Prodoehl *et al. BMC Global and Public Health* (2025) 3:97
https://doi.org/10.1186/s44263-025-00217-y

BMC Global and Public Health

COMMENT Open Access

Bridging the medical-dental divide: a public health imperative for temporomandibular disorders

Janey Prodoehl[1*], Allen Cowley[2,3], Justin Durham[4], Mark Lodes[5], Brad Rindal[6] and Sean Mackey[7]

Temporomandibular disorders (TMDs) represent a neglected public health challenge in the USA due to the often-debilitating effects on individuals' lives. Individuals with TMDs routinely encounter fragmented and ineffective care. This comment outlines how a unified care pathway for TMDs can be implemented within existing public health frameworks.

Background

Temporomandibular disorders (TMDs) impose significant social, emotional, and economic costs, creating a substantial public health burden [1]. Approximately 4.8% of U.S. adults' experience pain in the temporomandibular joint region [1, 2]. Despite this prevalence, coordinated care for TMDs remains notably inadequate. In 2020, the National Academies of Sciences, Engineering, and Medicine (the National Academies) issued a comprehensive consensus report highlighting major gaps in knowledge and care delivery for TMDs, emphasizing the need for a coordinated public health response [1]. Building on the National Academies' findings [1], a 2023 TMD forum convened clinicians, patients, and health leaders to work together addressing issues of shared interest and concern [3]. The goals of the TMD Forum are to provide an ongoing mechanism and a neutral setting in which to collaborate and engage in discussions that will facilitate cross-sector action and foster long-term multidisciplinary relationships focused on topics related to various issues including the development of a clinical care pathway for TMD aimed at closing existing gaps. The authors of this comment were selected from the broader group of participants involved in the TMD Forum, specifically from the standing committee members and topic experts invited to contribute to discussions held between 2023 and 2025.

Financial and clinical burden of TMDs

The financial burdens associated with TMD treatment can be severe, exacerbated by limited coverage from third-party payers [1]. Treatment complexity is further amplified by the frequent coexistence of known comorbid conditions with TMDs such as fibromyalgia, chronic fatigue syndrome, depression, anxiety, and the presence of other medical morbidities. While clinicians within medicine often possess the skills to manage or appropriately refer these comorbidities, they generally do not understand how TMDs integrate into broader musculoskeletal pain management frameworks. Conversely, general dentists typically are not trained to address either these comorbid or

*Correspondence:
Janey Prodoehl
jprodo@midwestern.edu
[1] Physical Therapy Program and College of Dental Medicine Illinois, Midwestern University, Downers Grove, IL, USA
[2] TMJ Association, Milwaukee, WI, USA
[3] Department of Physiology, Medcial College of Wisconsin, Milwaukee, WI, USA
[4] School of Dental Sciences, Newcastle University, Newcastle Hospitals NHS Foundation Trust, Newcastle Upon Tyne, UK
[5] Population Health and Medical Education, Medical College of Wisconsin, Milwaukee, WI, USA
[6] Center for Oral Health Integration, HealthPartners Institute, Minneapolis, MN, USA
[7] Departments of Anesthesiology, Pain Medicine, Neurosciences and Neurology, Stanford University School of Medicine, Perioperative, andPalo Alto, CA, USA

© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by-nc-nd/4.0/.

multimorbid conditions, and their ability to refer patients to medical specialists is constrained by several factors, including the traditional separation of dental and medical training and the often-siloed structure of dental practice [1]. Dentists are taught to make referrals within the dental field, but the process for cross-referring to a physician is often more limited hindering effective management of patients with more complex TMDs. Consequently, individuals with TMDs frequently fall into a gap between dentistry and medicine and must navigate care on their own. Many experience abandonment when initial treatments fail, often without guidance regarding alternative, evidence-based approaches. For patients with TMDs, finding an evidence-based provider can be difficult. Though general dentists and some oral medicine specialists offer treatment and advertise specialty TMD practice, few have formal advanced training. The specialty of orofacial pain was established to address this gap. These specialists are trained to diagnose and treat complex, chronic pain including TMD, myofascial pain, and headaches. However, there are fewer than 300 orofacial pain specialists currently practicing in the U.S. making it difficult to meet patient demand. Moreover, not all TMD patients require referrals to specialists, further complicating optimal care delivery.

Early, straightforward, and reversible treatments, focused on patient self-management, can lead to symptom improvement or resolution in up to 90% individuals with newly diagnosed TMDs. However, inadequate initial management significantly increases the risk of chronic pain; nearly half (49%) of individuals continue to experience TMD-related pain 6 months after symptom onset [4]. Effectively addressing TMDs on a population level necessitates systematic diagnostic approaches to evaluate those patients who present with facial pain and/or jaw dysfunction, followed by conservative, evidence-based management [5] across health disciplines. Such comprehensive strategies are critically needed yet notably absent from the current U.S. healthcare system.

Bridging the gap: addressing TMDs through coordinated public health care strategies

TMDs exist at the intersection of medicine and dentistry. Historically, medicine has largely overlooked TMDs in routine musculoskeletal care, whereas dentistry remains isolated from mainstream medical practice, hindering effective care coordination. Consequently, patients frequently receive fragmented and inadequate care. As stated by a TMD patient in the National Academies report [1], "Many patients here and around the world are lost, forgotten, and suffering. I cannot imagine that all of us here don't share the hope that someday the approach to TMDs will be drastically different from what we have experienced, and continue to experience today".

The historical emphasis on dental occlusion as the primary cause of TMDs [6], now recognized as misguided, reinforced perceptions that TMDs should be exclusively managed within dentistry. This perspective contributed to widespread adoption of invasive and often irreversible dental interventions, such as occlusal adjustment and bite reconstruction, despite limited evidence for efficacy. As a result, occlusal appliances became relied upon as initial treatments within dentistry [1].

Over the past two decades, understanding of TMDs has significantly evolved—paralleling progress seen in other pain conditions, such as low back pain and fibromyalgia. Today, TMDs are recognized as multifactorial conditions that can transition to chronic pain states, necessitating individualized and conservative management within a biopsychosocial care model [7, 8]. To effectively bridge existing care gaps, healthcare professionals across disciplines must be provided with robust and well-validated tools to quickly assess the subjective likelihood of having a painful TMD, evidence-based initial treatment strategies, and clearly defined referral protocols. Early identification and appropriate management of incident TMDs are critical for preventing progression to high-impact chronic pain. Developing and implementing a structured interdisciplinary care pathway represents an essential step toward addressing this significant public health concern.

Establishing a care pathway for TMDs in the U.S. healthcare system

Several narrative guidelines for managing TMDs have been developed but only one thus far utilized accepted standards and methodologies in its development as a clinical practice guideline [5]. The model proposed in this Comment (Fig. 1) draws upon this clinical practice guideline and an existing care framework from the United Kingdom [9] but is adapted to meet the specific demands and structure of the U.S. healthcare system. It is designed to be accessible, feasible and effective for all stakeholders, including patients, dentists, primary care physicians, physical therapists, and specialists.

Under this pathway, patients presenting with facial pain and/or jaw dysfunction can enter the healthcare system through any front-line clinician they choose- dental, medical, or allied health. Regardless of the entry point, a standardized initial care protocol applies, emphasizing shared assessment and triage tools while minimizing reliance on early imaging. This approach mirrors established guidelines for other musculoskeletal conditions such as low back pain, where early surgical referral and advanced imaging are de-emphasized in favor of conservative care, including self-management and physical therapy.

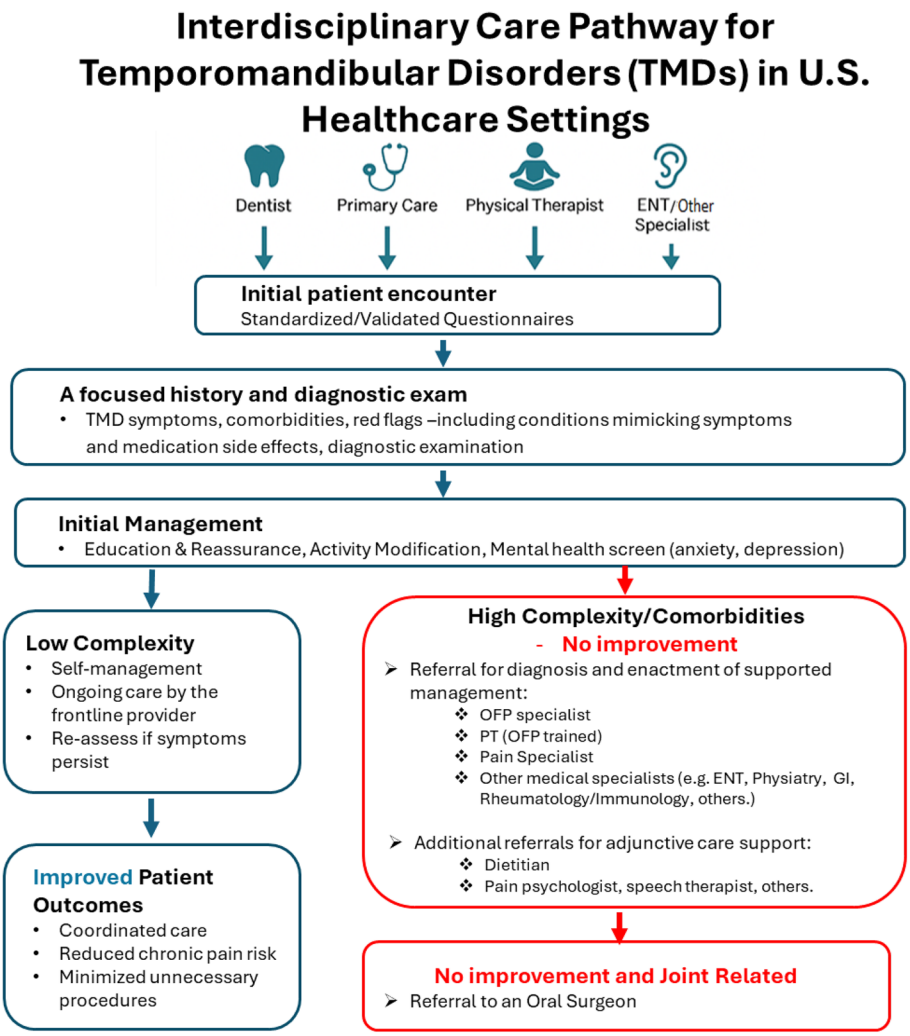

Fig. 1 The public health issues related to temporomandibular disorders (TMDs)

Validated questionnaire-based tools would be employed for patients with painful TMDs, distinguishing them from those whose symptoms (e.g., painless joint clicking) do not require further intervention. For those who score positive, assessing for conditions known to be comorbid with TMD, pain severity, and mental health factors such as anxiety and depression helps to guide next steps. Examination and history must also include "red flag" assessments to identify serious conditions requiring urgent specialist referral.

Training across disciplines is crucial to facilitate effective bidirectional referral and interdisciplinary collaboration. Medical clinicians must be trained to recognize dental sources of orofacial pain, while dental professionals need to consider non-dental origins when standard dental diagnostics are inconclusive. Shared terminology, protocols, and clinical tools will be integral to ensuring care continuity across disciplines.

Following a positive questionnaire for possible TMD, a focused history and brief diagnostic exam is conducted to assess likelihood and complexity. Clinicians unable to perform this assessment should refer patients to appropriate colleagues. History-taking includes evaluation of co-morbidities that may complicate or mimic the TMD clinical picture and signal the need for specialist involvement.

Currently, patients and clinicians lack clarity around referral options, a gap this pathway seeks to address. Referral decisions must account for local clinician availability, insurance coverage, and patient financial burden, particularly given the limited applicability of dental insurance and out-of-pocket costs and a clear understanding of the roles of each clinician. Transparent communication regarding these considerations is vital to facilitate shared decision-making and timely access to appropriate care.

For most individuals with new-onset TMDs, early conservative self-management strategies remain foundational [10]. Evidence suggests that education and symptom management can improve outcomes for the majority of patients and can be managed by any trained frontline clinician. However, patients with complex presentations which can include comorbid and other multimorbid conditions, severe pain, or lack of improvement may require early specialist referral.

Advanced management may involve orofacial pain specialists, pain psychologists, physical therapists with expertise in orofacial pain, pain physicians, nutritionists, and speech therapists. Referrals for known TMD comorbid conditions may include rheumatologists, neurologists, otolaryngologists, gastroenterologists, immunologists, and others. Surgical referrals are generally reserved for patients with specific criteria, such as urgent red flags including severe dietary restriction accompanied by profound limited mouth opening, or those who fail to respond to conservative care.

Implementing this structured care pathway offers a critical opportunity to close existing gaps in TMD management, reduce unnecessary interventions, and provide equitable, evidence-based care across medical and dental disciplines.

Conclusions

TMDs affect millions of U.S. adults who receive fragmented care. A new framework proposes an evidence-based pathway emphasizing early self-management and coordinated specialist referral. This approach aims to reduce unnecessary interventions and financial barriers by improving interdisciplinary collaboration and provider training to bridge the gap between medicine and dentistry.

Abbreviations

ENT	Ear, nose and throat physician
GI	Gastroenterology
OFP	Orofacial pain specialist
PT	Physical therapist
TMDs	Temporomandibular disorders
TMJ	Temporomandibular joint
U.S.	United States of America

Acknowledgements

We gratefully acknowledge the work of Rebecca English, Senior Program Officer at the National Academies of Sciences, Engineering, and Medicine, and Deanne Clare, TMJ Association, for their assistance with this paper and TMD forum members (https://www.nationalacademies.org/our-work/forum-on-temporomandibular-disorders#sectionCommittee) and participants for their work on advancing care for individuals with TMD.

Authors' contributions

Conceptualization: JP, AC, JD, BR, SM; writing—original draft: JP, AC; writing—review and editing: JP, AC, JD, BR, ML, SM. J.P., A.C., J.D. are members of the National Academies Forum on TMD; M.L. and B.R. participated in meetings of the National Academies Forum on TMD; and S.M. was vice chair of the 2020 National Academies report on TMD. All authors read and approved the final manuscript.

Funding

Not applicable.

Data availability

No datasets were generated or analyzed during the current study.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Received: 13 August 2025 Accepted: 22 October 2025
Published online: 04 November 2025

References

1. NASEM. The National Academies Collection: reports funded by National Institutes of Health. Temporomandibular disorders: priorities for research and care. Washington (DC): National Academies Press (US); 2020.
2. Schiffman E, Ohrbach R, Truelove E, Look J, Anderson G, Goulet JP, et al. Diagnostic criteria for temporomandibular disorders (DC/TMD) for clinical and research applications: recommendations of the international RDC/TMD consortium network and orofacial pain special interest group. J Oral Facial Pain Headache. 2014;28(1):6–27.
3. National Academies of Sciences, Engineering, and Medicine (NASEM). Forum on Temporomandibular Disorders 2023 [Available from: https://www.nationalacademies.org/our-work/forum-on-temporomandibular-disorders.
4. Slade GD, Ohrbach R, Greenspan JD, Fillingim RB, Bair E, Sanders AE, et al. Painful temporomandibular disorder: decade of discovery from OPPERA studies. J Dent Res. 2016;95(10):1084–92.
5. Busse JW, Casassus R, Carrasco-Labra A, Durham J, Mock D, Zakrzewska JM, et al. Management of chronic pain associated with temporomandibular disorders: a clinical practice guideline. BMJ. 2023;383:e076227.
6. Costen JB. A syndrome of ear and sinus symptoms dependent upon disturbed function of the temporomandibular joint. Ann Otol Rhinol Laryngol. 1934;43:1–15.
7. Slade GD, Fillingim RB, Sanders AE, Bair E, Greenspan JD, Ohrbach R, et al. Summary of findings from the OPPERA prospective cohort study of incidence of first-onset temporomandibular disorder: implications and future directions. J Pain. 2013;14(12 Suppl):T116–24.
8. American Academy of Orofacial Pain, Klasser GD, Romero Reyes M, editors. Orofacial Pain Guidelines for assessment, diagnosis, and management. 7th ed. Hanover Park, IL: Quintessence Publishing Co, Inc; 2023.
9. Beecroft E, Palmer J, Penlington C, Avery L, Aggarwal VR, Chase M, et al. Management of painful Temporomandibular disorder in adults 2024. Accessed October 17, 2025. Available from: https://www.rcseng.ac.uk/-/media/FDS/Comprehensive-guideline-Management-of-painful-Temporomandibular-disorder-in-adults-March-2024.pdf.
10. Aggarwal VR, Fu Y, Main CJ, Wu J. The effectiveness of self-management interventions in adults with chronic orofacial pain: a systematic review, meta-analysis and meta-regression. Eur J Pain. 2019;23(5):849–65.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.