

Interdisciplinary Perspectives on Oral and Facial Pain and Headache: Unravelling the Complexities for Improved Understanding, Prevention, and Management — Report

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Introduction

Oral and facial pain and headache (OFPH) are highly prevalent conditions that contribute substantially to individual suffering and health system burden. Important gaps remain in the identification of risk factors, underlying mechanisms, biomarkers, and effective prevention strategies, particularly for the transition from acute to chronic OFPH. These challenges disproportionately affect vulnerable populations, including children, older adults, individuals with disabilities, and Indigenous communities, who often face barriers to accessing timely and appropriate care.

To address these gaps, the hybrid workshop “Interdisciplinary Perspectives on Oral and Facial Pain and Headache: Unravelling the Complexities for Improved Understanding, Prevention, and Management” was convened in Montreal, Canada, on May 10–11, 2025. The workshop was supported by Canadian Institutes of Health Research, Network for Oral and Bone Health Research, and Quebec Pain Research Network.

Workshop Objectives

The workshop aimed to (1) identify key knowledge gaps in the epidemiology, mechanisms, diagnosis, management, and implementation of research on OFPH; (2) define priorities to advance prevention and treatment; and (3) develop strategic recommendations to foster interdisciplinary collaboration, strengthen data integration, and support knowledge mobilization.

Participants

This workshop convened researchers, clinicians, trainees, a patient, and patient partners from across Canada and internationally. Several participants serve as Chairs or members of Network for Canadian Oral Health Research (NCOHR) Working Groups, reflecting the workshop's strong connection to national efforts aimed at advancing interdisciplinary oral health research and knowledge mobilization in Canada.

Workshop Design

The hybrid workshop included a series of formal presentations addressing specific themes related to OFPH, followed by structured discussions involving all participants that focused on the key points raised in each presentation. The themes addressed were: “Oral and facial pain and headache: Why they matter more than you think?”; “Oral and facial pain mechanisms: current and future developments”; “Validation of animal models and tools for biomedical research”; “New and emerging biomarkers”; “An overview of the strategies to treat oral and facial pain and headache”; “Harnessing valid databases for robust oral and facial pain research”; “Data science and artificial intelligence approaches to enhance understanding and treatment of oral and facial pain and headache”; “Knowledge exchange and mobilization, and open science”; “The power of basic and clinical research in advancing trainee development”; and “The power of population and clinical pain research”.

Overview of Proceedings

Day 1: Knowledge to Action—Framing the Path Forward

Participants reviewed current evidence on the burden of OFPH, including underlying mechanisms, diagnostic frameworks, emerging biomarkers, and treatment approaches. Structured discussions focused on identifying critical gaps, including limited population-based data, insufficient longitudinal studies, and lack of integration across biological, psychological, and social domains, a lack of animal studies designed to reflect specific OFPH conditions and mechanisms, limited training opportunities, insufficient incorporation of patient perspectives into

research priorities and models of care, and challenges in knowledge translation and implementation.

Day 2: Building the Future

Participants considered the current state of evidence for the key topics covered on Day 2. The discussions brought into sharp focus several critical gaps that continue to limit progress in the field, including weaknesses in data infrastructure, underuse of artificial intelligence and data science methods, limited knowledge exchange and open science practices, insufficient integration across basic science, clinical research, and patient perspectives, and limited education on pain for dental students, as reflected in the limited pain content of their curriculum. Participants also highlighted the need for stronger interdisciplinary training and more effective collaboration to build capacity among future researchers and clinicians.

Key Research Priorities

Across sessions, several priority areas emerged. Participants emphasized the need for animal studies that incorporate psychological components to better elucidate the mechanisms underlying pain chronification. They also highlighted the importance of large-scale, longitudinal epidemiological research to clarify pain trajectories over time, as well as population-based surveys to estimate the burden of specific OFPH conditions. The assessment and integration of biomarkers were identified as important for improving diagnosis, identifying risk factors for pain persistence, and supporting more personalized care. Participants further emphasized the importance of incorporating patient perspectives to ensure that research priorities and models of care are aligned with lived experience, needs, and preferences. They also stressed the need to develop and evaluate prevention-oriented interventions and clinical decision-making models. Advancing the field will require better access to high-quality data through harmonized databases and collaborative networks.

Discussions shifted toward actionable strategies to address identified gaps. Key themes included strengthening data infrastructure, leveraging artificial intelligence and data science approaches, advancing knowledge exchange and open science practices, and enhancing integration across basic science, clinical research, and patient perspectives. Participants also emphasized the importance of training the next generation of researchers and clinicians through interdisciplinary programs and collaborative networks.

Implications for Research, Education, Practice, and Policy

Four key points emerged from the workshop. First, participants emphasized the need for coordinated, interdisciplinary efforts to address the complex and multifactorial nature of OFPH. Progress in this field will require integration across basic science, clinical research, and population health, along with stronger partnerships with patients and communities. Second, improving access to care and reducing disparities must remain central to future research, practice, and policy. Third, participants identified the need for a national survey in Canada to estimate the prevalence of OFPH using specific questions that distinguish among different pain conditions. Such data are essential for quantifying the burden of these disorders and for informing priorities in research, prevention, clinical care, and public policy. Fourth, participants underscored the importance of education and training in building capacity for future progress. They emphasized the need for interdisciplinary learning opportunities, stronger knowledge mobilization, and training approaches that better prepare researchers and clinicians to deliver integrated, evidence-based care.

Conclusions

This hybrid workshop represents an important step toward defining a coordinated research agenda for OFPH. By identifying key gaps and establishing priorities, it provides a foundation for future collaborative initiatives aimed at improving prevention, diagnosis, and treatment, while also strengthening oral health research capacity and advancing innovation in pain prevention and management. Sustained investment in interdisciplinary research, data infrastructure, and training will be essential to reduce the burden of these conditions and improve

health outcomes. These priorities are also aligned with broader national efforts, including those advanced through NCOHR, to strengthen oral health research capacity and foster interdisciplinary collaboration in Canada.

Authors' contributions

Ana Velly conceived the study. Barry Sessle, Gilles Lavigne, Limor Avivi-Arber, Maryam Amin, and Berlant AlSabbagh contributed to the design of the study. All authors contributed to the development of the report, critically reviewed and revised it, and approved the final version.

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