed robust Poisson regression models to estimate the association between sub-optimal oral health and MM and then assessed the effect measure modification by indicators of access to dental care on both multiplicative and additive scale.

Results: Indicators of sub-optimal oral health were significantly associated with MM (edentulism PR 1.17, 95%CI 1.08, 1.27; poor SROH PR 1.44, 95%CI 1.33, 1.54; other oral health problems PR 1.52, 95%CI 1.44, 1.78). The magnitude of this association was higher in individuals who reported fewer dental visits within the past year, lacked dental insurance, and those who avoided dental care due to costs.

Conclusions: The association between sub-optimal oral health and MM may be exacerbated by barriers to accessing to dental care. Policies aiming to enhance access to dental care may help mitigate MM in middle-aged and older Canadians with sub-optimal oral health.

Key words: Multimorbidity, Access to dental care

A Meta-Analysis of Surgical and Nonsurgical Treatments for Gingival Smile

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Introduction: Various surgical (SX) and nonsurgical (NSX) treatments for correction of excessive gingival display (EGD) have been proposed. Dental and medical specialists are among the professionals diagnosing and offering treatment for EGD, which reflects the multidisciplinary approach to this esthetic concern.

Objectives: To appraise the evidence on the effectiveness and stability of SX and NSX treatments for EGD.

Methodology: An electronic search was conducted for studies published between 2010 and 30 January 2023. The studies included adults with a complaint of EGD of more than 2 mm, undergoing SX or NSX treatments. The results were expressed as mean change in gingival display for SX and NSX treatments using random-effects model at 1-, 3-, 6-, and 12-month follow-up.

Results: Twenty-one studies reporting on a total of 633 patients were selected for the meta-analysis. At 1-month post-treatment, SX and NSX treatments yielded a comparable mean reduction of 3.50 mm (2.13–4.86) and 3.43 mm (2.67–4.19) in gingival display, respectively. However, by 6 months, NSX treatments exhibited a reduction of 0.51 mm (0.23–0.79) compared to 2.86 mm (2.06–3.65) with SX treatments.

Conclusions: In the short term, surgical and nonsurgical treatments provide a similar clinical outcome in EGD reduction. SX outcomes remained stable at 6 and 12 months, while the NSX outcomes partially relapsed at 6 months and returned to baseline at 12 months. Notably, NSX treatments were more effective in cases with mild initial EGD, while SX treatments showed a better outcome in severe cases. In light of rising clinician interest and patient demand regarding treatment of EGD, this systematic review provides quantifiable results, evidence-based indications and insights for future studies on these treatments.

Key words: smile esthetics, gingival smile

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Understanding Dental Students' Well-being: Challenges, Support Needs, and Practice Implications

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Introduction: The education and practice of oral healthcare can challenge the individuals' health and well-being. Such challenges often stem during preparation programs, persist, and sometimes grow in complexity and severity as students become practitioners. If left unaddressed, these challenges may impact the dentists' quality of life and the community at large, as they may lead to errors in treatment.

Objectives: This study aims to identify the challenges experienced by oral health sciences students and propose recommendations to students' and practitioners' health and well-being, and consequently, protect the public.

Methodology: A case study approach was used. Data was collected via semi-structured interviews and focus groups with 68 dental and dental hygiene students at the University of British Columbia between 2021 and 2023. Data was thematically analysed. Data from 24 first-year dental students who were surveyed in 2012/2013 was utilized for triangulation.

Results: Three well-being challenges emerged: lack of opportunities for practicing clinical and hands-on activities, lack of students' safety in the learning environment, and lack of students' engagement in the decision-making processes. Consequently, three well-being concerns have emerged: anger, fear of failure, and uncertainty of competency. Three recommendations were identified to support students' well-being: Clinical instructors' capacity building to create a culture of respect, trust, and inclusivity, particularly for minority and women students, and maximizing practice opportunities to bolster students' confidence. The third recommendation is transparent leadership process that involves students as partners in their education and encourages them to actively engage with their communities and organizations as practitioners.

Conclusions: While dental students experience many challenges, this study highlights several recommendations to support their well-being, which can be implemented and evaluated. Future interventions should center students, leadership personnel, and clinician instructors as the main factors that contribute to students' well-being domains.

Key words: Well-being, Oral Health Sciences Students, Clinical education

Cessation of Smoking and Alcohol Consumption Among Oral Cancer Patients

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Introduction: The association between tobacco smoking and alcohol consumption and the risk of oral cancer is very well established. However, little data is available on patient compliance with long-term tobacco smoking and alcohol cessation and associated factors.

Objectives: The main purpose is to describe the changes in alcohol and tobacco consumption in patients treated for oral cancer, between diagnosis and 4 years later.

Methodology: A descriptive study was performed from a retrospective cohort of patients who received surgery for a primary oral cancer resection at McGill University Health Centre (MUHC) Oral and Maxillofacial Surgery (OFMS) department between 2018-2019. Patients' health care records have been reviewed to collect data on participants' sociodemographic, smoking and alcohol consumption behaviors at diagnosis and at 4 years postsurgery. The calculations were made at diagnosis and at 4 years follow-up: proportions of smokers and alcohol drinkers, the median alcohol beverages and packs years of cigarettes consumed, the changes in smoking and alcohol consumption status, the recurrence rate by smoking and alcohol consumption habits at diagnosis.

Results: A total of 82 patients were referred for oral cancer to the MUHC OMFS department, including 39 males and 43 females. McNemar's tests determined that there was a statistically significant difference in the proportion of smokers and drinkers at diagnosis and at 4 years posttreatment ($p < 0,005$).

Conclusions: Our study goal is to provide health care providers with data on smoking and alcohol consumption among patients with oral cancer at long term after treatment and identify factors related to behavioral changes. This can further help in identifying treatment targets and facilitating better habits and in tailoring preventive strategies to prevent cancer recurrence.

Key words: oral cancer, tobacco and alcohol cessation, oral cancer survivors

Parents Understanding about Interim Canada Dental Benefit – An Evaluation

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Introduction: Learn about parents/caregivers' views and experiences with the Interim Canada Dental Benefit (CDB) for children < 12 years.

Objectives: This study assessed the parental/caregiver perspective and their awareness about CDB.

Methodology: A cross-sectional survey of parents/caregivers with children <12 years of age in Manitoba who met the eligibility criteria for CDB. Data were collected through an interviewer administered questionnaire via phone/in person/zoom from May to December 2023 and was analysed using NCSS-2023 version.

Results: A total of 125 parents/caregivers participated in the study out of which 109(88.6%) of the families were from Winnipeg. The majority were mothers (72.8%) mostly of African origin (41%). Most respondents, 106(84.80%), had heard about Interim CDB. Overall, 40% agreed that they had adequate information about the benefit. 54.4% parents have not visited the Government of Canada website for more information and only 51.2% of the parents from the ones who visited felt the information was clear. Overall, 25% of the parents learnt about the program from the dental offices. Majority of the respondents 86(69.3%) agreed that the dental office staff was helpful and knowledgeable about CDB, while 15.3% disagreed. Majority of the respondents would like to get more information about CDB in future from social media (20%) followed by schools/daycare (18%) and dental offices (17%).

Conclusions: The preliminary results show majority of the parents/caregivers were aware of the CDB although the eligibility requirements were not as clear amongst parents/caregivers. They have received information from the dental offices and would like to see/get more information on social media in future. The study identifies gaps in the dissemination and clarity of the eligibility criteria of CDB to the end-users which are parents /caregivers', that needs to be addressed in future.

Key words: Interim Canada Dental Benefit (CDB), Parents/Caregivers.

Funding Source: University of Manitoba

Challenges in Oral Care for Personal Care Home Dwelling Seniors

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Introduction: This study addresses oral care in seniors residing in Personal Care homes in Winnipeg, Manitoba.

Objectives: The primary aim of this study was to evaluate the state of oral health among the visited Personal care homes and understand the potential benefits of systematic oral health assessments.

Methodology: From September to December 2023, comprehensive oral health screening was conducted by a single provider on 200 seniors across eight personal care homes. A Canadian Oral Health screening tool for seniors focused on new patients and those not assessed in over a year. The data encapsulated various aspects of oral health, including the condition of soft and hard tissues, saliva, dentures, oral hygiene, pain, cognitive status and social interactions.

Results: A total of 244 patients were screened. Overall, 47.5% had missing teeth while 31.6% had dental prosthesis. Mild to moderate abnormalities were noted for gums and palate (33.2%), teeth structure (38.5%), and saliva (35.3%) which can signify seniors experiencing issues associated with dry mouth. Severe abnormalities were found in many participants: teeth structure (31.1%), and hygiene of teeth and dental prosthesis (52.9%). Fortunately, 79.5% had no signs of dental pain, 74.6% had normal lips, and 75.5% with normal cheeks and lips mucosa. A greater percentage of seniors have higher risk for poor oral health associated with their cognitive status and social interactions. Of the total participants, 35.7% needed to be prompted to perform daily mouth care while 24.6% were dependent on others for daily mouth care. Lastly, seniors were more frequently referred to both dentist and dental hygienist (49.2%) than being only referred to the dentist (8.2%) or dental hygienist (25.4%). The most common consultations advised for patients were oral hygiene care (27.5%), restoration (25.0%), and extraction (21.7%).

Conclusions: The study provides a snapshot of the oral health status of residents in the LTCs and identifies the type of required dental care. This highlights the unique challenges the elderly face in maintaining oral hygiene, including dental and root caries and lack of support at the PCHs to maintain oral health care. The study highlights the importance of improving access to care for residents in LTCs and underscores the importance of regular screenings, improved funding for personal care homes, and targeted care strategies to improve patients' oral health and overall quality of life.

Key words: Oral Health, Long-term care, Seniors, Access, Dental Caries, Manitoba, Canada

A Meta-Analysis of Teledentistry Clinical and Cost Effectiveness

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Introduction: Teledentistry has emerged as a solution to strengthen healthcare systems in enhancing access to care, offering benefits at micro, meso, and macro levels. However, its widespread implementation faces barriers, including limited evidence and, consequently, a lack of knowledge regarding its effectiveness.

Objectives: We aim to explore cost savings and clinical outcomes associated with teledentistry application from patients', dental healthcare providers'(DHCPs), and healthcare systems' perspectives. We will estimate the magnitudes of effects across studies and examine variations in patterns.

Methodology: A meta-analysis will search for information in MEDLINE (Ovid), Embase, PsycInfo, Cochrane Library, and CINAHL databases. Utilizing the PICOTS framework, we will compare teledentistry (intervention) to conventional care (comparator) for primary (clinical/disease-oriented) and secondary (cost-effectiveness) outcomes. Quantitative and mixed-methods studies, regardless of language, publication date, or study design, will be included. Two independent reviewers will conduct screening, study selection, and data extraction. Pooled estimates for relevant effect measures will be computed, and complementary analyses (meta-regression, sensitivity analyses, and subgroup analysis) will be performed. The Cochrane Risk of Bias tool and GRADE methodology will assess the study's quality and overall evidence.

Results: We will identify the overall effect of teledentistry compared to conventional face-to-face oral health care. Complementary analyses will provide insights into the diverse effects of teledentistry on oral health outcomes. Teledentistry is anticipated to show financial benefits to all stakeholders (patients, DHCPs, and healthcare systems).

Conclusions: The study is expected to conclude that teledentistry effectively addresses gaps in oral healthcare access while demonstrating effectiveness in terms of costs and clinical outcomes. This meta-analysis will be the first of its kind offering numerical evidence to demonstrate teledentistry's effectiveness. The results will inform stakeholders, policymakers, and practitioners about the benefits of integrating teledentistry into oral healthcare practices.

Key words: effectiveness; teledentistry

Safety of Botulinum Toxin (A) Use in Managing Temporomandibular Disorders.

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Introduction: Botulinum Toxin (A) (BTX) is being used for various cosmetic and therapeutic reasons including painful temporomandibular disorders (TMDs). Injection of BTX in animal models indicate that it causes changes to the local environment, particularly bone structures but also vascularity and muscles. Whether these changes can pose harmful risk to individual's oral health is yet to be determined.

Objectives: Use meta-analytic data to implement an observational study for cohort with TMDs to observe effect of toxin on local temporomandibular joint area.

Methodology: Comprehensive search of 3 databases retrieved 934 articles. Following screening, 6 articles quantitatively describing changes in mandibular bone structure after BTX injection in masseter and/or temporalis muscles in humans were included. Meta-analysis was conducted using random effects model. Subsequently, power analysis was used to quantify sample sizes for future study. Use of other imaging techniques were explored for implementation and IRB approval was attained.

Results: For humans, 96% of all participants being females 27 – 55 years of age with majority TMD diagnosed. BTX doses varied from 50-240 BTX units for human participants. Meta-analysis of data revealed significantly decreased cortical thickness of mandibular regions following BTX. Using power analysis calculations, we predict that recruiting 50 individuals can confirm this meta-analytic observation. Additionally, using established protocols to measure muscle activity, and vascular flow can shed light on changes in other issues. These reliable, non-invasive methods include surface electromyography and ultrasound.

Conclusions: Current literature suggests a detrimental effect of BTX on bone of the mandible as well as reduction in muscle activity. Using non-invasive imaging techniques can help identify spatio-temporal changes in physiological issues. Given that BTX action is reversible and requires additional injections, implementing studies that map the response of issues to BTX can help mitigate predictable changes.

Key words: Botulinum Toxin, Temporomandibular disorders

Mechanical Properties of Composite Core Build-Up Materials – A Comparative Study

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Introduction: To provide insightful information for the effective selection of core build-up materials based on their mechanical properties.

Objectives: To compare the mechanical properties of dedicated core build-up materials and bulk-fill resin composites as restorative options for core build-up materials.

Methodology: The flexural modulus (FM), flexural strength (FS), modulus of resilience (R), water sorption (WS), and solubility (SO) were evaluated for three dual-cure resins: CosmeCore DC Automix (Cosmedent), Clearfil DC Core Plus (Kuraray), and MultiCore Flow (Ivoclar Vivadent) and two bulk-fill resin composites (Filtek One Bulk Fill Restorative and Filtek Bulk Fill Flowable from 3M ESPE). Additionally, a control group consisted of a conventional resin composite Filtek Supreme Ultra (3M ESPE). All tests were conducted according to ISO 4049. For mechanical properties, beam-shaped specimens (25 mm x 2 mm x 2 mm, n=12) were fabricated and subjected to three-point bending using an Instron machine. WS and SO were determined for disc-shaped samples (15 mm x 1 mm, n=5) by desiccation. Samples were weighed until a constant mass (m1) was achieved, followed by immersion in deionized water to calculate WS (m2). Subsequent desiccation yielded m3. Data were statistically analyzed using one-way ANOVA and Tukey post-hoc tests ($p < 0.05$).

Results: CosmeCore DC Automix exhibited the highest FS, while Filtek Bulk Fill Flowable displayed the lowest FM and highest R, respectively. Filtek Supreme Ultra demonstrated the lowest value for both FS and R. Filtek Supreme Ultra showed the highest value for WS and CosmeCore DC Automix the lowest. No significant differences in SO across all groups were found.

Conclusions: The evaluated materials exhibited variations in mechanical and physical properties, with implications for their clinical applicability in core build-up procedures.

Key words: Mechanical Properties, Core Build-Up Materials

Citizen Science for Oral Health Advancement: A Scoping Review

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Introduction: Citizen science is a relatively new approach of recruiting public help to advance legacy data findings and curation. Recent shifts in scientific methodology have been promoting this kind of work across all scientific fields. Previously, my lab applied these principles to physiological spaceflight research, currently producing a large-scale meta-analysis of ~20,000 articles. By engaging citizen scientists, we reduced the screening time for analysis by a factor of 12 times, accelerating the pace of research while providing people from underrepresented groups in STEM with the opportunity to engage in research and earn valuable experience.

Objectives: This project aims to extend this idea of citizen science into the field of oral health sciences, by identifying the areas of study where this technique can be effectively used. Future work will develop a citizen science protocol for these areas of study, promoting the engagement of the community in oral health sciences.

Methodology: As the oral health field is wide and consists of varying areas each with their own complexities, a scoping review of the literature is required to determine where the needs and applications are for citizen science in oral health sciences.

Results: Preliminary data shows that there is no specific area that consistently utilizes citizen science. Instead, this technique has feasible application in several areas, primarily oral health education, research, and policy, but some results also show beneficial clinical applications as well.

Conclusions: This scoping review will dissect the current status of community involvement in all aspects of oral health and pinpoint where citizen science methodologies will have the most impact. Citizen science will not only accelerate oral health research and improve care but also provide young professionals with unique educational opportunities to help grow the scientific field.

Key words: Citizen Science; Engagement

Indigeneity: A Strength-Based Approach to Oral Health of Indigenous Children

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Introduction: Constructs of Indigeneity (e.g., traditional language, participation in cultural events, sharing traditional foods) may be harnessed in oral health promotion programming. Indigeneity is a strength-based approach to oral health as language and traditional culture are positive social determinants of health (SDH) for First Nations Peoples.

Objectives: To determine if a relationship exists between constructs of Indigeneity and untreated caries in First Nations children in Manitoba and Ontario, controlling for selected demographics and SDH.

Methodology: Survey and clinical exam results were nested in a community-based participatory study. Predictor variables measured Indigeneity constructs derived from the First Nations Regional Health Survey. Outcome variables measured untreated caries using the dt index. Chi-Square tests were used to determine the statistical association between mother's Indigeneity and untreated decay in children. Logistic regression using a combination of direct and statistical procedures was used to control for confounders.

Results: Children's mean age was 3.4 (SD=1.1), and mean number of decayed teeth was 5.5 (SD=4.1). Three-quarters of the caregivers were biological mothers (n=108/157). A child's odds of having three or more decayed teeth are 59% less (OR=0.41, 95% CI 0.19-0.89, p=.02) if the mother's primary spoken language is a First Nations language. Speaking a First Nations language in daily life remained the most important factor associated with untreated decay after adjusting for child's age, mother's education level, food insecurity, self-perceived racism in the healthcare system, and other confounders (OR=0.341, 95% CI 0.13-0.91, p=.03).

Conclusions: Speaking a First Nation language is a powerful predictor that may be protective against dental caries. Indigeneity constructs may be harnessed as strength-based approaches to research and programming with First Nations children. Strength-based approaches to Indigenous health aligns with the goal of decolonizing dental public health practice.

Key words: Indigeneity, oral health

Acknowledgments: The researchers would like to thank the participants and community partners of the seven First Nations communities in Ontario and Manitoba that took part in the study. Funding was provided by the Canadian Institutes of Health Research (CIHR), Institute of Indigenous Peoples Health, for the Nishtam Niwiipitan (My First Teeth) Study led by Dr. Herenia P. Lawrence (CIHR-IIPH Grant No.: PI1-151324). Personal student funding was in part provided by the Canada Graduate Scholarship-Master's Program, and the International Federation of Dental Hygienists Research Grant Program.

Efficacy of Vital Pulp Therapy Strategies in Mature Teeth with Symptomatic Irreversible Pulpitis: A Systematic Review and Network Meta-Analysis

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Introduction: Deep caries with exposure of the dental pulp can progress to induce severe inflammation in the dental pulp, resulting in pain, pulp necrosis and periapical inflammation. In mature permanent teeth diagnosed with irreversible pulpitis the treatment of choice is pulpectomy and root canal treatment (RT).

Objectives: We conducted a systematic review and network meta-analysis to determine whether vital pulp therapy (VPT) is the clinically effective approach in treating mature permanent teeth with irreversible pulpitis and to identify the parameters involved in clinical decision making.

Methodology: We searched six databases from 1950 to July 2021 for randomized clinical trials (RCTs) of vital pulp therapy interventions in mature permanent teeth. Two reviewers performed title/abstract screening, full text review, and data extraction independently. The main outcomes were absence of clinical symptoms of spontaneous pain, tenderness to percussion or palpation, no radiographic evidence of periapical changes indicative of apical periodontitis and/or positive response to pulp sensibility tests.

Results: We found five RCTs (846 patients). Compared with RT, direct pulp capping (risk ratio [RR] 1.07, 95% credible interval [CI] 0.11-4.75), pulpotomy with MTA (RR 0.6, 95% CI 0.13-1.86), pulpotomy with other Bioceramic materials (RR 0.59, 95% CI 0.17-1.64), miniature pulpotomy (RR 0.98, 95% CI 0.10-4.19), pulpotomy with calcium hydroxide, (RR 2.62, 95% CI 0.21-12.27) may have no effect on main outcomes.

Conclusions: VPT can be an alternative treatment to RT in mature permanent teeth with irreversible pulpitis. However, pulpotomy with calcium hydroxide may not be the best treatment option for teeth with symptoms indicative of irreversible pulpitis.

What is essential or medically necessary oral health care?

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Introduction: Governments worldwide, including Canada, are now deliberating on how best to address oral health care within broader health care policy. A crucial aspect is determining the oral health care services that should be encompassed within a universal health care package.

Objectives: The objective of this document review is to explore the notion of essential or medically necessary oral health care as used by public and private agencies to date.

Methodology: This document review synthesizes targeted academic and grey literature that speaks to essential or medically necessary oral health care.

Results: Documents highlight varying conceptions of essential oral health care; variation that became more apparent during the COVID-19 pandemic, when organizations had to consider what services should be available to the population in a time of crisis. The documents point to the need for agreed-upon interventions to protect and promote oral health, and the importance of stakeholder alignment and consensus-building processes in identifying essential oral health care.

Conclusions: There is a need for clear and universally accepted concepts to ground or even define essential or medically necessary oral health care.

Key words: Essential oral health care, medically necessary, policy, stakeholder perspectives, resource allocation.

Catastrophic health expenditure in Canada and dental out-of-pocket payments– Methodological aspects

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Introduction: The World Health Organization has highlighted the relevance of monitoring the impact of dental out-of-pocket spending. Similarly, financial protection to dental out-of-pocket spending has been recognized by the Canadian Government as a pressing matter.

Objectives: To estimate the proportion of out-of-pocket spending on dental care among Canadians who have experienced catastrophic spending from 2010-2019.

Methodology: We examined the Canadian Survey of Household Spending from 2010 to 2019 and used the survey weights to provide precise national estimates. Data were analyzed separately by year and pooled cross-sections. We compared estimates of catastrophic spending using three different methods: the budget share approach; actual food spending; and normative spending on food, housing and utilities. These methods all consider the ratios between total out-of-pocket expenditure on healthcare services (medicines, health devices, outpatient, dental care, diagnostic/paramedical, inpatient) and household resources. The budget share approach considers total household income as the denominator, whereas the latter two methods deduct necessary expenditures from the denominator. We then applied the 10% and 40% thresholds commonly used to determine the catastrophic spending headcount. Among households facing catastrophic spending, we compared the proportion of out-of-pocket payments from the different healthcare services used and the distribution of this spending across household income quintiles.

Results: We estimate around 8.8 million to 72.5 million Canadians have experienced catastrophic health expenditures from 2010-2019, affecting around 2.8% to 23.3% of the Canadian population. Among those who experienced catastrophic health expenditure, we found dental care to be the second highest contributor to out-of-pocket spending. This finding was consistent across the three methods used. On average, dental care services comprised about three of every 10 out-of-pocket dollars spent on healthcare services.

Conclusions: Among Canadians who have experienced catastrophic health spending in the past decade, dental care is the second-highest contributor in terms of out-of-pocket spending.

Key words: Health Expenditures; Dental Care

Implementation of Motivational Interviewing Training in Dentistry: A Scoping Review

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Introduction: Motivational Interviewing (MI) is a counseling approach concerned with having conversations about change in which practitioners seek to strengthen a person's own motivation for change. MI offers a set of skills and processes to help practitioners make the desired progress and build trusting relationships with their patients/clients. Evidence shows that MI is an effective tool in behavior change in various fields, yet the scope of implementing it's training in dentistry has not yet been reviewed.

Objectives: This scoping review aims to assess the implementation of Motivational Interviewing training in dental education.

Methodology: We used the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist and the Joanna Briggs Institute updated manual for evidence synthesis in this review. A search strategy was developed using Medical Subject Headings (MeSH terms), keywords, truncations, and proximity operators, and was applied to search the following databases: Medline (Ovid), Embase (Ovid), CINAHL, PsycINFO (Ovid), Web of Science and ProQuest. Screening of the retrieved articles was done according to the defined inclusion/exclusion criteria. Two researchers conducted the screening using the screening software Covidence to assess interrater agreement. Currently, full text screening and data extraction is underway.

Key words: Motivational Interviewing, Dental Education

Zygomatic-implant Fixed Rehabilitation for the Atrophic Maxilla: A Network Meta-analysis

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Introduction: Zygomatic implant fixed rehabilitation (ZIFR) is a promising treatment for the atrophic edentulous maxilla. However, there is a knowledge gap in patient-reported outcomes (PRO).

Objectives: To evaluate effectiveness of ZIFR in comparison to other implant-supported fixed rehabilitation techniques with regard to PRO and clinical outcomes.

Methodology: A network meta-analysis (NMA) will be conducted to assess outcomes in a single analysis by combining direct evidence from clinical studies and indirect evidence from within the study network. An electronic search will be conducted in MEDLINE, EMBASE, and Cochrane Central Register of Controlled Trials. Randomized and non-randomized clinical trials comparing implant-supported fixed rehabilitation modalities in edentulous adults with atrophic maxilla will be included. Patient satisfaction is considered as primary outcome. Secondary outcomes include quality of life and clinical outcomes such as success and survival rates. Risk of bias will be assessed using Cochrane Risk-of-Bias tool and Risk of Bias In Non-randomized Studies–of Interventions. Pair-wise meta-analysis will be conducted, followed by NMA using a network plot. Transitivity and consistency of the network will be analyzed. Interventions will be ranked using surface under the cumulative ranking curve. Level of evidence will be assessed using GRADE.

Results: The electronic search yielded 1064 studies for screening. Title and abstract screening resulted in 76 studies for full-text screening. In the full-text screening, 10 articles were eligible for data extraction.

Conclusions: We expect to conclude that ZIFR could better satisfy patients suffering from atrophic maxilla with similar implant survival and success rates compared to other rehabilitation techniques. This study will be the first to assess effectiveness of ZIFR in atrophic maxilla using NMA. The evidence obtained will aid clinical decision-making and will advance the knowledge on rehabilitation techniques for atrophic maxilla.

Key words: Zygomatic implant rehabilitation, patient-reported outcomes

Fitness Assessment of RPD Frameworks Manufactured Using Selective Laser Melting

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Introduction: Additive manufacturing selective laser melting (AM/SLM) can be used to produce removable partial denture (RPD) frameworks (FW). This procedure minimizes production time and provides a more efficient and cost-effective approach.

Objectives: Compare the fitness accuracy of RPD/FW manufactured using AM/SLM technology to those made using the conventional lost wax/casting technique.

Methodology: Three RPD/FWs groups were fabricated. G1 was produced through digital designing and printing using AM/SLM. G2 was produced by the lost wax/casting method, and G3 was produced by scanning the wax-up and printing it as in G1. Six FWs were produced from each group. Micro-CT images were used to investigate the fitness of the frameworks by measuring the spaces under the FWs seated on the master casts at five specified locations. RPD fitness was checked using light-body polyvinyl siloxane materials (PVS). One-way ANOVA and Tukey HSD post hoc multiple comparisons tests were used to compare the mean scores for the spaces (mm) under the FWs using the PVS technique and Micro-CT images for the three FWs groups.

Results: All frameworks from the three tested groups were seated fittingly on the casts without rotation, rocking, or lateral movement. Statistical analysis showed there was no significant difference in the spaces underneath the FWs among the three tested groups with both methods: PVS and micro-CT images.

Conclusions: There is no significant difference in the fitness accuracy for the printed RPD/FWs compared to the ones produced by the conventional method.

Key words: RPD framework fitness, Selective laser melting, 3D printing, Additive manufacturing, Micro-CT.

Funding: the Deanship of Scientific Research at Princess Nourah Bint Abdulrahman University (Grant No. #251/S/39).

The Impact of RPD Components on Abutment Teeth Prognosis

Authors' names: A Singh, S Saadaldin*

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Introduction: With the growing need for RPD, more research is required to investigate abutment teeth' prognosis and improve the preservation of abutment teeth.

Objectives: This study aims to evaluate the abutment teeth and supporting tissues clinically before and after RPD placement and correlate these findings with the RPD components

Methodology: Patients were recruited from the Schulich and Dentistry dental clinic at Western University. The clinical parameters of the abutment teeth were evaluated: tooth mobility (TM), caries, defective restorations, tooth fracture, probing depth (PD), gingival recession (GR), bleeding on probing (BOP) and plaque index (PI). These clinical measurements were collected at the time of RPD insertion and a minimum of two years after RPD insertion. Clinical parameters were analyzed using Kruskal Wallis H, Mann-Whitney U, and Chi Squared tests.

Results: 34 participants were recruited, and 40 cast metal RPDs were evaluated. Participants' mean age was 73.8 years, and the mean duration of denture use was 37.6 months. Most frameworks assessed were Kennedy Class III RPDs. Caries were significantly associated with different rest types, occlusal rests showed an increased incidence of caries compared to cingulum rests. Retentive clasp arm was associated with a mean difference in PD; cast circumferential and wrought wire clasp arms had deeper PD after RPD insertion than infra-gingival clasps (I-bars).

Conclusions: Supra-gingival clasp arms and occlusal rests are related to clinical findings and dental diseases affecting the abutment teeth. Further studies are needed to confirm the role of these design elements on periodontal deterioration.

Key words: Abutment teeth, Probing depth, Caries, Occlusal rest, Cingulum rest, Retentive clasps

Funding: This study was financially supported by the Schulich Dentistry Research Opportunity Program (SDROP) at Western University.

Validation Of The OHIP-EDENT Using Factor Analysis Methods

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Introduction: Oral Health Related Quality of Life (OHRQoL) plays a fundamental role in the overall well-being of an individual. The OHIP-EDENT questionnaire evaluates OHRQoL in edentulous populations with 20 items on functional, psychological, and social implications of being edentulous. While authors argue that a 7-factor model accurately captures the constructs of OHRQoL, multiple studies challenge this, suggesting alternative 3- and 4-factor models.

Objectives: To estimate:
1. the extent to which the OHIP-EDENT reliably reflects OHRQoL using data from two studies and
2. the optimal factor structure, potentially improving OHIP-EDENT's validity.

Methodology: Using baseline data from participants in a Canadian randomized clinical trial (n=255) and a US quasi-experimental study (n=155), the Kaiser Meyer Olkin and Bartlett tests assessed sampling adequacy. The Exploratory Factor Analysis (EFA) on US cohort data identified the latent constructs of the OHIP-EDENT. After identifying the 3-factor structure from the EFA, a Confirmatory Factor Analysis (CFA) of the Canadian cohort data validated this model. Factor analysis was performed on two separate datasets to ensure stability and generalizability of the 3-factor model. Subsequently, a 4-factor model (based on literature) was tested on Canadian cohort data by CFA, and the 3-and 4-factor CFA models were compared.

Results: The EFA revealed a 3-factor configuration of the OHIP-EDENT (Cronbach's alpha = 0.946); that EFA model was then validated using the Canadian cohort. 3-factor (RMSEA=0.043; CFI=0.995) and 4-factor (RMSEA=0.037; CFI= 0.996) CFA model were established.

Conclusions: The postulated 3-factor model identified constructs "Functional and Psychological Well-Being," "Social Impact," and "Physical Discomfort", while the 4-factor model included an additional construct, "Masticatory-related complaints", offering a more comprehensive framework to investigate the dimensions of OHRQoL in edentulous individuals.

Key words: Quality of Life, Oral Health, Validation, Factor Analysis

Sensitivity to Change of COVID-19 Anxiety Measure in Canadian Dentists

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Introduction: There is a need to further validate the COVID-19 Anxiety Syndrome Scale (C-19ASS) and identify factors associated with COVID-19 anxiety in dentists practising in Canada.

Objectives: To estimate the sensitivity to change over time of the C-19ASS; To identify factors associated with COVID-19 related anxiety in a sample of Canadian dentists.

Methodology: Longitudinal data were used from a prospective cohort study conducted to estimate incidence of COVID-19 among dentists in Canada. Mixed effects ordinal logistic regression models were used to estimate the association between total C-19ASS scores and follow-up time in the study and COVID-19 case counts in the province of practice of the participants during the 14 days prior to completing the C-19ASS questionnaire. Mixed effects ordinal logistic regression models were utilized to identify the factors associated with COVID-19 related anxiety.

Results: The odds of being in a more severe category of anxiety were reduced (OR 0.74, 95% CI 0.72-0.76) with every 30-day increase in the follow-up time. The odds of being in a more severe anxiety category increased (OR 1.20, 95% CI 1.12-1.27) with each 10,000 COVID-19 case increase in the dentists' work province during the 14 days prior to data collection.
Compared to the youngest age group, most older dentists had reduced odds of being in a more severe category of anxiety, except for the oldest group, which had increased odds of being in a more severe category of anxiety. For male dentists the odds of being in a more severe category of anxiety were lower (OR 0.71, 95% CI 0.70-0.71) than female dentists.

Conclusions: The C-19ASS is sensitive to change over time and with external anxiety stimuli. Age and sex were significantly associated with COVID-19 related anxiety in dentists, controlling for province of primary practice.

Key words: COVID-19 Anxiety Syndrome Scale, dentists

Uncertainty Quantification of Large Language Models in Oral Lesion Diagnosis

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Introduction: Diagnosing oral mucosal lesions is a complex task due to a diverse array of lesion types and overlapping clinical appearances. Pretrained Large Language Models (PLMs) may aid patient triaging, but assessing their predictive performance and uncertainty in specific tasks is crucial.

Objectives: The study aims to evaluate the uncertainty of a PLM-based prediction model in identifying oral lesion types from patient's descriptions.

Methodology: The Patient descriptions for three oral lesion type (Oral cancer, Amalgam Tattoo and Mucocele) were synthetically created with varying information content using reference from oral pathology textbook. Additionally, two out-of-distribution descriptions were also created. For PLM component we used OpenAI's Text DaVinci to generate clinical presentation of various types of oral mucosal lesions. OpenAI ADA model was used to embed semantics of descriptions to vector and then their cosine similarity metric was calculated. We used Approximate Bayesian Computation (ABC) method to estimate the posterior probability of oral lesion types given the textual description of symptoms.

Results: Our results indicate that Text DaVinci based classification model has commendable accuracy in classification tasks. Furthermore, posterior probabilities of oral lesion type given the clinical description showed reduction in uncertainty levels from prior distributions. Interestingly, model is also able to identify out-of-distribution samples.

Conclusions: Our ABC approach provides robust framework for integrating expert prior knowledge and quantifying uncertainty in generative AI models for healthcare applications. While predictive accuracy of model is satisfactory, uncertainty levels underline the need for further refinement and highlights importance of incorporating such uncertainty measures in clinical decision-making systems.

Key words: Approximate Bayesian Computation, Large Language Models

Economic Evaluations of Children's Dental Caries Procedures: Scoping Review

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Introduction: The WHO's Global Oral Health Action Plan for 2030 suggests prioritizing "best buys" preventive and minimally invasive (MI) dental caries interventions as essential oral health care services. Given the high prevalence of dental caries among children, guidance on conducting economic evaluations that compare these interventions is crucial.

Objectives: To identify and map the relevant literature on economic evaluations for preventive and MI dental caries procedures among children under 12 years of age.

Methodology: We conducted a systematic search using Medline, EMBASE, Scopus, Web of Science, Cochrane, LILACS, and PEDE up to October 5th, 2022. Two independent reviewers performed the screening and data extraction using the Covidence software. Disagreements were resolved by a third reviewer. Inclusion criteria comprised full economic evaluations, full-text original articles published in peer-reviewed journals, in English, Spanish, or Portuguese, and without any date restrictions. Data extraction included methodological characteristics items. We appraised the content reported using the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) 2022 checklist.

Results: Among 1108 studies screened, 56 were selected for data extraction. Most studies conducted a cost-effectiveness analysis (98%, n=55), and only 9% (n=5) and 4% (n=2) conducted a cost-benefit and cost-utility analysis. The majority evaluated sealants (32%, n=18) and fluoride varnish (27%, n=15), and only two assessed the cost-effectiveness of silver diamine fluoride. None of the included studies reported the CHEERS item related to community engagement. Moreover, there is a lack of studies among populations from the African region, most low and middle-income countries, and Indigenous communities.

Conclusions: Economic evaluations of preventive and MI dental caries procedures among children have increased over the last decade. Nonetheless, these are mostly cost-effectiveness analyses using clinically oriented outcomes, as opposed to patient-centred outcomes. We recommend collaboration with community partners while conducting economic evaluations for mutual capacity building.

Key words: Dental caries; Economic Evaluation

Funding: This study was funded by the Canadian Institutes of Health Research (CIHR), and the Institute of Indigenous Peoples Health, as part of the "Nishtam Niwiipitan (My First Teeth): A Multi-Pronged Approach for Improving Mother and Child Oral Health in Aboriginal Communities" study led by Dr. Herenia P. Lawrence (CIHR-IIPH Grant No.: PI1-151324).

Exploring Oral Healthcare Needs in Canadians with Rheumatic Diseases

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Introduction: Patients with rheumatoid arthritis (RA) experience substantial challenges with oral healthcare, because of the clinical presentation of RA and the side effects of RA medications in the oral cavity. Patients with rheumatic diseases (RD) have symptoms similar to RA and may have similar concerns with oral care, a phenomenon that can be explored in detail through qualitative interviews.

Objectives: The objectives of this study were to explore how patients with RDs perceive their oral health, to describe optimal oral self-care and professional dental care practices as recommended by patients with RD and health care providers (HCPs) and to inform best strategies for delivering oral health knowledge.

Methodology: Semi-structured interviews were conducted with patients with RD and healthcare providers. Interview transcripts were analyzed thematically by two analysts to interpret and understand the recorded interview transcripts at surface and deeper levels. Themes were identified and subsequently reported with substantiating quotes.

Results: Interviews were conducted online with 9 individuals (all female, age range 57 – 73 years) with RD (3 RA, 1 juvenile rheumatoid arthritis (JRA), 2 systemic lupus erythematosus (SLE), 1 systemic sclerosis, 1 with RA and SLE) and 3 HCPS (1 rheumatologist, 1 pediatric rheumatologist, 1 oral medicine and oral pathology dental specialist). On average, interviews were 23 minutes long (range 10 to 40). We identified 3 themes: 1) Oral care requires creativity and money, 2) Communication on oral health and RDs, 3) Need for change in model of care.

Conclusions: Patients with RD perceive substantial challenges with oral health and professional dental care. An interprofessional team with holistic approach could help establish a trusting relationship between patients and HCPs. Our findings may help guide the creating of patient- and provider- informed, evidence-based oral health and dental management guidelines and educational tools.

Key words: qualitative research, patient education, interprofessional relationships

Integrating Oral Health in School-based Health Programs – Scoping Review

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Introduction: Most school-based oral health promotion is clinically-oriented, labour-intensive, and costly. Educational programs are short-term, standalone, and do not address social determinants influencing oral health. Ecological approach targeting multiple levels of influence can lead to sustainable results. School-based health programs, most of which are multi-sectoral and target health conditions having risk factors common with oral diseases, can serve as opportunity to integrate oral health within existing framework.

Objectives: This review aims to map existing school health programs having oral health component to understand their intervention model - whether oral health is integrated within existing school health programs and how such integration occurs.

Methodology: Systematic search has been done across six databases: Medline, Embase, Scopus, Global Health, Eric, and Education Results from databases were exported in Covidence and 3,618 records were identified for screening, after removing 4,622 duplicates. Two independent reviewers are screening titles and abstracts. This will be followed by full-text review based on inclusion criteria. Differences of opinion will be resolved mutually through discussions. Studies with schools having existing health promotion program and having any kind of oral health intervention at elementary level will be included. Studies with schools that do not have existing school-based health promotion program will be excluded. Only fulltext articles will be included for review.

Results: While there are several school health programs, there may not be many studies that have oral health integrated within such programs.

Conclusions: The study is ongoing and final results will be available by May 1, 2024.
Results will help inform direction of a qualitative study to understand school stakeholders' perspectives on enablers and barriers to integrating oral health within existing school health framework. Findings will inform what works and does not work in context of integrating oral
health with existing school health promotion.

Key words: oral health promotion, school-based health programs, integration

COVID-19 vaccination in Canadian dental schools

Authors' names: Isabella Turquete

Affiliation of the authors: McGill University

Introduction: Vaccine hesitancy is one of the top ten issues that can threaten global health. It was a major issue during the COVID-19 crisis. Health care workers (HCW's) including dental students worldwide have shown vaccine hesitancy, however, few data are available for this group in Canada, highlighting the necessity for further research.

Objectives: This study aimed to document COVID-19 vaccination experience among students and academic and support staff in Canadian dental schools during the COVID-19 pandemic The study also considered the timing of receiving the first and second doses of the vaccine.

Methodology: This prospective cohort study, based on data from April 2021 to May 2022, included 600 participants from all 10 Canadian dental schools (students, faculty, and support staff). Univariate and multivariate logistic regression were performed to identify COVID-19 acceptance predictors as well as to investigate factors associated with receiving the vaccine later than the majority of the sample.

Results: Out of 600 participants (70% female; average age 36 years old), 93% received at least the first dose of the COVID-19 vaccine (n=545). Students took more days to receive both doses. No statistically significant associations were found between chronic conditions, flu vaccination status, age groups, gender, role, or university where participants work with COVID-19 vaccine acceptance. Individuals aged 50-59 were less likely to be vaccinated later than most of the sample.

Conclusions: The large majority of individuals in the sample received their first vaccine dose, and our study did not reveal any factors associated with vaccine hesitancy. This may be attributed to the limited number of unvaccinated individuals. Also, we noted that people aged 50-59 years were less likely to be vaccinated later than most of the sample.

Key words: COVID-19 vaccine, vaccine hesitancy.

Teledentistry: Assessing Access, Affordability, and Sustainability – A Rapid Review

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Introduction: Tele-technology, with its capacity for simple, rapid, and secure communication, offers a promising avenue for the exchange of health information. Teledentistry, specifically, encompasses the electronic sharing of dental data, digital imaging, information exchange, tele-consultations with experts, distant supervision, and continuing dental education.

Objectives: The primary goal of this study is to assess the accessibility, affordability, and sustainability of oral health care through the implementation of teledentistry in Anglosphere countries.

Methodology: To uncover pertinent evidence, a rapid review was conducted utilizing databases such as PubMed, Embase, and gray literature. The study focused on research describing the use of teledentistry in Anglosphere countries, aiming to provide sustainable, affordable, and accessible oral health care. The Population, Exposure, Comparator, Outcome, and Research Design framework guided the evaluation of the chosen study articles.

Results: The study incorporated a total of 42 papers, revealing that patients utilizing teledentistry benefit from easy access to specialists, regular dentists, and dental hygienists. Teledentistry demonstrates the potential to deliver oral health care to rural and underprivileged communities. Findings indicate that retaining electronic records is more straightforward and less expensive than managing paper-based documentation. Teledentistry facilitates the provision of cost-effective dental care, evaluation, information sharing, and oral health education.

Conclusions: Teledentistry emerges as a viable option within the field of dentistry. Information and communication technology have the potential to enhance the accessibility, cost-effectiveness, and long-term sustainability of oral health treatment. The study's findings underscore the transformative potential of teledentistry in revolutionizing dental care. The integration of information and communication technology, coupled with the accessibility afforded by mobile devices, holds promise for making oral health treatment more widely available, economically viable, and sustainable in the long run.

Fluoridation Cessation's Impact on Pediatric Dental General Anesthesia in Alberta

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Introduction: Dental caries poses significant challenges to children's oral health, leading to economic burdens and an increased need for dental treatments under General Anesthesia (DGA) in children with extensive dental diseases and uncooperative behaviour. Despite the proven preventive benefits of Community Water Fluoridation (CWF), some communities choose to cease fluoridation.

Objectives: To examine the frequency of DGA in fluoridated and non-fluoridated communities in Alberta, Canada.

Methodology: All children (12 years) living in Calgary (non-fluoridated) and Edmonton (fluoridated) who underwent caries-related DGA at publicly-funded facilities were included in this retrospective population-based study. Demographics and dental data were extracted from the health administrative database for 2010/11 (pre-cessation), 2014/15 and 2018/19 (post-cessation).

Results: Of the total 2659 children receiving DGA (mean (SD) age: 4.8(2.3) years), 65% resided in the non-fluoridated area. 0–5-year-olds (69.7%) received significantly more DGA in the non-fluoridated area ($p<0.05$). Adjusted analysis revealed that fluoridation was significantly associated with lower DGA incidents in both age groups (0-5 and 6-12) with a more beneficial effect in 0-5-year-olds (IRR 0.71, 95% CI 0.57,0.90). There was a significant positive association between the frequency of DGA and post-cessation time, with more DGA incidents occurring after eight years than in the four-year follow-up for both age groups. In the non-fluoridated community, the likelihood of having DGA in children of low-income families was three times higher in the eight-year follow-up compared to that in the pre-cession.

Conclusions: Discontinuing water fluoridation negatively affected children's oral health and was associated with a significant increase in DGA events and oral health disparities.
This study adds critical evidence on the consequences of CWF cessation, informing public health interventions. Maintaining CWF emerges as pivotal in promoting oral health equity, particularly in younger children.

Key words: Water Fluoridation, Public Health, Dental Caries, General Anesthesia

Funding: This study was funded by the University of Alberta, School of Dentistry Fund for Dentistry (#FFD-2020-08).

Human-Feline Oral Microbiome Cross-species Transmission and Tooth Resorption

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Introduction: Tooth resorption is an uncommon condition which is irreversible and highly destructive. The etiology, including pathogenic bacteria, of tooth resorption is unknown. There is speculation that contact with cats and the transmission of oral bacteria from cats to humans may be linked to tooth resorption in humans.

Objectives: This study investigated the oral microbiome of humans with tooth resorption and compared their oral microbiome to 1. humans without resorptive lesions and 2. the oral microbiome of cats and to investigate the potential environmental factors associated with humans with tooth resorption, in particular contact with cats.

Methodology: Oral plaque samples were collected from 10 human participants with tooth resorption and 10 matched sample controls were collected from humans without tooth resorption. Each participant completed a questionnaire. All plaque samples were processed for taxonomic assignment through DNA extraction, PCR and sequencing. Samples were statistically analyzed through taxonomic composition, alpha diversity, beta diversity and differential abundance testing with the results being compared to the feline oral microbiome. Descriptive analysis was performed on questionnaire data.

Results: There is no statistically significant difference between the oral microbiome of humans with and without tooth resorption. Humans and felines share a similar oral microbiome overall. There are three bacterial genera (Alysiella, Prevotella and Rothia) that appear to be common between the human oral microbiome and the oral microbiome of felines with resorptive lesions. There is no statistically significant association between tooth resorption and contact with cats based on descriptive data.

Conclusions: Further exploration is needed in the area of oral health and its connection to the transmission of oral bacteria from household pets.

Key words: External tooth resorption, internal tooth resorption, oral microbiome, feline oral microbiome, cats.

Identifying a Core Outcomes Set in Endodontics: A Delphi Study

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Introduction: Evidence synthesis in studies evaluating endodontic treatment outcomes is limited due to heterogeneity in their methodology and reporting bias.

Objectives: Core outcome sets (COS) represent the minimum outcomes that should be measured and reported in all clinical trials of a specific condition. This study aims to identify a COS related to Nonsurgical Endodontic Treatment, Retreatment, Surgical Endodontics, Vital Pulp Therapy, Apexification, and Regenerative Endodontics.

Methodology: A list of outcomes was developed by reviewing the existing scoping reviews on endodontic outcomes. To identify additional outcomes, we conducted a qualitative study with patients and a web-based survey with members of the American Association of Endodontists (AAE). We will employ a two-round Delphi survey involving clinicians, patients/their parents, academics, and researchers to establish consensus on the most important outcomes. In the first round, participants will rate the importance of outcomes for each of the endodontic treatments and suggest additional outcomes. In the second round, participants will review their ratings and re-rate each outcome. A follow-up online consensus meeting will ratify the results of the Delphi survey and finalize the COS.

Results: A total of 226 AAE clinicians participated in the survey and suggested 29 outcomes, with 2 of them being novel. The final list of outcomes included 278 outcomes related to all endodontic treatments. The Delphi surveys are set to begin in November 2023, and the results will be ready for presentation at the meeting.

Conclusions: This COS will be a valuable tool for guiding future research in the field of endodontics. By defining the minimum important outcomes related to endodontic treatments that matter to stakeholders, heterogeneity and reporting bias in future research will be mitigated. This, in turn, will enhance evidence synthesis, advance the field, and increase the relevance of research.

Key words: Endodontics, Delphi study

Funding: This research is funded by a grant from the American Association of Endodontists and the Federation of Endodontics.

STUDENT AND JUNIOR FACULTY POSTER PRESENTATIONS:

FUNDAMENTAL RESEARCH

Characterization of antimicrobial agents in *Paenibacillus polymyxa J*

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Introduction: Antimicrobial resistance (AMR) among bacterial pathogens including those causing oral diseases has become a daunting threat to human health. The development of new and effective drugs or strategies to counteract antibiotic resistance is urgently needed.

Objectives: This research aims to identify active compounds derived from natural sources. Our previous research demonstrated that *Paenibacillus polymyxa J*, a plant symbiotic bacterium, produces an unidentified compound that exhibits potent bactericidal activity against methicillin-resistant Staphylococcus aureus which caused some oral diseases. In this study, we aim to extract, purify, and identify the antimicrobial compounds produced
by *P. polymyxa J*.

Methodology: The bacterial cells were cultivated using both broth and solid culture in a bioreactor and on the agar plates respectively. The compounds produced by the bacterium were extracted using an organic solvent. High-performance liquid chromatography (HPLC) was used to separate the compounds in the extract. Further characterization assays, such as nuclear magnetic resonance (NMR) and liquid chromatography-mass spectrometry (LC-MS) and LC-MS-MS, were performed on these fractions to determine the structure of the compounds.

Results: Fractions containing bioactive compounds in HPLC were collected and concentrated. Signals generated from the LC-MS, LC-MS-MS and NMR analysis were interpreted and were used to search and compare with the databases to confirm the presence of any novel compounds. Also, potential gene clusters in the genome that are responsible for the production of antimicrobial compounds have been identified using Antismash.

Conclusions: Some of these compounds might be novel bioactive substances synthesized by P. polymyxa. According to the analysis, one of the fractions is consist of a fatty acid. More of the target compound would be needed to fully characterize the compounds of interest which is an ongoing process. The findings of this research can serve as a foundation for further investigation.

Key words: Antimicrobial – Antibiotic resistance

Bilayered PDMS-Polyurethane Films for Antifouling Coating of Silicone Implants

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Introduction: Facial prosthetics are used to provide synthetic reconstruction of facial features that have been lost or are absent due to congenital defects, injury, and cancer. These prosthetics can provide improved aesthetic for the patient and have demonstrated psychological improvements in patients who have lost parts of their face. Despite their benefits, biofouling on the inner surface of these prosthetics frequently occurs, leading to infections. A polyurethane (PU) layer has been used to protect the prosthetics from biofilm formation as well as improving their tear strength; however, it does not bind well to silicone.

Objectives: In this project, our objective is to show that modifying PU with polydimethylsiloxane (PDMS) will produce a bilayer film that can attach to silicone while maintaining its antifouling properties.

Methodology: A bilayered film from PU and PDMS is made at 80°C and left to polymerize for 24h after optimizing the layer-by-layer assembly of the two polymers. The adhesive properties of silicone to the bilayer film are tested quantitatively using a mechanical tester. Bacterial and cell culture is done on both sides of the film for antifouling and cytotoxicity assessments.

Results: The bilayered film was able to adhere to silicone substrates when the film was made of 10w% PDMS. The adhesion, antifouling, and cytotoxicity assessments are ongoing and the results will be available soon.

Conclusions: Preliminary results prove promising for making a bilayered film out of two non-adhering components. Further characterization will determine the performance of the materials in real-life settings.These films will provide post-op cancer patients with greater durability and reduced rate of surface infection for their prostheses and decrease the need for frequent prosthetic replacement.

Key words: Antifouling, Prosthetics

Interactive role of miR-29, miR-93, miR-205, and VEGF in salivary adenoid cystic carcinoma

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Introduction: Salivary adenoid cystic carcinoma (SACC) is one of the most common salivary gland tumors in which patients encounter local recurrence and lung metastases.

Objectives: Understanding prognostic biomarkers in SACC is essential for future development in prognosis and treatment. This study aimed to assess the expression level of vascular endothelial growth factor (VEGF) and its potential regulatory microRNAs in SACC for prognostic determination.

Methodology: The expression of VEGF in SACC samples was assessed using immunohistochemistry. Potential regulatory microRNAs were evaluated using quantitative reverse transcription-polymerase chain reaction. Associations between VEGF and microRNAs expression and clinicopathological parameters were investigated.

Results: VEGF expression levels positively correlated with histologic grade ($p = .004$) and treatment modality ($p = .04$). Decreased expression of miR-29a ($p = .01$) and increased expression of miR-93-5p and miR-205 (both $p < .0001$) were observed in SACC compared to normal salivary gland tissue. MiR-93-5p showed a positive association ($p = .02$) with VEGF overexpression.

Conclusions: Our results showed the downregulation of miR-29 and overexpression of miR-93 and miR-205 in the SACC group, and the correlation between miR-93 and VEGF suggests these biomarkers as potential prognostic markers in the future.

Key words: miR-205, miR-29, miR-93, salivary adenoid cystic carcinoma

Histatin Combined with Photodynamic Therapy: A Promising Treatment Against Biofilm

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Introduction: Candida albicans and Streptococcus mutans exhibiting synergistic survival in biofilms and contributing to progression of stomatitis.

Objectives: The main objective of this study was investigating the effect of Histatin 3 (Hist 3) combined with Photodynamic Therapy (aPDT) against dual-specie biofilms of Candida albicans and Streptococcus mutans growth in acrylic resin.

Methodology: *C. albicans* (polyene resistant; ATCC 200955) and *S. mutans* (UA159) were previously standardized (37°C/16h/5% CO2). Aliquots of each microorganism with acrylic resin specimens were submitted to acquired pellicle formation (2h/37◦C/60 rpm/min) with Hist 3 (previous standardized) followed by biofilm maturation (48h). Then, 8 experimental groups were divided/submitted as follow treatments: aPDT - Application of PDZ (200 mg/L) for 20 min (pre-incubation time), followed by LED light irradiation (660nm; 50 J/cm2); Hist 3 + aPDT - specimens previously treated by Hist 3 were submitted to aPDT; LED light- Irradiation by LED light; LED light + Hist 3- specimens previously treated with Hist 3 were irradiated by LED light; PDZ- 200 mg/L of photosensitizer; PDZ + Hist 3 - specimens previously treated by Hist 3 were submitted to PDZ; Hist 3- Peptide treatment only; Experimental group control- without treatment. To quantification of total biofilm biomass, crystal violet was used (200 uL/1%/570 nm) (n=12/group).

Results: The higher reduction of dual-specie biofilm was found in Hist 3 + aPDT group with 67% of viability decreased, compared to control ($p>0.05$). The combined treatment (Hist + aPDT) was able to reduce 82% as 75% of S. mutans and *C. albicans* single biofilm, respectively ($p>0.05$).

Conclusions: Histatin 3 was able to potentialize the effect of aPDT on C. albicans and S. mutans dual-species biofilms formed under acrylic resin.

Key words: Candida albicans; Histatins

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Can Unmeasured Confounders explain Oral Health-Head and Neck Cancer associations?

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Introduction: Studies have reported strong associations between oral health indicators and head and neck cancer (HNC). However, the validity of these results is contested due to potential mediators, and unmeasured risk factors influencing these links. Negative controls, a tool routinely employed to detect bias in observational studies, are widespread in epidemiology but notably absent in oral health research.

Objectives: To estimate the extent to which the association between oral health indicators and HNC risk is due to unmeasured confounders using a negative control exposure analysis.

Methodology: Data were drawn from a hospital-based case control study conducted in four main referral hospitals in Montreal, Canada. HNC incident cases (n=389) and controls frequency matched for sex and age (n=429) were recruited from the same hospitals. In-person interviews collected information on several life course exposures. Oral rinse and brush specimens were analysed for human papillomavirus (HPV) infection. We estimated odds ratios (OR) and 95% confidence intervals (CI) for the associations between oral health indicators and HNC using logistic regression, adjusting for tobacco, alcohol and HPV. Sexually Transmitted Diseases (STDs), which have not been associated with HNC, was the negative control exposure. The association between STDs and HNC risk was adjusted for confounders including HPV and assumed a null association. Any association observed between STDs and HNC risk would indicate bias due to unmeasured confounders in the association between oral health and HNC.

Results: Complete denture [OR= 1.33, 95%CI (0.93-1.90)] and having more than 9 missing teeth [OR=1.31, 95%CI (0.93-1.83)] were associated with HNC risk. Similar results persisted when stratified by HNC subsite. Negative control analysis yielded a null finding, indicating no considerable bias due to unmeasured confounders

Conclusions: Our findings support the associations between oral health and HNC risk observed in previous studies.

Key words: Head and Neck Cancers, Oropharyngeal Cancers, Epidemiology, Negative Controls, Bias Analysis

Quantitative Analysis of the Immune Microenvironment in Oral Premalignancy

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Introduction: Elucidating the role of the immune microenvironment has led to breakthroughs in cancer treatment and prognostication. However, the immune landscape in premalignancy has not been well characterized.

Objectives: Oral cancers are typically preceded by oral potentially malignant lesions exhibiting different degrees of cellular abnormality. Do these tissue changes incite an immune reaction and impact the disease course? There is a need to investigate the role of the immune microenvironment in premalignancy and its implication for cancer risk.

Methodology: Cases with a biopsy confirmed diagnosis of dysplasia, with or without lichenoid inflammation, no prior head and neck cancer, and at least five years of follow-up, were selected from the Oral Cancer Prediction Longitudinal study. Automated multiplex staining was completed on annotated formalin-fixed paraffin-embedded tissue using antibodies for a panel of four immune cell types. Slides were imaged and regions of interest in the epithelium and underlying stroma selected with an oral pathologist. A nuclear segmentation and phenotyping program was used to identify and label each cell type.

Results: 124 cases have been selected, and multiplex staining completed. There was a greater proportion of cells positive for CD8, CD57, CD163, and/or FOXP3 in both the epithelium and stroma of the lichenoid cases, compared to cases of dysplasia without lichenoid features, independent of the grade of dysplasia. As expected, regions of non-dysplastic tissue showed a lesser proportion of immune infiltrate in both the epithelium and stroma. We will also describe immune marker patterns and their correlation with clinical factors such as progression to malignancy and histology.

Conclusions: Oral dysplasia appears to elicit an inflammatory response in the sub-epithelial tissue compartment, extending into the epithelium. Lichenoid lesions present with striking patterns of immune infiltrate consistent with disease pathogenesis.

Key words: Microenvironment, oral dysplasia

Fibulin-4 and LTBP-4 Interact with Syndecans to Regulate Elastogenesis

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Introduction: Elastogenesis is a hierarchical process which confers elasticity to the periodontal ligament, the oral mucosa, and other tissues, requiring several extracellular matrix proteins including fibulin-4 (FBLN4) and latent TGF-β binding protein-4 (LTBP4). It is known that both FBLN4 and LTBP4 interact with cells, but their cell receptors and the respective molecular mechanisms in elastogenesis remain unknown.

Objectives: Elucidate the role of the interaction of Fibulin-4 and LTBP-4 with syndecans in elastogenesis.

Methodology: Elastogenic dermal skin fibroblasts (NSF) and vascular smooth muscle cells (SMC) were employed to analyze the interaction of cells with FBLN4 and LTBP4. Global knockdown of syndecans (SDC1-4) via siRNA abolished interaction of NSF with both proteins. To evaluate the functional importance of these interactions, pharmacological inhibition of myosin II, focal adhesion kinase (FAK), RhoA and ERK signalling was used to analyze elastic fibre assembly upon cell interaction with FBLN4 and LTBP4.

Results: NSF and SMC bound strongly to both FBLN4 and LTBP4. FBLN4 exclusively interacted as multimers, and two novel cell interaction epitopes on FBLN4 located in cbEGF2-3 and the C-terminal domain were identified. A new cell interaction site on the LTBP4 N-terminal half was mapped. Cell binding to FBLN4 and LTBP4 was absent in the presence of heparin and significantly reduced upon heparinase treatment, suggesting heparan sulfate proteoglycans as the cell surface receptors for these interaction. Specific knockdown of SDC-2 and SDC-3 impaired interaction of cells with FBLN4, whereas only SDC-3 knockdown abolished the interaction with LTBP4. The enhanced elastic fiber assembly promoted by FBLN4 and LTBP4 was mediated through an increase in cell contraction via upregulation of focal adhesion kinase (FAK), RhoA and ERK signalling. This was significantly compromised upon knockdown of SDC-2 and/or -3.

Conclusions: These results demonstrate that FBLN4 and LTBP4 cell interactions via SDC-2 and/or SDC-3 promote elastogenesis by enhancing focal adhesion formation and cell contractility through Erk1/2 and RhoA activation.

Key words: Elastogenesis, Syndecans

Detecting Dental Caries on Oral Photographs using Artificial Intelligence

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Introduction: Dental caries, affecting approximately two billion adults and 520 million children worldwide, presents a significant public health challenge. Timely detection of caries is crucial for effective management, reducing the need for extensive treatment and associated costs. Advancements in Artificial Intelligence (AI) have introduced promising assisting tools for caries detection.

Objectives: This systematic review aimed at evaluating the performance of artificial intelligence (AI) models in detecting dental caries on oral photographs.

Methodology: Methodological characteristics and performance metrics of clinical studies reporting on deep learning and other machine learning algorithms were assessed. The risk of bias was evaluated using the quality assessment of diagnostic accuracy studies 2 (QUADAS-2) tool. A systematic search was conducted in EMBASE, Medline, and
Scopus.

Results: Out of 3410 identified records, 19 studies were included with six and seven studies having low risk of biases and applicability concerns for all the domains, respectively. Metrics varied widely and were assessed on multiple levels. F1-scores for classification and detection tasks were 68.3%–94.3% and 42.8%–95.4%, respectively. Irrespective of the task, F1-scores
were 68.3%–95.4% for professional cameras, 78.8%–87.6%, for intraoral cameras, and 42.8%–80% for smartphone cameras. Limited studies allowed assessing AI performance for lesions of different severity.

Conclusions: Automatic detection of dental caries using AI may provide objective verification of clinicians' diagnoses and facilitate patient-clinician communication and teledentistry. Future studies should consider more robust study designs, employ comparable and standardized metrics, and focus on the severity of caries lesions.

Key words: machine learning, caries detection

Impact of Optimizing Planetary Mixing Time on a 3Y-TZP/TiO2 Ceramic

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Introduction: 3Y-TZP/TiO2 composite aiming to improve dental implants can be produced by ball-milling powder mixing for 10 to 12 hours. Planetary micro-milling could be an alternative to optimize the production of 3Y-TZP/TiO2 powders.

Objectives: This work aimed to investigate the effect of planetary mixing time on the ceramic composite's microstructure.

Methodology: 3Y-TZP and 11 mol% of TiO2 powders were mixed (planetary micro mill) for one, two and three hours (500 rpm/min) in isopropyl alcohol. The dried ceramic powder was uniaxially pressed into discs (θ=1.9 mm) and sintered at 1300°C for 10 hours. Specimens' shrinkage, apparent density (Archimedes principle), and hardness (Vickers hardness) were calculated. The hardness values were analyzed by one-way ANOVA and Tukey's test (α=0.05). Qualitative phase analysis was performed by XRD (Rietveld analysis).

Results: Density measurements for 1, 2 and 3 mixing hours were 5.64 g/cm3 (96.05%), 5.52 g/cm3 (93.53%), and 5.74 g/cm3 (97.75%), respectively, compared to the theoretical density. 3-hour mixing showed a diameter and thickness shrinkage of 23%, followed by 2-hour (∅=21.06%, h=26.54%) and 1-hour mixing (∅=21.63%, h=18.33%). Rietveld's analysis showed 89.52% tetragonal phase, 1.34% monoclinic phase, and 9.12% cubic phase for 1-hour mixing. Similar results were observed at the 2-hour (tetragonal 89.35%, monoclinic 2.63%, and cubic phase 8.01%) and 3-hour mixing specimens (tetragonal 87.29%, monoclinic 1.39% and cubic phase 11.31%). One-way ANOVA showed higher statistical hardness values for 2-hour mixing (9.72 GPa) and 3-hour mixing (9.95 GPa) compared to 1-hour mixing (9.12 GPa).

Conclusions: Mixing the 3Y-TZP/11TiO2 for three hours increased densification, good post-sintering shrinkage, and hardness values. The process developed in this study reduced the mixing time from 10 to 3 hours using planetary micro milling, producing a 3Y-TZP/11TiO2 ceramic with higher density and hardness values.

Key words: dental implants, zirconia

Evaluation of Causal Understanding in AI Models for Oral Lesions

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Introduction: Oral lesions pose complex clinical challenges and while convolutional neural networks (CNNs) show promise in accurate diagnostics, their lack of interpretability hinders clinical use. Counterfactual scenarios can be used to evaluate the causal understanding of these models. Furthermore, counterfactual images can be used to assess the safety and interpretability aspects of CNNs when used for safety critical clinical tasks such as diagnosis of oral lesions including oral cancers.

Objectives: This study aims to evaluate the causal understanding of two CNN models developed to classify oral lesions, under different counterfactual scenarios.

Methodology: We've created two CNN models for oral lesion identification. Model 1 emphasizes interpretability with a modified attention mechanism, while Model 2 focuses on uncertainty quantification. We'll produce counterfactual images for 240 test dataset images across 6 scenarios (color, size, border changes, different regions, lesion absence, and impossible lesions) using image editing tools. Additionally, we'll generate counterfactuals for 60 training images to check for overfitting. We'll evaluate the models' predictive performance and uncertainty metrics across these scenarios, comparing them to the original images.

Results: In our ongoing study, initial findings reveal that counterfactual images lacking lesions increased uncertainty in predicted probabilities. Changes in lesion attributes, especially size and color, caused significant shifts in model predictions. Assessing counterfactual images from the training data showed consistent, minimally deviated predictions, hinting at potential overfitting. Comprehensive quantitative results will be shared once finalized.

Conclusions: Evaluating deep learning models under counterfactual scenarios for ensuring clinical safety has a crucial role. Furthermore, our findings emphasize the need for interpretability-enhancing techniques to refine CNN models, enhancing their clinical applicability in diagnosing oral lesions.

Key words: counterfactual approach, oral lesion

Interactions between *Streptococcus mutans* and *Candida dubliniensis*: Implications for Early Childhood Caries Pathogenesis

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Introduction: *Streptococcus mutans* and *Candida dubliniensis*, which are prevalent in children with Early Childhood Caries (ECC), exhibit virulence traits like sucrose metabolism, acidogenicity, and aciduricity. Recent studies from our group detected higher levels of *C. dubliniensis* in children with ECC compared with caries-free children; correlation between *S. mutans* and *C. dubliniensis* has also been reported. Understanding the microbial physiology and interaction between these microbes can provide insights into ECC pathogenesis.

Objectives: This study aimed to explore interactions between *S. mutans* UA159 and *C. dubliniensis* JB11897 in mixed-species biofilms. Furthermore, we investigated the influence of the comCDE deletion mutant of *S. mutans* UA159 (*S. mutans* ΔcomCDE) on these interactions. The comCDE genes, involved in quorum sensing (QS), hold relevance in microbe-microbe interactions. We also examine the effect of *C. dubliniensis* QS molecules farnesol and tyrosol on these microbes.

Methodology: *S. mutans* ΔcomCDE was generated via PCR ligation mutagenesis, replacing these genes with a spectinomycin resistance gene. The interactions of *C. dubliniensis* JB11897 with *S. mutans* UA159 and its mutant *S. mutans* ΔcomCDE were compared. We tested the impact of farnesol and tyrosol on these interactions. This involved biofilm and acid production assays, and RNA-sequencing to examine the metabolic interactions and differential
expression of related genes.

Results: Co-culture of *S. mutans* UA159 and *C. dubliniensis* JB11897 resulted in enhanced biofilm formation with local heterogeneities and increased acid production compared to monocultures.

Conclusions: Our findings suggest that the co-presence of *S. mutans* UA159 and *C. dubliniensis* JB11897 influenced biofilm formation and physiology of these microbes. Understanding the interplay between S. mutans and *C. dubliniensis* in biofilm formation and metabolic activities holds significance in deciphering ECC pathogenesis.

Key words: Microbial interactions, dental caries

Funding: Operating grant from CIHR, grant number PJT-175800.

Canadian Oral Health Summit

June 20–22, 2024
Dalhousie University

Program

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MOVING DENTISTRY FORWARD

Contents

Registration & Wi-Fi

The main registration times and locations are listed here. Should you arrive after these times, please ask a member of event staff for assistance.

Thursday, June 20th: 7:30 am - 9:00 am Dentistry Entrance, 5981 University Avenue
Friday, June 21st: 7:30 am - 9:00 am Prince Hall, 6350 Coburg Road
Saturday, June 22nd: 7:30 am - 9:00 am Prince Hall, 6350 Coburg Road

Your unique Wi-Fi code can be found on the back of your name badge.

Locations

Prince Hall
6350 Coburg Road, Halifax NS, B3H 2A1, via the Arts & Administration Building

Dentistry building
5981 University Avenue, Halifax NS, B3H 4R2

Marion McCain Arts & Social Sciences building
6135 University Avenue, Halifax, NS B3H 4R2

Kenneth C. Rowe Management building
6100 University Avenue, Halifax, NS, B3H 4R2

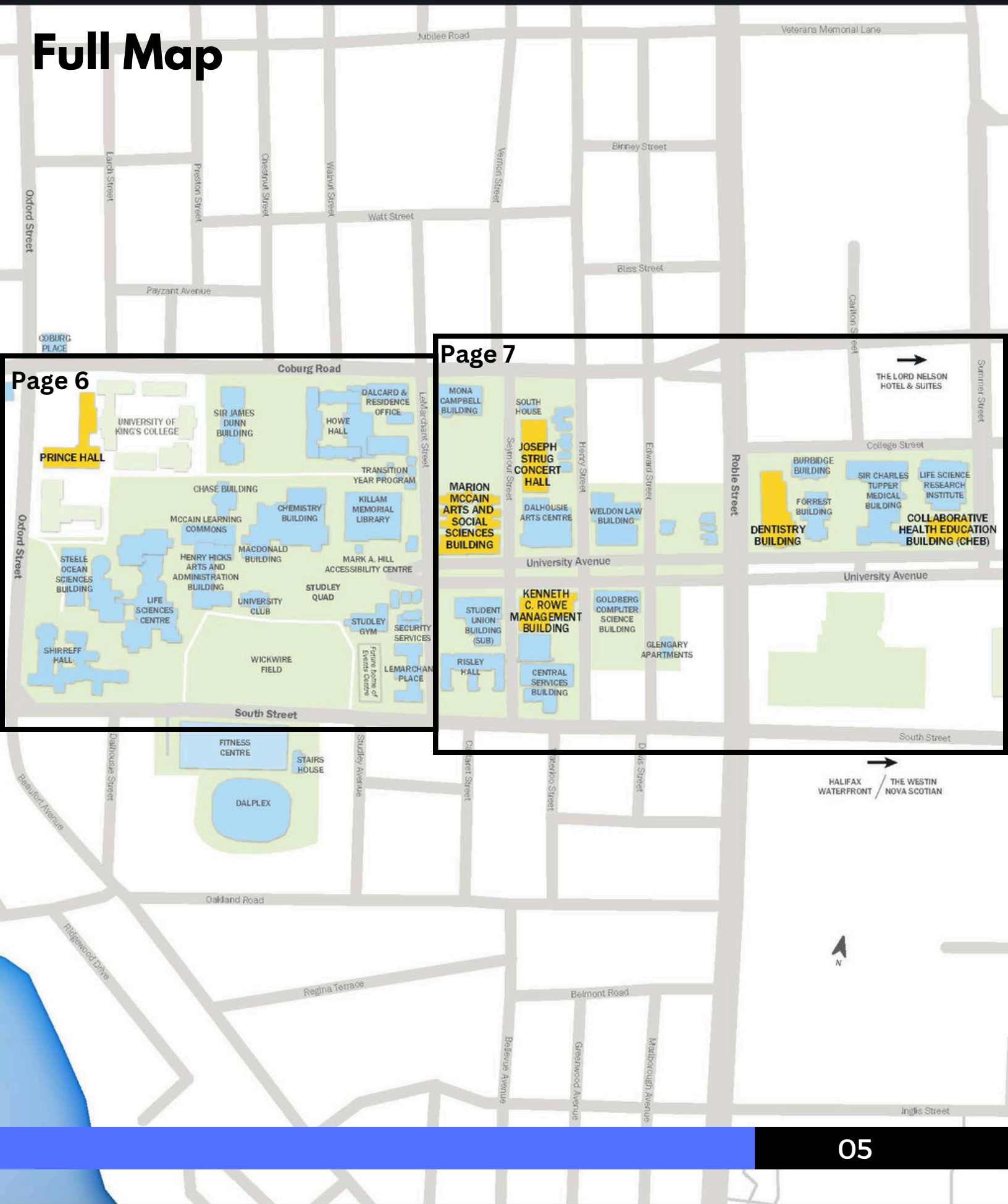
CHEB (Collaborative Health Education Building)
5793 University Avenue, Halifax, NS, B3H 4R2.

Joseph Strug Concert Hall
1385 Seymour St, Halifax, NS, B3H 3M6

The Westin Nova Scotian Hotel
1181 Hollis St, Halifax, NS, B3H 2P6

Note: Maps are provided on the next two pages. Please ensure you leave sufficient time to travel between buildings. While many of the sessions are located close together, we kindly draw your attention to the distance (600m) between Prince Hall and the Ondatjee Auditorium in the McCain building.

Full Map



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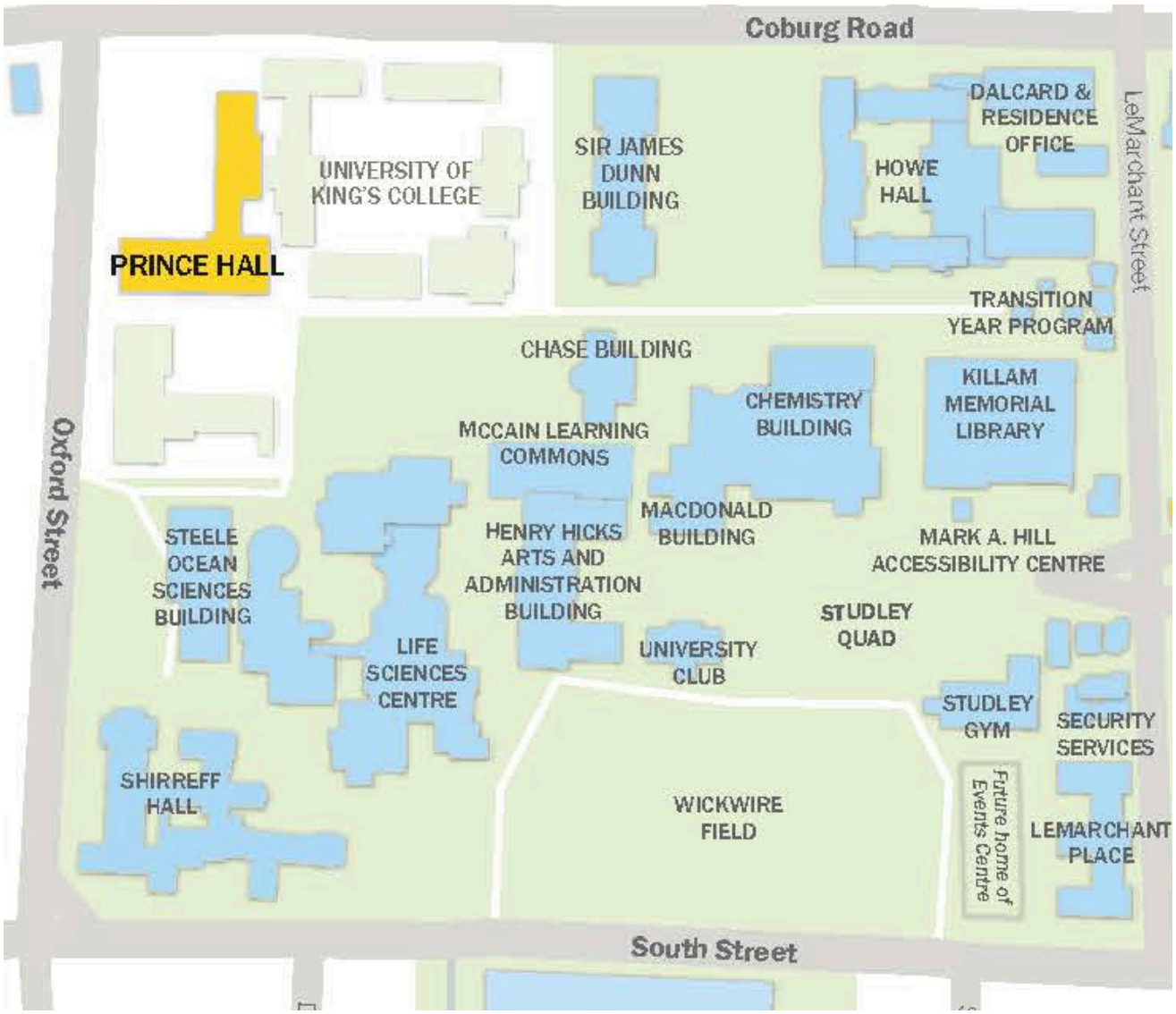
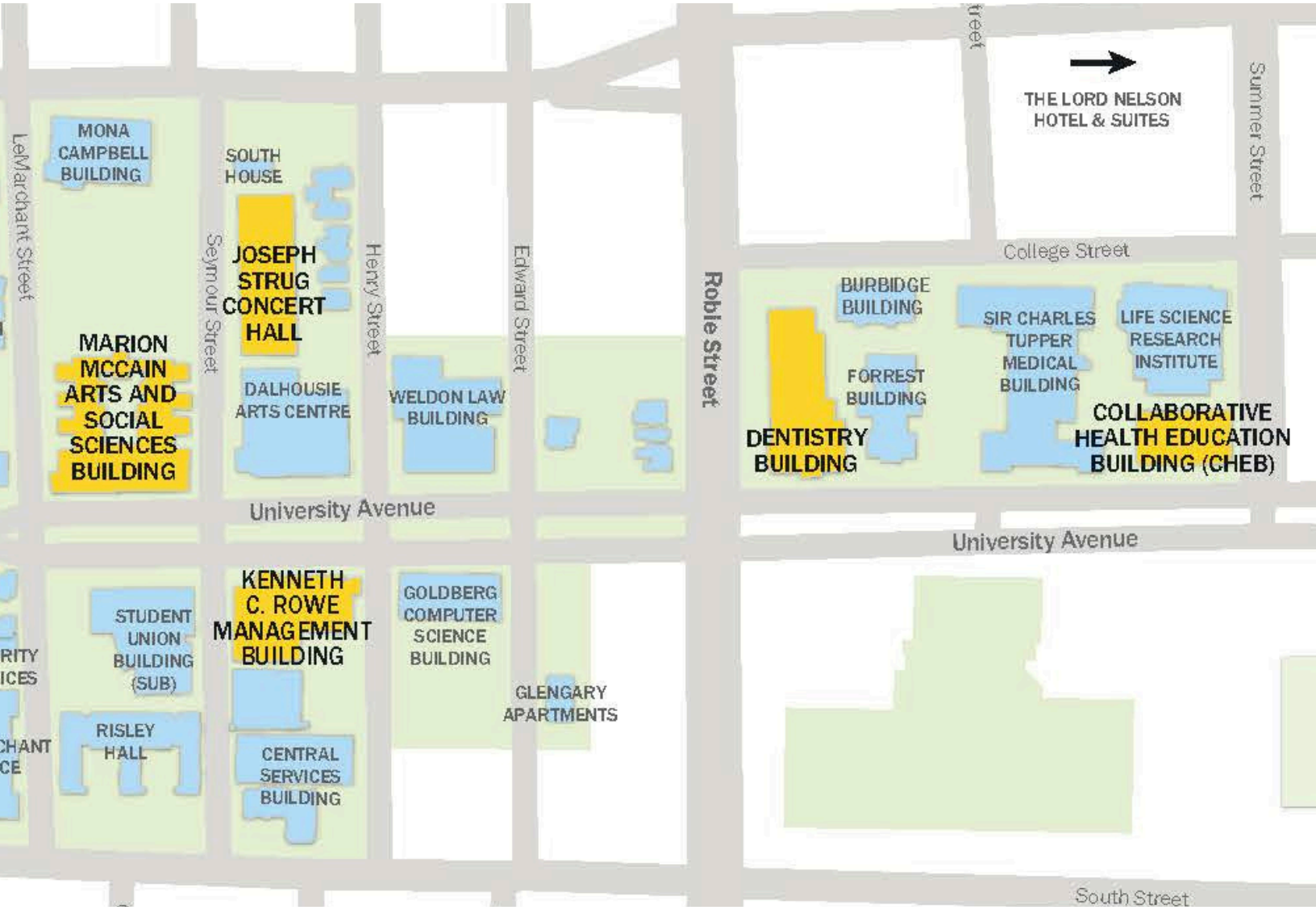
Close-up Map 1



Close-up Map 2



Event Details

The 2024 conference will be the inaugural Canadian Oral Health Summit, based at Dalhousie University in Halifax. Building on previous biannual meetings of the Association of Canadian Faculties of Dentistry (ACFD), this event is a collaboration with the Canadian Association for Dental Research (CADR), the Network for Canadian Oral Health Research (NCOHR) and the Institute of Musculoskeletal Health and Arthritis (CIHR-IMHA). The broader program will span three days, and bring together a wider audience across oral health care and research to advance oral health in Canada and internationally.

Attendees

- Canadian academic dentistry leaders: Deans, Associate Deans, Clinic Directors, Program Directors and others
- Professors from all 10 Canadian dental schools
- Leaders of national dental organizations
- Students, residents and other trainees
- Dentists, dental hygienists, dental therapists and other dental professionals
- Patient and public partners
- Leaders in Canadian health research
- Leaders in the Canadian Dental Care Program

Thursday, June 20 Workshops

Time	*Only people registered for workshops in summit registration system may attend. Space limited.*				
9:00 am - 10:00 am					CHMS data user workshop: Spotlight on oral health (9am - 5pm) **2019 McCain**
10:00 am - 10:30 am	Morning Break **3rd Floor Atrium Dentistry**				
10:30 am - 12:00 pm				Vision for a sustainable virtual oral health care (10:30 am - 5 pm) **1206 Dentistry**	CHMS Workshop *cont*
12:00 pm - 1:00 pm	Lunch **CHEB 170**				
1:00 pm - 3:00 pm	How to get published (2 pm - 4 pm) **4116 Dentistry**	Patient and public engagement 101 (1 pm - 3 pm) **4117 Dentistry**	Beyond the Surface: Analyzing Oral Health Data (1 pm - 5pm) **3157 Dentistry**	Vision for a sustainable virtual oral health care *cont*	CHMS Workshop *cont*
3:00 pm - 3:30 pm	How to get published *cont*	Afternoon Break **3rd Floor Atrium Dentistry**			
3:30 pm - 5:00 pm	How to Get Published Workshop (end at 4 pm)		Beyond the Surface: Analyzing Oral Health Data *cont*	Vision for a sustainable virtual oral health care *cont*	CHMS Workshop *cont*
5:30 pm - 7:00 pm	Welcome Cocktail **Joseph Strug Hall Atrium** *Open to All*				

Thursday, June 20 Meetings

Time	Event/activity	Attendees	Location
7:30 am – 9:00 am	Registration		Dentistry Entrance
7:30 am - 8:30am	Breakfast	ACFD committee & Workshop Attendees	3rd Floor Atrium Dentistry
8:30 am - 12:00 pm	ACFD Deans Committee (Invitation only)	Committee members	5150 Dentistry
	ACFD AAC (Invitation only)	Committee members	5236 Dentistry
	ACFD RAC (Invitation only	Committee members	5199 Dentistry
	ACFD CAC (Invitation only)	Committee members	5228 Dentistry
10:00 am - 10:30am	Mid-morning coffee break	Committee members & Workshop	3rd Floor Atrium Dentistry
10:30 am – 12:00 pm	Biomaterials NCOHR Advisory Group (Invitation only)	Advisory Group Members	5214 - Dentistry
12:00 pm - 12:45 pm	Lunch	ACFD committee & workshop	CHEB 170
12:45 pm - 2:00 pm	ACFD AGM	All welcome	3156 Dentistry
12:30 – 4:00 pm	Canadian Dental Assistants Association (Invitation only)	CDAA committee members	1205 Dentistry
2:15 pm - 5:00 pm	Joint ACFD/CDA/CDAC/CDRAF/ NDEB/RCDC meeting	ACFD committees & stakeholder reps	CHEB 170
3:20 pm - 3:40 pm	Mid-afternoon break	Committees & Workshop attendees	3rd Floor Atrium Dentistry
4:00 pm - 5:30 pm	For Editors, By Editors (Invitation Only)	Invitees Only	4116 Dentistry
5:30 pm - 7:00 pm	COHS welcome cocktail	All COHS attendees	Joseph Strug Hall Atrium

Friday, June 21

Time	Sessions	
7:30 am - 8:30 am	Breakfast **Prince Hall**	
8:30 am - 10:00 am	Welcome **Ondatjee Auditorium - McCain**	Dr. Ben Davis & Dr. Noha Gomaa
	Keynote Address	Minister Holland
	Canada's National Oral Health Research Strategy	Dr. Leigha Rock & Prof. Nick Jakubovics
	The WHO's Global Oral Health Action Plan	Dr. James Fitzgerald
	The Lancet Commission on Oral Health	Dr. Carol Guarnizo-Herreno
10:00 am - 10:30 am	Morning Break **Atrium - McCain**	
10:30 am - 12:00 pm	AI and Research, Learning and Healthcare Delivery **Ondatjee Auditorium - McCain**	
	Making Sense of Innovation: Artificial Intelligence in Oral Healthcare	Dr. Pascal Tyrrell
	Machine Learning Approaches for Mitigating Selection Bias in Oral Health Survey Data	Mohd Wasif Khan
	Application of AI in healthcare and lessons learned for Dental Medicine and Oral Health	Dr. Samira A. Rahimi
	Uncertainty in AI-based prediction models: the need and impact on clinical decision making	Dr. Sreenath Madathil
12:00 pm - 1:30 pm	Open Lunch **Prince Hall**	Public Health Lunch & Lightning Talks *Register in Advance* **Scotiabank Auditorium - McCain**

Friday, June 21 cont.

Time	Sessions		
1:30 pm - 3:00 pm	**Symposium #1** Federal initiatives to support oral health care in Canada **Ondatjee Auditorium - McCain**	**Symposium #2** Learning opportunities for oral health trainees to develop innovative and sustainable solutions: perspectives from the CHMS **1020 Rowe**	**Symposium #3** Student & junior faculty research presentations – fundamental research **Scotiabank Auditorium - McCain**
3:00 pm - 3:30 pm	Mid-afternoon Break **Atrium McCain**		
3:30 pm - 5:00 pm	**Symposium #4** Canada's National Oral Health Research Strategy: a discussion **Ondatjee Auditorium - McCain**	**Symposium #5** Humanizing Oral Health Professional Education to Actualize Person-Centred Care **Scotiabank Auditorium - McCain**	**Symposium #6** Exploring the Relationship Between Oral Health and Frailty: Experiences Planning and Hosting a Research Priority Generating Workshop **1020 Rowe**
5:00 pm - 7:00 pm	Posters and Drinks *Open to All* **Dentistry Clinic Lobbies**		

Saturday, June 22

Time	Sessions		
7:30 am - 8:30 am	Breakfast **Prince Hall**		
8:30 am - 10:00 am	Attracting and retaining excellent people for oral health care *Dr. Ben Davis, Ondina Love, Dr. Leigha Rock, Dr. Paul Major, Dr. Barb Hamilton-Hinch, Dr. Marsha Pyle* **Ondatjee Auditorium - McCain**		
9:30 am - 9:45 am	Morning Break **Atrium - McCain**		
9:45 am - 10:45 am	Attracting and retaining excellent people for oral health care (cont.) *Dr. Sachin Seth, Dr. Erin Steeves, Lindsay Van Dam, Dr. Clare Champoux and Dr. Doug Mackey* **Ondatjee Auditorium - McCain**		
10:45 am - 11:00 am	Break **Atrium - McCain**		
11:00 am - 12:00 pm	Attracting and retaining excellent people for oral health care (cont.) *Dr. Leigha Rock, Dr. Shauna Hachey, Dr. Haider Al-Waeli, Dr. Jim Lai, Stacy Bryan, Dr. Ben Davis* *To convene at:* **Ondaatje Auditorium - McCain** *Breakout rooms:* **Ondaatje Auditorium, Scotiabank Auditorium, 1198, 2016, 2021**		
12:00 pm - 1:00 pm	Lunch **Prince Hall**		
1:00 pm - 2:30 pm	**Symposium #7** Navigating the Future of Oral Health Workforce in the Era of the Canadian Dental Care Plan **Ondatjee Auditorium - McCain**	**Symposium #8** Community-engaged research experiences with priority populations in Canada **1020 Rowe**	**Symposium #9** Complex and Multimodal Data to Advance Canadian Population Oral Health Research: The Future is Now **Scotiabank Auditorium - McCain**

Saturday, June 22 cont.

2:30 pm - 3:00 pm	Mid-afternoon break **Atrium - McCain**		
3:00 pm - 4:30 pm	**Symposium #10** What can public dental care achieve and what are its limits? A discussion **Ondatjee Auditorium - McCain**	**Symposium #11** Cultivating Equity, Diversity, and Inclusivity in Dental Education: Narratives from Four Canadian Dental Schools. **Scotiabank Auditorium - McCain**	**Symposium #12** Student & junior faculty research presentations – applied research **1020 Rowe**
6:30 pm - 9:00 pm	Gala Dinner *Please Register (300 limit)* **Westin Hotel**		

The Honourable Mark Holland, Minister of Health

The Honourable Mark Holland was first elected as the Member of Parliament for Ajax in 2004 and served until 2011. He was re-elected in 2015, 2019, and 2021. He is currently serving his sixth term.

A lifelong resident of the Ajax-Pickering area, Minister Holland has served his community for over 20 years. He was elected as a Durham Regional Councillor, serving from 1997 to 2004. He also served as Acting Mayor of Pickering. During his time on council, he focused on the redevelopment of the Pickering waterfront, youth employment, and environmental issues.

As a Member of Parliament, Minister Holland has served as Leader of the Government in the House of Commons, as Chief Government Whip, as Parliamentary Secretary to the Minister of Public Safety and Emergency Preparedness, and as Parliamentary Secretary to the Minister of Democratic Institutions. He has been a staunch advocate of marriage equality rights, and played a key role in helping to reform Canada's animal cruelty laws.

In both public and private roles, Minister Holland has backed health-related initiatives. He served as Executive Director of the Heart and Stroke Foundation of Canada's Ontario Mission, as well as its National Director of Children and Youth, and helped to secure funding for Grandview Children's Centre's future Ajax location.

Message from The Honourable Mark Holland, Minister of Health

As Canada's Minister of Health, I am pleased to participate in the inaugural Canadian Oral Health Summit and join leaders in oral health care and research from across the country and around the world. This summit serves as a pivotal platform for experts, scholars, and oral health professionals alike to converge, exchange insights, discuss new and upcoming initiatives, and share impactful strategies that will positively shape the landscape of oral health care in Canada.

We can all agree that Canadians deserve access to quality oral health care, which is important not only for oral health, but for overall health. That is why our government continues to make significant investments in oral health care, notably through the Canadian Dental Care Plan. This plan, in which we will invest $13 billion over five years, starting in 2023–24, and $4.4 billion ongoing, will help make oral health care more affordable for up to nine million Canadians with a net family income of less than $90,000 who do not have access to dental insurance.

This is the biggest new social program in Canadian history, and we have been working with oral health professionals across the country to make it happen. I'm happy to say that the program has been an incredible success so far with over 2 million seniors now eligible under the plan and more than 10,500 providers who have confirmed their participation and are already providing care to thousands of seniors.

Evidence-based decision-making is central for our government, which is why we are also making investments to support researchers like you who provide the data we rely on. To further our understanding of the state of oral health in this country, the federal government has announced an investment of $23.1 million over two years (starting in 2023–24) for Statistics Canada to collect data on oral health and access to oral health care in Canada.

As many of you know, Statistics Canada's Cycle 7 of the Canadian Health Measures Survey (CHMS) included an oral health component which was informed by many of the oral health researchers attending this summit. While Statistics Canada is almost done collecting the data across the country, we'll be counting on many of you to use this data to answer the 10 core research questions of Cycle 7 in 2025, so that Canada is better informed in this field. Data from the CHMS and other surveys, such as the Survey of Oral Health Care Providers, will also better position Canada to fully engage in the World Health Organization's 2023–2030 Global Oral Health Action Plan.

Last November, the results of the 2022 Canadian Community Health Survey reconfirmed the importance of accessible and affordable oral health care, considering that more than one third of Canadians reported that they had not visited an oral health professional in the 12 months preceding the survey. Also, one in four Canadians reported avoiding dental visits due to cost. Additionally, the CIHR Oral Health Data Platform initiative will enable sustainable capacity in oral health-related research to improve the health of all Canadians. These efforts will in turn support the realization of the highly anticipated CIHR National Oral Health Research Strategy, a fantastic collaboration involving many national organizations in the oral health domain.

To respond to barriers to oral health care, our government committed $250 million in funding over three years, starting in the 2025–26 fiscal year, and $75 million ongoing to establish the Oral Health Access Fund. This fund is a grants and contributions program led by Health Canada that is designed to complement the Canadian Dental Care Plan. It supports projects that reduce or remove non-financial barriers to accessing oral health care for targeted populations. It is only by working together that we can harness the full power of research to pave the way for a brighter and healthier future for all Canadians. I am looking forward to continued collaboration with you to build on the work we've already done to improve health outcomes for everyone.

I wish you all a productive and fruitful summit.

The Honourable Mark Holland
Minister of Health

Friday Speaker Biographies

Leigha Rock

Leigha Rock, DipDH, BDSc, PhD, Associate Professor and Director, School of Dental Hygiene, Faculty of Dentistry, Dalhousie University. Dr. Rock is also cross appointed to the Departments of Pharmacology and Pathology in the Faculty of Medicine. She is a Scientist at the Beatrice Hunter Cancer Research Institute and holds a scientific appointment at Nova Scotia Health, Department of Anatomical Pathology. The overall goal of her research is to facilitate discoveries that will advance early oral cancer detection biomarkers and identify effective intervention strategies to reduce the number of individuals with aggressive advanced stage disease. Her research focuses on emerging biomarkers and translational precision health approaches to the interception of the malignant transformation of oral premalignant lesions. Dr. Rock is also a co-chair of the National Oral Health Research Strategy (NOHRS), a collaborative initiative led by the Canadian Institutes of Health Research (CIHR) Institute of Musculoskeletal Health and Arthritis (IMHA) in partnership with various Canadian oral health professional organizations and research/academic institutions. The strategy was co-created by the oral health research community, health researchers from other disciplines, professional bodies, and patient and public partners.

Nick Jakubovics

Nick Jakubovics is Professor of Oral Microbiology at Newcastle University, UK, and Editor-in-Chief of the Journal of Dental Research. He trained in biochemistry at the University of Cambridge, UK, before specializing in oral microbiology and biofilms during postdoctoral research at the University of Bristol, UK, and NIDCR, Bethesda, MD. He has received funding from research councils, charities and industry for his current research program that develops new approaches to control oral biofilms and biofilm-related infections elsewhere in the body. He has published more than 100 papers on these topics and has received several awards for his translational research, including the IADR Innovation in Oral Care Award in 2016. Nick was a member of the Executive Board of Applied Microbiology International from 2011-15 and was Features Editor of their quarterly magazine, The Microbiologist, for several years. He was Associate Editor at Oral Diseases (2016-17) and the Journal of Dental Research (2017-20) before being appointed Editor-in-Chief of the JDR in 2020. As part of this role, he is member of the Boards of Directors of the IADR and AADOCR.

James Fitzgerald

James Fitzgerald is the Director of Health Systems and Services at the Pan American Health Organization (PAHO), regional office of the World Health Organization (WHO) in the Americas. He oversees the PAHO/WHO work program to support the transformation of national health systems in the Americas to improve equity and resilience, strengthen Primary Health Care (PHC), and support the progressive realization and achievement of Universal Health.

As Director of Health Systems and Services at PAHO/WHO, he has led the development of reference policy frameworks to guide health sector reform to achieve Universal Health Coverage based on the Primary Health Care Strategy in the Americas. He has coordinated strategies to strengthen health systems resilience, health services organization, workforce capacity and regulatory systems development of medicines and medical products. He oversees the management of the PAHO Virtual Campus for Public Health, and the work program of the Organization in sexual and reproductive health. As a national of Ireland, he holds a B.Sc.(Pharm) and Ph.D. in Pharmaceutical Sciences from Trinity College Dublin, Ireland. After several years working with the pharmaceutical industry in Ireland, he joined PAHO/WHO in 1997 with posts held in Haiti and Brazil. He assumed leadership of the regional work program in Medicines and Health Technologies at PAHO headquarters, Washington DC, USA in 2008, and was appointed Director of Health Systems and Services in 2014.

Carol Guarnizo-Herreño

Carol is a Colombian public health dentist and researcher. Her research interests include socioeconomic inequalities in oral health and the social determinants of health, and the influence of macro-level factors (related to the economic and political context) on population oral health and patterns of inequalities. She has been the recipient of scholarships from Fulbright, UCL (University College London) and the Newton Fund. She has published various peer reviewed publications and book chapters and has led/co-led grants funded by the Colombian government, University of Iowa, the Newton Fund/British Council, and NIHR. Currently she works at the National University of Colombia and is also an Honorary Senior Research Fellow in the Department of Epidemiology and Public Health, UCL. Previous to her academic career, Carol worked at the Colombian National Institute of Health and the Secretariat of Health Bogota. Carol holds a BSc in Dentistry and an MSc in Public Health from the National University of Colombia and a PhD in Epidemiology and Public Health from UCL. Currently Carol is the co-chair of the Lancet Commission on Oral Health.

Pascal Tyrrell

Pascal Tyrrell, an accomplished data scientist, is the Director of Data Science and an Associate Professor at the University of Toronto's Department of Medical Imaging. He founded the MiDATA data science program and holds appointments in the Institute of Medical Science and the Department of Statistical Sciences. His research applies innovative Artificial Intelligence to medical image analysis for improved health outcomes. Pascal is also a serial entrepreneur with experience spanning computer software, medical devices, and agri-tech.

Mohd Wasif Khan

Mohd Wasif Khan is a PhD candidate in computational biology in the Department of Biochemistry and Medical Genetics at the University of Manitoba. He is pursuing his PhD under the supervision of Dr. Pingzhao Hu and Dr. Prashen Chelikani. Wasif holds an MSc degree in Biotechnology from the Indian Institute of Technology Bombay, India. His PhD research focuses on investigating the role of genetics and microorganisms in Early Childhood Caries (ECC). He utilizes statistical techniques such as meta-analysis, mediation analysis, and advanced machine learning methods for his research. Through his work, he aims to gain deeper insights into ECC etiology and to standardize methods for such analyses, along with appropriate visualization techniques. Wasif is dedicated to sharing knowledge and has conducted multiple seminars and tutorials on microbiome-related topics, effectively communicating complex concepts to fellow researchers.

Sreenath Madathil

Sreenath A Madathil is a cancer epidemiologist whose work lies at the intersection of epidemiology, dentistry, and artificial intelligence (AI). Dr. Madathil, completed his bachelor's in dental surgery from University of Calicut, India followed by M.Sc. in Dental Sciences and Ph.D. on Craniofacial Health Sciences from McGill University. His research interest is developing and validating statistical models, and machine learning approaches to support the clinical decision-making process in oral health care. Dr. Madathil's current research projects include i) uncertainty quantification in AI models for oral lesion diagnosis, ii) clinical prediction modelling, and iii) Bayesian inference for life course epidemiology. His research is supported by the Canadian Institutes of Health Research, Canadian Immunity Task Force, and Fonds de recherché du Quebec - Santé. Dr. Madathil has obtained a bachelor's in dental surgery from the University of Calicut, India, and an MSc and Ph.D. in Craniofacial Health Sciences from McGill University.

Samira A.Rahimi

Samira Abbasgholizadeh-Rahimi, BEng, PhD, is Canada Research Chair (Tier II) in Advanced Digital Primary Health Care, Assistant Professor of Family Medicine and Associate member of Faculty of Dental Medicine and Oral Health Sciences at McGill University. She is affiliated scientist at Jewish General Hospital, and Academic Member of Mila-Quebec AI Institute. Prof. Rahimi is co-director of McGill Collaborative for AI & Society (McCAIS), elected President of Canadian Operational Research Society, and Director of Artificial Intelligence in Family Medicine (AIFM). She is the recipient of numerous awards, including the 2022 New Investigator Primary Care Research Award of North American Primary Care Research Group (NAPCRG), an award that recognizes exceptional contributions by emerging investigators in the field of primary care research.

Saturday Speakers

Ben Davis DDS, Dip OMFS&Anes, FRCD(C)

Dean and Professor, Faculty of Dentistry, Dalhousie University

Ondina Love CAE

Chief Executive Officer, Canadian Dental Hygienists Association

Leigha Rock DipDH, BDSc, PhD

Director, School of Dental Hygiene, Faculty of Dentistry, Dalhousie University

Paul Major DDS, MSc, FRCD(C)

Professor and Chair, School of Dentistry. Senior Associate Dean, Dental Affairs Faculty Medicine and Dentistry, University of Alberta

Barb Hamilton-Hinch PhD

Assistant Vice Provost Equity and Inclusion, Associate Research Scholar in Healthy Populations Institute, Associate Professor, Faculty of Health, Dalhousie University

Marsha A. Pyle DDS, MEd

Senior Chief, Knowledge, Engagement and Development
Senior Scholar in Residence
American Dental Education Association

Sachin Seth DDS, Med, FACD

Associate Dean of Academic Affairs, Faculty of Dentistry, Dalhousie University

Erin Steeves DDS

Clinical Instructor, Faculty of Dentistry, Dalhousie University

Lindsay Van Dam BA, DDH, MHS

PhD in Health Student, Faculty of Health
Research Assistant and Clinical Research Coordinator, Faculty of Dentistry
Emerging Leader, Healthy Populations Institute

Clare Champoux DDS

Clinical Instructor and Small Group Practice Leader, Faculty of Dentistry, Dalhousie University

Doug Mackey DDS

Registrar, Provincial Dental Board of Nova Scotia

Symposia Details

Symposium #1

Title: Federal initiatives to support oral health in Canada.

Symposium description: This symposium will provide an overview of the Canadian Dental Care Plan (CDCP), which has been launched by the federal government. The symposium will involve three short presentations followed by a panel discussion with a moderator and the opportunity for audience engagement. The first presentation will be by the Chief Dental Officer of Canada and will provide the context and rationale for the CDCP, plus its overall goals. The second presentation will be by a representative of Health Canada and will provide a description of how the new Plan works and will touch on complementary investments, all of which aim to address oral health gaps among vulnerable populations and reduce barriers to accessing oral health care. This presentation will also discuss the expected outcomes of the Plan, and how they will be measured. The third presentation will be by a representative of Statistics Canada and will discuss the upcoming collection of oral health data through the Oral Health Statistics Program. Following these presentations, the moderator will facilitate questions from the audience on the topic and a discussion on how this new Plan and the various data sources discussed can support research opportunities.

Panelists:
James Taylor, Chief Dental Officer of Canada
Lindy VanAmburg, Health Canada
Jeff Latimer, Statistics Canada
Carlos Quinonez, Schulich School of Medicine & Dentistry, Western University

Symposium #2

Title: Learning opportunities for oral health trainees to develop innovative and sustainable solutions: perspectives from the Canadian Health Measures Survey

Symposium description: The ongoing Canadian Health Measures Survey (CHMS), cycle 7 investigates the oral and general health of a representative sample of the Canadian population aged 1 to 79. A broad range of data are collected from approximately 6000 participants including biological samples, clinical and physical measures and self-report indicators of demographics, psychosocial outcomes, behaviours, and health care utilization. The symposium will explore different aspects of this survey including its training component, which has allowed trainees in the field of oral health to enhance their skills to develop innovative and sustainable solutions in Canada. Presenters from diverse backgrounds will explain their perspectives on the unique partnership between Statistics Canada and the research team to train some of Canada's next generation of oral health researchers. This symposium will also help prepare the widest possible scientific community to use the forthcoming CHMS data to explore a range of research questions from oral microbiota to health and health care inequalities and the oral-systemic health continuum. We want Canada's current and future oral health care researchers to use these data to influence healthcare policies and improve health-related outcomes. This symposium, combining presentations, discussion and a panel, will provide key lessons and suggestions from four areas:

- The research team perspective: composition of the initial pan-Canadian research team and the current and future work to engage researchers for the next phases.
- The field work perspective: challenges and take-homes from clinical data collection at a population level including training and calibration of examiners and offering opportunity to dental and dental hygiene students across Canada to be on-site during the dry-run day to learn how clinical data are collected in Mobile Examination Centres and how dental examiners are trained and calibrated.
- The Statistics Canada perspective: developing and furthering a unique research training partnership in oral health that continues to evolve.
- The trainee perspective: the innovative CHMS oral health externship opportunity with Statistics Canada that has blossomed into sustained participation in cutting-edge research with the establishment of the Oral Health Section Unit.

Panelists:
Liran Levin, Professor of Periodontology, University of Alberta
Sonica Singhal, Assistant Professor, Program Director, Dental Public Health, University of Toronto
Yannick Fortin, Chief, Oral Health Statistics Program, Centre for Direct Health Measures, Statistics Canada
Faraz (Mohammed) Moharrani, PhD candidate and Dental Public Health Resident, Faculty of Dentistry, University of Toronto
Abby Hensel, Research Coordinator, Bruyère Research Institute and formerly MSc candidate, Schulich School of Medicine & Dentistry, Western University
Aimee Dawson, professeure agrégée, Faculté de médecine dentaire, Université Laval.

Symposium #3

Title: Student and Junior Faculty Research Presentations – Fundamental Research

Symposium description:

Presentation 1: Intercellular crosstalk in external inflammatory root resorption (Hadagalu Revana Siddappa, R.)

Presentation 2: Role of Oral Microbiome and Host Factors in Early Childhood Caries (Khan, W.)

Presentation 3: In Situ Antimicrobial Effect of DJK-5-containing Mouthwashes on Oral Biofilms (Liu, H.)

Presentation 4: The role of nociceptors in dental-derived stem cell-macrophage crosstalk in inflammation (Menon, N.)

Presentation 5: Prognosis of Head and Neck Cancer Outcomes Using Artificial Intelligence (Moharrami, M.)

Presentation 6: Oral Health Inequalities in Adolescents and Young Adults in Ontario (Rahman, M. *presented by Limo, L.)

Presentation 7: Overexpression of PITX1 induces Dentinogenesis Imperfecta-like Phenotype in Transgenic Mice (Sartipi, M.)

Presentation 8: Dysfunctional Immuno-host Cell Crosstalk under LPS-induced and Hyperglycemia in Chronic Wounds (Sharma, S.)

Presentation 9: The Epigenetic Regulator ANKRD11 Controls Tooth Development (Yuan, M.)

Symposium #4

Title: Our National Oral Health Research Strategy: a discussion.

Symposium description: In June 2024, the first ever Canadian National Oral Health Research Strategy (NOHRS) will be published. The NOHRS is being co-developed in a Canadian and international context in which much is happening in the world of oral health. In Canada, the Canadian Health Measures Survey is on-going and will provide valuable data concerning the oral health of Canadians. Also, the federal government is about to launch the Canadian Dental Care Plan (CDCP), which will enable access to dental care for many in Canada who currently cannot afford dental care. On the international stage, the WHO has recently published its Global Oral Health Action Plan with a strong push for the integration of oral health care into general medical care and universal health coverage globally. On top of this, in the coming months, The Lancet Commission on Oral Health will publish its report.

In this context, the Institute for Musculoskeletal Health & Arthritis at CIHR initiated the co-creation of the NOHRS. Work was initiated in autumn 2022, resulting in a meeting in Ottawa in March 2023 involving a broad range of stakeholders. Input from that meeting was then circulated broadly in the oral health community to seek feedback, and invitations to participate in writing teams around identified research priority areas were distributed in spring 2023. Volunteers were organized into writing teams in the summer of 2023. During the autumn and winter of 2023-24 the NOHRS has been prepared and the draft will be broadly distributed in March 2024. Following that input, it will undergo final revisions and be published at the COHS. This symposium will present the NOHRS and then invited stakeholders are asked to comment on and react to it, while also providing the audience with an opportunity to ask questions and raise relevant points.

Panelists:
Leigha Rock, Co-chair NOHRS; Director, School of Dental Hygiene, Faculty of Dentistry, Dalhousie University
Nick Jakubovics, University of Newcastle, UK; Editor-in-Chief, Journal of Dental Research
Christine Chambers, Director, Institute of Human Development, Child and Youth Health, CIHR; Dalhousie University
Christophe Bedos, Directeur, Réseau québécois de recherche intersectorielle en santé buccodentaire et osseuse durable; Faculty of Dental Medicine & Oral Health Sciences, McGill University
Carol Guarnizo-Herreno, National University of Colombia; Co-Chair, Lancet Commission on Oral Health
Dawn Richards, Consultant, IMHA Patient Engagement in Research Strategy
Discussion moderated by Paul Allison, Co-chair NOHRS and Faculty of Dental Medicine & Oral Health Sciences, McGill University

Symposium #5

Title: Humanizing Oral Health Professional Education to Actualize Person-Centred Care

Symposium description: In healthcare, person-centered care has emerged as a transformative approach that underscores the importance of viewing patients as whole individuals. This paradigm shift moves beyond the traditional focus on treating medical conditions to encompass the unique circumstances, experiences, and needs of each person. This holistic ideology extends its influence into oral health care education, where educators have long recognized the necessity of embracing inter-professional health education and the collaboration between students and different health care professionals. In contemporary oral health science professional programs, educators aim to cultivate person-centered care by acknowledging the individual beyond their clinical condition, with the objective being to equip dental professionals with the skills to provide holistic care. Despite the inherent challenges (e.g., resources, degree of faculty receptance, or curricular structural barriers, etc.) in achieving this goal, its significance cannot be overstated. Emphasizing and integrating person-centred care for dental students and professionals is critical in modern healthcare, which is becoming more complex as the numbers of older patients and culturally diverse patients are increasing. The upcoming symposium will delve into this imperative, featuring three speakers who will explore perspectives on oral health sciences student well-being, the theory and practice of effective communication with patients, and the integration of grief literacy into dental curricula to humanize oral health professions. By addressing these facets, the symposium aims to contribute to the ongoing effort to foster person-centered care within oral health education, recognizing its profound impact on the quality and efficacy of healthcare delivery.

Panelists:
HsingChi von Bergmann, Faculty of Dentistry, University of British Columbia
Tala Maragha, Faculty of Dentistry, University of British Columbia
Laura Dempster, Faculty of Dentistry, University of Toronto
Mary Ellen Macdonald, Faculty of Medicine, Dalhousie University

Symposium #6

Title: Exploring the Relationship Between Oral Health and Frailty: Experiences Planning and Hosting a Research Priority Generating Workshop

Symposium description: The *Exploring the Relationship Between Oral Health and Frailty* workshop was held in Halifax, Nova Scotia on May 25 and 26, 2023. The goals for the workshop were to 1) identify research priorities pertaining to the intersection of oral health and frailty; and 2) build Canadian research capacity in oral health and frailty. Thirty people from 10 clinical and academic institutions across Canada attended the workshop. This pan-Canadian interprofessional group of researchers and knowledge-users (i.e., clinicians, educators, and patient partners) shared their expertise in food science and nutrition; dysphagia; geriatric and family medicine, and nursing; specialty and general dentistry, and dental hygiene; palliative care; frailty; epidemiology; health promotion; education; and bioethics. Moreover, the patient partners belong to equity-seeking groups, bringing unique perspectives based on diverse lived experiences. The workshop opened with state-of-the-science presentations on oral health, frailty, nutrition, mastication, and swallowing. During the remainder of the workshop, attendees participated in guided group activities to first discuss knowledge and practice gaps, and then to identify research priorities. To advance the understanding of the impact of frailty on oral health needs (and vice versa) and care for older adults, 13 research priorities, addressing four main overarching priority areas, were generated: oral health education and promotion, access to oral health care for frail older adults, opportunities to leverage existing large data sets for research and need for research funding. The purpose of this symposium is to share the results of the Exploring the Relationship Between Oral Health and Frailty workshop, including 'lessons learned' while planning the workshop, acquiring funding, and ensuring meaningful participation from all attendees; the research priorities generated; and the plan for ongoing engagement with and between attendees.

Panelists:

Rebecca Affoo, School of Communication Sciences and Disorders, Faculty of Health, Dalhousie University
Shauna Hachey, School of Dental Hygiene, Faculty of Dentistry, Dalhousie University
Catriona Steele, KITE Research Institute - Toronto Rehabilitation Institute - University Health Network
Betty Wiswell, Patient partner

Symposium #7

Title: Navigating the future of oral health workforce in the era of the Canadian Dental Care Plan

Symposium description: The last national study of human resources in the oral health care sector in Canada was conducted in three phases between 1999 and 2005. A lack of valid data to populate the model that had been developed in the first phase of the study prevented the accomplishment of the main objective of the last phase of the study, which was supporting the emergence of a more effective human resource planning environment for the oral health care sector. In the absence of such a planning environment, measures intended to address human resources issues in other health care sector are being inappropriately applied to the oral health care sectors, resulting in an imbalance in the human resources available for the delivery of oral healthcare. That imbalance was magnified by the COVID-19 pandemic, resulting in dentists having to cancel appointments because they are unable to recruit dental hygienists and assistants in sufficient numbers.

As the launch of the new Canadian Dental Care Plan is heightening concerns about the availability the human resources in the oral health care sector, this symposium will discuss currently available sources of information, how they can be used for the development of evidence informed human resource policies, and actions that can be taken to promote the emergence of a more effective human resource planning environment for the oral health care sector.

Panelists:
Ondina Love, Chief Executive Officer, Canadian Dental Hygiene Association
Sylvie Martel, Director of Dental Hygiene Practice, Canadian Dental Hygiene Association
Benoit Soucy, Chief Knowledge Officer, Canadian Dental Association

Symposium #8

Title: Community-engaged research experiences with priority populations in Canada

Symposium description: In Canada, challenges continue to exist in addressing the unmet oral healthcare needs of equity-deserving populations. This includes seniors, children, low-income populations, people with special needs, 2SLGBTQQIA+ communities, people on social welfare, people experiencing homelessness, Indigenous people, new immigrants, refugees and others. While Canada's overall oral healthcare measures rank above average compared to developed countries worldwide, inequities in oral care persist. Vulnerable populations situated at the lower end of the social gradient face unique and complex access to oral healthcare challenges primarily attributed to social determinants of health. The Canadian Health Measures Survey revealed poor self-perceived oral health for those without access to regular dental care, signaling the importance of access to safe and patient-centred oral care in improving oral health outcomes. Community-engaged research seeks to reduce health disparities by meaningly involving those communities or populations it intends to reach. Speakers from three Canadian dental schools will share their community-engaged research experiences. This symposium will offer a comprehensive overview of best practices, ethical considerations and innovative methodologies that foster symbiotic collaborations, empower participants and communities, and co-create knowledge that addresses pressing issues faced by above mentioned populations.

Panelists:
Amrinderbir Singh, College of Dentistry, University of Saskatchewan.
Michelle Siqueira, College of Dentistry, University of Saskatchewan.
Abbas Jessani, Schulich School of Medicine and Dentistry, Western University.
Maryam Amin, Faculty of Medicine and Dentistry, University of Alberta

Symposium #9

Title: Harnessing Complex and Multimodal Data to Advance Canadian Population Oral Health Research: The Future is Now

Symposium description: The use of complex and multimodal data analytics for population oral health research is a growing area of interest and study. The use of emerging national datasets, administrative data and electronic health records (EHRs), tied with the application of innovative methods such as machine learning and predictive modeling, all provide promise for expanding the use of such data to address oral health research questions. This symposium will spotlight the power of harnessing Canadian oral health datasets, administrative data and EHRs to explore patterns, associations and possibly trends in oral health and oral health inequalities in various populations. The symposium will start with an introduction to speakers and topics. The first presentation will highlight the major Canadian national datasets, the strengths, and limitations of their oral health attributes, and how they compare to other datasets at the international level. The second presentation will discuss recent findings from national surveys that combine social and biological data to characterize common risk factors and pathways to oral health and related non-communicable chronic conditions in Canada's older population. The third presentation will delve into findings from studies using national datasets and EHRs to understand oral health inequalities as well as the role of oral health in chronic disease management. The fourth talk will discuss the use of innovative computational approaches for complex and multimodal data in oral health. Finally, there will be a session for a moderated discussion between the participants and speakers/panelists.

Panelists:
Kim McGrail, Centre for Health Services and Policy Research, University of British Columbia
Noha A. Gomaa, Schulich School of Medicine & Dentistry, Western University
Julie W. Farmer, Faculty of Dentistry, University of Toronto
Sreenath A Madathil, Faculty of Dental Medicine & Oral Health Sciences, McGill University

Symposium #10

Title: What can public dental care achieve and what are its limits? A discussion.

Symposium description: The aim of this symposium is to engage the audience in a discussion over the potential and actual contributions of public dental care to oral health and inequalities in oral health in Canada and elsewhere in the world. The symposium will start with a presentation by a representative of the Oral Health Program at the WHO discussing the recently published Global Oral Health Action Plan (GOHAP) as well as the broad push for Universal Health Coverage (UHC) globally by the WHO. We will then have a presentation from a member of the Health Policy Unit at the American Dental Association providing analyses of the benefits of public dental care among different populations in the USA. Finally, there will be a presentation by a Canadian expert on the current state of oral health and inequalities in oral health in Canada and how the new Canadian Dental Care Plan (CDCP) may help reduce inequalities in improve Canadians' oral health. Following these presentations, there will be a panel discussion including audience participation to discuss the topic.

Panelists:
Carolina Hommes, WHO PAHO (Pan American Health Organization) Oral Health Program,
Marko Vujicic, ADA, Health Policy Institute
Noha Gomaa, Schulich School of Medicine & Dentistry, Western University
Discussion moderated by Paul Allison, Faculty of Dental Medicine & Oral Health Sciences, McGill University

Symposium #11

Title: Cultivating Equity, Diversity, and Inclusivity in Dental Education: Narratives from Four Canadian Dental Schools.

Symposium description: Equity, Diversity, and Inclusion (EDI), along with the integrated principles of Decolonization and Indigenization (DI), stand as essential pillars in the delivery of dental care in Canada and worldwide. Ongoing efforts toward eliminating systemic racial discrimination towards Indigenous and Black, recognizing the diverse landscape shaped by immigration, the wide focus on gender and sex disparities, and the recent introduction of the National Dental Plan show the crucial role of EDI in dental education.

The incorporation of EDI-DI in dental curriculum not only enriches the learning experience of our learners but also contributes to a holistic understanding of oral health disparities while cultivating cultural humility.

This symposium will delve into the innovative teaching methodologies applied by Canadian dental schools, encompassing case studies, didactic delivery, small group learning, patient care, oral health outreach, and global health service learning to promote EDI-DI within their institutions. A key focus of this symposium will be the exploration of experiential learning opportunities, including active community engagement initiatives with diverse and equity-seeking communities within Canadian provinces. Additionally, this symposium will highlight the impact of interprofessional collaboration with various primary care providers fostering person-centered care within the realm of EDI-DI. Furthermore, the symposium will address the incorporation of artificial intelligence (AI) in health and oral health provision, discussing its strengths and limitations in conjunction with the integration of EDI-DI.

In conclusion, our symposium will cover innovative approaches, demonstrating how the Canadian dental curriculum can effectively prepare future oral health professionals to navigate the complexities of a multicultural and multi-faceted society.

Panelists:
Abbas Jessani, Schulich School of Medicine and Dentistry, Western University
Amrinderbir Singh, College of Dentistry, University of Saskatchewan
Anuradha Prakki, Faculty of Dentistry, University of Toronto
Elham Emami, Faculty of Dental Medicine and Oral Health Sciences, McGill University

Symposium #12

Title: Student and Junior Faculty Research Presentations – Applied Research

Symposium description:

Presentation 1: Multimorbidity Increases Periodontal Disease in Older Canadians (Abbas, A.)

Presentation 2: Application of Deep Learning Models in Children Dental Anxiety Assessment (Adabdokht, R.A.)

Presentation 3: Pediatric TMJ disc identification and displacement classification with machine learning (Almeida, F.)

Presentation 4: The Causal Effect of Human-Papillomavirus Vaccination on Head-and-Neck Cancer Risk (Amure, M.)

Presentation 5: Breaking Barriers: Initiatives for Dental Care Access in Immigrant Children (Bohlouli, S.)

Presentation 6: The Societal Costs and Benefits of a Comprehensive Dental Care Program (Ghoneim, A.)

Presentation 7: Adverse childhood experiences and co-occurring poor oral health and multimorbidity (Hensel, A.)

Presentation 8: Barriers Impeding Implementing the Canadian CRA Tool in Indigenous Communities (Olatosi, O.)

Presentation 9: Bitter Taste Genetics and Oral Health in Canadian Adults (Shafizadeh, M.)

Workshop Details

The Canadian Health Measures Survey (CHMS) data user workshop: Spotlight on oral health

Dr. Aimee Dawson and Statistics Canada

This workshop is intended to:
a) show users where to find and how to navigate sources of information about the CHMS,
b) help users understand what, why and how various aspects of the survey design need to considered and incorporated when analyzing the data
c) provide users with best practices when analyzing the data and
d) provide an overview of the oral health component, past and present, including hands-on examples of analyzing the oral health data

Vision for sustainable virtual oral health care

Dr. Pascaline Kengne Talla

Overall goal of workshop: The purpose of this half-day workshop is to bring together a range of stakeholders including patient partners/ community organization representatives, oral health care providers, dental trainees, researchers and policy/decision-makers, to draw on the research evidence to identify gaps and research priorities, and to suggest a outline plan for care, education/training and research settings pertaining to the delivery of sustainable virtual oral health care.

Patient and Public Engagement 101

CIHR-IMHA, Dr. Dawn Richards

This interactive workshop will help participants understand the basics of engaging patients and the public as research partners, as well as help them consider how to put these fundamentals into practice. Patient and public partners will share some of their own experiences as research partners and engage participants in a learning exercise where they will develop their own patient and public engagement plans for a hypothetical research project.

How to Get Published

Dr. Belinda Nicolau

The workshop is designed to help participants understand the ins and outs of academic publishing. It will provide practical tips on submitting your work successfully. Whether you are a student or a junior researcher, the goal is to share useful strategies so that you can confidently present your work to the academic community.

Beyond the Surface: Analyzing Oral Health Data and Outcomes

NCOHR

The workshop's primary emphasis will be on addressing learning strengths, obstacles and potential solutions for analyzing oral health data and outcomes, as well as obtain the appropriate understanding. The anticipated outcomes are:

·Learn the potential data sources, strength, obstacles, and possible solutions for improving oral health care data in order to evaluate the effectiveness of the new oral health care planning.

·Gain insights focused on reducing barriers for patients and healthcare professionals.

·Learn the best methods for combining data and to promote internal validity.

·Obtain practical insights aimed at comprehending the impact of the new program on health inequalities and health inequities.

·An Advisory Group within NCOHR will be established to address this critical data issue, with a focus on generating relevant valid data, especially among individuals at higher risk.

·A white paper summarizing the workshop results and recommended next steps for the oral health research community.

Public Health Lunch & Lightning Talks

Sonica Singhal (University of Toronto)
Carol Guarnizo-Herreno (National University of Colombia)
James Taylor (Chief Dental Officer of Canada)
Dawn Richards (CIHR-IMHA patient-Engagement Consultant)
Sylvie Martel (Canadian Dental Hygienists Association)
Jim Lai (Association of Canadian Faculties of Dentistry)
Cyerra Powder (Canadian Dental Therapists Association)
Aaron Bury (Canadian Dental Association)
Leslie Ann Wirth (Canadian Dental Assistants Association)
Amrinderbir Singh (Canadian Association of Public Health Dentistry)
Kim McGrail (University of British Columbia & Health Data Research Network Canada)
An-Wen Chan (University of Toronto & IMHA Advisory Board)
Bob Schroth (University of Manitoba)
Nick Jakubovics (Newcastle University & JDR Editor-in-Chief)
Belinda Nicolau (Canadian Association of Dental Research)
Ana Velly (Network for Canadian Oral Health Research)

Glossary

AADOCR: American Association for Dental, Oral, and Craniofacial Research
ACCORD: ACcurate COnsensus Reporting Document (ACCORD) project
ACFD: Association of Canadian Faculties of Dentistry
CADR: Canadian Association for Dental Research
CADTR: Canadian Alliance of Dental Technology Regulators
CAHS: Canadian Academy of Health Sciences
CAPHD: Canadian Association of Public Health Dentistry
CBPR: Community-Based Participatory Research
CDA: Canadian Dental Association
CDAA: Canadian Dental Assistants Association
CDAC: Commission on Dental Accreditation of Canada
CDHA: Canadian Dental Hygienists Association
CDRAF: Canadian Dental Regulatory Authorities Federation
CDTA: Canadian Dental Therapists Association
CHMS: Canadian Health Measures Survey
CIHR: Canadian Institutes of Health Research
CSDH: Canadian Society for Disability and Oral Health
DAC: Denturists Association of Canada
DDS: Doctor of Dental Surgery
DipDH: Diploma in Dental Hygiene
DMD: Doctor of Medicine in Dentistry
FCDSA: Federation of Canadian Dentistry Student Associations
FDI: FDI World Dental Federation
FRCDC: Fellow of The Royal College of Dentists of Canada
IADH: International Association for Disability and Oral Health
IADR: International Association of Dental Research
ICOH: Inter-Country Center for Oral Health for Africa
IDAC: Indigenous Dental Association of Canada
IMHA: Institute of Musculoskeletal Health and Arthritis
MPH: Master of Public Health
NCOHR: Network for Canadian Oral Health Research
NDEB: National Dental Examining Board of Canada
NIDCR: National Institute of Dental and Craniofacial Research
OCDOC: Office of the Chief Dental Officer of Canada
NIH: National Institutes of Health
PERA: CIHR-IMHA Patient Engagement Research Ambassador team
PHAC: Public Health Agency of Canada
PSAC: Public Service Alliance of Canada
RCDC: Royal College of Dentists of Canada
RCT: Randomized Controlled Trial
RSBO: Réseau de recherche en santé buccodentaire et osseuse/Bone and Oral Health Research Network
WHO: World Health Organization

Committees

Organization	Scientific Committee	Logistics Committee
Dalhousie	Ben Davis	Ben Davis Catherine Lyle Cynthia LeClair Pascale Khalife
ACFD	Paul Allison	Paul Allison Kristjana Oliver
CADR	Belinda Nicolau Anil Kishen	Melissa O'Connor
NCOHR	Ana Velly Petros Papagerakis Maryam Amin	Ana Velly Iona Worden-Driscoll
IMHA	Karim Khan Hetty Mulhall	Hetty Mulhall
Trainee Reps	Paras Ahmad Maryam Zanjir	

Contact

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